Bardoel Pit

Natural Environment Report

Project Location:
583398 Hamilton Road, South-West Oxford, ON

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March 31, 2025

MTE File No.: 45731-101

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1.0 INTRODUCTION

MTE Consultants Inc. was retained by J-AAR Materials Limited. to prepare this Natural Environment Report (NER) in support of a Class A application for a Pit Below Water pursuant to approval under the *Aggregate Resources Act* (ARA). The ARA is an act administered by the Ministry of Natural Resources and Forestry (MNRF) to regulate aggregate operational needs in Ontario while minimizing negative impacts to the environment. In conjunction with the ARA, approval under the *Planning Act* is also required.

The proposed aggregate extraction is to take place at 583398 Hamilton Road South in the Township of South-West Oxford to the southwest of the Town of Ingersoll, known as the "Bardoel Pit" (Figure 1). Extraction is proposed within 1.5 m of the water table; thus, it is considered a "pit below water" although extraction will not be occurring within the water table. Extraction will remain a minimum of 1 m above the water table. For the purposes of this report, the License Boundary will be referred to as the Subject Lands hereafter. Environmental features within the Study Area will be evaluated as per Oxford County criteria where available. In accordance with the *Natural Heritage Reference Manual* (NHRM; OMNR 2010), a Study Area, including the Subject Lands and adjacent lands within 120 m, has been defined for the purposes of evaluating ecological features and functions and determining negative impacts to the natural heritage system as a result of proposed aggregate extraction (Figure 1).

1.1 Report Objective

The purpose of a NER is to determine whether any of the significant natural heritage features as identified by the *Provincial Planning Statement, 2024* (PPS) are located in and/or within 120 m of the Subject Lands. This report is intended to address the report requirements under the Aggregate Resources of Ontario: Technical Reports and Information Standards, Section 2.2 (2020) as Aggregate Resource Applications (ARA) are to be in accordance with Provincial Standards per subsection 0.2(2) of Ontario Regulation 244/97. In addition, this report is intended to follow the requirements of an Environmental Impact Study (EIS) as per the County's natural heritage policies. The EIS requirements per Policy 3.2.4 in the County of Oxford Official Plan are generally consistent with the requirements of a NER. The NER will be submitted in support of Zoning By-law Amendment and Official Plan Amendment applications in order to facilitate aggregate extraction from the Subject Lands.

If any natural heritage features were identified within the Subject Lands or within the 120 m, the NER evaluates for provincial significance using the criteria provided in the County of Oxford Official Plan (Consolidated 2023), Natural Heritage Reference Manual (OMNR, 2010) and the Significant Wildlife Habitat Criteria Schedules (MNRF, 2015).

The NER assesses the potential for impacts to any of the identified features or ecological functions of the features from the proposed aggregate extraction. The NER also identifies any preventative, mitigative or remedial measures required, including protected species concerns and potential permitting requirements.

1.2 Format

Natural heritage features and functions identified in the report are evaluated through a review of the Natural Heritage Reference Manual (OMNR, 2010) for policy 4.1 of the Provincial Planning Statement (MMAH, 2024), and Section 3 Natural Resource Management Policies (County of Oxford Official Plan, 2022).

This report will be submitted to the MNRF as a part of an application for a license under the ARA and circulated to the County of Oxford and Township of South-West Oxford for agency review and comment on the findings and recommendations.

This NER contains the following components, in accordance with the standards noted above:

Section 2.0 Environmental Policy Context;

Section 3.0 Description of the Natural Environment;

Section 4.0 Natural Heritage Policy Considerations;

Section 5.0 Description of the Extraction;

Section 6.0 Impacts and Mitigation;

Section 7.0 Summary and Conclusions; and

Section 8.0 References.

1.3 Background Documents

The following additional documents were reviewed to provide context for the Project and conditions within Study Area:

- County of Oxford Official Plan (Consolidated 2023);
- Natural Heritage Reference Manual (MNRF, 2010);
- Oxford Natural Heritage Systems Study (2006 and DRAFT 2016); and
- Hydrogeological Level 1 and Level 2 Assessment (Novaterra Environmental Ltd., 2024).

1.4 Pre-Consultation and Site History

In 2017 to 2018, ecological data was collected in preparation for this NER. A request for information (Stage 1) was submitted to the MNRF on November 30th , 2017 and a response was received on December 11th, 2017, providing the background information on species in the area. In 2018, a pre-consultation meeting with Oxford County, J-AAR Materials Ltd. and MHBC took place, including supporting life science inventories required. An updated pre-consultation meeting took place between MHBC staff and County of Oxford staff on May 30th, 2023, to reintroduce the project and establish required studies. In 2023, a Terms of Reference (TOR) was completed and submitted by MHBC to the County of Oxford. The submitted TOR to agencies is provided in **Appendix A**. The intent is to resume the project and move forward with the ARA application by updating life science inventories, where necessary, and completing the required reporting through this NER.

2.0 ENVIRONMENTAL POLICY CONTEXT

2.1 County of Oxford Official Plan

The County of Oxford Official Plan (Consolidated 2023) includes environmental policies that provide direction for the long-term protection and conservation of natural heritage features and areas and the ecological functions, processes, and linkages that they provide in Oxford County. The general environmental goals of the Official Plan include, but are not limited to, the following:

- Use watershed planning to integrate the Natural Heritage System with regional systems
- Encourage naturalization, replanting of native vegetation and biodiversity throughout the Natural Heritage System;

- Provide for the identification, protection, rehabilitation, and management of natural heritage features and areas and their ecological functions;
- Protect, maintain, and improve surface and groundwater quality and quantity by protecting wetlands, groundwater recharge areas and headwater streams; and
- Minimize or prevent negative impacts on natural heritage features by regulating development, identifying environmental constraints, requiring an EIS as needed and implementing mitigation measures.

Natural Heritage features are identified and mapped on Schedule C-1 of the Official Plan (Consolidated March 2023). Development and site alteration is not permitted within or adjacent to Unevaluated Wetlands, Provincially Significant Wetlands, Significant Valleys, and Woodlands, Habitat of Endangered or Threatened Species, Areas of Natural and Scientific Interest, and Environmentally Significant Areas unless evaluated by a professional and proven to have no negative impacts on the features or ecological functions.

For an Official Plan Amendment to allow a new mineral extraction operation to commence, the County of Oxford requires the proponent to assess cumulative impacts and impacts on the following (to the satisfaction of the County):

- Municipal transportation;
- Natural heritage features and the natural heritage system as a whole;
- Quantity and quality on surface water and groundwater;
- Agricultural resources and operations;
- Community impacts on dust, noise, particulate matter, air quality and traffic; and
- Cultural heritage.

In accordance with Policy 3.4.1.3.4, a detailed plan outlining public consultation process and materials is required to be developed with the County of Oxford and the proponent.

According to Section 3.4.1.6 of the Official Plan, where aggregate extraction is proposed within, or on lands adjacent (i.e., within 50 m) to significant natural features, it must be demonstrated that there will be no negative impact on the natural features or their ecological functions, and that a net environmental gain, consistent with the policies of Section 3.4.1.3.6, will be achieved. Compliance with this policy shall be demonstrated through the completion of a natural heritage assessment, as defined within Section 3.4.1.3.2. If the proposed aggregate extraction expansion will have negative impacts on the natural heritage system, such as the removal of a significant woodland, rehabilitation and restoration will be required to improve the overall ecological function and areal extent of the natural heritage system.

Additionally, where proposed aggregate extraction will negatively impact the natural heritage system, County Council and/or the Area Municipal Council will “consider the relative quality and availability of any competing mineral resources, surface natural resources, or cultural resources, the ecological functions which may be affected, and relevant community and economic factors prior to implementing necessary Official Plan and/or Zoning By-law amendments” (Section 3.4.1.6; Oxford County, 2023), in consultation with the relevant provincial ministries and conservation authorities.

2.1.1 Environmental Classifications

County of Oxford, Schedule C-1 (Consolidated 2023)
To the northwest of the Subject Lands, the open pond is mapped as Provincially Significant Wetland (PSW) with an associated Significant Valleyland corridor connecting to the PSW in the southwest approximately 65 m from the Study Area in the northwest corner (Figure 2).

County of Oxford, Natural Heritage Study (ONHSS) (2006 and DRAFT 2016)
The Oxford County Natural Heritage System Study (UTRCA, 2006 and updated 2016 draft) provides more detailed information about the County's 'ecologically important' natural heritage features and areas and the broader natural heritage system. Features within the Subject Lands have been mapped as part of the Oxford County Natural Heritage System and will be evaluated in accordance with the policies of the Oxford County Official Plan.

2.1.2 Land Use Designations

County of Oxford, Schedule S-1 (Consolidated 2023)
The entirety of the Subject Lands is designated as Agriculture and references a Limestone Resource Area. The Limestone Resource Area does not represent a land use designation but has been identified on Schedule S-1 for reference purposes only. The Adjacent Lands are similarly mapped (Figure 3). Similarly, Appendix 2-1 of the Official Plan references a Sand and Gravel Resource Area on the Subject Lands.

2.2 Township of South-West Oxford Zoning By-Law (No. 25-98)

The Subject Lands are zoned as General Agriculture (A2) with an overlapping Limestone Resource reference (Schedule A; Key Map 30; Figure 4). The lots fronting Hamilton Road are zoned as Residential Existing Lot (RE) and the PSW is zoned as Environmental Protection 1 (EP1).

2.3 Upper Thames River Conservation Authority (UTRCA) Regulation

The Upper Thames River Conservation Authority (UTRCA) administers the Prohibited Activities, Exemptions and Permits regulation, under Ontario Regulation 41/24, pursuant to Section 28 of the *Conservation Authorities Act, 1990* (Revised April 1, 2024). Areas within the jurisdiction of the authority are delineated within the "Regulation Limit" and the Authority may grant permission for development within the Regulation Limit where it has been demonstrated that satisfactory controls will be implemented.

As per Ontario Regulation 596/22 which came into effect on January 1, 2023, Conservation Authorities have been prohibited from providing comments related to natural heritage matters.

Under Section 28 (11), lands licensed under the ARA are not required to obtain permission from Conservation Authorities. Conservation Authorities may act in an advisory role and provide local environmental, watershed and watercourse information to the application process.

2.4 Aggregate Resources Act

The *Aggregate Resources Act* was established to control aggregate resources in Ontario by managing operations on both private and Crown land. Through the regulation of resources, the intent is to minimize impacts on the natural environment due to aggregate extraction and restore extraction sites to previous uses.

Under the ARA, applicants are required to prepare a Natural Environment Report to fulfill the requirements under the Aggregate Resources of Ontario: Technical Reports and Information Standards, Section 2.2 (2020). In regard to natural environment, the report must identify any significant natural heritage features and their functions and assess the natural environment impacts to provide avoidance, mitigation, restoration and/or compensation measures as necessary.

2.5 Provincial Policy Statement

The Provincial Planning Statement (PPS; MMAH, 2024) was issued under the *Planning Act, 1990* to provide direction to regional and local municipalities regarding planning policy, ensuring that decisions made by planning authorities were consistent with provincial policy. With respect to natural heritage features and resources, the PPS defines seven natural heritage features:

- Significant Wetlands and Significant Coastal Wetlands;
- Significant Woodlands;
- Significant Valleylands;
- Significant Wildlife Habitat (SWH);
- Significant Areas of Natural and Scientific Interest (ANSI's);
- Fish Habitat; and
- Habitat of Endangered and Threatened Species.

The Subject Lands are within Ecoregion 7E where no development or site alteration are permitted in Provincially Significant Wetlands or Coastal Wetlands. Development and site alteration are not permitted in Habitat of Endangered or Threatened Species or Fish Habitat or, except in accordance with provincial and federal legislation. For the remaining features, development and site alteration shall not be permitted unless it has been demonstrated through an EIS that there will be no negative impacts on the features or their ecological functions.

While not all features and functions of provincial interest noted above are provided on provincial maps, a review of the Make a Natural Heritage Map (NHIC, 2024) suggests there are no additional mapped features not already covered by the Official Plan Maps. However, the policies noted above are reviewed later in this report supported by site specific field work and consultation with the municipal review agencies.

2.6 Endangered Species Act

The *Endangered Species Act, 2007* protects species listed as Threatened, Endangered or Extirpated in Ontario (SARO, 2007) from killing, harm, harassment or possession, and also protects their habitats from damage or destruction. Activities that may impact a protected species or its habitat require prior authorization from the Ministry of Environment, Conservation and Parks (MECP), unless the activities are exempt under a Regulation.

A stage one screening request was submitted to the MECP in 2017 to confirm species and habitat that needs to be considered as part of this NER. A response has been received at the writing of this report providing background information. The field investigations completed to support this NER have been used to refine the species and habitat lists.

2.7 Migratory Birds Convention Act

The federal *Migratory Birds Convention Act, 1994* (MBCA) aims to protect and conserve migratory birds as populations and individual birds in Canada and the United States. No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of bird species protected under the MBCA and/or Regulations under that Act. Many bird species not protected by the MBCA (e.g. raptors) are protected under the FWCA.

3.0 DESCRIPTION OF THE NATURAL ENVIRONMENT

The following section reviews the abiotic and biotic features on and within 120 m of the Subject Lands that contribute to the overall natural heritage features and functions of the Subject Lands and Adjacent Lands. This review provides relevant background information for interpreting environmental features and functions for evaluation in Section 5.0. Areas outside the property limits were studied from the edge of the property or using satellite imagery.

3.1 Physical Setting

3.1.1 Physiography

The Subject Lands are within a spillway of the physiographic region Oxford Till Plain (MECP, 2022). The Oxford Till Plain covers approximately 1554 km^2 in Ontario primarily in Oxford County (Chapman, L.J. and D. F. Putnam, 1984).

3.1.2 Soils

The Subject Lands contains both Burford Sandy Loam and Guelph Loam soils (OMAFRA, 2022), typical grey brown luvisolic soils (Chapman, L.J. and D. F. Putnam, 1984). Guelph Loam is along the eastern side of the Subject Lands while the remaining soils are Burford Sandy Loam. Both soils typically exhibit good drainage with the Burford Sandy Loam being stone free and the Guelph Loam soils only slightly stony (Wicklund, R.E and Richards, N.R, 1961). On a site-specific basis, Novaterra conducted a hydrogeological investigation drilling nine boreholes revealing clayey silt to silt till overlain by sand and gravel with trace amounts of silt and silty sand with trace amounts of gravel (Novaterra Environmental Ltd., 2024).

3.1.3 Topography

The topography within the general region of the Subject Lands ranges from nearly level to very gentle slopes (OMAFRA, 2019). Within the Subject Lands, the topography is gently undulating with the prominent topography gradient sloping towards the northwest pond (Novaterra Environmental Ltd., 2024).

3.1.4 Surface Water Features

There is an open water feature (pond) to the northwest of the Subject Lands mapped as Provincially Significant Wetlands named Five Points Woods (UT13). A watercourse to the west of the Subject Lands flows into the open pond before discharging into the Thames River to the north. Based on the observed and measured topography by Novaterra Environmental Ltd. (2024), all surface water is expected to flow in the northwesterly direction to the PSW pond.

3.1.5 Hydrogeology

The Subject Lands are within both a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer (MECP, 2022). In the general region of the Subject Lands, the primarily used aquifer is a confined bedrock aquifer (Novaterra Environmental Ltd., 2024). The water table level within the Subject Lands ranges from 285.71 to 268.28 metres above mean sea level.

3.2 Biological Setting

3.2.1 Records Review

Designated Natural Heritage Features

The Land Information Ontario (LIO) mapping (MNRF, 2024), Natural Heritage Information Centre (NHIC) online database (2024), and ONHSS (2006 and 2016) were reviewed for natural heritage features in the Study Area.

The open water to the northwest of the Subject Lands is mapped as a Provincially Significant Wetland named Five Points Woods (UT13). An associated Significant Valleyland is mapped to the west of the Subject Lands including the PSW (County of Oxford Official Plan, Schedule C-1; Figure 2). A continuation of the Five Points Woods is approximately 475 m to the south of the Subject Lands across Thomas Road.

Natural heritage features of the Subject Lands are also mapped as part of the Oxford County Natural Heritage System Strategy (DRAFT ONHSS, 2016 and ONHSS, 2006).

Species Records

For this NER, Protected Species are those listed as Endangered or Threatened on the Species at Risk in Ontario (SARO) List of the ESA. Only species listed as Endangered or Threatened on the SARO List receive protection for individuals or habitat under the ESA. Species of Conservation Concern are those listed as Special Concern on the SARO list, species with a provincial ranking of S1-S3, or locally designated species. Provincial status rankings for plants, vegetation communities and wildlife are based on the number of occurrences in Ontario and have the following meanings:

S1: critically imperiled; often fewer than 5 occurrences;

S2: imperiled; often fewer than 20 occurrences;

S3: vulnerable; often fewer than 80 occurrences;

S4: apparently secure;

S5: secure; and

S?: unranked, or, if following a ranking, rank uncertain (e.g. S3?).

A review of NHIC species records, the Ontario Breeding Bird Atlas, the Ontario Reptile and Amphibian Atlas, citizen science online databases such as eBird and iNaturalist, and the SARO List was conducted to identify Protected Species and SOCC with the potential to be present in the vicinity of the Subject Lands.

On November 30, 2017, a screening request was submitted for the Subject Lands to the MNRF. A response was received on December 11, 2017, outlining Protected Species occurrences in the area.

Protected Species and SOCC identified in background data sources and previous MNRF correspondence are provided in Table 1 below. A full evaluation of species and habitat is provided in **Appendix B.**

Table 1: Species Occurrence Data Review

Common Name	Scientific Name	SARO Status	SARA Status	Date Observed (If Known)	Source
American Badger	*Taxidea taxus*	END	END	-	MNRF, 2017
Bank Swallow	*Riparia riparia*	THR	THR	June 22, 2021	OBBA, 2005; eBird
Blanding's Turtle	*Emydoidea blandingii*	THR	THR	-	MNRF, 2017
Bobolink	*Dolichonyx oryzivorus*	THR	THR	June 22, 2021	NHIC, 2023; OBBA, 2005; eBird
Chimney Swift	*Chaetura pelagica*	THR	THR	-	OBBA, 2005
Eastern Meadowlark	*Sturnella magna*	THR	THR	-	NHIC, 2023; OBBA, 2005
Barn Swallow	*Hirundo rustica*	SC	SC	September 8, 2022	OBBA, 2005; eBird
Blue/Golden-winged Warbler	*Vermivora chrysoptera*	SC	SC	-	OBBA, 2005
Eastern Wood-Pewee	*Contopus virens*	SC	SC	June 20, 2022	eBird; OBBA, 2005
Olive-sided Flycatcher	*Contopus cooperi*	SC	SC	June 2, 2022	eBird
Snapping Turtle	*Chelydra serpentina*	SC	SC		NHIC, 2023;
Wood Thrush	*Hylocichla mustelina*	SC	THR	June 20, 2022	NHIC, 2023; eBird; OBBA, 2005

In addition to the above list, there are a number of other protected species that may be found in Oxford County that are not always listed in the background data sources. These additional species to consider include rare bat species (Little Brown Myotis [END], Northern Myotis [END], Tri-coloured Bat [END], Eastern Small-footed Myotis [END]) and Butternut [END]).

Where suitable habitat for these protected species and SOCC was identified during field investigations, targeted surveys were conducted by MTE on the Subject Lands as part of the current NER. Survey methods and results are discussed below.

Field Investigations

Site investigations were completed on the Subject Lands in 2018 and 2023 to document existing vegetation communities, inventory plant species present within or adjacent the Subject Lands, document bird species breeding on or adjacent to the Subject Lands, identify potential habitat for Protected Species, and record incidental observations of wildlife (Table 2). Targeted field investigations were undertaken in natural habitat within 30 m of the Subject Lands. These investigations were completed to support the assessment of potential impacts to natural heritage features and protected species in the context of provincial and municipal policy.

Table 2: Table of Ecological Surveys on the Subject Lands from 2017-2023

Survey Type	Date	Time	Weather	Staff
Preliminary ELC and Prism Sweep	October 26, 2017	12:30pm- 3:00pm	Partly cloudy, cool	Will Huys
Updated ELC and Bat Habitat	April 11, 2023	11:30am- 1:30pm	Sunny, warm	Will Huys
Spring Plant Inventory	May 2, 2018, and June 12, 2018	7:00am-	Clear, warm, breezy	Will Huys
Updated Spring Plant Inventory	May 31, 2023	8:45am- 10:15am	Sunny, warm	Will Huys
Summer Plant Inventory	July 5, 2018	6:00am-	Some clouds, warm, foggy	Will Huys
Updated Summer Plant Inventory	August 9, 2023	10:40am- 2:10am	Sunny, warm	Tanya Cooper
Fall Plant Inventory	October 26, 2017	-	-	Will Huys
Updated Fall Plant Inventory	October 12, 2023	-	-	Elise Roth
Breeding Bird Survey 1	June 12, 2018	7:00am-	Clear, calm	Will Huys
Updated Breeding Bird Survey 1	May 31, 2023	8:45am-10:15am	Sunny Warm	Will Huys
Breeding Bird Survey 2	July 5, 2018	6:00am-	Partly cloudy, warm, foggy	Will Huys
Updated Breeding Bird Survey 2	June 28, 2023	8:00am-10:00am	Warm, Smokey	Elise Roth
Amphibian Calling Survey	April 21, 2018	8:45pm- 9:20pm	Clear, calm, cool	Will Huys
Amphibian Calling Survey	May 10, 2018	9:24pm-9:54pm	Clear, calm, warm	Will Huys
Amphibian Calling Survey	June 18, 2018	10:45pm-10:48pm	Overcast, warm, humid	Will Huys

Vegetation Communities

Ecological Land Classification (ELC) was initially completed on October 26, 2017 and updated on April 11, 2023 by MTE Ecologists, using protocols outlined in the ELC System for Southern Ontario (Lee et al., 1998). The survey was conducted within the Subject Lands. Adjacent vegetation communities beyond the property limits were not investigated in detail.

All communities listed in Table 3 and shown on Figure 5 are secure in Ontario (NHIC, 2024). ELC field data collection sheets are provided in **Appendix C**.

Table 3: Ecological Land Classifications for the Subject Lands

Polygon	ELC Code	Description	S-rank	Area (ha) In Study Area
Anthropogenic Communities				
R1	-	Residence and Farmyard	N/A	**2.84**
AG	-	Agricultural Lands	N/A	**63.77**
Upland Communities				
1	CUM1/CUW1	Mineral Cultural Meadow/Woodland Ecosite	N/A	**1.36**
2	FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous Forest Type	N/A	**1.71**
2a	MAM3	Organic Meadow Marsh Inclusion	N/A	**0.26**
3	CUP2-1	Black Walnut-White Pine Mixed Plantation Type	N/A	**2.05**
4	CUT1/CUW1	Mineral Cultural Thicket/Woodland Ecosite	N/A	**2.86**
7	SWD	Deciduous Swamp	N/A	**0.67**
Wetland Communities				
5	SWM	Mixed Swamp	N/A	**1.38**
6	OAO	Open Water Aquatic	N/A	**4.65**

Based on collected 2023 data the composition of communities is as follows.

Community 1 is associated with the banks of Community 6 and is a mix of Mineral Cultural Meadow and Mineral Cultural Woodland (CUM1/CUW1). Trees are restricted to the adjacent lands and the most common species are Manitoba Maple (*Acer negundo*), Hackberry (*Celtis occidentalis*), and Bur Oak (*Quercus macrocarpa*) and cover only about 45% of the area. Understory shrubs are also on the adjacent lands and are commonly Buckthorn (*Rhamnus cathartica*), Honeysuckle (*Lonicera tatarica*) and Riverbank Grape (*Vitis riparia*). Grasses and goldenrods are the dominant groundlayer species.

Community 2 is a FOD5-7 Dry-Fresh Sugar Maple-Black Cherry Deciduous Forest Type community. Sugar Maple (*Acer saccharum*) is highly dominant with Black Cherry (*Prunus serotina*) as the next most dominant. Other canopy species include American Beech (*Fagus grandifolia*), Basswood (*Tilia americana*), and Red Oak (*Quercus rubra*). The community has been logged within the last 10 years and areas of logging have colonized heavily with young maple trees and Chokecherry (*Prunus virginiana*). Garlic Mustard (*Alliaria petiolata*) and Running Strawberry Bush (*Euonymous obovata*), alongside Canada Goldenrod (*Solidago canadensis*) are the most common groundlayer plants.

Along the west boundary of the woods, about 5-10m into the field is a seep/spring area that was not farmed in 2017 or 2023. Wetland plants were present at this spot along with non-wetland plants. Through the woods, from west to north-east is a low section which presumably carries water from this spring/seep to the adjacent wetlands and ultimately to the Thames River. This low section is wetland plant dominant (*Impatiens capensis, Eupatorium maculatum, Rumex obtusifolia*) and has been identified as an MAM3 Organic Meadow Marsh inclusion (Community 2a).

Community 3 is CUP2-1 Black Walnut-White Pine Mixed Plantation Type community. The community is fairly young, and most trees are between 2 and 7m tall. Black Walnut (*Juglans nigra*) but White Pine (*Pinus strobus*) is planted in at about a 10:1 ratio. The community is still quite open and Smooth Brome (*Bromus inermis*) is the dominant groundlayer plant.

