REPORT

Natural Environment Report

Proposed Safarik Pit

Submitted to:

CBM Aggregates, a division of St. Marys Cement Inc. (Canada)

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Distribution List

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1.0 INTRODUCTION

WSP Canada Inc. (WSP) was retained by CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada) to complete technical studies as part of the application of a new Class "A" licence (Pit Below Water) under the *Aggregate Resources Act* (ARA; Ontario 1990) for the property located at 4275 7th Concession, Township of Puslinch, Wellington County, Ontario (the Site; Appendix A - Figure 1).

1.1 Purpose

This report specifically addresses the requirements of a Natural Environment Technical Report (NER) (Aggregate Resources of Ontario Provincial Standards, Section 2.2) that will accompany the applications for a Class "A" Pit Below Water. This report also meets the requirements of an Environmental Impact Statement (EIS) for the Township of Puslinch and Wellington County.

For the purpose of this report, the following definitions are used:

License Area / Site (Figure 1) - The total area proposed for licensing. The license area is also referred to as the Site in this report. It is located to the east/southeast of the existing CBM Neubauer and McNally Pits. Although the Site is bisected by a hydro easement, access to the eastern portion of the Site is permitted. The Site is approximately 27.6 hectares (ha) in size.

Extraction Limit (Figure 1) – The total area within the Site in which aggregate is proposed for extraction. The total area of the Extraction Limit is approximately 21.5 ha.

Study Area (Figure 1) - The Study Area for the NER assessment is defined in the Aggregate Resources of Ontario Provincial Standards, Section 2.2 as the Site and surrounding 120 metres (m), also known as the 'Adjacent Lands' in the Provincial Planning Statement (PPS; MMAH 2024) and County of Wellington Official Plan (WCOP; Wellington 2024).

The purpose of this report is to assess potential environmental impacts of the proposed aggregate extraction on the Site with respect to the following:

- The environmental features and functions in the Study Area.
- The influence of extraction on the surrounding natural environment.
- The rehabilitation potential of the Site after extraction.

The potential impacts of the proposed extraction on groundwater and surface water resources are discussed separately in detail in the Water Report (WSP 2025) and have been incorporated where appropriate in this report as it relates to potential impacts to significant natural features.

1.2 Site and Adjacent Lands

1.2.1 Site Description

The Site is located on the east side of Concession Road 7 in an agriculturally dominated landscape in the Township of Puslinch. The majority of the Site consists of open agricultural fields, with a woodland in the northeastern extent of the Site and Study Area. Small patches of wetland, thicket, meadow, and hedgerows comprise the remainder of the Site. There are no watercourses mapped on the Site (Figure 1). There are also multiple structures along Concession Road 7 in the southwestern extent of the Site, including a house, large barn,

and a chicken coop/small outbuilding. The Site is bisected by an overhead 230 kV electrical transmission (hydro) corridor with access to the eastern portion of the Site permitted below the power lines (Figure 1).

1.2.2 Adjacent Lands

Off-Site, the Study Area consists of active agriculture with fields to the east, west, and south of the Site, with residential land-use along Concession Road 7. The woodland at the northeastern extent of the Site extends to the Study Area. Natural features off-Site, within the Study Area, include additional woodlands to the southeast and southwest of Site, as well as several unevaluated wetlands (Figure 1).

The landscape adjacent to the Study Area is a patchwork of agricultural, rural and aggregate land uses interspersed with natural features (e.g., woodlands and unevaluated wetlands; Figure 1). The Site is located to the east/southeast of the existing CBM Neubauer and McNally Pits.

2.0 ENVIRONMENTAL POLICY CONTEXT

The Site is located in the Township of Puslinch in the County of Wellington. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the proposed Safarik Pit consisted of the following:

- The ARA (Ontario 1990) and the Aggregate Resources of Ontario Standards (MNRF 2020)
- The Provincial Planning Statement (MMAH 2024)
- The *Fisheries Act* (Canada 1985)
- The *Migratory Birds Convention Act* (Canada 1994)
- The *Species at Risk Act* (Canada 2002)
- The *Endangered Species Act* (Ontario 2007)
- Ontario Regulation 41/24: Prohibited Activities, Exemptions, and Permits under the Conservation Authorities Act (Ontario 2024)
- The Greenbelt Plan (MMAH 2017)
- County of Wellington Official Plan (2024)
- Township of Puslinch Zoning By-Law 023-18 (Township of Puslinch 2021)

An overview of the above noted legislation and policy documents are discussed in Sections 2.1 to 2.9.

2.1 Aggregate Resources Act

Applicants for a Class A licence are required to prepare an NER in accordance with the ARA Provincial Standards (MNRF 2020). The NER is required to identify the designated natural heritage features and areas on, and within 120 m of the Site, as defined in the PPS (MMAH 2024) with guidance from supporting technical manuals prepared by the Ministry of Natural Resources (MNR) (MNR 2000, 2010; MNRF 2014, 2015a). Where any of these features/areas have been identified, the report must identify and evaluate any negative impacts on the natural features/areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the Site or any of the features/areas are located within a natural

heritage system that has been identified by a municipality in ecoregions 6E and 7E or by the province as part of a provincial plan.

2.2 Provincial Planning Statement

The PPS was issued under Section 3 of the *Planning Act* and came into effect on October 20, 2024, replacing the earlier version issued on May 1, 2020, titled the Provincial Policy Statement, 2020. The natural heritage policies of the PPS indicate that:

- *4.1.1 Natural features and areas shall be protected for the long-term.*
- *4.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.*
- *4.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.*
- *4.1.4 Development and site alteration shall not be permitted in:*
  - *a) significant wetlands in Ecoregions 5E, 6E and 7E; and,*
  - *b) significant coastal wetlands.*
- *4.1.5 Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:*
  - *a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;*
  - *b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
  - *c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
  - *d) significant wildlife habitat;*
  - *e) significant areas of natural and scientific interest; and,*
  - *f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 4.1.4(b).*
- *4.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*
- *4.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*
- *4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.3, 4.1.4 and 4.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

2.3 Fisheries Act

The purpose of the *Fisheries Act* (Canada 1985) is to maintain healthy, sustainable, and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. All projects undertaking work in or near-water must comply with the provisions of the *Fisheries Act*.

Measures to protect fish habitat include avoiding in-water work (i.e., below the high-water mark) and work on the banks or shoreline of watercourse/waterbody, as well maintaining riparian vegetation. Any project that is unable to avoid impacts to fish or fish habitat will require a project review (DFO 2019). If it is determined through the Fisheries and Oceans Canada (DFO) review process that the project will result in death of fish or the harmful alteration, disruption, or destruction of fish habitat (HADD), an authorization under the *Fisheries Act* is required. This includes projects that have the potential to obstruct fish passage or impacts flows.

Proponents of projects requiring a *Fisheries Act* Authorization are required to also submit a Habitat Offsetting Plan, which provides details of how the death of fish and/or HADD to fish habitat will be offset and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish and outline the steps taken to address them.

2.4 Migratory Birds Convention Act

Most birds in Canada are protected by the federal *Migratory Birds Convention Act* (MBCA; Canada 1994), which prohibits the disturbance or destruction of migratory birds, their eggs and nests on all lands in Canada, even incidentally. Upon the enforcement of the Migratory Birds Regulations, 2022 (MBR, 2022; Canada 2022) in July 2022, nest protection has been limited to active nests for most migratory bird species. Schedule 1 of the MBR, 2022 identifies 18 migratory bird species whose nests are protected year-round and must be confirmed inactive for a defined period (ranging between 12 and 36 months depending on the species) before they can be disturbed or destroyed. The nests must also be registered at the start of the defined period.

Although Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific purposes or to prevent damage being caused by birds, there are currently no permits available to exempt development, including maintenance and rehabilitation activities. ECCC advises that proponents schedule activities outside of the migratory bird nesting season to avoid incidental take. Proponents can apply for a damage or danger permit to remove or actively deter migratory birds from structures if it can be clearly demonstrated that the bird activity is causing damage to the structure or poses a health and safety concern for people (e.g., large nesting gull colonies generating waste in public places).

2.5 Species at Risk

2.5.1 Species at Risk Act

At a federal level, species at risk (SAR) designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment and Climate Change, species are added to the federal List of Wildlife Species at Risk (Canada 2002).

It is prohibited to kill, harm, harass, capture, possess, collect, buy, sell, or trade individuals, as well as damage or destroy the residence of a species listed as extirpated, endangered, or threatened on Schedule 1 of the *Species at Risk Act* (SARA). Furthermore, species that are included on Schedule 1 as extirpated, endangered or threatened are afforded protection of species-specific critical habitat on federal lands once critical habitat is

defined in a recovery strategy. Any alterations to critical habitat on federal lands require a permit under Section 73(3) of SARA. A permit may only be issued if the following conditions are met:

- all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted
- all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals
- the activity will not jeopardize the survival or recovery of the species

Although species listed as special concern are not afforded the same degree of legal protection, Section 65 of SARA requires that a management plan be developed that includes measures for the conservation of the species and their habitats, and it is expected that federal landowners will implement these measures on their lands.

On private or provincially-owned lands, only individuals and residences of migratory birds (as defined by the MBCA) and aquatic species that are listed as endangered, threatened, or extirpated are protected under SARA, and critical habitat protection is afforded only to aquatic species, unless ordered by the Governor in Council.

2.5.2 Endangered Species Act

SAR designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of the Environment, Conservation and Parks, species are added to the provincial ESA which came into effect June 30, 2008 (Ontario 2007). The Species at Risk in Ontario (SARO) List is contained in Ontario Regulation (O. Reg.) 230/08 (MNR 2025b).

Bill 5, also called the *Protecting Ontario by Unleashing Our Economy Act* (Ontario 2025a), received royal assent and became law on 5 June 2025. This legislation made amendments to several provincial legislations, including the ESA. Noted amendments include narrowing the definition of “habitat” and removing portions related to recovery strategies and management plans, along with other changes.

The ESA contains two key protection provisions:

- Section 9 prohibits killing, harming, capturing, taking of live extirpated, endangered and threatened species, and possessing, transporting, collecting, buying, selling, leasing, trading or offering to do any of these for species listed as extirpated, endangered or threatened on the SARO list, whether dead or alive.
- Section 10 prohibits the damage or destruction of the habitat of species listed as extirpated, endangered or threatened on the SARO list. No person can carry out an activity that causes any of the prohibited impacts, unless authorized to do so or in accordance with a conditional exemption.

The definition of “habitat” was updated in the ESA following the royal assent of Bill 5, to mean:

- In respect to animals, a dwelling-place (nests, dens, etc.) that is occupied or habitually occupied by one or more members of a species for breeding, rearing, staging, wintering, or hibernating, and the immediate surrounding area necessary for breeding, rearing, staging, or hibernation.
- In respect to vascular plant species, the critical root zone surrounding a member of the species.
- In respect of all other species, an area on which any member of a species directly depends in order to carry on its life processes.

- There are exceptions to this definition (e.g., existing permits, existing exemptions, and black ash (*Fraxinus nigra*)), where the definition of habitat remains as it was prior to Bill 5 becoming legislation.

The ESA has a permitting process to allow alterations to protected species or their habitats. In addition, the ESA allows for a registration approach for projects meeting specific conditions.

2.6 The Greenbelt Plan – Protected Countryside

There are two locations where the Greenbelt Plan extends on to the Site and Study Area. The areas are illustrated on Figure 1 and described as follows.

One area of overlap designated as Natural Heritage System (NHS) in the Greenbelt Plan occurs in the eastern portion of the Study Area on the adjacent lands beyond the Site.

The Greenbelt Plan only requires that the policies of Section 3.2.4 including a minimum 30 m vegetation protection zone apply to the NHS areas only. As such the Greenbelt NHS polices do not apply to the woodland that is on Site and the NHS buffer (Vegetation Protection Zone (VPZ)) of 30 m does not overlap with the Site. Woodland features outside the NHS are subject to the PPS polices.

The second area is a small portion of the Site that is designated as part of the Protected Countryside designation of the Greenbelt Plan (MMAH 2017). This area corresponds to small portions of the agricultural field and hedgerows and thicket along the southeastern Site boundary to the east of the hydro corridor (Figure 1).

This area of the Greenbelt Plan that is in the agricultural fields is beyond the Natural Heritage System within the Protected Countryside. Natural heritage features in the area are subject to Section 4.1 of the PPS.

2.7 Wellington County Official Plan

The Wellington County Official Plan (WCOP; 2024) identifies a 'Greenlands System' of environmental features and linkages. Policies of the WCOP have the goal of maintaining, restoring or where possible enhancing the Greenlands System. The Greenlands System (WCOP Schedule B) is divided into two broad categories: Core Greenlands and Greenlands. Schedule B7 identifies the Site as Secondary Agriculture with Greenlands and Core Greenlands occurring within the Site and Study Area. Additionally, the Site falls within the Regionally Significant Economic Development Study Area (WCOP Section 9.8.4).

Core Greenlands include features such as PSWs, all other wetlands, habitat of endangered or threatened species and fish habitat and hazardous lands. Core Greenlands are designated as shown on Schedule B7 of the WCOP, or as identified in accordance with WCOP Policies outlined in Part 5.4.

Four wetlands are mapped as Core Greenland features overlapping the Site with one located at the southwestern limit of the Site adjacent to residence and barn structures, two occurring within the agriculture fields along the northern limit of the Site coinciding with the hydro corridor, and one present within the woodland at the northeastern limit of the Study Area (Figure 1). Four additional, mapped wetlands occur off-Site, within the Study Area, with three located east of Site and one southwest of the Site (Figure 1).

Greenlands are identified as other *significant* natural heritage features such as woodlands, streams and valleylands, among other designations as identified in section 5.5 of the WCOP. The woodlot at the northeastern extent of the Site is designated as Greenlands in the WCOP and a portion within Study Area (adjacent lands) is also considered as part of the Greenbelt Plan Natural Heritage System (see Section 2.6).

As per Section 5.6.2 of the WCOP, development and site alteration proposed in the Greenland System or adjacent lands to the above noted features requires the completion of an EIS to evaluate potential impacts. While development and site alteration shall not be permitted within PSWs or significant habitat of endangered and threatened species (except in accordance with provincial and federal requirements), Section 5.6 outlines that 'aggregate extraction within Mineral Aggregate Areas subject to appropriate rezoning, licensing and the policies of this plan may be a permitted use within other Core Greenland areas not listed above and other Greenland areas'.

Lands within the Mineral Aggregate Resource Overlay are areas of high potential for mineral aggregate extraction. The Site is not located within the Mineral Aggregate Resources Overlay (Schedule D, WCOP). However, aggregate operations are not limited to this overlay and Section 6.5.3 of the WCOP outlines licensed aggregate operations as a permitted use within the Secondary Agriculture land-use designation.

2.8 Township of Puslinch Zoning By-law

Every property in the Township of Puslinch is subject to Zoning By-law No. 023-18 as amended. This by-law controls the use of land by setting out provisions such as permitted uses and the location and height of structures. The Site is currently zoned as Agricultural by the Township. Under Section 11.2 *Permitted Uses* in an Agricultural Zone aggregate extraction is not permitted.

2.9 Grand River Conservation Authority

The Site and Study Area are located within the jurisdiction of the Grand River Conservation Authority (GRCA) and is regulated under O. Reg 41/24 – Prohibited Activities, Exemptions, and Permits under the *Conservation Authorities Act, R.S.O. 1990*. As this project is under the purview of the ARA, this regulation does not apply and no permits from GRCA are required.

3.0 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed extraction area is approximately 21.5 ha in size. The proposed below water table extraction area is 10 ha. The proposed extraction area limit was established by applying appropriate setbacks to natural features (e.g., wetlands, woodlands) and property limits as applicable.

The proposed project has incorporated setbacks along the proposed extraction areas as follows (Figure 1):

- Wetlands (non-PSW) – 10 m set back
- Woodlands – 10 m buffer/setback

These setbacks will provide a buffer to the adjacent natural features and maintain natural areas on the Site and adjacent to the Site that will provide habitat for wildlife. Berms will be constructed a minimum of 10 m from any wetlands on or adjacent to the Site.

The maximum depth of extraction will be 295 m above sea level (masl).

Aggregate extraction will initially begin above the water table, with future extraction of aggregate below the water table using a dragline method. The resource will be stockpiled on-Site and pore water allowed to drain back to the pit pond prior to shipment off-Site. Aggregate from the Site will be shipped off-Site for processing at nearby CMB pits.

The Site operations will not require pumping or active dewatering. During extraction, there will be no direct off-Site discharge of water to any watercourse or wetland. As such, all internal drainage will be directed to the resulting pond created by the excavation. Storage or handling of significant quantities of fuels, oils or potentially hazardous materials will not be completed on-Site.

4.0 METHODS

4.1 Background Review

The investigation of existing conditions in the Study Area included a background information search and literature review to gather data about the local area and provide context for the evaluation of the natural features. A number of resources were used, including:

- Level One and Two Water Report – Safarik Pit (WSP 2025)
- Aerial imagery
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Bat Conservation International (BCI) range maps (BCI 2025)
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007)
- DFO Aquatic SAR Mapping (DFO 2025)
- eBird species maps (eBird 2025)
- GRCA Map Viewer (GRCA 2025)
- iNaturalist occurrence records (iNaturalist 2025)
- MNR Fish On-Line (MNR 2025a)
- MNR Land Information Ontario (LIO) geospatial data (MNR 2025b)
- Natural Heritage Information Centre (NHIC) database, maintained by the MNR (NHIC 2025a)
- Ontario Butterfly Atlas (Jones et al. 2025)
- Ontario Moth Atlas (Kaposi et al. 2025)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Species at Risk in Ontario (SARO) List (MECP 2025)
- Species at Risk Public Registry (ECCC 2025)
- Vascular Plants at Risk in Ontario (Leslie 2018)

To develop an understanding of the drainage patterns, ecological communities and potential natural heritage features that may be affected by the proposed aggregate development, MNR LIO data were used to create base layer mapping for the Study Area. A geographic query of the NHIC database was conducted to identify element occurrences of any natural heritage features, including wetlands, ANSIs, life science sites, rare vegetation

communities, rare species (i.e., species ranked S1-S3 by NHIC), species designated under the ESA or SARA, and other natural heritage features within the Study Area.

4.2 SAR Screening

SAR considered for this report includes those species listed in the ESA and SARA. An assessment was conducted to determine which SAR had potential habitat in the Study Area. A screening of all SAR, which have the potential to be found in the vicinity of the Study Area was conducted first as a desktop exercise using the sources listed in Section 4.1. Species with ranges overlapping the Study Area, or recent occurrence records in the vicinity, were screened by comparing their habitat requirements to habitat conditions in the Study Area.

The potential for the species to occur was determined through a probability of occurrence. A ranking of low indicates no suitable habitat availability for that species in the Study Area and no specimens identified. Moderate probability indicates more potential for the species to occur, as suitable habitat appeared to be present in the Study Area, but no occurrence of the species has been recorded. Alternatively, a moderate probability could indicate an observation of a species, but there is no suitable habitat on the Site or in the Study Area.
High potential indicates a known species record in the Study Area (including during the field surveys or background data review) and good quality habitat is present.

Searches were conducted during all field surveys for suitable habitats and signs of all SAR identified through the desktop screening. If the potential for the species to occur in the Study Area was moderate or high, the screening was refined based on the results of the field surveys. Any habitat identified during the field surveys with potential to provide suitable conditions for additional SAR not already identified through the desktop screening was also assessed and recorded. All probability rankings were updated based on the results of the field surveys.

4.3 Field Surveys

The habitats and communities on the Site and in the Study Area, where accessible, were characterized through field surveys. The following sections outline the methods used for each of the field surveys. During all surveys, area searches were conducted and additional incidental wildlife, plant, and habitat observations were recorded. Coverage for the wildlife surveys was approximately as shown in the Wildlife Survey Units (WSUs) as depicted on Figure 2; when possible, auditory or visual observations beyond the WSU limits were also recorded. Searches were also conducted to document the presence or absence of suitable habitat, based on habitat preferences, for those species identified in the desktop SAR screening described above. The dates when all surveys were conducted are included in Table 1.

Table 1: Summary of Field Surveys Conducted on the Site and Accessible Portions of the Study Area

Date	Type of Survey	Weather Conditions
April 12, 2022	Anuran Call Count (ACC) Survey #1	13°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 44%
May 13, 2022	ACC #2, Bat Habitat Assessment, Turtle Habitat Assessment, General Wildlife Survey	20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%
May 20, 2022	Plant Community and Botanical Survey #1, Turtle Basking #1, General Wildlife Survey	23°C Sky Code[3] – 1 Wind Code[4] – 4 Relative Humidity – 64%

Date	Type of Survey	Weather Conditions
June 3, 2022	Breeding Bird Surveys #1, Turtle Basking #2, General Wildlife Survey	19°C Sky Code[3] – 0 Wind Code[4] – 1 Relative Humidity – 35%
June 8, 2022	ACC #3, General Wildlife Survey	16°C Sky Code[3] – 8 Wind Code[4] – 1 Relative Humidity – 77%
June 17, 2022	Turtle Basking #3, General Wildlife Survey	23°C Sky Code[3] – 0 Wind Code[4] – 3 Relative Humidity – 45%
June 22, 2022	Bat Detector Setup, Bat Exit Surveys, General Wildlife Survey	26°C Sky Code[3] – 0 Wind Code[4] – 4 Relative Humidity – 44%
June 23, 2022	Turtle Basking #4, General Wildlife Survey	26°C Sky Code[3] – 1 Wind Code[4] – 3 Relative Humidity – 42%
June 27, 2022	Breeding Bird Surveys #2, Turtle Basking #5, General Wildlife Survey	18°C Sky Code[3] – 1 Wind Code[4] – 3 Relative Humidity – 49%
July 4, 2022	Breeding Bird Surveys # 3, General Wildlife Survey	13°C Sky Code[3] – 1 Wind Code[4] – 0 Relative Humidity – 40%
July 7, 2022	Bat Detector Retrieval, Plant Community and Botanical Survey #2, General Wildlife Survey	27°C Sky Code[3] – 0 Wind Code[4] – 3 Relative Humidity – 40%
September 1, 2022	Plant Community and Botanical Inventory #3, Woodland Delineation, General Wildlife Survey	25°C Sky Code[3] – 0 Wind Code[4] – 3 Relative Humidity – 41%
September 23, 2022	Woodland Boundary Delineation	13.5°C Sky Code[3] – 0 Wind Code[4] – 4 Relative Humidity – 47%

4.3.1 Plant Community Surveys and Botanical Inventory

Plant communities on the Site and in the Study Area were first delineated at a desktop level using high-resolution aerial imagery, then ground-truthed in the field (where accessible) using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). These inventories were carried out by systematically traversing the Site and Study Area, where accessible, for a thorough survey of species and communities. Information on dominant plant species and plant community structure and composition was recorded to better define and refine the plant community polygons.

The botanical inventory included area searches in all naturally occurring habitats in the Study Area, where accessible. The searches were conducted by systematically walking through all habitats in a meandering fashion,

generally paralleling the principal (long) axis of a natural area, where feasible, and ensuring that the full width of the area was examined. A vascular plant species list was compiled for the Site and Study Area. Searches were conducted for SAR plants such as butternut (*Juglans cinerea)*, black ash (*Fraxinus nigra*), provincially rare plants (ranked as S1 to S3 by NHIC), as well as food plants for any potentially present SAR insects. Locations of any rare or SAR plant species encountered, if any, were mapped using a hand-held GPS.

Vegetation species significance was determined using provincial ESA and federal SARA ranks for SAR designations, NHIC S-Ranks for provincial rarity designations, and The Flora of Wellington County (Frank and Anderson 2009) report, and The Distribution and Status of the Vascular Plants of Central Region (Riley et al. 1989) report for local rarity designations.

4.3.2 Amphibians

Anuran (frog and toad) call count surveys were conducted at ten stations on the Site and within the Study Area (Figure 2). Note that station ACC-10 was added after the first round of surveys had been completed. Surveys followed protocols from the Marsh Monitoring Program (MMP) method for vocalizing frog surveys (BSC 2008). This method involves collection of call data from fixed stations over three survey periods during the spring and early summer (April to June), with an interval of at least 15 days between surveys. Surveys began one half-hour after sunset and ended by midnight during evenings with appropriate weather conditions (i.e., little wind and a minimum air temperature of 5°C, 10°C, and 17°C for each respective survey period).

Each station consisted of a semi-circle with a 100 m radius from the centre point (where the observer stands), and each survey was three minutes in duration. All frogs and toads seen or heard were noted on pre-printed datasheets. Frogs and toads heard or seen outside of the 100 m radius were also noted, including estimated distance (where possible).

Consultation with a local expert, who has served as a member of the Jefferson Salamander Recovery Team, indicated that Jefferson salamander (*Ambystoma jeffersonianum*) has not been recorded south of Highway 401 in the Puslinch area (Bogart 2025). For this reason, no targeted surveys for this species were completed at the Site.

4.3.3 Breeding Bird Survey

Breeding bird surveys conducted according to standard protocols established in the Ontario Breeding Bird Atlas (Cadman et al. 2007). Two surveys were completed during appropriate timing (early morning surveys; June and early July 2022) and suitable weather conditions (low wind and no precipitation). Based on the presence of potentially open grassland and hayfield/pasture habitat, an additional survey was completed to capture potentially breeding grassland SAR, in accordance with standard protocols (MNR 2011a; MNR 2013a).

Breeding bird surveys were conducted by qualified, experienced staff and involved point count stations (Figure 2), which generally targeted natural features within and adjacent to the Site. Surveys were conducted between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird calling. All species of birds heard or observed as the surveyor walked between point count stations, as well as all birds heard or observed during all other survey events, were noted. Species, abundance and level of breeding evidence were recorded for all avifauna observations.

Snag or cavity trees suitable to support red-headed woodpecker nesting were documented during field surveys, if encountered. In addition, BBS (Section 4.3.5) are well known to document this species (COSEWIC 2018a; ECCC 2021; MECP 2022). Two rounds of BBS were conducted between May 30 and June 28, which is consistent with

the survey timing identified in the guidance document (WDNR 2017). This survey also assisted in identifying nests of any bird species protected under the MBR 2022, if present.

4.3.4 Bat Habitat Survey

A qualitative bat habitat assessment was conducted concurrently with plant community surveys in woodland features within the Study Area (where access was available) to assess the potential bat maternity roost habitat. The survey included a general search for preferred tree species (e.g., mature oak [*Quercus sp.*] and maples [*Acer sp.*]) with habitat features (e.g., cavities, peeling bark, retained dead leaf clumps or squirrel nests). As several of Ontario's bat species roost in foliage, the presence of treed habitat was considered potential presence of habitat for these species. Other features, such as anthropogenic structures, rock piles or exposed bedrock with crevices, that may be used by non-tree roosting bats were also identified and recorded.

4.3.4.1 Snag Density Surveys

One area of woodland (FOD5-4) immediately northeast of the Site in the Study Area, on lands owned by CMB, was identified as potential bat roost habitat. The woodland feature extends approximately 1 km east beyond the Site, but does not overlap the Site. Based on the size of the feature, a total count of snags was completed within the feature on the portion owned by CMB (i.e., where land access was available)

All snags >10 cm diameter-at-breast-height (dbh) within the portion of the woodland feature surveyed were assessed using methods described in MECP guidelines (2022b). Where snag density is calculated as 10 or greater snags per hectare, the associated vegetation community is to be considered high quality potential maternity roost habitat for cavity roosting bat species (MECP 2022b).

4.3.4.2 Bat Acoustic Monitoring and Exit Surveys

Based on the presence of potentially suitable habitat within the woodland feature (FOD5-4) and suitable anthropogenic structures on-Site, two stationary bat acoustic monitors were deployed (Figure 2).

One acoustic monitor (BAT-01; Figure 2) was set up in the western extent of the Site and positioned in the vicinity of the barn structure assessed as potential roost habitat. The second acoustic monitor (BAT-02; Figure 2) was set just east of the Site on CBM-owned lands in the vicinity of cavity trees within the woodland feature (FOD5-4). Acoustic monitoring units were deployed on June 22nd, 2022, and retrieved after 15 nights. In addition to stationary acoustic monitoring, bat exit surveys were conducted at the two structures on-Site with potentially suitable roosting habitat in the vicinity of BAT-01. Exit survey station BE-01 and BE-02 were both associated with the barn structure at the western reach of the Site (Figure 2). Survey stations were on the east and west sides of the barn (BE-01 and BE-02, respectively) to account for the size of the structure. The east face of the structure was observed to have more potential entry points compared to the west face. Bat exit surveys were conducted for 90 minutes (between one half hour before sunset to one hour after) and completed under suitable weather conditions (i.e., >10°C, Beaufort Wind Code – 2; Beaufort Sky Code – 3) (MECP 2021a). The bat exit surveys targeted the most suitable exit / entry points, with occasional movement around the structures to capture any additional exiting bats or bat passes in the vicinity of the structures.

4.3.4.3 Data Analysis

Sonobat Data Wizard was used to attribute file names and scrub the data set of noise files. The high-grade noise scrubber setting was used. Bat call files were processed with SonoBat 4.4.5 call analysis software (Sonobat, Arcata, CA, USA) with the north-northeast classifier for automated classification. To identify calls to the species level, SonoBat measures numerous variables of call sequences (e.g. maximum frequency, minimum frequency,

duration, and call slope; Table 2). SonoBat regional classifiers are based on the most robust, species-confirmed full-spectrum reference library available and integrates quantitative machine learning with algorithms that incorporate more than two decades of expert acoustic classification. Manual call analysis of a portion of the calls was performed to determine at what threshold the software's species attributions become unreliable. Manual call analysis was also performed to test attribution of call sequences to the non-bat category (i.e., birds, rodents or static discharge). The same call analysis criteria used by SonoBat 4.4.5 was applied during manual analysis in addition to visual comparison to reference files. Call analysis software may give false positive identifications or false negative non-identifications and the likelihood of these erroneous identifications is related to the presence of various factors, including echoes, multiple bats, naturally overlapping call characteristics and poor recording quality. In some instances, all files within a species category were manually analysed to confirm identifications (i.e., for unlikely species and high frequency files). Calls were grouped as undetermined high- or low- frequency species (i.e., characteristic frequency above or below 35 kHz), or undetermined bats when species or group determinations could not be made. A Myotis category was also created that included calls identified as undifferentiated Myotis species, as well as high-frequency calls not identified to the species or genus level.

Table 2: Bat Call Analysis Criteria used to Inform Sonobat 4.4.5 Auto-classification and Manual Call Analysis.

