REPORT

Natural Environment Level 1/2 Report

Proposed Port Colborne Quarry Pit 3 Expansion

Submitted to:

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Distribution List

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Port Colborne Quarries Inc. to complete hydrogeological, hydrological, natural environment, cultural heritage resources, blast impact, and noise studies to support the application of a new Category 2, Class A, Quarry Below Water, under the *Aggregate Resources Act* (ARA) for the property located on Part of Lots 18 & 19, Concession 2, and Plan 59R-16702, City of Port Colborne, Regional Municipality of Niagara, Ontario (the site) (Figure 1). The application is part of the proposed Pit 3 extension of the existing Port Colborne Quarry.

1.1 Purpose

This report specifically addresses the requirements of a Natural Environment Level 1 and Level 2 (NEL 1/2) Technical Report (Aggregate Resources of Ontario Provincial Standards, Section 2.2) that will accompany the application for a Category 2, Class A, Quarry Below Water. This report also meets the City of Port Colborne's (the City) and the Niagara Peninsula Conservation Authority's (NPCA) requirements for an Environmental Impact Statement (EIS).

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

Site (Figure 1; Figure 2) - the total land area within the property owned by Port Colborne Quarries Inc. that is proposed for licensing under the ARA. The site is approximately 106.29 hectares (ha).

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 71.1 ha. The Extraction Limit will be set back 30 metres (m) along roads, 15 m along property boundaries and 10 m from the deciduous swamp in the north end of the site.

Study Area (Figure 2) - The study area for the NEL 1/2 assessment is defined in the Aggregate Resources of Ontario Provincial Standards, Sections 2.2.3 and 2.2.4 as the site and surrounding 120 m. Because the predicted groundwater drawdown has a maximum extent of 1 km (Golder 2020), the study area was extended beyond 120 m to coincide with the estimated groundwater zone of influence.

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; and
- The rehabilitation potential of the site after extraction.

1.2 Site and Adjacent Lands

1.2.1 Site Description

The site is located directly east of the existing Port Colborne Quarry, between Second Concession Road to the north and Highway 3 to the south and extending approximately 400 m east of Carl Road (Figure 1) along Second Concession. The southern edge of the site extends 200 m east of Carl Road to Miller Road.

The majority of the site is covered by open agricultural field. There is deciduous swamp at the northern end of the site, and smaller areas of deciduous forest in the northeastern corner of the site. There are rural residential properties in the southwest and northeast corners of the site, and the Humberstone Speedway in the southeastern corner of the site. There are several surface water features on the site, including an unnamed

tributary that connects with a municipal drain, the East Wignell Drain (formerly known as the Mitchner Drain) in the northern and eastern portions of the site, a pond in the northeast corner, and three more ponds in the Humberstone Speedway in the southeast corner of the site (Figure 2).

1.2.2 Adjacent Lands

The existing Port Colborne Quarry is located immediately west of the site. Most of the study area is characterized by agricultural fields and rural residential properties. There are also areas of deciduous forest and deciduous swamp in the study area (Figure 2).

2.0 ENVIRONMENTAL POLICY CONTEXT

The proposed site is located in the City of Port Colborne (the City) and the Regional Municipality of Niagara (the Region). Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the proposed site and study area consisted of the following:

- ARA (Ontario 1990) and the Provincial Standards of Ontario – Category 2 – Class A Quarry Below Water (MNR 1997);
- Provincial Policy Statement (MMAH 2020);
- *Fisheries Act* (Canada 1985);
- *Migratory Birds Convention Act* (Canada 1994);
- *Species at Risk Act* (Canada 2002);
- *Endangered Species Act* (Ontario 2007);
- Growth Plan for the Greater Golden Horseshoe (MMAH 2017);
- City of Port Colborne Official Plan (2017);
- Regional Municipality of Niagara Official Plan (2014); and
- Niagara Peninsula Conservation Authority (NPCA) Reg. 155/06 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario 2006).

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 are required under the ARA Provincial Standards to prepare a Level 1 Natural Environment Technical Report and, where significant natural environment features occur on, or in proximity (i.e., within 120 m, or the estimated area of groundwater drawdown) to the proposed operation, a Level 2 Natural Environment Report is required. Significant natural heritage features are defined in the PPS (MMAH 2020) with guidance from supporting technical manuals prepared by the Ministry of Natural Resources and Forestry (MNRF) (MNR 2000; MNR 2010; MNRF 2015). A Level 2 Natural Environment Technical Report, identifying the particular features and functions of the designated natural environment feature(s), the nature of the potential negative impacts of the extractive operation, the proposed mitigation of those effects and the nature and magnitude of any residual effects is also required to satisfy the ARA Provincial Standards (MNR 1997). As well, the proposed rehabilitation of the

extraction area, and any particular prescriptions for that rehabilitation, are identified and discussed in the Level 1 and, if necessary, the Level 2 Natural Environment Technical Reports. For this project, the Level 1 and Level 2 reports have been combined into one comprehensive Natural Environment Level 1/2 Technical Report (NEL 1/2).

2.2 Provincial Policy Statement

The PPS was issued under Section 3 of *The Planning Act*. The natural heritage policies of the PPS (MMAH 2020) indicate that:

- 2.1.1 Natural features and areas shall be protected for the long-term;
- 2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features;
- 2.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas;
- 2.1.4 Development and site alteration shall not be permitted in:
    a) significant wetlands in Ecoregions 5E, 6E, and 7E; and
    b) significant coastal wetlands.
- 2.1.5 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 2.1.4(b).
- 2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements;
- 2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements; and
- 2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

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, as well as outlining associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities that cause harm to fish and outline the steps taken to address them.

2.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) (Canada 1994) prohibits the killing or capturing of migratory birds, as well as any damage, destruction, removal or disturbance of active nests. It also allows the Canadian government to pass and enforce regulations to protect various species of migratory birds, as well as their habitats. While Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific or agricultural purposes, or to prevent damage being caused by birds, it does not typically allow for permits in the case of industrial or construction activities.

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). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA). On private or provincially owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under SARA, 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 Environment, Conservation and Parks, species are added to the *Endangered Species Act* (ESA) which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or endangered. The Species at Risk in Ontario (SARO) List is contained in Ontario Regulation (O. Reg.) 230/08.

Subsection 9(1) of the ESA prohibits the killing, harming or harassing of species identified as ‘endangered’ or ‘threatened’ in the various schedules to the Act. Subsection 10(1) (a) of the ESA states that “*No person shall*

damage or destroy the habitat of a species that is listed on the SARO list as an endangered or threatened species".

General habitat protection is provided, by the ESA, to all threatened and endangered species. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. The ESA has a permitting and registration process where alterations to the habitat of protected species may be considered.

2.6 Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe was issued under *The Places to Grow Act* (MMAH 2019). The Growth Plan is intended, in coordination with other provincial plans, to establish a unique land use planning framework for the Greater Golder Horseshoe that supports the achievement of complete communities, a thriving economy, clean and healthy environment and social equity (MMAH 2019). A natural heritage system for the Greater Golder Horseshoe was developed and mapped under the Growth Plan in February 2018, which is intended to support planning for the protection of the region's natural heritage and biodiversity.

The site and study area are within the Prime Agricultural Area of the Growth Plan. Growth Plan policies require that new mineral aggregate operations within the Prime Agricultural Area be supported by an agricultural impact assessment, and where possible, maintain or improve connectivity of the Agricultural System. New mineral aggregate operations must also comply with the rehabilitation requirements outlined in Section 4.2.8 (4) of the Growth Plan (MMAH 2019).

2.7 City of Port Colborne

The site and majority of the study area are within the Agricultural land use area according to Schedule A (City-Wide Land Use) of the City's OP (Port Colborne 2017). The existing Port Colborne Quarry to the west of the site is designated as a Mineral Aggregate Operation land use area.

A deciduous swamp (SWD3-2) at the north end of the site, and a deciduous swamp off-site to the north of Second Concession Road (Figure 2), are designated as Environmental Conservation Areas, which include regionally significant ANSIs, non-provincially significant wetlands, significant wildlife habitat (SWH), significant woodlands, significant valleylands, habitats of species of concern and Environmental Corridors and Linkages. Permitted uses within Environmental Conservation Areas are generally restricted to existing uses, conservation uses, flood and erosion control, fish, forestry and wildlife management, and passive recreational. Completion of an EIS is required for new development proposals on lands within 50 m of an Environmental Conservation Area and must demonstrate there will be no adverse impacts on the surrounding features for the proposal to proceed.

The areas of deciduous swamp on the site and off-site within the study area are mapped more specifically as both significant woodlands and non-provincially significant wetlands according to Schedule B2 (Environmental Conservation Area) of the City's OP. Development or site alteration proposed within or adjacent to non-provincially significant wetlands must comply with Policies 4.3.2.1 (a and b) of the City's OP and demonstrate through an EIS there will be no adverse impacts to water quality or quantity. Development or site alteration proposed within or adjacent to significant woodlands must demonstrate through an EIS there will be no adverse impacts to the feature or its ecological function. A Tree Preservation Plan must also be prepared based on the results of the EIS.

The municipal drain in the eastern portion of the site, known as the East Wignell Drain (formerly Mitchner Drain), is mapped as fish habitat and is also designated as an Environmental Protection Area, which include Provincially

Significant Wetlands (PSW), provincially significant Areas of Natural and Scientific Interest (ANSI), habitat of threatened or endangered species and Natural Hazard Areas. Permitted uses within Environmental Protection Areas are generally restricted to forest, fish and wildlife management, small-scale passive recreational, and conservation and flood control projects. Development within or adjacent to fish habitat is only permitted in accordance with the federal *Fisheries Act*. In addition, a minimum vegetation protection buffer of 30 m is required adjacent to critical fish habitat (as defined by the MNRF), or 15 m from important or marginal fish habitat (as defined by the MNRF). Reduced buffers may be considered adjacent to important or marginal fish habitat where an EIS demonstrates there will be no harm to fish or fish habitat.

Where development is proposed adjacent to a municipal drain, a minimum buffer of 15 m is required (as measured from the stable top of bank) to provide access for drain maintenance. Reduced buffers may be considered where it is demonstrated there will be no significant negative impact to the maintenance or function of the drain, and to the satisfaction of the NPCA.

More specifically, the East Wignell Drain and riparian area are mapped as Natural Hazard Lands on Schedule B1 (Environmental Protection Area) of the City's OP. Development and site alteration is not permitted on hazardous sites (i.e., areas of unstable soil, organic soil or unstable bedrock) unless it is demonstrated through geotechnical studies that the development is feasible.

2.8 Regional Municipality of Niagara

According to Schedule A (Regional Structure) of the Region's OP (Niagara 2015), the site and study area are within the Good General Agriculture land use area.

The deciduous swamp (SWD3-2) at the north end of the site, and the deciduous swamp off-site to the north of Second Concession Road (Figure 2), are designated as Environmental Conservation Areas according to Schedule C (Core Natural Heritage) of the Region's OP. Environmental Conservation Areas include significant woodlands, significant valleylands, SWH, habitats of species of concern, regionally significant ANSIs, other evaluated wetlands, rare plant communities (i.e., savannah, tallgrass prairie and alvars), and publicly owned conservation lands. Online regional mapping does not provide more detailed mapping of these features.

Development or site alteration may be permitted within or adjacent to Environmental Conservation Areas where it is demonstrated through an EIS that over the long term there will be no significant adverse impacts to the feature or adjacent lands.

The East Wignell Drain on the site is mapped as a municipal drain and fish habitat. Development within or adjacent to fish habitat is only permitted in accordance with the federal *Fisheries Act*. Similar to the City's policies, minimum vegetation protection buffers of 30 m (adjacent to critical fish habitat) and 15 m (adjacent to important or marginal fish habitat) are required. Although reduced buffers may be considered where an EIS demonstrates there will be no harm to fish or fish habitat, the setback from critical fish habitat can never be less than 15 m.

2.9 Niagara Peninsula Conservation Authority

The study area is located within the jurisdiction of the NPCA. According to the NPCA (A. Parks., pers. comm. 2017), the deciduous swamps and municipal drain on the site are regulated features under O. Reg. 155/06. Because this project is under the purview of the ARA, permits from the NPCA will not be required.

3.0 DESCRIPTION OF PROPOSED DEVELOPMENT

The existing Port Colborne Quarry is bounded by Second Concession Road to the north, Highway 140 to the west, Main Street East (Highway 3) to the south, and 200 m west of Carl Road to Miller Road.

The proposed quarry expansion (i.e. site) is located to the east of the existing quarry and will be excavated to the same stratigraphic horizon, corresponding to the top of bluish-grey shale on the base of the adjacent quarry. This corresponds to a range of elevations from approximately 162 to 169 metres above sea level (masl). The proposed quarry consists of approximately 40 to 50 million tonnes of limestone resource within the extraction limits.

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:

- Natural Heritage Information Centre (NHIC) database, maintained by the MNRF (NHIC 2019);
- Land Information Ontario (LIO) geospatial data (MNRF 2019a);
- Species at Risk Public Registry (ECCC 2019);
- Species at Risk in Ontario (SARO) List (MNRF 2019b);
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Bat Conservation International (BCI) range maps (BCI 2019);
- Ontario Butterfly Atlas (Jones et al. 2019);
- eBird species maps (eBird 2019);
- MNRF LIO Aquatic Resources Area Layer (MNRF 2019d);
- MNRF Fish On-Line (MNRF 2019e);
- DFO Aquatic SAR Maps (DFO 2019);
- City of Port Colborne Official Plan (2017);
- Regional Municipality of Niagara Official Plan (2014);
- NPCA Watershed Explorer (NPCA 2019);
- Lake Erie North Shore Watershed Plan (NPCA 2010a);
- Natural Areas Inventory 2006-2009 (NPCA 2010b); and

- Aerial imagery.

To develop an understanding of the drainage patterns, ecological communities and potential natural heritage features that may be affected by the proposed aggregate development, MNRF 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), regionally significant or rare species, species designated under the ESA or SARA, and other natural heritage features within the study area.

4.2 Agency Consultation

An information request was submitted to the MNRF and NPCA on May 18, 2017, and responses were received on June 12, 2017 (NPCA) and March 27, 2018 (MNRF) (Appendix D). A terms of reference (TOR) was submitted to the Region on March 13, 2020 and subsequently approved on May 21, 2020. The email correspondence is presented in Appendix D.

4.3 SAR Screening

SAR considered for this report include 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.

In addition to the species-specific surveys, searches were conducted during all field surveys for suitable habitats and signs of all SAR. 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 SAR not already identified through the desktop screening was also assessed and recorded.

4.4 Field Surveys

The habitats and communities on the site and in limited locations within 500 m of the site, 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. 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. Field data is provided in Appendix E.

Table 1: Summary of Field Surveys Conducted within the Proposed Port Colborne Expansion Study Area, 2017-2020

Date	Type of Survey
2017	
April 24	Amphibian Habitat Assessment and Anuran Call Count (ACC) Survey, General Wildlife Survey
May 24	Breeding Bird Survey (BBS) #1, Ecological Land Classification (ELC), Botanical Inventory, General Wildlife Survey
June 13	BBS #2, ELC, Botanical Inventory, General Wildlife Survey
June 27	BBS #3, General Wildlife Survey
July 5 - 20	Bat Acoustic Survey (Stationary Detectors)
July 5	Bat Active Monitoring Survey
July 20	Bat Active Monitoring Survey
September 29	ELC, Botanical Inventory, General Wildlife Survey
November 10	Aquatic Habitat Assessment
2018	
June 21	BBS #1, ELC, Botanical Inventory, General Wildlife Survey
June 26	BBS #2, General Wildlife Survey
July 3	BBS #3, General Wildlife Survey
2019	
April 17	Aquatic Habitat Assessment, Turtle Visual Encounter Survey (VES) #1, General Wildlife Survey, Bat Habitat Assessment.
May 21	Turtle VES #2, General Wildlife Survey
May 27	Turtle VES #3, General Wildlife Survey
June 4	Turtle Nesting #1, General Wildlife Survey
June 7	BBS #1, Turtle VES #4, General Wildlife Survey
June 7 – July 3	Bat Acoustic Survey (Stationary Detectors)
June 12	BBS #2, Turtle VES #5, General Wildlife Survey
June 21	Turtle Nesting #2, General Wildlife Survey
July 3	BBS #3, ELC, Botanical Inventory, General Wildlife Survey
2020	
April 28	ACC Survey #1, Survey of Ecological Features of the Deciduous Swamp, General Wildlife Survey
May 19	Woodland Dripline Delineation and Staking (with the Region), ACC Survey #2, General Wildlife Survey
June 15	ACC Survey #3, General Wildlife Survey

4.4.1 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). Plant communities located off-site within the study area were assessed from roadside and aerial imagery. These inventories were carried out by systematically traversing the site and study area, where accessible, to ensure a thorough survey of species and communities. During the field surveys, information on dominant plant species and plant community structure and composition was recorded to better define and refine the plant community polygons. In addition, the boundaries of any wetlands identified on the site were delineated according to the Ontario Wetland Evaluation System (OWES) (MNR 2013). A full OWES evaluation was not completed.

A three-season botanical inventory was conducted within the naturally occurring plant communities on the site. 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 list of all plant species identified during all the field surveys was compiled.

4.4.2 Bat Survey

Field survey methods for the bat surveys were based on the MNRF guidance document, *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR 2011). (Figure 3).

4.4.2.1 Habitat Assessment

An assessment of potential suitable maternity roost habitat on the site was conducted for both natural communities (i.e., hedgerows and thicket) and anthropogenic features (i.e., buildings). Natural communities were assessed based on high-level plant community classification, snag density estimates, and average tree diameter (i.e., diameter at breast height [DBH]). Buildings were assessed from the exterior and interior (where possible and safe to access) for suitable roosting features such as presence of chimneys, loose boards, condition of soffits, and potential entrance/egress points.