Community 4 is on the adjacent lands to the east. The community appears to be and has been classified as CUT1/CUW1 Mineral Cultural Thicket/Woodland Ecosite. Bitternut (*Carya cordiformis*), Elm (*Ulmus americana*), and Aspen (*Populus tremuloides*) and others, cover about 55% of the area. Buckthorn (*Rhamnus cathartica*), Hawthorn (*Crataegus sp.)* and Dogwood (*Cornus racemosa*) cover much of the remaining area.

Community 5 is also on adjacent lands and is part of the same feature as Community 2 and 4. It is a Mixed Swamp (SWM). Ferns and Joe-Pye Weed (*Eupatorium maculatum*) are common.

Community 6 is an OAO Open Water Aquatic. The community is presumably an old aggregate pond. Around 150 Mallards were on the pond in October 2017; ducks were observed in 2023 as well. Fragrant Water Lily (*Nymphea odorata*) and Broad-leaved Cattail (*Typha latifolia*) vegetation was visible from the edge. A 210 m strip of cultural meadow continues west, and a 150 m of cultural meadow is present along the east side of the feature.

Community 7 is Deciduous Swamp (SWD) Community dominated by Red and Silver Maples (*Acer sp*.).

3.2.2 Significant Wildlife Habitat

The MNRF Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (January 2015) uses ELC ecosite codes and habitat criteria (e.g. size of ELC polygon, proximity to other natural features) to define candidate SWH. An assessment of candidate SWH was completed for the Subject Lands using a combination of desktop analysis and field observations, and is provided in **Appendix D.** The following SWH types were identified:

Candidate Seasonal Concentrations of Animals

Candidate Specialized Habitats of Wildlife Considered SWH

Candidate Habitats for Species of Conservation Concern Considered SWH

Candidate SWH types are further evaluated using the results of targeted field investigations to determine if SWH was confirmed based on criteria such as species presence, abundance, and diversity. Results of the assessment of significance for SWH are presented in Section 5.0.

Floristic Quality Analysis

Botanical inventories conducted on the Subject Lands were used to inform associated vegetation community assessments using the Southern Ontario Floral Inventory Analysis (SOFIA; Lebedyk, 2018). SOFIA assigns quantitative plant community values based on floral inventories to evaluate the ecological significance and natural quality of vegetation communities. Results of the floristic quality analysis are provided in Table 4 for each ELC unit identified on the Subject Lands.

Through SOFIA, the mean CoC of vegetation communities was calculated based all species observed to provide a measure of floristic quality (Lebedyk, 2018). A mean CoC greater than 3.5 is indicative of a floristic quality characteristic of remnant natural habitats. A mean CoC greater than 4.5 indicates a relatively intact natural area with high floristic quality.

The Floristic Quality Index (FQI) defined through SOFIA is intended to quantify the overall vegetative quality of a community based on the mean CoC and the number of species present (Oldham et.al., 1995). A community with a FQI less than 20 is considered to have minimal significance from a natural quality perspective, while a community with a FQI greater than 20 is of high floristic quality and a community with a FQI greater than 35 is considered to have sufficient conservatism and richness to be floristically important from a provincial perspective. The mean CoC of Community 2 is higher than the minimum 3.5 threshold for floristic quality. The mean FQI values of Communities 2 and 4 are higher than the minimum 20 threshold for floristic quality.

Table 4: Southern Ontario Floral Inventory Analysis (SOFIA) Results

Vegetation Community	Mean CoC	FQI	% Native Species	Comments
Community 1	1.67	10.98	63	• Not sufficient to be of remnant natural quality • Not significant from a natural quality perspective
Community 2	**3.67**	**25.40**	83	• Sufficient floristic quality to be of remnant natural quality • Significant from a natural quality perspective
Community 3	1.64	12.29	57	• Not sufficient to be of remnant natural quality • Not significant from a natural quality perspective
Community 4	3.06	**21.22**	85	• High floristic quality • Significant from a natural quality perspective
Community 5	3.39	19.50	88	• High floristic quality to be of remnant natural quality • Not significant from a natural quality perspective
Community 6	3.00	4.24	100	• High floristic quality • Not significant from a natural quality perspective
Community 7	3.00	6.71	100	• High floristic quality • Not significant from a natural quality perspective

Minimal vascular plants were recorded for communities 6 and 7 as Community 6 is an open aquatic pond and community 7 is largely off the Subject Lands and was only observed for obvious species from a distance. Due to the lack of collected vascular plants, the floristics for communities 6 and 7 presented in table 3 are misrepresentative of the communities and should be interpreted with caution. The full floral inventory is provided in **Appendix E**.

3.2.3 Faunal Site Investigations

Breeding bird surveys, bat habitat assessments and general observations of habitat suitability for Protected Species were completed on the Subject Lands.

Avifauna

Two breeding bird surveys were conducted by Will Huys on May 31, 2023, and Elise Roth on June 28th following on the protocols provided in the Ontario Breeding Bird Atlas (OBBA) (Cadman et al., 2007). Surveys consisted of an area search in all vegetation communities on the Subject Lands. The highest level of breeding evidence was recorded for each species using codes from the Ontario Breeding Bird Atlas (Cadman et al. 2007). Surveys began within half an hour of sunrise and were completed by 10 am.

A total of 28 species were observed within the Subject Lands. All species observed were secure (S5B) or apparently secure (S4B) breeding species in Ontario.

Barn Swallows, a species of special concern, were observed in the field during visit two in 2023. A complete list of bird species observed is provided in **Appendix F**.

Bats

Candidate bat maternity roost trees were identified using guidance from the *Survey Protocol for Species at Risk within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-coloured Bat* (MNRF, 2017). This protocol involves assessing trees based on species, diameter at breast height (DBH), height, presence of loose/peeling bark, cavity and cavity height, decay class, open canopy, and proximity of other snags.

Three candidate bat habitat trees were noted along the east edge of the woodland feature and photographed for reference. One candidate bat maternity roost was observed from a distance along the west boundary (Figure 6).

4.0 NATURAL HERITAGE POLICY CONSIDERATIONS

Provincial and municipal natural heritage policies provide guidelines that determine appropriate land uses on and adjacent to natural heritage features and functions. This section reviews the provincial, municipal and Conservation Authority regulatory policies which apply to Natural Heritage features and functions of the Subject Lands and larger Study Area.

Policies and regulations that may pertain to the Subject Lands include:

- the 2024 Provincial Planning Statement, Section 4.1, issued under the *Planning Act, 1990*
- the Natural Heritage Reference Manual (NHRM; OMNR, 2010),
- the County of Oxford Official Plan, Chapter 3 – Natural and Cultural Resource Management Policies (Consolidated 2023),
- the UTRCA Regulations (*Conservation Authorities Act – Ontario Regulation 41/24*).
- the *Endangered Species Act, 2007*
- the *Migratory Birds Convention Act, 1994*

The policies above are applied to natural features and functions identified in Section 4.0 of this NER in order to determine which components of the natural heritage system will require additional consideration.

4.1 Provincial Policy

4.1.1 Provincially Significant Wetlands (PSW)

In accordance with the PPS (2024), significant wetlands are defined as an area identified as provincially significant by MNRF or their designates, using evaluation criteria established by the province (i.e., Ontario Wetland Evaluation System; MNR, 2022).

As per the LIO database, one wetland unit occurs within the Study Area. Of the identified wetlands, no wetland units were identified on, or partially overlapping, the Subject Lands. The Open Pond to the northwest of the Subject Lands is mapped as a PSW named the Five Point Woods (Figure 2).

Development and site alteration shall not be permitted within significant wetlands as per Policy 4.1.4 of the PPS (2024).

4.1.2 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (OMNR, 2000) and the Criteria Schedules for Ecoregion 7E (MNRF, 2015) provide guidance to planning authorities with respect to the identification and protection of SWH in the context of the municipal planning process. Candidate habitat shall be evaluated in accordance with ELC Ecosite Codes and habitat criteria defined within the Criteria Schedules for Ecoregion 7E (MNRF, 2015) to identify potential protection areas. Not all sites identified as candidate habitat will be protected due to habitat limitations and based on minimum standards for habitat quality and sustainability. Candidate SWH shall subsequently be reviewed in the context of defining criteria for confirmed SWH based on the results of targeted ecological field investigations assessing species presence, abundance and diversity.

Appendix D provides a detailed assessment of SWH types with the potential to occur within the Study Area. Based on the results of the SWH assessment, the following candidate and confirmed habitat types were identified on, or adjacent to, the Subject Lands:

Candidate Significant Wildlife Habitat

Seasonal Concentrations of Animals

Waterfowl Stopover and Staging Areas (Aquatic; Adjacent Lands)
Raptor Wintering Area (Subject & Adjacent Lands)
Bat Maternity Colonies (Adjacent Lands)
Turtle Wintering Areas (Adjacent Lands)
Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs; Adjacent Lands)

Specialized Habitats of Wildlife Considered SWH

Waterfowl Nesting Area (Adjacent Lands)
Turtle Nesting Area (Adjacent Lands)
Springs and Seeps (Subject & Adjacent Lands)
Amphibian Breeding Habitat (Woodland; Adjacent Lands)

Habitats for Species of Conservation Concern Considered SWH

Marsh Breeding Bird Habitat (Adjacent Lands)
Open County Bird Breeding Habitat (Subject Lands)
Terrestrial Crayfish (Adjacent Lands)
Habitat for Eastern Wood-Pewee, Snapping Turtle and Wood Thrush (Adjacent Lands)

Remaining Candidate Significant Wildlife Habitat

- Bat Habitat Colonies (Adjacent Lands);
- Turtle Wintering Areas (Adjacent Lands);
- Turtle Nesting Areas (Adjacent Lands);
- Springs and Seeps (Adjacent Lands);
- Amphibian Breeding Habitat (Woodland; Adjacent Lands);
- Terrestrial Crayfish (Adjacent Lands); and
- Habitat for Snapping Turtle (Adjacent Lands).

As per Section 4.1.5 of the PPS, development and site alteration shall not be permitted within SWH, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Potential impacts to candidate and confirmed SWH identified on, and adjacent to, the Subject Lands are addressed further in Section 7. Avoidance, mitigation, and compensation strategies to demonstrate that proposed extraction will satisfy the test of no negative impacts, per the PPS, are provided in Section 7.

Bat Maternity Colonies

There may be candidate habitat in the Adjacent Lands; however, it was not investigated in detail and as such bat maternity colonies for the Adjacent Lands remain candidate SWH.

Turtle Wintering Areas

There is potential habitat in the permanent pond to the northwest of the Subject Lands. Targeted surveys were not conducted to confirm the presence or absence of turtles; therefore, turtle wintering areas remain candidate SWH for the Adjacent Lands.

Turtle Nesting Areas

There is potential habitat in the permanent pond to the northwest of the Subject Lands. Targeted surveys were not conducted to confirm the presence or absence of turtles; therefore, turtle nesting areas remain candidate SWH for the Adjacent Lands.

Springs and Seeps

A spring was observed in 2018 at the boundary of the Subject Lands and Community 2. This was confirmed again in 2023. Additional springs may be present within the Adjacent Lands; however, the Adjacent Lands were not thoroughly investigated. It can not be confirmed if more springs are present as such springs and seeps remain candidate SWH for the Adjacent Lands.

Amphibian Breeding Habitat (Woodland)

There is potential amphibian breeding habitat within the adjacent pond and wetland habitat to the east of the Subject Lands. Targeted amphibian surveys were not conducted to confirm absence or presence of amphibians as such amphibian breeding habitat remains candidate SWH.

Terrestrial Crayfish

Suitable habitat is present in the adjacent wetland communities (2a and 5); however, these were not investigated in detail to confirm absence or presence of chimneys or burrows as such it remains as candidate SWH.

Habitat for Snapping Turtle

There is potential habitat for snapping turtle in the adjacent permanent pond to the northwest of the Subject Lands. Targeted surveys were not conducted to confirm presence or absence of species as such habitat for snapping turtle remains candidate SWH.

4.1.3 Habitat of Endangered or Threatened Species

In accordance with the *ESA* (2007), the habitat of all provincially ranked Threatened or Endangered species shall be protected from damage or destruction.

Through the background review and ecological field investigations, the presence of the woodland community (Communities 2, 2a, 4 and 5 contiguous feature) requires that SAR bat species (i.e., Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat) also be considered. Three candidate bat habitat trees were noted along the eastern edge of the contiguous woodland and wetland feature. A single candidate bat habitat tree was identified along the west boundary of the Subject Lands.

4.1.4 Fish Habitat

Fish habitat, as defined under the federal *Fisheries Act*, "*means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas*." Under the *Fisheries Act*, any work, undertaking, or activity that would result in the harmful alteration, disruption, or destruction of fish habitat (subsection 35(1)) or the death of fish by any other means other than fishing (subsection 34.4(1)) is prohibited.

Fish habitat is not present within the Subject Lands or Study Area as per DFO mapping (2019) no critical habitat or endangered or threatened species are present within the Subject Lands. Fish habitat may be present within the adjacent Thames River approximately 132 m from the Subject Lands across Hamilton Road.

4.1.5 Significant Valleylands

Significant valleyland are defined as natural areas occurring within a valley or other landform depression with flowing or standing water that are "*ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system*" (MMAH, 2024). Significant valleylands are defined and designated by the planning authority based on the general guidelines for determining valleyland significance that are outlined within Section 8.0 of the NHRM (OMNR, 2010). Recommended evaluation criteria for determining valleyland significance include landform prominence, degree of naturalness, community and species diversity, habitat value, linkage functions and restoration potential.

The closest mapped Significant Valleylands are associated with the Thames River approximately 110 m to the north of the Subject Lands and the unnamed drain associated with the open pond to the west and northwest on Schedule C-1 of the Official Plan outside of the Subject Lands. The mapped drain overlaps the Study Area where it flows through the pond in the northwest, approximately 115 m from the Subject Lands. The PSW itself is considered part of the Significant Valleyland (Figure 2).

4.1.6 Significant Woodlands

Significant woodlands should be defined and designated by the planning authority in accordance with the evaluation criteria outlined within Section 7.0 of the NHRM (OMNR, 2010). Criteria for designating significant woodlands include size, shape, proximity to other woodlands or natural features, linkages, species diversity, uncommon characteristics, and economic and social value (i.e., per NHRM Table 7-2). In accordance with the NHRM (OMNR, 2010), woodland size criteria are defined by the special extent of the woodland relative to the percentage of woodland coverage among the physical sub-units (e.g., watersheds, biophysical

regions) within the planning area. Woodland patches with bisecting openings 20 m or less in width are considered part of the same continuous woodland. Furthermore, minimum patch widths may be applied as a size threshold at the discretion of planning authority when delineating woodlands to exclude relatively narrow linear treed areas such as hedgerows (e.g., a minimum 40 m average width where the size threshold is 4 ha or 60 m width where the size threshold is 10 ha).

Within the Oxford County, woodland coverage is approximately 12%. As per the woodland size criteria defined within the NHRM (OMNR, 2010), where woodland cover is between 5% to 15% of the land cover, woodlands 4 ha or more in size should be considered significant.

Woodlands located in Community 2 are 1.71 ha in size and are generally contiguous with wetland community 5 and the cultural woodland in community 4 for a total of approximately 6.21 ha. As such, woodlands adjacent to the Subject Lands meet provincial significance criteria as defined within the NHRM (OMNR, 2010). In addition, Community 2 has sufficient floristic quality to be of remnant natural quality and is floristically significant from a natural quality perspective. The high floristic quality of the feature combined with the relatively high floristic quality of the adjacent communities, confirmed spring in Community 2 and candidate SWH the significance of the entire woodland feature is supported. The woodland is abutting the northeast corner of the Subject Lands.

As per Section 4.1.5 of the PPS (MMAH, 2024), development and site alteration shall not be permitted within significant woodlands, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

4.1.7 Areas of Natural and Scientific Interest (ANSIs)

Significant ANSIs are identified as provincially significant by MNRF in accordance with evaluation procedures established by the province.

As per LIO mapping, no significant ANSIs were identified within the Study Area.

4.2 Oxford County Official Plan Environmental Protection Areas

4.2.1 Significant Wetlands

In accordance with the PPS (2024), significant wetlands are defined as an area identified as provincially significant by MNRF or their designates, using evaluation criteria established by the province (i.e., Ontario Wetland Evaluation System; MNRF, 2022).

As per the LIO database, one wetland unit occurs within the Study Area. Of the identified wetlands, no wetland units were identified on, or partially overlapping, the Subject Lands. The Open Pond to the northwest of the Subject Lands is mapped as a PSW named the Five Point Woods (Figure 2).

Development and site alteration shall not be permitted within significant wetlands as per Policy 4.1.4 of the PPS.

4.2.2 Significant Wildlife Habitat

In accordance with the County of Oxford Official Plan, Significant Wildlife Habitat is identified based on the following criteria:

- Extent of wildlife;
- Habitat diversity;

- Existing linkages; and
- Seasonal concentration of wildlife species.

Significant Wildlife Habitat was also assessed by comparing available data from desktop and field investigations to the criteria set out the in Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (January 2015). Candidate SWH is outlined in Section 5.1.2.

4.2.3 Fish Habitat

Fish habitat, as defined under the federal *Fisheries Act*, "*means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas*." Under the *Fisheries Act*, any work, undertaking, or activity that would result in the harmful alteration, disruption, or destruction of fish habitat (subsection 35(1)) or the death of fish by any other means other than fishing (subsection 34.4(1)) is prohibited.

Fish habitat is not present within the Subject Lands or Study Area. Fish habitat may be present within the adjacent Thames River approximately 132 m from the Subject Lands across Hamilton Road.

4.2.4 Significant Valleylands

There are no mapped Significant Valleylands within the Subject Lands. The closest mapped Significant Valleylands are associated with the Thames River approximately 110 m to the north and the unnamed drain associated with the open pond to the west and northwest on Schedule C-1 of the Official Plan. The PSW itself is considered part of the Significant Valleyland (Figure 2).

4.2.5 Significant Woodlands

There are no mapped Significant Woodlands on Schedule C-1 of the Official Plan within the Subject Lands. Based on size alone, the woodlands to the east of the Subject Lands are considered significant as per Section 5.1.6.

4.2.6 Significant Life Science Areas of Natural and Scientific Interest

There are no mapped Significant Life Science ANSIs within or adjacent to the Subject Lands.

4.2.7 Locally Significant Natural Heritage Features

There are no mapped locally significant natural heritage features within or adjacent to the Subject Lands on Schedule C-1 of the Official Plan.

4.3 Oxford County Official Plan Open Space Areas

Open Space Areas apply to the following areas Regulatory Flood Plain Areas, Floodways where Two Zone Flood Plain policies apply, Conservation Authority lands, other public lands, Earth Science Areas of Natural and Scientific Interest, parks, pathways, recreation areas and stormwater management facilities. Open Space Area designations are applied to encourage the passive enjoyment of natural features and active recreation. Open Space Areas recognize the natural constraints and aim to enhance current important ecological functions by encouraging passive uses of the space.

4.3.1 Regulatory Floodplain and Floodway Areas

Based on online UTRCA regulation mapping, the open pond (Five Points Woods PSW) is within the UTRCA's regulation limit likely associated with a floodplain area. On Schedule C-2 (County of Oxford Official Plan Consolidated 2023) the open pond feature is also mapped as Erosion Hazard Land. These features are regulated in accordance with Ontario Regulation 41/24, pursuant to Section 28 of the *Conservation Authorities Act*.

4.3.2 Conservation Authority Lands

Based on online UTRCA regulation mapping, the open pond (Five Points Woods PSW) is within the UTRCA's regulation limit. This regulation is associated with the Five Points Woods PSW.

4.3.3 Other Public Lands

There are no parks, pathways, or other public lands within the Subject Lands.

4.3.4 Earth Science Areas of Natural and Scientific Interest

There are no Earth Science Areas of Natural and Scientific Interest identified on Schedule C-1 or identified in the LIO database (NHIC, 2024).

4.3.5 Parks and Recreation Areas

There are no mapped Parks or Recreation Areas within the Subject Lands.

4.3.6 Non-Provincially Significant and Unevaluated Wetlands

The wetland communities adjacent to the Subject Lands to the northwest and southwest are mapped as Provincially significant and are discussed in Section 5.1.1. The additional wetland communities to the west of the Subject Lands are unevaluated contained within the woodland feature.

4.3.7 Woodlots and Trees

Woodlands to the east of the Subject Lands are not mapped on Schedule C-1 as Locally Significant Natural Heritage Features. The proposed aggregate pit will not require the removal of any trees to the west as it will be outside the Subject Lands. No trees exist within the boundaries of the Subject lands. Regulations governing the removal and destruction of trees are discussed in Section 5.4, Oxford County Woodlands Conservation By-Law.

4.3.8 Locally Important Habitat Areas

Significant wildlife habitat was discussed in Section 5.1.4. General habitat for wildlife is associated with the natural vegetation communities within the Subject Lands. The watercourses through the woodland feature and the hedgerow along the west property boundary may provide additional wildlife movement corridors.

4.4 Oxford County Woodlands Conservation By-Law (6035-2018)

The Woodlands Conservation By-Law (No. 6035-2018) regulates the injuring and destruction of trees and encourages preservation and planting of trees to conserve and enhance woodlands throughout the County of Oxford; however, the injuring or removal of trees under the Aggregate Resources Act is exempt from the County By-law.

4.5 Summary of Identified Features and Functions

Table 5 presents a summary of features and functions of the Subject Lands and Adjacent Lands that have been identified through the policy review, above, as requiring further consideration in the NER.

Table 5: Environmental Considerations for the Study Area

Policy Category	Environmental Consideration	Natural Heritage Feature	Present on Subject Lands	Present on Adjacent Lands
Provincial Policy Statement	Provincially Significant Wetlands	• Provincially Significant Wetlands: pond to the northwest of the Subject Lands is a PSW (Five Points Woods)		✓
	Significant Woodlands	• The woodland feature to the east of the Subject Lands meets the NHRM size criteria for significance.		✓
	Significant Wildlife Habitat	• Candidate Significant Wildlife Habitat in the Adjacent Lands: Bat Habitat Colonies, Turtle Wintering Areas, Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs), Turtle Nesting Areas, Springs and Seeps, Amphibian Breeding Habitat (Woodland), Terrestrial Crayfish, Habitat for Snapping Turtle		✓
County of Oxford (Consolidated 2023)	Significant Wetlands	• Significant Wetlands: pond to the northwest of the Subject Lands is a PSW (Five Points Woods)		✓
	Significant Valleylands	• Significant Valleyland is mapped along the PSW to the northwest of the Subject Lands extending to the south		✓

5.0 DESCRIPTION OF THE EXTRACTION

Based on the above review, there are several components of the natural heritage system within the Study Area that have been considered in this NER. No removal of natural heritage features is proposed as the current extraction limit is a minimum of 15 m away from adjacent natural heritage features. Temporary berms 6 m high are proposed within buffer areas to the PSW and significant woodland. Berms will be progressively deconstructed and used for rehabilitation. Post-extraction, buffer areas should remain and be seeded to provide a net environmental gain to the existing features. A 1.2 m high post and wire fence is proposed along the eastern boundary adjacent to the significant woodland. To minimize cumulative impacts, the extraction will be phased, and each phase will be rehabilitated sequentially as such the entire Subject Lands will not be disturbed at once. Site and rehabilitation plans, prepared by others, will adhere to applicable standards as outlined in the *Aggregate Resources of Ontario: Site Plan Standards (2020).*

5.1.1 Ecological Buffers

Ecological buffers intended to protect natural heritage features and areas, and their ecological functions and processes.

Buffer requirements are determined as part of an EIS and guided by reference documents such as:

- UTRCA Policy Manual (2017);
- Ecological Buffer Guideline Review (Beacon, 2012); and
- NHRM (OMNR, 2010).

Provincially Significant Wetlands, Significant Wildlife Habitat, and habitat for Protected Species are present within the Study Area. Suggested setbacks for woodlands range from 10 m (Beacon, 2012) to 30 m. The suggested buffer widths will be taken into account along with the sensitivity and quality of the features to determine appropriate setbacks from extraction to natural heritage features. Buffers will be further discussed in Section 7 in the context of impact avoidance and mitigation.

6.0 IMPACTS AND MITIGATION

In accordance with provincial standards, potential impacts, predicted effects, mitigation and enhancement measures associated with the proposed development and/or site alteration should be assessed through an EIS, or like study, prepared to the satisfaction of the MNRF, County and Township. The impact assessment and mitigation measures presented herein shall address the requirements of the PPS (2024) to ensure that the test of no negative impacts to natural heritage features and areas or their ecological functions is demonstrated. Potential impacts to the natural heritage features and environmental functions that occur on, and adjacent to, the Subject Lands have been evaluated over the short and long term to ensure that proposed avoidance and/or mitigation strategies will contribute to the sustainability and resiliency of a diverse ecosystem over the long term.

The predominant natural heritage features present on, and adjacent to, the Subject Lands include Provincially Significant Wetlands, Candidate Significant Wildlife Habitat, Candidate Bat Maternity Roosts and Significant Woodlands (Figure 6).