Bat Species or Group	Criteria* (values indicated are one standard deviation below and above each respective mean)
Bat	Calls with poor call quality that hinders discrimination of other call characteristics
High-frequency bat	Broad band FM calls with a Lo f >35Khz but where poor call quality hinders discrimination of other call characteristics
Undifferentiated Myotis Species	Broad band FM calls with a Lo f >32Khz, distinctive downward 'toes' are visible at the end of call pulses.
Little brown myotis	Lo f 35-38 kHz, f_c 38-41 kHz, Hi f 61-78 kHz, upper 6.7-14, lower 2.3-4.6, dur 4.9-6.7 Longer duration calls (duration >7 and lower slope <3) are distinctive
Northern myotis	Lo f 32-42 kHz, f_c 40-47 kHz, Hi f 95-114 kHz, upper 18-30, lower 7.4-16, dur 3.1-4.6
Eastern small-footed myotis	Lo f 42-39 kHz, f_c 42-46 kHz, Hi f 86-104 kHz, upper 27-40, lower 7-12, dur 2.5-3.9 Frequency modulation sweep a smooth curve (i.e., no inflection), beginning steeply and then increasing in curvature. May have a well-defined downward tail. Some calls may have an inflection, but the smoothly curved variant is diagnostic.
Tri-colored bat	Lo f 40-43 kHz, f_c 37-44 kHz, Hi f 54-81 kHz, upper 1.7-14, lower 0.4-1.7, dur 5.8-8.4 Strongly inflected, almost vertical frequency modulation changing to low slope below 47 kHz for the majority of the call
Eastern red bat	Lo f 37-43 kHz, f_c 37-44 kHz, Hi f 54-81 kHz, upper 4.4-16, lower 0.7-3.2, dur 4.6-9.1 U-shaped calls (up–turn at end of call); may exhibit variable f_c across sequence
Low-frequency bat**	Short band FM calls with a Lo f <35Khz but where poor call quality hinders discrimination of other call characteristics
Big brown bat	Lo f 25-28 kHz, f_c 26-30 kHz, Hi f 42-56 kHz, upper 3.3-8.3, lower 0.7-2.9, dur 5.3-11. Calls with Hi f above 65kHz are diagnostic (distinguished from silver-haired bat)

Bat Species or Group	Criteria* (values indicated are one standard deviation below and above each respective mean)
Silver-haired bat	Lo f 24-27 kHz, f_c 25-28 kHz, Hi f 33-51 kHz, upper 1.7-9.3, lower 0-2.7, dur 4.8-13, calls with flat slope ≥26 kHz are diagnostic (distinguished from big brown bat)
Hoary bat	Lo f 18-22 kHz, f_c 18-22 kHz, Hi f 21-31 kHz, upper 0.3-4.1, lower -0.1-0.2, dur 7-15, call may have pronounced or subtle U-shape

* **Lo *f***: lowest apparent frequency, ***fc***: frequency of the call at its lowest slope or the lowest frequency for consistent FM sweeps, **Hi *f***: highest apparent frequency, **upper**: the slope of the upper portion or onset of the call (kHz/ms), **lower**: the slope of the lower portion or body of the call (kHz/ms), **dur**: call duration (ms).

** Used for manual call identification. SonoBat attributes high- or low-frequency species groupings based on individual calls identified to the species level (Szewczak 2022).

4.3.5 Turtle Habitat Assessment and Basking Surveys

A turtle habitat assessment was completed on May 13, 2022, and potentially suitable wetland and aquatic habitat for turtles was identified on-Site. As such, a total of five turtle basking surveys were completed within suitable wetland and aquatic habitat on-Site between ice off and June 28, 2022 (refer to Table 1), using the visual encounter methodology outlined in MNR (2015b).

Open water wetlands were surveyed using binoculars from multiple vantage points and more heavily vegetated wetlands (e.g., swamps) with shallow water were traversed by field staff searching for turtles utilizing the habitat. Surveys were completed between 08:00 and 17:00 under suitable weather conditions, as described in MNR (2015b).

4.3.6 General Wildlife Survey

General wildlife surveys were completed based on guidelines from several resources (Pyle 1984; Bookhout 1994; McDiarmid 2012; MNR 2013b; MNRF 2016). General wildlife surveys included track and sign surveys, area searches, and incidental observations, concurrent with other field surveys. The full range of habitats across the Site and Study Area were searched, where accessible, with special attention given to edge habitats and other areas where mammals might be active. Areas of exposed substrate such as sand or mud were located and examined for any visible tracks. Any wildlife (including mammals, salamanders, butterflies, and dragonflies) seen and identified were recorded. When encountered, tracks and other signs (e.g., egg-masses, tracks, scats, hair, tree scrapes, etc.) were identified to a species, if possible, and recorded. Observations of wildlife species or signs during all field surveys were recorded.

4.4 Analysis of Significance and Sensitivity and Impact Assessment

An assessment was conducted to determine the significance of natural features as well as SAR observed or determined to have the potential to use the Study Area. The assessment was completed by analysing natural environment data collected through the background review and field surveys, using the methods and criteria outlined in the following sources:

- Natural Heritage Reference Manual [NHRM; (MNR 2010)]
- Significant Wildlife Habitat Technical Guide [SWHTG; (MNR 2000)]
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E [SWHCS; (MNRF 2015a)]

- Habitat mapping for provincially endangered and threatened species through application of ESA regulated habitat or General Habitat Descriptions to the Site, where available

An assessment was then conducted to determine how the proposed extraction may negatively impact significant natural features. Preventative, mitigative and remedial measures were considered in assessing the net effects of the proposed extraction on the surrounding ecosystem. Where impacts to significant wildlife habitat were determined to be possible, mitigation was determined using the guidance provided in the Significant Wildlife Habitat Mitigation Support Tool [SWHMiST; (MNRF, 2014)]

Field data collected in conjunction with the background data compilation was also analysed and integrated with the hydrogeological and surface water studies (WSP 2025) to complete an impact assessment. Impacts were identified as direct (those that will occur on the Site) and indirect (those affecting features and functions off-Site) in the context of municipal, regional, provincial and federal natural heritage policy considerations.

5.0 EXISTING CONDITIONS

5.1 Ecosystem Setting and Regional Context

The Study Area is located at the southern edge of Ecoregion 6E (Lake Simcoe – Rideau), which covers just over 6% of southern Ontario (Crins et al. 2009). Ecoregion 6E is underlain by bedrock of dolomite and limestone and is characterized by gently rolling surface terrain interspersed by drumlin fields and moraines. Soils are primarily mineral-based and dominated by Gray Brown Luvisols and Melanic Brunisols. The majority of the region is covered by cropland or pasture (57%), with 16% covered by forest and 4% covered by water (Crins et al. 2009).

Chapman and Putnam (1984) describe the Site as consisting of Till Moraines that are part of the Horseshoe Moraines physiographic region of southern Ontario. Surficial geology mapping indicates that the Site is located south of the Aberfoyle Spillway, on the northern edge of the Galt Moraine. The Galt Moraine is formed of Wentworth Till, which is described as a stoney to sandy silt till with occasional zones of ice contact sand and gravel.

5.2 Hydrogeology and Hydrology

According to the Water Report (WSP 2025), the Site and Study Area are located within the headwaters of three individual subwatersheds. The majority of the Site is located within the Mill Creek subwatershed, the eastern corner of the Site is located within the Bronte Creek subwatershed, and the Fletcher Creek/Spencer Creek subwatershed is present south of the Site.

Eight unevaluated wetlands are mapped on the Site and in the Study Area (Figure 2). As shown in the cross-section figures (Figures 8 and 9 in the Water Report, WSP 2025), these wetland features are situated at least 10 m above the water table. These features are therefore not supported by groundwater discharge. Similar to many other mapped wetlands adjacent to gravel pits in Puslinch Township, these features exist due to the presence fine grained peaty soils limiting infiltration of precipitation and limited seasonal runoff.

The proposed setbacks from these features, in conjunction with the location of these features within catchments, and the relatively high permeability of the lands within the agricultural fields outside the wetlands, indicates that the current water regime on Site and near surface soil conditions at the wetlands will remain similar to existing condition. As such, these wetlands are not anticipated to be affect by the proposed aggregate development.

In summary, all wetlands on Site and in the Study Area will be maintained under the proposed development scenario. Adverse impacts to ecological functions of these features are not predicted.

5.3 Vegetation

5.3.1 Regional Setting

The Study Area is located in the Great Lakes – St. Lawrence Forest Region. The natural upland forest cover in this region is dominated by sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), white oak (*Quercus alba*), bur oak (*Quercus macrocarpa),* eastern hemlock (*Tsuga canadensis*) and eastern white pine (*Pinus strobus*). The lowland areas are characterized by forests of silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), red elm (*Ulmus rubra),* black ash (*Fraxinus nigra*) and eastern white cedar (*Thuja occidentalis*) (Rowe 1972).

5.3.2 Plant Communities

Based on the field surveys conducted, twelve ELC community types were identified in the Study Area in addition to residential, hedgerow, and agricultural areas. The ELC communities are shown in Appendix A - Figure 3 and ELC communities are briefly described in Table 3 with a list of all recorded plant species provided in Appendix B. Of the plant communities observed on the Site and in the Study Area that have been assigned a provincial rarity ranking by the NHIC database, all are common and secure in the province (S-Rank 4 or 5).

ELC communities in the Study Area's north extent were delineated into units smaller than 0.5 ha, where deemed appropriate. Units were delineated smaller than 0.5 ha to better categorize and delineate the wetlands and significant woodland boundaries present, which contribute to natural heritage constraints within the Study Area (refer to Section 6.0).

Table 3: Plant Communities in the Proposed Safarik Expansion Study Area

ELC Community	Field Description	SRANK[a]
UPLAND		
CUM1- Mineral Cultural Meadow Ecosite	Cultural meadow communities were present in several locations on the Site and in the Study Area. Dominant species consisted of non-native grasses of orchard grass (*Dactylis glomerata*), smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*) and common timothy (*Phleum pratense*). Grasses were intermixed with a variable abundance of wild chicory (*Cichorium intybus*), Canada thistle (*Crsium arvense*), wild carrot (*Daucus carota*), alfalfa (*Medicago sativa*), catnip (*Nepeta cataria*), scotch thistle (*Onopordum acanthium*), Virginia creeper (*Parthenocissus quinquefolia*), common burdock (*Arctium minus*), english plantain (*Plantago lanceolata*), common plantain (*Plantago major*), dock sp. (*Rumex sp.*), bladder campion (*Silene vulgaris*), white mustard (*Sinapis alba ssp. alba*), rough-stemmed goldenrod (*Solidago rugosa*), garlic mustard (*Alliaria petiolata*), new england aster (*Symphyotrichum novae-angliae*), common dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*) and saplings of European buckthorn (*Rhamnus cathartica*) and invasive honeysuckle sp. (*Lonicera sp.*). Minimal occurrence of common milkweed (*Asclepias syriaca*) was also noted.	n/a
CUT1 – Mineral Cultural Thicket Ecosite	This vegetation community was observed in the northwest quadrant of the Site. This area was composed of naturalizing pastureland with a thick growth of shrubs and open patches of cultural meadow (CUM1) species. The shrubs included a dense growth of European buckthorn, invasive honeysuckle, and cultivated apple (*Malus sp.*). The ground layer was comprised of cultural meadow (CUM1) species listed above, with an abundance of Kentucky bluegrass, alfalfa, and orchard grass.	n/a
CUW / CUM1 - Cultural Woodland / Mineral Cultural Meadow Ecosite	This community was observed off-Site in the Study Area's southwest corner. This area was assessed from the right-a-way (ROW) of Concession Road 7. Vegetation composition indicated a historically disturbed area, including successional species, young trees, and exotic weedy groundcover. The community was composed of a variable abundance of young to middle-age Manitoba maple (*Acer negundo*), white spruce (*Picea glauca*), Norway maple (*Acer platanoides*), black locust (*Robinia pseudoacacia*), black walnut (*Juglans nigra*), eastern white cedar (*Thuja occidentalis*), eastern cottonwood (*Populus deltoides*) and a dense shrub layer of European buckthorn, invasive honeysuckle, staghorn sumac (*Rhus typhina*) and common lilac (*Syringa vulgaris*) The ground layer consisted of cultural meadow (CUM1) species.	n/a
AGR – Agriculture	Active pastureland made up the large central agricultural areas of the Site. This pastureland was observed in different stages of growth, including un-mowed and mowed/harvested periods. The composition of the pasture consisted of an abundance of timothy hay mixed with ryegrass (*Elymus sp.*), tall fescue (*Festuca arundinacea*), white clover and alfalfa. A group of cattle (~ 20 individuals) had access to walk in each pasture area, with evidence of compaction and trails observed in each area. Annual row crops, including corn, soy and pasture, were observed in the active agricultural areas adjacent to the Site.	n/a
FOD5-4 Dry – Fresh Sugar Maple – Ironwood Deciduous Forest	This area was observed in the northeast extent of the Site. The area consists of a high botanical quality forest (refer to **Section 5.5.3**) composed of sugar maple (*Acer saccharum*) with occasional eastern white pine (*Pinus strobus*), black cherry (*Prunus serotina*), basswood (*Tilia americana*), white elm (*Ulmus americana*) and bitternut hickory (*Carya cordiformis*). The understory consisted of an abundance of eastern hop-hornbeam (*Ostrya virginiana*), black cherry and a few American beech (*Fagus grandifolia*). The shrub layer consisted of a sugar maple, black cherry, alternate-leaved dogwood (*Cornus alternifolia*) and a large cluster of common prickly-ash (*Zanthoxylum americanum*) adjacent to the willow mineral deciduous swamp (SWD4-1). The ground layer consisted of species typical of sugar maple forests. Common species observed included tall anemone (*Anemone virginiana*), red columbine (*Aquilegia canadensis*), wild sarsaparilla (*aralia nudicaulis*), jack-in-the-pulpit (*Arisaema triphyllum*), Canada wild-ginger (*Asarum canadense*), common lady fern (*Athyrium filix-femina*), cut-leaved toothwort (*Cardamine concatenata*), drooping woodland sedge (*Carex arctata*), woodland sedge (*Carex blanda*), peck's sedge (*Carex peckii*), long-stalked sedge (*Carex pedunculata*), broad-leaved enchanter's nightshade (*Circaea canadensis*), spreading wood fern (*Dryopteris expansa*), bottlebrush grass (*Elymus hystrix*), broad-leaved helleborine (*Epipactis helleborine*), yellow trout-lily (*Erythronium americanum*), large-leaved aster (*Eurybia macrophylla*), Canada avens (*Geum canadense*), sharp-lobed hepatica (*Hepatica acutiloba*), Virginia waterleaf (*Hydrophyllum virginianum*), wild lily-of-the-valley (*Maianthemum canadense*), large false solomon's seal (*Maianthemum racemosum*), garlic mustard, bloodroot (Sanguinaria canadensis), blue-stemmed goldenrod (*Solidago caesia*), zigzag goldenrod (*Solidago flexicaulis*), calico aster (*Symphyotrichum lateriflorum*) Ontario aster (*Symphyotrichum ontarionis*), yellow violet (*Viola pubescens*) and long-spurred violet (*Viola rostrata*). Regionally rare hairy solomon's seal (*Polygonatum pubescens*) was also found in low abundance (refer to **Section 5.5.3**).	S5
FOD5 - Dry – Fresh Sugar Maple Deciduous Forest Ecosite	This community was observed off-Site in the Study Area's southeast corner. This area was assessed from the right-a-way (ROW) of Concession Road 7. The dominant canopy cover was observed to be sugar maple with the occasional occurrence of black cherry, American beech, eastern hop-hornbeam and bitternut hickory. The shrub and ground layer was not observed from the ROW. However, given the similar canopy cover composition, this community is expected to have a similar composition to the fresh sugar maple–ironwood deciduous forest (FOD5-4) community.	n/a
FOC1 - Dry – Fresh Pine Coniferous Forest Ecosite	This community was observed from off-Site in the Study Area's northeast corner. This community was observed from the fence line of the Site. The dominant canopy cover consisted of young white pine less than 20 cm diameter at breast height (DBH) and sugar maple. The understory was open with a ground cover of sparse fresh sugar maple-ironwood deciduous forest (FOD5-4) species.	n/a
ANTH – Anthropogenic	A few farm buildings (e.g., barns, sheds, animal shelters and paddocks with feeding troughs) and single-dwelling houses were observed at the edges of the Study Area.	n/a

ELC Community	Field Description	SRANK[a]
HR - Hedgerow	Hedgerows on Site were organized into seven (7) sections. The quality of the Site's hedgerows was assessed to be of poor ecological value as they were observed to be narrow, contained numerous gaps or disturbances (e.g., accessed by cattle) and were predominantly made up of shrub vegetation consisting of many invasive species. One small ephemeral pool was observed in the hedgerow in the centre of the Site (HR #1; Figure 3). Mature bitternut hickories were observed in hedgerow #4, and mature sugar maples were observed in the southern extent of hedgerow #1. Species included a dominant abundance of Manitoba maple, invasive honeysuckle, European buckthorn, autumn olive (*Eaeagnus umbellata*), red ash (F*raxinus pennsylvanica*), black walnut, staghorn sumac, chokecherry (*Prunus virginiana*) and common prickly-ash. The ground layer consisted of cultural meadow (CUM1) species with a dense growth of riverbank grape (*Vtis riparia*), and large patches of field horsetail (*Equisetum arvense*) in low-lying areas.	n/a
WETLAND		
SWT2-2 / MAS2 - Willow Mineral Thicket Swamp/ Mineral Shallow Marsh Ecosite	This area was in the centre of the Site, adjacent to HR #6. This area is composed of peach-leaved willow (*Salix amygdaloides*), pussy willow (*Salix discolor*), sandbar willow (*Salix interior*), common elderberry (*Sambucus canadensis*) and red-osier dogwood (*Cornus sericea*). A marsh community was observed in the centre of the thicket swamp and was predominantly composed of rough manna grass (*Glyceria maxima*) and lesser duckweed (*Lemna minor*). Other common species observed included water-plantain sp. (*Alisma sp.*), nodding beggarticks (*Bidens cernua*), crested sedge (*Carex cristatella*), Tuckerman's sedge (*Carex tuckermanii*), perennial yellow flatsedge (*Cyperus esculentus*), wild cucumber (Echinocystis lobata), common bedstraw *(Galium aparine*), northern water-horehound (*Lycopus uniflorus*), mint sp. (*Mentha sp.*), sensitive fern (*Onoclea sensibilis*), smartweed sp. (*Persicaria sp.*), reed canary grass (*Phalaris arundinacea var. arundinacea*), and hard-stemmed bulrush (*Schoenoplectus acutus*).	S5
SWD4-1 / MAM2-2 - Willow Mineral Deciduous Swamp / Reed-canary Grass Mineral Meadow Marsh	This community was observed in the centre of the Site, adjacent to HR #6. The understory and ground cover were open due to the community's active use by the cattle. Dominant canopy vegetation consisted of middle-aged to mature white willow (*Salix alba*). An abundance of reed canary grass was observed in the centre of the community, suggesting a historic water ponding. The interface between the agricultural field and the swamp consisted of cultural thicket (CUT1) species.	S4
SWD4-1 - Willow Mineral Deciduous Swamp	This community was observed in the northern section of the Site, adjacent to the sugar maple-ironwood deciduous forest (FOD5-4). The understory and ground cover were open due to the community's active use by the cattle. The canopy consisted of mature white willow. A few remnant ground layer species remained at the edges of the cattle stamped area, including jack-in-the-pulpit, bladder sedge (*Carex intumescens*), broad-leaved enchanter's nightshade, ostrich fern (*Matteuccia struthiopteris*), reed canary grass, buttercup sp. (*Ranunculus sp.*), common water-parsnip (*Sium suave*) and stinging nettle (*Urtica dioica*).	S4
SWD - Deciduous Swamp	This community was observed from off-Site in the Study Area's northeast corner. This community was observed from the fence line of the Site and aerial imagery. The dominant vegetation is expected to be white willow and Manitoba maple.	n/a
MAS - Shallow Marsh	This community was observed from off-Site in the Study Area's northeast corner. This community was observed from the fence line of the Site and aerial imagery. The dominant vegetation is expected to be cattail (*Typha sp.*) boarded by willow shrubs.	n/a
OAO / FOD7 - Open Aquatic (Farm Pond) / Fresh - Moist Lowland Deciduous Forest Ecosite	This community was observed in the Site's southwest corner, adjacent to a rural property. The canopy consisted of white willow, Manitoba maples and silver maples. The understory comprises landscaped and cultural thicket (CUT1) species. The farm pond is isolated and appears to dry up in periods of low rain. The pond was observed to be void of vegetation due to cattle frequently accessing it as a water source.	n/a

[a] An SRank is a provincial –level rank indicating the conservation status of a species or plant community and is assigned by the NHIC in Ontario (NHIC 2025b). SRanks are not legal designations but are used to prioritize protection efforts in the province. SRanks for plant communities in Ontario are defined in the Significant Wildlife Habitat Technical Guide (MNR 2000). Ranks 1-3 are considered extremely rare to uncommon in Ontario; Ranks 4 and 5 are considered to be common and widespread. n/a indicates a community that has not been ranked, which often applies to anthropogenic, culturally-influenced, or high-level ELC communities (i.e., SWD).

5.3.3 Vascular Plants

A total of 149 vascular plant species were identified during the botanical and other surveys completed in the Study Area (Appendix B). Fifteen or 10% of these species could not be identified to the species level due to plant condition (i.e., damaged, dead or difficulty in taxonomic differentiation outside a lab setting). Of the 134 species remaining, 95 (71%) are native species, and 39 (29%) are exotic species. A higher proportion of native species was observed in the woodland to the north extent of the Study Area. This suggests the forest has a lower level of cultural disturbance compared to areas where exotic species are abundant (i.e., CUM1; CUT1; and hedgerows).

Significant and Sensitive Species

All plant species identified on the Site are secure and common, widespread, and abundant in Ontario and globally (S4 or S5; G5) or unranked alien species (SNA; GNR).

Species at Risk

No plant species designated as SAR under the ESA were observed during the field surveys, and none were determined to have a moderate or high potential to be present in the Study Area (Appendix C).

Regionally Rare

One regionally rare (Frank and Anderson 2009; Riley et al. 1989) species was observed off-Site within the FOD5-4 community in the Study Area (Figure 4) during the botanical surveys, namely:

- Hairy Solomon's Seal (*Polygonatum pubescens*) (R1 - Most rare or growing on only 1-3 known sites for the region)

High Co-efficient of Conservatism

The co-efficient of conservatism (CC) is a ranking system from 0 to 10 based on plants' degree of fidelity to a habitat condition. A high CC value (> 7) indicates that for a species to thrive, a higher-quality habitat with minimal disturbance is required.

Three species with a high CC value (> 7), were observed, including:

- Spreading wood fern (*Dryopteris expansa*) (CC:9)
- Sharp-lobed hepatica (*Hepatica acutiloba*) (CC:8)
- Tuckerman’s sedge (*Carex tuckermanii*) (CC:7)

Species with the highest CC value, spreading wood fern and sharp-lobed hepatica, were found in the woodland in the Study Area’s northeastern extent. This suggests the forest community associated with woodlands has undergone little disturbance.

Tuckerman’s sedge was found in the willow mineral deciduous thicket swamp (SWT2-2 / MAS2) in the Site's central west portion within the hydro corridor. Several invasive species and cattle trails were observed in this community.

5.4 Wildlife

A list of all wildlife observed during the study is presented in Appendix E.

5.4.1 Amphibians

A total of six amphibian species were observed during anuran call count or other surveys conducted on the Site (Appendix D).

Four amphibian species were observed during anuran call count surveys. Spring peeper (*Pseudacris crucifer*) was the most frequently detected and abundant amphibian species recorded with seven documented choruses across six survey stations and was present at nine of ten stations (ACC 1-9). Wood frog (*Lithobates sylvaticus*) and gray treefrog *(Dryophytes versicolor*) were also frequently documented and both present at nine of ten stations (ACC1-9). American toad (*Anaxyrus americanus*) was the least recorded of the four and was only present at three stations (ACC1, 3, and 4) and did not record a call count greater than 1-4 individuals (Appendix D).

All targeted features had moderate to high amphibian presence except for ACC-10 which targeted a vernal pool within Hedgerow #1 (Figure 3) and did not record any amphibians.

Two mineral swamp habitats (SWT2-2 / MAS2 and SWD4-1 / MAM2-2) occur along the northern extent of the Site adjacent to Hedgerow #6. Both features had all four species present. SWT2-2 / MAS2 (ACC-3) within the Site boundary; however, the SWT2-2 / MAS2 had the highest abundance of breeding amphibians recorded on-Site during surveys, with full choruses of spring peeper and wood frog documented during surveys.

ACC7 and ACC8 targeted wetland communities east of the Site, within the Study Area (SWD and MAS, respectively). Both of these stations documented high abundance with full choruses of gray treefrog and spring peeper documented at both survey locations.

Green frog (*Lithobates clamitans)* and northern leopard frog (*Lithobates pipiens)* were both observed as incidental wildlife and not documented during call count surveys.

Significant and Sensitive Species

All of the amphibian species identified during the surveys are secure and common, widespread, and abundant in Ontario and globally (S5; G5). None of the amphibian SAR species with ranges that overlap the Site (Appendix C) were observed during field surveys.

5.4.2 Breeding Birds

A total of 53 bird species were observed during breeding bird and other surveys conducted in the Study Area (Appendix E). Species included generalists which tolerate some human disturbance (such as American goldfinch [*Spinus tristis*], American robin [*Turdus migratorius*], black-capped chickadee [*Poecile atricapillus*]), as well as forest interior, and grassland specific species (such as pine warbler [*Setophaga pinus*], willow flycatcher [*Empidonax traillii*], field sparrow [*Spizella pusilla*], and grasshopper sparrow [*Ammodramus savannarum*]). The most frequently observed species were European starling (*Sturnus vulgaris*), followed by red-winged blackbird (*Agelaius phoeniceus*). Three species were confirmed as breeding during the breeding bird surveys: barn swallow (*Hirundo rustica*), red-winged blackbird, and field sparrow.

In addition to those species observed during the breeding bird surveys, hairy woodpecker (*Dryobates villosus*), horned lark (*Eremophila alpestris*) and rock pigeon (*Columba livia*) were observed outside of the breeding season and are not considered to be breeding on the Site.

The majority of bird species identified through the breeding bird, or other, surveys are secure and common, widespread, and abundant in Ontario and globally (S4 or S5; G5), or SNA (not applicable – species is not a target

for conservation), with the exception of those discussed below. For a full list of avian species, please refer to Appendix E.

Significant and Sensitive Species

Five SAR and species of conservation concern (SOCC) (MNRF 2015a) were observed during breeding bird, or other, surveys:

- **Bobolink** (*Dolichonyx oryzivorus*; threatened under the ESA) – This species historically breeds in grassland, prairie, meadow or alvar habitats, but can be found nesting in anthropogenic grassland habitats such as agricultural fields (ECCC 2022). Bobolink were observed within or adjacent to four wildlife survey units within the Site (WSU-1, 2, 4, and 5; see Figure 2 for locations of each observation).
    - Within WSU-1, five individuals were documented calling at two locations in the cattle pasture directly behind the residence along Concession 7, with one individual calling along the hedgerow at the border of WSU-1 and WSU-2. This species was not documented within this WSU during round 2 and 3 of the breeding bird survey, indicating that this pasture is not being utilized for nesting habitat.
    - Within WSU-2, one individual was documented, without calling activity, within the pasture during the second round.
    - Within WSU-4, no individuals were documented on-Site; however, three individuals were documented calling during the first round and one male was displaying territorial behaviour during the second round. This activity was observed east of the Site boundary, within the Study Area in the cultural meadow adjacent to HR#7. It is likely that this species is using this habitat off-Site for nesting.
    - Within WSU-5, two individuals were documented calling during both round one and two of the breeding bird surveys, indicating ‘probable’ breeding evidence. It is likely that this species is utilizing the pastures within WSU-5 for nesting.
- **Eastern meadowlark** (*Sturnella magna*; threatened under the ESA) – This species most commonly breeds in native grasslands, pastures, and savannahs, but can be found using other anthropogenic grassland habitats with suitable grass to forb composition (COSEWIC 2011b). Eastern meadowlarks were documented displaying agitated behaviour outside of WSU-5, within the Study Area during round 2 of breeding bird surveys (see Figure 2 for locations of each observation). Further, this species was documented calling in the agricultural field east of the Site along the southern extent of WSU-4 during round one and two of breeding bird surveys (Figure 2). With ‘probable’ breeding evidence, it is likely that this species is utilizing suitable habitat east of WSU-4 and WSU-5 off-Site, within the Study Area.

Bobolink and eastern meadowlark are designated as threatened under the ESA and are afforded individual and habitat protection. These species are discussed further in Section 6.1.

- **Barn swallow** (*Hirundo rustica;* special concern under the ESA) – This species breeds in areas containing suitable nesting structures such as barns, buildings, sheds, bridges, and culverts, and open areas for foraging. Preferred foraging habitat includes fields, pastures, agricultural cropland, open water, and wetlands (COSEWIC 2011a). Barn swallows were documented foraging along active agricultural fields and open habitat in WSU-2, and active nests were confirmed with WSU-1 in the barn structure and the smaller outbuilding (Figure 3).

- **Eastern wood-pewee** (*Contopus virens*; special concern under the ESA) – This species inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. It also occurs in anthropogenic habitats providing an open forested aspect, such as parks and suburban neighborhoods (COSEWIC 2012). Eastern wood-pewee individuals were documented calling in the woodland (FOD5-4) at the eastern extent of the Study Area, in WSU-3 (see Figure 2 for location of observations). As such, it is probable that this species is using these woodlands for breeding. No individuals were documented calling within the woodland at the southeastern extent of the Study Area during breeding bird surveys.
- **Grasshopper sparrow** (*Ammodramus savannarum*; special concern under the ESA) – This species is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of low-intensity agricultural fields, including hayfields and pastures. Close-grazed pastures and limestone plains (e.g., Carden and Napanee Plains) support the highest density of this bird in the province (COSEWIC 2013b). Grasshopper sparrow was documented during all three survey rounds in WSU-1 displaying territorial calls in the agricultural field directly behind the residence along Concession 7 (see Figure 2 for location of observations). Additionally, grasshopper sparrow was observed within WSU-5 during the first two rounds of surveys, displaying territorial behaviour during the second round. Grasshopper sparrow is a 'probable' breeder on-Site in WSU-1 and WSU-5 in the agricultural fields on both sides of Hedgerow #1 (Figure 2). One individual was documented calling off-Site to the east of WSU-4 in the Study Area, with possible breeding evidence.

Species designated as special concern do not receive regulatory protection under the ESA; however, habitat for these species must still be considered under the significant wildlife habitat (SWH) criteria in the assessment of significance for this NER. Barn swallow, eastern wood-pewee, and grasshopper sparrow, designated as special concern, are discussed further in Section 6.7.

5.4.3 Bats

5.4.3.1 Habitat Assessment

Based on the qualitative bat habitat assessment, the Dry – Fresh Sugar Maple – Ironwood Deciduous Forest (FOD5-4) off-Site in the northeast extent of the Study Area has potential for suitable maternity roosting for tree roosting bats.

The hedgerows and deciduous thicket (CUT1) on Site were assessed as having a low likelihood of providing suitable habitat for tree roosting bats. These treed features are exposed, and fragmented from the greater landscape.

For anthropogenic structures, the barn and smaller outbuildings adjacent to Concession 7 were assessed. The main barn has a stone foundation, several access points through lifted, damaged or missing boards, and open or damaged windows and doors. Suitable access/egress points were identified as well as potential crevices for roosting bats. The main barn was assessed as having high potential for bat roosting habitat.

5.4.3.2 Snag Density Surveys

Snag density was calculated for the woodland in the northern extent of the Study Area, which was assessed as having potential to support maternity roosting for tree roosting bats. A total of five snags were documented during snag density surveys in the woodland. Four of the five trees were basswood with one or more cavities. The fifth snag identified was a splitting white pine with multiple cavities near the top of the tree.

The calculated snag density for the accessible portion of this feature that overlaps the Study Area is 1.34 snags/ha. The snag density is below the threshold of ≥10 snags/ha to be considered high-quality roost habitat, and so the portion of this feature assessed is considered low quality potential maternity roost habitat.

5.4.3.3 Bat Acoustic Monitoring

In total, six bat species were identified during the acoustic surveys: hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*), and eastern small-footed myotis (*Myotis leibii*). Additional bat passes were identified as unknown myotis species, high frequency unknown species, and low frequency unknown species. The mean bat passes per night with standard deviation for all bat species at the stationary detectors is provided in Table 4. The total and maximum number of passes of myotis species is provided in Table 5.

Monitoring station BAT-01 (Figure 2) was established adjacent to open pasture with scattered trees and anthropogenic structures (i.e., barn and chicken coop) on the Site. This station experienced high levels of activity with a total of 2,569 passes recorded (197.62 mean passes/night) including 1,787 low frequency passes and 782 high frequency passes. All six species were identified from these recordings. The most common species recorded was big brown bat (848), followed by eastern small-footed myotis (187), hoary bat (104), little brown myotis (83), and silver-haired bat (77). The other bat passes were classified as eastern red bat (3), low frequency unknown species (758), undifferentiated myotis species (461), and high frequency unknown species (48).