4.4.2.2 Active Monitoring

Active monitoring surveys were conducted in the deciduous swamp (SWD3-2) at the northern end of the site (Figure 3). Surveys were conducted between one half hour before sunset and one hour after sunset (i.e., the time period when bats emerge from roosts). A survey transect was established that followed Carl Road through the deciduous swamp, along the southern edge of the swamp, and then into two open areas in the southern portion of the swamp. Two biologists walked along the survey transect and recorded bat activity with handheld Echo Meter Touch (EMT) detectors. Using the real-time sonogram display, the biologists distinguished between lower frequency bats, eastern red bat (*Lasiurus borealis*) and 40 kHz Myotis. The locations and time of detection of any 40 kHz Myotis bats was recorded along with behavioural observations and notes on habitat and proximity to potential roost trees. All bat recordings collected during active monitoring was analysed according to the methods described below in Section 4.4.2.4.

4.4.2.3 Acoustic Surveys

A single SM4BAT FS detector was deployed in the deciduous swamp (SWD3-2) in the northern portion of the site in 2017. The detector was positioned at the south end of the swamp along the edge of Carl Road (Figure 3). The detector functioned for 6 nights before the memory card became full.

A total of six passive full-spectrum SM3BAT bat detectors were deployed on the residential properties north of Highway 3 and on the Humberstone Speedway property in 2019 (Figure 3). The microphones were positioned to monitor the airspace in front of openings in buildings and cavity trees for the purpose of evaluating these features as SAR bat maternity roost habitat. A general description of the target habitat feature associated with each detector and details of the equipment set up are provided in Table 2. The detectors were programmed to record between a half hour before sunset and a half hour after sunset. The detectors recorded for a total of 12 nights in 2019, except for station 19BAT03 which recorded for only two nights before malfunctioning.

Table 2: Description of Passive Bat Detector Locations and Habitat

Detector	Target Habitat Feature	Description
17BAT01	Deciduous swamp	Microphone attached to a 2.5 m pole, along the edge of the swamp, facing east towards the agricultural field.
19BAT01	Building (Humberstone Speedway)	Microphone located 3.5 m above the ground, facing east towards the building.
19BAT02	Snack shack (Humberstone Speedway)	Microphone located 3.5 m above the ground, facing southeast towards the shack.
19BAT03	House and snag trees	Microphone located 2.5 m above the ground, facing south
19BAT04	House	Microphone located 4 m above the ground, facing northwest towards house
19BAT05	Snag tree	Microphone located 2.5 m above the ground, facing southeast
19BAT06	Shed	Microphone located 4 m above the ground, facing northwest towards shed

4.4.2.4 Data Analysis and Assessment

Acoustic data was filtered in Sonobat Data Wizard to remove noise files, and the high-grade noise scrubber setting was used. The data was analyzed and auto-classified using SonoBat 4.3.0 call analysis software (Sonobat, Arcata, CA, USA) with the north-northeast classifier for automated classification (Sonobat 2017). To identify calls to the species level, SonoBat measures numerous variables of call sequences (e.g. maximum frequency, minimum frequency, duration, and call slope; see Table 3). SonoBat regional classifiers are based on the most robust, species-confirmed full-spectrum reference library available, and also integrate quantitative machine learning with algorithms that incorporate more than two decades of expert acoustic classification (SonoBat 2018). 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 4.3.0 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 Myotis species since the listed species identified during this survey are also from the Myotis genus, as well as high-frequency calls not identified to the species level. For calls that were auto-classified to species by SonoBat but not reviewed, the SonoBat classification was accepted.

Bat passes cannot always be identified to species level. This can be due to either poor quality of the recording (i.e. high signal to noise ratio), or ambiguity of the call type. Some bat species have very similar calls and all bats have variability in their call repertoires. Some bat calls are quite diagnostic and can be confidently identified to species while other bat passes can only be identified to a Genus or to a group of species.

Table 3: Bat call analysis criteria used to inform Sonobat 4.3.0 Auto-classification or Manual Call Analysis

Bat Species or Group	Criteria* (values indicated are one standard deviation below and above each respective mean)
Bat	Calls with poor recording quality that hinders discrimination of other call characteristics
High-frequency bat	Broad band FM calls with a Lo f >35Khz but where poor recording quality hinders discrimination of other call characteristics
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 recording 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)
Silver-haired/big brown bat	Lo f 25-27 kHz, f_c 26-28 kHz, Hi f 42-51 kHz, upper 3.3-8.3, lower 0.7-2.7, dur 5.3-11
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 (SonoBat 2017).

Manual call analysis effort is presented in Table 4.

Table 4: Manual Call Analysis Effort

Detector	Percentage of Files Manually Reviewed		
	All Files	High Frequency Files	Low Frequency Files
17BAT01	784/5350 (14.7%)	324/324 (100%)	460/5026 (9.2%)
19BAT01	845/905 (93.4%)	736/736 (100%)	109/169 (64.5%)
19BAT02	104/179 (58.1%)	13/13 (100%)	91/166 (54.8%)
19BAT03	125/306 (40.9%)	29/29 (100%)	96/277 (34.7%)
19BAT04	138/267 (51.7%)	18/18 (100%)	120/249 (48.2%)
19BAT05	210/369 (56.9%)	10/10 (100%)	200/359 (55.7%)
19BAT06	232/570 (40.7%)	31/31 (100%)	201/539 (37.3%)
All Stations Combined	**2438/7946 (30.7%)**	**1161/1161 (100%)**	**1277/6785 (18.8%)**

4.4.3 Breeding Bird Surveys and Bobolink/Eastern Meadowlark Surveys

Breeding bird point count surveys for songbirds and other diurnal birds were conducted on the site and off-site, within the study area in 2017, 2018 and 2019 (Figure 3). Surveys followed protocols from the Canadian Breeding Bird Survey (Downes and Collins 2003) and the OBBA (Cadman et al. 2007). Point count stations were established in representative habitats on the site and were spaced a minimum of 250 m apart. Surveys were conducted between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird song. Each station consisted of a circle with a 100 m radius from the centre point (where the observer stands), and each point count was 10 minutes in duration, and was separated into survey windows of 0-3, 3-5, and 5-10 minutes. All birds seen or heard were noted on pre-printed datasheets and observations were made regarding sex, age and notable behaviour, when possible. Birds heard or seen outside of the 100 m radius were also noted using methods from the OBBA, including estimated distance (where possible).

In 2017, 14 stations were surveyed on the site and from roadside locations in the study area. In 2018 the site boundary was expanded and three additional stations were surveyed in the new area. A hayfield that was found to provide grassland bird habitat in 2017 was surveyed again in 2018. In 2019, the site boundary was further expanded to include the Humberstone Speedway and two residential properties north of Highway 3. Six additional survey stations focused on these new properties and on a newly established hay field on the site were surveyed in 2019.

At 11 stations (i.e. BBS04, BBS05, BBS06, BBS09, BBS12, BBS13, BBS18, BBS19, BBS20, BBS21 and BBS25) (Figure 3) where the habitat was potentially suitable for bobolink (*Dolichonyx oryzivorus*) and/or eastern meadowlark (*Sturnella magna*) breeding, a third round of surveys was conducted as per the draft *Survey Methodology under the Endangered Species Act, 2007:* Dolichonyx oryzivorus *(Bobolink)* (MNR 2007). At the remaining point count stations, two rounds of point count surveys were conducted in each year

4.4.4 Amphibian Habitat Assessment and Anuran Call Count Surveys

An assessment of surface water features on the site and in the study area was conducted to evaluate the suitability to support breeding amphibians, specifically frogs and toads. In particular, the size, water depth and water permanency of surface water features was evaluated.

One round of anuran (frog and toad) call count surveys was conducted at 12 stations in the study area in 2017, and three rounds of anuran call count surveys were conducted at 12 stations in the study area in 2020. Of the 12 stations surveyed in 2020, 11 were the same as 2017. One survey station from 2017 (i.e. ACC05) was not surveyed due to habitat unsuitability and traffic concerns, and one new survey location (i.e. ACC13) was added. Survey stations are shown on (Figure 3).

Surveys followed the methods outlined in the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (BSC 2009). Surveys were conducted between 30 minutes after sunset and 22:00 under favourable weather conditions. Each survey consisted of a semi-circular plot with a 100 m radius from the centre point (where the observer stands), and each point count was 3 minutes in duration. All anurans heard were noted on pre-printed datasheets. Anurans heard outside of the 100 m semi-circular plot area were also noted. Abundance measures were recorded using the call level code and abundance count methods described in the protocol. Anuran surveys use three call level codes to categorize the intensity of calling activity as a measure of calling abundance. Level code 1, individuals can be counted, calls not simultaneous; level code 2, calls distinguishable, some simultaneous calling; level code 3, full chorus, calls continuous and overlapping.

4.4.5 Turtle Surveys

4.4.5.1 Visual Encounter (Basking) Surveys

Turtle Visual Encounter Surveys (VES) were conducted at each of the four ponds on the site (Figure 3) and were based on the methods outlined in the *Occurrence Survey Protocol for Blanding's Turtle* (Emydoidea blandingii) *in Ontario* (MNR 2013). The perimeter of the pond shoreline and other potential basking sites were scanned for basking turtles using binoculars or a spotting scope from several vantage points. The surveyor began the survey from a distance to avoid disturbing turtles (which can cause turtles to move below the water surface and reduce detectability) before slowly moving closer. The surveyor wore polarized sunglasses to allow a clear view under the water. Surveys were conducted between mid-morning and late afternoon on clear days with a calm to light wind to encompass the period of maximum sun exposure.

4.4.5.2 Nesting Surveys

Nesting surveys were based on the methods outlined in the *Occurrence Survey Protocol for Blanding's Turtle* (Emydoidea blandingii) *in Ontario* (MNR 2013). Surveys were conducted between 7 and 10 pm on evenings in the month of June, which is the core nesting season in southern Ontario. Areas of potentially suitable nesting habitat (e.g., sandy or gravelly areas) in proximity to the ponds on the site (Figure 3) were surveyed for evidence of nesting. Nesting evidence may include observations of turtles actively building nests, predated nests, nest mounds, or turtle tracks. Each area was surveyed twice per evening, approximately one hour apart. High powered flashlights were used to scan the areas for evidence of nesting. The areas were approached cautiously to reduce the risk of disturbing nesting turtles.

Nesting survey areas included the following:

- The area of gravel and crushed asphalt southwest of ponds 1 and 2;
- The western property boundary of the Humberstone Speedway to the south of pond 3;

- The area of semi-crushed gravel southeast of pond 3;
- The gravel road shoulders along Highway 3 south of Humberstone Speedway, and along Second Concession north of pond 4; and
- The residential driveway and forest edge west and north of pond 4.

4.4.6 Fish and Fish Habitat Survey

Golder completed a qualitative fish habitat assessment of the East Wignell Drain (formerly Mitchner Drain) in 2017. Two additional reaches of the East Wignell Drain were assessed in 2019 in the area of the new expanded site. Golder used internal Technical Procedures 8.5.1 -Watercourse Mapping System to complete the work (Golder 2005 unpublished document) based on previous habitat mapping methods of Hamilton and Bergerse (1984), Hawkins et al (1993) and Roper and Scarnecchia (1995).

The following data were collected in the East Wignell Drain:

- habitat mapping including key habitat features (e.g., riffles, pools, woody debris, undercut banks, boulder clusters), groundwater seepage areas, depth, substrate types, bank stability and soil types and in-water cover;
- In-situ water quality parameters including dissolved oxygen, temperature, pH, and electrical conductivity, observations of water colour and clarity;
- riparian vegetation and in-stream aquatic vegetation;
- critical habitat areas (e.g., potential spawning areas, deep water holding habitat), existing infrastructure (i.e., culverts, road crossings) and potential pollution point sources; and
- georeferenced photographs, and GPS locations of fish observations.

Surface water features located off-site within the study area including the West Wignell Drain and the Beaverdam Drain were not surveyed.

4.4.7 General Wildlife Survey

General wildlife surveys included track and sign surveys, area searches, and incidental observations, concurrent with all other field surveys. The full range of habitats across the site were searched, with special attention paid 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, butterflies, and dragonflies) seen and identified were recorded. When encountered, tracks and other signs (e.g. 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.

Visual encounter surveys for reptiles and amphibians, as well as reptile and amphibian habitat (with a focus on SAR) were conducted on the site. All suitable habitats for reptiles and amphibians were searched (e.g., flipping logs and other types of cover objects, observations in piles of rocks) and all reptiles and amphibians observed were identified and recorded.

4.4.8 Woodland Dripline Delineation

The boundary of the significant woodland was staked in the field in coordination with the Region.

4.5 Analysis of Significance and Sensitivity and Impact Assessment

An assessment was conducted to determine if any significant environmental features or SAR exist, or have moderate or high potential to exist, in the study area and assess whether the proposed extraction would negatively impact surrounding significant natural heritage features or SAR. Preventative, mitigative and remedial measures were considered in assessing the net effects of the proposed extraction operation on the surrounding ecosystem.

5.0 EXISTING CONDITIONS

5.1 Ecosystem Setting and Regional Context

The study area is located in Ecoregion 7E (Lake Erie-Lake Ontario), which covers approximately 2% of southern Ontario. Ecoregion 7E, also known as the Carolinian Forest zone, is underlain by limestone bedrock and is generally flat. Most substrates are calcareous mineral materials dominated by Gray Brown Luvisols and Gleysols. Approximately 78% of Ecoregion 7E is used for cropland or pasture, and another 7% is developed. Deciduous and mixed forest covers just over 12% of the ecoregion (Crins et al. 2009).

The study area is located in the Lake Erie North watershed, and the Lake Erie Northshore- Wignell Drain subwatershed. Approximately 20% of the watershed is forested (NPCA 2010).

5.2 Hydrogeology

The study area is located in the Haldimand Clay Plain physiographic region, which is comprised of shallow overburden overlying dolostone bedrock (Chapman and Putnam 1984). Topography in the study area is generally flat.

There is inward groundwater flow to the existing quarry which is dewatered. On the proposed extension there is a general westward direction of flow toward Pit #3. According to calculations the dewatering zone of influence (ZOI) was interpreted to range from 700 m to 1,000 m (1 km) from the site boundary. At the maximum distance of 1 km, groundwater level drawdown is expected to be less than 10 cm and is considered minimal.

A more detailed discussion of hydrogeologic resources is provided in a separate report, entitled Hydrogeological Assessment Level 1 / 2 Water Resources Study (Golder 2020a).

5.3 Surface Water Resources

There are five surface water features on the site: East Wignell Drain (formerly Mitchner Drain) and four ponds. According to LIO mapping, the East Wignell Drain originates in the southeast corner of the deciduous swamp (SWD3-2) in the northern portion of the site and drains southwards along the eastern portion of the site (Figure 3). It is Golder's understanding that the City is planning to realign the East Wignell Drain around the eastern boundary of the site and that a separate study will be undertaken by the City to assess the impacts of the realignment on the aquatic and fish habitat of this Drain. Currently, the East Wignell Drain flows beneath Main Street East via a culvert at the southeast corner of the site and continues flowing southwards approximately 2.2 km before converging with the Wignell Drain off-site (Figure 1).

Ponds 1, 2 and 3, located at the north end of the Humberstone Speedway property (Figure 3), are anthropogenic (man-made) and are not hydrologically connected to other surface water features or to each other.

Pond 1 is rectangular in shape and is approximately 0.16 ha in size. The depth of pond 1 was not measured but appeared to be at least 2 m deep and no shallow areas were observed. No emergent, submergent or floating aquatic vegetation was observed. Riparian vegetation was dominated by reed canary grass and substrates at the shoreline was clay.

Pond 2 is rectangular in shape and is approximately 0.12 ha in size. The depth of pond 2 was not measured but appeared to be at least 2 m deep and no shallow areas were observed. No emergent, submergent or floating aquatic vegetation was observed. Riparian vegetation was dominated by reed canary grass and substrates at the shoreline was clay.

Pond 3 consisted of two areas of open water separated by a narrow upland berm. A small opening in the berm provided a hydrologic connection between the two areas of open water. Pond three is approximately 0.25 ha. The maximum depth of pond 1 could not be determined, but it consisted of variable depths, with shallow areas observed in the south end and along the shores, and deeper areas observed in the north an in areas further from shore. Riparian vegetation consisted of red-osier dogwood, green ash, pussy willow and reed canary grass. Shallow areas contained unidentified submergent and emergent aquatic vegetation including flowering rush (*Butomus umbellatus*). The substrate at the shore was clay.

Pond 4 is located on the residential property south of Second Concession Road and east of the deciduous swamp (SWD3-2). It is anthropogenic and is hydrologically isolated from other surface water features. It is irregular in shape, contains a small island, and is approximately 0.55 ha in size. The riparian habitat consisted of manicured turf grass, as well as reed canary grass and sedges (*Carex* spp.). The maximum depth could not be determined, but it consisted of variable depths with shallow areas along the shores. The substrates at the shoreline was clay.

Off-site, within the study area (Figure 1), there are additional surface water features including:

- West Wignell Drain - extends from the active quarry to the west of the site and flows southwest approximately 2.5 km before converging with the East Wignell Drain. It then continues south approximately 2 km and drains into Lake Erie;
- Beaverdam Drain West Branch – originates along Miller Road approximately 250 m north of the site and flows eastward approximately 1 km to drain into the main branch of Beaverdam Drain. The drain then flows southwards approximately 4 km to drain into the Beaver Dam Creek Complex PSW south of the study area;
- Several small, isolated ponds in the northern portion of the study area;
- A small, isolated pond on an agricultural property approximately 100 m south of the site;
- A series of large holding ponds in the northeast corner of the study area, west of White Road; and
- Quarry ponds created through aggregate excavation on the active Port Colborne Quarry west of the site.

A more detailed discussion of surface water resources is provided in a separate report, entitled Hydrological Assessment in Support of the Aggregate Resources Act Application for the Port Colborne Quarry Expansion, Port Colborne Ontario (Golder 2020b).