Potential impacts of proposed extraction operations on existing ecological features and functions shall be reviewed in the context of:

1) Direct Impacts: Associated with the direct removal or alteration of natural heritage features that may occur in support of a proposed extraction;
2) Indirect Impacts: Potential secondary effects to ecological functions or pathways that could result in long-term, negative impacts to natural heritage features;
3) Induced Impacts: Associated with post-extraction impacts that may result in an increased demand on natural resources; and
4) Cumulative Impacts: Incremental effects to natural heritage features occurring as a result of adjacent land uses.

Potential direct and indirect effects based on the proposed limit of extraction illustrated on Figures 7 & 8, and a summary of general recommended mitigation and restoration strategies are provided below.

6.1 Direct Impacts and Mitigation

6.1.1 Vegetation Removal

No natural vegetation outside of the Subject Lands will be removed to accommodate the aggregate operation. Annual row crops and farm field vegetation will be removed for the duration of the aggregate extraction. Upon completion of the aggregate extraction lands will be restored to farm field operations with the exception of buffer/setback areas.

6.2 Indirect Impacts and Mitigation

6.2.1 Provincially Significant Wetlands and Wetlands

The Five Points Woods PSW to the northwest of the Subject Lands will not be directly impacted and is bordered by an existing permanent fence line. The PSW boundary is generally in line with the permanent fence, which is approximately 15 m from the License Boundary. Further, a 15 m buffer/setback from the License Boundary to the extraction limit will be applied (**Figure 7**) creating a total combined buffer of approximately 30 m from the mapped PSW boundary. The construction of a temporary berm is proposed within the 15 m setback from the License Boundary and will remove a portion of the existing cultural meadow vegetation surrounding the PSW.

The following recommendations are listed below to further protect the PSW from adjacent works.

Recommendation 1: As per the Novaterra Environmental Ltd. Hydrogeological Level 1 and Level 2 Assessment Report (2024), develop and implement a groundwater monitoring and contingency plan.

Recommendation 2: No extraction shall occur between the License Boundary and the Extraction Limit as shown on **Figure 7**. Buffers (including berms) should be seeded as per Section 6.2.8.

6.2.2 Significant Woodlands

The contiguous woodland feature to the east side of the Subject Lands meets the size criteria to be considered significant under the OMNR criteria. No removal of the significant woodland feature is proposed to accommodate extraction or construction and as such, no net negative impacts are expected. A 15 m buffer from the woodland dripline is recommended to protect the ecological functions of the woodland. The use of variable berms and vegetative screens should be considered in the design of operations as to complement the natural topography and protect adjacent natural features. The proposed 1.2 m high post and wire fence along the boundary of the Subject Lands is not anticipated to harm any trees within the significant woodland.

Recommendation 3: No extraction shall occur within 15 m of the significant woodland. Buffers (including berms) should be seeded as per Section 6.2.8.

6.2.3 Significant Wildlife Habitat

All candidate SWH is associated with adjacent natural vegetation communities. No adjacent features will be removed or directly impacted due to the implementation of a 15 m buffer/setback from the License Boundary, which is beyond the significant woodland and wetland features.

6.2.4 Habitat of Endangered and Threatened Species

The three (3) candidate bat maternity trees along the east side of the Subject Lands and one along the west will not be impacted as they are outside of the extraction limit. A 15 m buffer from the Subject Lands (License Boundary) will be applied as such extraction activities will not impact candidate bat maternity trees.

Recommendation 4: Maintain a 15 m buffer from the woodland to protect the candidate bat maternity trees.

6.2.5 Migratory Birds and Wildlife

Nesting migratory birds are protected under the MBCA. No work is permitted to proceed that would result in the destruction of active nests (i.e., nests with eggs or young birds), or the wounding or killing of birds, of species protected under the MBCA. Some MBCA-protected species, such as Killdeer, may make use of fallow areas present on the Subject Lands as this species frequently nests on the ground on construction sites and within other disturbed areas.

Wildlife may also experience disturbance during construction when crossing roads or moving through active construction areas. Timing restrictions on vegetation removal are recommended to avoid disturbance to wildlife that may be using natural areas on the site, including breeding birds and reptiles.

Recommendation 5: If minor vegetation clearing or pruning is required, avoid the work during migratory bird breeding season (April 1 to August 31) to ensure that no active nests are removed or disturbed, in accordance with the MBCA. If works are proposed during the breeding season, the area should be checked for nesting birds by a qualified professional prior to any vegetation removal or ground disturbance. If nesting birds are present, works in the area should not proceed until after August 31 or until the nest has been confirmed inactive (e.g., young have fledged).

Recommendation 6: Major site grading activities during construction phases should be timed to avoid breeding, nesting and migration periods of amphibians and turtles (i.e., generally April 1 to September 31). Site personnel should be advised to take particular care when working in this active period for wildlife and instructed how to respond appropriately to wildlife encounters.

Recommendation 7: Advise workers of potential incidental encounters with wildlife and the necessary protections. If an animal enters the work site, work at that location will stop and the animal should be permitted to leave without being harassed. If there are repeat observations of wildlife in the work area, barrier fencing may be used to direct wildlife away from active construction and toward natural areas.

6.2.6 Sediment and Erosion Control Measures

Erosion and sedimentation from the disturbed work area has the potential to result in adverse effects on water quality and/or adjacent wetlands. Extraction and construction impacts must be mitigated in order to prevent adverse effects through the implementation of erosion and sediment control measures.

Recommendation 8: Temporary berm slopes adjacent to the PSW and significant woodland shall be graded at 2:1 and vegetated immediately to prevent erosion and sedimentation into the features as outlined below in Section 6.2.8.

Recommendation 9: Prior to construction phases, robust sediment and erosion control fencing should be installed along outer berm toe-of-slope adjacent to the PSW and the significant woodland. Erosion and sediment control fencing will act as a barrier to spills and disturbance that may impact the adjacent wetlands and woodlands, as well as aid in keeping existing vegetation intact. Sediment and erosion control fencing will be installed according to the Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019).

Recommendation 10: Soil stockpiles should be established in locations where natural drainage is directed away from the adjacent wetlands and woodlands. No soil should be stockpiled in close proximity to wetlands or the adjacent woodland feature to the east. If this is not possible and there is a possibility of any stockpile slumping and moving toward the edge of these features, the stockpiles should be protected with alternative sediment and erosion control measures. Access to the stockpile should be confined to the up-gradient side.

Recommendation 11: Sediment and erosion control fencing should be inspected prior to construction and extraction operations to ensure it was installed correctly and during construction/extraction to ensure that the fencing is being maintained and functioning properly. Any issues that are identified are to be resolved in the same day.

Recommendation 12: Sediment and erosion control fencing should not be removed until adequate re-vegetation and site stabilization has occurred. Additional re-vegetation plantings and/or more time for vegetation to establish may be required; however, two growing seasons are typically sufficient to stabilize most sites.

6.2.7 Construction Site Management

Construction on the Subject Lands should be organized, executed, and controlled to ensure compliance with approved NER requirements, erosion and sediment control monitoring and applicable legislation. Construction should be kept away from natural areas to minimize impacts and/or damage to adjacent properties.

Recommendation 13: No heavy equipment, vehicles or other equipment is to enter adjacent natural areas. Limits of construction shall be delineated with Erosion and Sediment Control fencing prior to construction phases.

Recommendation 14: Implement Best Management Practices (BMPs) for all refueling, fuel, and lubricant storage and equipment maintenance activities.

Recommendation 15: Prohibit refueling and maintenance activities within 30 m of any waterbody.

Recommendation 16: Implement a spill contingency plan during construction.

Recommendation 17: Creation of suitable Bank Swallow habitat (e.g., soil stockpiles) during extraction should be avoided. Best management practices for deterring nesting during extraction activities should be implemented (MNRF, 2017). These measures should include but are not limited to grading stockpiles, eliminating near vertical extraction faces, reducing slopes to 70 degrees or less beginning at the start of April until at least July 20 of any year.

Recommendation 18: All necessary lighting for operations should be directed downward and directed away from the adjacent PSW and significant woodland features.

6.2.8 Long-term Land Conservation

As per the County of Oxford OP Policy 3.4.1.3.5, the first priority of the County is to return extraction areas to agricultural lands where feasible. Where the return of agricultural lands is determined to be unfeasible, the second priority is to rehabilitate and improve natural heritage

features for the overall system. After extraction is complete, the lands will be restored to agricultural lands. A rehabilitation plan outlining final ground surface topography and other details is to be prepared by others. No natural features will be removed to accommodate extraction or construction operations. The proposed 30 m and 15 m buffers (including berms) shall be seeded immediately upon berm creation and berm deconstruction with appropriate seed mixes to provide additional natural area and buffer to the natural heritage feature post-extraction. The dominant vegetation communities of the Subject Lands and adjacent lands should be used to guide the restoration plan for the buffers. The buffer adjacent to the woodland community (Communities 2 and 3) should be seeded with OSC's Woodland Native Seed Mixture (8275) or approved equivalent while the buffer areas along the north and west of the extraction limits should be seeded with OSC's Early Succession Dry Prairie Meadow Native Seed Mixture (8115) or approved equivalent. Sowing measures should be followed as outlined by the OSC instructions All seed mixes selected for buffer areas should include native plants to the Ecoregion (7E) and preferably included in the UTRCA recommended plant lists (UTRCA, 2021a,b).

The seeding of buffers will provide an extension of existing natural areas. These areas should remain after extraction completion to provide a net environmental benefit to adjacent features as per the County of Oxford OP Policy Section 3.4.1.6.

6.3 Induced Impacts

Induced impacts are potential environmental effects associated with the post-extraction landscape. As the intent is to return the extraction lands to their previous use of agricultural lands with natural buffer areas, induced impacts are limited to the reduction of thickness of the unsaturated soil layer as aggregate material has been removed as per the Novaterra Environmental Hydrogeological Level 1 and Level 2 assessment report. The current farm operations and land uses are expected to continue after the extraction phase is complete. Traffic, noise, and lighting impacts are anticipated to be temporary occurring only for the duration of the proposed extraction; however, recommendation 20 in Section 6.2.7 is encouraged.

6.4 Cumulative Impacts

Cumulative impacts are potential effects that may occur as a result of adjacent land uses. These effects may include upstream or downstream impacts, or activities that could otherwise adversely affect natural features connected to the Subject Lands.

To the west of the Subject Lands is an existing licensed aggregate extraction pit, currently being farmed with crops. To the east of the Subject Lands are natural features and residential homes, similarly residential homes to the north and agricultural lands to the south. The proposed extraction is expected to have minimal long-term impacts on the surrounding landscape. As extraction is proposed to the west and no natural features are proposed for removal on the Subject Lands, the proposed operation is of low impact.

Cumulative impacts associated with proposed extraction and construction operations that have the potential to influence the PSW pond to the northwest of the Subject Lands and Significant Woodland to the east and will be protected through the application of a 30 m and 15 m naturalized buffer, respectively. With the proposed buffers in place adjacent to natural features, there will be a net environmental gain as the buffers will provide a natural extension of these features to remain after operations cease and the land is returned to agriculture. To minimize cumulative impacts, the extraction will be phased and each phase will be rehabilitated sequentially.

No negative impacts are expected on the larger natural heritage system as the PSW pond is connected to the larger system via an unnamed watercourse and associated significant valleyland to the north and west of the Subject Lands. No work is proposed outside of the extraction limits nor are any indirect impacts anticipated to features outside of the Study Area. The east significant woodland contains limited connections to the larger natural heritage system as it is bounded on the north end by Hamilton Road and the south end by Thomas Road. The ecological function will remain as is post-extraction as no direct impacts are proposed and temporary indirect impacts are mitigated through recommendations in Sections 6.2.1-6.2.8 above.

6.5 Construction Monitoring Plan

Mitigation and buffer measures recommended in this NER aim to minimize indirect impacts to the significant natural heritage features and their functions. The monitoring plan is recommended to document the implementation of mitigation and buffer seeding measures during construction phases. The below monitoring recommendations may be completed by an Erosion Sediment Control (ESC) qualified person.

Recommendation 19: Boundaries of the extraction limits and license boundaries adjacent to the natural heritage features are clearly staked prior to construction phases. Monitoring should occur during all construction phases to ensure boundaries are respected and the adjacent natural features remain unaffected.

Recommendation 20: Ongoing weekly ESC monitoring should occur for the duration of construction phases (e.g., berm construction and deconstruction) to ensure ESC measures are installed and maintained in good condition, including the establishment of seeding on the outer berms.

7.0 SUMMARY AND CONCLUSIONS

This NER has set out recommendations such as erosion and sediment control measures to protect the adjacent significant natural heritage features from indirect impacts. No direct impacts to natural heritage features are proposed. The following features were identified within the adjacent lands:

- Provincially Significant Wetlands
- Candidate Significant Wildlife Habitat
- Significant Woodlands
- Candidate Bat Maternity Roosts

All features are outside of the Subject Lands and will be protected with appropriate fencing, vegetation, and berm measures as applicable. No extraction measures are proposed within the identified natural features in the adjacent lands as such no direct impacts are anticipated. Indirect impacts will be mitigated with seeded buffers and sediment and erosion control fencing.

Provided the recommendations in this NER are followed; it is our opinion that the proposed extraction can proceed.

MTE seeks comments from the County of Oxford with respect to the contents of the NER. Formal comments can be submitted in writing to MTE of behalf of the client. Should you wish to clarify any questions or require additional information as part of the review of this report, do not hesitate to contact us.

All of which is respectfully submitted,

MTE Consultants Inc.

Elise Roth,
B.sc., M.E.S.

Digitally signed
by Daniel J Knee
Date: 25-04-01

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EXR:jmm
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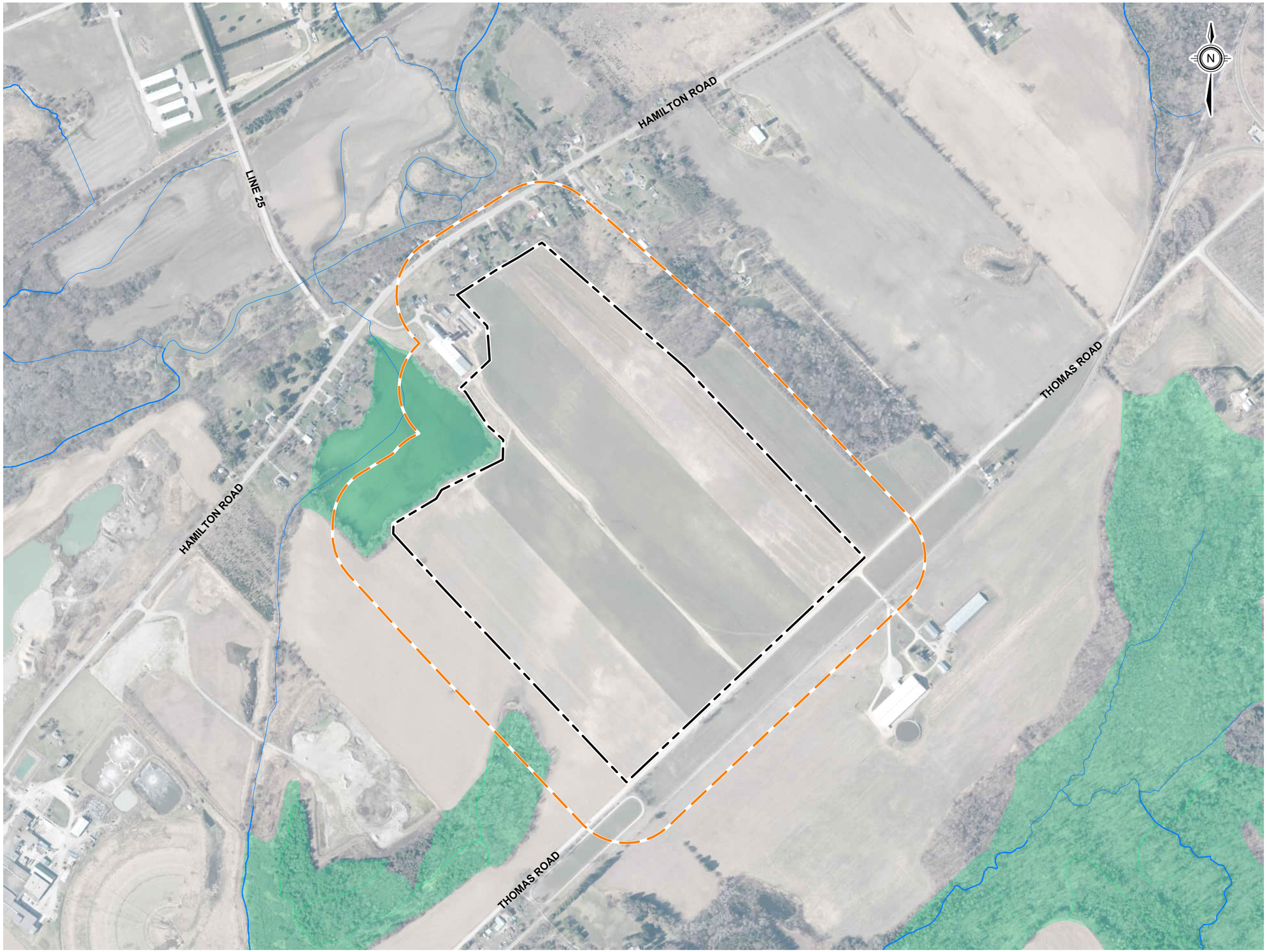
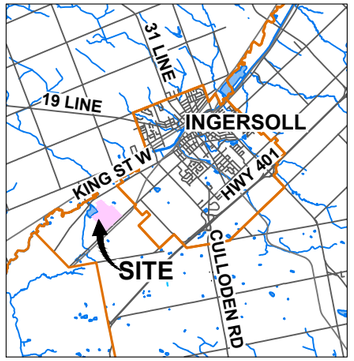
Figures





KEY PLAN (nts)

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- STUDY AREA (120m from Area to be Licensed)
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)

REFERENCES

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NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

0 75 150 225 300

MTE
Engineers, Scientists, Surveyors

PROJECT
NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
PROJECT LOCATION

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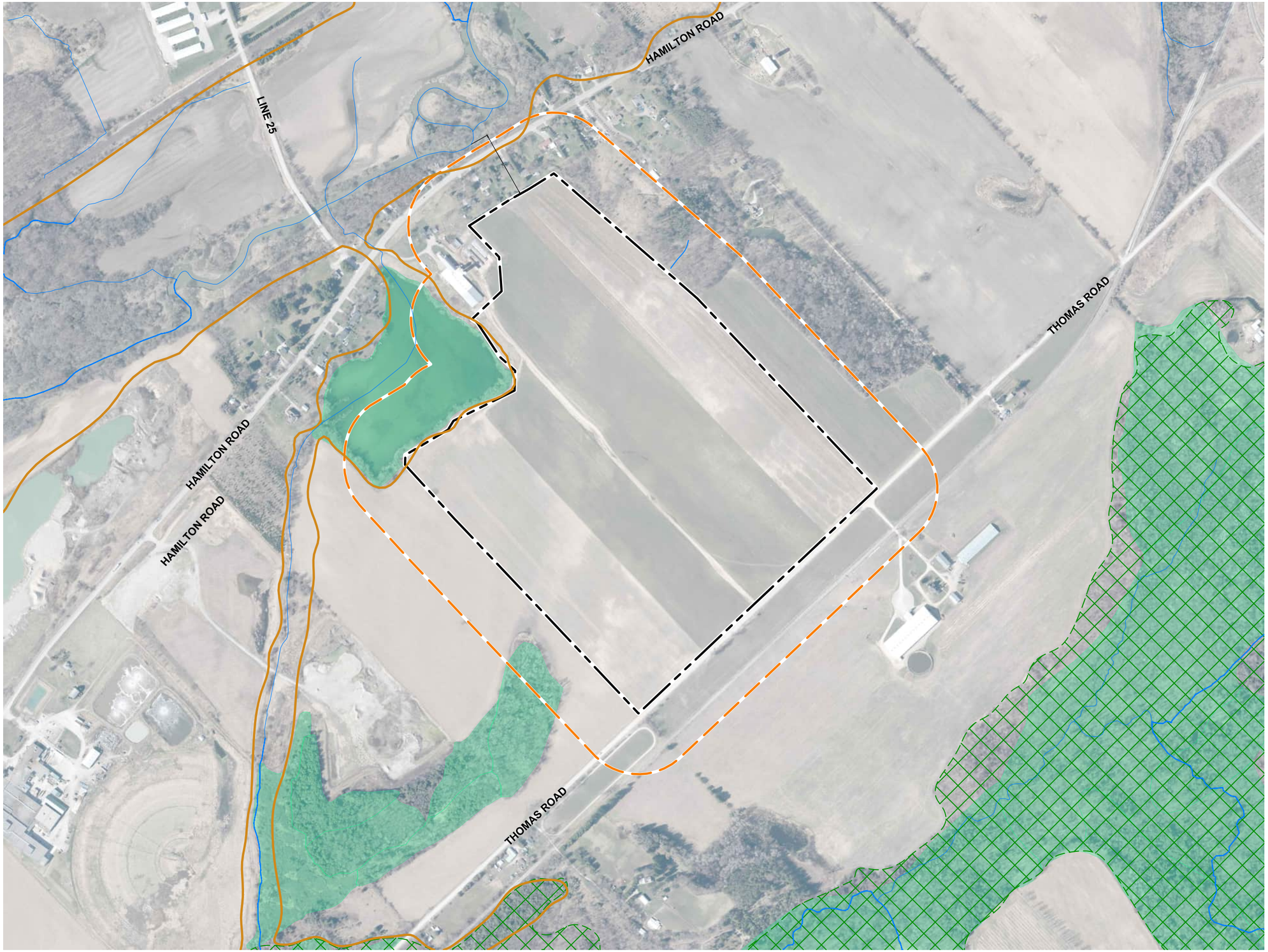
Date: 2024-01-03	Rev No.: 0	



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LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- STUDY AREA (120m from Area to be Licensed)
- (1) VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- WETLAND - PSW (LIO/Oxford County)
- WATERCOURSE (UTRCA)
- SIGNIFICANT WOODLAND (Oxford County)
- SIGNIFICANT VALLEYLAND (Oxford County)

REFERENCES

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SCALE IN METRES

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1:5,000

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NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE

DESIGNATED NATURAL HERITAGE FEATURES and BACKGROUND DATA REVIEW

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Date 2024-06-03	Rev No. 0	

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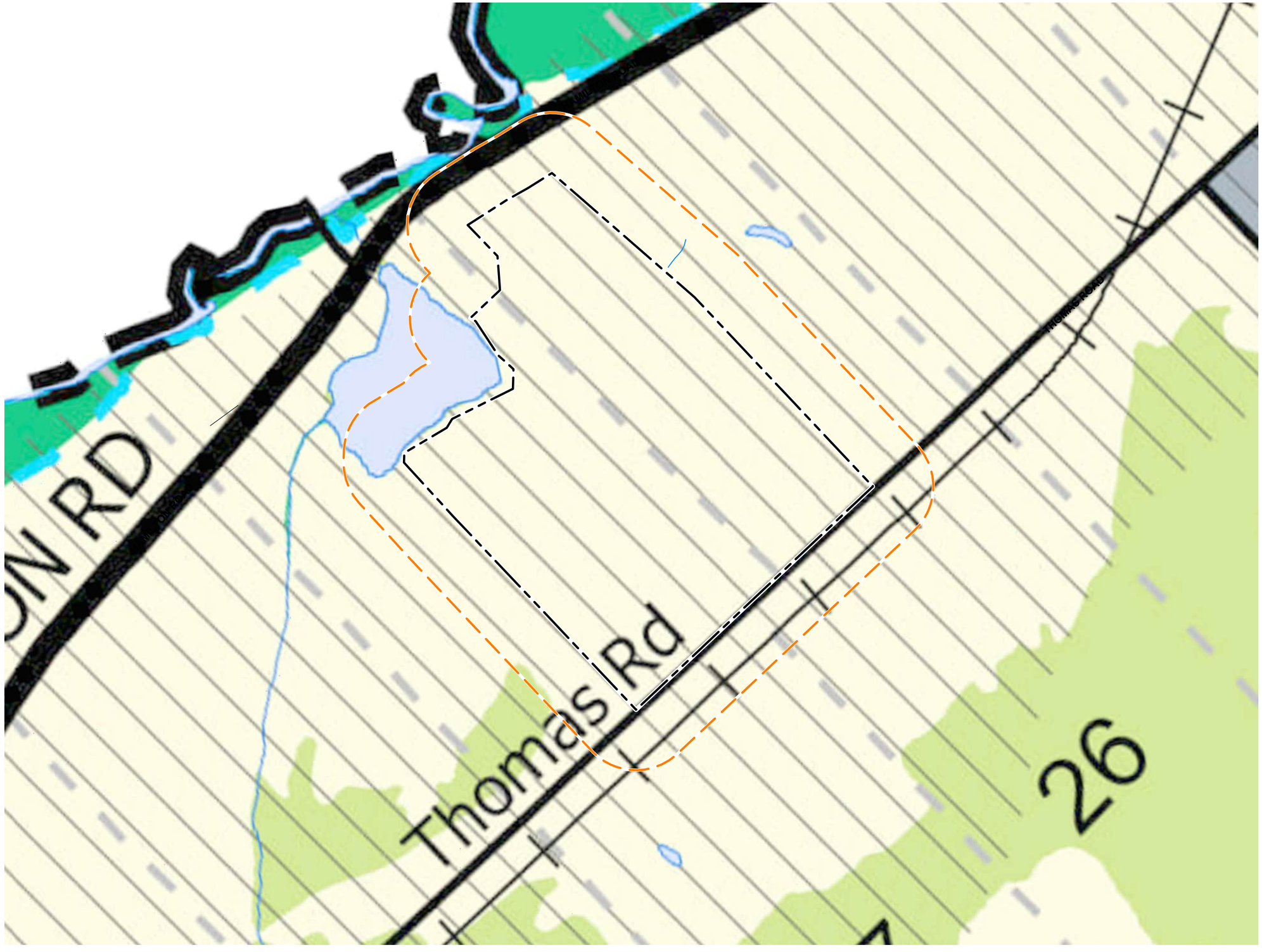

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
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- ENVIRONMENTAL PROTECTION
- FUTURE URBAN GROWTH
- LIMESTONE RESOUCE
- LOT LINE
- MUNICIPAL BOUNDARY
- MAJOR ROAD
- OPEN SPACE
- WATERBODY
- WATERCOURSE

REFERENCES

OXFORD COUNTY PARCEL MAPPING, OPEN DATA SET; AND
OXFORD COUNTY, SCHEDULE "S-1", LAND USE PLAN, AUGUST 12 - 2020.