An exit survey (BE-01) was conducted in an area around the barn structure on the far side of the road with most of the suitable crevices/exit points for the barn. There was a total of 14 bat passes, including 5 big brown bat, 3 undifferentiated myotis species, 3 high frequency unknowns and 3 low frequency unknowns. An additional exit survey (BE-02) was conducted in an area around the barn structure on the near side of the road with minimal exit points. There was a total of 2 bat passes, including 1 big brown bat and 1 undifferentiated myotis species.

The results of acoustic monitoring at BAT-01, and the exit surveys at BE-01 and BE-02 show high levels of bat activity for both non-SAR and SAR species. Big brown bat is not at risk and was the most detected at this station. The other five species confirmed at this location are SAR. Based on the activity levels and timing of detections, it is likely that the barn structure provides suitable roosting habitat for eastern small-footed myotis and little brown myotis. The other species recorded, potentially indicating roosting nearby, are not known to roost in anthropogenic structures (hoary bat, silver-haired bat and eastern red bat) so it is likely these species are roosting off-Site in nearby woodlands.

Monitoring station BAT-02 (Figure 2) was established off-Site in FOD5-4 in the general vicinity of suitable cavity trees. This station exhibited a high level of activity with a total of 5,289 passes recorded (~417 mean passes/night) including 4,948 low frequency passes and 341 high frequency passes. A total of four species were recorded. The species recorded were silver-haired bat (1,084), big brown bat (639), and hoary bat (210). The other bat passes were classified as eastern red bat (1), low frequency unknown species (3,015), high frequency unknown species (117), and undifferentiated myotis species (223).

The results of the acoustic monitoring at BAT-02 show high levels of bat activity for both non-SAR and SAR species. The only non-SAR detected was big brown bat and was the second most frequently detected species at this station. Silver-haired bat was most frequently detected and is a SAR. Other SAR species confirmed at this location include hoary bat, and a single pass of eastern red bat. 117 high frequency unknown passes are likely SAR. Based on these results, it is likely that the off-Site FOD5-4 provides roost habitat for silver-haired bat, hoary bat and potentially also for eastern red bat (although it was recorded in very low numbers).

It is important to note that the acoustic monitors have a limited range, (~30 m) for high frequency bats depending on many factors (e.g., detector set up, temp, humidity, ambient noise, etc.). It is not possible to state the number of bats recorded as there is no method of determining whether five passes are made by one bat, or five bats flying over once. It is also not possible to confirm roosting with acoustics alone as this can only be determined by observations of bats in a roost. However, higher rates of bat passes around dusk (i.e., when bats emerge from their roosts), combined with detailed habitat information, can be used to suggest that a maternity roost may be present in the area of detection.

Significant and Sensitive Species

One of the bat species observed during the field surveys is secure and common in Ontario (S4; big brown bat), while little brown myotis is ranked vulnerable (S3) and eastern red bat, hoary bat, silver-haired bat and eastern small-footed bat are imperiled (S2S3).

Five of the bat species observed during the acoustic surveys are also designated endangered under the ESA: little brown myotis, eastern small-footed myotis, eastern red bat, hoary bat and silver-haired bat.

Little brown myotis, eastern small-footed myotis, eastern red bat, hoary bat, and silver-haired bat are discussed further in Section 6.1.

Table 4: Mean (Standard Deviation) Bat Passes per Night at Acoustic Monitoring Stations from June 23rd – July 7th, 2022.

Mean (StDev) Bat Passes/Night											
Station	Number of Nights Surveyed	Big Brown Bat	High Frequency Unknown Species	Eastern Red Bat	Hoary Bat	Silver-haired Bat	Low Frequency Unknown Species	Eastern Small-footed Myotis	Little Brown Myotis	Unknown Myotis Species	Grand Total
Bat-01	13	65.23(77.47)	3.69(2.39)	0.23(0.44)	8(9.67)	5.92(3.38)	58.31(37.93)	14.38(10.74)	6.38(4.93)	35.46(24.05)	197.62(139.49)
Bat-02	13	52.42(57.04)	9.33(7.74)	0.08(0.29)	17.08(13.16)	81.92(21.01)	238.25(151.76)	0(0)	0(0)	18.17(15.84)	417.25(233.7)

HiF = High Frequency; LoF = Low Frequency

[1] - Results presented in the format of X (Y), where X = mean number of bats passes per night and Y = standard deviation

[2] - Recordings classified as bats with low frequency calls but could not be classified to the species level, typically including hoary bat, big brown bat and silver-haired bat

[3] - Recordings classified as bats with high frequency calls but could not be classified to the species level, typically including eastern red bat, tri-colored bat and all bats in the *myotis* genera

Table 5 Total Passes and Maximum Passes within One Night for SAR Bats at Acoustic Monitoring Stations from June 23rd – July 7th, 2022.

Total Passes and Nightly High Passes for SAR and Potential SAR Bats																
Station	Total Unknown High Frequency	Max Unknown High Frequency	Total Unknown Low Frequency	Max Unknown Low Frequency	Total Eastern Small-footed Myotis	Max Eastern Small-footed Myotis	Total Little Brown Myotis	Max Little Brown Myotis	Total Unknown Myotis Species	Max Unknown Myotis Species	Total Eastern Red Bat	Max Eastern Red Bat	Total Northern Hoary Bat	Max Northern Hoary Bat	Total Silver-haired Bat	Max Silver-haired Bat
Bat-01	48	8	758	169	187	42	83	18	461	87	3	1	104	39	77	15
Bat-02	117	22	3015	572	0	0	0	57	223	57	1	1	210	46	1084	121

5.4.4 Turtles

Two wetlands (SWT2-2/MAS2; SWD4-1/MAM2-2; Figure 3) were identified as having potentially suitable habitat for turtles based on the presence of standing water at sufficient depth to provide cover and thermoregulation functions. Visual encounter surveys were conducted at these wetlands during field surveys (Figure 2).

- TVES-01 – This community is approximately 0.3 ha and corresponds to the SWD4-1 / MAM2-2 community. This wetland community had limited standing water and was heavily disturbed by cattle. No turtles were documented in this feature during surveys.
- TVES-02 – This community is approximately 0.6 ha and corresponds to the SWT2-2 / MAS2 community. This wetland community provided the most suitable turtle habitat on-Site. One midland painted turtle (*Chrysemis picta marginata*) was documented in this feature during surveys (Figure 2).

The pond adjacent to the pasture and residence along Concession Road 7, located off-Site, was seen to contain three midland painted turtles and one snapping turtle (*Chelydra serpentina*) during field surveys (Figure 2).

Significant and Sensitive Species

Midland painted (S4) and snapping turtle (S4) were documented within two wetlands on-Site, as described above. Snapping turtle is listed special concern provincially under the ESA, and both species are listed federally as special concern under SARA. As such, this species is not afforded protection under either the ESA or the SARA.

Snapping turtle is considered SOCC and its habitat is considered SWH (MNRF 2015a). This species is discussed further in Section 6.7.3.2.

5.4.5 Other Wildlife

In addition to the species outlined in the above sections, two amphibian, two insect, and five mammal species were observed during field surveys conducted in the Study Area (Appendix E): Canadian tiger swallowtail (*Papilio canadensis*), widow skimmer (*Libellula luctuosa*), coyote (*Canis latrans*), eastern chipmunk (*Tamias striatus*), eastern gray squirrel (*Sciurus carolinensis*), northern raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*).

No fish habitat was observed on the Site or in the Study Area. No watercourses are present, and the wetland features are small and isolated from other surface water features.

Significant and Sensitive Species

All of the species observed during general wildlife surveys are secure and common in Ontario and globally (S5; G5) (Appendix E).

No monarchs were observed during field surveys; however, the larval host plant for this species was identified in the understory of hedgerows within the Site. CUM-1 was noted to have minimal occurrence of common milkweed therefore potential habitat on-Site was limited in range and abundance.

None of the other wildlife SAR with ranges that overlap the Study Area (Appendix C), not already discussed in the above sections (e.g., SAR bats), were observed on the Site or in the Study Area during field surveys.

6.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES

6.1 Habitat of Endangered or Threatened Species

Ten species were determined to have moderate to high potential for occurrence within the Study Area (Appendix C), each of which is discussed below.

The WCOP prohibits development or site alteration within significant habitat of endangered or threatened species except in accordance with provincial or federal requirements. Development or site alteration may be permitted adjacent to the habitat (i.e., within 120 m) where it is demonstrated there will be no adverse impacts on the habitat or its ecological function.

Jefferson Salamander

Jefferson salamander uses ponds and vernal pools for breeding, which are generally located within or adjacent to deciduous or mixed woodland habitat (JSRT 2013). This species receives individual and habitat protection, with their habitat being defined within O. Reg 832/21 to the ESA as follows:

i. "*a wetland, pond or vernal or other temporary pool that is being used by a Jefferson salamander or Jefferson dominated polyploid or was used by a Jefferson salamander or Jefferson dominated polyploid at any time during the previous five years,*

ii. *an area that is within 300 metres of a wetland, pond or vernal or other temporary pool described in subparagraph i and that provides suitable foraging, dispersal, migration or hibernation conditions for Jefferson salamanders or Jefferson dominated polyploids,*

iii. *a wetland, pond or vernal or other temporary pool that,*

   a. *would provide suitable breeding conditions for Jefferson salamanders or Jefferson dominated polyploids,*

   b. *is within one kilometre of an area described in subparagraph i, and*

   c. *is connected to the area described in subparagraph i by an area described in subparagraph iv, and*

iv. *an area that provides suitable conditions for Jefferson salamanders or Jefferson dominated polyploids to disperse and is within one kilometre of an area described in subparagraph i.*"

However, the revised definition of habitat in the amended ESA is simply "*a dwelling-place (nests, dens, etc.) that is occupied or habitually occupied by one or more members of a species for breeding, rearing, staging, wintering, or hibernating, and the immediate surrounding area necessary for breeding, rearing, staging, or hibernation*."

No Jefferson salamander or Unisexual Ambystoma (Jefferson salamander-dependent) populations are known to occur in Puslinch south of the 401, based on decades of research (Bogart 2025). Although unlikely, suitable breeding habitat for this species is present within the woodland northeast of the Site (SWD4-1; FOD5-4; FOD5; Figure 3); however, no individuals or egg masses were documented during field investigations. No impacts to this species are anticipated based on the retention of the suitable breeding ponds and immediately adjacent forested habitat (i.e., wintering) with a 10 m setback, and the mitigation measures outlined in Section 8. Further, no impacts to water levels within wetlands associated with the woodland are anticipated based on the results of the Water Report (WSP 2025) (see further discussion in Section 7.2).

As such, no further analysis is warranted for this species.

Bobolink

Bobolink is listed as threatened under the ESA. The GHD for bobolink (MECP 2021b) identifies three habitat categories:

- **Category 1:** Nest and the area within 10 m of the nest
- **Category 2:** The area between 10 m and 60 m of the nest or centre of approximated defended territory
- **Category 3:** The area of continuous suitable habitat between 60 m and 300 m of the nest or approximated centre of defended territory.

However, as noted above, the definition of habitat has been refined in the amended ESA.

This species was documented within open pastures on-Site within WSU1, WSU2, and WSU5, as well off-Site within the Study Area to the east (Figure 2). No nests were documented on the Site or in the Study Area.

To determine protected habitat for this species on the Site, a mapping exercise will be completed as part of future registration of the activity under the ESA (see Section 7.1).

Potential impacts to bobolink are discussed further in Section 7.1.

Eastern Meadowlark

Eastern meadowlark is listed as threatened under the ESA. The GHD for eastern meadowlark (MECP 2021c) identifies three habitat categories:

- **Category 1:** Nest and the area within 10 m of the nest
- **Category 2:** The area between 10 m and 100 m of the nest or centre of approximated defended territory
- **Category 3:** The area of continuous suitable habitat between 100 m and 300 m of the nest or approximated centre of defended territory.

However, as noted, the definition of habitat has been refined in the amended ESA.

No individuals were documented calling on-Site; however, this species was documented with breeding evidence off-Site, within the Study Area, to the east (Figure 2). No nests were documented on the Site or in the Study Area.

To determine protected habitat for this species, a mapping exercise will be completed as part of future registration of the activity under the ESA (see Section 7.1).

Potential impacts to eastern meadowlark are discussed further in Section 7.1.

Eastern Red Bat, Hoary Bat, Silver-haired Bat

Eastern red bat, hoary bat and silver-haired bat are listed as endangered under the ESA. Currently, these species receive general habitat protection under the ESA.

Eastern red bat and hoary bat generally roost in the foliage of trees and occasionally shrubs, making availability of suitable trees important to limit predation and improve offspring success. Both bats are solitary roosting bats (or with their pups).

Silver-haired bats roost primarily under bark and in tree cavities, relying on habitat with large, decaying trees. Silver-haired bats will use both deciduous and coniferous tree species for roosting and are known to occasionally roost in or on anthropogenic structures, especially during migration (COSEWIC 2023).

Based on the field surveys, eastern red bat, hoary bat, and silver-haired were documented within the woodland at the northern extent of the Study Area (FOD5-4; SWD4-1; FOC1; Figure 3). Further, the woodland communities off-Site, in the southwestern extent of the Study Area (CUW; FOD5), may provide suitable roosting habitat for these species; however, no targeted surveys were completed for this feature due to lack of access permissions. Given the documented calls for each of these species near the structures along Concession Road 7 (BAT-01; Figure 2), it is likely that these individuals utilize the Site for foraging.

Potential impacts to eastern red bat, hoary bat, and silver-haired bat are discussed further in Section 7.1.

Eastern Small-footed Myotis

Eastern small-footed myotis currently receives general habitat protection under the ESA.

While this species is usually documented in rock piles, fissures / crevices, talus slopes, etc., it is also known to occasionally roost in anthropogenic structures offering similar conditions (Humphrey 2017). This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures along Concession Road 7 and it is likely that they are utilizing the large barn structure on the Site for roosting. No suitable rock piles or other rocky habitat that may provide roosting habitat for this species was identified on-Site.

Potential impacts to eastern small-footed myotis are discussed further in Section 7.1.

Little Brown Myotis

Little brown myotis are listed as endangered under the ESA.

Anthropogenic maternity roosting habitat for little brown myotis is best defined by the physical structure providing roosting habitat (e.g., an entire bridge, building, contiguous extent of a rock pile, cut rock face, or riprap, etc.). In treed landscapes, this species is known to roost in tree cavities and under peeling bark.

Based on the field surveys, little brown myotis maternity roosting is likely occurring in the barn structure on the Site; however, no evidence of roosting was documented within the woodland at the northeastern extent of the Study Area (FOD5-4; SWD4-1; FOC1; Figure 3).

Further, the woodland communities off-Site, in the southwestern extent of the Study Area (CUW; FOD5), may provide candidate roosting habitat for this species; however, no targeted surveys were completed for this feature because it is off-Site.

Potential impacts to little brown myotis are discussed further in Section 7.1.

6.2 Fish Habitat

No surface water features meeting the definition of fish habitat are present on-Site or within the Study Area.

No further analysis is warranted.

6.3 Significant Wetlands

Significant wetlands are areas identified as provincially significant using evaluation procedures established by the province, as amended from time to time (MNRF 2022). Wetlands are assessed based on a range of criteria, including biology, hydrology, societal value, and special features.

Development and site alteration is not permitted within significant wetlands according to both the PPS and WCOP. Development may be permitted adjacent to (i.e., within 120 m) significant wetlands where it is demonstrated there will be no adverse impacts to the feature or its ecological functions.

There are no PSWs mapped within the Study Area (MNRF 2025b) (Figure 1). There are eight small, perched wetland pockets (WSP 2025); however, these features do not meet the size criterion (>2 ha) or serve important ecological, hydrological, hydrogeological or social function triggering an evaluation under OWES (MNRF 2022). They would not be considered for complexing under the recent changes to OWES manual (MNRF 2022).

As such, no further analysis is required for significant wetlands.

Potential impacts to unevaluated wetlands protected under the WCOP are discussed in Section 7.2.

6.4 Significant Woodlands

Woodlands can vary in their level of significance at the local, regional, and provincial levels. Significant woodlands are areas which are ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to their contribution to the broader landscape because of their location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history (MMAH 2024). Guidelines for determining the significance of woodlands are presented in the NHRM (MNR 2010). Significant woodlands may also be defined and designated by the local planning authority.

According to the WCOP, significant woodlands within the rural system are defined as woodlands greater than 4 ha and are included in the Greenlands System. The contiguous woodland located at the northern extent of the Study Area (SWD4-1; FOD5-4; FOC1; FOD5; Figure 3) is mapped as Greenlands under the WCOP and meets the size requirement for woodland significance. It should be noted that this feature will be impacted by the future Highway 6 by-pass, which will pass through this feature.

From a provincial perspective under the PPS, the woodland at the northern extent of the Study Area also meets the criteria for significance in the NHRM.

The location and dripline limits for the significant woodlands were delineated and staked by a qualified ecologist on September 1, 2022. The staked significant woodland limits were then surveyed by an Ontario Land Surveyor on September 23, 2022, in conjunction with an ecologist (Figure 4). Notable in the delineation of the feature was the exclusion of a small portion of hedgerow that was mapped as Greenlands in the WCOP schedules. This hedgerow is not considered part of the significant woodland based on the field verified assessment and delineation.

Potential impacts to significant woodlands are discussed in Section 7.3.

6.5 Significant Valleylands

General guidelines for determining significance of valleylands are presented in the NHRM (MNR 2010). Significant valleylands may also be defined and designated by the local planning authority. Valleylands are included within the Greenland designation under the WCOP.

Both the NHRM and WCOP define valleylands as ‘a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year’.

There are no features on-Site that meet the definition of valleyland. As such, no further discussion is warranted.

6.6 Significant Areas of Natural and Scientific Interest

Significant ANSIs are areas identified as provincially significant by the MNRF using evaluation procedures established by the province, as amended from time to time.

The Galt Moraine Earth Science ANSI is present off-Site, within the Study Area, south of Concession Road 7. Earth Science ANSI are designated based on the presence of geological formations. Based on existing separation associated with road infrastructure, as well as the 15 m property setback, no impacts to the geological formation for which the Galt Moraine ANSI was designated are anticipated.

As such, further analysis is not warranted.

6.7 Significant Wildlife Habitat

SWH is one of the more complicated natural heritage features to identify and evaluate. The NHRM (MNR 2010) includes criteria and guidelines for designating SWH. The SWHTG and the SWHMiST (MNR 2000; MNRF 2014) can also be used to help determine which areas and features should be considered SWH. These documents were used as reference material for this study. SWH should be evaluated in the context of the entire planning authority’s jurisdiction; where habitat representation in a planning area is high, though the habitat may be valuable to wildlife, the likelihood of it being significant is reduced (MNR 2000).

There are five general types of SWH: seasonal concentration areas, migration corridors, rare vegetation communities, specialized habitats, and habitat for SOCC. The specific habitats considered in this report are evaluated based on the criteria outlined in the Ecoregion 6E Criterion Schedule (MNRF 2015).

According to the PPS, development is permitted within SWH where it is demonstrated there will be no negative impacts to the feature or its ecological functions. In the WCOP, SWH is considered part of the Greenlands designations and aggregate extraction (subject to appropriate rezoning, licensing, and policies of the WCOP) is not permitted unless the following criteria are met:

- *‘there are no negative impacts on significant features and functions and no significant negative impacts on other greenland features and functions;*
- *the hazardous lands policies of Section 5.4.3 are met;*
- *the development conforms to policies of the applicable adjacent or underlying designation.’*

A detailed SWH screening is provided in Appendix F and habitat screening for SOCC are included in Appendix C. Only those SWH types identified in Appendix F that were evaluated as confirmed or candidate on the Site or in the Study Area are discussed further in this report. Based on the analysis, there are five types of confirmed or candidate SWH on the Site and in the Study Area (Table 6).

Table 6. Confirmed and Candidate Significant Wildlife Habitat Types within the Study Area

SWH Category	Specific Habitat Type	Candidate / Confirmed	Site / Study Area
Seasonal Concentration Areas	Bat Maternity Colonies	Candidate	Study Area
	Turtle Wintering Areas	Candidate	Study Area
Specialized Habitat for Wildlife	Amphibian Breeding Habitat (Woodland)	Confirmed	Site / Study Area
Habitat for Species of Conservation Concern	Terrestrial Crayfish	Candidate	Study Area
	Special Concern and Rare Wildlife Species	Candidate / Confirmed	Site / Study Area

6.7.1 Seasonal Concentration Areas

Seasonal concentration areas of animals are areas where large numbers of a species gather at one time of the year, or where several species congregate on an annual basis. Candidate SWH for two types of seasonal concentration areas were identified off-Site, within the Study Area, as discussed below.

6.7.1.1 Bat Maternity Colonies – Candidate

Snag density within the accessible portions of the significant woodland at the northeastern extent of the Study Area (FOD5-4) does not meet the criteria for this SWH type (i.e., 10 snags / ha of large diameter [≥ 25 cm dbh] trees).

The deciduous forest (FOD5) off-Site to the southeast, within the Study Area, may provide suitable habitat conditions for bat maternity colonies; however, no snag density or acoustic monitoring was completed for this feature.

As such, the deciduous forest (FOD5) in the southern extent of the Study Area has been identified as Candidate Bat Maternity Colonies.

6.7.1.2 Turtle Wintering Areas – Candidate

None of the wetlands on-Site appeared to provide suitable overwintering habitat for turtles based on the lack of sufficient water depth and cattle access. Further, all wetland features will be retained with a 10 m setback from the extraction limit (Figure 4).

Unevaluated wetlands off-Site, within the Study Area, are anticipated to be similar to those on-Site. A 10 m setback to these wetlands would ensure that the proposed extraction does not intrude into these features.

As such, no further analysis is warranted.

6.7.2 Specialized Habitat for Wildlife

Specialized habitats for wildlife are large areas of suitable habitat that contribute to a species long-term survival. Some species require large areas of unfragmented, suitable habitat for successful breeding, and populations can decline if these habitats reduce in size. Specialized habitat for wildlife is community- and diversity-based, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes. Confirmed or

SWH for one type of specialized habitat for wildlife were identified on-Site and in the Study Area, as discussed below.

6.7.2.1 Amphibian Breeding Habitat (Woodland) – Confirmed

Based on the results of the anuran call surveys, the SWT2-2 / MAS2 at the western extent of the Site and the three wetlands off-Site to the east (i.e., two SWD features; one MAS feature), within the Study Area, meet the criteria for this SWH type (Figure 4).

For this SWH type, the defined habitat includes the entire wetland communities, along with all woodland habitat within 230 m of the wetland. Where the wetland is fragmented from a woodland (but within 120 m), a travel corridor is included within the SWH delineation (MNRF 2015a), as follows:

- **SWT2-2 / MAS2** – The nearest woodland habitat to this feature is the SWD4-1 / MAM2-2 and thus the delineation of this SWH includes the wetland (SWT2-2/MAS2; Figure 4), woodland habitat within 230 m (SWD4-1 / MAM2-2), as well as a travel corridor. Based on the existing conditions the most suitable travel corridor will be along the existing hedgerow at the Site boundary and extending into the Study Area. All of these features and the travel corridor will be maintained with a setback (i.e., to the wetland or property setback for the travel corridor). The significant woodland is greater than 120 m from the SWT2-2 / MAS2 providing amphibian breeding SWH.
- **MAS off-Site** – The nearest woodland habitat is the deciduous swamp north of the wetland, which will also be retained as this SWH type (see below; Figure 4). The delineation of this SWH includes the wetland (MAS), woodland habitat within 230 m (SWD), as well as a travel corridor. Based on the existing conditions the most suitable travel corridor will be through the cultural meadow off-Site, within the Study Area, that already provides connectivity between these two features. Although this travel corridor is greater than 120 m in length, the only other that would provide a connection less than 120 m would be through active agricultural fields off-Site, which likely increases risk of harm during migration.
- **SWD off-Site** – There are two deciduous swamp communities that were identified as providing SWH for this amphibian breeding (woodland) (Figure 4). As these features are woodlands themselves, the wetland area and surrounding 230 m woodland habitat are included in the delineation of this habitat. No travel corridor is required, given the breeding habitat is located within woodland communities.

As outlined in MNRF (2015a), breeding pools within woodlands or located closer to forest / woodland habitat are considered more significant due to the risk of harm to migrating amphibians. As such, it is likely that the SWD communities off-Site provide the most significant amphibian breeding habitat within the Study Area.

6.7.3 Habitat for Species of Conservation Concern

Special concern and rare wildlife species include species listed as special concern under the ESA; species identified as endangered or threatened by COSEWIC; species that are rare, whose populations are significantly declining or have a high percentage of their global population in Ontario (i.e., ranked S1-S3 by NHIC); species considered rare in a specific planning area (e.g., regional or local level); and species subject to recovery programs. This category excludes species listed as endangered or threatened under the ESA (refer to Section 6.1).

6.7.3.1 Terrestrial Crayfish – Candidate

All suitable wetland and wet meadow habitat on-Site were searched for terrestrial crayfish burrows during general wildlife surveys. No evidence of terrestrial crayfish was found on-Site during field surveys; however, as no access was permitted to assess potentially suitable wetland ecosites off-Site (SWD; MAS), all wetland communities off-Site within the Study Area have been identified as Candidate SWH for Terrestrial Crayfish.

Based on the distance from the proposed extraction area, no impacts are anticipated to this SWH type and no further analysis is warranted.

6.7.3.2 Special Concern and Rare Species – Candidate / Confirmed

The following sections outline the SOCC that were identified as having candidate or confirmed habitat on-Site or within the Study Area. Details regarding the habitat assessment and screening for SOCC are provided in Appendix C.

Barn Swallow – Confirmed

Active nests for this species were documented within the two non-residence structures along Concession Road 7 within WSU-1 (Figure 2). Although SWH typically excludes anthropogenic features, this species almost exclusively relies on anthropogenic structures for nesting. As such, the two structures with barn swallow nests are considered Confirmed SWH (Figure 4).

Further, individuals were documented foraging over open habitat on-Site during field surveys. While suitable foraging habitat is present on-Site and within the Study Area, most suitable open habitat is associated with active agricultural fields (i.e., pastures). Additional foraging habitat on-Site consists of the cultural thicket (CUT1), wetland pockets, and the small portion of cultural meadow at the northeastern extent of the Site. While barn swallows are using the Site for foraging, there is sufficient foraging habitat within the greater landscape.

Eastern Wood-pewee – Confirmed

This species was documented within the significant woodland off-Site (specifically the FOD5-4) with ‘probable’ breeding evidence (Figure 3; Figure 2). As such, the contiguous, significant woodland feature has been identified as Confirmed SWH for eastern wood-pewee (Figure 4).

No individuals were documented during breeding bird or other field surveys in suitable woodland habitat elsewhere off-Site, within the Study Area (i.e., FOD5 in southeastern extent of Study Area).

Grasshopper Sparrow – Confirmed

This species was observed in WSU-1 and WSU-5 with probable breeding evidence. As such, the two agricultural fields on the east and west sides of Hedgerow #1 and south of Hedgerow #2 (Figure 3) are identified as Confirmed SWH for this species (Figure 4). No individuals were documented within any of the other agricultural fields / pastures on-Site.

Further, one individual was documented calling within agricultural fields east of WSU-4 (Figure 2) with ‘possible’ breeding evidence. It is possible that this species is utilizing the agricultural fields off-Site to the east for breeding, within the Study Area.

Hairy Solomon's Seal – Confirmed

This species was documented within the deciduous forest (FOD5-4) north of the Site, but within the Study Area. As such, this deciduous forest (FOD5-4) is considered Confirmed SWH for this regionally rare species (Figure 4).

West Virginia White – Candidate

This species was not documented during field surveys. The woodland at the northern extent of the Site and Study Area may provide suitable habitat based on the dominant canopy cover (maple-dominated) and confirmed presence of toothwort (*Cardamine spp.*).

In the absence of targeted surveys, suitable woodland habitat (FOD5-4) has been identified as Candidate SWH for this species. This feature will be retained with a 10 m setback and no impacts to vegetative composition (e.g., associate species – toothwort; maples) are anticipated. As such, no further analysis is warranted.

Snapping Turtle - Confirmed

This species was observed within the small wetland feature southwest of the Site, adjacent to the residence along Concession Road 7. Further, the off-Site wetlands throughout the Study Area may provide suitable aquatic habitat for this species. All wetlands on Site and in the Study Area are set back a minimum of 10 m from the proposed extraction, and no impacts to the hydrology of these features are expected to result from extraction (see further discussion in Section 7.2). As such, no further analysis is warranted.

6.8 Greenlands System – County of Wellington

As outlined in Section 2.8, the WCOP identifies a 'Greenlands System' of environmental features and linkages. The Greenlands System (WCOP Schedule B) is divided into two broad categories: Core Greenlands and Greenlands.

6.8.1 Core Greenlands

Based on the results of the field surveys and the evaluation of significance outlined throughout Section 6, the following features on-Site would be considered Core Greenlands:

- **All Other Wetlands** – No PSWs are present on-Site; however, all wetlands on-Site and within the Study Area are considered 'all other wetlands' per the policies of the WCOP (Figure 2; Figure 4).
- **Habitat of Endangered or Threatened Species** – All habitat of endangered and threatened species identified in Section 6.1 and outlined on Figure 4. This habitat includes the following species: bobolink, eastern meadowlark, and all SAR bats outlined in Section 6.1,

Section 5.6 of the WCOP outlines that 'aggregate extraction within Mineral Aggregate Areas subject to appropriate rezoning, licensing and the policies of this plan' may be a permitted use within 'all other wetlands''; however, all wetland features are being retained with a 10 m setback.

Further, no extraction is permitted within habitat of endangered or threatened species, except in accordance with provincial and federal regulations.

6.8.2 Greenlands

Based on the results of the field surveys and the evaluation of significance outlined throughout Section 6, the following features on-Site would be considered Greenlands:

- **Significant Wildlife Habitat** – All confirmed and candidate SWH identified in Section 6.7 would be conservatively included as Greenlands (Figure 4).
- **Significant Woodland** – The contiguous woodland at the northern extent of the Study Area meets the municipal criteria for a significant woodland and would be included as Greenlands. This feature will be retained with a 10 m setback from the dripline. This feature overlaps with Core Greenlands as it is also confirmed habitat for endangered or threatened species (i.e., SAR bats).

Section 5.6 of the WCOP outlines that 'aggregate extraction within Mineral Aggregate Areas subject to appropriate rezoning, licensing and the policies of this plan' may be a permitted use within and adjacent to 'Greenlands'.

7.0 IMPACT ASSESSMENT

This section assesses considerations of potential impacts on the natural heritage features and functions (as outlined in Section 6.0) located within the Study Area and the Site, associated with direct impacts as well as potential impacts of below water extraction on the features.

The following natural heritage features were not identified on the Site or within the Study Area, or will not be physically impacted, and are not discussed further in this report:

- Significant wetlands
- Fish habitat
- Significant valleylands
- Areas of Natural and Scientific Interest (Galt Moraine Earth Science ANSI)

Based on the assessment, the following natural heritage features were identified on the Site or in the Study Area that are considered and addressed in the analysis of potential impacts include:

- Habitat of Endangered and Threatened Species
- Wetland (non-PSW)
- Significant Woodlands
- Significant Wildlife Habitat
- Greenlands System (WCOP)

7.1 Habitat of Endangered and Threatened Species

The following section outlines the impact assessment for the SAR identified in Section 6.1 and includes bobolink, eastern meadowlark, eastern red bat, eastern small-footed myotis, hoary bat, little brown myotis, and silver-haired bat.

Bobolink and Eastern Meadowlark

As outlined in Section 6.1, both these SAR grassland birds were documented with breeding evidence within the Study Area. Bobolink was documented in pastures within the WSU-1, WSU-2, and WSU-5, as well as off-Site to

the east (Figure 2). Whereas eastern meadowlark was only documented calling in agricultural fields off-Site, to the east (Figure 2).