5.4 Vegetation

5.4.1 Regional Setting

The study area is located in the Deciduous Forest Region and the Niagara subregion (Rowe 1972). This region is dominated by deciduous forest cover, with the most common association consisting of sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) together with basswood (*Tilia americana*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*), and bur oak (*Quercus macrocarpa)*. Other common species include butternut (*Juglans cinerea*), bitternut hickory (*Carya cordiformis*), rock elm (*Ulmus thomasii*), silver maple (*Acer saccharinum*) and blue-beech (*Carpinus caroliniana*). There is poor representation of coniferous species, which occur as scattered individuals, and may include eastern white pine (*Pinus strobus*) and eastern white cedar (*Thuja occidentalis*) (Rowe 1972).

This subregion also contains the main distribution of Carolinian species in Canada, including black walnut (*Juglans nigra*), sycamore (*Platanus occidentalis*), swamp white oak (*Quercus bicolor*) and shagbark hickory (*Carya ovata*), as well as scattered representations of tulip tree (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), chinquapin oak (*Quercus muehlenbergii*), pin oak (*Quercus palustris*), blue ash (*Fraxinus quadrangulata*), cucumber tree (*Magnolia acuminata*), red mulberry (*Morus rubra*), and sassafras (*Sassafras albidum*) (Rowe 1972).

5.4.2 Plant Communities

Six ELC community types were identified on the site, in addition to anthropogenic communities such as residential and agricultural. Additional ELC community types were identified off-site, within the study area, and generally consist of agricultural fields, deciduous forest and swamp, extraction areas and rural residential properties. The ELC communities on the site and within the study area are shown on Figure 2. The ELC communities on the site are described briefly in Table 5.

Table 5: Plant Communities on the Proposed Port Colborne Quarry Expansion Site

ELC Community	Field Description	SRANK[a]
Forest		
FOD7 Fresh - Moist Lowland Deciduous Forest	This plant community is located east of the deciduous swamp (SWD3-2) and south of Second Concession Road. It is an immature lowland deciduous forest dominated by trembling aspen (*Populus tremuloides*) and containing green ash (*Fraxinus pennsylvanica*) and silver maple (*Acer saccharinum*). This plant community contained low wet inclusions dominated by red-osier dogwood (*Cornus sericea*) and pussy willow (*Salix discolor*).	n/a
FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This plant community is located southeast of the deciduous swamp (SWD3-2) and south of Second Concession Road. It is an immature green ash dominated deciduous forest containing low wet areas dominated by red-osier dogwood and pussy willow.	S5
FOM9 Scot's Pine - Conifer - Green Ash Mixed Forest	This plant community is located east of the speedway racetrack and west of the East Wignell Drain. The canopy is dominated by scots pine (Pinus sylvestris). The canopy also contained green ash, silver maple, white pine and white spruce. The understory and ground cover layers are dominated by invasive species including, common buckthorn (*Rhamnus cathartica*), European common reed (*Phragmites australis* subsp. *australis*), and Japanese knotweed (*Reynoutria japonica*).	n/a

Wetland / Aquatic		
SWD3-2 Silver Maple Mineral Deciduous Swamp	This plant community is located at the north end of the site, and south of Second Concession Road. See section 5.4.2.1 for description and details.	S5
OAO Open Water Aquatic	Three ponds are located north of the speedway racetrack. These ponds are anthropogenic in origin. They are largely unvegetated.	n/a
Meadow		
CUM1-1 Old Field Cultural Meadow	This plant community is located south of Second Concession Road in the northeast part of the site. It contains a mix of terrestrial forbs and grasses including Canada goldenrod (*Solidago canadensis*), Fuller's teasel (*Dipsacus fullonum*) and reed canary grass (*Phalaris arundinaceae*).	n/a
Anthropogenic		
CBL4 Recreational	The Humberstone Speedway is located in the southeast part of the site and contains buildings, a racetrack, and disturbed old field habitat.	n/a
CVR4 Rural Residential	Two rural residential properties are located in the southwest part of the site north of Highway 3. One rural residential property is located in the northeast part of the site south of Second Concession Road. These properties consist of buildings, manicured areas, and mature trees.	n/a
OAGM1 Open Agriculture annual row crops	Annual row crop agriculture was present on site east of Carl Road and in an area west of Carl Road south of the deciduous swamp.	n/a
OAGM2 Open Agricultural perennial cover crop	A large area of the agricultural land on the site west of Carl Road was planted as hay in 2019.	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 2019). 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., FOD).

5.4.2.1 Deciduous Swamp Characterization

The silver maple deciduous swamp (SWD3-2) located at the north end of the site (Figure 2) is designated as a significant woodland (Port Colborne 2017) and a provincially non-significant wetland (NHIC 2019). In addition to the ELC and botanical inventory, details on the ecological features and functions were collected for this community.

The canopy of the silver maple deciduous swamp contained a diverse assemblage of trees including pin oak (*Quercus palustris*), chinquapin oak (*Quercus muehlenbergii*), swamp white oak (*Quercus bicolor*), shagbark hickory (*Carya ovata*), bur oak, and red maple. The understory was dominated by spicebush (*Lindera benzoin*). Ground cover contained a diverse assemblage of graminoids and forbs including fringed sedge (*Carex crinita*) and jewelweed (*Impatiens capensis*).

The soil texture in the community was assessed to be clay. Ephemeral pools were observed throughout the community. The majority of trees in the swamp were 10-25 cm in diameter and approximately 16 m tall. Larger oaks and maples with diameters of approximately 80 to 90 m, and with heights greater than 20 m, were observed scattered throughout the community. No evidence of ground water discharge (seeps, springs, iron precipitates) were observed during field surveys.

Invasive plant species including garlic mustard (*Alliaria petiolata*), common buckthorn, multiflora rose (*Rosa multiflora*), Tartarian honeysuckle (*Lonicera tatarica*), and Fuller's teasel were observed in the community but were concentrated along the edges and along Carl Road, which bisects the community. The interior habitat within the swamp was dominated by native plant species.

Carl Road bisects the swamp into east and west blocks. This raised anthropogenic landform prevents the surface water from freely flowing between the two blocks. The linear disturbance also provides opportunities for invasive plants to infiltrate the swamp interior and may increase predation pressure on wildlife from domestic animals (cats and dogs) as well as opportunistic wild predators and scavengers that benefit from anthropogenic disturbance such as coyotes or raccoons.

In the south end of the deciduous swamp, green ash (*Fraxinus pennsylvanica*) trees once made up a significant percentage of the canopy. Many of these trees have died due to infestation from emerald ash borer (*Agrilus planipennis*). As a result, openings in the canopy have been created in the south end of the deciduous swamp which has increased solar penetration and resulted in a drying of the surface soils. The drying provides opportunities for non-wetland plants to infiltrate the swamp. Evidence of selective logging was also observed in this area, which has had the effect of further opening up the canopy.

Despite the presence of invasive plant species and localized anthropogenic disturbance, the deciduous swamp is a healthy plant community, with large areas of undisturbed native vegetation. It provides wildlife habitat and contributes to the biodiversity of the study area and larger region.

5.4.3 Vascular Plants

A total of 154 vascular plant species were identified during the botanical, and other, surveys completed on the site (Appendix A). Of these, 66% are native species and 30% are non-native species. The remaining 4% were unable to be identified to the species level due to plant condition (i.e., browsed).

Significant and Sensitive Species

All of the plant species identified through the botanical, or during other, surveys are secure and common, widespread and abundant in Ontario and globally (S4 or S5; G5) or are unranked alien species (SNA; GNR).

The MNRF identified records for three plant SAR in the vicinity of the study area: common hoptree (*Ptelea trifoliata*), eastern flowering dogwood (*Cornus florida*) and Shumard oak (*Quercus shumardii*) (A. Parks, pers. comm. 2018). The NPCA also identified records for four SAR or rare plants in the vicinity of the study area: eastern flowering dogwood, pin oak (*Quercus palustris*), halberd-leaved tearthumb (*Persicaria arifolia*) and pale false mannagrass (*Torreyochloa pallida*) (A. Parks., pers. comm. 2017). However, since the time of the information request, pin oak and pale false mannagrass are no longer considered rare in Ontario and has been assigned a provincial rarity rank of S4 (apparently secure – uncommon but not rare) by the NHIC (NHIC 2019). As such, neither species is discussed further in this report. None of the other SAR or rare plant species identified by MNRF or NPCA were observed during the field surveys. However, halberd-leaved tearthumb was assessed to have moderate potential to occur off-site, within the study area, based on the availability of potential suitable habitat.

Halberd-leaved tearthumb, ranked S3 (vulnerable), grows in a variety of moist habitats including moist woodlands, swamps and thickets (Oldham and Brinker 2009). Although the deciduous swamp (SWD3-2) on the site (Figure 2) may provide suitable habitat, no individuals were observed during field surveys. Other deciduous swamps off-site, within the study area, may provide suitable growing habitat.

Two of the plant species observed during field surveys are considered regionally rare (NPCA 2010b): tamarack (*Larix laricina*) and necklace sedge (*Carex projecta*). None of the plant SAR identified in the desktop SAR screening as having ranges which overlap the study area were found during the botanical, or other, field surveys (Appendix B).

Tamarack was observed on the residential property at 1645 Second Concession Road located east of the deciduous swamp (SWD3-2) (Figure 2). Although tamarack is considered a regionally rare species, the individuals observed on the site are in close proximity to a house and are likely planted specimens rather than a naturally occurring population with regional rarity status. No further analysis is warranted. Necklace sedge was observed in the deciduous swamp (SWD3-2) located on site.

Halberd-leaved tearthumb and nnecklace sedge are discussed further in Section 6.7.

5.5 Wildlife

5.5.1 Bats

5.5.1.1 Habitat Assessment

Based on the habitat assessment, two natural features and four anthropogenic structures on the site were assessed to have potential to provide suitable maternity roost habitat for bats designated endangered under the ESA, including tri-colored bat (*Perimyotis subflavus*), little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*) (Table 6).

Table 6: Description of Bat Maternity Roost Habitat Features on the Proposed Port Colborne Site

Feature	Description of Suitable Habitat
Deciduous Swamp (SWD3-2)	A high density of large diameter (i.e., greater than 30 cm DBH) trees or snags with cavities, peeling bark, or leaf clumps / squirrel nests.
Main Building (Humberstone Speedway)	A large building with several openings in the soffit providing access to the attic.
Snack shack (Humberstone Speedway)	An old building with several openings that may provide entry/exit points for bats.
1326 Highway 3. House (west side) and cavity tree.	An old house with several entry/exit points. Resident indicated that bats have previously roosted in the house. There is a large maple tree adjacent to the house with several cavities that may also provide roosting potential.
1252 Highway 3. Cavity tree on residential lawn.	A large cavity tree on a residential property.
1252 Highway 3. Shed on residential lawn.	A small wooden shed with several openings that may provide entry/exit points for bats.

Little brown myotis will roost in both natural and man-made structures including building. Natural roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas (ECCC 2018). Northern myotis usually roosts 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 as well as on anthropogenic structures (ECCC 2018). 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 (ECCC 2018).

Eastern small-footed myotis (*Myotis leibii*), also designated endangered under the ESA, is not known to roost within 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 and occasionally inhabits buildings (Humphrey 2017). No suitable roosting habitat for eastern small-footed myotis was observed on the site.

Off-site, within the study area, there are additional anthropogenic structures, areas of deciduous forest and swamp, and rock piles or exposed bedrock cracks that may provide suitable maternity roost habitat for these four SAR bat species.

5.5.1.2 Active Monitoring

Minimal bat activity was detected visually or by the EMTs during the first 45 minutes of active monitoring. Bat activity that was recorded by the EMTs during this period was weak and incomplete, indicating the calls were coming from a distance. Bat activity increased during the second half of active monitoring and activity was recorded along the entire survey transect. Activity levels and the quality of calls detected by the EMTs were highest along the southern portion of the survey transect, which included the southern edge of the deciduous swamp (SWD3-2) adjacent to the open agricultural fields (Figure 3).

Bat activity is often highest at the forest edge, or other large forest openings, where many bats congregate to forage in the open air space. Activity recorded at forest edges may also include commuting bats. Based on the sonogram display of the EMTs, bat species recorded during the active monitoring included big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), red bat (*Lasiurus borealis*) and silver-haired bat (*Lasionycteris noctivagans*).

5.5.1.3 Acoustic Survey

Four bat species were identified during the acoustic surveys (stationary detectors): hoary bat, silver-haired bat, big brown bat and red bat. Additional bat passes were identified as unknown myotis species, high frequency unknown species, low frequency unknown species and big brown bat or silver-haired bat passes. Unknown myotis species and high frequency unknown species can both be indicative of potential SAR bat species. High frequency calls may include tricolored bat, little brown myotis, eastern small-footed myotis and northern myotis, while unknown myotis species may include calls of little brown myotis, eastern small-footed myotis and northern myotis.

The mean bat passes per night with standard deviation for all bat species at the stationary detectors is included in Table 7. The total and maximum number of passes of potential SAR bat species is provided in Table 8.

Table 7: Mean (Standard Deviation) Bat Passes per Night at Acoustic Monitoring Stations from July 5-20, 2017 and June 7-18, 2019[1]

Detector[2]	Year of Survey	# of Nights Surveyed	Total Passes per Night (all bats)	Bat Species or Species Group									
				HiF total[3]	LoF total[3]	LoF Unknown Species[4]	HiF Unknown Species[5]	Hoary Bat	Silver-haired Bat	Big Brown Bat	Eastern Red Bat	Big Brown or Silver-haired Bat	Unknown Myotis
17BAT01	2017	6*	891.67(585.8)	54(18.06)	837.67(593.44)	73.67(33.88)	7(8.05)	30(7.1)	0(0)	725.83(568.48)	47(19.02)	8.17(5.46)	0(0)
19BAT01	2019	12	75.42(49.87)	61.33(43.78)	14.08(9.67)	2.92(3.4)	14.67(12.67)	2.33(2.02)	1.25(1.42)	5.17(3.49)	46.67(35.27)	2.42(2.35)	0(0)
19BAT02	2019	12	14.92(10.11)	1.08(1)	13.83(10.12)	4.25(3.39)	0.17(0.39)	3.42(2.57)	2.17(2.69)	2.83(3.64)	0.92(0.79)	1.17(1.34)	0(0)
19BAT03	2019	2**	153(15.56)	14.5(7.78)	138.5(7.78)	16.5(6.36)	1.5(0.71)	1(1.41)	1.5(2.12)	97(2.83)	10(7.07)	22.5(7.78)	3(0)
19BAT04	2019	12	22.25(22.41)	1.5(1.78)	20.83(20.91)	3.08(2.97)	0.75(1.22)	1.92(1.56)	2.5(3.8)	7.92(8.01)	0.75(0.97)	5.33(7.83)	0(0)
19BAT05	2019	12	30.75(30.6)	0.83(1.03)	29.92(29.96)	6(5.38)	0(0)	5.17(5.46)	1.58(1.78)	9.58(11.13)	0.83(1.03)	7.58(11.58)	0(0)
19BAT06	2019	12	47.5(64.68)	2.58(2.78)	44.92(62.76)	9.5(11.95)	1.08(1.56)	3.83(3.56)	2.58(2.15)	25(44.83)	1.5(1.62)	4(6.25)	0(0)

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

[2] - Station 17BAT01 surveyed in 2017; Stations 19BAT01-19BAT06 surveyed in 2019

[3] - HiF = High Frequency; LoF = Low Frequency

[4] - 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

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

* - This detector recorded for six nights before the memory card became full.

** - This detector recorded for only two nights before malfunctioning.

Table 8: Total Passes and Maximum Passes within One Night for SAR Bats at Acoustic Monitoring Stations June 5-20, 2017 and June 7 – 18, 2019[1]

Detector[2]	Bat Species or Call Frequency Type			
	Total Unknown HiF[1]	Max Unknown HiF[1]	Total Myotis Species	Max Myotis Species
17BAT01	42	22	0	0
19BAT01	176	46	0	0
19BAT02	2	1	0	0
19BAT03	3	2	6	3
19BAT04	9	4	0	0
19BAT05	0	0	0	0
19BAT06	13	5	0	0

[1] - HiF = High Frequency; LoF = Low Frequency

[2] - Station 17BAT01 surveyed in 2017; Stations 19BAT01-19BAT06 surveyed in 2019

Bat activity at Detector 17BAT01 (Figure 3) was very high for a site in southern Ontario, with mean bat activity of approximately 891 passes per night, and a total of 5,350 bat passes over the entire six-night monitoring period. The vast majority of bat passes (81%) were classified as big brown myotis (*Eptesicus fuscus*). Approximately 5% (282) of passes were classified as eastern red bat (*Lasiurus borealis*), 3% (180) were hoary bat (*Lasiurus cinereus*), and 0.9% (49 passes) were classified as big brown bat or silver-haired bat. An additional 8% (442) of bat passes were classified as low frequency unknown, and 0.8% (42 passes) were classified as high-frequency unknown species.

The four SAR bat species in Ontario, and eastern red bat, all produce a high-frequency call. Based on the absence of confirmed SAR myotis or tri-colored bat passes at Detector 17BAT01, and the fact that there were several eastern red bat passes (Table 7), it can be inferred that the high-frequency unknown bat passes recorded at Detector 17BAT01 (Table 8) were most likely produced by eastern red bats.

The detectors at the Humberston Speedway and at two residential properties north of Highway 3 (Figure 3) recorded a relatively moderate to high level of bat activity for a site in southern Ontario, with mean bat activity ranging from approximately 14 passes per night at detector 19BAT02 to 153 passes per night at detector 19BAT03. The most frequently recorded bat species included (in order) big brown bat (800 passes), eastern red bat (628 passes), hoary bat (202 passes), and silver-haired bat (*Lasionycteris noctivagans*) (124 passes). There were also a large number (1760 passes) of low frequency unknown species passes, as well as 291 passes classified as big brown bat / silver-haired bat. There were 13 passes of high frequency unknown species and six passes identified as unknown myotis species (Table 8), which may be attributable to SAR bats. All six unknown myotis species passes were recorded at detector 19BAT03.