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NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
LAND USE

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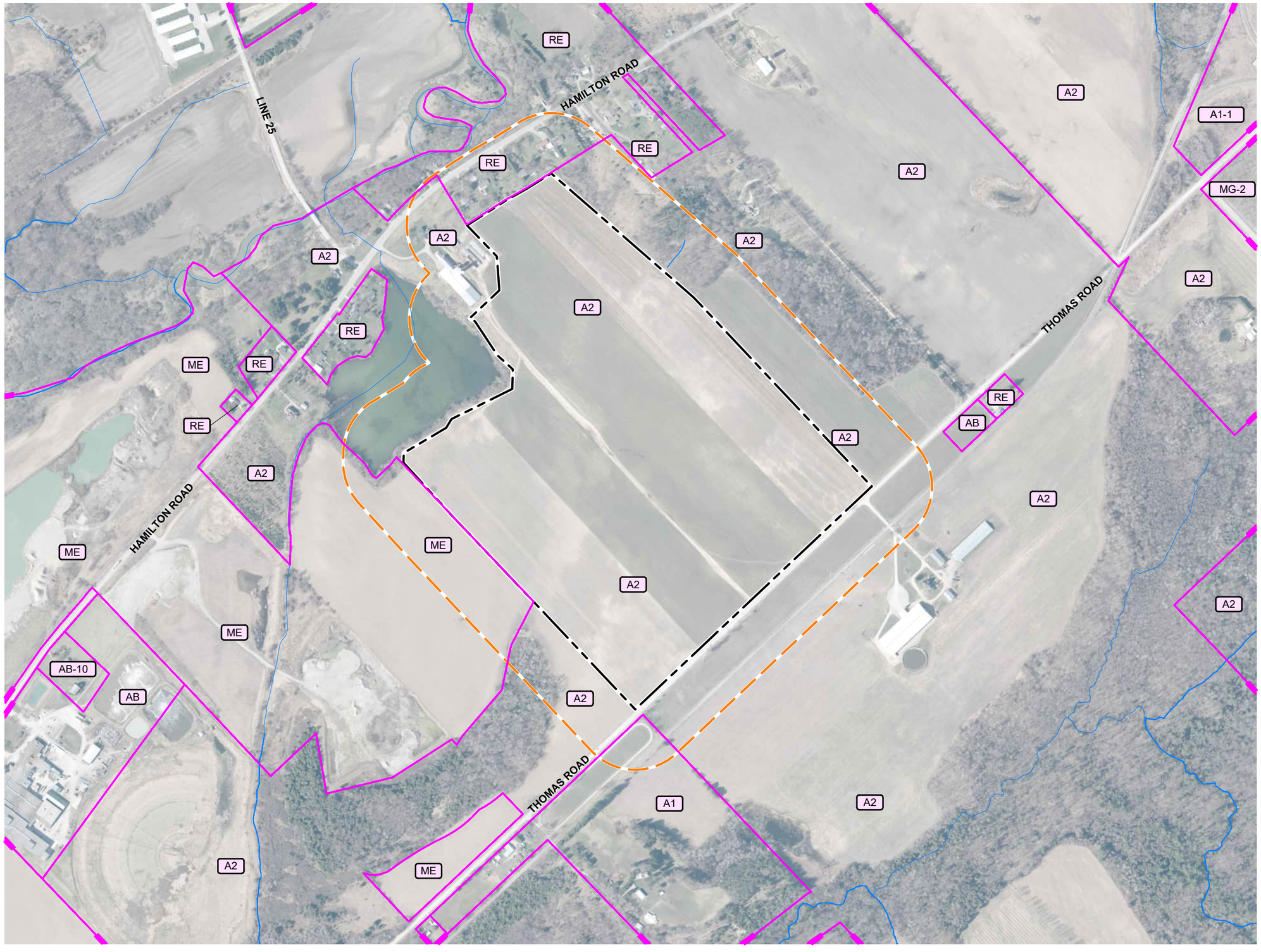

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- STUDY AREA (120m from Area to be Licensed)
- ZONING

- A1 LIMITED AGRICULTURAL ZONE
- A2 GENERAL AGRICULTURAL ZONE
- AB AGRI-BUSINESS ZONE
- RE RESIDENTIAL EXISTING LOT ZONE
- ME AGGREGATE INDUSTRIAL ZONE
- MG GENERAL INDUSTRIAL ZONE

REFERENCES

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OXFORD COUNTY ENVIRONMENTAL FEATURES PLAN, SCHEDULE "C-1", MARCH 11 - 2015.

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PROJECT
NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
ZONING

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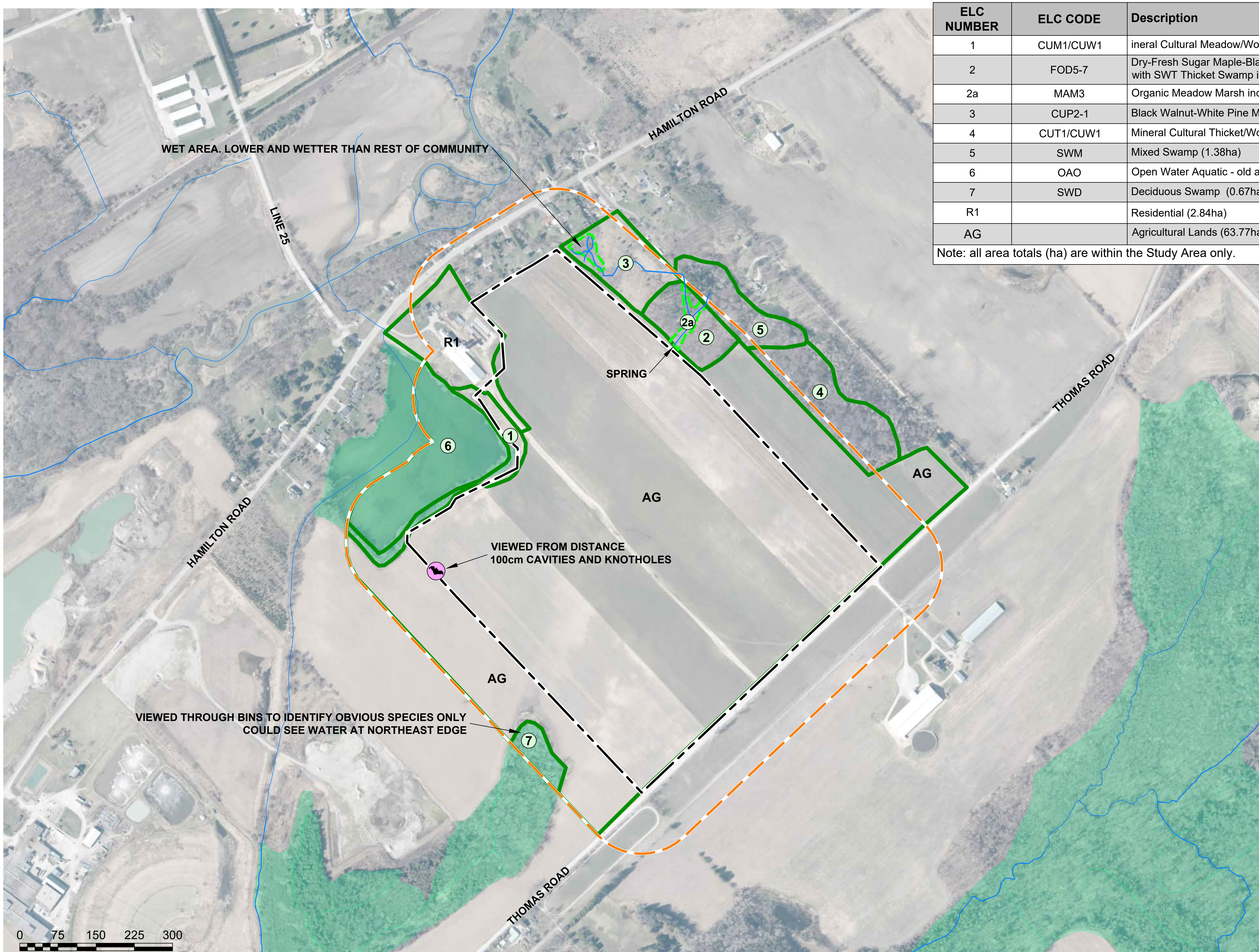

ELC NUMBER	ELC CODE	Description
1	CUM1/CUW1	ineral Cultural Meadow/Woodland Ecosite - banks of old aggregate pond (1.36ha)
2	FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous - Forest Type with SWT Thicket Swamp inclusion (1.71ha)
2a	MAM3	Organic Meadow Marsh inclusion (0.26ha)
3	CUP2-1	Black Walnut-White Pine Mixed Plantation Type (2.05ha)
4	CUT1/CUW1	Mineral Cultural Thicket/Woodland Ecosite (2.86ha)
5	SWM	Mixed Swamp (1.38ha)
6	OAO	Open Water Aquatic - old aggregate pond (4.65ha)
7	SWD	Deciduous Swamp (0.67ha)
R1		Residential (2.84ha)
AG		Agricultural Lands (63.77ha)

Note: all area totals (ha) are within the Study Area only.

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- STUDY AREA (120m from Area to be Licensed)
- VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)
- CANDIDATE MATERNITY ROOST TREE

REFERENCES

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NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE

VEGETATION COMMUNITIES

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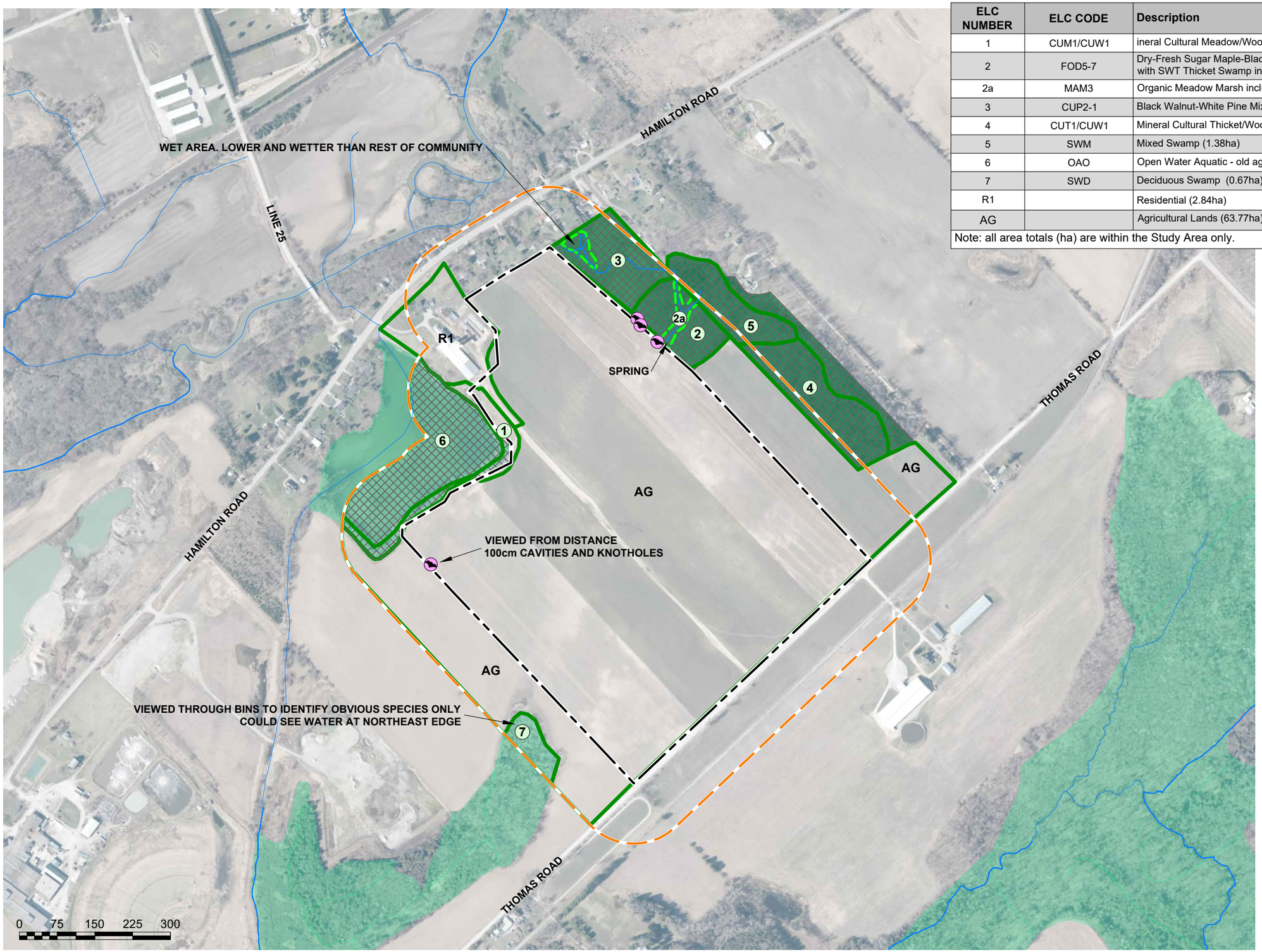
Date 2024-01-03	Rev No. 0	



ELC NUMBER	ELC CODE	Description
1	CUM1/CUW1	ineral Cultural Meadow/Woodland Ecosite - banks of old aggregate pond (1.36ha)
2	FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous - Forest Type with SWT Thicket Swamp inclusion (1.82ha)
2a	MAM3	Organic Meadow Marsh inclusion (0.27ha)
3	CUP2-1	Black Walnut-White Pine Mixed Plantation Type (2.32ha)
4	CUT1/CUW1	Mineral Cultural Thicket/Woodland Ecosite (2.86ha)
5	SWM	Mixed Swamp (1.38ha)
6	OAO	Open Water Aquatic - old aggregate pond (4.65ha)
7	SWD	Deciduous Swamp (0.67ha)
R1		Residential (2.84ha)
AG		Agricultural Lands (63.77ha)

Note: all area totals (ha) are within the Study Area only.

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- STUDY AREA (120m from Area to be Licensed)
- VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- CANDITATE SIGNIFICANT WILDLIFE HABITAT
- SIGNIFICANT WOODLAND
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)
- CANDIDATE MATERNITY ROOST TREE

REFERENCES

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NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

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Engineers, Scientists, Surveyors

PROJECT
NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
SIGNIFICANT NATURAL HERITAGE FEATURES and KEY FINDINGS

Drawn	Scale	Figure
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Checked	Project No. 45731-101	
Date 2024-04-11	Rev No. 0	

Figure 7: Extraction Limits

A. General
1. This site plan is prepared under the Aggregate Resources Act (ARA) for a Class 'A' Licence for a pit below the ground water table (to 1m of the water table) and follows the Aggregate Resource of Ontario: Site Plan Standards August 2020, specifically Operations for all sites (Number 33-56 in the standards).
2. Area calculations
   i. Licence Boundary 49.4 ha (122.1 acres)
   ii. Limit of Extraction 45.3 ha (111.9 acres)
3. The maximum number of tonnes of aggregate to be removed from this property is 500,000 tonnes in any calendar year.
4. No buildings or structures (including a scale and scale house) are proposed.
5. The maximum predicted water table within the limit of extraction varies between 268.35 masl in the northern portion of the site and 285.56 masl in the eastern portion of the site (Source: Novaterra Environmental, June 14, 2024). The maximum predicted water table is shown in each cross section on drawing 4 of 4.
6. The site lies within the Thames-Sydenham and Region Source Protection Area. Part of the subject site occupies an area designated as WHPA (Well Head Protection Area) associated with Ingersoll Municipal Well 3. No hydraulic relationship between Ingersoll Municipal Well 3 and the water table aquifer at the site was found (Source: Novaterra Environmental - June 14, 2024). See 'Hydrogeology' notes under Section M on this page for mitigation measures.
7. Agricultural production will continue in areas not under extraction.
8. Setbacks will be as shown and labelled on the Sequence of Operations Diagram and on the Existing Features Plan (page 1 of 4).
9. See this page for site plan overrides.

B. Hours of Operation
1. Hours of operation shall be Monday to Friday between 7:00 am and 7:00 pm and on Saturdays between 7:00 am to 1:00 pm. No operations are permitted on Sunday or statutory holidays.

C. Site Access and Fencing
1. The existing farm/field access on Thomas Road will remain for monitoring, maintenance and agricultural purposes. This access shall be gated, kept closed during hours of non-operation and maintained throughout the life of the licence. Aggregate trucks shall not be permitted to access the site in this location.
2. An operational entrance/exit is proposed at the existing access on Hamilton Road (as shown on the plan view). This access shall be gated, kept closed during hours of non-operation and maintained throughout the life of the licence. A potential operational entrance/exit is identified in the eastern corner of the site at Thomas Road. This access point requires Township approval prior to being used by aggregate trucks.
3. Portions of the licence boundary that are not currently fenced shall be fenced with post and wire fencing at least 1.2 metres in height and maintained for the life of the licence.
4. Fencing shall not be required where the licence abuts existing licence #16190 and in these locations, the boundary will be demarcated by 1.2m high marker posts that are visible from one to the other. If conditions in or around the licensed property change or if either licensed site is surrendered or sold, a 1.2m high fence will be installed. All fencing shall be maintained for the life of the extraction. Fencing shall also not be required next to the Five Points Woods Wetlands as an existing fence exists offset the licence boundary. Fencing will not be required next to the Bardoel residence and agricultural structures as there is existing fencing along the property boundaries at Hamilton Road, next to adjacent houses and the Five Points Woods Wetland (see Section N Variations from Control and Operation Standards). In all other locations along the boundary of the site, a fence of at least 1.2 m in height shall be erected and maintained.
5. A sign of at least 0.5 metres by 0.5 metres in size shall be erected and maintained at the main entrance that says in legible words "This site is licensed under the Aggregate Resources Act Licence # _____".

D. Drainage
1. During excavation surface drainage from active pit areas will be contained within the pit area. Drainage of undisturbed areas will continue and be in the directions shown on the Existing Features drawing on page 1 of 5.

E. Site Preparation
1. Prior to site preparation, a Spills Contingency Plan shall be developed to address any potential spills from equipment on-site.
2. Timber resources (if any) will be salvaged for use as saw logs, fence posts and fuel wood where appropriate. Non-merchantable timber, stumps and brush may be used or mulched for use in progressive rehabilitation. Excess material not required for uses mentioned above will be burned (with applicable permits).
3. During construction and earth-moving operations, sediment control measures will be put in place to prevent runoff of suspended solids from leaving the site (see Section M Technical Recommendations 1. Natural Environment).
4. Substantial storage of topsoil and minimize the storage of subsoil shall be minimized. Stripped soils, not required for berm construction, shall be moved directly to depleted areas where they will be immediately used for agricultural rehabilitation. Stripping areas shall be limited to what is required for the season of operation.
5. Topsoil/overburden stockpiles will be graded smooth and seeded to prevent erosion (if they are to remain for more than one year). Seeding shall not be required if these stockpiles have vegetated naturally in the first year.

F. Berms and Screening
1. Berms shall be constructed as specified in the locations shown on the Sequence of Operations and in accordance with the Technical Recommendations (4. Acoustic Assessment). Locations and heights for all berms are provided on the Sequence of Operations diagram, this page. The heights/elevations shown are the minimum required. Overburden may be stored in separate berms throughout the extraction area.
2. Berms shall not be located within three metres of the licence boundary, except for where provided in Section N. variations from Control and Operation Standards.
3. All proposed berms will be constructed in accordance with the "Typical Berm Detail" on this page and will be vegetated and maintained to control erosion using a low maintenance grass/legume seed mixture (e.g. MTO Seed Mix) composed of Creeping red Fescue, Perennial Ryegrass, Kentucky Bluegrass and White Clover. Temporary erosion control will be implemented as required.
4. Existing vegetation within the setbacks shall be maintained except where berms are required. There are no proposed tree screens at this site.

G. Site Drainage
1. No existing or proposed surface water diversions or discharge has and/or will occur on the proposed extraction area. There will be no dewatering or pumping of water in the extraction area.

H. Extraction Sequence
1. The operational plan depicts a schematic operations sequence for this property. Phases do not represent any specific or equal time period and blending requirements may require material from adjacent phases. Extraction shall be permitted in two phases simultaneously to facilitate the availability of different aggregate materials located within the Phases and to allow transition between phases.
2. The direction of extraction will be in accordance with the Sequence of Operations diagram shown on this page.
3. Progressive and final rehabilitation will be completed in direct correlation to the development of the pit as the extraction limits in each Phase are reached and enough area is available to ensure that rehabilitation activities will not interfere with the production and stockpiling of aggregate materials.

I. Extraction Details
1. The maximum depth of extraction is as shown as spot elevations on the Sequence of Operations drawing (this page). Extraction will occur in a maximum of 1 lift through the three phases as shown on the Sequence of Operations Diagram on this page and in accordance with the Ministry of Labour requirements. The maximum lift height will be 10 m.
2. Extraction will occur to within 1m of the maximum predicted water table. The pit floor will be located at an elevation of 271 to 287 masl. See Rehabilitation Plan (page 3) and Cross Sections (page 4) for excavation depths and final rehabilitation contours.
3. Aggregate stockpiles will be located on the pit floor and will follow the working pit face throughout the life of the operations of the pit. Stockpiles will not be located within 30m of the Licensed boundary, except for the western boundary as per agreement with adjacent operator (see Variations from Control and Operational Standards table on this page).
4. Internal haul road locations will vary as extraction progresses and will transport materials to the northern operational entrance/exit. Dust will be mitigated on site. Water or another provincially approved dust suppressant will be applied to internal haul roads as often as required to mitigate dust.

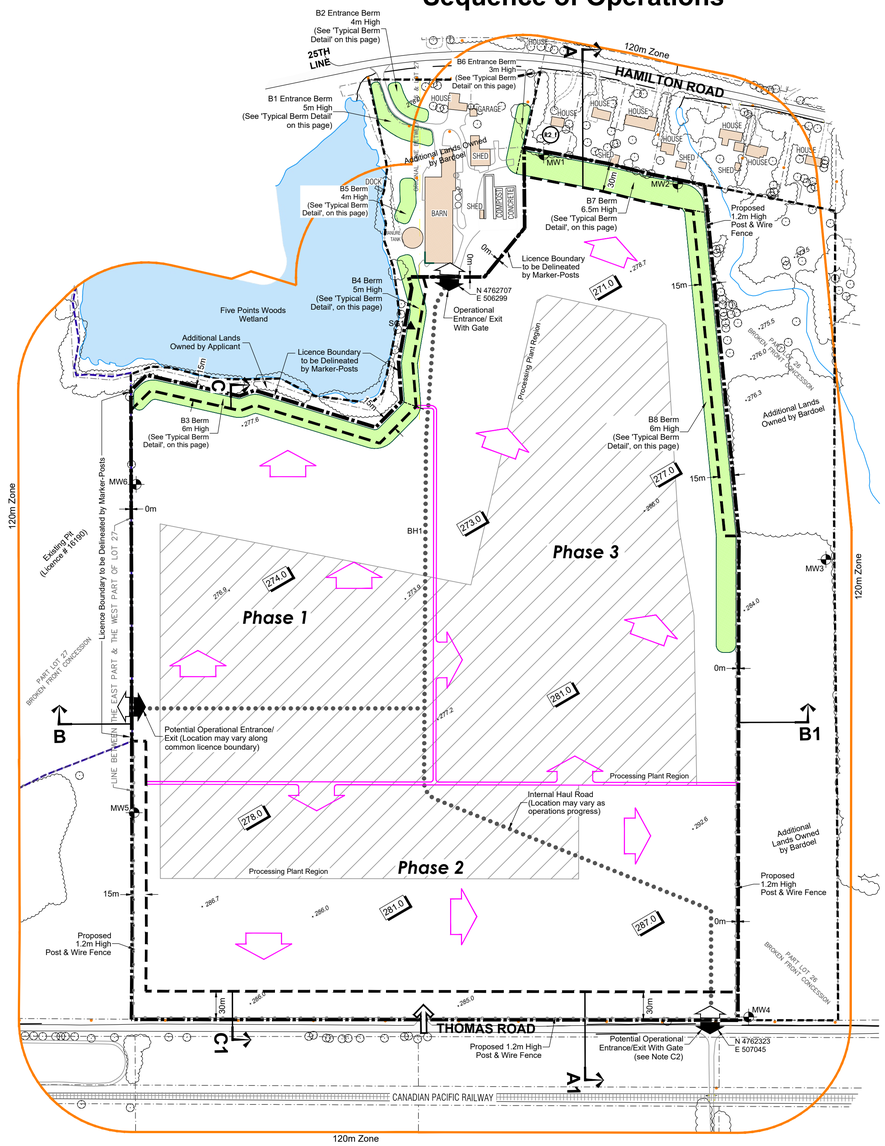
J. Equipment and Processing
1. Equipment used on-site may include portable crushers, a portable screening plant, loaders, stacker and trucks.
2. No permanent processing areas are proposed on site. Portable processing equipment (crusher and screener) may be used on site and will be restricted to the 'Processing Plant Region'. The portable equipment shall be located below grade on the pit floor in close proximity to the extraction face in order to maximize acoustical shielding and within the 'Processing Plant Region'. See Note M 'Noise' and Sequence of Operations diagram for location of 'Processing Plant Region'.
3. Within the 'Processing Plant Region', the processing equipment shall remain a minimum of 30 metres from the licence boundary (except where the licence boundary abuts existing licence #16190 - see Section N Variations from Control and Operation Standards) and 90 metres from a property with a residential use. All processing equipment is subject to noise controls and applicable permitting under MECP Environmental Compliance Approvals.
4. Dust will be mitigated on site. Water or another provincially approved dust suppressant will be applied to processing areas as often as necessary to mitigate dust. Processing equipment will be equipped with dust suppression or collection devices where the equipment creates dust and is being operated within 300 metres of a sensitive receptor.