Protected habitat for these species will be delineated and mapped as outlined in Section 6.1 as part of future approvals under the ESA, as required.

As outlined in the PPS and WCOP, development and site alteration are not permitted within habitat for endangered or threatened species, *except in accordance with provincial and federal requirements*. This registration meets the requirements under the ESA for these species, satisfying the policies in the PPS and WCOP.

Eastern Red Bat, Eastern Small-footed Myotis, Hoary Bat, Little Brown Myotis, and Silver-haired Bat

Each of the listed bats were documented during targeted acoustic monitoring either on-Site or in woodlands off-Site, within the Study Area.

Eastern red bat, hoary bat, and silver-haired bat were all documented within the significant woodland at the northeastern extent of the Study Area. No tree removal is required within the significant woodland and a 10 m setback will be applied to the dripline (Figure 4).

No impacts to roosting habitat within the woodland with confirmed SAR bat use is anticipated based on the proposed extraction. Suitable woodland habitat is present for tree roosting bats off-Site to the southeast, within the Study Area (FOD5; Figure 4); however, no targeted surveys were completed for this feature. No impacts to any roosting SAR bats are anticipated based on the retention of this feature off-Site and the application of a property setback.

Eastern small-footed myotis and little brown myotis were both documented in the vicinity of the large barn structure and it is likely that they are using this structure for roosting habitat. The large barn on-Site will be retained within the property setback (Figure 4) and no removal of roosting habitat is anticipated as part of the proposed extraction.

As discussed above, no confirmed SAR bat habitat is identified for removal as part of the proposed extraction area. Isolated, treed features such as hedgerows may provide suitable cavities for day roosting habitat and can be used by SAR bats. However, these features represent a ‘proportionally small number of potentially suitable maternity or day roosting trees’ given the presence of larger, contiguous woodland features within the Study Area and greater landscape (i.e., ‘avoidance considerations’) (MECP 2022a). Further, the removal of hedgerows will not lead to fragmentation or barriers to movement for these species and tree removals will occur outside of the active bat window (MECP 2022b). Based on recent discussion with MECP, the new active bat window for the newly listed migratory bats (i.e., eastern red bat, hoary bat, and silver-haired bat) is April 1 – November 30 (Norman 2025).

While land-use on the Site will shift from existing agricultural practices to aggregate extraction, foraging habitat for these species will be maintained over the ponds on-Site during extraction. Further, sufficient foraging habitat is present in the landscape adjacent to the Site (e.g., active agriculture, open habitat off-Site). Post rehabilitation, improved foraging conditions are anticipated on-Site for these species, with more natural vegetation and waterbodies for foraging (as opposed to active agriculture). Based on this, no impacts to these species or their habitats are anticipated to result from the proposed extraction.

As outlined in the PPS and WCOP, development and site alteration are not permitted within habitat for endangered or threatened species, *except in accordance with provincial and federal requirements*. However, the retention of confirmed SAR bat habitat in the Study Area and the application of 'avoidance considerations' (MECP 2022a) satisfies the policies of the PPS and WCOP.

7.2 Wetlands

Eight small, perched wetland pockets (WSP 2025) are present within the Study Area, with four wetlands overlapping the Site (Figure 3). As outlined in Section 6.3, these wetland features do not meet the size criterion (>2 ha) or serve important ecological, hydrological, hydrogeological or social function that would trigger an evaluation under OWES (MNRF 2022).

Setbacks can be used to avoid direct impacts and to mitigate some indirect impacts. Setbacks should be of a sufficient distance to protect wetland form and associated function (e.g., hydrological, hydrogeological, wildlife habitat) from potential development impacts, including direct removal, edge effects, and screening of human disturbances (e.g., noise, light) (Beacon 2012). All wetland features are excluded form the extraction footprint and protected in-situ. Given the characteristics of the wetlands with relatively common function on the landscape, and no critical function zones, a minimum 10 m setback from extraction has been applied to all wetlands. This is consistent with a recent review of the most commonly identified buffer widths implemented by conservation authorities for non-provincially significant wetland features (10–15 m) (NPCA and NSE 2022). WSP has recommended a 10 m setback based on the small, degraded nature of the wetlands on-Site and immediately adjacent (within the significant woodland). This distance is also supported by Beacon's Ecological Buffer Guideline Review (Beacon 2012), indicating 10 m is recommended as the base buffer width for protection of wetland features and functions (e.g., water quality, core habitat and screening of human disturbance). Other wetlands off-Site are located greater than 50 m from the proposed extraction area.

Based on the results of the water assessment (WSP 2025), these wetland features are situated at least 10 m above the water table. These features are therefore not supported by groundwater discharge. Similar to many other mapped wetlands adjacent to gravel pits in Puslinch Township, these features exist due to the presence fine grained peaty soils and limiting infiltration of precipitation and limited seasonal runoff. The proposed setbacks from these features, in conjunction with the location of these features within catchments, and the relatively high permeability of the lands within the agricultural fields outside the wetlands, indicates that the current water regime on Site and near surface soil conditions at the wetlands will remain similar to existing condition during and post-extraction. As such these wetlands are not anticipated to be affect by the proposed aggregate development. All wetlands on Site and in the 120 m adjacent lands will be maintained under the proposed development scenario. Adverse impacts to ecological functions of these features are not predicted.

It is proposed that the wetland setbacks be planted as part of the Rehabilitation Plan. These areas are currently under agricultural operations. The planted species will consist of a mix of native species woody and herbaceous species, including coniferous species which are more effective at dampening noise and a native herbaceous layer that will control soil erosion and sedimentation that may have been a concern when no buffer existed between the agricultural operations and the wetlands. This approach will ultimately result in a vegetated buffer that will provide increased protection of the wetland form and function compared to a unvegetated or sparsely vegetated buffer. The similarity in structure between the wetland plant communities and the reforested setbacks in the rehabilitated state will create a soft edge at the interface, which will be an ecological improvement over the hard edge that currently exists just beyond the wetland edge and the adjacent agricultural crop fields (MNR 2011b). The soft edge transition zone will also help mitigate potential for invasive species migration into the wetland. Cadenasso

and Pickett (2001) demonstrated that a thinned/sparsely vegetated or “open” edge allowed for higher volume of seed dispersal as well as further distance of dispersal into the forest interior compared to an intact or “vegetated” edge.

As noted in the Water Report (WSP 2025) the area where groundwater levels may be impacted by the proposed extraction may extend up to 600 m from the Site in a northeasterly direction. Drawdown of the groundwater table in this area is predicted to be 0.25 m. Based on this, the small evaluated (non-PSW) and unevaluated wetlands outside the Study Area, within this area of predicted drawdown, are unlikely to experience any impacts to hydrology, hydroperiod, or plant communities based on the very minimal amount of drawdown anticipated. Further, it is probable that these wetlands are perched, similar to the wetlands studied on-Site, in the Study Area, and others in Puslinch Township, which would further buffer them from any changes in the groundwater table.

7.3 Significant Woodlands

The woodland in the northeastern part of the Study Area is noted in the WCOP as a significant woodland and part of the County’s Greenlands System. It consists of four ELC communities (SWD4-1; FOD5-4; FOC1; FOD5; Figure 3).

The woodland feature as delineated in 2022 with the GRCA is proposed to be protected in its entirety. A small portion of hedgerow, which extends from the woodland on to agricultural fields, is proposed for removal. This portion is mapped as part of this significant woodland in the OP Schedules. The portion proposed for removal will be replaced as part of rehabilitation plantings and will be added to the core of the significant woodland as shown on Figure 5.

The woodland is noted to not be within the Greenbelt policy area.

It is proposed that the setback be established 10 m from the surveyed dripline of the feature. These areas are currently under agricultural operations, it is proposed to be enhanced as a planted buffer zone. The planted species will consist of deciduous and coniferous woody species which are more effective at dampening anthropogenic noise and a native herbaceous layer that will control soil erosion and sedimentation that may have been a concern when no buffer existed between the agricultural operations and the woodland. This approach will result in a vegetated buffer that will provide increased protection to the woodlands form and function and the other ecosystems within the woodland including a wetland, compared to a unvegetated area that is currently under agricultural cultivation.

The southeast corner of the license area outside of the extraction area will also be replanted, contiguous with the woodland and buffer.

No berms are proposed in the setback to the significant woodland.

According to the Water Report (WSP 2025), groundwater at the Site is found approximately 10 m below the ground surface at its closest point, which is well below the depth that root systems of most vegetation reach. The Water Report (WSP 2025) has predicted that groundwater within an area extending 600 m northeast from the Site boundary may decrease by 0.25 m as a result of extraction. Based on the fact that most plant root systems are within the first metre of soil, and groundwater in the area has been documented to be well below ground surface, it is unlikely that a reduction in the groundwater by 0.25 m will have any impact on surface vegetation, including significant woodlands.

There are no negative impacts to the significant woodland feature.

7.4 Significant Wildlife Habitat

The following sections outline the impact assessment for the confirmed and candidate SWH identified for further analysis in Section 6.7.

7.4.1 Bat Maternity Colonies – Candidate

The accessible portions of the woodland at the northeastern extent of the Study Area did not meet the snag density criteria for this SWH type (MNRF 2015a); however, in the absence of snag density surveys, candidate bat maternity colonies are present in the woodland off-Site, in the southeastern extent of the Study Area.

According to the SWHMiST (MNRF 2014), the best method of mitigation for development is to avoid bat maternity colonies and to implement timing windows for habitat removal. All candidate habitat is being retained, and tree removal will be completed outside of the active bat season (April 1 – November 30 for migratory bats).

No impacts to this feature are anticipated with the implementation of mitigation measures outlined in Section 8.2.

7.4.2 Amphibian Breeding Habitat (Woodland) – Confirmed

One wetland overlapping the Site, the SWT2-2 / MAS2 within the hydro corridor, met the criteria for Amphibian Breeding Habitat (Woodland), as outlined in Section 6.7.2.1. Woodland habitat within 230 m of the wetland ecosite was limited to the SWD4-1 / MAM2-2, which would be included in this habitat. Both wetland / woodland ecosites are being retained with a 10 m setback to mitigate direct impacts to amphibian breeding habitat. As outlined in MNRF (2015a), a movement corridor should be included within this SWH type where the breeding pool is not located within a woodland. As such, the most suitable corridor would be the existing hedgerow along the western edge of the Site. This feature will be retained and further impacts to amphibian movement will be mitigated by the property setback. At rehabilitation, the on-Site wetlands will have a naturalized buffer compared to existing agricultural practices in the adjacent fields, and there will no longer be cattle impacts to these features.

Three additional wetlands off-Site, within the Study Area met the criteria for Amphibian Breeding Habitat (Woodland), as outlined in Section 6.7.2.1, as follows:

- The meadow marsh (MAS) community located off-Site to the east, within the Study Area, met the criteria for this SWH type. Woodland habitat within 230 m of the wetland ecosite was limited to the SWD immediately north of the wetland. As outlined in MNRF (2015a), a movement corridor should be included within this SWH type where the breeding pool is not located within a woodland. As such, the most suitable corridor would be the existing hedgerow immediately east of the Site, within the Study Area. All amphibian breeding habitat (i.e., wetland, woodland, and movement corridor) are off-Site and no impacts are anticipated based on the distance of these features from the proposed extraction area.
- Two deciduous swamp communities (SWD) located off-Site to the east, within the Study Area, met the criteria for this SWH type. Woodland habitat within 230 m of the wetland ecosites included the SWD communities themselves, as well as the significant woodland at the northern extent of the Site and Study Area. As breeding features are present within woodlands, no movement corridor is required for the delineation of this habitat. All breeding pools are located off-Site and suitable woodland habitat within the significant woodland are being retained with a 10 m setback from the dripline.

According to the SWHMiST (MNRF 2014), the best mitigation option is to avoid developing within amphibian breeding habitat. Further, treed buffers should be retained, where present, to further minimize impacts to

amphibian breeding. No tree removal is proposed within 10 m of amphibian breeding habitat or associated woodland habitat.

As such, no negative impacts are anticipated to feature with the implementation of mitigation measures outlined in Section 8.2.

7.4.3 Special Concern and Rare Species

The following sections outline the SOCC that were identified as having candidate or confirmed habitat on-Site or within the Study Area. Details regarding the habitat assessment and screening for SOCC are provided in Appendix C.

Barn Swallow – Confirmed

As outlined in Section 6.7.3.2, the two anthropogenic structures (i.e., large barn; outbuilding) were identified as SWH for this species (Figure 4). Both structures are being retained and impacts to nesting barn swallows is not anticipated based on the proposed extraction area.

While land-use on the Site will shift from existing agricultural practices to aggregate extraction, foraging habitat for these species will be maintained over the ponds on-Site during extraction. Further, sufficient foraging habitat is present in the landscape adjacent to the Site (e.g., active agriculture, open habitat off-Site). Post rehabilitation, improved foraging conditions are anticipated on-Site for these species, with more natural vegetation and waterbodies for foraging (as opposed to active agriculture).

As such, no negative impacts are anticipated to feature with the implementation of mitigation measures outlined in Section 8.2.

Eastern Wood-pewee – Confirmed

As outlined in Section 6.7.3.2, SWH for eastern wood-pewee is present within the significant woodland the northeastern extent of the Study Area (Figure 4). The entire significant woodland is being retained with a 10 m setback from the dripline to further mitigate and potential negative impacts.

As there will be no encroachment within this habitat and a setback will be applied, no negative impacts are anticipated to feature with the implementation of mitigation measures outlined in Section 8.2.

Grasshopper Sparrow – Confirmed

As outlined in Section 6.7.3.2, this species was documented with breeding evidence is WSU-1, WSU-5, and off-Site to the east, within the Study Area (Figure 4). On-Site, suitable habitat is limited to pastures at the southern extent of the Site (Figure 4). While it is likely that these pastures are providing breeding habitat for this species, it is unlikely that suitable habitat on-Site provides sufficient area to support large populations of this species (MNR 2000). Further, there is sufficient, suitable open habitat (e.g., agricultural fields, cultural meadows) within the greater landscape to support this species. As such, it is unlikely that the removal of two pastures would result in a negative impact to significant habitat for this species in the planning area.

Additional breeding was documented off-Site to the east of WSU-4, within the Study Area. All pastures and suitable meadow habitat is being retained off-Site and further separated by a property setback.

As such, no negative impacts are anticipated to the function of this SWH type within the landscape with the implementation of mitigation measures outlined in Section 8.2.

Hairy Solomon's Seal – Confirmed

As outlined in Section 6.4.3.2, this species was documented in the woodland in the northeastern extent of the Study Area (Figure 4), which is located outside of the extraction area and will be buffered by a 10 m setback from the surveyed dripline.

As such, no negative impacts are anticipated to this species or its habitat within the landscape with the implementation of the mitigation measures outlined in Section 8.2.

7.5 Greenlands System – County of Wellington

As outlined in Section 6.8, municipally designated Core Greenlands and Greenlands are present on-Site and within the Study Area. The following sections outline the impact assessment for these municipally designated features.

7.5.1 Core Greenlands

Based on the results of the field surveys and the evaluation of significance outlined throughout Section 6, the following features on-Site would be considered Core Greenlands:

- **All Other Wetlands** – As outlined in the WCOP, 'All other wetlands will be protected in large measure and development that would seriously impair their future ecological functions will not be permitted'. All wetlands within the Study Area have been provided a 10 m setback from the proposed extraction area to protect the features and maintain ecological function. No negative impacts are anticipated to the function of these wetlands with the implementation of mitigation measures outlined in Section 8.2.
- **Habitat of Endangered or Threatened Species –** As outlined in the WCOP, 'Development and site alteration will not be allowed in significant habitat of endangered or threatened species except in accordance with provincial and federal requirements'. Further, 'Development or site alteration adjacent to significant habitat of endangered or threatened species shall require a satisfactory Environmental Impact Assessment that demonstrates there will be no negative impact on the significant habitat of endangered or threatened species or its ecological function.'
  - **Bobolink and Eastern Meadowlark**
    - Suitable pasture habitat is present, with breeding evidence for Bobolink, on-Site within WSU-1, WSU-2, and WSU-5. As the area of removal will be less than 30 ha, this project is eligible for registration under O. Reg 830/21 to the ESA, meeting provincial requirements per the WCOP policies.
    - All suitable habitat off-Site, within the Study Area will be retained and will be setback from the proposed extraction area with the implementation of a property setback. No indirect impacts are anticipated to SAR bat habitat adjacent to the proposed extraction area with the implementation of mitigation measures outlined in Section 8.2.
  - **Species at Risk Bats**
    - All suitable and confirmed habitat for these species (i.e., woodlands, large barn structure) are being retained with a setback from the proposed extraction area. No MECP authorization is required for the removal of hedgerows and isolated trees based on the application of 'avoidance considerations' (MECP 2022b).

- No indirect impacts are anticipated to SAR bat habitat adjacent to the proposed extraction area with the implementation of mitigation measures outlined in Section 8.2.

Section 5.6 of the WCOP outlines that 'aggregate extraction within Mineral Aggregate Areas subject to appropriate rezoning, licensing and the policies of this plan' may be a permitted use within 'all other wetlands'. However, all wetland features are being retained with a 10 m setback.

Further, no extraction is permitted within habitat of endangered or threatened species, except in accordance with provincial and federal regulations.

7.5.2 Greenlands

Based on the results of the field surveys and the evaluation of significance outlined throughout Section 6, the following features on-Site would be considered Greenlands:

- **Significant Wildlife Habitat** – As outlined in WCOP, 'development and site alteration shall not be allowed in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the habitat or its ecological functions.'
  - All SWH types have been avoided by the proposed extraction area, as outlined in Section 7.4, with the exception of the pastures on-Site being utilized by grasshopper sparrow. This habitat is anthropogenic and ample breeding habitat is present within the landscape. Further, based on the current land-use, this feature could be transitioned from suitable hayfield / pasture habitat to unsuitable row cropping and would not be subject to the policies of the PPS or Greenlands System policies in the WCOP.
  - Restoration and enhancement of natural features within property and natural feature setbacks will provide additional suitable habitat on-Site and provide connection to breeding habitat to the east of Site, within the Study Area.
  - No indirect impacts are anticipated to retained SWH adjacent to the proposed extraction area with the implementation of mitigation measures outlined in Section 8.2.
- **Significant Woodland** – As outlined in the WCOP, 'Significant woodlands will be protected from development or site alterations which would negatively impact the woodlands or their ecological functions'.
  - The entire significant woodland is being retained with a 10 m setback from dripline to avoid direct impacts to this feature or the associated ecological function.
  - No indirect impacts are anticipated to significant woodland with the implementation of mitigation measures outlined in Section 8.2.

Section 5.6 of the WCOP outlines that 'aggregate extraction within Mineral Aggregate Areas subject to appropriate rezoning, licensing and the policies of this plan' may be a permitted use within and adjacent to 'Greenlands'. As outlined in Section 7.4.3, the removal of the pastures providing breeding habitat for grasshopper sparrow is unlikely to negatively impact this species based on the size of the pastures, proposed restoration around the margins of the extraction area, and the presence of ample breeding habitat within the greater landscape.

8.0 REHABILITATION / MITIGATION / MONITORING

8.1 Rehabilitation Concept

The Rehabilitation Plan has been designed to fit into the overall regional context and complement the existing topography and terrestrial and aquatic features in the area. The design of the Rehabilitation Plan has also considered the following:

- Potential to increase biodiversity of the site post-extraction (aligns with Ontario's Biodiversity Strategy [OBD 2011]).
- Potential to align with local restoration or rehabilitation targets and objectives, where feasible.
- Potential to improve and/or enhance habitat connectivity across the Site.
- Potential to create habitat features to support the existing local wildlife community and/or attract additional wildlife and increase productivity.

Because the extraction is below-water, the Rehabilitation Plan will consist of two pond / lake features surrounded by nearshore, riparian, and upland habitats. Proposed rehabilitation of the extraction area will proceed progressively through each phase.

The proposed final Rehabilitation Plan includes the creation of the two pond / lake features, wetland and terrestrial habitats comprised of backfilled areas, overburden slopes, and terrestrial nodal plantings. Shallow shoreline widths and depths will be varied to promote maximum diversity within the near-shore wetland habitat for fish and wildlife. The natural influx of external organic matter (i.e., leaf litter) will be promoted along shoreline areas through buffer edge management, management of forest edges, and minimization of cleared areas between the extraction area and significant woodland at the northeastern extent of the Study Area.

Plantings (i.e., nodal plantings) included in the Rehabilitation Plan will focus on locally native and non-invasive species that create habitat in the short term and promote natural succession processes. Wetland plants will include shrubs such as red-osier dogwood (*Cornus sericea*) and slender willow (*Salix petiolaris*), and herbaceous plants such as water plantain (*Alisma plantago-aquatica*), lake sedge (*Carex lacustris*), swamp milkweed (*Asclepias incarnata*), softstem bulrush (*Schoenoplectus tabernaemontani*), and common cattail (*Typha* spp.). Shallow emergent marsh vegetation (i.e., herbaceous species listed above) will be planted in water ±0.15 m deep at the north end of the eastern pond, and be interspersed with cover structures (e.g., boulders and root wads) areas along the shoreline. Basking logs, nesting platforms and boxes will be created for turtle, waterfowl, and swallows respectively.

Above-water side slopes will be rough graded to a 3:1 aspect to ensure stability. The slopes will be seeded with a mix of grasses and legumes consisting of native, non-invasive species. Woody species planted in the setback areas may include white cedar, white spruce (*Picea glauca*), sugar maple, red maple, white birch, American basswood, white pine, white cedar, trembling aspen, and balsam poplar. Shrubs such as serviceberry, nannyberry, ninebark (*Physocarpus opulifolius*), dogwoods, highbush cranberry (*Viburnum opulus*), elderberry, choke cherry (*Prunus virginiana*), willows and others may be used to add diversity and increase pollinator/wildlife diversity.

A portion of the Site will be planted as a pollinator plot to enhance opportunities for pollinator foraging. These plantings shall include the following species: common milkweed (*Asclepias syriaca*), showy tick-trefoil

(*Desmodium canadense*), wild bergamot (*Monarda fistulosa*), foxglove beardtongue (*Penstemon digitalis*), Virginia mountain-mint (*Pycnanthemum virginianum*), black-eyed susan (*Rudbeckia hirta*), early goldenrod (*Solidago juncea*), frost aster (*Symphyotrichum pilosum*), smooth aster (*Symphyotrichum laeve*), hoary vervain (*Verbena stricta*), white vervain (*Verbena urticifolia*). Wildflowers will be established in the pollinator plot area by planting plugs. Local seed collection may also be used to augment wildflower species composition. Plugs should be planted when the risk of frost is low. Minor variations in species selections may be necessary depending on availability.

8.2 Mitigation

8.2.1 General Best Management Practices

Standard Best Management Practices to be followed during site preparation and operations to mitigate damage to the adjacent natural features include the following:

- Clearly demarcate and maintain recommended setbacks on the Site Plan.
- Nesting migratory birds are protected under the MBCA. 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. In order to protect nesting migratory birds, in accordance with the MBCA, the Contractor will ensure that:
  - No active nests (nests with eggs or young birds) will be removed or disturbed.
  - No vegetation clearing (including grubbing and removal of trees, shrubs, and grasses) will occur during the bird nesting season (**April 1 to August 31**), unless construction disturbance is preceded by a nesting survey conducted by a qualified biologist. If any active nests are found during the nesting survey, a buffer will be installed around the nest to protect against disturbance. Vegetation within the protection buffer cannot be removed until the young have fledged the nest.

8.2.2 Significant Woodlands and ‘All Other Wetlands’

The following mitigation measures are recommended to minimize adverse indirect impacts on the adjacent wetlands and significant woodland:

- Implement a 10 m setback from ‘all other wetland’ features and the significant woodland.
- To avoid compacting the soil in the setback area (which can negatively impact tree roots) the use of heavy machinery should be minimized within 5 m of the dripline (where potential for root damage is most likely), particularly during wet periods (e.g., spring) when soil may already be saturated.
- Any berms located within the 10 m setback area must be located a minimum of 5 m from the dripline of the woodland to protect the critical root zone for the woodland.

8.2.3 Habitat of Endangered and Threatened Species

- Registration through a Notice of Activity under the ESA will be required for bobolink and eastern meadowlark. All mitigation and avoidance measures as outlined in the applicable regulations will be implemented.
- No tree removal or grubbing will occur within the active bat window (**April 1 – November 30**).

8.3 Monitoring

Based on the finding of this report, no specific ecological monitoring is required or recommended. Monitoring of surface and groundwater, as recommended in the Water Report (WSP 2025) will be implemented for the proposed extraction. If the results of the surface and groundwater monitoring program indicate the potential for adverse impact to surface water features, then appropriate mitigative actions would be developed. Specifics regarding monitoring of the proposed Rehabilitation Plan will be determined through consultation with the MNR.

9.0 SUMMARY AND RECOMMENDATIONS

The proposed expansion of the existing CBM Safarik Pit has been assessed for potential ecological impacts under the ARA Provincial Standards (Section 2.1), the Provincial Planning Statement (Section 2.2), policies of the Township of Puslinch (Section 2.7) and County of Wellington (Section 2.8), as well as other relevant legislation, including ESA (Section 2.5).

Based on these analyses, no negative impacts are anticipated with the proposed mitigation strategies in place, and the proposed extraction is in conformity with all applicable natural heritage policies.

10.0 SITE PLAN NOTES

The following notes will be included on the Site Plan for the proposed pit:

- Consult with MECP to map habitat for bobolink and eastern meadowlark on the Site as part of authorizations under the *Endangered Species Act*.
- Sediment and erosion control measures will be installed along the dripline of the significant woodland and wetland features.
- Extraction setbacks as identified on the Operational Plan are to be clearly demarcated and respected. Existing natural vegetation communities will be retained within the setbacks, except where berms are proposed.
- No clearing of vegetation shall occur within the core breeding bird season (April 1 – August 31) unless a nesting survey has been completed by a qualified biologist within 24 hours of the clearing, and no active nests were observed.
- No tree clearing or grubbing shall occur within the active season for bats (April 1 – November 30).
- Standard best management practices shall be implemented to reduce dust and noise during operations.
- Undertake rehabilitation as outlined in the Rehabilitation Plan.
- Implement a SAR Training Program and Encounter Protocol. The SAR Training Program is to be provided for all new on-Site staff as part of orientation training. The Training Program will include:
    - Information / training on identifying SAR
    - What to do if a SAR is observed (Encounter Protocol)
    - How to protect a turtle or bird nest
    - Information on how to report a SAR sighting

11.0 LIMITATIONS

This report was prepared for the exclusive use of CBM Aggregates, a division of St. Marys Cement (Canada). The report, which specifically includes all tables, figures, and appendices, is based on data and information collected by WSP Canada Inc. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by WSP Canada Inc. as described in this report.

WSP Canada Inc. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, WSP Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

12.0 CLOSURE

We trust this report meets your current needs. If you have any further questions regarding this report, please contact the undersigned. Curriculum Vitae are provided in Appendix G.

Signature Page

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https://wsponline.sharepoint.com/sites/gld-148930/project files/6 deliverables/ph 3000-natural environment/final - august 2025/ca-gld-21476582_cbmsafarikpit_ner_september 2025_final.docx

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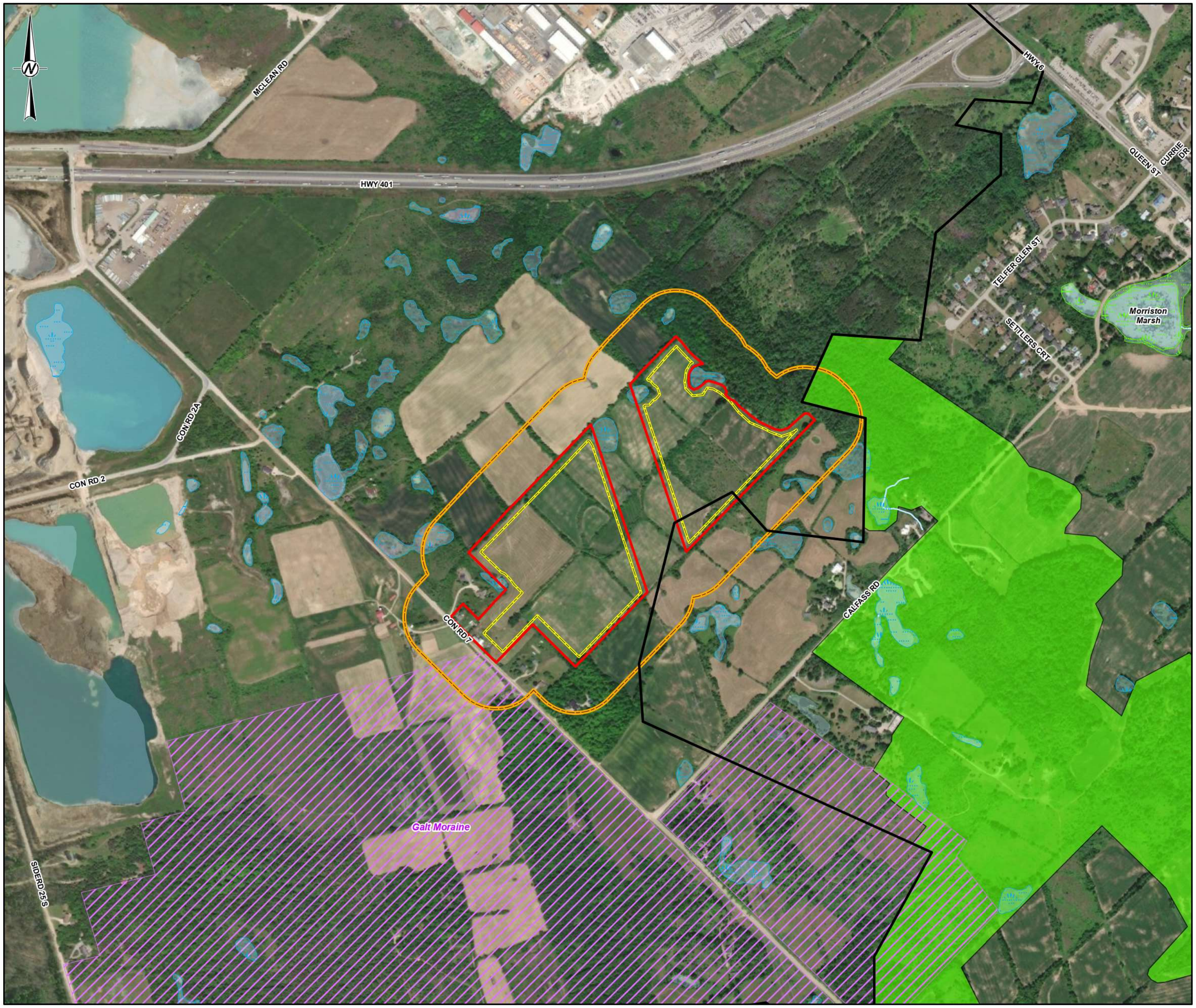
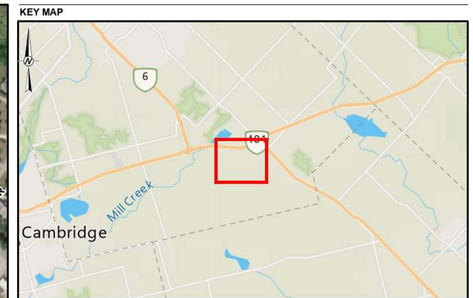
APPENDIX A

Figures





SCALE 1:300,000

LEGEND

- WATERCOURSE
- LICENCE BOUNDARY
- EXTRACTION LIMIT
- 120 m STUDY AREA
- PROVINCIAL: ANSI, EARTH SCIENCE
- WATERBODY
- GREENBELT OUTER BOUNDARY
- GREENBELT PLAN NHS

WETLAND SIGNIFICANCE

- UNEVALUATED WETLAND
- EVALUATED WETLAND (NO SIGNIFICANCE)