Detector 19BAT03 was deployed on the west side of an old house where a large cavity tree was located. Another detector (19BAT04) was deployed on the east side of the same house approximately 25 m from detector 19BAT03. No SAR bat passes were recorded at detector 19BAT04. Six unknown myotis species passes were recorded at 19BAT03. The detection times of these six unknown myotis species passes were reviewed and there were no detections with the first hour of sunset at the time when bats typically exit their roosts. The earliest detection was recorded at 23:27 on June 7, 2019. The other five unknown myotis species passes were recorded after midnight, including three passes within a 49-second period at 01:22 on June 8, 2019. Although the data for detector 19BAT03 was limited to two nights due to a malfunction, based on the very low number of SAR bat passes, the absence of detections around dusk (defined as 0.5 hr before sunset to 1 hr after sunset) when bats are exiting roosts, and the absence of SAR bat passes at the adjacent detector 19BAT04, the features monitored (the house and cavity tree) it is unlikely that the bats are roosting in the house, and the house was assessed as having low potential as roosting habitat for SAR bats. The unknown myotis bats recorded at 19BAT03 were likely commuting or feeding at the time that they were recorded.

The number of bat passages recorded by a detector may include multiple passes by the same bat individual and therefore are only indicative of presence/absence, rather than the number of bats that are potentially using the study area.

Significant and Sensitive Species

The four bat species observed during the acoustic surveys are secure and common in Ontario (S4). One species (big brown bat) is secure and common globally (G5), while three species (eastern red bat, hoary bat, and silver-haired bat) are considered vulnerable to apparently secure globally (G3G4) (Appendix C).

NPCA identified four bat SAR with potential to occur in the vicinity of the study area: little brown myotis, northern myotis, tri-colored bat and eastern small-footed myotis (A. Parks., pers. comm. 2017). All four of these bat species are designated as endangered under the ESA. No bat SAR bat passes that could be classified to the species level were recorded during the field surveys. Six SAR bat passes were classified to the genus level as unknown myotis species. Although some passes classified as high frequency unknown species (which may be attributable any of these four SAR bats) were recorded, these were determined to have low potential to belong to SAR bats based on the assessment. Based on the low number of SAR bat passes and the absence of SAR bat passes during the roost emergence period (dusk), Therefore, the potential for little brown myotis, northern myotis, eastern small-footed myotis and tri-colored bat roosting habitat to be present on the site was assessed to be low.

Little brown myotis, northern myotis, eastern small-footed myotis and tri-colored bat are discussed further in Section 6.1.2.

5.5.2 Birds

A total of 66 bird species were observed during breeding bird, or other, surveys conducted on the site and in the study area (Appendix C). Species observed include a mixture of grassland breeding birds such as field sparrow (*Spizella pusilla*), grasshopper sparrow (*Ammodramus savannarum*), and vesper sparrow (*Pooecetes gramineus*) and birds that prefer open or successional woodland habitat or woodland edges, such as chestnut-sided warbler (*Setophaga pensylvanica*), eastern phoebe (*Sayornis phoebe*), indigo bunting (*Passerina cyanea*) and orchard oriole (*Icterus spurius*).

Significant and Sensitive Species

All of the bird species have provincial rarity rankings of S4 (apparently secure), S5 (secure) or SNA (not applicable – species is not a target for conservation). All bird species also have a global rarity ranking of G5 (very common).

Based on the results of the agency information request, the MNRF (A. Parks, pers. comm. 2018) identified two bird SAR with potential to occur in the vicinity of the study area: bobolink and bald eagle (*Haliaeetus leucocephalus*). The NPCA (A. Parks, pers. comm. 2017) identified five bird SAR with potential to occur in the vicinity of the study area: barn swallow (*Hirundo rustica*), bobolink, eastern meadowlark, eastern wood-pewee (*Contopus virens*) and wood thrush (*Hylocichla mustelina*). Five of these SAR were observed during field surveys: barn swallow, bobolink, eastern meadowlark, eastern wood-pewee, and wood thrush. Two additional bird species observed during field surveys are designated under the ESA: bank swallow (*Riparia riparia*), and grasshopper sparrow.

Two other bird SAR were assessed to have moderate potential to occur off-site, within the study area, based on the presence of potential suitable habitat (Appendix B): common nighthawk (*Chordeiles minor*) and chimney swift (*Chaetura pelagica*).

Bank swallow, designated threatened under the ESA, breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods (Garrison 1999). Bank swallow was observed flying over the agricultural fields on the site during field surveys in 2018 and 2019. There is no potential suitable nesting habitat on the site. Off-site, within the study area, the aggregate pits to the west of the site may contain stockpiles that provide suitable nesting habitat (Figure 2). However, no nesting sites or breeding colonies were confirmed during the field surveys.

Barn swallow, designated threatened under the ESA, 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 right-of-ways, and wetlands (COSEWIC 2011). Barn swallow was observed on the site and in the study area during field surveys in 2017, 2018 and 2019. In April 2019 a barn swallow nest from a previous year was observed in the eastern portion of the site, in a trailer at the north end of the raceway property (Figure 2, 3). The nest was monitored on subsequent field surveys throughout the spring and summer of 2019 and it was determined that the nest was not active in 2019. By July 2019, the unoccupied nest had fallen to the floor of the trailer. No other barn swallow nests were observed on the site during field surveys.

Bobolink, designated threatened under the ESA, 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 and have low tolerance for presence of woody vegetation (Renfrew et al. 2015). Bobolink was observed on the site and within the study area during field surveys in 2017 and 2019. In 2018, bobolink was observed in the study area to the east of the site only but was not observed on site. Bobolink was observed in all of the agricultural fields on site located to the west of Carl Road (Figure 2, 3), as well as other agricultural fields off-site in the southern and eastern portions of the study area, including the field (OAGM1) east and west of Miller Road and the agricultural fields south of Main Street East at Miller Road (Figure 2, 3). Based on the current crop rotation on the site as observed in 2019, only the hay pasture in the western portion of the site was assessed to provide suitable habitat for bobolink.

Common nighthawk, designated special concern under the ESA, 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). Open habitat on the site is primarily actively farmed and is not likely to provide preferred nesting habitat conditions for common nighthawk. Off-site, within the study area, open habitats may provide suitable nesting habitat.

Chimney swift, designated threatened under the ESA, most commonly breed in chimneys, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007). No suitable habitat was identified on site during field surveys. There is potential for chimneys within the study area that may provide suitable nesting/roosting habitat.

Eastern meadowlark, designated threatened under the ESA, 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 2003). Eastern meadowlark was observed on the site and within the study area during field surveys 2017, 2018 and 2019. Eastern meadowlark was observed in all three agricultural fields on the site (Figure 2, 3), as well as agricultural fields off-site in the southern portion of the study area, including the hay field immediately west of the site, and the agricultural fields south of Main Street East at Miller Road (Figure 2). Based on the current crop rotation on the site as observed in 2019, only the hay pasture in the western portion of the site was assessed to provide suitable habitat for eastern meadowlark.

Eastern wood-pewee, designated special concern under the ESA, 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. This species also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods (COSEWIC 2012a). Eastern wood-pewee was observed both on the site and within the study area during field surveys in 2017. It was observed in the deciduous swamp (SWD3-2) in the northern portion of the site, as well as in several deciduous forest/swamp units off-site within the study area, including the deciduous forest (FOD2) and deciduous swamp (SWD3) north of Killaly St E (approximately 535 m

south of the site), the deciduous swamp/forest (SWD/FOD) east of Miller Road (approximately 700 m southeast of the site), and both swamp/forest (SWD/FOD) units north of Second Concession Road (immediately north of the site) (Figure 2).

Grasshopper sparrow, designated special concern under the ESA, breeds in medium to large grasslands with low herbaceous cover and few shrubs. This species also occurs in a wide variety of agricultural fields including cereal crops and pastures (COSEWIC 2013). Grasshopper sparrow was observed on site in 2017, 2018 and 2019 in the hay fields west of Carl Road (Figure 2).

Wood thrush, designated special concern under the ESA, 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 (COSEWIC 2012). Wood thrush was observed both on the site and within the study area during field surveys in 2017. It was observed within the deciduous swamp (SWD3-2) in the northern portion of the site, and also in the large deciduous swamp/forest (SWD/FOD) east of Miller Road, approximately 700 m southeast of the site (Figure 2).

Bank swallow, barn swallow, bobolink, chimney swift and eastern meadowlark are discussed further in Section 6.1.1. Common nighthawk, eastern wood-pewee, grasshopper sparrow and wood thrush are discussed further in Section 6.7.

5.5.3 Amphibians

Six amphibian species were observed during anuran call count surveys and general wildlife surveys conducted in the study area (Appendix C).

Three species were observed during the anuran call count surveys conducted in 2017. Spring peeper (*Pseudacris crucifer*) was the most frequently observed species during the surveys, followed by western chorus frog (*Pseudacris triseriata*) and American toad (*Anaxyrus americanus*). Green frog and northern leopard frog were also observed in pond 4 (Figure 3) during general wildlife surveys and turtle surveys in 2019, and American bullfrog was observed visually and auditorily at pond 3 (Figure 3) during general wildlife surveys and turtle surveys conducted in 2019.

Six species were observed during the anuran call count surveys conducted in 2020: spring peeper, western chorus frog, American toad, northern leopard frog (*Lithobates pipiens*), green frog (*Lithobates clamitans*), and American bullfrog (*Lithobates catesbeianus*). American bullfrog was observed at three locations: pond 3 located at the Speedway (ACC06), south of Highway 3 calling from an anthropogenic farm pond (ACC07), and north of Second Concession Road calling from a large pond associated with a residential property (Figure 3). Of these three locations, only pond 3 is located on the site within the extraction area.

Significant and Sensitive Species

All of the amphibian species are secure and common, widespread and abundant in Ontario and globally (S4 or S5; G5). American bullfrog is considered regionally significant (Yagi et al. 2009).

None of the amphibian SAR species with ranges that overlap the study area (Appendix B) were observed during field surveys.

5.5.4 Turtles

Two turtle species were observed during the turtle, or other, surveys conducted on the site: snapping turtle (*Chelydra serpentina*) and painted turtle (*Chrysemys picta marginata*).

A single snapping turtle was observed in pond 1 during turtle VES on May 21, 2019. No other turtles were observed during turtle VES.

One dead painted turtle was observed at the edge of the site on the southern shoulder of Second Concession Road, just east of the intersection with Carl Road during a turtle nesting survey conducted on June 21, 2019. The turtle had been killed by a vehicle. During the same turtle nesting survey, possible evidence of turtle nesting was observed along the side of the northern shoulder of Second Concession Road approximately 290 m east of Carl Road. Approximately eight shallow holes dug into the gravel shoulder of the road were observed. No turtle egg fragments were observed in these holes, which suggests that these may have been aborted turtle nesting attempts, or predated nests where all eggs or egg fragments were removed. Alternatively, the holes may have been dug by nest predators (i.e. racoon, red fox) in failed attempts to predate turtle nests. No evidence of turtle nesting was observed around the racetrack in the southeast portion of the site (Figure 3) and it was determined that the substrates in the majority of that area were too compact for turtle nesting.

Significant and Sensitive Species

Painted turtle is considered secure and common in Ontario and globally (S4; G5T5).

Snapping turtle is designated S3 (vulnerable) in Ontario but is considered secure and common globally (G5) (Appendix B). Snapping turtle is also designated special concern under the ESA. 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). Based on the field surveys, pond 1 appears to provide suitable aquatic habitat to support snapping turtle.

None of the other turtle SAR with ranges that overlap the study area (Appendix B) were observed during field surveys. Snapping turtle is discussed further in Section 6.7.

5.5.5 Fish and Fish Habitat

5.5.5.1 Fish Habitat

The reach of East Wignell Drain (formerly Mitchner Drain) extending from Highway 3 north approximately 1 km to the eastern edge of the site is considered Important Fish Habitat (Type 2) by the NPCA (A. Parks, pers. comm. 2017). A portion of the Important Fish Habitat overlaps the southeastern corner of the site (Figure 1). The remaining surface water features on the site or in the study area were not identified as Important Fish Habitat as part of the information request.

During the fish habitat assessment, all reaches of East Wignell Drain on the site were surveyed. The East Wignell Drain originates as a ditch with intermittent flow and a north-south orientation along the east side of Carl Road in the area of the deciduous swamp (SWD3-2) (WC1) (Figure 3). During periods of high flow, the drain receives surface water input from the adjacent deciduous swamp east of Carl Road, as well as from portions of the swamp west of Carl Road. Carl Road prevents surface water flow between the two sections of deciduous swamp for much of its length. However, during the November 2017 survey, which was conducted at a time of moderate water levels, surface water was observed flowing across the surface of Carl Road from west to east and entering

the north-south ditch in an area located approximately 310 m south of Second Concession Road. Measurements were taken at a location 240 m south of Second Concession Road, which are representative of the surveyed reach: bankfull width 3 m, bankfull depth 0.5 m, wetted width 2 m, wetted depth 0.1 m. Riparian vegetation was dominated by silver maple and reed canary grass (*Phalaris arundinacea*). No barriers to fish passage and no evidence of groundwater discharge were observed. Although overall habitat potential for fish in this reach was considered to be low, fish may enter this reach during periods of high flow, and this reach likely contributes to the quality of downstream fish habitat.

At the southern end of the deciduous swamp, East Wignell Drain changes course and flows to the east though a straight ditch that separates the eastern half of the deciduous swamp from an agricultural field to the south (WC2) (Figure 3). In addition to the inflow from WC1, WC2 also receives intermittent inflow through a culvert under Carl Road at the location where East Wignell Drain changes course (the interface between WC1 And WC2). Although no flow through this culvert was observed during the survey conducted in November 2017, it likely conveys water from a part of the swamp west of Carl Road into WC2 during times of high flow. Although WC2 is deeper and conveys larger volumes of water for longer periods of time than WC1, the flow is intermittent, ceasing to flow during dryer times of the year. Measurements were taken at a location 140 m east of Carl Road, which are representative of the surveyed reach: bankfull width 5 m, bankfull depth 1 m, wetted width 2.5 m, wetted depth 0.2 m. The riparian vegetation consisted primarily of silver maple and reed canary grass. No evidence of groundwater discharge was observed. Although overall habitat potential for fish in this reach was considered to be low, fish may enter this reach during periods of high flow, and this reach likely contributes to the quality of downstream fish habitat.

WC2 is separated from the downstream reaches of East Wignell Drain by twin circular culverts (1m diameter) under a small private agricultural roadway at the south east corner of the deciduous swamp (Figure 3). The culvert is positioned near bankfull height of the downstream end of WC2. At the time of the survey in November 2017, the water level in WC2 was below the culvert level and no flow was observed though the culvert. At the time of the April 2019 survey, water levels were higher, and flow was observed from WC2 through the culvert to the downstream reaches. Because of the culvert's elevated position, WC1 and WC2 are only connected to the downstream reaches during periods of high flow such as during the spring freshet and after large precipitation events. For the majority of the year, WC1 And WC2 collect surface water from the deciduous swamps which pool in the ditches and are isolated from the downstream reaches of East Wignell Drain.

A ditch was also observed along the southern edge of the deciduous swamp west of Carl Road (Figure 3). The ditch collects surface water that drains from the deciduous swamp. It is not connected to WC1 or WC2, or to any other surface water features.

Reach 3 (referred to as the North Channel) begins downstream of the twin culverts and was surveyed in April 2019 when flows were high. In contrast to the straightened ditches upstream (WC1 and WC2), the North Channel is characterized by a natural meandering course that flows to the southeast. It flows through a post agricultural field (CUM1-1) and past the lowland deciduous forest (FOD7-2). At the time of the survey, the water level was very high and had flooded the banks along this reach. This reach may cease to flow and temporarily dry up during periods of low flow. Measurements were taken at a location approximately 150 m downstream of the twin culverts, which were representative of the surveyed reach: bankfull width 4 m, bankfull depth 0.4 m, wetted width 4 m, wetted depth 0.4 m. Substrates in this reach consisted of clay and small amounts of organic detritus. The riparian vegetation consisted primarily of pussy willow (*Salix discolor*), which provided overhanging cover in several areas along the North Channel. The banks of this reach were mostly stable with the exception of minor

erosion observed just downstream of the twin culverts. No evidence of groundwater discharge was observed and no barriers to fish were observed in this reach. At the time of the survey the water was turbid, and the following water quality parameters were recorded: temperature = 14.65°C, pH= 6.93, DO= 7.6, and specific conductivity = 0.196 mS/cm. Overall habitat potential for fish in this reach was considered moderate, as it likely provides habitat for fish during at least part of the year. This reach also contributes to the quality of the downstream fish habitat.

At the downstream end of the North Channel, East Wignell Drain flows off-site in a southeast direction through early successional forest (Figure 3). The channel then becomes straightened and flows past agricultural fields (pasture and annual row crop) east of the site. This off-site reach of East Wignell Drain was not surveyed.

Downstream of this off-site reach, East Wignell Drain re-enters the site at the northeast corner of the Humberstone Speedway property (Figure 3). Reach 4 (referred to as the South Channel) extends from the point of re-entry to where it exits the site at a culvert under Highway 3, was surveyed in April 2019. Similar to WC1 and WC2, the channel morphology of this reach has been constructed to divert surface water from agricultural fields. However, the morphology of the South Channel was not straight and was characterized by a broad arc flowing to the southeast before curving into a south-southwest orientation. It flows past annual row crop agricultural fields to the east and cultural meadow (CUM1-1), open disturbed Speedway lands and mixed forest (FOM9) to the west. This reach receives intermittent surface water inflow from the west through agricultural tiling at a location approximately 225 m north of Highway 3. Approximately 420 m north of Highway 3, the South Channel flows through a circular culvert with a 2 m diameter. This reach appeared to have permanent flow but may cease to flow and temporarily dry up during periods of very low flow. Measurements were taken at a location 215 m upstream of Highway 3, which was representative of the surveyed reach: bankfull width 7 m, bankfull depth 1 m, wetted width 5 m, wetted depth 0.45 m. Substrates in this reach consisted of organic muck and clay. The riparian vegetation consisted primarily of red-osier dogwood, pussy willow, and green ash. Overhanging woody riparian vegetation along both banks was observed along most of the length of this reach. Although the banks were stable along most of this reach, erosion of the west bank was observed approximately 475 m north of Highway 3. No evidence of groundwater discharge was observed and no barriers to fish were observed in this reach. At the time of the survey the water was turbid, and the following water quality parameters were recorded: temperature = 12.45°C, pH = 6.99, DO = 8.2, specific conductivity = 0.192 mS/cm. Overall habitat potential for fish in this reach was considered high, as it likely provides habitat for warmwater fish species during at least part of the year. This reach also contributes to the quality of the downstream fish habitat.