K. Fuel Storage
1. No fuel or associated products will be stored on site. Mobile fuelling will occur in accordance with the Gasoline Handling Act, as amended, the Gasoline Handling Code and regulations, as amended, and Liquid Fuels Handling Code.
2. Mobile fuelling shall not occur within 30 m of any waterbody.
3. A Spills Contingency Plan shall be prepared and implemented prior to site preparation. The Spills Contingency Plan shall be available on-site and all employees and contractors shall be informed and required to comply with this plan.

L. Scrap and Recycling
1. No recycling is proposed.
2. Scrap may be stored on-site within the 'Processing Plant Region' and shall be removed on an on-going basis.
3. Scrap shall only include material generated directly as a result of the aggregate operation such as refuse, debris, scrap metal, lumber, discarded machinery and equipment.
4. Scrap shall not be stored within 30 metres of any body of water, or the licence boundary.
5. The site shall be kept in an orderly condition.

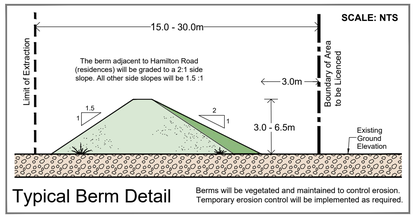
M. Technical Recommendations (Page 3 of 4)

Sequence of Operations



N. Variations from Control and Operation Standards

No.	O.Reg 244/97 Section 0.13	Variation	Rationale
1.	(1)1	A gate will not be required along the potential entrance adjacent to Licence #16190.	Gate not required next to existing pit licence (0 m setback).
2.	(1)10.i	Setback reduced to 0m from 15m along portions of the western, northern and eastern limits of site.	Per executed common boundary agreement, material can be extracted along the common boundary with Licence #16190. The northern and eastern limits of the site are adjacent to the additional lands owned by the Bardoel's (lessor).
3.	(1)13.i	Stockpiling/processing may take place within 30m along the boundary of Licence #16190.	Per executed common boundary agreement, material can be processed/stockpiled along the common boundary with Licence #16190.
4.	(1)16	Berms may be located within 3m boundary of the site where indicated on the Sequence of Operations.	Berms may be located within this area and on the lands owned by the Bardoel's (lessor).
5.	(3)(a)	Fencing shall not be required where the licence abuts existing Licence #16190. Fencing shall not be required next to the Five Points Woods Wetlands. Fencing shall not be required next to the Bardoel residence and agricultural structures for the lands owned by the Bardoel's (lessor).	Fencing not required along existing licensed pit and per executed common boundary agreement. Fencing exists along the property boundaries at Hamilton Road, next to adjacent houses and the Five Points Woods Wetland.



Legal Description

Pt Lt 26-27 Con Broken Front West Oxford,
Township of Southwest Oxford
Oxford County

Legend

- Boundary of Area to be Licensed
- Additional Lands Owned by Bardoel (Lessor)
- Existing Licensed Boundary — LICENCE #16190
- Existing Fence — 1.2m POST & WIRE FARM FENCE UNLESS OTHERWISE NOTED
- Existing Vegetation
- Public Road
- Building/Structure — LOCATION AND USE FOR BUILDINGS ON-SITE AND WITHIN 120m ARE SHOWN ON THIS PAGE.
- Farm/Field Access
- MW6 / SG1 Monitoring Well/ Staff Gauge — NOVATERRA ENVIRONMENTAL (2017)
- Existing Spot Height Elevation — METRES ABOVE SEA LEVEL
- A1 Cross Sections — SEE PAGE 4 OF 4 FOR EXISTING AND REHABILITATED CROSS SECTIONS
- Limit of Extraction — ALL SETBACKS ARE DRAWN TO SCALE AND SHOW LABELLED DISTANCES
- Operational Entrance
- Proposed Haul Route
- Direction of Excavation — REFER TO NOTES (THIS PAGE) FOR ADDITIONAL DETAILS
- Processing Plant Region — (NO CRUSHING/SCREENING OUTSIDE THIS REGION)
- Proposed Fence — 1.2m POST & WIRE FARM FENCE UNLESS OTHERWISE NOTED
- Acoustic Berm — SEE "TYPICAL BERM DETAIL" AND NOTES ON PAGE 2 OF 4
- Optional Storage Berm — SEE "TYPICAL BERM DETAIL" AND NOTES ON PAGE 2 OF 4
- Proposed Spot Elevation — MAXIMUM DEPTH OF BELOW WATER EXTRACTION
- Receptor Locations — WITHIN 120m OF THE SITE

Site Plan Amendments

No.	Date	Description	By

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR. KITCHENER, ON. N2B 3X9 | P: 519.576.3650 | WWW.MHBCPLAN.COM

MNR Approval Stamp

Stamp

DRAFT

north

J-AAR Materials Ltd.
3003 Page Street
London, Ontario
N5V 4J1
Tel: (519) 652-2104

Applicant's Signature

DRAFT

Jamie Kortelle
J-AAR Materials Ltd.

Project

Bardoel Pit

ARA Licence Reference No.

Pre-approval review:

For Submittal to MNR - March 2025

Plan Scale **1:3,000 (Arch D)**

SCALE
50 0 50 100
METRES

Plot Scale 1:3 [1mm = 3 units] MODEL

Drawn By G.C./DGS

Checked By N.D.

File No. **18218A**

File Name

OPERATIONAL PLAN

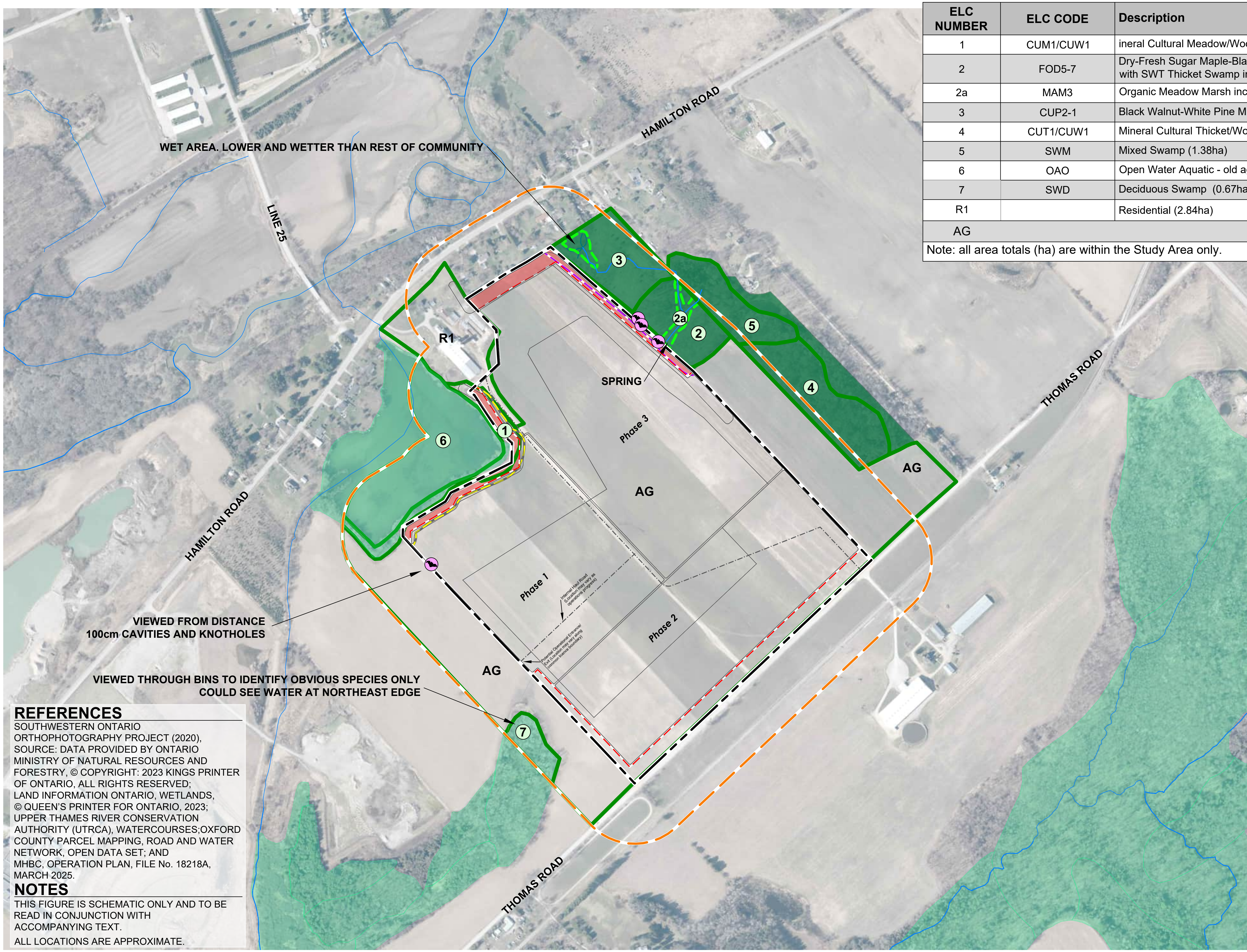
Drawing No.

2 OF 4

K:\18218A- AAROC Bardoel Pit\A\Bardoel Pit Operplan2of4 March2025.dwg

ELC NUMBER	ELC CODE	Description
1	CUM1/CUW1	ineral Cultural Meadow/Woodland Ecosite - banks of old aggregate pond (1.36ha)
2	FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous - Forest Type with SWT Thicket Swamp inclusion (1.82ha)
2a	MAM3	Organic Meadow Marsh inclusion (0.27ha)
3	CUP2-1	Black Walnut-White Pine Mixed Plantation Type (2.32ha)
4	CUT1/CUW1	Mineral Cultural Thicket/Woodland Ecosite (2.86ha)
5	SWM	Mixed Swamp (1.38ha)
6	OAO	Open Water Aquatic - old aggregate pond (4.65ha)
7	SWD	Deciduous Swamp (0.67ha)
R1		Residential (2.84ha)
AG		

Note: all area totals (ha) are within the Study Area only.



LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- LIMIT OF EXTRACTION
- STUDY AREA (120m from Area to be Licensed)
- VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- CANDITATE SIGNIFICANT WILDLIFE HABITAT
- SIGNIFICANT WOODLAND
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)
- 15m BUFFER FROM WOODLAND (Dripline to be marked prior to earth works)
- 30m BUFFER FROM PSW
- RESTORATION AREA
- CANDIDATE MATERNITY ROOST TREE

0 75 150 225 300

REFERENCES

SOUTHWESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (2020), SOURCE: DATA PROVIDED BY ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © COPYRIGHT: 2023 KINGS PRINTER OF ONTARIO, ALL RIGHTS RESERVED; LAND INFORMATION ONTARIO, WETLANDS, © QUEEN'S PRINTER FOR ONTARIO, 2023; UPPER THAMES RIVER CONSERVATION AUTHORITY (UTRCA), WATERCOURSES;OXFORD COUNTY PARCEL MAPPING, ROAD AND WATER NETWORK, OPEN DATA SET; AND MHBC, OPERATION PLAN, FILE No. 18218A, MARCH 2025.

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

MTE
Engineers, Scientists, Surveyors

PROJECT
NATURAL ENVIRONMENT REPORT
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
EXTRACTION OVERLAY

Drawn	Scale	Figure
DCH	1:7,500	8
Checked	Project No. 45731-101	
Date 2025-03-31	Rev No. 0	

CAD: P:\P\45731\101\2_PROD\45731-101-R02 NATURAL ENVIRONMENT REPORT\45731-101-R02008.DWG

Plot Date: March 31, 2025 - 1:13 PM

Appendix A

Record of Pre-Application Consultation

Laura McLennan

From: Dave Hayman
Sent: Monday, December 11, 2017 3:42 PM
To: Laura McLennan
Subject: FW: Bordoel Proposal for Aggregate License.
Attachments: AARCOBardoelMNRFStageFinal.pdf

Agg pit Stage 1 response.

Dave Hayman, MSc.
BioLogic Incorporated
110 Riverside Drive
London, ON N6H 4S5

Direct: 519 657 0299
Office: 519 434 1516 x 106
Fax: 519 434 0575

Windsor: 519 966 1645

From: ESA-Aylmer (MNRF) [mailto:ESA.Aylmer@ontario.ca]
Sent: December-11-17 3:24 PM
To: Dave Hayman <dhayman@biologic.ca>
Subject: RE: Bordoel Proposal for Aggregate License.

Hi Dave,

MNRF provides the following natural heritage information for the AAROC – Thorton Pit, a new aggregate extraction application, with the draft license boundary as shown in the information provided (attached).

Species at Risk (SAR)
The Species at Risk in Ontario (SARO) List (https://www.ontario.ca/laws/regulation/080230) is Ontario Regulation 230/08 issued under the *Endangered Species Act*, *2007* (ESA). The ESA came into force on June 30, 2008, and provides both species protection (under section 9) and habitat protection (under section 10) to species listed as endangered or threatened on the SARO List.

An initial SAR (Endangered and Threatened species) screening has been completed for the above-noted property.

There are known occurrences of the following SAR in the area with the potential to occur on or adjacent to the site, including:

- Barn Swallow (threatened) – receives species and general habitat protection
  - Please refer to the General Habitat Description: https://www.ontario.ca/page/barn-swallow-general-habitat-description
- Bobolink (threatened) – receives species and general habitat protection
  - Please refer to the Bobolink General Habitat Description: https://www.ontario.ca/page/bobolink-general-habitat-description
- Eastern Meadowlark (threatened) – receives species and general habitat protection;
  - Please refer to the Eastern Meadowlark General Habitat Description: https://www.ontario.ca/page/eastern-meadowlark-general-habitat-description
- Blanding's Turtle (threatened) – receives species and general habitat protection
  - Please refer to the General Habitat Description:

https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_ghd_bln_trtl_en.pdf

- American Badger (Southwestern Ontario population) (endangered) – receives species and regulated habitat protection
  - Please refer to the *Endangered Species Act* Regulation 242/08 S.24 https://www.ontario.ca/laws/regulation/080242#BK50
- SAR bats (endangered) – receives species and general habitat protection

The adjacent Thames River is aquatic SAR habitat based on DFO mapping (http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm). We recommend consulting Fisheries and Oceans Canada (DFO) for additional information.

Please note that this is an initial screening for SAR and the absence of an element occurrence does not indicate the absence of species. The province has not been surveyed comprehensively for the presence or absence of SAR and MNRF data relies on observers to report sightings of SAR. Field assessments by a qualified professional may be necessary if there is a high likelihood for SAR species and/or habitat to occur within the project footprint and potentially be impacted.

SAR/SAR habitat may occur on-site with the potential to be impacted by the proposed site alteration, as described in the information provided. MNRF recommends that a qualified professional be retained if proposed activities have the potential to contravene the ESA, and that an Information Gathering Form is submitted to **ESA.Aylmer@Ontario.ca** for review to further advise if activities will likely contravene the ESA. Attached is MNRF Aylmer District's SAR Screening Process Technical Memo that provides additional information about the process.

It is important to note the following:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List.
- As a result, species designations may change and changes may occur in both species and habitat protection which could affect the level of protection they receive under the ESA 2007 and whether proposed projects may have adverse effects on SAR.
- Habitat protection provisions for a species may change if a species-specific habitat regulation comes into effect.

If an activity or project will result in adverse effects to endangered or threatened species and/or their habitat, additional action would need to be taken in order to remain in compliance with the ESA. Additional action could be applying for an authorization under section 17(2)(c) of the ESA, or completing an online registry for an ESA regulation and following the rules in regulation if the project is eligible (http://www.ontario.ca/environment-and-energy/natural-resources-approvals). Questions about the registry process should be directed to MNRF's Registry and Approval Services Centre at 1-855-613-4256 or at mnr.rasc@ontario.ca. Please be advised that applying for an authorization does not guarantee approval and the process can take several months.

Significant Wildlife Habitat (SWH)

Significant wildlife habitat (SWH) may be present on or adjacent to the above-noted subject lands (within 120 m). Please consult the Significant Wildlife Habitat Technical Guide (SWHTG, OMNR 2000), the Natural Heritage Reference Manual (NHRM) and the Ecoregion Criteria Schedules for criteria on identifying and determining significance of wildlife habitat. SWH is identified by planning authorities using the criteria and processes recommended in the SWHTG and Ecoregion Criteria Schedules.

Link to the SWHTG: https://www.ontario.ca/environment-and-energy/guide-significant-wildlife-habitat
Link to Ecoregion 7E criteria schedule: http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=21843&Attachment_ID=45645

Habitat of species of special concern (not legally protected under the ESA) and those ranked S 1 to 3 receives consideration for SWH of Special Concern and Rare Wildlife Species. The following species are known to occur in the area for your information:

- Eastern Wood-pewee (Special Concern)
- Wood Thrush (Special Concern)
- Snapping Turtle (Special Concern)
- Milksnake (S3)
- Green Dragon (Special Concern)
- Western Meadowlark (S3B)
- Great St. John's-wort (S3)

Areas of Natural and Scientific Interest (ANSIs)

There are no Provincially or Regionally Significant Earth or Life Science ANSI's within or adjacent to the proposed subject lands.

Significant Woodlands

There appears to be woodland located on and adjacent to the project area. We recommend you refer to applicable Official Plans for criteria to determine the significance of woodlands near the project locations. The NHRM also contains information and criteria for determining significant woodlands.

Significant Wetlands

There is Provincially Significant Wetland (PSW) present immediately adjacent to the project area – Five Points Woods. Wetland shapefiles can be downloaded from Land Information Ontario (LIO) or viewed on our Make a Natural Heritage Map tool (https://www.ontario.ca/page/make-natural-heritage-area-map).

Also note there may be unevaluated wetland on or adjacent to the site. If so, a Level 2 report should include a complete wetland Data Summary Form and a map showing the boundary of the wetland community(ies) within/ contiguous with the 120 m adjacent lands of the site, based on what is observable in the field and photo interpretation as feasible. It should also demonstrate whether negative impacts may occur to any unevaluated wetland present.

Significant Valleylands

MNRF does not possess significant valleylands mapping. The NHRM provides guidance and evaluation criteria for determining significant valleylands. Conservation authorities should be contacted to inquire about information pertaining to significant valleylands if they have not been identified in the applicable Official Plan.

Fish and Fish Habitat

Aquatic Resource Area data is available for the Thames River immediately north of the subject lands.

- Thermal Regime: Warm - based on species present
- Species Summary: Iowa darter, North American Catfishes, Sunfishes, black bullhead, blackside darter, bluntnose minnow, brook stickleback, brown bullhead, brown trout, central mudminnow, central stoneroller, common carp, common shiner, creek chub, eastern blacknose dace, fantail darter, fathead minnow, golden shiner, green sunfish, greenside darter, hornyhead chub, johnny darter, johnny darter/tesselated darter, largemouth bass, least darter, logperch, longear sunfish, mimic shiner, muskellunge, northern hog sucker, northern pike, northern redbelly dace, pumpkinseed, rainbow darter, river chub, rock bass, rosyface shiner, silver shiner, smallmouth bass, spotfin shiner, stonecat, striped shiner, walleye, white sucker, yellow perch

Aquatic Resource Area data is available for the Five Points Creek immediately south of the subject lands.

- Thermal Regime: Cold - based on species present
- Species Summary: brook trout, brown trout, brook stickleback, eastern blacknose dace

MNRF recommends you contact the appropriate conservation authority and DFO for up-to-date fisheries, mussel, and drain information.

Natural Heritage Systems

Policy 2.1.2 of the PPS states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems (**NHS**), 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.

Natural environment studies should identify and recognize natural heritage systems and the linkages between and among natural heritage features and areas associated with the proposed development and site alteration. Based on the local NHS/linkages identified, or those specifically identified in an Official Plan, natural environment studies should outline potential impacts to the NHS and consider ways of maintaining, restoring, and/or improving linkages between and among natural heritage features and areas, based on the details of the proposed activity and the features present.

Conservation Authorities and Official Plans may provide additional natural heritage information for this study.

Please be advised that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

If you have any questions or require additional information, please feel free to contact me.

Regards,

Kathleen Buck
Management Biologist
MNRF Aylmer District
615 John St. N.
Aylmer, ON N5H2S8
P (519)773-4785
F (519)773-9014
Kathleen.Buck@ontario.ca

From: Dave Hayman [mailto:dhayman@biologic.ca]
Sent: November-30-17 1:07 PM
To: ESA-Aylmer (MNRF)
Subject: RE: Bordoel Proposal for Aggregate License.

This is a stage 1 request, we will be conducting supporting inventories next year but the final timing for approval is difficult to predict. The owner I am sure would like to start now but I expect the earliest would be 2019.

This seems rather detailed information for a first consulation submission.

Dave Hayman M. Sc.
BioLogic Incorporated
110 Riverside Drive, Suite 201
London ON N6H 4S5
Direct: 519 657 0299
Office: 519 434 1516 x 106
Fax: 519 434 0575

Windsor: 519 966 1645

From: ESA-Aylmer (MNRF) [mailto:ESA.Aylmer@ontario.ca]
Sent: November-30-17 12:57 PM
To: Dave Hayman <dhayman@biologic.ca>
Subject: RE: Bordoel Proposal for Aggregate License.

Thank you for submitting your information request to the Aylmer District Office of the Ministry of Natural Resources & Forestry. In order for our office to respond to your request, please provide the following:

- *More specific timing and duration of proposed activities; ie. Proposed start and end dates of activities*

Regards,

Ministry of Natural Resources & Forestry
Aylmer District
ESA Screening Requests
ESA.Aylmer@ontario.ca

From: Dave Hayman [mailto:dhayman@biologic.ca]
Sent: November-30-17 12:41 PM
To: ESA Screening Request Aylmer District (MNRF)
Cc: Bill Bradshaw (bill.b1661@gmail.com); Jim Aarts
Subject: Bordoel Proposal for Aggregate License.

Please find attached a Stage one screening request for the above noted lands.

A confirmation of receipt of this submission would be appreciated.

Dave Hayman M. Sc.
BioLogic Incorporated
110 Riverside Drive, Suite 201
London ON N6H 4S5
Direct: 519 657 0299
Office: 519 434 1516 x 106
Fax: 519 434 0575

Windsor: 519 966 1645

MTE Consultants
123 St. George St., London, Ontario N6A 3A1

June 1st, 2023

MTE File No.: 45731-101

Spencer McDonald
Development Planner, Community Planning
County of Oxford
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario, N4S 7Y3
Email: jsmcdonald@oxfordcounty.ca

Dear Spencer:

To support an application for a Zoning By-Law Amendment, MTE has been retained by AAROC Aggregates Ltd. to complete an Environmental Impact Study (EIS) for Part Lots 26 & 27, Broken Front Concession, Township of South-West Oxford in Oxford County ("the Site"; Figure 1). The Site consists of natural features and active agricultural lands. The Site is zoned "General Agriculture (A2)" with a pond feature in the northwest Adjacent Lands, zoned as "Environmental Protection (EP1)." The Site is designated "Agriculture" pursuant to Oxford County Official Plan Schedule S-1 and included within the Limestone Resource Area. The open pond to the northwest of the Site is designated as part of the Five Points Woods Provincially Significant Wetland (Figure 2; Oxford County Official Plan Schedule C-1).

The Provincially Significant Wetland (PSW) in the northwest corner and adjacent lands, extending onto the License Boundary, are within the mapped regulation area of the Upper Thames River Conservation Authority (UTRCA).