0 100 200 400

1:10,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: COMMUNITY: SOURCES: ESRI, TOMTOM, GARMIN, FAO, NOAA, USGS, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY WORLD IMAGERY: MAXAR
3. LICENSE BOUNDARY PROVIDED BY MHBC MARCH 2025
4. EXTRACTION LIMIT PROVIDED BY MHBC JUNE 2025
5. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
SAFARIK PIT

TITLE
STUDY AREA AND DESIGNATED FEATURES

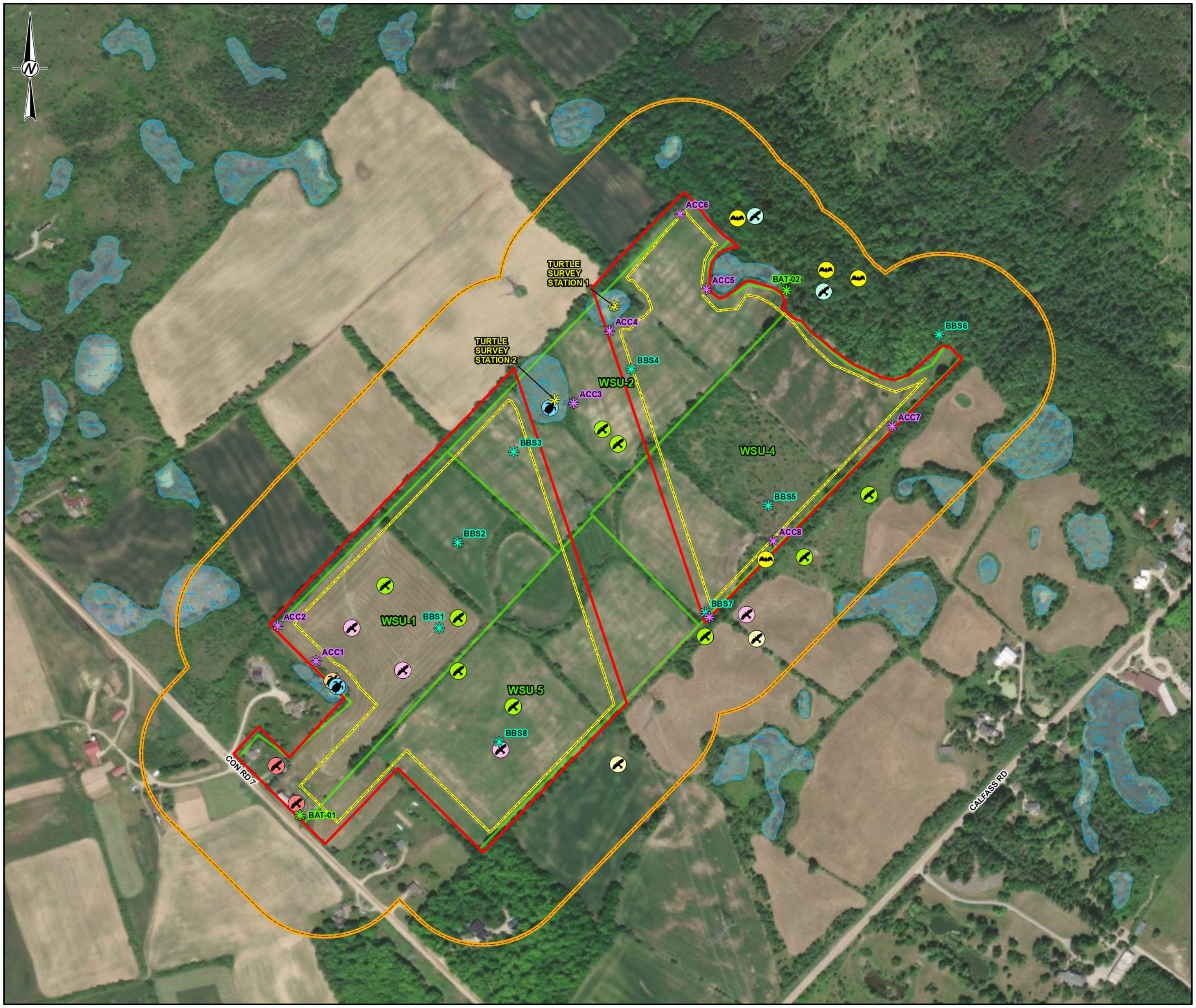
CONSULTANT

YYYY-MM-DD	2025-10-02
DESIGNED	----
PREPARED	SO/MC
REVIEWED	NC
APPROVED	DE

PROJECT NO.	CONTROL	REV.	FIGURE
21476582	0002	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm
0

PATH: S:\Clients\Votorantim_Cimentos\Neubauer_Pit\99_PROJ\21476582_Safarik_Pit_Expansion\40_PROD\0002_Natural_Environment\CA21476582-0002-RB-0000\CA21476582-0002-RB-0000.aprx PRINTED ON: AT: 2:18:14 PM



KEY MAP

SCALE 1:150,000

LEGEND

- AMPHIBIAN CALLING STATION
- BAT DETECTOR LOCATION
- BREEDING BIRD STATION
- TURTLE SURVEY STATION
- WILDLIFE SURVEY UNITS
- UNEVALUATED WETLAND
- LICENCE BOUNDARY
- EXTRACTION LIMIT
- 120 m STUDY AREA

SPECIES AT RISK OBSERVED

- POTENTIAL BAT CAVITY TREE
- BARN SWALLOW NEST (*HIRUNDO RUSTICA*)
- EASTERN WOOD-PEWEE (*CONTOPUS VIRENS*)
- GRASSHOPPER SPARROW (*AMMODRAMUS SAVANNARUM*)
- BOBOLINK (*DOLICHONYX ORYZIVORUS*)
- EASTERN MEADOW LARK (*STURNELLA MAGNA*)
- COMMON SNAPPING TURTLE (*CHELYDRA SERPENTINA*)
- MIDLAND PAINTED TURTLE (*CHRYSEMYS PICTA*)

0 50 100 200
1:5,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
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3. LICENSE BOUNDARY PROVIDED BY MHBC MARCH 2025
4. EXTRACTION LIMIT PROVIDED BY MHBC JUNE 2025
5. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

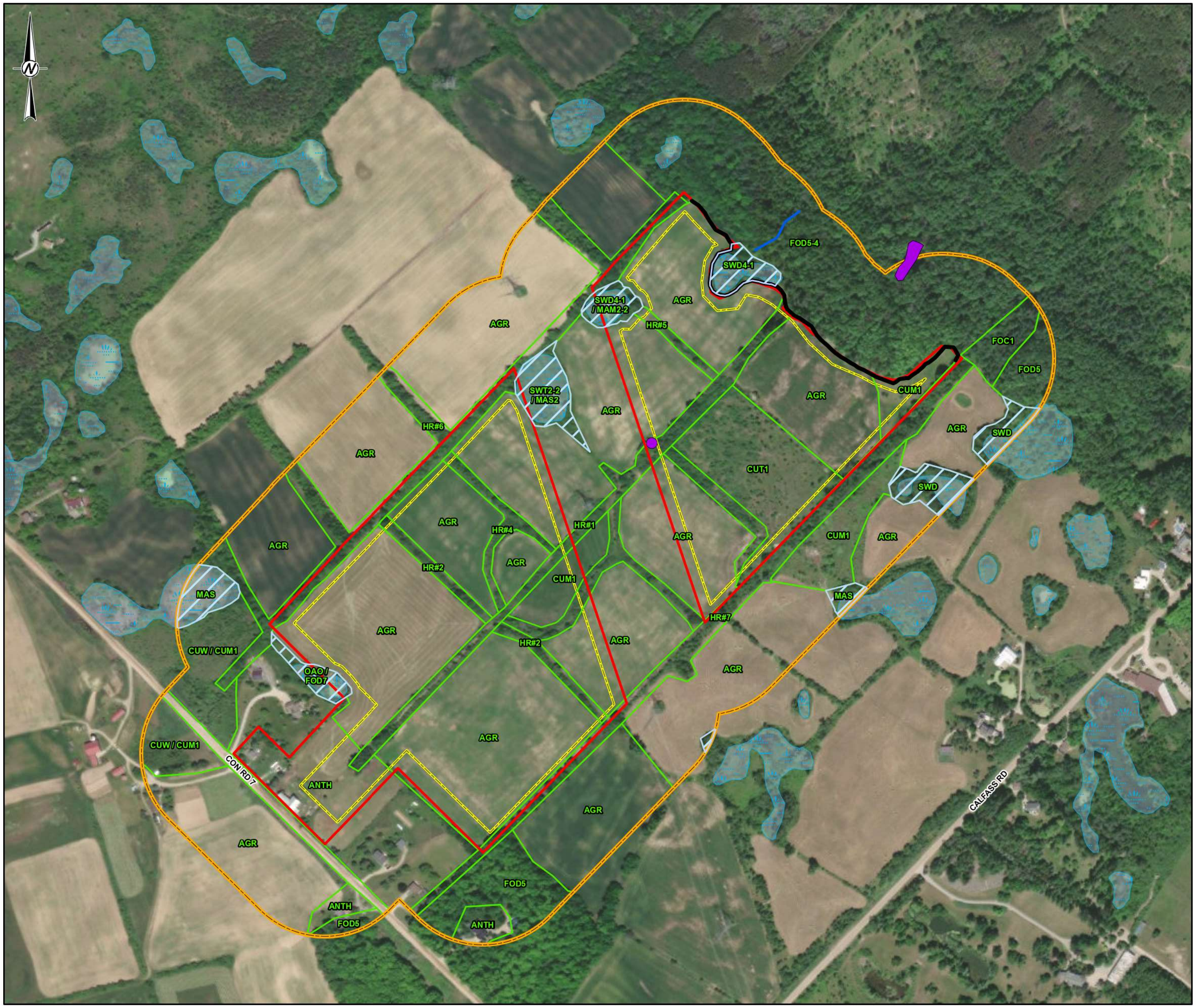
PROJECT
SAFARIK PIT

TITLE
WILDLIFE SURVEY STATIONS AND WILDLIFE SAR SIGHTINGS

CONSULTANT

YYYY-MM-DD	2025-09-25
DESIGNED	----
PREPARED	SO/MC
REVIEWED	NC
APPROVED	DE

PROJECT NO.	CONTROL	REV.	FIGURE
21476582	0002	0	2



KEY MAP

SCALE 1:150,000

LEGEND

- EPHEMERAL POOLING
- STAKED WOODLAND DRIPLINE
- SURFACE DRAINAGE
- ECOLOGICAL LAND CLASSIFICATION
- LICENCE BOUNDARY
- EXTRACTION LIMIT
- 120 m STUDY AREA
- UNEVALUATED WETLAND (LIO, 2025)
- UNEVALUATED WETLANDS – WSP (2022)

ELC COMMUNITIES

ELC Code	ELC Description
AGR	AGR - Agriculture
ANTH	ANTH - Anthropogenic
CUM1	CUM1 - Mineral Cultural Meadow Ecosite
CUT1	CUT1 - Mineral Cultural Thicket Ecosite
CUW / CUM1	CUW / CUM1 - Cutural Woodland / Cutural Meadow
FOC1	FOC1 - Dry – Fresh Pine Coniferous Forest Ecosite
FOD5-4	FOD5-4 - Dry – Fresh Sugar Maple – Ironwood Deciduous Forest
HR	HR - Hedgerow
MAS	MAS - Shallow Marsh
OAO / FOD7	OAO / FOD7 - Open Aquatic / Fresh - Moist Lowland Deciduous Forest Ecosite
SWD	SWD - Deciduous Swamp
SWD4-1	SWD4-1 - Willow Mineral Deciduous Swamp
SWT2-2 / MAS2	SWT2-2 / MAS2 - Willow Mineral Thicket Swamp / Mineral Shallow Marsh Ecosite

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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3. LICENSE BOUNDARY PROVIDED BY MHBC MARCH 2025
4. EXTRACTION LIMIT PROVIDED BY MHBC JUNE 2025
5. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
SAFARIK PIT

TITLE
ECOLOGICAL LAND CLASSIFICATION

CONSULTANT

wsp

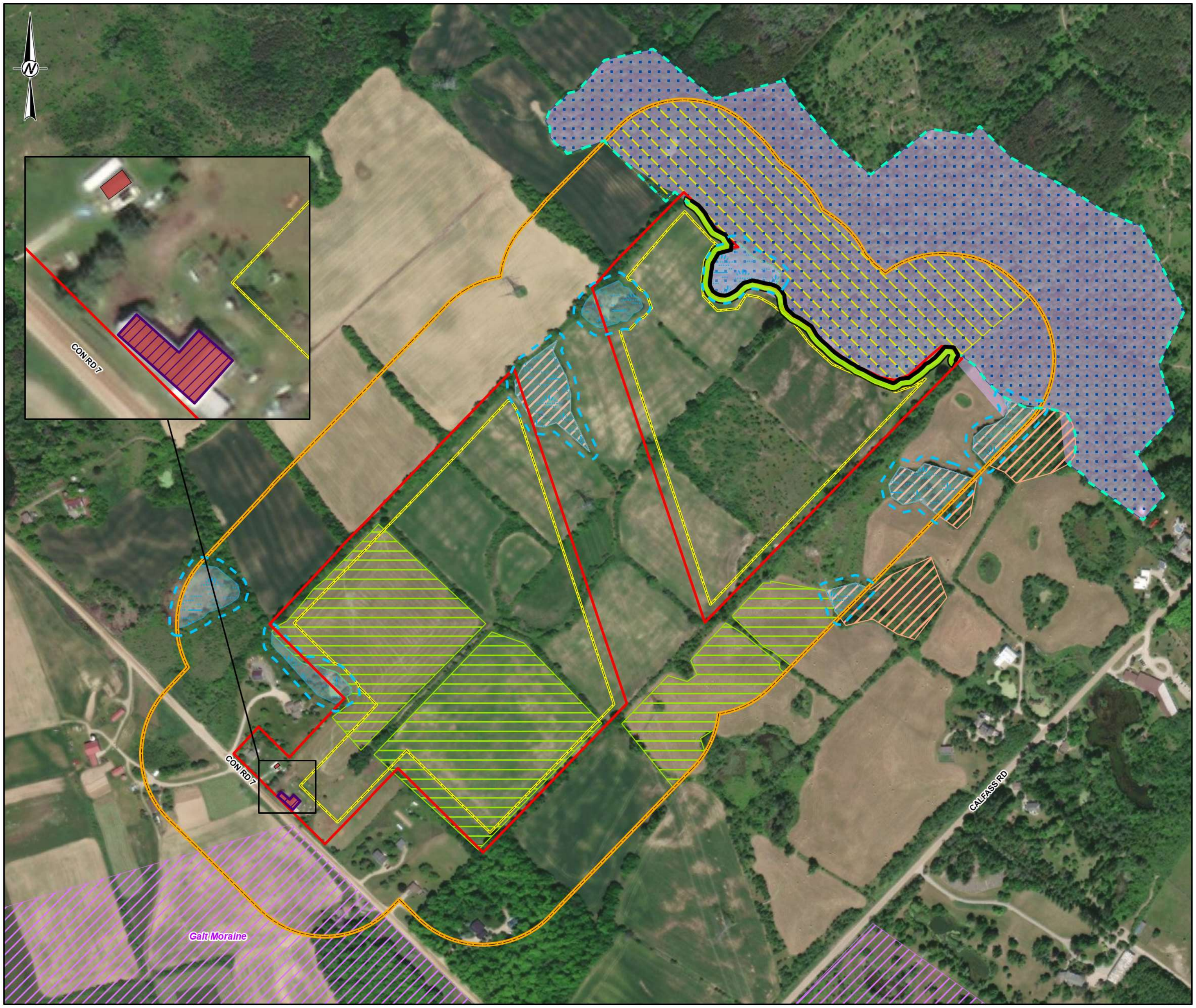
YYYY-MM-DD	2025-09-25
DESIGNED	----
PREPARED	SO/MC
REVIEWED	NC
APPROVED	DE

PROJECT NO.	CONTROL	REV.	FIGURE
21476582	0002	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: S:\Clients\Votorantim_Cimentos\Neubauer_Pit\99_PROJ\21476582_Safarik_Pit_Expansion\40_PROD\0002_Natural_Environment\CA21476582-0002-RB-0000\CA21476582-0002-RB-0000.aprx PRINTED ON: AT: 10:15:43 PM



KEY MAP

SCALE 1:150,000

LEGEND

- STAKED WOODLAND DRIPLINE
- LICENCE BOUNDARY
- EXTRACTION LIMIT
- 120 m STUDY AREA
- 10 m SIGNIFICANT WOODLAND BUFFER
- UNEVALUATED WETLANDS – WSP (2022)
- 10 m BUFFER WETLANDS OUTSIDE OF THE GREENBELT PLAN AREA
- PROVINCIAL: GALT MORAINE ANSI, EARTH SCIENCE
- SIGNIFICANT WOODLAND

SIGNIFICANT WILDLIFE HABITAT

- CONFIRMED AMPHIBIAN BREEDING HABITAT
- CONFIRMED SPECIAL CONCERN AND RARE WILDLIFE SPECIES (BARN SWALLOW)
- CONFIRMED SPECIAL CONCERN AND RARE WILDLIFE SPECIES (EASTERN WOOD-PEWEE)
- CONFIRMED SPECIAL CONCERN AND RARE WILDLIFE SPECIES (GRASSHOPPER SPARROW)
- CONFIRMED SPECIAL CONCERN AND RARE WILDLIFE SPECIES (HAIRY SOLOMON'S SEAL)

SPECIES AT RISK HABITAT

- CONFIRMED EASTERN RED BAT, HOARY BAT, AND SILVER-HAIRED BAT HABITAT
- CONFIRMED EASTERN SMALL-FOOTED MYOTIS & LITTLE BROWN MYOTIS HABITAT

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
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WORLD IMAGERY: TOWN OF OAKVILLE, MAXAR, MICROSOFT
WORLD IMAGERY: TOWN OF OAKVILLE, MAXAR
3. LICENSE BOUNDARY PROVIDED BY MHBC MARCH 2025
4. EXTRACTION LIMIT PROVIDED BY MHBC JUNE 2025
5. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
SAFARIK PIT

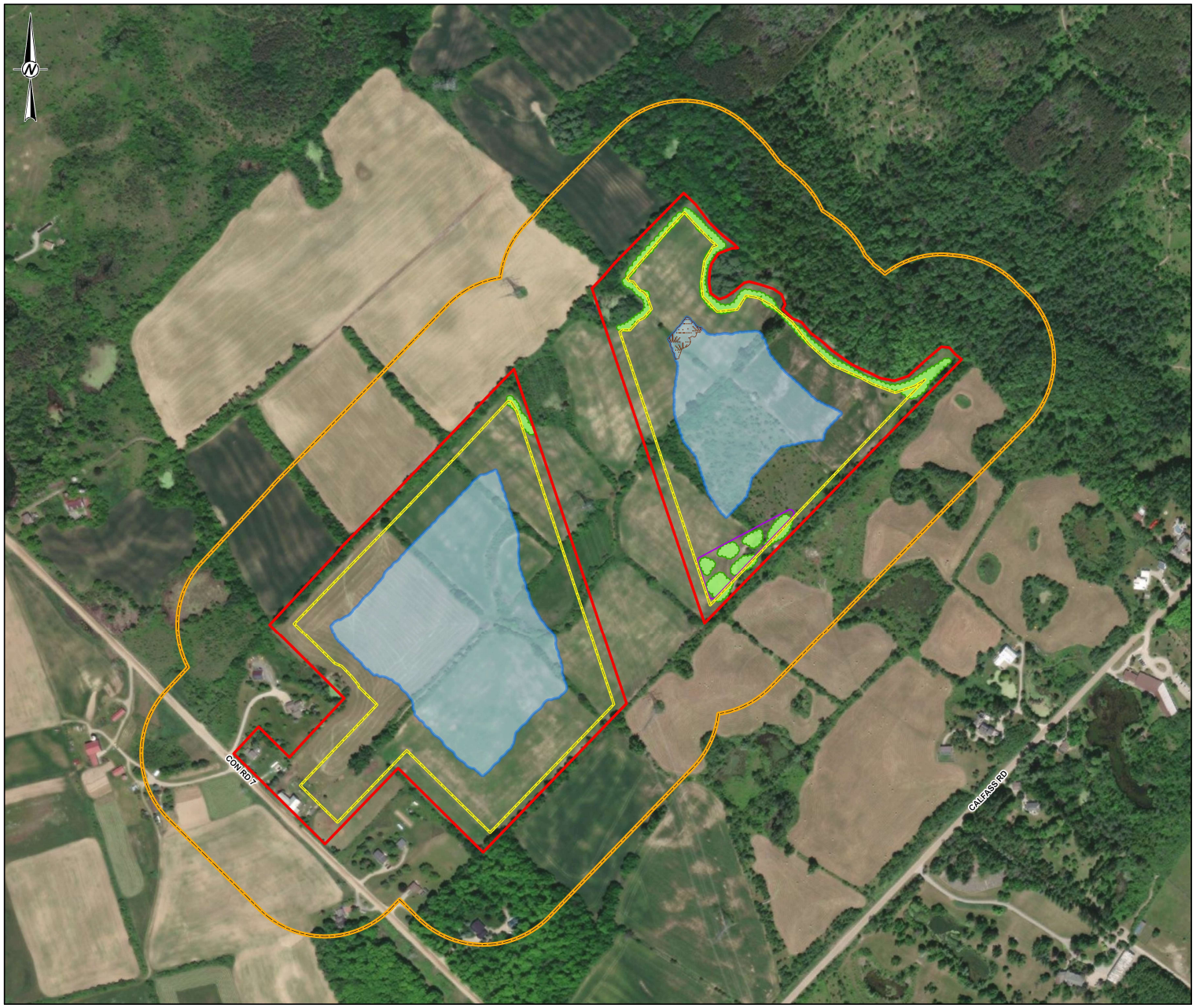
TITLE
CONSTRAINT MAPPING

CONSULTANT

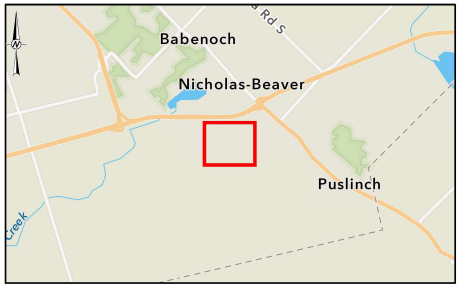
wsp

YYYY-MM-DD	2025-10-02
DESIGNED	----
PREPARED	SO/MC
REVIEWED	NC
APPROVED	DE

PROJECT NO.	CONTROL	REV.	FIGURE
21476582	0002	0	4



KEY MAP



SCALE 1:150,000

LEGEND

- LICENCE BOUNDARY
- EXTRACTION LIMIT
- 120 M STUDY AREA
- POLLINATOR PLOT AREA
- NODAL PLANTING AREA
- PROPOSED WETLAND AREA
- PROPOSED SHORELINE AREA
- POST EXTRACTION POND

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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3. LICENSE BOUNDARY PROVIDED BY MHBC MARCH 2025
4. EXTRACTION LIMIT PROVIDED BY MHBC JUNE 2025
5. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
SAFARIK PIT

TITLE
REHABILIATION PLAN

CONSULTANT

wsp

YYYY-MM-DD	2025-09-26
DESIGNED	----
PREPARED	SO/MC
REVIEWED	GW
APPROVED	DE

PROJECT NO.	CONTROL	REV.	FIGURE
21476582	0002	0	5

APPENDIX B

Plants List

SCIENTIFIC NAME	COMMON NAME	CC[1]	G_RANK[3]	N_RANK[4]	S_RANK[5]	COSEWIC[6]	SARA[7]	SARO[8]	COSSARO Status[9]	NATIVE STATUS[10]	WELLINGTON COUNTY (Frank & Anderson 2009)[11]	Unit 1 - CUT1	Unit 2 - FOD5-4	FOC1	HR general	CUM1 and Pasture A general	SWD4 / Mas general	Unit 4 - SWT2-2 / MAS2	Sorting Column
Acer negundo	Manitoba Maple	0	G5	N5	S5					N					X		X		X
Acer saccharinum	Silver Maple	5	G5	N5	S5					N							X		X
Acer saccharum	Sugar Maple	4	G5	N5	S5					N			x		X				X
Actaea rubra	Red Baneberry	6	G5	N5	S5					N					X				X
Actaea sp.	Baneberry sp.												X						X
Alisma sp.	Water-plantain sp.																	X	X
Alliaria petiolata	Garlic Mustard		GNR	NNA	SNA					I		X	X						X
Anemone virginiana	Tall Anemone	4	G5	N5	S5					N			X						X
Apocynum cannabinum var. canna	Hemp Dogbane	3	G5T5	NNR	S5					N						x			X
Apocynum sp.	Dogbane sp.															X			X
Aquilegia canadensis	Red Columbine	5	G5	N5	S5					N			X						X
Aralia nudicaulis	Wild Sarsaparilla	4	G5	N5	S5					N			X						X
Arctium minus	Common Burdock		GNR	NNA	SNA					I			X			X			X
Arisaema triphyllum	Jack-in-the-pulpit	5	G5	N5	S5					N			X				X		X
Asarum canadense	Canada Wild-ginger	6	G5	N5	S5					N			X						X
Asclepias syriaca	Common Milkweed	0	G5	N5	S5					N						X			X
Athyrium filix-femina	Common Lady Fern	4	G5	N5	S5					N			X						X
Berberis sp.	Barberry sp.												X						X
Bidens cernua	Nodding Beggarticks	2	G5	N5	S5					N								x	X
Bidens frondosa	Devil's Beggarticks	3	G5	N5	S5					N					X				X
Bromus inermis	Smooth Brome		G5T5	NNA	SNA					I		X				X			X
Cardamine concatenata	Cut-leaved Toothwort	6	G5	N5	S5					N			X						X
Carex arctata	Drooping Woodland Sedge	5	G5	N5	S5					N			X						X
Carex blanda	Woodland Sedge	3	G5	N5	S5					N			X						X
Carex communis	Fibrous-root Sedge	6	G5	N5	S5					N			x (cf)						X
Carex cristatella	Crested Sedge	3	G5	N5	S5					N								x	X
Carex intumescens	Bladder Sedge	6	G5	N5	S5					N			x (cf)				X		X
Carex peckii	Peck's Sedge	6	G5	N5	S5					N			X						X
Carex pedunculata	Long-stalked Sedge	5	G5	N5	S5					N			X						X
Carex pensylvanica	Pennsylvania Sedge	5	G5	N5	S5					N			x (cf)						X
Carex rosea	Rosy Sedge	2	G5	N5	S5					N			x (CF)						X
Carex tuckermanii	Tuckerman's Sedge	7	G5	N5	S5					N								x	X
Carya cordiformis	Bitternut Hickory	6	G5	N5	S5					N			X		X				X
Centaurea diffusa	Diffuse Knapweed		GNR	NNA	SNA					I					X				X
Centaurea nigra	Black Knapweed		GNR	NNA	SNA					I					X				X
Cichorium intybus	Wild Chicory		GNR	NNA	SNA					I						X			X
Circaea canadensis	Broad-leaved Enchanter's Nightshade	2	G5	N5	S5					N			X				X		X
Cirsium arvense	Canada Thistle		G5	NNA	SNA					I						X			X
Cornus alternifolia	Alternate-leaved Dogwood	6	G5	N5	S5					N			X						X
Cornus sericea	Red-osier Dogwood	2	G5	N5	S5					N							X	X	X
Cyperus esculentus	Perennial Yellow Flatsedge	1	G5	N5	S5					N								x	X
Dactylis glomerata	Orchard Grass		GNR	NNA	SNA					I		X				X			X
Daucus carota	Wild Carrot		GNR	NNA	SNA					I						X			X
Dryopteris expansa	Spreading Wood Fern	9	G5	N5	S4					N			X						X
Echinochloa muricata	Rough Barnyard Grass	4	G5	N5	S5					N					X				X
Echinocystis lobata	Wild Cucumber	3	G5	N5	S5					N					x			x	X
Echium vulgare	Common Viper's Bugloss		GNR	NNA	SNA					I						X			X
Elaeagnus umbellata	Autumn Olive		GNR	NNA	SNA					I					X				X
Elymus hystrix	Bottlebrush Grass	5	G5	N5	S5					N			X						X
Elymus repens	Quackgrass		GNR	NNA	SNA					I						X			X
Epipactis helleborine	Broad-leaved Helleborine		GNR	NNA	SNA					I			X						X
Equisetum arvense	Field Horsetail	0	G5	N5	S5					N					x				X
Erigeron annuus	Annual Fleabane	0	G5	N5	S5					N						X			X
Erigeron philadelphicus	Philadelphia Fleabane	1	G5	N5	S5					N						X			X

SCIENTIFIC NAME	COMMON NAME	CC[1]	G_RANK[3]	N_RANK[4]	S_RANK[5]	COSEWIC[6]	SARA[7]	SARO[8]	COSSARO Status[9]	NATIVE STATUS[10]	WELLINGTON COUNTY (Frank & Anderson 2009)[11]	Unit 1 - CUT1	Unit 2 - FOD5-4	FOC1	HR general	CUM1 and Pasture A general	SWD4 / Mas general	Unit 4 - SWT2-2 / MAS2	Sorting Column
Erythronium americanum	Yellow Trout-lily	5	G5	N5	S5					N			X						X
Euonymus obovatus	Running Strawberry-bush	6	G5	N4	S4					N			X						X
Eurybia macrophylla	Large-leaved Aster	5	G5	N5	S5					N			x						X
Fagus grandifolia	American Beech	6	G5	N5	S4					N			X						X
Fragaria virginiana	Wild Strawberry	2	G5	N5	S5					N						X			X
Fraxinus pennsylvanica	Red Ash	3	G4	N5	S4					N					X				X
Fraxinus sp.	Ash sp.												X (dead)						X
Galium aparine	Common Bedstraw	4	G5	N5	S5					N								x	X
Geranium robertianum	Herb-Robert	2	G5	N5	S5					I						X			X
Geum canadense	Canada Avens	3	G5	N5	S5					N			X						X
Glechoma hederacea	Ground-ivy		GNR	NNA	SNA					I						X			X
Glyceria maxima	Rough Mannagrass		GNR	NNA	SNA					I								X	X
Hepatica acutiloba	Sharp-lobed Hepatica	8	G5T5	N5	S5					N			X						X
Hydrophyllum virginianum	Virginia Waterleaf	6	G5	N5	S5					N			X						X
Hypericum perforatum	Common St. John's-wort		GNR	NNA	SNA					I		X							X
Ilex verticillata	Common Winterberry	5	G5	N5	S5					N							x		X
Juglans nigra	Black Walnut	5	G5	N4?	S4?					N					X				X
Leersia oryzoides	Rice Cutgrass	3	G5	N5	S5					N			X						X
Lemna minor	Small Duckweed	5	G6	N6	S6					N							X	X	X
Leonurus cardiaca	Common Motherwort		GNR	NNA	SNA					I					X				X
Leucanthemum vulgare	Oxeye Daisy		GNR	NNA	SNA					I						X			X
Lolium arundinaceum	Tall Ryegrass		GNR	NNA	SNA					I						X			X
Lonicera sp.	Honeysuckle sp.											X			X	X			X
Lycopus uniflorus	Northern Water-horehound	5	G5	N5	S5					N								x	X
Maianthemum canadense	Wild Lily-of-the-valley	5	G5	N5	S5					N			X						X
Maianthemum racemosum	Large False Solomon's Seal	4	G5T5	N5	S5					N			X						X
Malus sp.	Apple sp.											X							X
Matteuccia struthiopteris	Ostrich Fern	5	G5	N5	S5					N							X		X
Medicago sativa	Alfalfa		GNR	NNA	SNA					I		X				X			X
Mentha sp.	Mint sp.																	x	X
Nepeta cataria	Catnip		GNR	NNA	SNA					I						X			X
Oenothera sp.	Evening Primrose sp.														X				X
Onoclea sensibilis	Sensitive Fern	4	G5	N5	S5					N							x	x	X
Onopordum acanthium	Scotch Thistle		GNR	NNA	SNA					I						X			X
Ostrya virginiana	Eastern Hop-hornbeam	4	G5	N5	S5					N			X						X
Parthenocissus quinquefolia	Virginia Creeper	6	G5	N4?	S4?					N						X			X
Persicaria sp.	Smartweed sp.																	x	X
Phalaris arundinacea var. arundinac	Reed Canarygrass	0	G5TNR	NNR	S5					N							X	x	X
Phleum pratense	Common Timothy		GNR	NNA	SNA					I						X			X
Pilosella caespitosa	Meadow Hawkweed		GNR	NNA	SNA					I		X							X
Pinus strobus	Eastern White Pine	4	G5	N5	S5					N			X	X	X				X
Plantago lanceolata	English Plantain		G5	NNA	SNA					I						X			X
Plantago major	Common Plantain		G5	NNR	SNA					I						X			X
Plantago rugelii	Rugel's Plantain	1	G5	N5	S5					N								X	X
Poa pratensis	Kentucky Bluegrass	0	G5	N5	S5					I		X				X			X
Polygonatum pubescens	Hairy Solomon's Seal	5	G5	N5	S5					N	R1		X						X
Potentilla recta	Sulphur Cinquefoil		GNR	NNA	SNA					I					X				X
Prunella vulgaris	Common Self-heal	0	G5	N5	S5					N			X		X				X
Prunus serotina	Black Cherry	3	G5	N5	S5					N			X		X				X
Prunus virginiana	Chokecherry	2	G5	N5	S5					N			X		X				X
Ranunculus abortivus	Kidney-leaved Buttercup	2	G5	N5	S5					N			X						X
Ranunculus sceleratus	Cursed Buttercup	2	G5	N5	S5					N								X	X
Ranunculus sp.	Buttercup sp.																X		X
Rhamnus cathartica	European Buckthorn		GNR	NNA	SNA					I		X			X		X		X