The ponds located on the site do not meet the definition of fish habitat under the Fisheries Act because they are anthropogenic in origin and are isolated for other surface water features. However, if fish are present in these ponds a fish salvage program will be required prior to dewatering. See Section 8.2 for details.

5.5.5.2 Fish

No fish were observed in East Wignell Drain (formerly Mitchner Drain) during field surveys. Although the ponds on the site are all isolated from other surface water features, it is possible that fish could have become established by way of bird drop or intentional release by people. However, no fish were observed in any of the four ponds during field surveys.

According to NPCA (A. Parks, pers. comm. 2017) and available MNRF data (MNRF 2019d), there is no fisheries data for any of the three municipal drains within the study area (i.e. East Wignell Drain, West Wignell Drain or

Beaverdam Drain). However, MNRF data indicates that the thermal regime for all three municipal drains is warmwater (MNRF 2019d).

All three municipal drains are connected to Lake Erie to the south of the study area. Depending on the presence of fish barriers (e.g., perched culverts, dams) and the characterization of fish habitat (e.g., water permanency, depth and flow, substrates, etc.) in the municipal drains between the site and Lake Erie, they may support some of the warmwater fish species known to characterize Lake Erie. Lake Erie is known to support species such as bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), common carp (*Cyprinus carpio*), pumpkinseed (*Lepomis gibbosus*), largemouth bass (*Micropterus salmoides*), rock bass (*Ambloplites rupestris*), and smallmouth bass (*Micropterus dolomieu*) (MNRF 2019e). Although Lake Erie has been historically stocked with lake trout (*Salvelinus namaycush*) and rainbow trout (*Oncorhynchus mykiss*), these species are unlikely to be found in the municipal drains because they are coldwater species (MNRF 2019e).

Significant and Sensitive Species

None of the fish SAR with ranges that overlap the study area were observed during field surveys or have records of occurrence within the study area based on the background review (Appendix B).

5.5.6 Other Wildlife

Three arthropods, one snake species, and two mammal species (other than bats) were observed during field surveys conducted in the study area (Appendix C): black swallowtail (*Papilio polyxenes*), monarch (*Danaus plexippus*), red admiral (*Vanessa atalanta*) eastern gartersnake (*Thamnophis sirtalis*), muskrat (*Ondatra zibethicus*) and white-tailed deer (*Odocoileus virginianus*).

Significant and Sensitive Species

All but one of the wildlife species observed are secure and common in Ontario and globally (S5; G5) (Appendix C). Monarch is designated S2N, S4B (non-breeding population imperiled and breeding population apparently secure) in Ontario and is considered secure and common globally (G5). Monarch is also designated special concern under the ESA.

As part of the information request, NPCA identified three wildlife SAR with potential to occur in the vicinity of the study area: eastern hog-nosed snake (*Heterodon platirhinos*), gray fox (*Urocyon cinereoargenteus*), and monarch (A. Parks, pers. comm. 2017). One of these species was observed within the study area during field surveys: monarch.

No other wildlife SAR with ranges that overlap the study area (Appendix B) were observed during field surveys. One mammal SAR, woodland vole (*Microtus pinetorum*), was assessed to have moderate potential to occur off-site, within the study area, based on the availability of potential suitable habitat.

Monarch is found wherever there are milkweed (*Asclepius* 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 (COSEWIC 2010). Monarch was observed in the eastern portion of the site near pond 4, and off-site within the southeast portion of the study area during field surveys. Common milkweed (*Asclepias syriaca*), the preferred host plant of monarch, was also identified on the site and within the study area during the field surveys. Monarch is discussed further in Section 6.7.

Woodland vole, designated special concern under the ESA, is associated with mature deciduous forests with soft, often sandy soils and a deep litter and humic layer, suitable for burrowing. This species is often found at woodland

edges near roads, railway tracks and field edges (COSEWIC 2010). Woodland vole is also considered a rare species in Ontario, and is ranked as S3? (vulnerable; "?" denotes an inexact rank). No individuals or evidence of burrows were observed during field surveys. Off-site, within the study area, deciduous forests may provide suitable habitat (Figure 2). Woodland vole is discussed further in Section 6.7.

6.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES

This section assesses the natural heritage features and functions (as outlined in Section 2.0) located within the study area. The following sources were used during the assessment of features:

- Natural Heritage Reference Manual (NHRM; MNR 2010);
- Significant Wildlife Habitat Technical Guide (SWHTG; MNR 2000);
- Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF 2014); and
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015).

6.1 Habitat of Endangered or Threatened Species

General habitat protection is provided by the ESA to all threatened and endangered species. General habitat is defined as the area on which a species depends directly or indirectly to carry out life processes, including reproduction, rearing, hibernation, migration or feeding. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. A habitat regulation outlines specific habitat features and associated buffers that are protected, and also specifies the geographic area(s) of the province where the habitat regulation applies. In some cases, a General Habitat Description (GHD) may also be prepared to help define and refine the area of protected habitat in advance of a habitat regulation.

Four species designated threatened under the ESA were observed on the site or within the study area during field surveys: bank swallow, barn swallow, bobolink and eastern meadowlark.

Five additional species designated threatened or endangered were assessed to have moderate potential to occur within the study area based on the availability of suitable habitat: chimney swift (*Chaetura pelagica*), eastern small-footed myotis, little brown myotis, northern myotis and tri-colored bat.

6.1.1 Birds

Bank Swallow

The draft bank swallow GHD (MNRF 2015b) defines habitat by three categories:

- **Category 1** - the breeding colony, including burrows and substrate around them;
- **Category 2** - the area within 50 m of the colony bank face (to allow entry/exit); and
- **Category 3** - the area of suitable foraging habitat within 500 m of the outer edge of the colony.

Although bank swallow was observed flying over the agricultural fields on the site, no breeding colonies or potentially suitable nesting habitat was identified on the site during field surveys. Off-site, in the eastern portion of the study area, stockpiles in the adjacent Port Colborne Quarry may provide suitable nesting habitat. However, no

breeding colonies were confirmed within the study area. The agricultural fields (OAGM1, OAGM2) and ponds on the site (Figure 3), as well as agricultural fields in the study area, may provide suitable foraging habitat for bank swallow that may be nesting in the area. Because bank swallow was observed on the site and there is potential for nesting habitat within the study area, bank swallow is carried forward to the impact analysis (Section 7.1.1).

Barn Swallow

The barn swallow GHD (MNR 2013a) defines habitat by three categories:

- **Category 1** – nest;
- **Category 2** - the area within 5 m of the nest (representing area by the male); and
- **Category 3** - the area between 5 m and 200 m of the nest (i.e., foraging habitat).

Barn swallow was observed flying over the site during field surveys, and a single barn swallow nest was observed in a structure in the eastern portion of the site in April 2019. However, the nest was determined to be inactive in 2019 and had fallen to the ground by the end of the breeding season. Although there was no active barn swallow nesting observed on the site, structures off-site in the study area may provide suitable nesting habitat. The open meadows (CUM1), agricultural fields (OAGM1, OAGM2), and ponds on the site (Figure 3), as well as agricultural fields in the study area, may also provide suitable foraging habitat for barn swallow.

Because there is no active nesting habitat on the site, and suitable foraging habitat within the study area will not be altered, barn swallow is not expected to be impacted by minimal removal of foraging habitat on the site. Foraging habitat is not limited in the study area and the proposed Project is not expected to impact the ability of barn swallow to forage. Further analysis is not warranted.

Bobolink

The GHD (MNR 2013b) for bobolink defines habitat by three 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 approximate defended territory; and
- **Category 3** - the area of continuous suitable habitat between 60 m and 300 m of the nest, or centre of approximate defended territory.

Bobolink was observed during field surveys and was confirmed breeding in the hay field (OAGM2) on the site (Figure 3). Because bobolink was observed using suitable habitat on the site during the breeding season, it is carried forward to the impact analysis (Section 7.1.1).

Chimney Swift

Chimney swift, designated threatened under the ESA, was assessed to have a moderate potential to occur off-site, within the study area.

The GHD (MNR 2013d) for chimney swift defines habitat by one category:

- **Category 1** – human-made nest/roost, or a natural nest/roost cavity and the area within 90 m of the natural cavity.

No natural or human-made nests or roosts were identified on the site. There is potential that chimneys or large diameter cavity trees may occur within the study area that could provide suitable nesting or roosting habitat. Because there is potential suitable habitat within the study area, chimney swift is carried forward to the impact analysis (Section 7.1.1).

Eastern Meadowlark

The GHD (MNR 2013c) for eastern meadowlark defines habitat by three 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 approximate defended territory; and
- **Category 3** - the area of continuous suitable habitat between 100 m and 300 m of the nest, or centre of approximate defended territory.

Eastern meadowlark was observed during field surveys and confirmed breeding in the hay field (OAGM2) on the site (Figure 3). Because eastern meadowlark was observed using suitable habitat on the site during the breeding season, it is carried forward to the impact analysis (Section 7.1.1).

6.1.2 Bats

There is no habitat regulation or GHD for little brown myotis, northern myotis, tri-colored bat or eastern small-footed myotis and all four species receive general habitat protection under the ESA.

Based on the results of the field surveys, there is low potential for SAR bats to roost on the site. Off-site, within the study area, little brown myotis, northern myotis, tri-colored bat and eastern small-footed myotis were assessed to have moderate potential to occur due to the presence of potential suitable habitats. Because there is potential suitable maternity roost habitat off-site, in the study area, little brown myotis, northern myotis, tri-colored bat and eastern small-footed myotis are carried forward to the impact analysis (Section 7.1.2).

6.2 Fish Habitat

East Wignell Drain (formerly Mitchner Drain) on the site is mapped as fish habitat according to both the Town and Region OPs, and it is further characterized as Important Fish Habitat (Type 2) by the NPCA (A. Parks, pers. comm. 2017).

The ponds on site are isolated features that have no connection to any other surface water feature. No fish were observed in any of the ponds during field surveys, nor are they hydrologically connected to any fish-bearing waterbody. However, it is possible that these ponds have been colonized by fish via bird drop or deliberate release by humans.

Off-site, within the study area, there are anthropogenic ponds to the west of the site. However, these are constructed features associated with aggregate extraction and are unlikely to contain fish, nor are they hydrologically connected to any fish-bearing waterbody.

As described in Section 2.0, development within or adjacent to fish habitat is only permitted in accordance with the federal *Fisheries Act*. The City requires a minimum vegetation protection buffer of 30 m from critical fish habitat and 15 m from important or marginal fish habitat. Reduced buffers may be considered adjacent to important or marginal fish habitat where an EIS demonstrates there will be no harm to fish or fish habitat (Port Colborne 2017). Where development is proposed adjacent to a municipal drain, a minimum buffer of 15 m is

required to provide access for drain maintenance. Reduced buffers may be considered where it is demonstrated there will be no significant negative impact to the maintenance or function of the drain, and to the satisfaction of the NPCA (Port Colborne 2017).

Because there is fish habitat on the site and within the study area it is carried forward to the impact analysis (Section 7.2).

6.3 Significant Wetlands

Significant wetlands are areas identified as provincially significant by the MNRF using evaluation procedures established by the Province, as amended from time to time (MMAH 2014). Wetlands are assessed based on a range of criteria, including biology, hydrology, societal value and special features (MNRF 2018f).

There are no significant wetlands on the site. Off-site, within the study area, the Beaver Dam Creek Wetland Complex PSW overlaps the southeastern corner of the study area (corresponding to ELC communities SWD/FOD and SWD3), approximately 315 m south of the site (Figure 2). There are also areas of an evaluated, non-significant wetland known as the Upper Wignell Drain Wetland Complex that overlap the northern portion of the site (corresponding to ELC community SWD3-2) and study area (corresponding to two ELC communities SWD/FOD north of 2nd Concession) (Figure 2).

Development or site alteration is not permitted within PSWs. According to both City and Regional policies, an EIS that demonstrates there will be no negative impacts to the feature or its function is only required for development or site alteration proposed within 120 m. However, because the Beaver Dam Creek Wetland Complex PSW is within the groundwater drawdown ZOI, potential impacts to the feature must still be considered under the policies of the ARA.

Development or site alteration proposed within or adjacent to non-provincially significant wetlands (i.e., the Upper Wignell Drain Wetland Complex) must demonstrate through an EIS there will be no adverse impacts to water quality or quantity. Evaluated, non-significant wetlands are considered an Environmental Conservation Area under the Region's OP. Development or site alteration may be permitted within or adjacent to Environmental Conservation Areas where it is demonstrated through an EIS that over the long term there will be no significant adverse impacts to the feature or adjacent lands.

Both the Beaver Dam Creek Wetland Complex PSW and the evaluated, non-significant Upper Wignell Drain Wetland Complex are carried forward to the impact assessment (Section 7.4).

6.4 Significant Woodlands

Woodlands can vary in their level of significance at the local, regional and provincial levels. Significant woodlands are an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its 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 2020). Where local municipalities have not defined or mapped significant woodlands, these features are to be identified using criteria established by the MNRF as included in the NHRM for Policy 2.3 of the PPS (MNR 2010).

The City has mapped municipally-designated significant woodlands on Schedule B2 of their OP (Port Colborne 2017). Significant woodlands are classified as an Environmental Conservation Area by the Region and may be included in the OP mapping for this designation. Although the Region does not provide specific mapping of

significant woodland features, it defines significant woodlands as woodlands meeting one or more of the following criteria:

- Contains threatened or endangered species, or species of concern (i.e., special concern under the ESA or as designated by COSEWIC, or that is ranked S1-S3 by NHIC);
- Is 2 ha or larger within or overlapping Urban Area Boundaries, or 10 ha or larger outside of Urban Areas and south of the Niagara Escarpment;
- Contains interior habitat;
- Contains old growth forest and is 2 ha or greater in size;
- Overlaps or contains one or more other significant natural heritage features; and
- Abuts or is crossed by a watercourse or waterbody and is 2 ha or greater in size.

Woodlands within the study area determined to be significant based on municipal, regional or provincial criteria are listed in Table 9.

Table 9: Significant Woodlands within the Proposed Port Colborne Study Area

Woodland Feature	Significant		
	City of Port Colborne [1]	Region of Niagara[2]	Province of Ontario[3]
Site			
WD1 - Deciduous swamp (SWD3-2) in the northern portion of the site	Yes	Yes (size, interior habitat, contains other natural heritage features, abuts a watercourse)	Yes (interior habitat, adjacent to fish habitat, water protection)
Study Area			
WD2 - Deciduous swamp/forest (SWD/FOD) located north of 2nd Conc, between Babion Rd and Carl Rd.	Yes	Yes (contains other natural heritage features)	No
WD3 - Deciduous swamp/forest (SWD/FOD) located north of 2nd Conc, between Carl Rd. and Miller Rd.	No	Yes (contains other natural heritage features, abuts a waterbody)	No
WD4 - Deciduous swamp/forest (SWD/FOD) located east of Miller Rd, south of 2nd Conc.	Yes	Yes (may provide habitat for SAR or species of concern)	No
WD5 - Deciduous swamp/forest (SWD/FOD) located south of Killaly St. E in southeast corner of study area.	Yes	Yes (size, interior habitat, contains other natural heritage features may provide habitat for SAR or species of concern)	Yes (size, interior habitat, linkages, water protection)
WD6 - Maple deciduous swamp (SWD3) located north of Killaly St. E in southeast corner of study area.	No	Yes (may provide habitat for SAR or species of concern)	No
WD7 - Oak-Maple-Hickory deciduous forest (FOD2) located north of Killaly St. E in southwest corner of study area.	No	Yes (may provide habitat for SAR or species of concern)	No
WD8 – Deciduous forest (FOD) west of Lorraine Rd.	Yes	Yes (may provide habitat for SAR or species of concern)	No

[1] – Includes woodlands mapped as significant on Schedule B2 of the City's OP (Port Colborne 2017)
[2] – Includes woodlands determined to meet one or more significance criteria outlined in the Region's OP (Niagara 2014)
[3] – Includes woodlands that meet one or more significance criteria outlined in the NHRM (MNR 2010)

Development or site alteration within, or adjacent to, significant woodlands may be permitted by the City where is it demonstrated through an EIS there will be no adverse impacts to the feature or its ecological function (Port Colborne 2017). Development or site alteration may be permitted within or adjacent to Environmental Conservation Areas (including significant woodlands) by the Region where it is demonstrated through an EIS that over the long term there will be no significant adverse impacts to the feature or adjacent lands (Niagara 2014).

The City requires a Tree Preservation Plan be prepared based on the results of the EIS (Port Colborne 2017).

Because there are significant woodlands on the site and within the study area, significant woodlands are carried forward to the impact assessment (Section 7.3).

6.5 Significant Valleylands

Significant valleylands should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM for Policy 2.3 of the PPS (MNR 2010). Recommended criteria for designating significant valleylands under the PPS include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential, and historical and cultural values.

There are no significant valleylands on the site or in the study area according to Schedule B2 of the City's OP (Port Colborne 2017).