The proposal is to extract mineral aggregate resources from within the Extraction Limit with the intention of returning the land back to agricultural use once extraction is completed. The proposed extraction limit is contained within the agricultural lands, avoiding the northwest PSW and east woodland areas. A general site investigation to confirm Ecological Land Classification (ELC) vegetation communities and assess bat trees was conducted on April 11, 2023. Seven vegetation communities were identified within the Study Area (Figure 3). Extraction is proposed to occur within 1 m of the water table. As stated in the County of Oxford policy 3.2.4, an EIS is required when development or site alteration is proposed within or adjacent to Environmental Protection Areas (EPA). In this case, the Five Points Woods PSW is zoned as an EPA.

This Terms of Reference is intended to develop, in collaboration with the Township of South-West Oxford and Oxford County, an agreed upon scope of natural heritage field investigations as well as the contents of the EIS report to address potential impacts of the project. This Terms of Reference was prepared with reference to the Oxford County Policy 3.2.6.3.

The following policies will also be discussed as applicable in the EIS:

Provincial Policy Statement (PPS, 2020)

The Provincial Policy considerations are based on the Provincial Policy Statement from MMAH, 2020, section 2.1 and reviewed using the Natural Heritage Reference Manual (Sections 5-11) (MNR, 2010). All relevant subsections of Section 2.1 will be reviewed and discussed within the submitted EIS report.

County of Oxford Official Plan

The County of Oxford Official Plan (2021) includes environmental policies that provide direction for the long-term protection and conservation of natural heritage features and areas and the ecological functions, processes, and linkages that they provide in Oxford County. Chapter 3 of the OP provides the Natural Resource Management Policies that include measures for the identification, assessment and protection of natural heritage features which will be reviewed as part of the EIS (Policies 3.2.3.3, 3.2.4.2.1-3.2.4.2.5, and 3.2.7.1). Natural Heritage features are identified and mapped on Schedule C-1 of the Official Plan (Consolidated September 2022).

Oxford Natural Heritage Study (2006, and Draft 2016)

The Oxford County Natural Heritage System Study (ONHSS; UTRCA, 2006 and updated 2016 draft) provides more detailed information about Oxford County's natural heritage system. Features of the Subject Lands identified as part of the County's natural heritage system within the ONHSS will be described and assessed within the EIS.

Upper Thames River Conservation Authority Regulation Limit

The UTRCA regulates sections of the Subject Lands under Ontario Regulation 157/06. This regulation area is associated with the Five Points Woods Provincially Significant Wetland.

Endangered Species Act (ESA, 2007)

The *Endangered Species Act (ESA,* 2007) protects species and habitat not specifically identified on municipal Official Plan Schedules. To be consistent with the Provincial Policy Statement (Ministry of Municipal Affairs and Housing (MMAH), 2020), the requirements for additional studies can be triggered without any adjacent features identified on the Official Plan schedules.

Aggregate Resources Act

The *Aggregate Resources Act* (ARA) was established to control aggregate resources in Ontario by managing operations on both private and Crown land. Through the regulation of resources, the intent is to minimize impacts on the natural environment due to aggregate extraction and restore extraction sites to previous uses.

Under the ARA, applicants are required to prepare a Natural Environment Assessment to fulfill the requirements under the Aggregate Resources of Ontario: Technical Reports and Information Standards, Section 2.2 (2020). Regarding the natural environment, the report must identify any significant natural heritage features and their functions and assess the impacts to provide avoidance, mitigation, restoration and/or compensation measures as necessary.

Additional Relevant Legislation

- Fish and Wildlife Conservation Act
- Migratory Birds Convention Act

Proposed Field Investigations and Reporting

The following field investigations are proposed to inform the EIS. Additional field investigations may be undertaken based on preliminary field findings:

1. **Ecological Land Classification**

Ecological Land Classification (ELC) to identify and delineate vegetation communities on the Subject Lands, conducted in according to the protocols listed in the *Ecological Land Classification for Southern Ontario, First Approximation and Its Application* (Lee et.al., Ontario Ministry of Natural

Resources, 1998). The ELC will take into consideration data gathered from spring to fall as part of the floral inventory, described below.

Please note that ELC delineations were completed on April 11, 2023.

2. Floral Inventory

Three-season botanical inventory of all vegetation communities on the Subject Lands using commonly acceptable sampling and recording methods. Walking transects are used where terrain permits. Floristics data for plant surveys will be analyzed using the Southern Ontario Floral Inventory Analysis (SOFIA) software.

3. Bat Habitat Assessment

Candidate bat maternity roost trees will be identified using guidance from the *Survey Protocol for Species at Risk within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-coloured Bat* (MNRF, 2017). This protocol involves assessing trees based on: Species, diameter at breast height (DBH), height, presence of loose/peeling bark, cavity and cavity height, decay class, open canopy, and proximity of other snags.

Please note that potential bat trees were assessed on April 11, 2023 to capture leaf-off conditions.

4. Breeding Bird Surveys

Two rounds of breeding bird surveys (May 24 – July 10) will be undertaken in all vegetation communities on the Subject Lands with reference the Ontario Breeding Bird Atlas protocols. As point counts are designed for repeat surveying and long-term monitoring, a combination of wandering transects (area searching) and point counts in all vegetation communities are proposed to more adequately characterize the breeding bird communities on the Subject Lands. The 1st breeding bird survey will be completed between May 24 and June 15 while the 2nd survey will be completed between June 15 and July 10. Surveys are to be completed between 5:00am and 10:00am.

5. Species at Risk Screening

A Species at Risk screening using data obtained from publicly available sources (e.g., Natural Heritage Information Centre species records, municipal Protected Species lists, eBird, iNaturalist, Ontario Reptile and Amphibian Atlas) and identification of potential habitat for Protected Species (provincially endangered or threatened species) based on above-noted sources, satellite photo interpretation and field observations of vegetation communities and habitat features present. The EIS will determine the likelihood of impacting Protected Species and their habitat and include recommendations for next steps, if required (e.g., permitting by the MECP).

6. Significant Wildlife Habitat Assessment

An assessment of candidate Significant Wildlife Habitat in the Study Area using the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015) using ELC, satellite photo interpretation and results of targeted surveys for plants and wildlife.

7. Incidental Wildlife Observations

Documentation of incidental wildlife observations and their habitats in relation to the site.

Reporting

The EIS report will include:

- a description of existing natural heritage features in the Study Area using data gathered during field investigations as well as background sources, such as the Oxford Natural Heritage Study (Upper Thames River Conservation Authority, 2006 and Draft 2016), Natural Heritage

Information Centre species records, Land Information Ontario database of natural features, and citizen science databases (e.g. eBird, iNaturalist, Ontario Reptile and Amphibian Atlas). Features in the Study Area will also be viewed within the landscape context.

- an assessment of the significance and sensitivity of the features and functions of Natural Heritage features in accordance with municipal and provincial policies, including wildlife corridors and landscape connectivity, and how the extraction proposal could affect them.
- an assessment of potential direct and indirect impacts, including short-term and long-term impacts, on the viability and integrity of the Natural Heritage System as a result of the extraction proposal.
- recommendations and mitigation measures to avoid impacts to the natural features, including recommendations on how to protect, enhance or mitigate impacts on the features and their functions through planning, design, and construction practices. This will include an analysis of buffers and setbacks.
- anticipated agency permits and approvals will be determined during future design phases
- a monitoring plan to address monitoring during and post-construction, using baseline data as a benchmark.
- a summary of all recommended mitigations, numbered for convenience, and
- conclusions of the EIS, including a statement whether or not the proposal should proceed as planned, taking into consideration the recommended mitigation measures summarized above, and recommendations for development conditions.

The EIS will consider how natural heritage features on the Subject Lands function in relation to the surrounding landscape, as well as incorporate findings and recommendations from related studies (e.g., geotechnical and hydrogeological as required). Figures depicting key natural features and the proposed extraction on the Site and within 120 m of the License Boundary will be included with the report, along with appendices documenting data collection. The agreed-upon TOR will be provided as an appendix to the EIS report.

Conclusion

This TOR outlines the specific policies, background documents, and life science investigations that will be discussed in the future comprehensive EIS report submission, in accordance with the Oxford County Policy 3.2.6.3. The proposed extraction will be evaluated in the EIS with discussions of recommendations for avoidance, enhancement, and conservation of natural features included. The EIS will identify potential impacts and mitigation techniques for site plan considerations as well as subsequent construction and post-construction considerations.

Should you wish to clarify any questions or require additional information as part of the review of this TOR, do not hesitate to contact us. We welcome your comments and look forward to confirming these Terms of Reference.

Yours Truly,

MTE Consultants Inc.

Daniel J Knee

Digitally signed by Daniel J Knee
DN: cn=Daniel J Knee, c=CA, o=CENTRE DE CERTIFICATION DU QUEBEC, ou=CORPORATION, email=dknee@mte85.com
Date: 2023.06.02 12:15:43 -04'00'

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Elise Roth
Biologist
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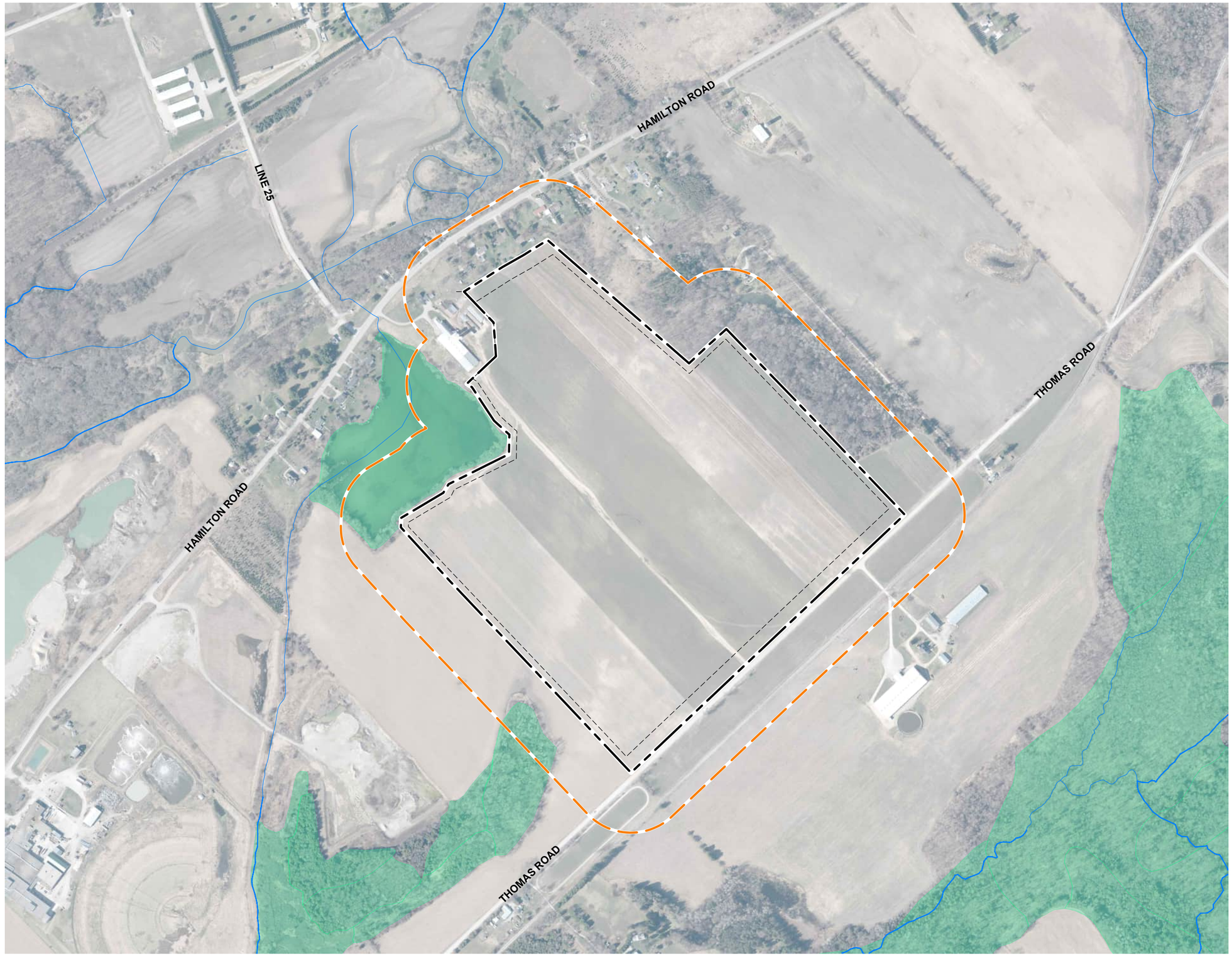
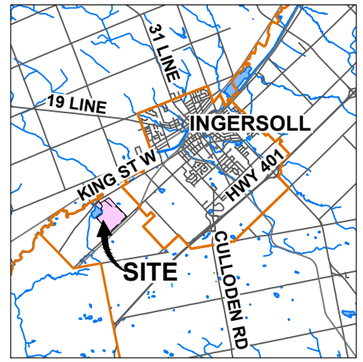
Figures





KEY PLAN (nts)

N

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- LIMIT OF EXTRACTION
- STUDY AREA (120m from Area to be Licensed)
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)

REFERENCES

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NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

SCALE IN METRES

0 150 300m

1:7,500

MTE
Engineers, Scientists, Surveyors

PROJECT

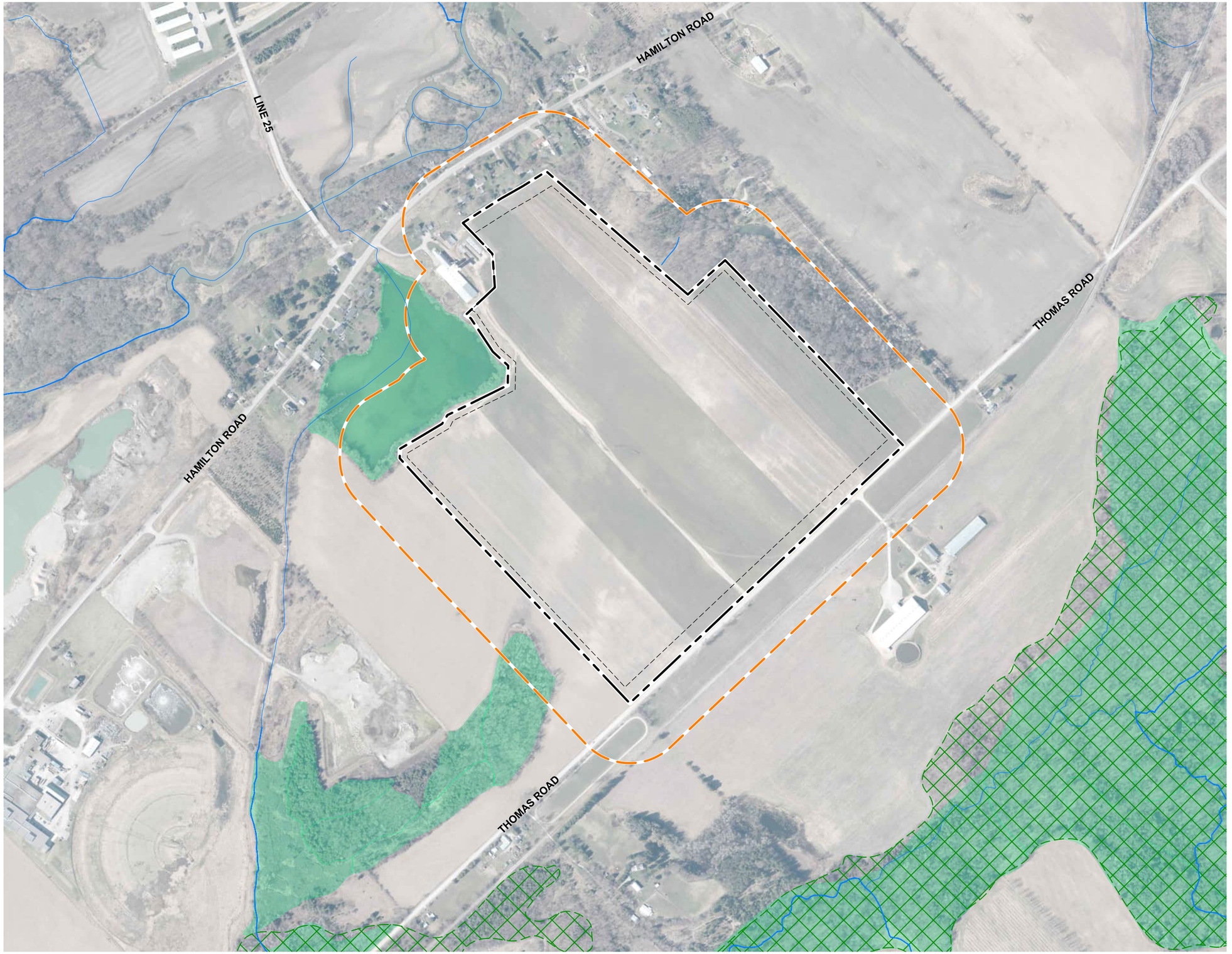
TERMS OF REFERENCE
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE

PROJECT LOCATION

Drawn: DCH	Scale: AS SHOWN
Checked:	Project No.: 45731-101
Date: May 18/23	Rev No.: 0

FIGURE 1



N

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- LIMIT OF EXTRACTION
- STUDY AREA (120m from Area to be Licensed)
- (1) VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- WETLAND - PSW (LIO/Oxford County)
- WATERCOURSE (UTRCA)
- SIGNIFICANT WOODLAND (Oxford County)

REFERENCES

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NOTES

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ALL LOCATIONS ARE APPROXIMATE.

SCALE IN METRES

0 150 300m

1:7,500

MTE
Engineers, Scientists, Surveyors

PROJECT

TERMS OF REFERENCE
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE

NATURAL HERITAGE

Drawn: DCH	Scale: AS SHOWN	**FIGURE 2**
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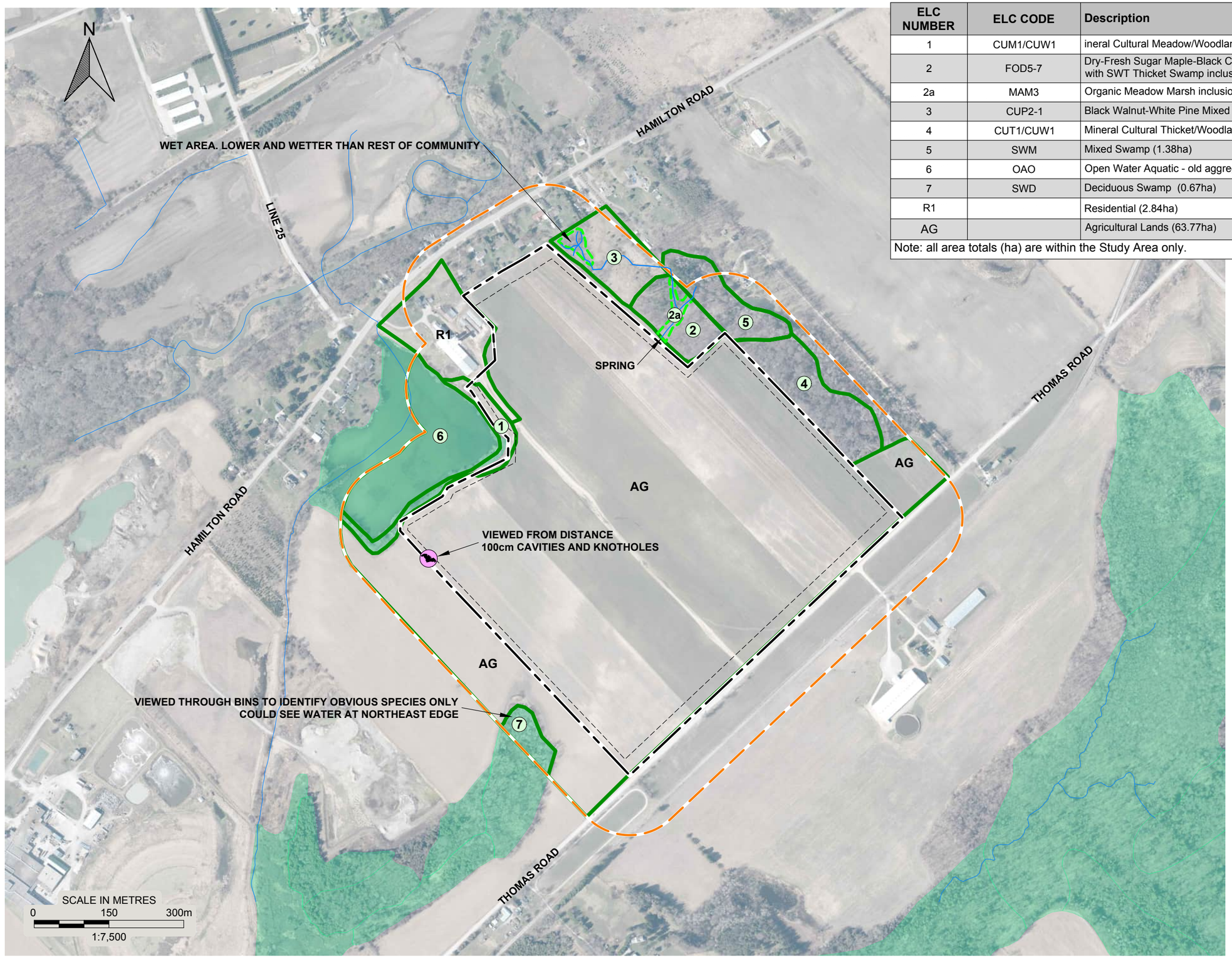

ELC NUMBER	ELC CODE	Description
1	CUM1/CUW1	ineral Cultural Meadow/Woodland Ecosite - banks of old aggregate pond (1.36ha)
2	FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous - Forest Type with SWT Thicket Swamp inclusion (1.71ha)
2a	MAM3	Organic Meadow Marsh inclusion (0.26ha)
3	CUP2-1	Black Walnut-White Pine Mixed Plantation Type (2.05ha)
4	CUT1/CUW1	Mineral Cultural Thicket/Woodland Ecosite (2.86ha)
5	SWM	Mixed Swamp (1.38ha)
6	OAO	Open Water Aquatic - old aggregate pond (4.65ha)
7	SWD	Deciduous Swamp (0.67ha)
R1		Residential (2.84ha)
AG		Agricultural Lands (63.77ha)
Note: all area totals (ha) are within the Study Area only.		

LEGEND

- BOUNDARY OF AREA TO BE LICENSED
- LIMIT OF EXTRACTION
- STUDY AREA (120m from Area to be Licensed)
- (1) VEGETATION COMMUNITY
- VEGETATION COMMUNITY (Inclusion)
- WETLAND - PSW (LIO)
- WATERCOURSE (UTRCA)
- CANDIDATE MATERNITY ROOST TREE

REFERENCES

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NOTES

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ALL LOCATIONS ARE APPROXIMATE.