SCIENTIFIC NAME	COMMON NAME	CC[1]	G_RANK[3]	N_RANK[4]	S_RANK[5]	COSEWIC[6]	SARA[7]	SARO[8]	COSSARO Status[9]	NATIVE STATUS[10]	WELLINGTON COUNTY (Frank & Anderson 2009)[11]	Unit 1 - CUT1	Unit 2 - FOD5-4	FOC1	HR general	CUM1 and Pasture A general	SWD4 / Mas general	Unit 4 - SWT2-2 / MAS2	Sorting Column
Rhus typhina	Staghorn Sumac	1	G5	N5	S5					N					X				X
Ribes sp.	Gooseberry sp.														X				X
Rubus idaeus	Red Raspberry	2	G5	N5	S5					N					X				X
Rubus occidentalis	Black Raspberry	2	G5	N5	S5					N					X				X
Rumex crispus	Curled Dock		GNR	NNA	SNA					I								X	X
Rumex sp.	Dock sp.															X			X
Salix alba	White Willow		G5	NNA	SNA					I							X		X
Salix amygdaloides	Peach-leaved Willow	6	G5	N5	S5					N								x	X
Salix discolor	Pussy Willow	3	G5	N5	S5					N								x	X
Salix interior	Sandbar Willow	1	G5	N5	S5					N								x	X
Salix sp.	Willow sp.																	X	X
Sambucus canadensis	Common Elderberry	5	G5T5	N5	S5					N								x	X
Sanguinaria canadensis	Bloodroot	5	G5	N5	S5					N			X						X
Schoenoplectus acutus	Hard-stemmed Bulush	5	G5	N5	S5					N							x	x	X
Silene vulgaris	Bladder Campion		GNR	NNA	SNA					I						X			X
Sinapis alba ssp. alba	White Mustard		GNRTNR	NNA	SNA					I						X			X
Sium suave	Common Water-parsnip	4	G5	N5	S5					N							X		X
Solanum dulcamara	Bittersweet Nightshade		GNR	NNA	SNA					I					x		x	x	X
Solidago caesia	Blue-stemmed Goldenrod	5	G5	N5	S5					N			X		X				X
Solidago canadensis	Canada Goldenrod	1	G5	N5	S5					N		X			X				X
Solidago flexicaulis	Zigzag Goldenrod	6	G5	N5	S5					N			X						X
Solidago nemoralis	Grey-stemmed Goldenrod	2	G5	N5	S5					N					X				X
Solidago rugosa	Rough-stemmed Goldenrod	4	G5	N5	S5					N						X			X
Symphyotrichum lanceolatum	Panicled Aster	3	G5	N5	S5					N					X			x	X
Symphyotrichum lateriflorum	Calico Aster	3	G5	N5	S5					N		X							X
Symphyotrichum novae-angliae	New England Aster	2	G5	N5	S5					N						X			X
Symphyotrichum ontarionis	Ontario Aster	6	G5	N5	S5					N			X						X
Symphyotrichum urophyllum	Arrow-leaved Aster	6	G4G5	N4	S4					N		X			X				X
Taraxacum officinale	Common Dandelion		G5	N5	SNA					I		X				X			X
Tilia americana	Basswood	4	G5	N5	S5					N			X		X				X
Tragopogon sp.	Goatsbeard sp.											X							X
Trifolium pratense	Red Clover		GNR	NNA	SNA					I		X							X
Trifolium repens	White Clover		GNR	NNA	SNA					I						X			X
Ulmus americana	White Elm	3	G4	N5	S5					N			X						X
Urtica dioica	Stinging Nettle		G5	NNR	SNA					N							X		X
Verbascum thapsus	Common Mullein		GNR	NNA	SNA					I						X			X
Viola pubescens	Yellow Violet	5	G5	N5	S5					N			X						X
Viola rostrata	Long-spurred Violet	6	G5	N5	S5					N			X						X
Viola sororia	Woolly Blue Violet	4	G5	N5	S5					N					X				X
Vitis riparia	Riverbank Grape	0	G5	N5	S5					N					X				X
Zanthoxylum americanum	Common Prickly-ash	3	G5	N5	S5					N			X		X				X

APPENDIX C

Species at Risk Table

Taxon	Common Name	Scientific Name	G-Rank	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Impacts and Mitigation
Amphibians	Jefferson Salamander	*Ambystoma jeffersonianum*	*G4*	S2	END	END	END	END	In Ontario, Jefferson salamander is found only in southern Ontario, along southern portions of the Niagara Escarpment and western portions of the Oak Ridges Moraine. Jefferson salamander prefers moist, well-drained deciduous and mixed forests with a closed canopy. It overwinters underground in mammal burrows and rock fissures and moves to vernal pools and ephemeral wetlands in the early spring to breed. Breeding ponds are typically located in or near to forested habitats, and contain submerged debris (i.e. sticks, vegetation) for egg attachment sites. Ephemeral breeding pools need to have water until at least mid-summer (mid to late July) (Jefferson Salamander Recovery Team 2010).	**Low/Moderate -** Suitable breeding habitat (i.e. woodland pools) is present on-Site and within the study area; however, no ambystoma egg masses were observed on-Site during field surveys. Suitable habitat is limited to the woodland feature at the northern extent of Site as isolated wetland pockets are fragmented from the contiguous woodland habitat for this species. Targeted Jefferson salamander surveys were not completed; however, this species was not observed during other field surveys and is not known to occur south of Highway 401 in Aberfoyle, based on communication with Dr. J. Bogart of the Recovery Team.	**None -** No impacts are anticipated to this species with the retention of the woodland habitat at the northern extent of site with a 30 m setback from the dripline and the mitigation measures outlined in Section 8 of the NER. No water level impacts are anticipated to wetlands or ephemeral pools within the woodland based on the results of the Water Report (WSP 2025).
Birds	Bank Swallow	*Riparia riparia*	*G5*	S4B	THR	THR	THR	THR	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	**None -** There is no suitable nesting habitat for this species. No individuals were observed during field surveys.	**None -** No suitable habitat is present on-site or within the study area.
Birds	Barn Swallow	*Hirundo rustica*	*G5*	S4B	SC	THR	SC	SC	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	**High -** Adult Barn Swallows were documented nesting within the two non-residence structures located along Concession Road 7 within WSU-1. This species was also documented foraging over open habitat on-Site.	Any structure removal with Barn Swallow nests will be removed outside of the active breeding bird window (April 1 - August 31) to avoid impacts to nesting Barn Swallows. No registration or MECP consultation is required as this species has been downlisted provincially to Special Concern. This species is still considered a species of conservation concern and signficant wildlife implications are discussed within the body of the report.
Birds	Bobolink	*Dolichonyx oryzivorus*	*G5*	S4B	THR	THR	SC	THR	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	**High** - Bobolink were documented with breeding evidence in most pastures (AGR) on-Site, as well as agricultural fields and cultural meadow habitat east of the Site within the Study Area.	Vegetation removal is recommended to be completed outside of the active breeding window (May 1 – July 31) to avoid impacts to nesting birds. Based on the proposed limit of extraction within confirmed habitat for this species, the activity will require registration (for areas of habitat <30 ha) under O.Reg 830/21 to the ESA prior to commencement, including submission of a Notice of Activity Form, preparation of a management plan (including creation or enhancement of habitat), monitoring, and other conditions under O.Reg 830/21.
Birds	Canada Warbler	*Cardellina canadensis*	*G5*	S5B	SC	THR	SC	SC	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	**Low -** The woodland feature at the northern extent of the site and study area may provide suitable nesting habitat for this species. However, this species was not observed during breeding bird or other field surveys.	**None** - This species was not present on-Site or within the Study Area during targeted surveys.
Birds	Chimney Swift	*Chaetura pelagica*	*G4G5*	S3B	THR	THR	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	**Low -** No suitable anthropogenic nesting structures (i.e., open chimneys) are present on-Site or within the Study Area. Tree cavity nesting for this species is limited to large, hollow trees. There is potential for suitable tree cavity nesting within the woodland at the northern extent of Site. Suitable open habitat is present for foraging for this sepecies. No targeted crepuscular surveys were completed; however, no individuals were observed during field surveys.	**None -** No impacts are anticipated to this species with the retention of the woodland habitat at the northern extent of site with a 30 m setback from the dripline and the mitigation measures outlined in Section 8 of the NER.
Birds	Common Nighthawk	*Chordeiles minor*	*G5*	S4B	SC	SC	SC	SC	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bogs, fens, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	**Low -** Suitable open wooded habitat providing natural nesting habitat is not present on-Site. Additionally, no gravel rooftops are present to provide anthropogenic nesting habitat. Suitable open habitat is present for foraging for this sepecies. No targeted crepuscular surveys were completed; however, no individuals were observed during field surveys.	**None -** no impacts are anticipated to this species with vegetation removal occurring outside of the breeding bird window (May 1 – July 31) and the mitigation measures outlined in Section 8 of the NER.
Birds	Eastern Meadowlark	*Sturnella magna*	*G5*	S4B,S3N	THR	THR	THR	THR	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	**High -** Eastern meadowlark were documented calling off-site along agricultural fields to the east, within the Study Area. Based on the overlap in nesting requirements, the habitat identified for Bobolink will also be considered habitat for Eastern Meadowlark.	Vegetation removal is recommended to be completed outside of the active breeding window (April 1 - August 31) to avoid impacts to nesting birds. Based on the proposed limit of extraction within confirmed habitat for this species, the activity will require registration (for areas of habitat <30 ha) under O.Reg 830/21 to the ESA prior to commencement, including submission of a Notice of Activity Form, preparation of a management plan (including creation or enhancement of habitat), monitoring, and other conditions under O.Reg 830/21.

Taxon	Common Name	Scientific Name	G-Rank	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Impacts and Mitigation
Birds	Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	SC	SC	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	**High -** The woodland feature at the northern extent of the site and study area , as well as the woodland associated with a residential property off-site in the southeast extent of the Study Area, may provide suitable habitat for this species. This species was observed in the woodland in WSU-3 at the northern extent of site with probable breeding evidence. No individuals were documented calling within FOD5 at the southeastern extent of the Study Area.	**None -** No impacts are anticipated to this species with the retention of the woodland habitat at the northern extent of site with a 30 m setback from the dripline and the mitigation measures outlined in Section 8 of the NER.
Birds	Golden-winged Warbler	*Vermivora chrysoptera*	G4	S3B	SC	THR	THR		In Ontario, golden-winged warbler breeds in regenerating scrub habitat with dense ground cover and a patchwork of shrubs, usually surrounded by forest. Their preferred habitat is characteristic of a successional landscape associated with natural or anthropogenic disturbance such as rights-of-way, and field edges or openings resulting from logging or burning. The nest of the golden-winged warbler is built on the ground at the base of a shrub or leafy plant, often at the shaded edge of the forest or at the edge of a forest opening (Confer et al. 2011).	**Low -** The thicket in the northeastern portion of the site may provide suitable nesting habitat for this species.However, this species was not observed during breeding bird and field surveys.	**None** - This species was not present on-Site or within the Study Area during targeted surveys.
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	G5	S4B	SC	SC	SC	SC	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g. Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	**High -** Pastures (AGR) on-Site provide suitable habitat for this species on-Site and within the Study Area. This species was observed on-Site in pastures within WSU-1 and WSU-5 with 'possible' and 'probable' breeding evidence, respectively. As such, the pastures with documented individuals are considered confirmed SWH. Although each pasture is larger than the home range for this species (0.3 ha to 1.4 ha)(COSEWIC 2013), the exact centre of defended territory was not determined so each pasture is depicted as SWH on Figure 3. This species was also documented off-Site, within the Study Area, to the east. Suitable open and habitat and agricultural fields are present. As such, it is likely that this species is also utilizing suitable habitat on the property to the east of the Site.	Vegetation removal is recommended to be completed outside of the active breeding window (April 1 - August 31) to avoid impacts to nesting birds. Based on the proposed limit of extraction within confirmed habitat for this species, removal of active pastures that support breeding for this species will require removal. However, there is no anticipated impact on this species based on the ample suitable breeding habitat (e.g., grasslands, agricultural fields) within the immediate landscape.
Birds	Henslow's Sparrow	*Centronyx henslowii*	G4	S1B	END	END	END	END	In Ontario, Henslow's sparrow breeds in large grasslands with low disturbance, such as lightly grazed and ungrazed pastures, fallow hayfields, grassy swales in open farmland, and wet meadows. Preferred habitat contains tall, dense grass cover, typically over 30 cm high, with a high percentage of ground cover, and a thick mat of dead plant material. Henslow's sparrow generally avoids areas with emergent woody shrubs or trees, and fence lines. Areas of standing water or ephemerally wet patches appear to be important. This species breeds more frequently in patches of habitat greater than 30 ha and preferably greater than 100 ha (COSEWIC 2011).	**Low -** Suitable pastures are present on-site and within the study area. However, no individuals were observed during breeding bird or other field surveys.	**None** - This species was not present on-Site or within the Study Area during targeted surveys.
Birds	Least Bittern	*Ixobrychus exilis*	G4	S4B	THR	THR	SC		In Ontario, least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	**None -** The wetland pockets on-site and within the study area are too small to provide suitable nesting habitat for Least Bittern.	**None -** No suitable habitat is present on-site or within the study area.
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	G5	S3	END	END	END	END	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	**Low** - The hedgerows and woodland edges throughout the site and study area may provide suitable nesting habitat. However, no individuals were recorded during breeding bird or other field surveys.	**None -** This species was not present on-Site or within the Study Area during targeted surveys.
Birds	Wood Thrush	*Hylocichla mustelina*	G4	S4B	SC	THR	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	**Low -** The woodland feature at the northern extent of the site and study area may provide suitable nesting habitat for this species. However, no individuals were observed during breeding bird or other field surveys.	**None** - This species was not present on-Site or within the Study Area during targeted surveys.
Insects	Monarch	*Danaus plexippus*	G4	S2N,S4B	SC	END	END	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (Asclepias spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	**Low** - The cultural meadows and edges of agricultural fields throughout the site and study area may provide suitable habitat for this species and its host plant, common milkweed (*Asclepias syriaca*). No Monarch individuals were documented during field surveys. Common milkweed was documented in low abundance along hedgerows and wihtin the cultural meadow community at the northeastern extent of site. However, abundance and range of this plant was limited and would not be sufficient to support large populations of Monarch.	**None** - No impacts to this species are anticipated based on the limited habitat function for this species on-site and the implementation of mitigation measures outlined in Section 8 of the NER. Further, higher quality habitat for this species is abundant within the landscape.
Insects	American Bumble Bee	*Bombus pensylvanicus*	G3G4	S3S4	SC	SC	SC	SC	This bumble bee species is found in open grassland habitats, including agricultural fields and meadows. It builds nests in tufts of grass, old bird nests, rock piles, mammal burrows or cavities of trees (Hatfield et al. 2015).	**Moderate** - Suitable cultural meadow and agricultural fields (pastures) are present on-site and within the study area that may provide suitable foraging habitat for this species. Further, the woodlands may provide suitable nesting habitat. No individuals were observed during field surveys; however, targeted insect surveys were not completed.	**None** - While suitable habitat may present on-site, suitable woodland habitat will be retained, which may provide nesting opportunities for this species. Further, there is ample open foraging habitat (e.g., meadows, agricultural fields) within the landscape. As such, no impacts are anticipated for this species with the mitigation measures outlined in Section 8 of the NER.
Insects	West Virginia White	*Pieris virginiensis*	G4	S3	SC				In Ontario, west Virginia white is found primarily in the central and southern regions of the province. This butterfly lives in moist, mature, deciduous and mixed woodlands, and the caterpillars feed only on the leaves of toothwort (Cardamine spp.), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated. This species is associated with woodlands growing on calcareous bedrock or thin soils over bedrock (Burke 2013).	**Moderate -** The woodland feature at the northern extent of the site and study area may provide suitable habitat for this species based on the composition of the canopy (maple-dominated) and presence of toothwort (*Cardamine spp.*). No individuals were observed during field surveys; however, targeted insect surveys were not completed.	**None -** No impacts are anticipated to this species with the retention of the woodland habitat at the northern extent of site with a 30 m setback from the dripline and the mitigation measures outlined in Section 8 of the NER.

Taxon	Common Name	Scientific Name	G-Rank	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Impacts and Mitigation
Insects	Yellow-banded Bumble Bee	*Bombus terricola*	G3G4	S3S5	SC	SC	SC	SC	Yellow-banded bumblebee is a forage and habitat generalist, occupying open woodlands, meadows, grasslands, farmlands and urban parks, and taking nectar from various flowering plants (COSEWIC 2015). It is an early emerging species, making it likely an important pollinator of early blooming wild flowering plants (e.g. wild blueberry) and agricultural crops (e.g., apple). Nest sites are often in abandoned rodent burrows in old fields and queens overwinter by burrowing into loose soil or rotting trees (COSEWIC 2015).	**Moderate -** Suitable cultural meadow, woodland and agricultural fields (pastures) are present on-site and within the study area that may provide suitable habitat for this species. No individuals were observed during field surveys; however, targeted insect surveys were not completed.	**None -** Although the site and study area may provide suitable habitat for this species, there is ample open field and woodland habitat (e.g., cultural meadow, open woodlands, agricultural fields) within the landscape. As such, no impacts are anticipated for this species with the mitigation measures outlined in Section 8 of the NER.
Mammals	Eastern Red Bat	*Lasiurus borealis*	G3G4	S2S3	END		END	END	Eastern Red Bats occupy a wide diversity of habitats across their geographic range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. Male Eastern Red Bats in particular have been observed to use saplings as roosts, which is rarely reported for reproductive females. They forage in both forested and non-forested habitats. Heavily disturbed habitats are generally avoided. Eastern Red Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	**High -** The woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures; however, this species is not known to roost in anthropogenic structures and this likely represents foraging individuals that may be roosting off-site (i.e., FOD5 in the southeast extent of the study area). This species was also documented in low numbers within the woodland feature at the northern extent of the site; however, it is likely a portion of the undifferentiated high frequency calls belong to Eastern Red Bat. Woodland and open habitat on-site and within the study area likely provide foraging opportunities for this species.	All suitable woodland habitat will be retained on-Site and within the Study Area, with a minimum 10 m setback from the dripline to avoid direct impacts to SAR bats. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - November 30). No impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Mammals	Eastern Small-footed Myotis	*Myotis leibii*	G4	S2S3	END			END	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	**High -** The anthropogenic structures along Concession Road 7 may provide suitable roosting habitat for this species. This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures and it is likely that there is a maternity roost for this species associated with the anthropogenic structures. Open habitat on-site and within the study area likely provides foraging habitat for this species.	The large barn structure providing potential roosting habitat for this species will be retained within the property setback and located outside of the extraction area. As such, no impacts are anticipated to roosting habitat for this species. Further, no impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Mammals	Little Brown Myotis	*Myotis lucifugus*	G3G4	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	**High -** The anthropogenic structures along Concession Road 7 and the woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures and it is likely that this species is utilizing these structures for roosting. No individuals were documented within the woodland feature at the northern extent of the site and study area during acoustic monitoring. As such, it is unlikely that this species is using this wooded habitat. No acoustic monitoring was completed in woodland features off-site along the southern extent of the study area. As such, it is possible that these woodlands provide roosting habitat for this species. Woodland and open habitat on-site and within the study area likely provides foraging habitat for this species.	The large barn structure providing potential roosting habitat for this species will be retained within the property setback and located outside of the extraction area. As such, no impacts are anticipated to roosting habitat for this species. All contiguous, woodland habitat is being retained at the northern and southeastern extent of the Study Area, with a setback from the proposed extraction area. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - September 30). Further, no impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Mammals	Northern Hoary Bat	*Lasiurus cinereus*	G3G4	S2S3	END		END	END	Hoary Bats occupy a wide diversity of habitats across their geographic range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. They forage in the open, and suitable habitats may include wetlands, grasslands and open fields with patchily distributed trees. Heavily disturbed habitats are generally avoided. Hoary Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	**High -** The woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures; however, this species is not known to roost in anthropogenic structures and this likely represents foraging individuals that may be roosting off-site (i.e., FOD5 in the southeast extent of the study area). This species was also documented within the woodland feature at the northern extent of the site and it is likely that there is a roost in the vicinity of BAT-02 Open habitat on-site and within the study area likely provide foraging opportunities for this species.	All suitable woodland habitat will be retained on-Site and within the Study Area, with a minimum 10 m setback from the dripline to avoid direct impacts to SAR bats. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - November 30). No impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Mammals	Northern Myotis	*Myotis septentrionalis*	G2G3	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	**Low-** The anthropogenic structures along Concession Road 7 and the woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was not documented during acoustic monitoring on-site in the vicinity of suitable habitat. As such, it is unlikely that this species is using suitable habitat on-site for roosting. No acoustic monitoring was completed in woodland features off-site along the southern extent of the study area. As such, it is possible that these woodlands provide roosting habitat for this species.	**None -** Although this species was not documented during acoustic monitoring, all suitable woodland habitat will be retained on-Site and within the Study Area, with a minimum 10 m setback from the dripline to avoid direct impacts to SAR bats. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - September 30). No impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.

Taxon	Common Name	Scientific Name	G-Rank	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area	Potential Impacts and Mitigation
Mammals	Silver-haired Bat	*Lasionycteris noctivagans*	G3G4	S2S3	END		END	END	Silver-haired Bats occupy a wide diversity of habitats across their geographic range. They roost in a variety of large diameter coniferous and deciduous trees. Roosting occurs primarily under bark and in the cavities of trees, and occasionally buildings. They forage in young and old forest, as well as forest openings (canopy gaps), but are concentrated along forest edges and intact forest. Silver-haired Bats overwinter in the United States, southeastern British Columbia and sometimes the Great Lakes region. In British Columbia, they have been documented hibernating in mines, rock crevices, trees, and snags. Little else is known about their winter ecology.	**High -** The woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was documented during acoustic monitoring in the vicinity of the anthropogenic structures; however, this species is not known to roost in anthropogenic structures and this likely represents foraging individuals that may be roosting off-site (i.e., FOD5 in the southeast extent of the study area). This species was also documented within the woodland feature at the northern extent of the site and it is likely that there is a roost in the vicinity of BAT-02 Open woodlands and woodland edges on-site and within the study area likely provide foraging opportunities for this species.	All suitable woodland habitat will be retained on-Site and within the Study Area, with a minimum 10 m setback from the dripline to avoid direct impacts to SAR bats. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - November 30). No impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Mammals	Tricolored Bat	*Perimyotis subflavus*	G3G4	S3?	END	END	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	**Low -** The anthropogenic structures along Concession Road 7 and the woodland features at the northern (FOD5-4; SWD4-1; FOC1) and southern (CUW; FOD5) extent of the site and study area may provide suitable roosting habitat. This species was not documented during acoustic monitoring on-site in the vicinity of suitable habitat. As such, it is unlikely that this species is using suitable habitat on-site for roosting. No acoustic monitoring was completed in woodland features off-site along the southern extent of the study area. As such, it is possible that these woodlands provide roosting habitat for this species.	**None -** Although this species was not documented during acoustic monitoring, all suitable woodland habitat will be retained on-Site and within the Study Area, with a minimum 10 m setback from the dripline to avoid direct impacts to SAR bats. All isolated tree / hedgerow removal will occur outside of the active window for this species (April 1 - September 30). No impacts to foraging habitat is anticipated based on the transition from agriculture to an aggregate pond during extraction. Foraging conditions will likely improve post-rehabilitation.
Reptiles	Blanding's Turtle	*Emydoidea blandingii*	G4	S3	THR	END	END	THR	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	**None -** Although suitable wetland ecosites are present on-site and within the study area, it is likely that these wetlands are too small, fragmented, and disturbed to support Blanding's turtle. No individuals were documented during turtle visual encounter or other surveys.	**None** - This species was not present on-Site or within the Study Area during targeted surveys.
Reptiles	Eastern Ribbonsnake	*Thamnophis saurita*	G5	S4	SC	SC	SC	SC	In Ontario, eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds (COSEWIC 2012).	**Low -** Although suitable wetland ecosites are present on-site and within the study area, it is likely that these wetlands are too small, fragmented, and disturbed to support eastern ribbonsnake. Although no targeted snake surveys were completed, this species was not documented on-site during field surveys.	Although it is highly unlikely that the wetland on-site are suitable for eastern ribbonsnake, all wetlands will be retained on-site with a 10 m setback. As such, no impacts are anticipated for this species with the mitigation measures outlined in Section 8 of the NER.
Reptiles	Northern Map Turtle	*Graptemys geographica*	G5	S3	SC	SC	SC	SC	In Ontario, northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	**None** - There are no large waterbodies on the site or within the study area. No individuals were observed during field surveys.	**None** - This species and suitable habitat was not present on-Site or within the Study Area during targeted surveys.
Reptiles	Snapping Turtle	*Chelydra serpentina*	G4G5	S4	SC	SC	SC		In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	**High -** The wetlands on-site and throughout the study area may provide suitable aquatic habitat for this species. One potential snapping turtle was also documented in the pond adjacent to the pasture and residence; however, identification could not be confirmed due to the individual submerging and not resurfacing. However, this pond feature represents a highly degraded feature frequented by cattle and exhibiting signs of contamination from the surrounding agricultural land-use. As isolated wetlands are not under-represented in the landscape and the pond is unlikely to support large populations of snapping turtle.	This species was not documented during targeted surveys in the wetlands along the hydro corridor at the northern extent of the site. One individual was documented within the degraded pond along the residence; however, this feature will be retained with a 10 m setback.
Vascular Plants	American Chestnut	*Castanea dentata*	G3	S1S2	END	END	END	END	In Ontario, American chestnut occurs in mixed or deciduous forests in the Carolinian zone (Farrar 1995). It is often found in communities with dense canopy cover and often associated with oak and maple. This tree grows primarily on acidic, sand or gravel soils (Boland et al. 2012).	**None -** Although the forest in the northeastern portion of the site and study area may provide suitable habitat for this species, there are no known individuals in the vicinity of the study area (Boland et al. 2012). No individuals were observed during botanical surveys.	**None** - This species and suitable habitat was not present on-Site during botanical surveys.
Vascular Plants	Butternut	*Juglans cinerea*	G3	S2?	END	END	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	**None -** Hedgerows throughout the site and study area, as well as the forest edge in the northeastern portion of the site and study area may provide suitable habitat for this species. No individuals were observed during botanical surveys.	**None** - This species and suitable habitat was not present on-Site during botanical surveys.
Vascular Plants	Hill's Pondweed	*Potamogeton hillii*	G3	S2S3	SC	SC	SC	SC	In Ontario, Hill's pondweed grows in the muddy substrates of cold, clear, slow-moving, calcareous streams, ditches, and ponds. It is found in water up to 1 m in depth. Often found near flow obstructions including the upstream side of road culverts, among stumps and fallen trees, or in shallow water among rushes and sedges (Parks Canada Agency 2014).	**Low -** Although the wetlands in the northern portion of the site and throughout the study area may provide suitable aquatic habitat for this species, there are no known individuals in the vicinity of the study area (Parks Canada Agency 2014). No individuals were observed during botanical surveys.	**None** - This species and suitable habitat was not present on-Site during botanical surveys.