Significant valleylands are classified as an Environmental Conservation Area by the Region and may be included in the OP mapping for this general designation. However, the Region does not provide specific mapping of significant valleylands. The Region's definition of significant valleylands is consistent with the Province's definition and criteria as described in the NHRM (MNR 2010), which defines valleylands as natural areas that occur in a valley or other landform depression that has water flowing through or standing for some period of the year. The only watercourses on the site or within the study area are municipal drains that have been constructed for the purposes of conveyance of surface water. Although the drains do convey water, they are not naturally occurring and do not represent significant landform features in the local landscape. The Drains have a low degree of naturalness and species diversity and provide limited habitat value and linkage functions.

Based on this analysis, the municipal drains on the site [East Wignell Drain (formerly Mitchner Drain)] and within the study area (West Wignell Drain and Beaverdam Drain) do not meet the significance criteria outlined in the NHRM and are not considered significant valleylands. Further analysis is not 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.

There are no provincially or regionally significant ANSIs on the site or in the study area. 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 includes criteria and guidelines for designating SWH. There are two other documents, the SWHTG (MNR 2000) and the SWHMiST (MNRF 2014), that can be used to help decide what areas and features should be considered significant wildlife habitat. These documents were used as reference material for this study.

There are four general types of significant wildlife habitat: seasonal concentration areas, migration corridors, rare or specialized habitats, and species of conservation concern. The specific habitats considered in this report are evaluated based on the criteria outlined in the Ecoregion 7E Criterion Schedule (MNRF 2015). All types of SWH are discussed below in relation to the site and the proposed extraction area.

6.7.1 Seasonal Concentration Areas

Seasonal concentration areas are those areas where large numbers of a species congregate at one particular time of the year. Examples include deer yards, amphibian breeding habitat, bird nesting colonies, bat hibernacula, raptor roosts, and passerine migration concentrations. If a SAR, or if a large proportion of the population may be lost if significant portions of the habitat are altered, all examples of certain seasonal concentration areas may be designated.

The SWHTG (MNR 2000) and Ecoregion 7E Criterion Schedule (MNRF 2015) identifies the following 11 types of seasonal concentrations of animals that may be considered significant wildlife habitat:

- waterfowl stopover and staging areas (terrestrial and aquatic);
- shorebird migratory stopover areas;
- raptor winter feeding and roosting areas;
- bat hibernacula;
- bat maternity colonies;
- turtle wintering areas;
- reptile hibernacula;
- colonial bird nesting sites;
- migratory butterfly stopover areas;
- landbird migratory stopover areas; and
- winter deer yards and congregation areas.

There are no large, non-agricultural open fields in the study area to provide terrestrial waterfowl stopover or staging areas. There are no waterbodies or wetlands suitable to provide aquatic waterfowl stopover or staging areas in the study area. No shorebird migratory stopover areas were identified in the study area during field surveys. No exposed bedrock or rock piles that extend below the frost line that would support bat or reptile hibernacula were identified in the study area during field surveys. No colonial bird nesting sites were identified in the study area during field surveys. No migratory butterfly field habitat in the study area was identified in the background review or agency consultation and the fields in the study area are mostly cultivated cropland and disturbed old field habitat that are unlikely to support significant migratory butterfly stopover areas. The ponds on site are of anthropogenic origin and therefore do not qualify as turtle wintering area SWH.

The combined area of deciduous swamp (SWD3-2), lowland deciduous forest (FOD7), ash lowland deciduous forest (FOD7-2), and cultural meadow (CUM1-1) in the northern portion of the site (Figure 2) may provide suitable raptor wintering habitat. However, the meadow is surrounded by large woodland features and hedgerows that may prevent adequate wind activity to limit snow accumulation. In addition, red-tailed hawk is the only indicator

species that was observed in the study area during field surveys. According to other background data red-tailed hawk and American kestrel are the only indicator species that have been observed during the winter months within the study area, but not in high enough numbers to indicate potential significance of the habitat (eBird 2019). The majority of other woodland/field combinations in the study area consist of agricultural fields actively managed for crop production and do not represent suitable habitat areas.

MNRF mapping has identified deer wintering areas (Stratum 2) in the study area, which include the deciduous swamp (SWD3-2) at the north of the site as well as the three deciduous forest/ deciduous swamp (FOD/SWD) communities north of Second Concession Road and the deciduous forest/deciduous swamp (FOD/SWD) community east of Miller Road (Figure 2). No Stratum 1 (Core) deer wintering areas are located in the study area, and none of the communities identified as Stratum 2 are large enough to meet the minimum size criteria (>50 ha) to be considered SWH. Furthermore, none of the Stratum 2 areas are located within the proposed extraction area.

The forest and swamp plant communities in the study area are within 5 km of Lake Erie. Those communities greater than 5 ha in size, including the deciduous swamp (SWD3-2) on the site (Figure 2), could potentially provide significant landbird migratory stopover area habitat. As these areas were not confirmed as significant, they should be considered candidate landbird migratory stopover area SWH. This candidate SWH is carried forward to the impact analysis.

Buildings used by bats as maternity roosts are not considered to be SWH. The deciduous swamp (SWD3-2) on the site and the forest and swamp plant communities off-site in the study area (Figure 2) could potentially provide significant bat maternity roost habitat for big brown bat and/or silver-haired bat. According to the Ecoregion 7E Criterion Schedule (MNRF 2015), there must be confirmed use by 10 or more big brown bats and/or 5 or more silver-haired bats to confirm a candidate maternity colony as SWH. Bat acoustic surveys conducted in the deciduous swamp (SWD3-2) on site in 2017 detected very high activity levels of big brown bat (Table 7, Section 5.5.1.3). However, use of individual roosts was not confirmed during field surveys and some of the recorded passes may be attributable to commuting or foraging bats. Therefore, the deciduous swamp should be considered candidate bat maternity roost SWH. As no surveys were conducted in the off-site forest and swamp plant communities in the study area, they should also be considered candidate bat maternity roost SWH. This candidate SWH is carried forward to the impact analysis.

6.7.2 Migration Corridors

The SWHTG (MNR 2000) defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. This is generally in response to different seasonal habitat requirements. For example, trails used by deer to move to wintering areas or areas used by amphibians between breeding and summer habitat. To qualify as significant wildlife habitat, these corridors would be a critical link between habitats that are regularly used by wildlife.

No significant migration corridors were identified during the desktop review, agency consultation, or during field surveys.

6.7.3 Specialized Habitat for Wildlife

Specialized habitats are microhabitats that provide a critical resource to some groups of wildlife. Examples include salt licks for ungulates and groundwater seeps for wild turkeys.

The SWHTG (MNR 2000) and Ecoregion 7E Criterion Schedule (MNRF 2015) defines seven specialized habitats that may be considered SWH. They are:

- woodland area-sensitive bird breeding habitat;
- amphibian breeding habitat (woodlands and wetlands);
- turtle nesting habitat;
- woodland raptor nesting habitat;
- waterfowl nesting areas;
- bald eagle and osprey habitat; and
- seeps and springs.

No seeps or springs were identified on the site or in the study area during field surveys. No bald eagle or osprey individuals, and no nests, were observed during field surveys. No suitable wetland habitat was identified on the site or in the study area to support waterfowl and no consideration of waterfowl nesting habitat is required. No woodland raptor nesting habitat was identified on the site or in the study area during field surveys. No woodland area-sensitive bird breeding habitat was identified during field surveys.

Although evidence of suspected predated turtle nests and a dead midland painted turtle were observed along the shoulder of Second Concession Road (Figure 3) during a turtle nesting survey, road shoulder nesting sites are not considered SWH. The exposed substrates located near the Humberstone Speedway ponds are predominantly clay and were considered too compact to provide suitable nesting habitat, and no other turtle nesting habitat was identified in the study area other than gravel road shoulders.

Based on the result of the anuran call count surveys (Section 5.5.3) no SWH for amphibian woodland breeding was identified in the study area.

Because breeding American bullfrogs were observed in pond 3 located on the Humberstone Speedway property, and in the residential ponds located off-site in the study area north of Second Concession Road 2 and south of Highway 3 (Figure 3), these ponds and the surrounding riparian vegetation are confirmed as amphibian wetland breeding habitat SWH. This SWH is carried forward to the impact analysis.

6.7.4 Rare Habitat

This category includes vegetation communities that are considered rare in the province. Generally, communities assigned an SRANK of S1 to S3 (extremely rare to rare-uncommon) by the NHIC could qualify. It is assumed that these habitats are at risk and that they are also more likely to support rare species and other features that are considered significant.

No rare vegetation communities were identified on the site or in the study area during the field surveys. No further analysis is warranted.

6.7.5 Habitat for Species of Conservation Concern

Habitat for species of conservation concern (SOCC) and rare species includes habitat for three groups of species:

- Species that are rare, those whose populations are significantly declining, or have a high percentage of their global population in Ontario;
- Species listed as special concern under the ESA; and

- Species listed as threatened or endangered under SARA.

Rare species are considered at five levels: globally rare, nationally rare, provincially rare, regionally rare, and locally rare (i.e., in the municipality). This is also the order of priority that should be attached to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to forest fragmentation and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

The SWHTG (MNR 2000) and Ecoregion 7E Criterion Schedule (MNRF 2015) defines five specialized habitats that may be considered SWH. They are:

- marsh bird breeding habitat;
- open country bird breeding habitat;
- shrub/early successional bird breeding habitat;
- terrestrial crayfish; and
- special concern and rare wildlife species.

No marsh or shrub/early successional bird breeding habitat was identified on the site or in the study area during field surveys. No habitat for terrestrial crayfish was identified on the site or in the study area during field surveys. Further analysis of these types of SWH is not warranted.

Three of the indicator species for open country bird breeding SWH were observed in hayfields and pasture on site and in the study area during field surveys: grasshopper sparrow, vesper sparrow and savannah sparrow (*Passerculus sandwichensis*). All observations of these species were within active agricultural lands (hay and pasture). Active agricultural lands are not considered SWH for open country bird breeding habitat, and no further analysis is warranted.

As discussed in Section 5.0, six special concern and rare species were observed on the site or within the study area during field surveys: necklace sedge, eastern wood-pewee, grasshopper sparrow, wood thrush, snapping turtle and monarch. Three additional species were assessed to have moderate potential to occur off-site, within the study area, based on the availability of suitable habitat: common nighthawk, woodland vole, and halberd-leaved tearthumb. According to the Ecoregion 7E Criterion Schedule (MNRF 2015), an area of habitat must contribute to an important life stage component for the species in order to be considered SWH. The area of habitat considered to be SWH is defined by the ELC community.

Necklace sedge, a regionally rare species, was observed in the deciduous swamp (SWD3-2) on site (Figure 2). Consideration of the deciduous swamp (SWD3-2) as SWH for necklace sedge is carried forward to the impact analysis (Section 7.5).

Common nighthawk is designated special concern under the ESA. No individuals were observed and no habitat was identified on the site. Off-site, within the study area, open habitats may provide suitable nesting habitat for this species. Consideration of habitat for common nighthawk as SWH is carried forward to the impact analysis (Section 7.5).

Eastern wood-pewee is designated special concern under the ESA. This species was observed in seven woodlands in the study area including the deciduous swamp (SWD3-2) on site (Figure 2). Consideration of habitat for eastern wood-pewee as SWH is carried forward to the impact analysis (Section 7.5).

Wood thrush is designated special concern under the ESA. This species was observed in the woodlands in the study area including the deciduous swamp (SWD3-2) on site and the large woodland southeast of the intersection of Killaly Street East and Miller Road (Figure 2). Consideration of habitat for wood thrush as SWH is carried forward to the impact analysis (Section 7.5).

Grasshopper sparrow is designated special concern under the ESA. This species was observed in the hayfield located on the site and in hayfield located south of the existing quarry. Consideration of habitat for grasshopper sparrow as SWH is carried forward to the impact analysis (Section 7.5).

Halberd-leaved tearthumb is a provincially rare species (i.e. ranked S3). No individuals were observed on the site during field surveys. Deciduous swamps off-site, within the study area, may provide suitable growing habitat. Consideration of habitat for halberd-leaved tearthumb as SWH is carried forward to the impact analysis (Section 7.5).

Snapping turtle is designated special concern under the ESA. This species was observed on the site in pond 1 located on the Humberstone Speedway property (Figure 3). Similar suitable habitat for snapping turtle is also present in pond 2 and pond 3 which are also located on the Humberstone Speedway property (Figure 3). Consideration of habitat for snapping turtle as SWH is carried forward to the impact analysis (Section 7.5).

Monarch is designated special concern under the ESA. This species was observed on the site near pond 4 located on the Humberstone Speedway property and on a residential property north of Highway 3 (Figure 3). Consideration of habitat for monarch as SWH is carried forward to the impact analysis (Section 7.5).

Woodland vole is designated special concern under the ESA. No individuals or evidence of burrows were observed during field surveys. Off-site, within the study area, deciduous forests may provide suitable habitat (Figure 2). Consideration of habitat for woodland vole as SWH is carried forward to the impact analysis (Section 7.5).

7.0 IMPACT ANALYSIS

7.1 Threatened and Endangered Species

7.1.1 Birds

Bank Swallow

Because potential nesting habitat and suitable foraging habitat within the study area will not be altered, bank swallow is not expected to be impacted by minimal removal of foraging habitat that may be present on the site. Foraging habitat is not limited in the study area and the proposed Project is not expected to impact the ability of bank swallow to forage. The project may result in the creation of additional nesting habitat in the form of aggregate stockpiles. Further analysis is not warranted.

Bobolink and Eastern Meadowlark

No vegetation removal or stripping is expected to occur in the bobolink and eastern meadowlark habitat before 2024. The field is leased to a local farmer, and based on the farming practices on site, Port Colborne Quarries Inc.

has confirmed with the farmer that the crop will rotate in future years as part of typical crop rotation practice. The hay will be replaced with a nitrogen fixing cover crop such as alfalfa is planted to restore nutrients. It is anticipated that at the time when vegetation removal and stripping will be undertaken, the agricultural lands on the site will be unsuitable for bobolink and eastern meadowlark. If, due to standard agricultural practices, the fields on the site are unsuitable as habitat for bobolink and eastern meadowlark at the time when vegetation clearing and stripping are conducted, no authorization or permit under the ESA is required. Prior to vegetation removal, a survey should be conducted to confirm that this habitat is no longer in existence. The requirement for this survey will be included in the site plans.

Chimney Swift

Because potential suitable nesting habitat within the study area will not be altered, chimney swift is not expected to be impacted by the proposed project. Foraging habitat is not a category of habitat protected under the GHD. Further analysis is not warranted.

7.1.2 Bats

Because no maternity roost or hibernation habitat for little brown myotis, northern myotis, tri-colored bat and eastern small-footed myotis was identified on the site, and suitable maternity roost habitat for these species that may be present within the study area will not be altered, these species are not expected to be effected by the project. Further analysis is not warranted.

7.2 Fish Habitat

It is Golder's understanding that the City is planning to realign the East Wignell Drain (formerly Mitchner Drain) around the eastern boundary of the site. Without these realignment design details, it is not possible to assess the potential effects of the proposed quarry expansion on the realigned Wignell Drain prior to its planned realignment. However, it is anticipated that the newly aligned drain will remain in the overburden and that the dewatering from the expanded quarry will likely discharge water into the newly aligned drain resulting in increased average annual flow. The results of the hydrogeology report have indicated the presence of clayey deposits over bedrock in the woodland area based on boreholes and also in the area along Miller Road based on water well information. The details of the rerouting of the East Wignell Drain are not know at this point but it is assumed that that the channel will be on low permeability clayey overburden materials and not directly on bedrock. It is therefore assumed that there will not be impacts related to leakage through the base of the drain.

Although, the drainage area contributing to East Wignell Drain will be lost as part of the quarry extraction, flow in the drain is expected to be maintained through quarry dewatering. The pumping of surface water runoff and groundwater seepage from the quarry to East Wignell Drain is expected to increase the average annual flow, while creating a stable flow regime with controlled peak flows and likely reductions in the risk of peak flow erosion.

7.3 Significant Woodlands

No part of the significant woodlands on the site or in the study area will be removed by the proposed extraction. The significant woodland located at the north end of the site (WD1, Deciduous Swamp SWD3-2) has been excluded from the area of extraction, and a 10 m setback will be established from the dripline to protect the critical root zones of the trees located along its perimeter, and to minimize disturbance on the woodland from extraction activities. The results of the borehole drilling as part of the hydrogeology study have indicated the presence of relatively thick (up to 10m) clayey deposits overlying bedrock beneath the wetland. These low permeability materials limit the infiltration of surface water through the base of the wetland. As a result, there is shallow

standing surface water in the wetland during seasonal periods of high rainfall or snowmelt. There are downward hydraulic gradients beneath the wetland reflecting the hydraulic potential for infiltration although the rate is slow due to the low permeability overburden beneath the wetland. A hydrogeological cross-section through the wetland is shown on Figure 14 of the hydrogeological report Golder (2020). Based on the observations of extensive areas of persistent standing water throughout the majority of the deciduous swamp during the field surveys in 2017 and 2019, it does not appear that the dewatering activities associated with the existing Port Colborne Quarry, which is located immediately adjacent to the deciduous swamp, has resulted in a drying out of the feature. Although the ground water drawdown ZOI from the ongoing dewatering extends beyond this wetland feature, the ecological function of the feature as a swamp is intact and no signs of vegetation stress attributable to the dewatering were observed. The deciduous swamp is underlain by a clay layer that traps surface water and maintains the soil moisture regime necessary for the swamp to persist in its current form. The ongoing drawdown of the aquifer below the clay layer does not appear to be negatively affecting the perched water table that maintains the moisture of the surface soils on which the swamp vegetation relies based on the observation of the vegetation. In other words, the ecological form and function of the swamp has been maintained despite the ongoing dewatering activities associated with the existing adjacent quarry because it is does not appear that the drawdown has affected the surface soil moisture, or the hydroperiod of ephemeral pools to the point where it has affected vegetation. The drainage area contributing surface water runoff to the wetland (i.e. areas to the north and the wetland area itself) will remain largely unchanged with proposed quarry extraction. Therefore, the runoff sources to the wetland is not expected to change as a result of the project.