MTE
Engineers, Scientists, Surveyors

PROJECT
TERMS OF REFERENCE
BARDOEL FARMS AGGREGATE PIT LEVEL 1 & 2
INGERSOLL, ONTARIO

TITLE
VEGETATION COMMUNITIES

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Date: May 18/23	Rev No.: 0

FIGURE 3

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Appendix B

Species Records Review Tables

Table 2a: Habitat Potential for Threatened and Endangered Species Based on Satellite Photo Interpretation and Background Data Review

Common Name	Scientific Name	SARO	Habitat Descriptions and Range	Rationale and Field Observations	Habitat Present on the Subject Lands?	Habitat Present on the Adjacent Lands?
Plants						
Butternut	*Juglans cinerea*	END	Usually found alone or in small groups in deciduous forests with moist, well-drained soils. Often occurs along streams. Butternut require sunny conditions and therefore are often found in canopy openings or near forest edges. Range: Found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Suitable habitat for this species may be present on the Subject Lands and Adjacent Lands as there is forest habitat present.	No	Yes
Mammals						
American Badger	*Taxidea taxus*	END	Variety of habitats including tall grass prairies, sand barrens, open grassland, and farmland. Range: Southwestern Ontario, close to Lake Erie in the Norfolk and Middlesex area. Northwestern population in Thunder Bay and Rainy River Districts. (7E(2,5)).	Suitable habitat for this species may be present on the Subject Lands as there is open farmland habitat present.	Yes	Yes
Eastern Small-footed Myotis	*Myotis leibii*	END	Roosts in caves, mine shafts, crevices, or buildings in or near a woodland. Hibernates in cold dry caves or mines. Range: From south of Georgian Bay to Lake Erie, east to Pembroke. (4E, 5E(3,4,7-11), 6E, 7E(2-6)).	There are no caves, mines, crevices or buildings near a woodland within the Subject or Adjacent Lands.	No	No
Northern Myotis	*Myotis septentrionalis*	END	Roosts in houses, manmade structures, but prefers hollow trees or under loose bark. Hunts in forests. Range: Throughout forested areas in southern Ontario. (All except 1E, 7E(1)).	There may be potential suitable candidate maternity bat roosts within and adjacent to the Subject Lands.	Yes	Yes
Little Brown Myotis	*Myotis lucifugus*	END	Little Brown Myotis roosts in caves, quarries, tunnels, hollow trees, or buildings. Little Brown Myotis typically prefer buildings or building-associated features for maternity roosting rather than natural features (Gerson, 1984; Humphrey & Fotherby, 2019). This species hibernates in humid caves and forages in wetlands and forest edges. Range: Widespread across southern Ontario. (All except 1E).	There may be potential suitable candidate maternity bat roosts within and adjacent to the Subject Lands.	Yes	Yes
Tri-coloured Bat	*Perimyotis subflavus*	END	Roosts in older forests and occasionally barns/structures. Hibernate in damp, draft-free caves. Hunt over water and along streams in a forest. (4E, 5E(8-11), 6E(1,8,9), 7E(2,3,4)).	There may be potential suitable candidate maternity bat roosts within and adjacent to the Subject Lands.	Yes	Yes
Reptiles						
Blanding's Turtle	*Emydoidea blandingii*	THR	Lives in shallow water, usually large wetlands, and shallow lakes with lots of water vegetation – darkly coloured water with high productivity, but also observed in clear waters. Sometimes hundreds of meters from water when finding a new nesting site or mate. Nesting sites are open habitats with low vegetation cover and high sun exposure, with sand, organic soil, gravel, cobblestone, and substrates. Overwinters in substrate beneath standing permanent or temporary water bodies, can overwinter in relatively shallow water (7cm). Can make long-distance overland movements between wetlands. Range: Great Lakes/St. Lawrence population primarily in southern Ontario. (4E,5E,6E,7E).	There is suitable habitat within the Subject Lands within the open pond in the northeast.	Yes	No
Birds						
Bank Swallow	*Riparia riparia*	THR	Nests in natural and disturbed settings where there are vertical faces in silt and sand deposits. Many found along rivers and lakes, but also in active sand and gravel pits. Range: Found across southern Ontario, sparse in northern Ontario. Largest populations found along Lake Erie and Lake Ontario shorelines, and along the Saugeen River.	The Subject and Adjacent Lands do not contain suitable vertical faces in silt and sand deposits.	No	No

Table 2a: Habitat Potential for Threatened and Endangered Species Based on Satellite Photo Interpretation and Background Data Review

Common Name	Scientific Name	SARO	Habitat Descriptions and Range	Rationale and Field Observations	Habitat Present on the Subject Lands?	Habitat Present on the Adjacent Lands?
Bobolink	*Dolichonyx oryzivorus*	THR	Found in large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields, marshes. Grasslands size requirements have been reported to range from 5 ha to 50 ha depending on the study (MNR, n.d.). Range: Widely distributed throughout most of the province south of the boreal forest. May be found in the north where suitable habitat exists.	There was previously noted potential hay field habitat for this species in 2018.	No	No
Chimney Swift	*Chaetura pelagica*	THR	Found in urban and rural areas near buildings. Nest and roosts in hollow trees, crevices of rock cliffs and, most commonly, in unlined chimneys. Suitable sites are reused annually. Range: Estimated 7500 breeding individuals in Ontario; most widely distributed in the Carolinian south and southwest.	There are no unlined chimneys within or adjacent to the Subject Lands to provide optimal nesting habitat for this species.	No	No
Eastern Meadowlark	*Sturnella magna*	THR	Breeds mostly in moderately tall grasslands (native prairies and savannahs), also pastures, hayfields, herbaceous fencerows, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Eastern Meadowlarks may not be strongly area-sensitive (McCracken et al. 2013), however large tracts of grasslands (5 ha or greater) are preferred over smaller fragments (Herkert 1991, Vickery et al. 1994). Range: Primarily found south of the Canadian Shield, but also inhabits Lake Nipissing, Timiskaming, and Lake of Woods areas.	There was previously noted potential hay field habitat for this species in 2018 within the Subject Lands.	Yes	No

Table 2b: Habitat Potential for Species of Conservation Concern (SOCC) Based on Satellite Photo Interpretation and Background Data Review

Common Name	Scientific Name	SARO	Habitat Descriptions and Preliminary Habitat Assessment	Rationale and Field Observations	Habitat Present on the Subject Lands?	Habitat Present on the Adjacent Lands?
Reptiles						
Snapping Turtle	*Chelydra serpentina*	SC	Spend most of their time in water, preferring shallow waters to hide in soft mud and leaf litter. Nest in gravelly or sandy areas along streams, taking advantage of man-made structures for nesting sites, including roads, dams, and aggregate pits. Range: Limited to southern part of Ontario.	There are no open ponds or water features within the Subject Lands; however, there may be suitable habitat within the adjacent pond to the west of the Subject Lands.	No	Yes
Birds						
Golden-winged Warbler	*Vermivora chrysoptera*	SC	Prefers to nest in areas with young shrubs surrounded by mature forests. Range: Breed in central-eastern Ontario as far south as Lake Ontario and St. Lawrence River. Have been found as south as Long Point.	There may be potential habitat for this species within and Adjacent to the Subject Lands as there is forest habitat present.	Yes	Yes
Barn Swallow	*Hirundo rustica*	SC	Barn Swallows are typically found nesting in close association with human rural settlements, such as in old sheds, barns, and under bridges or culverts. This species forages for aerial insects in open habitats including grassy fields, pastures, agricultural fields and farms, lake and river shorelines, wetlands, and clearings. Range: Throughout southern Ontario and as far north as Hudson Bay.	There are no suitable buildings to provide nesting habitat for this species within or adjacent to the Subject Lands.	No	No
Eastern Wood-Pewee	*Contopus virens*	SC	Lives in mid-canopy layer of forest clearings and the edges of deciduous and mixed forests. Abundant in middle-aged forests with little understory. Range: Found across most of southern and central Ontario.	The Subject and Adjacent Lands may provide suitable forest habitat for this species in the northwest.	Yes	Yes
Olive-sided Flycatcher	*Contopus cooperi*	SC	Found along natural forest edges and openings. Breeds in coniferous or mixed forests adjacent to rivers or wetlands. Range: Widely distributed throughout the central and northern areas of the province.	There may be potential suitable habitat for this species within the Subject and Adjacent Lands as there is forest habitat and the Thames River approximately 100 m to the north.	Yes	Yes
Wood Thrush	*Hylocichla mustelina*	SC	Lives in mature deciduous and mixed forests, seeking moist stands with well-developed undergrowth. Prefer large forests, but will use smaller. Range: Across southern Ontario, less common up north to Lake Superior.	The Subject and Adjacent Lands may provide suitable moist deciduous forest habitat.	Yes	Yes

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Zanchetta, C., D. C. Tozer, T. M. Fitzgerald, K. Richardson, and D. Badzinski. 2014. Tree cavity use by Chimney Swifts: implications for forestry and population recovery. Avian Conservation and Ecology 9(2): 1. http://dx.doi.org/10.5751/ACE-00677-090201. Last accessed: January 13, 2020.

Appendix C

Ecological Land Classification

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Havoc-Bardoel		POLYGON: 1	
SURVEYOR(S): WH	DATE: Oct 26	TIME: start	
		finish	
UTMZ: 17	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
■ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	■ MINERAL SOIL	☐ RIVERINE	■ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		■ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	■ TABLELAND		☐ LICHEN	☐ SWAMP
		■ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		■ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
		☐ CREVICE / CAVE		☐ MIXED	■ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			■ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

SITE	COVER
☐ OPEN WATER	■ OPEN
☐ SHALLOW WATER	☐ SHRUB
■ SURFICIAL DEP.	■ TREED
☐ BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	ACEnegu ≥ CELocci > QUEmacr > SALalba
2	SUB-CANOPY			
3	UNDERSTOREY	3	3	RHAcath = LONtata = VITripa
4	GRD. LAYER	6	4	DACglom > SOLcana > RUBocci > CIRarve

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	< 10	10 - 24	25 - 50	> 50
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	CULTURAL	CU
COMMUNITY SERIES:	MEADOW / WOODLAND	CUM / CUW
ECOSITE:	MINERAL	CUM1 / CUW1
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes: adjacent pond and banks surveyed from edge only

ELC MANAGEMENT / DISTURBANCE

SITE: Bardoel
POLYGON: 1
DATE: Oct 26
SURVEYOR(S): WH

DISTURBANCE EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	0
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	0
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	0
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	~~ABUNDANT~~	DOMINANT	6
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	0
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	0
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	0
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 1
DATE: Oct 26, July 5
SURVEYOR(S): WN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ACEnegun					
SALalba					
QUE_macr					
RUBocci					
ROSmult					
LONtata					
SOLcang					
BROiner					
DACglom					
ERIspnn					
CICinty					
SYMpilo					
RUMcris					
ELYrepe					
ARCmin					
CORseri					
EUTgram					
SILcucu					
CRApunc					
CELocci					
PRUsero					
SETfabe					
ECHlobo					
URTdioi					
LEOcard					
MONalba					
RHAcath					
EUDebro					
VITrip					
VERHti					
DAUcaro					

SPECIES CODE	LAYER 1	2	3	4	COL.
CIRarve					
COPrace					
OSTvirg					
ACEsacc					
FESarun					

Page ..... of .....

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 1
DATE:
SURVEYOR(S): WN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of .....

ELC
WILDLIFE

SITE: Bardoel
POLYGON:
DATE: Jn 12, 2018
SURVEYOR(S): WH
START TIME: 7:00 END TIME:

TEMP (°C): 14 CLOUD (10th): 8 WIND: 1 PRECIPITATION: NO
CONDITIONS: clear, warming, still

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	RWBL	FY	HHT III	
	CEDW	OB	1	
	RBVI	SM	II	
	INBU	SM	1	
	WAVI	SM	1	
	SAVS	SM	II	
	COGR	P	III	
	DOWO	VO	1	
	YWAR	SM	1	
	GRCA	P	II	
	BAOR	SM	1	

TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):
BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC
WILDLIFE

SITE: Bardoel
POLYGON: 1
DATE: July 5, 2018
SURVEYOR(S): WH
START TIME: 6:00 END TIME:

TEMP (°C): 22 CLOUD (10th): 5 WIND: 0 PRECIPITATION: NO
CONDITIONS: foggy, still, warm

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	GRCA	SM	1	
	RWBL	FY	HHT II	
	EUST	FY	HHT HHT	
	WAVI	SM	1	
	DOWO	VO	1	
	AMGO	P	HT1	
	AMPI	FY	1 II	
	BAOR	SM	1	
	SAVS	SM	1	
	YWAR	SM	1	
	SOSP	P	II	
	EAKI	VO	II	

TY	SP. CODE	EV	NOTES	#
	RED SQUIRREL			

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):
BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Bardoel		POLYGON: 2	
SURVEYOR(S): WH	DATE: Oct 26	TIME: start	
		finish	
UTMZ: 17	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
■ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	■ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	■ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☐ TABLELAND		☐ LICHEN	☐ SWAMP
SITE		■ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		■ DECIDUOUS	☐ BOG
☐ OPEN WATER		☐ TALUS	**COVER**	☐ CONIFEROUS	☐ BARREN
☐ SHALLOW WATER		☐ CREVICE / CAVE		☐ MIXED	☐ MEADOW
■ SURFICIAL DEP.		☐ ALVAR	☐ OPEN		☐ PRAIRIE
☐ BEDROCK		☐ ROCKLAND	☐ SHRUB		☐ THICKET
		☐ BEACH / BAR	■ TREED		☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			■ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	ACEsasa ≥ PRUser > FAGgran = TILamer
2	SUB-CANOPY	2	3	ACEsasa ≥ PRUser > FAGgran > OSTvir
3	UNDERSTOREY	4	3	PRUvir >> RHAcath >> SALfrag
4	GRD. LAYER	6	3	ALLpet = EQUlob > GEUcan > GERrob

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION: ACEsasa 55 PRUser 27 TILamer 8 FAGgran 5 — BA: 26

SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	A	25 - 50	O	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	O	25 - 50	O	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	FOREST	FO
COMMUNITY SERIES:	DECIDUOUS	FOD
ECOSITE:	DRY-FRESH SUGAR MAPLE	FOD5
VEGETATION TYPE:	DRY-FRESH SUGAR MAPLE - BLACK CHERRY DECIDUOUS	FOD5-7
INCLUSION		
COMPLEX		

Notes:

ELC — MANAGEMENT / DISTURBANCE

SITE: Bardoel
POLYGON: 2 2
DATE: Oct 26
SURVEYOR(S): WH

DISTURBANCE EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	~~5 - 15 YRS~~	0 - 5 YEARS	2
INTENSITY OF LOGGING	NONE	FUEL WOOD	~~SELECTIVE~~	DIAMETER LIMIT	4
EXTENT OF LOGGING	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	~~SMALL~~	INTERMEDIATE	LARGE	1
EXTENT OF GAPS	NONE	~~LOCAL~~	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	~~ABUNDANT~~	DOMINANT	2
EXTENT OF ALIEN SPECIES	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	0
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	~~FAINT TRAILS~~	WELL MARKED	TRACKS OR	1
EXTENT OF TRACKS/TRAILS	NONE	~~LOCAL~~	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	0
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	~~LIGHT~~	MODERATE	HEAVY	2
EXTENT OF DISEASE / DEATH	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	~~LIGHT~~	MODERATE	HEAVY	2
EXTENT OF WIND THROW	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	~~LIGHT~~	MODERATE	HEAVY	2
EXTENT OF BROWSE	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	~~MODERATE~~	HEAVY	2
EXTENT OF FLOODING	NONE	~~LOCAL~~	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 2
DATE: Oct 26, 2017, May 2, 2018, Jun 12
SURVEYOR(S): WK

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ACEsasa	D				
JUGnigr					
CELocci					
CARcord					
RUBaca					
RHAcath					
ALLpeti					
EUOobov					
FRApenn					
THA					
GELcana					
MATstru					
ONOsens					
LARcana					
PRUsero					
PRUvirg					
FAGgran					
BETalle					
QUErubr					
TILamer					
OSTvirg					
RUBall6					
PINstro					
ULMamer					
IMPcape					
PHAarun					
EUPmacu					
SOLdulc					
SALfrag					
RUMobtu					
SALamyg					

SPECIES CODE	LAYER 1	2	3	4	COL.
URTdioi					
SAMcana					
CIRbico					
SYMlate					
VIBlent					
RIBamer					
MALrace					
ALLcana					
GERrobe					
AESmatr					
ARCmin					
ATHfeli					
AGRgrup					
QUEalba					
ERYamer				A	
GERmacu					
SYMfoet					Inc
HESmatr					
VERoff					Inc
CALpalu					Inc
SANcana				O	
CLAvirg				O	
ALLtric					
CAUthal					
PODpelt					
TRIgran					
CAMpenn					
TRIbrev					
VIO					pic
VIBlent					
MALstell					

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ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 2
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
CARtene					
GEUstri					
CHEglab					

SPECIES CODE	LAYER 1	2	3	4	COL.

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ELC WILDLIFE	SITE: Bardoel	
	POLYGON: 2	
	DATE: Jn 12, 2018	
	SURVEYOR(S): WH	
	START TIME: 5:45	END TIME:

TEMP (°C): 10	CLOUD (10th): 0	WIND: 1	PRECIPITATION: no
CONDITIONS: clear, still, cool			

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
	INBU	SM	1						
	SOSP	SM	1						
	HOWR	SM	1						
	RWBA	FY	1111						
	REVI	SM	1						
	AMRO	FY	1111						
	AMCR	VO	1						
	COYE	SM	1						
	BAOR	SM	1						
	GCFL	VO	1						
	EAWP	SM	1						

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC WILDLIFE	SITE: Bardoel	
	POLYGON: 2	
	DATE: July 5, 2018	
	SURVEYOR(S): W.H	
	START TIME: 7:45	END TIME:

TEMP (°C): 24	CLOUD (10th): 5	WIND: 0	PRECIPITATION: no
CONDITIONS: still, foggy, hot			

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
	DOWO	T	1						
	RHCO	P	11						
	HOWR	FY	111						
	RWBA	VO	11						
	NOCA	SM	1						
	REVI	SM	1						
	MODO	SM	1						
	RTHA	T	1						
	COYE	SM	1						
	MODO	SM	1						
	RWBL	FY	111						
	SOSP	SM	11						
	GCFL	VO	11						
	CHSP	SM	11						

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC

SOILS ONTARIO

SITE: Bardoel

POLYGON: 2

DATE:

SURVEYOR(S): WH

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

STAND CHARACTERISTICS

SITE: Bardoel

POLYGON: 2

DATE: Oct 26

SURVEYOR(S): WH

TREE TALLY BY SPECIES:

PRISM FACTOR 2m

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
PRUsero	10.5	0	0			10.5	27
SOUrubr	2	0	0			2	5
TILamer	1	2	0			3	8
FAGgran	2	0	0			2	5
ACEsasa	4	5.5	12			21.5	55
TOTAL	19.5	7.5	12			39	100
BASAL AREA (BA)	39	15	24			78	26
DEAD	2	3	0			5	11

STAND COMPOSITION:

ACEsasa 55 PRUsero 27 TILamer 8 FAGgran 5

COMMUNITY PROFILE DIAGRAM

Notes:

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Bardol		POLYGON: 3	
SURVEYOR(S): WH	DATE: Oct 26	TIME: start / finish	
UTMZ: 17	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☒ TABLELAND		☐ LICHEN	☐ SWAMP
		☒ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☐ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
		☐ CREVICE / CAVE		☒ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☒ PLANTATION

SITE	COVER
☐ OPEN WATER	☒ OPEN
☐ SHALLOW WATER	☐ SHRUB
☒ SURFICIAL DEP.	☒ TREED
☐ BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	3	3	JUGnigr ≥ PINstro
2	SUB-CANOPY			
3	UNDERSTOREY	3	2	RUBocci = LONtata = RHAcath
4	GRD. LAYER	5	4	BROiner >> SOLcana >

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	< 10	10 - 24	25 - 50	> 50
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH
		X			

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	CULTURAL	CU
COMMUNITY SERIES:	PLANTATION	CUP
ECOSITE:	MIXED	CUP2
VEGETATION TYPE:	BLACK-WALNUT-WHITE PINE MIXED PLANTATION	CUP2-1
INCLUSION		
COMPLEX		

Notes:

ELC
MANAGEMENT / DISTURBANCE

SITE: BARDOL
POLYGON: 3
DATE: Oct 26
SURVEYOR(S): WH

DISTURBANCE EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	0
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	0
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	~~LARGE~~	6
EXTENT OF GAPS	NONE	LOCAL	~~WIDESPREAD~~	~~EXTENSIVE~~	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	~~ABUNDANT~~	DOMINANT	6
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	~~DOMINANT~~	9
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	6
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	6
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	0
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	4
EXTENT OF BROWSE	NONE	LOCAL	~~WIDESPREAD~~	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 3
DATE: Oct 26, 2017, May 2'18, Jn 12, July 5
SURVEYOR(S): WN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
JUGnigr					
MALspp					
QUErubr					
PINstro					
ACEsacc					
SALalba					
ACEnegu					
CARdeci					
SILvulg					
HESmatr					
CALpalu					
SYMfoet					
SALdisc					
CORseri					
VERthap					
DAUcaro					
BROiner					
SOLcana					
TARoffi					
ALLpeti					
HESmatr					
MEDsati					
STITCHWORT					

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 3
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

WILDLIFE

SITE: Bardwell
POLYGON: 3
DATE: Jn 12, 2015
SURVEYOR(S): WH
START TIME: 5:45 END TIME:

TEMP (°C): 10 CLOUD (10th): 0 WIND: 1 PRECIPITATION: no

CONDITIONS: clear, wet, still

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	SOSP	~~FY~~	11	
	CHSP	P	11	
	EAST	VO	1	
	MODO	P	11	
	RWBL	VO	1	
	HOSP	SM	1	
	AMRO	P	11	
	BAOR	SM	1	
	WAVI	SM	1	
	EAKI	T	1	
	AMGO	P	11	

TY	SP. CODE	EV	NOTES	#
	M. Clark			

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC

WILDLIFE

SITE: Badger
POLYGON: 3
DATE: July 5 2018
SURVEYOR(S): WH
START TIME: 7:30 END TIME: 8:00

TEMP (°C): 24 CLOUD (10th): 0 WIND: 0 PRECIPITATION: no

CONDITIONS: hot, humid, still, clear

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	RWBL	FY	HHT	
	AMRO	FY	HHT 11	
	SOSP	FY	1111	
	RBGR	SM	1	
	WAVI	SM	11	
	GRCA	P	11	
	EAKI	T	11	
	VESP	SM	1	
	MODO	SM	1	
	AMGO	P	11	
	CEDW	P	11	

TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Bardoel		POLYGON: 4	
SURVEYOR(S): WH	DATE: Oct 26	TIME: start	finish
UTMZ: 17	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☒ TABLELAND		☐ LICHEN	☐ SWAMP
SITE		☐ ROLL. UPLAND	**COVER**	☐ BRYOPHYTE	☐ FEN
☐ OPEN WATER		☐ CLIFF	☐ OPEN	☒ DECIDUOUS	☐ BOG
☐ SHALLOW WATER		☐ TALUS	☒ SHRUB	☐ CONIFEROUS	☐ BARREN
☒ SURFICIAL DEP.		☐ CREVICE / CAVE	☒ TREED	☐ MIXED	☐ MEADOW
☐ BEDROCK		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☒ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☒ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	CARcord > ULMamer = ACEsacc
2	SUB-CANOPY			
3	UNDERSTOREY	3	3	RHAcath = CRAspp ≥ MALspp. = CORspp
4	GRD. LAYER	5	3	ALLpet > SOLdul na =

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	CULTURAL	CU
COMMUNITY SERIES:	THICKET / WOODLAND	CUT / CUW
ECOSITE:	MINERAL	CUT1 / CUW1
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
MANAGEMENT / DISTURBANCE

SITE: Bardoel
POLYGON: 4
DATE: Oct 26, 2017
SURVEYOR(S): WH

DISTURBANCE EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	0
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	0
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	~~LARGE~~	9
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	~~ABUNDANT~~	DOMINANT	6
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	0
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	0
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	0
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	6
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	6
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	~~EXTENSIVE~~	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 4
DATE: Oct 26, 2017
SURVEYOR(S): WH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
RHAcath					
CARcord					
MALspp					
ULMamer					
EUOeleo					
ACLpeti					
SORcana					
CORcori					
POPtrem					
MORalba					
PRUBorei					
CELocci					
JUGnigr					
FRApenn					
CORrace					
ECHkoba					
CRAspun					
MALrac					
RUBidae					
SALalba					
VIBlent					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of .....

ELC
PLANT SPECIES LIST

SITE: Bardoel
POLYGON: 4
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of .....