[1] Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA

[2] *Endangered Species Act* (ESA), 2007. General (O.Reg 242/08 last amended 1 April 2021 as O. Reg 228/21). Species at Risk in Ontario List (O.Reg 230/08 last amended 25 January 2023 asO. Reg. 9/23); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

[3] *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 3 February 2023); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[4] Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

[5] Committee on the Status of Species at Risk in Ontario (COSSARO)

APPENDIX D

Anuran Data

Table 4. Anuran Call Count Survey Results for the Proposed Neubauer Pit Expansion Study Area

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
ACC-1	Pond adjacent to residential and agricultural features. Little to no aquatic veg, lots of deadfall and basking features	1	1	21:37 – 21:40 10°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	2 – 6	1 – 2
			2	22:47 – 22:50 17°C Sky Code[3] – 0 Wind Code[4] – 1 Relative Humidity – 75%	1 – 3	–	–	1 – 4	–	1 – **1**	–
			3	23:04 – 23:07 15°C Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 86%	1 – 4	–	–	–	–	–	–
ACC-2	Mapped marsh north of residential lot, western extent of the site.	1	1	21:31 – 21:34 10°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	3	1 – 5
			2	22:38 – 22:41 17°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 75%	–	–	–	–	–	1 – 5	–
			3	22:58 – 23:01 15°C Sky Code[3] – 6	–	–	–	1 – 5	–	–	–

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
				Wind Code[4] – 1 Relative Humidity – 86%							
ACC-3	Flooded thicket swamp, bordered by agricultural fields	2	1	21:15 – 21:18 10°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	3	3
			2	22:22 – 22:25 17°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 75%	1 – 2	–	–	1 – 7	–	1 – 7	–
			3	22:41 – 22:44 15°C Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 86%	–	–	–	2 – 11	–	–	–
ACC-4	Pond surrounded by deciduous trees and bordered by agricultural fields	2	1	21:09 – 21:12 11°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	2 – 10	2 – 15
			2	22:09 – 22:12 17°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 75%	1-2	–	–	2-10	–	–	–
			3	22:33 – 22:37 15°C Sky Code[3] – 6	–	–	–	1 – 2	–	–	–

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
				Wind Code[4] – 1 Relative Humidity – 87%							
ACC-5	Deciduous swamp at edge of woodland at north/east extent of site	3	1	20:56 – 20:59 12°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	2 – 15	2 – 8
			2	21:52 – 21:55 20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%	–	–	–	1 – 2	–	1 – 2	–
			3	22:17 – 22:20 15°C Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 87%	–	–	–	–	–	–	–
ACC-6	Unevaluated wetland pocket within woodland at northern extent of Study Area	3 (targeted feature north of the site, within the study area	1	21:02 – 21:05 11°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	3	2 – 10
			2	22:00 – 22:03 20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%	–	–	–	2 – 10	–	1 – 6	–
			3	22:25 – 22:28 15°C	–	–	–	–	–	–	–

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
				Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 87%							
ACC-7	Two mapped wetlands southeast of the site within the study area, not visible	4	1	20:45 – 20:48 11°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	3	2 – 10
			2	21:27 – 21:30 20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%	–	–	–	3	–	1 – 7	–
			3	21:51 – 21:54 16°C Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 78%	–	–	–	–	–	–	–
ACC-8	Mapped wetland in study area, south of the site, not visible	4	1	20:36 – 20:39 13°C Sky Code[3] – 2 Wind Code[4] – 1 Relative Humidity – 80%	–	–	–	–	–	3	1 – 5
			2	21:15 – 21:18 20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%	–	–	–	1 – 6	–	2 – 15	–

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
			3	21:40 – 21:43 16°C Sky Code[3] – 6 Wind Code[4] – 1 Relative Humidity – 77%	–	–	–	3	–	–	–
ACC-9	Mapped wetland immediately east of study area	4	1	20:30 – 20:33 13°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 44%	–	–	–	–	–	3	1 – 3
			2	21:05 – 21:08 21°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 73%	–	–	–	1 – 1	–	3	–
			3	21:30 – 21:33 16°C Sky Code[3] – 8 Wind Code[4] – 1 Relative Humidity – 77%	–	–	–	–	–	–	–
ACC-10			1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			2	21:40 – 21:43 20°C Sky Code[3] – 1 Wind Code[4] – 1 Relative Humidity – 64%	–	–	–	–	–	–	–
			3	22:04 – 22:07 16°C Sky Code[3] – 8 Wind Code[4] – 1	–	–	–	–	–	–	–

Survey Station	Habitat	Wildlife Survey Unit	Survey #	Time of Survey and Weather Conditions	Species[1], Call Code[2], and Abundance						
					AMTO	BULL	GRFR	GRTR	NLFR	SPPE	WOFR
				Relative Humidity – 78%							

[1] Species: AMTO – American Toad; BULL – Bullfrog; GRFR – Green Frog; GRTR – Gray treefrog; SPPE – Spring Peeper; WOFR – Wood Frog
[2] Call Code: 1 – Individuals can be counted; calls not simultaneous; 2 – Calls distinguishable; some calling simultaneously; 3 – Full chorus; calls continuous and overlapping; abundance can not be estimated for this code.
[3] Beaufort Sky Code: 0 – clear (no cloud cover); 1 – partly cloudy (scattered or broken) or variable; 2 – cloudy or overcast; 6 – rain; 8 – showers
[4] Beaufort Wind Code: 1 – Light air movement, smoke drifts (3-5 km/h)

APPENDIX E

BBS and Wildlife List

Taxon	Common Name	Scientific Name	G-rank[1]	S-rank[2]	COSSARO Status[3]	ESA Status[4]	COSEWIC Status[5]	SARA Status[6]	SARA Schedule[6]	Wellington County[7]	Area Sensitive Birds - Ecoregion 6E[8]	WSU-1	WSU-2	WSU-3	WSU-4	WSU-5
Amphibians	American Toad	*Anaxyrus americanus*	G5	S5								X	X	X		
Amphibians	Gray Treefrog	*Dryophytes versicolor*	G5	S5								X	X	X	X	
Amphibians	Green Frog	*Lithobates clamitans*	G5	S5												
Amphibians	Northern Leopard Frog	*Lithobates pipiens*	G5	S5		NAR	NAR					X				
Amphibians	Spring Peeper	*Pseudacris crucifer*	G5	S5								X	X	X	X	
Amphibians	Wood Frog	*Lithobates sylvaticus*	G5	S5								X				
Birds	American Goldfinch	*Spinus tristis*	G5	S5						3		X				
Birds	American Redstart	*Setophaga ruticilla*	G5	S5B						2		X				
Birds	American Robin	*Turdus migratorius*	G5	S5								X				
Birds	Baltimore Oriole	*Icterus galbula*	G5	S4B								X				
Birds	Barn Swallow	*Hirundo rustica*	G5	S4B	SC	SC	SC	THR	1	3++		X				
Birds	Blue Jay	*Cyanocitta cristata*	G5	S5								X				
Birds	Bobolink	*Dolichonyx oryzivorus*	G5	S4B	THR	THR	SC	THR	1	2++		X				
Birds	Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B						3		X				
Birds	Eastern Towhee	*Pipilo erythrophthalmus*	G5	S4B,S3N						2		X				
Birds	Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	SC	SC	1			X		X		
Birds	Field Sparrow	*Spizella pusilla*	G5	S4B,S3N						3		X				
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	G5	S4B	SC	SC	SC	SC	1	3	X					X
Birds	Gray Catbird	*Dumetella carolinensis*	G5	S5B,S3N						4		X				
Birds	Great Crested Flycatcher	*Myiarchus crinitus*	G5	S5B										X		
Birds	Hairy Woodpecker	*Dryobates villosus*	G5	S5								X				
Birds	Horned Lark	*Eremophila alpestris*	G5	S4						3		X				
Birds	House Sparrow	*Passer domesticus*	G5	SNA								X				
Birds	Killdeer	*Charadrius vociferus*	G5	S4B								X				
Birds	Mallard	*Anas platyrhynchos*	G5	S5								X				
Birds	Mourning Dove	*Zenaida macroura*	G5	S5												
Birds	Northern Flicker	*Colaptes auratus*	G5	S5								X				
Birds	Red-bellied Woodpecker	*Melanerpes carolinus*	G5	S5						3		X				
Birds	Red-eyed Vireo	*Vireo olivaceus*	G5	S5B								X				
Birds	Red-tailed Hawk	*Buteo jamaicensis*	G5	S5		NAR	NAR					X				
Birds	Red-winged Blackbird	*Agelaius phoeniceus*	G5	S5								X				
Birds	Rock Pigeon	*Columba livia*	G5	SNA								X				
Birds	Song Sparrow	*Melospiza melodia*	G5	S5								X				
Birds	Yellow Warbler	*Setophaga petechia*	G5	S5B								X				
Insects	Canadian Tiger Swallowtail	*Papilio canadensis*	G5	S5												
Insects	Widow Skimmer	*Libellula luctuosa*	G5	S5										X		
Mammals	Big Brown Bat	*Eptesicus fuscus*	G5	S4								X		X		
Mammals	Coyote	*Canis latrans*	G5	S5										X		
Mammals	Eastern Chipmunk	*Tamias striatus*	G5	S5										X		
Mammals	Eastern Gray Squirrel	*Sciurus carolinensis*	G5	S5										X		
Mammals	Northern Hoary Bat	*Lasiurus cinereus*	G3G4	S2S3	END	END	END					X		X		
Mammals	Little Brown Myotis	*Myotis lucifugus*	G3G4	S3	END	END	END	END	1			X				
Mammals	Northern Raccoon	*Procyon lotor*	G5	S5								X				
Mammals	Eastern Red Bat	*Lasiurus borealis*	G3G4	S2S3	END	END	END					X				
Mammals	Silver-haired Bat	*Lasionycteris noctivagans*	G3G4	S2S3	END	END	END					X		X		
Mammals	Eastern Small-footed Myotis	*Myotis leibii*	G4	S2S3	END	END						X				
Mammals	White-tailed Deer	*Odocoileus virginianus*	G5	S5								X			X	X
Reptiles	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	G5T5	S5												
Reptiles	Midland Painted Turtle	*Chrysemys picta marginata*	G5T5	S4			SC	SC	1			X				
Reptiles	Snapping Turtle	*Chelydra serpentina*	G5	S4		SC	SC	SC	1			X				
Insects	Meadowhawk sp.	*Sympetrum sp.*												X		

Common Name	Scientific Name	G-rank[1]	S-rank[2]	COSSARO Status[3]	ESA Status[4]	COSEWIC Status[5]	SARA Status[6]	Wellington County[7]	MNR Area Sensitive[8]	Area Sensitive Birds - Ecoregion 6E[8]	Protected Under MBCA	WSU-1 Highest Abundance	WSU-1 Highest Breeding Evidence	WSU-2 Highest Abundance	WSU-2 Highest Breeding Evidence	WSU-3 Highest Abundance	WSU-3 Highest Breeding Evidence	WSU-4 Highest Abundance	WSU-4 Highest Breeding Evidence	WSU-5 Highest Abundance	WSU-5 Highest Breeding Evidence
American Crow	*Corvus brachyrhynchos*	G5	S5									-	-	-	-	2	PROB	2	POSS	-	-
American Goldfinch	*Spinus tristis*	G5	S5					3			✓	1	POSS	1	POSS	2	PROB	2	PROB	1	OBS
American Redstart	*Setophaga ruticilla*	G5	S5B					2	X		✓	-		3	POSS	-	-	1	POSS	-	
American Robin	*Turdus migratonius*	G5	S5								✓	2	POSS	5	PROB	1	PROB	2	POSS	2	PROB
Baltimore Oriole	*Icterus galbula*	G5	S4B								✓	1	POSS	2	POSS	1	POSS	1	POSS	1	POSS
Barn Swallow	*Hirundo rustica*	G5	S4B	SC	SC	SC	THR	3++			✓	5	CONF	4	OBS	-	-	-	-	-	-
Black-capped Chickadee	*Poecile atricapillus*	G5	S5					4			✓	1	POSS	-	-	2	PROB	2	POSS	-	-
Blue Jay	*Cyanocitta cristata*	G5	S5									-	-	-	-	4	PROB	1	PROB	1	POSS
Bobolink	*Dolichonyx oryzivorus*	G5	S4B	THR	THR	SC	THR	2++			✓	5	POSS	1	POSS	-	-	3	PROB	2	PROB
Brown Thrasher	*Toxostoma rufum*	G5	S4B					1			✓	1	OBS	1	POSS	-	-	1	POSS	1	PROB
Brown-headed Cowbird	*Molothrus ater*	G5	S5									1	POSS	1	POSS	1	POSS	3	POSS	-	-
Canada Goose	*Branta canadensis*	G5	S5								✓	-	-	3	OBS	-	-	-	-	-	-
Cedar Waxwing	*Bombycilla cedrorum*	G5	S5								✓	2	POSS	2	PROB	2	POSS	2	PROB	-	-
Chipping Sparrow	*Spizella passerina*	G5	S5B,S3N								✓	1	PROB	-	-	-	-	-	-	-	-
Common Grackle	*Quiscalus quiscula*	G5	S5									2	POSS	3	POSS	-	-	-	-	-	-
Eastern Bluebird	*Sialia sialis*	G5	S5B,S4N		NAR	NAR		1			✓	-	-	-	-	-	-	1	POSS	1	POSS
Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B					3			✓	1	POSS	1	POSS	-	-	1	POSS	-	-
Eastern Meadowlark	*Stumella magna*	G5	S4B,S3N	THR	THR	THR	THR	2++			✓	-	-	-	-	-	-	2	POSS	4	PROB
Eastern Towhee	*Pipilo erythrophthalmus*	G5	S4B,S3N					2			✓	-	-	-	-	-	-	2	PROB	-	-
Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	SC	SC				✓	-	-	-	-	2	PROB	-	-	-	-
European Starling	*Stumus vulgaris*	G5	SNA									8	PROB	4	POSS	-	-	84	POSS	80	PROB
Field Sparrow	*Spizella pusilla*	G5	S4B,S3N					3			✓	1	POSS	-	-	1	POSS	3	CONF	2	PROB
Grasshopper Sparrow	*Ammodramus savannarum*	G5	S4B	SC	SC	SC	SC	3	X	X	✓	2	POSS	-	-	-	-	1	POSS	2	PROB
Gray Catbird	*Dumetella carolinensis*	G5	S5B,S3N					4			✓	1	POSS	2	PROB	-	-	3	PROB	2	POSS
Great Crested Flycatcher	*Myiarchus crinitus*	G5	S5B								✓	-	-	-	-	-	-	-	-	2	POSS
House Finch	*Haemorhous mexicanus*	G5	SNA								✓	1	POSS	-	-	-	-	-	-	-	-
House Sparrow	*Passer domesticus*	G5	SNA									2	POSS	-	-	-	-	-	-	-	-
House Wren	*Troglodytes aedon*	G5	S5B								✓	1	PROB	-	-	-	-	-	-	1	PROB
Indigo Bunting	*Passerina cyanea*	G5	S5B								✓	-	-	2	PROB	1	PROB	-	-	-	-
Killdeer	*Charadrius vociferus*	G5	S4B								✓	3	PROB	-	-	-	-	-	-	1	POSS
Mallard	*Anas platyrhynchos*	G5	S5								✓	-	-	2	OBS	-	-	-	-	-	-
Mourning Dove	*Zenaida macroura*	G5	S5								✓	1	POSS	-	-	-	-	-	-	-	-
Northern Cardinal	*Cardinalis cardinalis*	G5	S5								✓	2	PROB	2	PROB	1	POSS	2	PROB	1	PROB
Northern Flicker	*Colaptes auratus*	G5	S5								✓	-	-	-	-	1	POSS	-	-	-	-
Orchard Oriole	*Icterus spurius*	G5	S4B					4			✓	-	-	1	POSS	-	-	2	PROB	-	-
Pine Warbler	*Setophaga pinus*	G5	S5B,S3N					3	X		✓	-	-	-	-	1	POSS	-	-	-	-
Red-bellied Woodpecker	*Melanerpes carolinus*	G5	S5					3			✓	-	-	-	-	1	POSS	-	-	-	-
Red-breasted Nuthatch	*Sitta canadensis*	G5	S5					3	X	X	✓	-	-	-	-	1	POSS	-	-	-	-
Red-eyed Vireo	*Vireo olivaceus*	G5	S5B								✓	1	POSS	-	-	4	PROB	-	-	1	POSS
Red-tailed Hawk	*Buteo jamaicensis*	G5	S5		NAR	NAR						-	-	-	-	-	-	1	POSS	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S5									3	PROB	18	CONF	2	PROB	3	PROB	-	-
Ring-billed Gull	*Larus delawarensis*	G5	S5								✓	1	OBS	-	-	-	-	-	-	1	OBS
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	G5	S5B								✓	3	PROB	-	-	1	POSS	-	-	-	-
Savannah Sparrow	*Passerculus sandwichensis*	G5	S5B,S3N					1	X	X	✓	5	PROB	2	PROB	-	-	6	PROB	4	PROB
Song Sparrow	*Melospiza melodia*	G5	S5								✓	4	PROB	4	PROB	1	POSS	3	PROB	2	PROB
Tree Swallow	*Tachycineta bicolor*	G5	S4S5B								✓	1	POSS	1	POSS	-	-	1	OBS	2	OBS
Turkey Vulture	*Cathartes aura*	G5	S5B,S3N					3				-	-	-	-	-	-	-	-	2	OBS
Warbling Vireo	*Vireo gilvus*	G5	S5B								✓	-	-	1	POSS	-	-	-	-	-	-
Willow Flycatcher	*Empidonax traillii*	G5	S4B								✓	-	-	4	POSS	-	-	1	POSS	-	-
Yellow Warbler	*Setophaga petechia*	G5	S5B								✓	3	POSS	3	PROB	-	-	1	PROB	-	-

WILDLIFE LIST LEGEND

[1] **G-Rank (global)**
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to Extinction.
G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to Extinction.
G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
G5 Very common - demonstrably secure under present conditions.

[2] **S-Rank (provincial)**
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure - Common, widespread, and abundant in the nation or state/province.
S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SAN Non-breeding accidental.
SE Exotic - not believed to be a native component of Ontario's fauna.
SZN Non-breeding migrants/vagrants.
SZB Breeding migrants/vagrants.

[3] **COSSARO (Committee on the Status of Species at Risk in Ontario) Status**
The provincial review process is implemented by COSSARO

COSSARO is an independent advisory panel to the Ontario Ministry of Environment, Conservation and Parks (MECP) that assesses the status of species at risk of extinction.
http://cossaroagency.ca/

COSSARO Conservation Status Ranks
EXT Extinct - A species that no longer exists anywhere in the world.
EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
END Endangered - A species that is facing imminent Extinction or extirpation.
THR Threatened - A species that is likely to become Endangered if steps are not taken to address factors threatening to lead to its Extinction or extirpation.
SC Special Concern – A species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats.

[4] **ESA (Endangered Species Act) Status**
Provincial status from MECP
https://www.ontario.ca/page/species-risk-ontario

ESA Conservation Status Ranks
EXT Extinct - A species that no longer exists anywhere in the world.
EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
END Endangered - A species that is facing imminent Extinction or extirpation.
THR Threatened - A species that is likely to become Endangered if steps are not taken to address factors threatening to lead to its Extinction or extirpation.
SC Special Concern – A species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats.

[5] **COSEWIC (Committee on the Status of Endangered Wildlife in Canada) Status**
The federal review process is implemented by COSEWIC

COSEWIC is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.
https://www.cosewic.ca/index.php/en-ca/

COSEWIC Conservation Status Ranks
EXT Extinct - A species that no longer exists.
EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered - A species facing imminent extirpation or Extinction.
THR Threatened - A species likely to become Endangered if limiting factors are not reversed.
SC Special Concern (formerly vulnerable) - A species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.
NAR Not At Risk - A species that has been evaluated and found to be not at risk of Extinction given the current circumstances.
DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of Extinction.

[6] **SARA (Species at Risk Act) Status and Schedule**
Federal status from the Government of Canada's Species at Risk Public Registry
https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

EXT Extinct - A wildlife species that no longer exists.
EXP Extirpated - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A wildlife species that is facing imminent extirpation or Extinction.
THR Threatened - A wildlife species that is likely to become Endangered if nothing is done to reverse the factors leading to its extirpation or Extinction.
SC Special Concern - A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as Extirpated, Endangered, Threatened and Special Concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as Endangered or Threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as Special Concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are Extirpated, Endangered, Threatened and Special Concern, the prohibitions do not apply to species of Special Concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[7] **Regional Status**

Wellington County
Conservation rankings for birds of the Grand River basin: a tool for conservation and management. June 2000. Bird Studies Canada and the Grand River Conservation Authority.
Document: http://www.bsc-eoc.org/download/gcra_mainreport.pdf
Technical Appendix: http://www.bsc-eoc.org/download/gcra_appendices.pdf

Levels 1-4 are a relative ranking within each habitat grouping based on a scoring system, which took into account: Jurisdictional Responsibility (JR, a scale-dependent measure related to breeding distribution within a given spatial unit); Preservation Responsibility (PR, a scale-independent measure based on the biological characteristics of the species); and, Area Sensitivity (AS, a scale-independent measure related to the habitat-area requirements of the species).

There are 3 habitat groups: Forest, Open Country/Grassland and Marsh. There is no difference in importance among species within a given category (Level 1 to 4), regardless of habitat group.

Level 1 is the highest priority (highest scoring in habitat group) and Level 4 is the lowest priority (lowest scoring in habitat group, but still considered a "priority species").

++ denotes 'Endangered' or 'Threatened' status at the provincial or federal level
* denotes 'vulnerable' status at the provincial or federal level

[8] **MNR Area Sensitive Species**
Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers

From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.

From: Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E. January, 2015. Regional Operations Division, Southern Region Resources Section. 39pp.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED
X Species observed in its breeding season (no breeding evidence).

POSSIBLE
H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.

D	Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
M	Multiple (at least 7) individuals with S
N	Nest-building (Wren/Woodpecker)
P	Pair observed in suitable nesting habitat in nesting season.
T	Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
V	Visiting probable nest site

CONFIRMED

AE	Adult leaving or entering nest sites in circumstances indicating occupied nest.
CF	Adult carrying food for young.
DD	Distraction display or injury feigning.
FS	Adult carrying fecal sac.
FY	Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
NB	Nest-building (non-Wren/Woodpecker)
NE	Nest containing eggs.
NU	Used nest or egg shells found (occupied or laid within the period of the survey).
NY	Nest with young seen or heard.

APPENDIX F

SWH Screening

Wildlife Habitat	Habitat Criteria	Criteria Required to Confirm SWH	Assessment	SWH Confirmed?
Seasonal Concentration Areas of Animals				
1. Waterfowl Stopover and Staging Areas (Terrestrial)	•Fields with sheet water during spring (mid-March to May). •Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available	•Any mixed species aggregations of 100 or more individuals required.	No suitable large fields with sheet water during spring are present on the Site or in the Study Area. No waterfowl aggregations were observed.	No
2. Waterfowl Stopover and Staging Areas (Aquatic)	•Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. •Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.	•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	No suitable waterbodies large enough to support large aggregations of waterfowl are present on the Site or in the Study Area. No waterfowl aggregations were observed.	No
3. Shorebird Migratory Stopover Area	•Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. •Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. •Sewage treatment ponds and storm water ponds do not qualify as a SWH.	•Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period •Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 whimbrel used for 3 years or more is significant.	No suitable waterbodies large enough to support large aggregations of shorebirds are present on the Site or in the Study Area.	No
4. Raptor Wintering Area	•The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. •Raptor wintering (hawk/owl)sites need to be > 20 ha with a combination of forest and upland •Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands •Field area of the habitat is to be wind swept with limited snow depth or accumulation. •Eagle sites have open water and large trees and snags available for roosting	Studies confirm the use of these habitats by: •One or more short-eared owls or; One of more bald eagles or; •At least10 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	No short-eared owls or bald eagles were documented during field surveys. Further, 10 individuals of the listed hawk/owl species were not documented during field surveys. Further, there is no suitable combination of upland habitat (with the exception of managed agriculture) and woodland habitat.	No
5. Bat Hibernacula	•Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. •Active mine sites should not be considered as SWH	•All sites with confirmed hibernating bats are SWH	No mines or caves on the Site or in the Study Area.	No
6. Bat Maternity Colonies	Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees •Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2 •Silver-haired bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred •Buildings are not considered to be SWH •Maternity roosts are not found in caves and mines in Ontario	•Maternity Colonies with confirmed use by: >10 big brown bats and >5 adult female silver-haired bats	The woodland at the northern extent of the Site and Study Area does not meet the snag density criteria for this SWH type (< 10 snags / ha of > 25 cm dbh trees). No targeted snag density or acoustic monitoring was completed for the deciduous forest off-Site, within the Study Area, to the southeast.	In the absence of snag density surveys in the deciduous forest off-site to the southeast (FOD5), this feature has been identified as **Candidate SWH**.
7. Turtle Wintering Areas	•Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen, water deep enough not to freeze, and soft mud substrates •Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH	•Presence of 5 over-wintering midland painted turtles •One or more northern map turtle or snapping turtle over-wintering within a wetland	None of the wetland communities on-Site provide suitable depth for overwintering turtles and were heavily disturbed by active agriculture (grazing by cattle). Midland painted turtles were not documented in suitable numbers (≥ 5 overwintering turtles); however, emergence surveys were not completed. One snapping turtle was documented in the degraded pond adjacent to the residence; however, it is heavily disturbed based on the surrounding land use. Further, all wetlands on-Site will be retained with a minimum 10 m setback. Unevaluated wetlands off-Site, within the Study Area, are anticipated to be similar to those on-site. A 10 m setback to these wetlands would not encroach within the Site limits and proposed extraction limit.	**Candidate SWH** is present within wetlands that were not assessed as part of the NER off-Site, within the Study Area.
8. Reptile Hibernaculum	•For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. •Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line •Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. •Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures	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 anthropogenic structure foundations may provide access / egress below the frost line and thus, suitable overwintering habitat for snakes. Further, it is possible there is suitable hibernacula features within the woodlands off-Site, within the Study Area; however, no suitable hibernaculum features were documented on-Site during field investigations. However, no snakes were observed on-Site during field surveys. Although no targeted snake emergence surveys were completed, multiple wildlife surveys were completed for suitable habitat on-Site during the spring (April / May) and no snakes or associated congregations were documented.	No
9. Colonially -Nesting Bird Breeding Habitat (Bank and Cliff)	•Any site or areas with exposed soil banks, undisturbed or naturally eroding. •Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. •Does not include a licensed/permitted Mineral Aggregate Operation	Studies confirming: •Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season	There are no banks or cliffs on-Site or within the Study Area. No cliff swallows or rough-winged swallows were observed during field surveys.	No

Wildlife Habitat	Habitat Criteria	Criteria Required to Confirm SWH	Assessment	SWH Confirmed?
10. Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)	•Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.	Studies confirming: •Presence of 5 or more active nests of great blue heron or other listed species	No lakes, islands, or peninsulas are present on-Site or within the Study Area. Further, treed wetlands within the Study Area are insufficient in size to support this SWH type. No heron or egret nests were observed during field surveys.	No
11. Colonially -Nesting Bird Breeding Habitat (Ground)	•Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. •Brewers blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands	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.	There are no rocky islands or peninsulas on Site or within the Study Area. Suitable cultural (CUM) and marsh (MAS) ecosites are present on-Site and within the Study Area for Brewer's blackbird; however these ecosites are not in close proximity to streams or irrigation ditches. One ring-billed gull was documented, without breeding evidence, during breeding bird surveys. No terns or Brewer's blackbirds were observed during field surveys.	No
12. Migratory Butterfly Stopover Areas	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario •The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat	Studies confirm: •The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)	The Site and Study Area are not within 5 km of Lake Ontario and therefore this SWH type is not applicable.	No
13. Landbird Migratory Stopover Areas	•Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. •If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant •Sites have a variety of habitats; forest, grassland and wetland complexes •The largest sites are more significant	Studies confirm: •Use of the woodlot 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	The Site and Study Area are not within 5 km of Lake Ontario and therefore this SWH type is not applicable.	No
14. Deer Yarding Areas (Ecoregion 6E only)	Mapped by MNR	Mapped by MNR	No Deer Yarding Areas are present within the Study Area, as mapped by MNR.	No
15. Deer Winter Congregation Areas	Mapped by MNR	Mapped by MNR	No Deer Winter Congregation Areas are present within the Study Area, as mapped by MNR.	No
Rare Vegetation Communities				
16. Cliffs and Talus Slopes	N/A	•Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	There are no cliffs or talus slopes, or potential cliffs / talus slopes on-Site or within the Study Area.	No
17. Sand Barren	A sand barren area >0.5ha in size	•Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics	There are no sand barrens, or potential sand barrens, on-Site or within the Study Area.	No
18. Alvar	An Alvar site > 0.5 ha in size	•Field studies that identify four of the five Alvar Indicator Species is Significant. •Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). •The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses	There are no alvars, or potential alvars, on-Site or within the Study Area.	No
19. Old Growth Forest	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest	Field Studies will determine: •If dominant trees species of the ecosite 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)	Although the contiguous woodland habitat at the northern extent of the Site and Study Area meet the minimum size criterion, the dominant tree species are not >140 years old. There are no other woodlands >30 ha or with >10 ha of interior habitat on-Site or in the Study Area.	No
20. Savannah	•No minimum size to site •Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present	There are no savannahs, or potential savannahs, on-Site or within the Study Area.	No
21. Tallgrass Prairie	•No minimum size to site. •Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present	There are no tallgrass prairies, or potential tallgrass prairies, on-Site or within the Study Area.	No
22. Other Rare Vegetation Communities	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M of SWHTG	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community	No other rare vegetation communities, or potentially rare vegetation communities, were identified on-Site or within the Study Area.	No
Specialized Habitats of Wildlife considered SWH				
23. Waterfowl Nesting Area	•A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. •Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. •Wood ducks and hooded mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.	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	There is no combination of suitable wetland ecosites and upland habitat on-Site or within the Study Area. No nesting pairs of waterfowl were observed during field surveys.	No
24. Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	•Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. •Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	Studies confirm the use of these nests by: •One or more active osprey or bald eagle nests in an area	There are no suitable large waterbodies on-Site or within the Study Area. No osprey or bald eagle nests were observed during field surveys.	No
25. Woodland Raptor Nesting Habitat	All natural or conifer plantation woodland/forest stands >30 ha with >10 ha of interior habitat. Interior habitat determined with a 200 m buffer	Studies confirm: •Presence of 1 or more active nests from species list is considered significant	The woodland habitat at the northern extent of the Site and Study Area, extending beyond the Study Area, may meet the size requirements for this SWH type. None of listed species were documented during field investigations and the woodland will be retained with a 10 m setback.	No

Wildlife Habitat	Habitat Criteria	Criteria Required to Confirm SWH	Assessment	SWH Confirmed?
26. Turtle Nesting Areas	•Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. •For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. •Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used	Studies confirm: •Presence of 5 or more nesting midland painted turtles •One or more northern map turtle or snapping turtle nesting is a SWH	No suitable exposed soils in proximity to the listed wetland ecosites are present on-Site or within the Study Area. While turtles may utilize gravel roadsides and agricultural fields for nesting, these are not considered SWH. No turtle nesting evidence was observed on the Site or in the Study Area.	No
27. Seeps and Springs	•Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system	Field Studies confirm: •Presence of a site with 2 or more seeps/springs	There are no forested headwater features for seeps/springs on the Site or in the Study Area.	No
28. Amphibian Breeding Habitat (Woodland)	•Presence of a wetland, pond or woodland pool (including vernal pools) >500 m2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. •Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat	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 Codes of 3	Potentially suitable wetlands and woodland pools are present on-Site and within the Study Area. No newt/salamander species and no egg masses were observed during field surveys. Two or more of the listed anuran species were documented with a Call Level Code within the following features: - The SWT2-2/MAS2 had a full chorus of spring peeper and wood frog. As this feature is <120 m from the nearest woodland ecosite (SWD4-1/MAM2-2), the wetland feature, the hedgerow corridor, and the SWD4-1/MAM2-2 within 230 m would be considered SWH. - The two SWD communities associated with ACC7, off-Site within the Study Area to the northeast, had a full chorus of spring peeper and gray treefrog. As such, these treed wetlands and woodland habitat within 230 m would be considered SWH. - The MAS community east of the Site, within the Study Area, had a full chorus of spring peeper and gray treefrog. As such, this wetland, a corridor through the cultural meadow and woodland habitat within 230 m is considered SWH.	**Confirmed SWH was documented on-Site and within the Study Area as depicted on Figure 4.**
29. Amphibian Breeding Habitat (Wetlands)	•Wetlands>500 m2 (about 25 m diameter),supporting high species diversity are significant •Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. •Bullfrogs require permanent water bodies with abundant emergent vegetation.	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 Codes of 3 or •Wetland with confirmed breeding bullfrogs are significant.	There are no wetlands >500 m^2 that are isolated (>120 m) from woodland ecosites. Further, there are no large marshes that support aquatic species adjacent to woodlands that may meet the criteria for this SWH type.	No
30. Woodland Area-Sensitive Bird Breeding Habitat	•Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. •Interior forest habitat is at least 200 m from forest edge habitat	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.	While the contiguous woodland in the northern extent of Study Area may provide suitable interior forest habitat for this SWH type, only one of the listed species was documented during field investigation including breedng bird surveys (red-breasted nuthatch - one individual with 'possible' breeding evidence).	No
Habitat for Species of Conservation Concern				
31. Marsh Breeding Bird Habitat	•Nesting occurs in wetlands. •All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present •For green heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water	Studies confirm: •Presence of 5 or more nesting pairs of sedge wren or marsh wren, or •1 pair of sandhill cranes; or •breeding by any combination of 5 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	None of the listed wetland ecosites (MAM1 to MAM6; SAS1; SAM1; SAF1; FEO1; BOO1) are present on-Site or within the Study Area. For green heron, suitable swamp (SWD; SWT) and marsh (MAS) ecosites are present on-Site and within the Study Area. None of the listed species were documented calling during field surveys including breeding bird surveys with coverage off-Site, within the Study Area.	No
32. Open Country Bird Breeding Habitat	•Large grassland areas (includes natural and cultural fields and meadows) >30 ha •Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years) •Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.	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	No suitable large grasslands (>30 ha) are present on the Site or in the Study Area. The agricultural fields on-site have been actively used within the last 5 years and as such, do not meet the criteria for this SWH type.	No
33. Shrub/Early Successional Bird Breeding Habitat	Large field areas succeeding to shrub and thicket habitats>10 ha in size. •Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) •Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species •Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands	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 as Significant Wildlife Habitat	Although indicator species were documented during breeding bird surveys within suitable thicket and meadow ecosites (brown thrasher - 'possible'; field sparrow - 'confirmed'; eastern towhee - 'probable'; willow flycatcher - 'possible'), successional habitat and shrub thicket within the study area is too small (<10 ha) to support this SWH type.	No