Based on the observed resilience of the ecological form and function of the deciduous swamp despite ongoing groundwater drawdown, it is not anticipated that the deciduous swamp will be negatively impacted by the proposed quarry expansion and the associated increase in groundwater drawdown in other areas of the wetland. However, it is recommended that a vegetation monitoring plan be undertaken to monitor for unanticipated negative impacts on this feature resulting from the proposed quarry expansion. Details of the proposed monitoring plan are provided in Section 8.3.

The effects of the ground water drawdown from the proposed project on the significant woodlands in the study area that are located off-site are expected to be negligible. For the same reasons described above, it is not anticipated that the proposed project will negatively impact other significant woodlands in the study area.

Animal movement corridors between the deciduous swamp and offsite natural features to the north will not be negatively impacted. It is anticipated that the realigned East Wignell Drain will provide similar animal movement corridor to the existing drain. No negative impacts on animal movement corridors or connections between natural features/habitats are anticipated. Recommendations to enhance connectivity and animal movement between the deciduous swamps and offsite natural features to the north are described in Section 8.1.

7.4 Significant Wetlands

The non-significant Upper Wignell Drain Wetland Complex includes the deciduous swamp (SWD3-2) located on the site and three smaller areas of deciduous swamp (SWD) north of Second Concession Road (Figure 2). The impact assessment for this feature is addressed in Section 7.3.

The Beaver Dam Creek Wetland Complex PSW will not be directly affected by the proposed extraction. Although a part of the PSW is within the ZOI of groundwater drawdown, the effect of the groundwater drawdown is not expected to negatively effect the ecological function of the wetland for the same seasons described in Section 7.3.

7.5 Significant Wildlife Habitat

7.5.1 Candidate Landbird Migratory Stopover Habitat

All candidate landbird migratory stopover habitat SWH is located outside of the proposed limit of extraction. It is not anticipated that the proposed quarry expansion will have a negative effect on the use of this candidate (but unconfirmed) SWH by migrant birds.

7.5.2 Candidate Woodland Bat Maternity Roost Habitat

All candidate bat maternity roost SWH is located outside of the proposed limit of extraction. No potential roosting trees will be removed, and it is not anticipated that the proposed quarry expansion will have a negative effect on the use of this candidate (but unconfirmed) SWH by roosting bats.

7.5.3 Amphibian Wetland Breeding Habitat

Pond 3 and its associated riparian vegetation, which provide breeding habitat for American bullfrog, has been confirmed as amphibian wetland breeding habitat SWH. This habitat will be removed as a result of the proposed quarry expansion. Impacts to American bullfrog and its wetland breeding habitat will be addressed through the creation of new habitat as part of the rehabilitation plan. Subject to the implementation of the rehabilitation plan, it is not anticipated that the proposed quarry expansion will have a net negative impact on American bullfrog or its wetland breeding habitat. Two residential ponds and associated riparian vegetation off-site in the study area were also confirmed as amphibian wetland breeding SWH because they provide breeding habitat for American bullfrog. This habitat will not be removed and it is not anticipated that the proposed quarry expansion will have a negative effect on the use of this SWH by American bullfrog.

7.5.4 Habitat for Species of Conservation Concern

Necklace Sedge

All confirmed habitat for necklace sedge is located outside of the proposed limit of extraction in the deciduous swamp (SWD3-2) on the site. Additional habitat may be present in the other deciduous swamp plant communities located off-site in the study area. As discussed in Section 7.4, it is not anticipated that the proposed quarry expansion and associated dewatering activities will affect the moisture regime in the deciduous swamp on site or that of the other swamp communities in the study area. For the same reasons described in Section 7.3, no negative impacts on necklace sedge are anticipated.

Eastern Wood-pewee

All eastern wood-pewee habitat is located outside of the proposed limit of extraction. It is not anticipated that the proposed quarry expansion will have a negative effect on this species or its habitat.

Wood Thrush

All eastern wood-pewee habitat is located outside of the proposed limit of extraction. It is not anticipated that the proposed quarry expansion will have a negative effect on this species or its habitat.

Grasshopper Sparrow

All habitat for grasshopper sparrow located within the proposed limit of extraction consists of actively managed agricultural land (hay). The hay field is leased to a local farmer, and based on the farming practices on site, Port Colborne Quarries Inc. has confirmed with the farmer that the crop will rotate in future years as part of typical crop rotation practice. It is anticipated that at the time when vegetation removal and stripping will be undertaken, the

agricultural lands on the site will be unsuitable for grasshopper sparrow. No negative impacts on this species or its habitat as a result of the proposed extraction is anticipated.

Snapping Turtle

The ponds located on the Humberstone Speedway property have been confirmed as habitat for snapping turtle. This habitat is within the limit of extraction and will be removed. Impacts to snapping turtle and its aquatic habitat will be addressed through the creation of new habitat as part of the rehabilitation plan. Subject to the implementation of the rehabilitation plan, it is not anticipated that the proposed quarry expansion will have a net negative impact on snapping turtle or its aquatic habitat.

Monarch

Small areas of suitable foraging habitat were identified within the limit of extraction and will be removed. However, these areas are small and isolated, and unlikely to support a large concentration of monarch individuals. There is abundant similar habitat in the study area in the surrounding landscape that will not be affected, and loss of minimal habitat on site is not expected to impact the regional population of monarch. Foraging and caterpillar host plants (common milkweed) will be replaced through site rehabilitation. Further analysis is not warranted.

Common Nighthawk, Woodland Vole, Heart-leaved Tearthumb

Habitat for common nighthawk, woodland vole, and halberd-leaved tearthumb may be present in the study area outside of the proposed limit of extraction. It is not anticipated that the proposed quarry expansion will have a negative effect on these species or their habitats.

7.6 Impact Assessment Summary

The impacts of the proposed quarry expansion on the natural heritage features and functions in the study area are summarized in Table 10.

Table 10: Impact Assessment Summary Table

Natural Heritage Features and Functions		Impact	Mitigation
Threatened and Endangered Species	bank swallow	No nesting habitat will be removed and foraging habitat is abundant in the study area. No negative impacts are anticipated.	Avoidance
	bobolink and eastern meadowlark	Nesting habitat on the site has been created by cyclical agricultural crop rotation practices. It is anticipated that no nesting habitat will be present on the site at the onset of quarry operational activities.	Surveys will be conducted prior to vegetation removal to confirm that the nesting habitat is no longer present.

Natural Heritage Features and Functions		Impact	Mitigation
	chimney swift	No nesting habitat will be removed and foraging habitat is abundant in the study area. No negative impacts are anticipated.	Avoidance
	tri-colored bat, little brown myotis, northern myotis	No maternity roost habitat or hibernation habitat was identified on the site or in the study area. No negative impacts are anticipated.	Avoidance
Fish Habitat	East Wignell Drain	The drain is expected to be realigned by the City. Although the development of the quarry will remove part of the drainage area, flow is anticipated to be maintained or increased through discharge from quarry dewatering.	None
Significant Woodlands	Deciduous Swamp (WD1, SWD3-2)	No part of this feature will be removed. The moisture regime is expected to be maintained.	There will be a setback of 10 m established from the dripline of the significant woodland. Plantings, as part of the rehabilitation plan, are recommended to increase connectivity between this woodland and the woodland features located offsite, north of 2nd Concession Road.
Significant Wetlands	Beaver Dam Creek Wetland Complex PSW	No part of the PSW will be removed. Although a part of the PSW in within the ZOI of	Avoidance

Natural Heritage Features and Functions		Impact	Mitigation
		groundwater discharge, no negative impacts are anticipated.	
Significant Wildlife Habitat	Candidate Landbird Migratory Stopover Habitat	All candidate landbird migratory stopover habitat SWH is located outside of the proposed limit of extraction, no negative impacts are anticipated.	Avoidance
	Candidate Woodland Bat Maternity Roost Habitat	All candidate bat maternity roost SWH is located outside of the proposed limit of extraction and no negative impacts are anticipated.	Avoidance
	Amphibian Wetland Breeding Habitat	Pond 3 provides breeding habitat for American bullfrog. This pond will be removed.	Mitigation includes replacement habitat as part of the rehabilitation plan to offset the negative impacts.
	Species of Conservation Concern-necklace sedge	All confirmed habitat for necklace sedge is located outside of the proposed limit of extraction in the deciduous swamp (SWD3-2) on the site, and no negative impacts are anticipated.	Avoidance
	Species of Conservation Concern-eastern wood-pewee	All eastern wood-pewee habitat is located outside of the proposed limit of extraction, and no negative impacts are anticipated	Avoidance

Natural Heritage Features and Functions		Impact	Mitigation
	Species of Conservation Concern-wood thrush	All wood thrush habitat is located outside of the proposed limit of extraction, and no negative impacts are anticipated	
	Species of Conservation Concern-grasshopper sparrow	Nesting habitat on the site has been created by cyclical agricultural crop rotation practices. It is anticipated that no nesting habitat will be present on the site at the onset of quarry operational activities.	Surveys will be conducted prior to vegetation removal to confirm that the nesting habitat is no longer present.
	Species of Conservation Concern-snapping turtle	The Humberstone Speedway ponds provide habitat for snapping turtle. These ponds will be removed.	Mitigation in the form of replacement habitat as part of the rehabilitation plan will offset the negative impacts.
	Species of Conservation Concern-monarch	Small areas of foraging habitat will be removed.	Mitigation in the form of planting milkweed during site rehabilitation will offset any negative impacts.
	Species of Conservation Concern-common nighthawk	Habitat may be present in the study area outside of the limit of extraction, no negative impacts are anticipated.	Avoidance
	Species of Conservation Concern-Woodland Vole	Habitat may be present in the study area outside of the limit of extraction, no negative impacts are anticipated.	Avoidance
	Species of Conservation Concern-	Habitat may be present in the study area outside of the limit of	Avoidance

Natural Heritage Features and Functions		Impact	Mitigation
	Heart-leaved Tearthumb	extraction, no negative impacts are anticipated.	

8.0 REHABILITATION / MITIGATION / MONITORING

8.1 Rehabilitation Concept

The post-extraction 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. Because the extraction is below-water, the overall final rehabilitation plan will consist of a lake with surrounding wetland and upland areas.

All plantings (i.e., nodal plantings) included in the rehabilitation plan will be locally native, non-invasive species that create habitat in the short term and promote natural succession processes. The sourcing of plantings should consider the regionally adapted genetics of the species. Plantings from local sources are likely to be well adapted to the local climate and growing conditions and may have a higher likelihood of successful establishment. Therefore, plantings will be procured from local sources to the extent possible. Wetland and aquatic plants that may be planted in the nearshore or shoreline areas 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 wetland habitats will be created through construction of submerged benches, approximately 0.25 to 0.75 m deep. Shallow emergent marsh vegetation (i.e., herbaceous species listed above) will be planted in water ±0.15 m deep and extend ±5 m from the shore and be interspersed with cover structures (e.g. boulders and root wads) in the shallow shoreline wetland areas. Organic material and topsoil will be added to the shoreline areas to promote shoreline vegetation. Basking logs, nesting platforms and boxes will be created for turtle, waterfowl and swallows respectively. This habitat will be designed to be suitable as snapping turtle aquatic habitat and bullfrog breeding habitat.

Upland areas will be seeded with a mix of grasses and legumes consisting of native, non-invasive species. It is recommended that common milkweed be planted in upland areas to provide host plants for monarch caterpillars. If terrestrial nodal plantings are included on the side slopes, they will include a mixture of coniferous and deciduous tree species to promote species diversity and provide a variety of species to compensate for any substrate deficiencies. The species may include white pine, sugar maple, red oak, trembling aspen, and white birch, with a secondary focus on species such as choke cherry (*Prunus virginiana*), alternate-leaved dogwood (*Cornus alternifolia*), highbush cranberry (*Viburnum opulus*), nannyberry (*Viburnum lentago*) and serviceberry (*Amelanchier* spp.). It is recommended that ash (*Fraxinus* spp.) species in rehabilitation plantings be avoided due to the invasion of emerald ash borer.

In addition to the post-extraction rehabilitation plan described above, it is recommended that the segment of Carl Road that bisects the deciduous swamp be rehabilitated following the decommissioning of the road. This linear disturbance has enabled invasive plants to infiltrate the swamp interior and may be increasing predation pressure on wildlife from domestic and feral animals (cats and dogs) as well as opportunistic wild predators and scavengers that benefit from anthropogenic disturbance such as coyotes or raccoons. Excavations in three or four areas along the length of the road should be created to improve surface water drainage. Plantings along this segment of Carl Road should include the dominant tree and shrub species found in the deciduous swamp

including silver maple, pin oak, swamp white oak, bur oak, red maple, and spicebush. Invasive shrub species including multiflora rose, common buckthorn, and Tartarian honeysuckle have become established in this area and may prevent the successful establishment of the native plantings. These invasive shrubs should be removed prior to the planting of Carl Road.

It is recommended that the area north of the existing quarry (Pit 3) and west of the northern end of the deciduous swamp be rehabilitated to enhance connectivity and wildlife movement between the deciduous swamp and the significant woodland located north of 2nd Concession Road between Carl Road and Babion Road. These two significant woodlands are separated by 2nd Concession Road and distance of approximately 70 m. The area recommended for rehabilitation consists of a berm vegetated with terrestrial grasses and forbs and a sparsely vegetated area north of Pit 3.

It is recommended that the setback area at the north end of extraction area 3 and east of the deciduous swamp be supplemented with additional plantings to enhance connectivity and wildlife movement opportunities between the deciduous swamp and the hedgerow located east of the site woodland located northeast of the site across 2nd Concession Road. This area currently consists of a cultural meadow. The establishment of a wooded area will create a corridor linking the north end of the deciduous swamp with the forested areas offsite, including the significant woodland located between Carl Road and Babion Road. These additional plantings will also enhance ecological connectivity and facilitate wildlife movement between these features. Native tree and shrub species plantings should be selected based on their suitability for the soils and moisture regime in those areas and may include: red oak, trembling aspen, eastern white cedar, red maple, basswood, bur oak, white pine, serviceberry species, gray dogwood (*Cornus racemosa*) and staghorn sumac (*Rhus typhina*).

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;
- Avoid removal of vegetation during the active season for breeding birds (April 15 – August 15), 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;
- Prior to the removal of vegetation in the agricultural fields on the site, a biologist should confirm that no suitable habitat for bobolink and eastern meadowlark is present. If habitat is confirmed to be present and in use by bobolink or eastern meadowlark, permitting or registration under the ESA may be required to remove habitat. Implement appropriate sediment and erosion controls, spill prevention, etc. during the construction phase of the project;
- Implement appropriate measures mitigate noise and dust on the site during site preparation and operation phases of the project; and
- Common milkweed should be included in the rehabilitation plantings seed mix to provide host plants for monarch caterpillars and offset the removal of monarch habitat.

8.2.2 Fish and Fish Habitat

Although man-made ponds are not considered fish habitat under the *Fisheries Act*, if the ponds (ponds 1, 2, 3, 4) contain fish, the fish will need to be removed prior to dewatering or destruction of the ponds to prevent the death of the fish. A permit to collect fish for scientific purposes and direction from the MNRF will need to be obtained prior to relocation of the fish in order to avoid contravening the *Fisheries Act* (Section 34.4 (1); prohibition on death of fish by means other than fishing). The MNRF requires that native fish species be relocated to suitable nearby habitat and non-native fish are euthanized.

8.3 Monitoring

It is recommended that a wetland vegetation monitoring program be implemented in the deciduous swamp (SWD3-2) located at the north end of the site. To accurately monitor changes in the wetland community over time and to measure the success of management actions, it is critical to monitor changes to the vegetation conditions and species composition.

Long-term monitoring plots and/or monitoring transects shall be established within the wetland for the purpose of identifying trends and changes in plant growth. In each year of monitoring, a detailed botanical inventory will be conducted and will involve a count of the number of stems and percent cover for all plant species present within the monitoring plot or along the monitoring transect. Baseline monitoring should be conducted in the year prior to the initiation of extraction Phase 1B or Phase 2, whichever begins first. Monitoring should be conducted once annually, at a similar time of year (i.e. late July) for the duration of extraction Phases 1B, 2 and 3.

All plants identified to the species level will also be categorized by wetness index based on the *Floristic Quality Assessment System for Southern Ontario* (Oldham et al. 1995).

The following parameters will also be recorded in the field:

- Estimate of percentage of open water;
- Average and maximum water depth (if possible);
- Water temperature; and
- Water quality (i.e., dissolved oxygen, pH).

Photo documentation of the wetland and monitoring plots/transects will also be collected in the field and a Photo Log included as an appendix to the annual report. Photos will be taken from established photo-monitoring stations to allow for visual comparisons of the wetland community over time.

In addition, a groundwater monitoring program has been developed for the proposed extension involving both groundwater quality sampling and analysis and groundwater level monitoring. The groundwater level monitoring results will be used to assess the groundwater level drawdown associated with quarry dewatering as the quarry expands. The monitoring program can be used to confirm that there are no unanticipated effects on natural environment features (Golder 2020a) through the monitoring of existing wells within the wetland, and a new monitoring well to be installed in the northeast corner of the wetland.

9.0 SUMMARY AND RECOMMENDATIONS

The proposed expansion of the existing Port Colborne Quarry has been assessed for potential ecological impacts under the ARA Provincial Standards, the Provincial Policy Statement, policies of the City of Port Colborne, as well as other relevant legislation, including the ESA.