ELC

WILDLIFE

SITE: Bardoel
POLYGON: 4
DATE: Jn 12
SURVEYOR(S): WN
START TIME: 6:45 END TIME:

TEMP (°C): 11 CLOUD (10th): 0 WIND: 1 PRECIPITATION: NO
CONDITIONS: clear, still, cool

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	NOCA	SH	1	
	HOWR	NB	11	
	GRCA	SM	11	
	AMRO	P	11	
	RTHA	OB	1 FLYOVER	
	WOTH	SM	1	
	INBU	T	11	
	AMGO	P	11	
	AMRE	SM	1	

TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC

WILDLIFE

SITE: Bardoel
POLYGON: 4
DATE: July 5, 2018
SURVEYOR(S): WN
START TIME: 6:45 END TIME:

TEMP (°C): 24 CLOUD (10th): 5 WIND: 0 PRECIPITATION: NO
CONDITIONS: hot, foggy, still

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
	WOTH	SM	1	
	INBU	SM	1	
	REVI	SM	1	
	AMRO	P	11	
	SOSP	SM	11	
	GRCA	SM	11	
	AMCR	FY	111	
	HOWR	SM	1	

TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

Appendix D

Significant Wildlife Habitat Assessment

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Seasonal Concentration of Animals

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Waterfowl Stopover and Staging Areas (Terrestrial)	CUM1, CUT1	• Large fields with abundant sheet water in spring not noted within the Subject Lands or Adjacent Lands	No	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300m radius, dependent on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).	No
Waterfowl Stopover and Staging Areas (Aquatic)	SWD	• There is a pond in the Adjacent Lands to the northwest that may provide suitable habitat	Yes (Adjacent Lands)	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • The combined area of the ELC ecosites and a 100m radius area is SWH • Wetland area and shorelines associated with sites identified within the SWHTG are significant wildlife habitat. • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • No waterfowl species were observed during breeding bird surveys.	No
Shorebird Migratory Stopover Area	-	• No beach areas, bars, seasonally flooded, muddy and un-vegetated shoreline habitat available within the Subject Lands or Adjacent Lands	No	Studies confirming: • Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Seasonal Concentration of Animals

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Raptor Wintering Area	FOD5-7, CUM1, CUT1, CUW1	• A combination of forest and field habitat >20 ha extends outside of the Subject Lands into the Adjacent Lands that may provide suitable habitat	Yes (Subject & Adjacent Lands)	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • Studies did not confirm use of at least 10 Bald Eagles and two of the listed hawk/owl species. • Only Red-tailed Hawk was observed in 2018.	No
Bat Hibernacula	-	• No suitable features present.	No	• All sites with confirmed hibernating bats are SWH. • The area includes 200m radius around the entrance of the hibernaculum for most development types and 1000m for wind farms • Studies are to be conducted during the peak swarming period (Aug–Sept). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”	No
Bat Maternity Colonies	FOD5-7, SWD, SWM	• There may be suitable habitat within the woodland to the east of the Subject Lands.	Yes (Adjacent Lands)	Maternity Colonies with confirmed use by; • >10 Big Brown Bats • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”	Candidate (Adjacent Lands)

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Seasonal Concentration of Animals

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Turtle Wintering Areas	SWD, SWM, OAO	• The Adjacent open water pond to the northwest of the Subject Lands may provide suitable habitat. In the Adjacent Lands to the east, there may also be suitable habitat.	Yes (Adjacent Lands)	Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC Ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deepwater pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept-Oct) or spring (Mar-May). • Congregation of turtles is more common where wintering areas are limited and therefore significant.	Candidate (Adjacent Lands)
Reptile Hibernaculum	All other than really wet	• No features indicative of hibernation sites (bedrock fissures, rock piles, burrows) present within the Subject Lands.	No	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. Near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern Species present, then site is SWH. • The feature in which the hibernacula is located plus a 30 m radius area is SWH.	No
Colonially-Nesting Bird Breeding Habitat (Bank/Cliff)	-	• No exposed soil banks, cliff faces, sandy hills, borrow pits, steep slopes, or other suitable habitat present.	No	Studies confirming: • Presence of 1 or more nesting sites with 8cxlix or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Seasonal Concentration of Animals

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs)	SWD	• There may be suitable wetland habitat to the east of the Subject Lands.	Yes (Adjacent Lands)	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April-August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • No listed species were observed during targeted breeding bird surveys.	No
Colonially-Nesting Bird Breeding Habitat (Ground)	CUT1, CUM1	• No islands, peninsulas, or low bushes close to streams/ditches are present.	No	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	No
Migratory Butterfly Stopover Areas	CUM1, CUT1, FOD5-7, CUP2-1	• A butterfly stopover area will be >10 ha in size with a combination of forest (FOD) and field (CUM/CUT), and be located within 5 km of Lake Erie or Lake Ontario. • Criteria not met due to the distance from Great Lakes.	No	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Seasonal Concentration of Animals

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Land Bird Migratory Stopover Areas	FOD5-7, SWD, SWM	• Subject Lands are not within 5 km of Lake Ontario and Lake Erie. Criteria not met.	No	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Mar to May) and fall (Aug-Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	No
Deer Winter Congregation Areas	FOD5-7, SWM, SWD	• No woodlots >100 ha in size. • No White-tailed Deer wintering areas identified in the area by LIO wildlife values area mapping.	No	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by whitetailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Rare Vegetation Communities

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Cliffs and Talus Slopes	-	Not present.	No	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes.	No
Sand Barren	-	Not present.	No	• Confirm any ELC Vegetation Type for Sand Barrens. • Site must not be dominated by exotic/introduced species (<50% vegetative cover exotic sp.).	No
Alvar	-	Not present.	No	• Field studies that identify 4 of the 5 Alvar Indicator Species at a Candidate Alvar site is significant. • Site must not be dominated by exotic/introduced species (<50% vegetative cover exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses.	No
Old Growth Forest	FOD5-7, SWD, SWM	• Woodland area is >0.5ha; dominant trees species are not >140 years old	No	Field Studies will determine: • If dominant trees species are >140 years old, then the area containing these trees is SWH. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics.	No
Savannah	-	Not present.	No	• Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic/introduced species (<50% vegetative cover exotic sp.).	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Rare Vegetation Communities

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Tallgrass Prairie	-	Not present.	No	• Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic/introduced species (<50% vegetative cover exotic sp.).	No
Other Rare Vegetation	-	Not present.	No	• Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Specialized Habitats of Wildlife Considered SWH

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Waterfowl Nesting Area	MAM3, SWD	- Wetland habitat is available within the adjacent pond and wetland communities east of the Subject Lands	Yes (Adjacent Lands)	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April-June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • No listed bird species were observed during breeding bird surveys in 2023.	No
Bald Eagle and Osprey Nesting, Foraging, Perching	FOD5-7, SWD, SWM	- There are no major rivers with forested shorelines, islands or structures over water available.	No	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • No Bald Eagles or Osprey were observed during breeding bird surveys.	No
Woodland Raptor	FOD5-7, SWD, SWM	- No natural or conifer	No	Studies confirm:	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Specialized Habitats of Wildlife Considered SWH

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Nesting Habitat		plantation woodlands/forest stands >30ha with >4ha of interior habitat. Criteria not met.		• Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.	
Turtle Nesting Areas	-	- There may be potentially sandy and gravelly areas adjacent to the pond, outside of the Subject Lands.	Yes (Adjacent Lands)	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.	Candidate (Adjacent Lands)
Springs and Seeps	-	- A spring was observed in 2018 at the boundary of the Subject Lands and Community 2. This was confirmed again in 2023. -Additional springs may be present within the Adjacent Lands.	Yes (Subject & Adjacent Lands)	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat. • Two or more springs were not observed within the Subject Lands. • Springs or seeps may be present within the Adjacent Lands.	Candidate (Adjacent Lands)

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Specialized Habitats of Wildlife Considered SWH

Wildlife Habitat	ELC Codes Triggers	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Amphibian Breeding Habitat (Woodland)	FOD5-7, SWD, SWM	-There is potential amphibian breeding habitat within the adjacent pond and wetland habitat to the east of the Subject Lands.	Yes (Adjacent Lands)	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Code 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • Amphibian call surveys were not conducted in 2023.	Candidate (Adjacent Lands)
Amphibian Breeding Habitat (Wetlands)	OAO	- No wetlands located >120m from woodland ecosites are present within or directly adjacent to the Subject Lands.	No	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals • (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.	No
Woodland Area-Sensitive Bird Breeding Habitat	FOD5-7, SWD, SWM	- No large mature (>60yrs old) forest stands or woodlots >30 ha are present within or adjacent to the Subject Lands.	No	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Habitats of Species of Conservation Concern Considered SWH

Wildlife Habitat	ELC Codes Triggers	Candidate Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Marsh Breeding Bird Habitat	MAM3, SWD, CUM1	• There may be suitable habitat to support this species in the Adjacent Lands	Yes (Adjacent Lands)	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • No listed marsh bird species were observed during 2018 or 2023 breeding bird surveys	No
Open Country Bird Breeding Habitat	CUM1	• Large annual crop fields that may be hay.	Yes (Subject Lands)	Field studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • No listed species were recorded during breeding bird surveys.	No
Shrub/Early Successional Bird Breeding Habitat	CUT1, CUW1	• There are large fields succeeding to shrub and thicket habitats >10 ha in size are present; however, in 2018 they were active hay fields. In 2023, they were a blend of annual row crops (e.g., corn).	No	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered SWH. • The area of the SWH is the contiguous ELC Ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

Habitats of Species of Conservation Concern Considered SWH

Wildlife Habitat	ELC Codes Triggers	Candidate Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Terrestrial Crayfish	SWD, SWM, MAM3 CUM1	• Potential suitable habitat is present within the Adjacent Lands.	Yes (Adjacent Lands)	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. • Area of ELC ecosite or an eco-element area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. • No chimneys or individuals observed within the Subject Lands in 2018 or 2023.	Candidate (Adjacent Lands)
Special Concern and Rare Wildlife Species (NHIC and MNRF pre-consultation)	-	• NHIC identified several Special Concern or rare species as potentially present within the area of the Subject Lands. These include Golden-winged Warbler, Barn Swallow Eastern Wood-Pewee, Olive-sided Flycatcher, Snapping Turtle and Wood Thrush.	Yes for Eastern Wood-Pewee, Snapping Turtle and Wood Thrush (Adjacent Lands)	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat.	Candidate for Snapping Turtle (Adjacent Lands)

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

SWH Exceptions

Wildlife Habitat	ELC Codes Triggers*	Additional Habitat Criteria	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Amphibian Movement Corridors	-	• Movement corridors are determined when there is confirmed amphibian breeding habitat in wetlands. Amphibian wetland habitat has not been identified as candidate or confirmed.	No	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.	No

ELCs: Subject Lands: CUM1, CUW1
Adjacent Lands: FOD5-7, MAM3, CUP2-1, CUT1, CUW1, SWM, SWD, OAO

SWH Exceptions

Wildlife Habitat	Ecosites	Habitat Criteria and Information	Candidate SWH	SWH Defining Criteria	Confirmed SWH
Bat Migratory Stopover Area	No triggers	- The site is not near Long Point.	No	• The confirmation criteria and habitat areas for this SWH are still being determined.	No

Appendix E

Floral Inventory

Floral Inventory															
1	2	3	4	5	6	7	Scientific Name	Common Name	CW	COSEWIC	SARO	SRank	OX	Type	Invasive
X				X			*Acer negundo*	Manitoba Maple	0.0			S5	X	TR	Y
	X						*Acer nigrum*	Black Maple	3.0			S4?	X	TR	
		X				X	*Acer rubrum*	Red Maple	0.0			S5	X	TR	
		X				X	*Acer saccharinum*	Silver Maple	-3.0			S5	X	TR	
	X		X	X			*Acer saccharum*	Sugar Maple	3.0			S5	X	TR	
		X					*Achillea millefolium*	Common Yarrow	3.0			SE	IX	FO	
			X				*Agrimonia gryposepala*	Hooked Agrimony	3.0			S5	X	FO	
		X					*Agrostis stolonifera*	Creeping Bentgrass	-3.0			SE5	IX	GR	
X	X	X	X	X			*Alliaria petiolata*	Garlic Mustard	0.0			SE5	IX	FO	Y
	X		X				*Allium tricoccum*	Wild Leek	3.0			S4		FO	
		X					*Ambrosia artemisiifolia*	Common Ragweed	3.0			S5	X	FO	
X		X					*Ambrosia trifida*	Great Ragweed	0.0			S5	X	FO	
		X					*Anthriscus sylvestris*	Wild Chervil	5.0			SE4?	IX	FO	Y
	X		X				*Aralia nudicaulis*	Wild Sarsaparilla	3.0			S5	X	FO	
X	X			X			*Arctium minus*	Common Burdock	3.0			SE5	IX	FO	
	X		X	X			*Arisaema triphyllum*	Jack-in-the-pulpit	-3.0			S5	X	FO	
X		X	X				*Asclepias syriaca*	Common Milkweed	5.0			S5	X	FO	
	X		X				*Athyrium filix-femina*	Common Lady Fern	0.0			S5		FE	
		X					*Barbarea vulgaris*	Bitter Wintercress	0.0			SE5	IX	FO	
				X			*Betula alleghaniensis*	Yellow Birch	0.0			S5	X	TR	
X	X			X			*Boehmeria cylindrica*	False Nettle	-5.0			S5	X	FO	
X		X					*Bromus inermis*	Smooth Brome	5.0			SE5	IX	GR	Y
			X				*Carya cordiformis*	Bitternut Hickory	0.0			S5	X	TR	
	X						*Caulophyllum thalictroides*	Blue Cohosh	5.0			S5	X	FO	
X	X						*Celtis occidentalis*	Common Hackberry	0.0			S4	X	TR	
X							*Cirsium arvense*	Canada Thistle	3.0			SE5	IX	FO	Y
		X					*Clinopodium vulgare*	Field Basil	5.0			S5	X	FO	
	X						*Cornus alternifolia*	Alternate-leaved Dogwood	3.0			S5	X	SH	
X			X				*Cornus racemosa*	Gray Dogwood	0.0			S5	X	SH	
X		X				X	*Cornus sericea*	Red-osier Dogwood	-3.0			S5	X	SH	
X	X		X	X			*Crataegus punctata*	Dotted Hawthorn	5.0			S5	X	SH	
X		X					*Dactylis glomerata*	Orchard Grass	3.0			SE5	IX	GR	
X		X					*Daucus carota*	Wild Carrot	5.0			SE5	IX	FO	
X							*Echinochloa crus-galli*	Large Barnyard Grass	-3.0			SE5	IX	GR	
X	X	X	X	X			*Echinocystis lobata*	Wild Mock-cucumber	-3.0			S5	X	VI	
X							*Elymus canadensis*	Canada Wildrye	3.0			S5	X	GR	
			X	X			*Epipactis helleborine*	Eastern Helleborine	3.0			SE5	IX	FO	Y
			X				*Equisetum arvense*	Field Horsetail	0.0			S5	X	FE	
X		X	X				*Erigeron annuus*	Annual Fleabane	3.0			S5	X	FO	
X							*Erigeron canadensis*	Canada Horseweed	3.0			S5	X	FO	
	X		X				*Erythronium americanum*	Yellow Trout-lily	5.0			S5	X	FO	
	X						*Euonymus obovatus*	Running Strawberry Bush	3.0			S4	X	SH	
		X					*Euthamia graminifolia*	Grass-leaved Goldenrod	0.0			S5	X	FO	
	X			X			*Eutrochium maculatum*	Spotted Joe Pye Weed	-5.0			S5		FO	
	X						*Fagus grandifolia*	American Beech	3.0			S4	X	TR	
			X	X			*Fraxinus pennsylvanica*	Green Ash	-3.0			S4	X	TR	
		X					*Galium mollugo*	Smooth Bedstraw	5.0			SE5	IX	FO	Y
				X			*Gaultheria procumbens*	Eastern Teaberry	3.0			S5	X	SH	
	X						*Geranium maculatum*	Spotted Geranium	3.0			S5	X	FO	
	X						*Geranium robertianum*	Herb-Robert	3.0			S5	X	FO	
		X	X				*Geum aleppicum*	Yellow Avens	0.0			S5	X	FO	
	X	X					*Geum canadense*	White Avens	0.0			S5	X	FO	

Floral Inventory														
1	2	3	4	5	6	7	Scientific Name	Common Name	CW	COSEWIC	SARO	SRank	OX	Type	Invasive
X		X					*Hackelia virginiana*	Virginia Stickseed	3.0			S5	X	FO	
X	X	X	X	X			*Hesperis matronalis*	Dame's Rocket	3.0			SE5	IX	FO	Y
			X				*Hydrophyllum virginianum*	Virginia Waterleaf	0.0			S5	X	FO	
		X					*Hypericum perforatum*	Common St. John's-wort	5.0			SE5	IX	FO	Y
	X	X	X				*Impatiens capensis*	Spotted Jewelweed	-3.0			S5	X	FO	
				X			*Impatiens pallida*	Pale Jewelweed	-3.0			S4	X	FO	
		X					*Juglans nigra*	Black Walnut	3.0			S4?	X	TR	
				X			*Laportea canadensis*	Wood Nettle	-3.0			S5	X	FO	
		X					*Larix laricina*	Tamarack	-3.0			S5	X	TR	
	X	X					*Leonurus cardiaca*	Common Motherwort	5.0			SE5	IX	FO	
			X				*Lobelia siphilitica*	Great Blue Lobelia	-3.0			S5		FO	
X							*Lonicera tatarica*	Tartarian Honeysuckle	3.0			SE5	IX	SH	Y
	X		X				*Maianthemum racemosum*	Large False Solomon's Seal	3.0			S5	X	FO	
	X		X				*Malus pumila*	Common Apple	5.0			SE4	IX	SH	
	X		X	X			*Matteuccia struthiopteris*	Ostrich Fern	0.0			S5	X	FE	
		X					*Medicago lupulina*	Black Medic	3.0			SE5	IX	FO	
					X		*Nymphaea odorata*	Fragrant Water-lily	-5.0			S5		FO	
			X	X			*Onoclea sensibilis*	Sensitive Fern	-3.0			S5	X	FE	
	X						*Ostrya virginiana*	Eastern Hop-hornbeam	3.0			S5	X	TR	
				X			*Oxalis stricta*	Upright Yellow Wood-sorrel	3.0			S5		FO	
X	X		X	X			*Parthenocissus vitacea*	Thicket Creeper	3.0			S5	X	VW	
	X	X	X	X			*Persicaria virginiana*	Virginia Smartweed	0.0			S4		FO	
X		X				X	*Phalaris arundinacea*	Reed Canary Grass	-3.0			S5	X	GR	Y
		X					*Phleum pratense*	Common Timothy	3.0			SE5	IX	GR	
				X			*Picea glauca*	White Spruce	3.0			S5	X	TR	
		X					*Pilea pumila*	Dwarf Clearweed	-3.0			S5	X	FO	
	X	X					*Pinus strobus*	Eastern White Pine	3.0			S5	X	TR	
		X					*Plantago major*	Common Plantain	3.0			SE5	IX	FO	
		X					*Poa palustris*	Fowl Bluegrass	-3.0			S5	X	GR	
		X	X				*Podophyllum peltatum*	May-apple	3.0			S5	X	FO	
			X				*Polystichum acrostichoides*	Christmas Fern	3.0			S5	X	FE	
			X			X	*Populus deltoides*	Eastern Cottonwood	0.0			S5		TR	
			X	X			*Populus tremuloides*	Trembling Aspen	0.0			S5	X	TR	
			X				*Prunus avium*	Sweet Cherry	5.0			SE4		TR	
X	X		X				*Prunus serotina*	Black Cherry	3.0			S5	X	TR	
	X		X	X			*Prunus virginiana*	Choke Cherry	3.0			S5	X	TR	
				X			*Pteridium aquilinum*	Bracken Fern	3.0			S5	X	FE	
X	X						*Quercus macrocarpa*	Bur Oak	3.0			S5	X	TR	
	X						*Quercus rubra*	Northern Red Oak	3.0			S5	X	TR	
	X	X	X				*Rhamnus cathartica*	Common Buckthorn	0.0			SE5	IX	SH	Y
X							*Rhus typhina*	Staghorn Sumac	3.0			S5	X	SH	
X	X		X	X			*Ribes americanum*	Wild Black Currant	-3.0			S5	X	SH	
			X				*Ribes cynosbati*	Prickly Gooseberry	3.0			S5	X	SH	
X							*Rosa multiflora*	Multiflora Rose	3.0			SE5	IX	SH	Y
X							*Rubus allegheniensis*	Allegheny Blackberry	3.0			S5	X	SH	
	X	X	X				*Rubus idaeus*	Common Red Raspberry	3.0			S5		SH	
X		X	X				*Rubus occidentalis*	Black Raspberry	5.0			S5	X	SH	
X		X	X				*Rumex crispus*	Curly Dock	0.0			SE5	IX	FO	
X							*Salix alba*	White Willow	-3.0			SE4	IX	TR	
X							*Sambucus canadensis*	Common Elderberry	-3.0			S5	X	SH	
			X				*Sanguinaria canadensis*	Bloodroot	3.0			S5	X	FO	
		X					*Silene latifolia*	White Campion	5.0			SE5	IX	FO	

Floral Inventory														
1	2	3	4	5	6	7	Scientific Name	Common Name	CW	COSEWIC	SARO	SRank	OX	Type	Invasive
X		X					*Silene vulgaris*	Bladder Campion	5.0			SE5	IX	FO	
X	X						*Solanum dulcamara*	Bittersweet Nightshade	0.0			SE5	IX	VW	Y
X	X	X	X	X			*Solidago canadensis*	Canada Goldenrod	3.0			S5		FO	
		X					*Solidago flexicaulis*	Zigzag Goldenrod	3.0			S5	X	FO	
		X					*Solidago nemoralis*	Gray-stemmed Goldenrod	5.0			S5		FO	
				X			*Streptopus lanceolatus*	Rose Twisted-stalk	3.0			S5	X	FO	
X		X	X				*Symphyotrichum lateriflorum*	Calico Aster	0.0			S5	X	FO	
		X					*Symphyotrichum novae-angliae*	New England Aster	-3.0			S5	X	FO	
	X		X	X			*Symplocarpus foetidus*	Skunk Cabbage	-5.0			S5	X	FO	
		X					*Taraxacum officinale*	Common Dandelion	3.0			SE5	IX	FO	
	X		X	X			*Thalictrum dasycarpum*	Purple Meadow-rue	-3.0			S4?		FO	
	X						*Thalictrum dioicum*	Early Meadow-rue	3.0			S5	X	FO	
				X			*Thuja occidentalis*	Eastern White Cedar	-3.0			S5	X	TR	
	X						*Tilia americana*	American Basswood	3.0			S5	X	TR	
	X						*Toxicodendron radicans*	Poison Ivy	0.0			S5		VW	
X		X					*Tragopogon pratensis*	Meadow Goat's-beard	5.0			SE5	IX	FO	
		X					*Trifolium repens*	White Clover	3.0			SE5	IX	FO	
		X			X		*Typha latifolia*	Broad-leaved Cattail	-5.0			S5	X	FO	
			X				*Ulmus americana*	American Elm	-3.0			S5	X	TR	
X	X	X		X			*Urtica dioica*	Stinging Nettle	0.0			S5		FO	
X		X					*Verbascum thapsus*	Common Mullein	5.0			SE5	IX	FO	
X							*Verbena urticifolia*	White Vervain	0.0			S5	X	FO	
	X						*Viburnum opulus ssp. opulus*	Cranberry Viburnum	-3.0			SE3?	IR	SH	Y
		X					*Vicia cracca*	Tufted Vetch	5.0			SE5	IX	VI	Y
	X						*Viola sororia*	Woolly Blue Violet	0.0			S5	X	FO	
X		X	X	X			*Vitis riparia*	Riverbank Grape	0.0			S5	X	VW	

Appendix F

Breeding Bird Summary

AVIFAUNAL SURVEY INFORMATION SUMMARY SHEET

Project Name: Bardoel Farms Aggregate Pit Level 1 & 2 NER **MTE File No.: 45731-101**
Collector(s): Will Huys, Elise Roth

	Date	Start	Finish	Weather
Visit 1	31-May-23	8:45	10:15	22C, Wind 2, Wind direction S, CC 0%, No rain
Visit 2	28-Jun-23	8:00	10:00	13C, Wind 1, Wind direction NW, CC 100% (Smoke), No rain

Species Abbr.	Species Name	Comm. 1				Comm. 2				Comm. 3				Comm. 4				Comm. 5				S Rank	ESA Status	PIF Status	Notes
		Visit 1		Visit 2		Visit 1		Visit 2		Visit 1		Visit 2		Visit 1		Visit 2		Visit 1		Visit 2					
		Code	No.	Code	No.	Code	No.	Code	No.	Code	No.	Code	No.	Code	No.	Code	No.	Code	No.	Code	No.				
WITU	Wild Turkey													OB	5							S5	-		
KILL	Killdeer															SM,VO	2					S5			IN FIELD
BEKI	Belted Kingfisher	FO	1																			S4		RC	HUNTING POND
DOWO	Downy Woodpecker					VO	1															S5			
GCFL	Great Crested Flycatcher							SM	1													S4	-		
EAKI	Eastern Kingbird	SH	1																			S4		RC	SAW 1 BIRD
WAVI	Warbling Vireo	SH,SM	1	VO	2																	S5			
REVI	Red-eyed Vireo	SM	1			SM	1	SM	1	SM	1			SM	1	SM	1					S5			
BLJA	Blue Jay							SM	1					VO	2							S5			
AMCR	American Crow					T	2									VO	1					S5			
TRES	Tree Swallow	SH	3	VO, O	3																	S4			
BARS	Barn Swallow															VO,OB	6					S4	THR		IN FIELD
BCCH	Black-capped Chickadee	SH	1													SM	1					S5	-		ONE CALL HEARD
HOWR	House Wren									SM	1	SM,VO	2	SM	1							S5			
AMRO	American Robin	SH	9	SM	6					P	6	VO,SM	5	OB	11							S5			MANY FORAGING FIELD EDGE
GRCA	Gray Catbird					SM	1							SM	2							S4			
EUST	European Starling	SH	3																			SNA			GROSS BIRD
CEDW	Cedar Waxwing	P	2	OB	1							SM	1	P	4							S5			
YWAR	Yellow Warbler	SM	3	SM	2																	S5			
COYE	Common Yellowthroat							SM	1							SM	1			SM	1	S5	-		IN TREES NEAR END OF COMM
SOSP	Song Sparrow	T	4	SM,VO	3					SM	2	SM	1	SM	1	OB,SM	4					S5			
NOCA	Northern Cardinal			SM	1	SM	2	VO	1			SM	1	SM	1	SM	1			SM	1	S5			
RBGR	Rose-breasted Grosbeak													P	2							S4		RS	LIKELY BREEDERS
INBU	Indigo Bunting	SM	1			SM	2	SM,VO	2							SM	1					S4			
RWBL	Red-winged Blackbird	P	11	VO	11	VO	2			P	6			FY	5							S4			PAIR AND 3 YOUNG
COGR	Common Grackle									VO	2											S5			
BAOR	Baltimore Oriole	P	2			SH	1															S4		RC,RS	
AMGO	American Goldfinch					SM	1							SH	2	SM	1					S5			

Evidence Codes:
Breeding Bird - Possible
SH=Suitable Habitat SM=Singing Male
Breeding Bird - Probable
T=Territory A=Anxiety Behaviour D=Display N=Nest Building P=Pair V=Visiting Nest
Breeding Bird - Confirmed
DD=Distraction NE=Eggs AE=Nest Entry NU=Nest Used NY=Nest Young FY=Fledged Young FS=Food/Faecal Sack
Other Wildlife Evidence
OB=Observed DP=Distinctive Parts TK=Tracks VO=Vocalization HO=House/Den FE=Feeding Evidence CA=Carcass
Fy=Eggs or Young SC=Scat SI=Other Signs (specify)