Wildlife Habitat	Habitat Criteria	Criteria Required to Confirm SWH	Assessment	SWH Confirmed?
34. Terrestrial Crayfish	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. •Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water.	Studies Confirm: •Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or terrestrial sites	Suitable wetland ecosites are present on-Site and within the Study Area. No terrestrial crayfish chimneys were observed during field surveys on-Site; however, the wetland communities off-site, within the Study Area. As such, these are considered Candidate SWH.	**Candidate SWH for wetland communities off-Site, within the Study Area (SWD; MAS)**
35. Special Concern and Rare Wildlife Species	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites	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.	**Barn Swallow (SC)** Active nests for this species were documented in two anthopogenic structures (outbuilding; barn; Figure 3) on-Site. Further, individuals were documented foraging over agricultural fields and open habitat in WSU-2. As nesting habitat for this species is generally limited to anthropogenic structures, both of these structures on-Site have been assessed as **Confirmed SWH**. While suitable foraging habitat is present on-Site and within the Study Area. The majority of open habitat is associated with active agricultural practices. Further, there is sufficient foraging habitat within the immdediate landscape (e.g., open habitat, agricultural fields, wetland pockets).	**Confirmed SWH for the outbuilding and barn located along Concession Road 7.**
			Eastern Wood-pewee (SC) Eastern wood-pewee individuals were documented with 'probable' breeding evidence in the northern extent of the Site during breeding bird surveys. As such, it is likely that this species is using these woodland for breeding. No individuals were documented wihtin the woodland at the southeastern extent of the Study Area, off-Site, during breeding bird surveys. Based on the size of the contiguous woodland at the northern extent of the Site and Study Area and the presence of individuals with breeding evidence, the woodland (SWD4-1;FOD5-4; FOC1; FOD5) are considered confirmed SWH for this species.	**Confirmed SWH is present in the contiguous the woodland (SWD4-1; FOD5-4; FOC1; FOD5) at the northern extent of the Site and Study Area.**
			Grasshopper Sparrow (SC) Pastures (AGR) on-Site provide suitable habitat for this species on-Site and within the Study Area. This species was observed on-Site in pastures within WSU-1 and WSU-5 with 'possible' and 'probable' breeding evidence, respectively. As such, the pastures with documented individuals are considered confirmed SWH. Although each pasture is larger than the home range for this species (0.3 ha to 1.4 ha)(COSEWIC 2013), the exact centre of defended territory was not determined so each pasture is depicted as SWH on Figure 3. This species was also documented off-Site, within the Study Area, to the east. Suitable open and habitat and agricultural fields are present. As such, it is possible that this species is also utilizing suitable habitat on the property to the east of the Site. However, no impacts to the agricultural fields off-Site are anticipated.	**Confirmed SWH is present in the in the pastures outlined on Figure 4 within WSU-1 and WSU-5.**
			Hairy Solomon's Seal (Regionally Rare) This species was confirmed within the FOD5-4 northeast of the Site, within the Study Area. This area is being maintained and set back a minimum of 10 m from the extraction area. No impacts to this feature are anticipated.	**Confirmed SWH is present in the forested area northeast of the Site in the Study Area.**
			American Bumblebee and Yellow-banded Bumblebee (SC) These species were not documented during field surveys; however, targeted insect surveys were not completed. Potentially suitable habitat is present within agricultural fields and cultural meadows on-Site and within the Study Area. As no individuals were documented during numerous surveys within the agricutural fields and meadow habitat, it is unlikely that the Site provides suitable habitat for large populations of these species.	No
			West Virginia White (SC) This species was not documented during field surveys; however, targeted insect surveys were not completed. Potentially suitable habitat is present within woodland at the northern extent of the Site and Study Area, based on presence of larval host plant.	**Candidate SWH is present within woodland at the northern extent of the Site and Study Area.**
			Snapping Turtle (SC) One snapping turtle was documented in the pond adjacent to the pasture and residence. However, this pond feature represents a highly degraded feature frequented by cattle and exhibiting signs of contamination from the surrounding agricultural land-use. As isolated wetlands are not under-represented in the landscape and the pond is unlikely to support large populations of snapping turtle (MNR 2000), this feature is not considered SWH.	No

Wildlife Habitat	Habitat Criteria	Criteria Required to Confirm SWH	Assessment	SWH Confirmed?
Animal Movement Corridors				
36. Amphibian Movement Corridors	Movement corridors between breeding habitat and summer habitat Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat –Wetland) of this Schedule	•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 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m •Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.	No Candidate or Confirmed Amphibian Breeding Habitat - Wetland was identified on-Site or within the Study Area. Therefore, assessment of this SWH type is not warranted.	No
37. Deer Movement Corridors (Ecoregion 6E only)	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. •A deer wintering habitat will have corridors that the deer use during fall migration and spring dispersion •Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	•Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas . •Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. •Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors	No confirmed deer wintering habitat is present within the Study Area.	No

APPENDIX G

Curriculum Vitae

DANIEL EUSEBI, BES, MCIP, RPP

Senior Principal Ecologist

Areas of practice

Landuse Planning – Natural Heritage

Natural Heritage Impact Assessment

Species at Risk Assessment, Overall benefit plans

Wetland impact analysis and mitigation development

Restoration, rehabilitation and natural heritage enhancement

Public Consultation

Adaptive management planning

Ecological monitoring plan development

Environmental policy understanding and implementation

Languages

English

PROFILE

Daniel is a Registered Professional Planner in Ontario and a senior ecologist at WSP. He has a broad range of expertise in the environmental field, gained over a 35+ year career. He has coordinated the environmental planning and implementation components for detailed natural science-based environmental assessments, environmental screenings, detailed design, rehabilitation, construction inspection and detailed post-development monitoring projects. Through his extensive experience, Daniel provides a wealth of knowledge concerning permitting and approvals for a number of environmental disciplines. He has lead the natural environment monitoring components of various development undertakings and integrated those findings with the findings of complementary disciplines such as hydrology and hydrogeology. He manages the public consultation phase for high profile projects and has provided testimony as an Expert Witness at the OMB and OLT.

Daniel's practical experience includes natural science based environmental assessments [flora, fauna and aquatics, often involving species at risk (SAR)], site decommissioning and redevelopment, design and implementation of protection techniques for development sites and linear facilities, and rehabilitation and restoration of natural areas, as well as compliance and performance monitoring.

EDUCATION

BES (Honours), Major in Environmental and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada	1988

PROFESSIONAL DEVELOPMENT

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC) System for Southern Ontario, Turkey Point, Ontario, Canada	2011
Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), North Bay, Ontario, Canada	2009

PROFESSIONAL ASSOCIATION

Certified Member, Canadian Institute of Planners

Registered Professional Planner, Ontario Professional Planners Institute

Member, Environment and Land Use Committees , Ontario Stone, Sand & Gravel Association

CAREER

WSP Canada Inc.	2024
Stantec Consulting Limited	2003 - 2024
Ecological Service Group Ltd	1990 – 2003
Ministry of Natural Resources	1989
Ministry of Agriculture and Food	1988

PROFESSIONAL EXPERIENCE

ENVIRONMENTAL ASSESSMENTS

- PRISM Pipeline Project, Environmental Permit and Approval Manager and Acquisition Coordinator. Environmental construction permits and approvals for all natural environment features. Work involved assessing natural environment baseline conditions and developing permit packages for crossing of natural environment features and assisting with the development of design mitigation. The pipeline traversed wetland, woodland and watercourse environments.
- Fox Hollow Subdivision Phase 1 External Sanitary Sewer - Water crossing, permits and approval package, Project Manager.
- Transportation Design, Construction Report and Aquatic Assessment. Highway 3 Road Improvement St. Thomas to Aylmer, Ontario Ministry of Transportation, Environmental Planner, Coordinated and managed the assessment of baseline conditions and natural environment permitting conditions for an MTO highway project. Activities included input to design elements and negotiating permits with the MNR.
- Fisheries Assessment and Letter of Intent - Highway 3 Improvements/Aquatic Crossings, Ministry of Transportation, Environmental Planner.
- Transportation Environmental Study Report, Highway 401 Bridge Rehabilitation at County Road 36 and Concession Road 7, Puslinch Township, Wellington County, Ministry of Transportation Ontario (MTO), Environmental Planner.
- Public Consultation Program for Remediation of Brownfield Site in Residential Neighbourhood, Pirelli Cable Inc, Project Manager, Developed two phase public consultation program for remediation of brownfield site. Presented information and completed individual liaison with affected landowners.
- NEB Environmental Assessment, Great Lakes Power Ltd., Project Manager, Coordinated public consultation program for high voltage power cable line – NEB Environmental Assessment. Involved preparation of notifications, presentation materials and establishment of public input database.
- Groundwater Assessment Investigations and Remediation Initiatives for southwestern Ontario Tank Farm and Pumping Station, Enbridge Pipeline Inc., Project Manager.
- Environmental Property Assessments, Preliminary Phase I Assessment for Contamination Identification, 50 Sites, Canadian National Real Estate Division, Project Manager.
- Phase I and II Environmental Property Site Assessments, Manager, More than 250 Phase I, and II Environmental Property Site Assessments in Ontario and Quebec for private industry, as well as federal and municipal governments.
- Ontario Manitoba Interconnection Project. Data Collection and Regulatory Agency Issue Assessment, Ontario Hydro, Resource Planner, Collected baseline condition information for a proposed Ontario Hydro line connecting Ontario and Manitoba grids. Assessed baseline conditions and provided input to the route selection undertaking.
- Highway 17 Route Planning Study and New Highway 69 Connection, GWP 5031-09-00, Sudbury to Markstay, Ontario, Natural Environment Planner,

Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a route for a future four-lane controlled access Highway 17 between Sudbury and Markstay, including a new Highway 69 connection to the Sudbury Southeast Bypass.

- Highway 401 Interchange Improvements/Structure Replacements, West Region GWP 3070-09-00, London, Ontario, Natural Environment Planner, Coordinated collection of baseline data to support preliminary design and environmental assessment for structure replacements and interchange improvements at Highway 401/Westminster Drive (Site 19-366 west of London), Highway 401/Highway 19 (Site 23-210 Ingersoll), and Highway 401/Norwich Avenue (Site 23-170, Woodstock), providing input to the Preliminary Design Transportation Environmental Study reports.
- Highway 144 Route Planning Study, Northeastern Region GWP 5023-09-00, Sudbury, Ontario, Natural Environment Planner, Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a future controlled access Highway 144 through the communities of Chelmsford and Dowling in the City of Greater Sudbury. Provided input to Transportation Environmental Study report.

ENVIRONMENTAL PLANNING

- Ontario Line Subway, Metrolinx, Toronto, Ontario, Canada, 2021-Present, Project Role: Senior Ecological Discipline Lead: The Ontario Line is a 15.6-kilometre stand-alone rapid transit line in Toronto. Dan is ecological Lead for the project. He coordinates and overseas Natural Environment Technical report for the Ontario Line project and various support Natural Heritage Impact Study (NHIS). The role involves supporting project planning, resource forecasting, design input, compensation assessment and design plan, coordination and implementation of Species at Risk (SAR) surveys and associated reporting in accordance with MECP permit D requirements under the Endangered Species Act Communities (key contact). DFO Request for Review and on-going Authorizations.
- Bowmanville Rail Expansion , Metrolinx, Oshawa and Clarington, ON, Canada, 2021-Present, Project Role: Senior Ecological Discipline Lead: Stantec, and a partner firm for Metrolinx's Bowmanville Rail Expansion project. Dan oversees the Natural Environment Technical Report (NETR). He manages the Species at Risk studies and in engaged in the proposed Permit D Authorization for the project under Endangered Species Act. Dan is also involved in managing and addressing Indigenous Community engagement as it relates to both terrestrial and aquatic biota. He provides senior assistance with high level negotiations with Regulatory Stakeholders.
- Environmental Impact Study, 781 Victoria Road Rezoning Application, Guelph, Ontario, 2008-2015, Senior Environmental Planner: Coordinated preparation of the EIS and draft EIR for the site, conducted agency liaison and made presentations before the Environmental Advisory Committee (EAC). Served as an Expert Witness at the Ontario Municipal Board (OMB). OMB Decision was successful.

- Metrolinx Stouffville Grade Separations, Natural Environment Manager: Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum.
- Metrolinx Scarborough Junction and Grade Separation , Natural Environment Manager : Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum.
- Metrolinx Lincolnville Go Station Existing Conditions Report, Metrolinx, Ecosystem Project Manager and ESA Management: Managed the natural environment studies for the Lincolnville Go Station site. Coordinate the field studies and wetland evaluation with MNRF. Assessed wetland impacts and Species at Risk habitat including development of SAR mitigation plans for Barn Swallow and bats. Provide design input for vegetation buffers species at risk habitat and wildlife crossings.
- Enbridge Gas Distribution Inc. GTA Project, Greater Toronto Area (GTA) Pipeline, Enbridge Gas Distribution Inc., Ontario, Environmental Permit and Approval Manager and Acquisition Coordinator: Responsible for coordinating acquisition of environmental permits and approvals from regulatory agencies for pipeline installation works, including MOECC, MNRF, Four Conservation Authorities and municipalities.
- Enbridge Gas Distribution Inc. GTA Project, Enbridge Gas Distribution Inc., Greater Toronto Area Pipeline, Ontario, Project Manager - Natural Environment: Construction inspection and compliance manager, environment. Responsible for the management of environmental discipline inspection and monitoring during construction. Disciplines managed include hydrology, archaeology, air, noise, vibration, environmental rehabilitation, restoration planting, wildlife, vegetation, and aquatic. Responsible for coordinating and managing health and safety requirements for environmental services and geotechnical disciplines.
- Hybridine Solar Farm, Municipality of Clarington, Ontario, Environmental Planner: Stantec was retained to complete a REA submission to the MOECC for a proposed 2 MW solar farm project on behalf of EDF. Daniel managed and coordinated information for the natural heritage lead for the NHA/EIS, completed consultation with MNRF regarding background data collection and natural heritage surveys. Assessed wetland and significant wildlife habitat at the site and developed mitigation strategies to reduce natural environment impacts from the project.
- Kortright Subdivision Environmental Impact Study, Victoria Road, Guelph, Ontario, Project Environmental Planner.
- Victoria Valley Golf Course Environmental Impact Study, Victoria Road South and Maltby Road East, Guelph, Ontario, Project Environmental Planner.
- Pergola Lands Environmental Impact Study, Gordon Street and Clair Road, Guelph, Ontario, Project Environmental Planner.
- Dallan Lands Environmental Impact Study, Clair Road, Guelph, Ontario, Project Environmental Planner.
- Clearview Stables Environmental Impact Study, 1065 Victoria Road South, Guelph, Ontario, Project Environmental Planner.

- Victoria Park Village, 1159 Victoria Road South, Guelph, Ontario, Project Environmental Planner.

ENVIRONMENTAL SITE MANAGEMENT

- St. Clair River Directional Drilling Operations and Regulatory Approvals, Vector Pipelines Ltd., Project Manager: Development of environmental protection procedures for directional drilling operations of the St. Clair River and coordinated regulatory approval requirements.
- PRISM Pipeline Project, Imperial Oil Ltd., Project Manager: Conducted ongoing monitoring and compliance requirements for directional drilling operation at the Grand River.
- Grand River Crossing at Cambridge, Union Gas, Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- First Nations Consultation Program and Training Program at Remote Site in Northern Ontario, Bell Canada, Project Manager: Programs involved presenting project remediation information to First Nations groups and providing training for community based employment opportunities.
- Crude Oil Leak Site, Enbridge Pipeline Inc., Project Manager: Conducted public liaison in emergency response scenario at crude oil leak site. Maintained ongoing public information liaison with affected landowners.
- Terrace Pipeline Project, Enbridge Pipeline Inc., Project Manager/Inspector: Environmental supervision of the directional drill, South Saskatchewan River (1100m drill).
- St. Clair River Sediment Quality Sampling Investigations, Vector Pipelines Ltd., Project Manager: Coordinated sediment quality sampling investigations of the St. Clair River for proposed directional drilling operations.
- Emergency Response Management Services - Wolverton Leak Site, Enbridge Pipeline Inc., Project Manager.
- Emergency Response Management Services - Bronte Junction Historic Leak Site, Enbridge Pipeline Inc., Project Manager.
- Emergency Response Management Services - Binbrook Leak Site (Spill Response and Land Rehabilitation), Enbridge Pipeline Inc., Project Manager.
- Emergency and Spill Response Services, Alltech Canada Inc., Project Manager.
- Emergency and Spill Response Management, Sarnia Suncor Metering Facility, Project Manager.
- Clarkson Station - Spill Response and Site Management, Enbridge Pipeline Inc., Project Manager.
- Decommissioning of Four Crude Oil Pumping Stations, Interprovincial Pipe Line Inc., Project Manager: Managed decommissioning of Four Crude Oil Pumping Stations: Keyser, Smithville, Wolverton and Bryanston.
- Golf Course and Estate Residential Facility, Town of Aurora, Project Manager: Environmental site peer review of mitigation and construction of golf course and estate residential facility-up site management for the Bronte Junction compound facility.

- Housing Development On-going Site Monitoring, City of Guelph, Project Manager: On-going Site Monitoring of South Creek, Clairfields, Clarington Place and Whitetail Sites.
- Meadowlily ESA, City of London, Project Manager: Environmental Inspection, Meadowlily ESA, Subdivision development project. Inspection of topsoil stripping, vegetation clearing, erosion and silt control, construction activities, dewatering and rehabilitation monitoring.

NATURAL SCIENCES & HERITAGE RESOURCES

- Numerous Environmental Impact Statements in the City of London and Surrounding Areas, for the City of London, York Developments, Sifton, Tricar, etc.: Project management EIS's and other discipline inputs to EIS in support of Official Plan and Zoning By-Law Amendments and development approvals as it relates to natural environment. Focus includes approvals with MECP, Conservation Authorities, DFO, and community Environmental Advisory Groups.
- Member of The City of London's Environmental Management Guidelines (EMGs) taskforce: Select Environmental Professionals chosen by the City of London to provide guidance for implementing the natural heritage policies of the London Plan. On-going.
- Richardson Farms Scoped Environmental Impact Study, Z Group, Ecosystem Project Manager: Assessed and presented the removal and transfer of a portion of Provincial Significant Wetland for approval to the UTRCA Board of Directors in the City of London. Approval was granted.
- Environmental Impact Study 1250 Gordon Street Guelph, Tricar, Ecosystem Project Manager: Assessed development impacts and identified bat Species at Risk habitat on site. Negotiated Approvals from the City for Impacts to woodland and wetlands.
- City of Guelph Development Projects: Senior environmental adviser and quality reviewer for a number of Guelph development projects, including, Blue Water Developments, Victoria Road, Tricar, 1250, 1858 Gordon Street, 71 Wyndam Street and 220 Arkell Road. Dan has directed the EIS and EIR components of the projects as well as the flora and fauna surveys and monitoring undertakings.
- Hardrock Mine, Greenstone Gold Mines (GGM), Geraldton, Ontario. Terrestrial Environment Discipline Lead: Terrestrial technical report in support of a combined Federal Environmental Impact Statement (EIS) and provincial Environmental Assessment (EA), Stantec was retained to assist with natural environment work and seek permits and approvals for the Hardrock Project, in Greenstone Ontario. Dan lead the development of Terrestrial component of Biodiversity Management and Mitigation Plan that addressed terrestrial diversity and compliance conditions of approval.
- Vector Pipeline Project, Vector Pipeline Ltd., Project Manager: Development of watercrossing technique design for environmental protection. Coordination of regulatory approval requirements.
- OCWA Water Pipeline at the Ausable River Watercrossing, Ontario Clean Water Agency, Project Manager: Developed and implemented environmental protection methods on-site.

- Medway Trunk Sanitary Sewer Crossings, City of London, London, Ontario, 2006, Project Manager / Environmental Planner: Coordinated preparation of watercrossing plans, including bed-level crossing for the Medway Trunk Sanitary Sewer project. Supporting studies included a Fisheries Habitat Assessment. Medway Creek supports a mollusc SAR (Wavy-rayed Lampmussel) and construction of the project involved mussel relocation and monitoring. Prepared the permits and approval package.
- Line Lowering at 403 Burlington - Rambo Creek Crossing, Interprovincial Pipe Line Inc., Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- Line 9C, Shell Take off to Sarnia Terminal, Interprovincial Pipe Line Inc., Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- Line 9C Sarnia Delivery Line, Enbridge Pipeline Inc., Project Manager: Development of watercrossing design for protection of water resource.

CEMENT / AGGREGATES

- CBM Aggregates Canada (Votorantim Cimentos) Master Service Agreement (MSA): Negotiated a multi-year MSA with CBM Procurement and CBM Director of Land, Resources and Environment.
- Natural Environment Level 2 Technical Reports. Walkers Uppers Quarry, ARA approval and JART process. Walkers Brother Inc., Thorold, Ontario, Project Manager / Senior Environmental Planner. OLT Expert Witness – On-going, currently in JART Process: Managed the Natural Environment Studies and Joint Agency Review Process (JART) and First Nations Engagement as it relates to natural environment for this large aggregate Quarry project. Involved in impact assessment and design option development with the client and MHBC to advance a feasible development scenario and reduce project risk.
- ARA Pit Application, Tikal Pit Application. Project Director for Natural Environment, Archaeology, Traffic Noise, Air Quality, Water Resources and Stakeholder Engagement. supporting Class EA for the Disposition of Crown Land. CBM Aggregates, Puslinch, Ontario| Project Director/Manager / Senior Environmental Planner
- Duntroon Quarry Application Adaptive Management Plan (AMP), Walker Industries, Collingwood, Ontario, Environmental Planner.: Manager for the on-going implementation and revisions to the Duntroon quarry AMP including assessing impacts and supporting amendments to current ARA Site Plans and license.
- ARA Quarry Application, Simpson Lake Quarry, Project Director for ARA Site Plans, Natural Environment, Archaeology, Traffic, Public Engagement and supporting Class EA for the Disposition of Crown Land. Coloured Aggregates, Renfrew, Ontario| Project Director/Manager / Senior Environmental Planner.: Directed project disciplines and negotiation with Regulators to a successful Quarry Permit under the ARA.
- Level 2 Natural Environment Technical Report, Maaskant Property, Lavis Contracting Co. Ltd, Clinton, Ontario, Environmental Planner and Director
- Peer Review: Natural Environment Report for the Proposed Category 4 – Class A – Above Water Rockridge Quarry, County of Peterborough, Municipality of

Trent Lakes, Ontario, 2019, Senior Environmental Planner: Stantec was retained by the County of Peterborough to conduct peer reviews of various technical studies in support of an Aggregate Resources Act application for a proposed limestone quarry at 110 County Road, Highway 507 (Lot 21, Concession 8 Municipality of Trent Lakes, County of Peterborough). For this assignment, Daniel reviewed the Natural Environment Level 1 & Level 2 Technical Reports prepared by NEA Inc. (2018) and associated background studies.

- Olszowka Aggregate Pit Species at Risk Authorization, CBM Aggregates, Project Manager: Developed a detailed mitigation and Overall Benefit plan for Blanding's Turtle Species at Risk for authorization under the Endangered Species Act.
- Natural Environment Level 2 Technical Reports and Site Plans for Aggregate Pits S1, S4 and T2 , Greenstone Gold Mines, Geraldton, Ontario, Project Manager / Senior Environmental Planner: Managed and coordinated the preparation of three aggregate reports and associated site plans to support the development of the Greenstone Gold Mine in Geraldton Ontario.
- Dufferin Aggregates Acton Quarry Extension Natural Environment Studies, Dufferin Aggregates, Acton, Ontario, Canada, Natural Environment Manager: Coordinated natural environment baseline studies for terrestrial plant and wildlife species. These studies were used to define the extraction footprint and design mitigation strategies, including monitoring and adaptive management planning.
- Levels 1 & 2 Natural Environment Technical Report and Environmental Impact Study for Proposed Simpson Lake Quarry, Coloured Aggregates, Coloured Aggregates, Bancroft, Ontario, 2012-present, Environmental Planner.
- Peer Review: Natural Environment Level 1 and 2 Technical Report for Proposed Category 8 - Class B Quarry (Above Water) East Half Lot 1, Concession 3 (Geographic Township of Galway) Peterborough County, Ontario, 2011, Environmental Planner.
- Peer Review: Scoped EIS for Dewdney Mountain Farms Ltd. Severance Application B75-11, Lots 28-32, Concession 15, Township of Galway-Cavendish Harvey, County of Peterborough, Ontario, 2011, Environmental Planner.
- Levels 1 & 2 Natural Environment Technical Assessment Report, Proposed Bromberg Aggregate Application, CBM Aggregates, Township of North Dumfries, Ontario, 2013, Senior Environmental Planner: Coordinated preparation of Levels 1 & 2 Natural Environment Technical Assessment Report for the proposed Bromberg Pit. Served as an key Expert Witness at the Ontario Municipal Board (OMB).
- Level 2 Natural Environment Technical Assessment Report for Aggregate Expansion, Hillsburgh Pit, CBM Aggregates, Erin, Ontario, 2008, Environmental Planner, Project Manager.
- Adaptive Management Plan, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.
- Landscape and Ecosystem Restoration Plan, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.

- Level 2 Natural Environment Technical Report, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.
- Duntroon Quarry Application Adaptive Management Plan (AMP), Walker Industries, Collingwood, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environment Technical Assessment Report for Aggregate Application, Godfrey Extension, CBM Aggregates, Peterborough County, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environment Assessment, Holman Pit| Capital Paving , Guelph Eramosa Township, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environmental Technical Assessment Report for Proposed Olszowka Aggregate Application, CBM Aggregates, Brant County, Ontario, Project Manager: Managed natural environment studies for development of proposed 140 hectare pit proposed by CBM Aggregates in Brant County. Management included natural environment surveys including species at risk. In addition the project involved engaging in stakeholder consultation with both public and private sectors including the presentation of the project during public information sessions. Extensive MNRF consultation was undertaken in response to species at risk on site. An Overall Benefit plan was developed in consultation with the MNRF for an ESA Authorization application. Expert Witness Testimony at the OLT.
- Level 2 Natural Environmental and Aquatic Assessment - Aggregate Quarry Application, Federal White Cement, Oxford County, Ontario, Project Manager.
- Level 2 Natural Environment Technical Report, Spencer Pit, Tri City Lands Limited, Guelph, Ontario, Environmental Director.

PUBLICATIONS AND PRESENTATIONS

Unique Features of Environmental Management System/ISO-14001 Application to Linear Facilities. 7th International Symposium on Environmental Concerns in Right-of-Way Management, 2002

GWENDOLYN WEEKS, H.B.Sc.Env

Lead Ecologist and Project Manager

Areas of practice

Terrestrial Ecology

Vegetation and Wildlife

Impact Assessment

Permitting

Project Management

Languages

English

PROFILE

Gwendolyn has been providing ecological consulting services since 2004, with particular knowledge in the field of terrestrial ecology. Supported by her depth of experience, Gwendolyn thrives on anticipating and providing pro-active solutions for clients' needs as they navigate the natural environment approvals process. She is skilled at agency and community liaison, and prides herself on providing creative, efficient and positive outcomes for her clients.

Gwendolyn has authored numerous environmental impact statements, natural environment reports, species at risk studies, natural heritage assessments, and due diligence reports for a variety of sectors, including residential development, recreational development, aggregates, energy projects (transmission lines, pipelines and renewable energy), as well as for municipalities, and federal and provincial agencies. She has also provided terrestrial ecology peer review services.

Gwendolyn's expertise is founded on years of direct in-field experience, where she gained extensive skills in identifying and understanding the ecology of Ontario's flora, fauna, and plant communities. Gwendolyn is certified in both the Ministry of Natural Resources (MNR) Ecological Land Classification (ELC) and Ontario Wetland Evaluation System (OWES), as well as being an MNRF certified Butternut Health Assessor.

EDUCATION

B.Sc. Environmental Science (Hons), Major in Natural Resources Management, University of Guelph	2004

PROFESSIONAL DEVELOPMENT

Ecological Land Classification – MNR Certification	2004
Ontario Wetland Evaluation System – MNR Certification	2005
Butternut Health Assessor – MNR Certification	2011
Wetland Creation Course – Toronto Zoo	2010
Habitat Restoration Planning and Implementation - Northwest Environmental Training Centre	2014
Ontario Stream Assessment Protocol (OSAP) - Headwater Drainage Features – MNR Certification	2017

PROFESSIONAL ASSOCIATIONS

Field Botanists of Ontario, since 2006	FBO

CAREER

Lead Ecologist, Ontario Environment and Planning, WSP	2025 – Present
Senior Ecologist, Cambium Inc., Ottawa, ON	2024 – 2025
Lead Ecologist, Ontario Environment and Planning, Golder Associates Ltd. (WSP Acquisition), Ottawa, ON	2010 – 2023
Ecologist, Stantec Consulting Ltd., Guelph, ON	2004 - 2010

PROFESSIONAL EXPERIENCE

Construction Materials

- *PEMBROKE QUARRY, Renfrew, Ontario. Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a new limestone quarry operation. Work included discussions with the MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- RENFREW GOLF PIT, Renfrew, Ontario. Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a new sand pit operation. Work included scoping the detailed fiend investigations, discussions with the MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- GILBERT QUARRY EXTENSION, South Frontenac, Ontario. Prepared a Natural Environment Report for G. Tackaberry and Sons Construction Company Ltd.'s proposed Gilbert Quarry extraction area expansion within the licensed area of their existing quarry. Gwendolyn acted as the natural environment component lead.
- STITTSVILLE II QUARRY EXPANSION, Ottawa, Ontario. Prepared a Natural Environment Report for R.W. Tomlinson Ltd. according to the Aggregate Resources Act requirements for a limestone quarry expansion. Work included scoping the detailed field investigations, discussions with the City of Ottawa, MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Work included evaluation of wetlands according to the updated Ontario Wetland Evaluation System (OWES). Gwendolyn acted as the natural environment component lead.
- BANK STREET QUARRY EXTENSION, Ottawa, Ontario. Prepared a Natural Environment Level II report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a small limestone quarry expansion. Work included discussions with the MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- HIGHLAND LINE PIT, Lanark, Ontario. Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a new sand pit operation. Work included discussions with the DFO, MNR, and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- WEST CARLETON QUARRY EXPANSION, Ottawa, Ontario. Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a small limestone quarry expansion.

Work included discussions with the City of Ottawa, MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Gwendolyn acted as the natural environment component lead.

- NAVAN QUARRY EXPANSION, Ottawa, Ontario. Prepared a Natural Environment Level II report for Lafarge Canada Inc. according to the Aggregate Resources Act requirements for a limestone quarry expansion. Work included discussions with the City of Ottawa, MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- ARNOTT PIT, Lanark, Ontario. Prepared a Natural Environment Level II report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act requirements for a new aggregate pit operation. Work included discussions with the MNR and MECP, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- RIDEAU ROAD QUARRY EXPANSION, Ottawa, Ontario. Prepared a Natural Environment Level II report for R.W. Tomlinson Ltd. according to the Aggregate Resources Act requirements for a small limestone quarry expansion. Work included discussions with the MNR, field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Gwendolyn acted as the natural environment component lead.
- KENNEDY PIT, Ottawa, Ontario. Prepared a Natural Environment Level II report for Karson Aggregates according to the Aggregate Resources Act requirements for a new sand pit operation. Work included discussions with the MNR, designing and undertaking the field studies, and authoring the Natural Environment Report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Worked with the Mississippi Valley Conservation Authority to develop an environmental monitoring program. Gwendolyn acted as the natural environment component lead.
- MCMACHEN PIT SPECIES AT RISK, Rideau Lakes, Ontario. Designed and undertook a baseline study and mitigation plan for a sensitive species at risk on G. Tackaberry and Sons Construction Company Ltd.'s proposed aggregate pit expansion lands in accordance with O.Reg. 242/08 under the Endangered Species Act. Gwendolyn acted as the natural environment component lead, Lead Ecologist and project manager.

*Completed while employed at another organization.

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