Based on these analyses, it is expected that there will be no negative impacts to the significant natural features and functions in the Study Area. In addition, an ecologically based rehabilitation plan and preventive mitigation measures that will enhance the natural heritage system have been developed. These conclusions are based on the following recommendations:

- Sediment/erosion controls will be implemented adjacent to natural features during site preparation and as needed during operations;
- Prior to the removal of vegetation in the agricultural fields on the site, a biologist should confirm that no suitable habitat for bobolink and eastern meadowlark is present. If habitat is confirmed to be present and in use by bobolink or eastern meadowlark, permitting or registration under the ESA may be required to remove habitat;
- Prepare a Tree Preservation Plan for the site in accordance with City guidelines;
- Standard Best Management Practices to control noise and dust impacts on adjacent natural features will be implemented;
- Implement standard best management practices, including sediment and erosion controls, spill prevention, etc. during the construction phase of the project;
- A groundwater monitoring program will be implemented to monitor for drawdown as the quarry expands. The data could be used to assess unanticipated effects on natural environment features;
- The site will be rehabilitated in accordance with the requirements of the rehabilitation plan developed with ecological concepts from this report; and
- Prior to the removal of the Ponds 1, 2, 3, and 4. A survey shall be conducted to determine if fish are present. If fish are present, a permit to collect fish for scientific purposes and direction from the MNRF will need to be obtained prior to relocation of the fish in order to avoid contravening the *Fisheries Act.*

10.0 SITE PLAN NOTES

The following notes should be included on the site plan:

- Prior to the vegetation removal and stripping, a habitat survey will be conducted to confirm that standard agricultural practice (crop rotation) has resulted in the removal of the hay fields on the site and that no habitat for bobolink, eastern meadowlark and grasshopper sparrow is present; and
- A wetland vegetation monitoring program will be implemented in the deciduous swamp (SWD3-2) located at the north end of the site to monitor for impacts associated with quarry operations. Baseline monitoring will be conducted the summer prior to the start of extraction Phase 2.

11.0 CLOSURE

We trust this report meets your current needs. If you have any further questions regarding this report, please contact the undersigned.

Signature Page

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LO/HM/mp/ll

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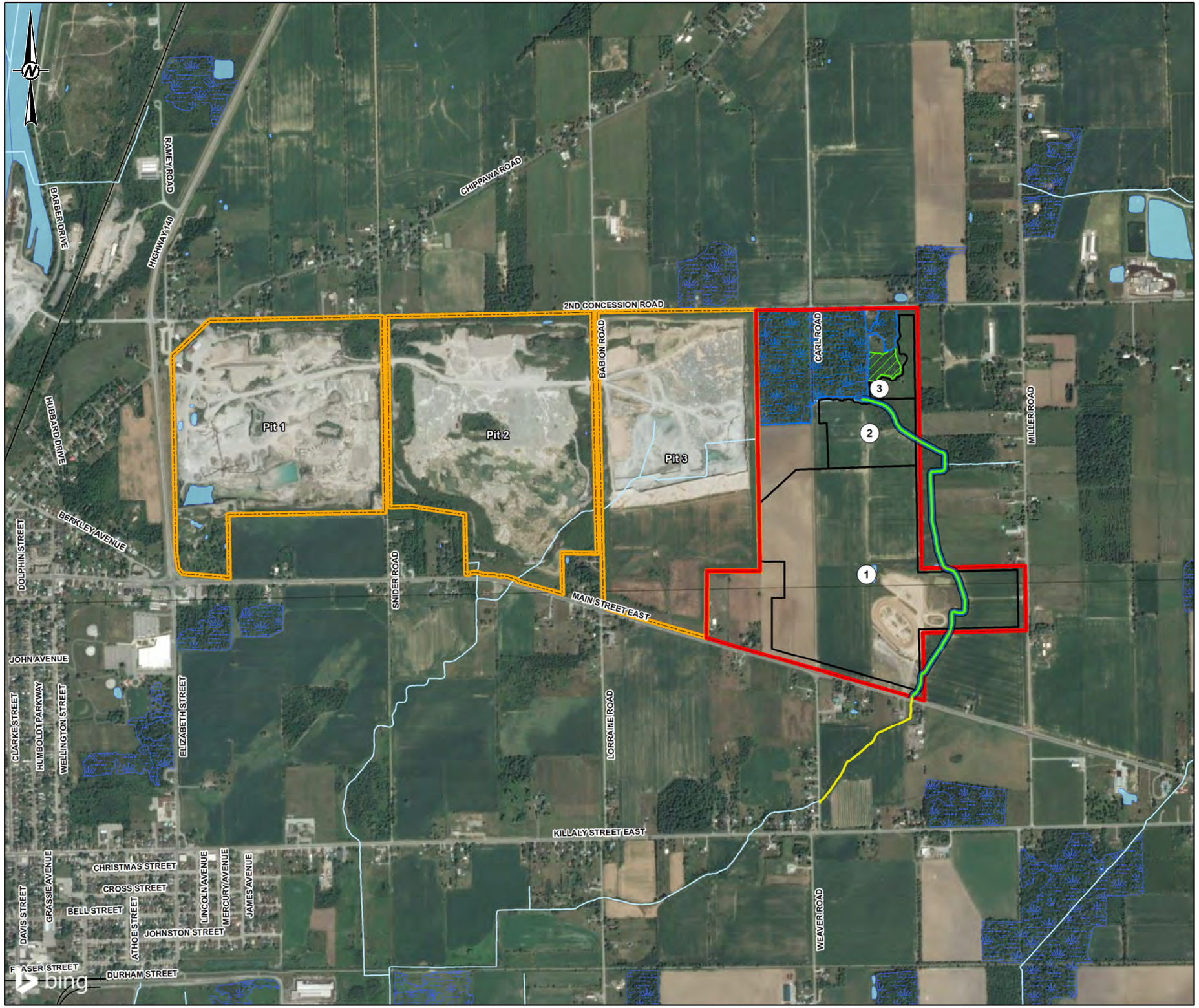
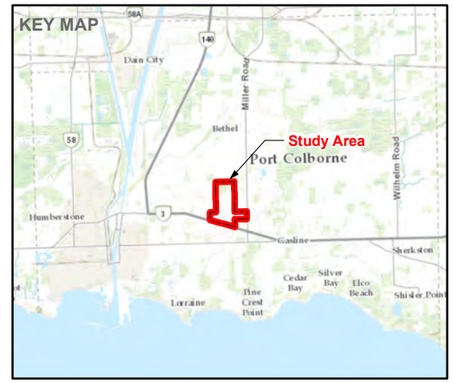
FIGURES

Figure 1 – Site Location Plan



LEGEND

- 1 Excavation Phase
- Roads
- Railway
- Wignell Drain (formerly Mitchner Drain)
- Mitchner Drain
- Important Fish Habitat
- Watercourse
- Waterbody
- Wetland
- Woodland
- Property Boundary
- Proposed Quarry Extension
- Approximate Excavation Phasing Boundary



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NOTE(S)

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3. PROJECTION: TRANSVERSE MERCATOR NAD 1983 UTM ZONE 17N

CLIENT
RANKIN CONSTRUCTION

PROJECT
PROPOSED PORT COLBORNE QUARRY EXTENSION

TITLE
SITE LOCATION PLAN

CONSULTANT
GOLDER

YYYY-MM-DD	2020-08-06
DESIGNED	PR
PREPARED	PR
REVIEWED	LO
APPROVED	-

PROJECT NO.	CONTROL	REV.	FIGURE
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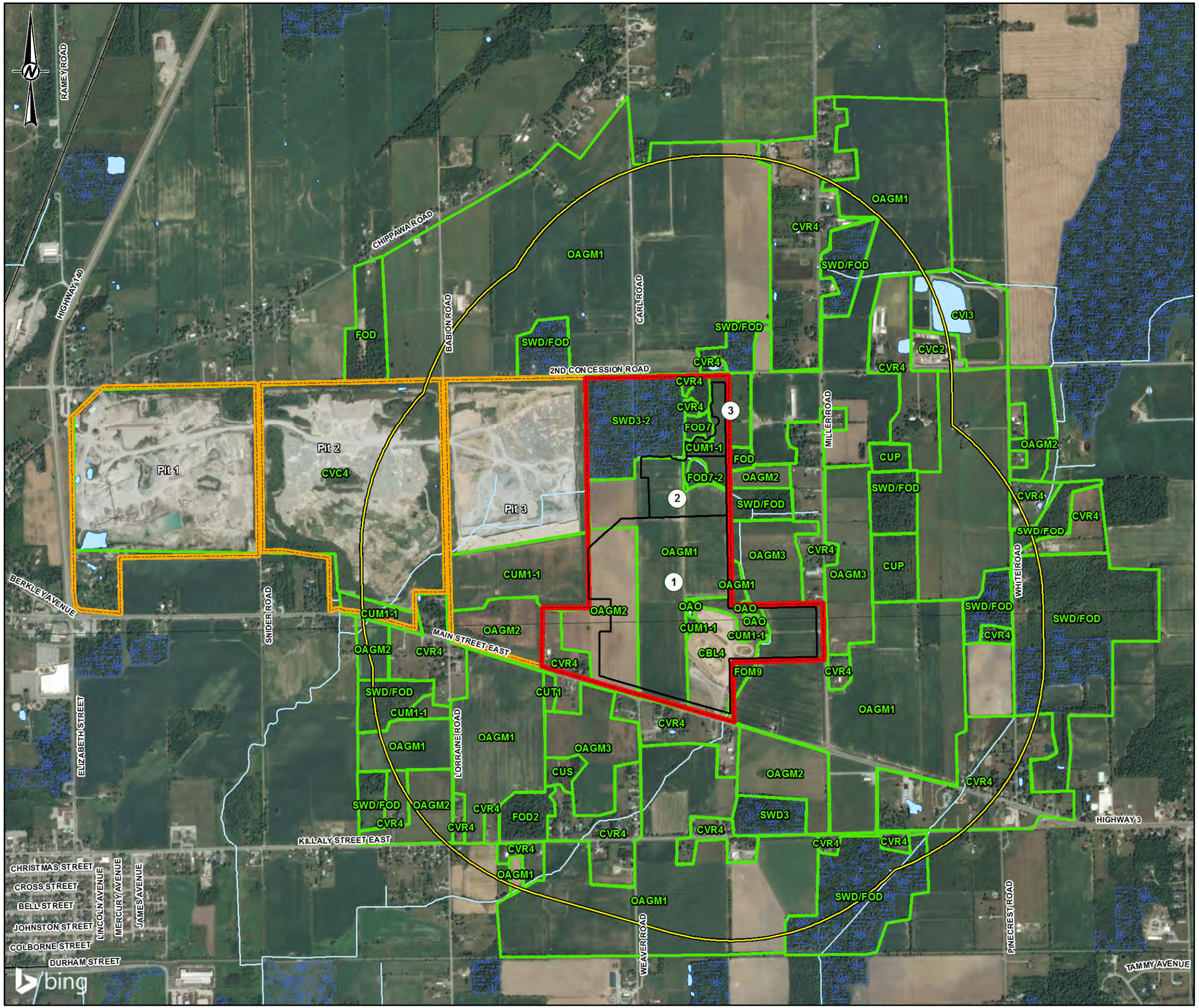
Figure 2 – Plant Community Classification Within the Study Area



LEGEND

- Roads
- Railway
- Watercourse
- Wetland
- Waterbody
- Approximate Excavation Phasing Boundary
- Proposed Quarry Extension
- Property Boundary
- ELC Area
- Study Area (1000 m from Extraction Area Boundary)

ELC Code	Plant Community Name
CBL4	Recreational (Speedway)
CUM1-1	Old Field Cultural Meadow
CUP	Cultural Plantation
CUS	Cultural Savannah
CUT1	Cultural Thicket
CVC2	Light Industry
CVC4	Extraction
CVI3	Water and Sewage Treatment
CVR4	Rural Residential
FOD	Deciduous Forest
FOD2	Dry - Fresh Oak - Maple - Hickory Deciduous Forest
FOD7	Fresh - Moist Lowland Deciduous Forest
FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest
FOM9	Scot's Pine - Conifer - Green Ash Forest
OAGM1	Open Agriculture -annual row crop.
OAGM1	Annual Row Crop Ariculture
OAGM1	Annual Row Crop Agriculture
OAGM2	Open Agricultural -perennial cover crop (hay)
OAGM2	Perennial Cover Crop (Hay)
OAGM3	Pasture
OAO	Open Water Aquatic
SWD/FOD	Deciduous Swamp / Deciduous Forest
SWD3	Maple Mineral Deciduous Swamp
SWD3-2	Silver Maple Mineral Deciduous Swamp

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REFERENCE(S)
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2. IMAGERY: © 2020 MICROSOFT CORPORATION © 2020 MAXAR ©CNES (2020) DISTRIBUTION AIRBUS DS
3. PROJECTION: TRANSVERSE MERCATOR NAD 1983 UTM ZONE 17N

CLIENT
RANKIN CONSTRUCTION

PROJECT
PROPOSED PORT COLBORNE QUARRY EXTENSION

TITLE
PLANT COMMUNITY CLASSIFICATION WITHIN THE STUDY AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2020-07-31
DESIGNED	PR
PREPARED	PR
REVIEWED	LO
APPROVED	-

PROJECT NO.	CONTROL	REV.	FIGURE
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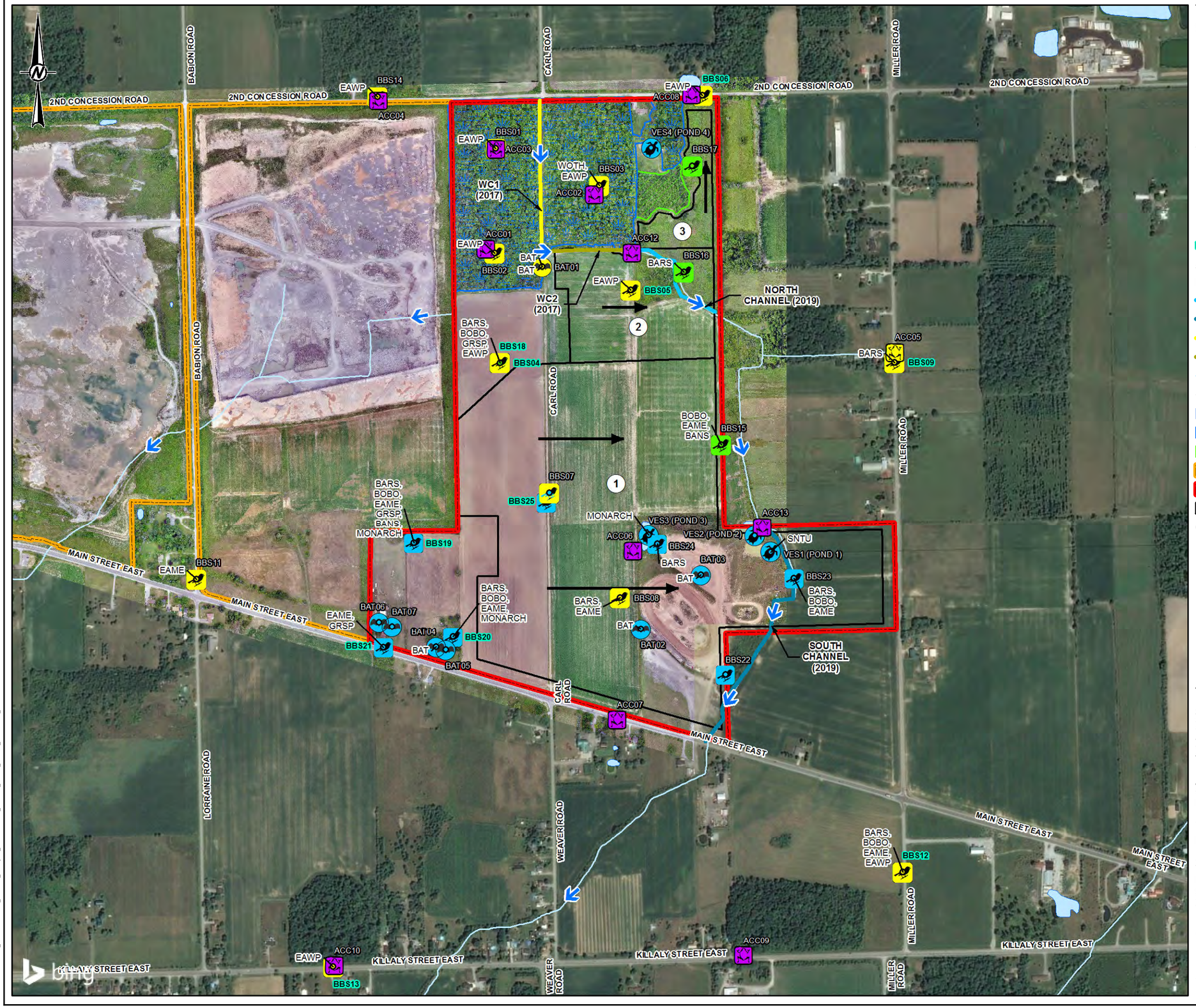
Figure 3 – Natural Environment Survey Station Locations and SAR Observations



LEGEND

Survey Station Type

- Anuran Call Count
- Bat
- Breeding Bird
- Turtle VES

Year Surveyed

- 2017
- 2018
- 2019
- 2020

BBS06 Considered a Grassland Bird Survey

Aquatic Habitat Survey

Date Surveyed

- North Channel (2019)
- South Channel (2019)
- WC1 (2017)
- WC2 (2017)
- Watercourse
- Railway
- Waterbody
- Wetland
- Woodland
- Property Boundary
- Proposed Quarry Extension
- Approximate Excavation Phasing Boundary
- Excavation Direction Arrow
- (1) Excavation Phase
- Surface Flow Direction

Species at Risk (SAR) Observation

BANS	Bank Swallow
BARS	Barn Swallow
BAT	Bat
BOBO	Bobolink
EAME	Eastern meadowlark
EAWP	Eastern wood-pewee
GRSP	Grasshopper sparrow
Monarch	Monarch
SNTU	Snapping turtle
WOTH	Wood thrush

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REFERENCE(S)

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4. PROJECTION: UTM ZONE 17N DATUM: NAD 83

CLIENT
RANKIN CONSTRUCTION

PROJECT
PROPOSED PORT COLBORNE QUARRY EXTENSION

TITLE
NATURAL ENVIRONMENT SURVEY STATION LOCATIONS AND SAR OBSERVATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2020-07-31
DESIGNED	PR
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REVIEWED	LO
APPROVED	-

PROJECT NO.	CONTROL	REV.	FIGURE
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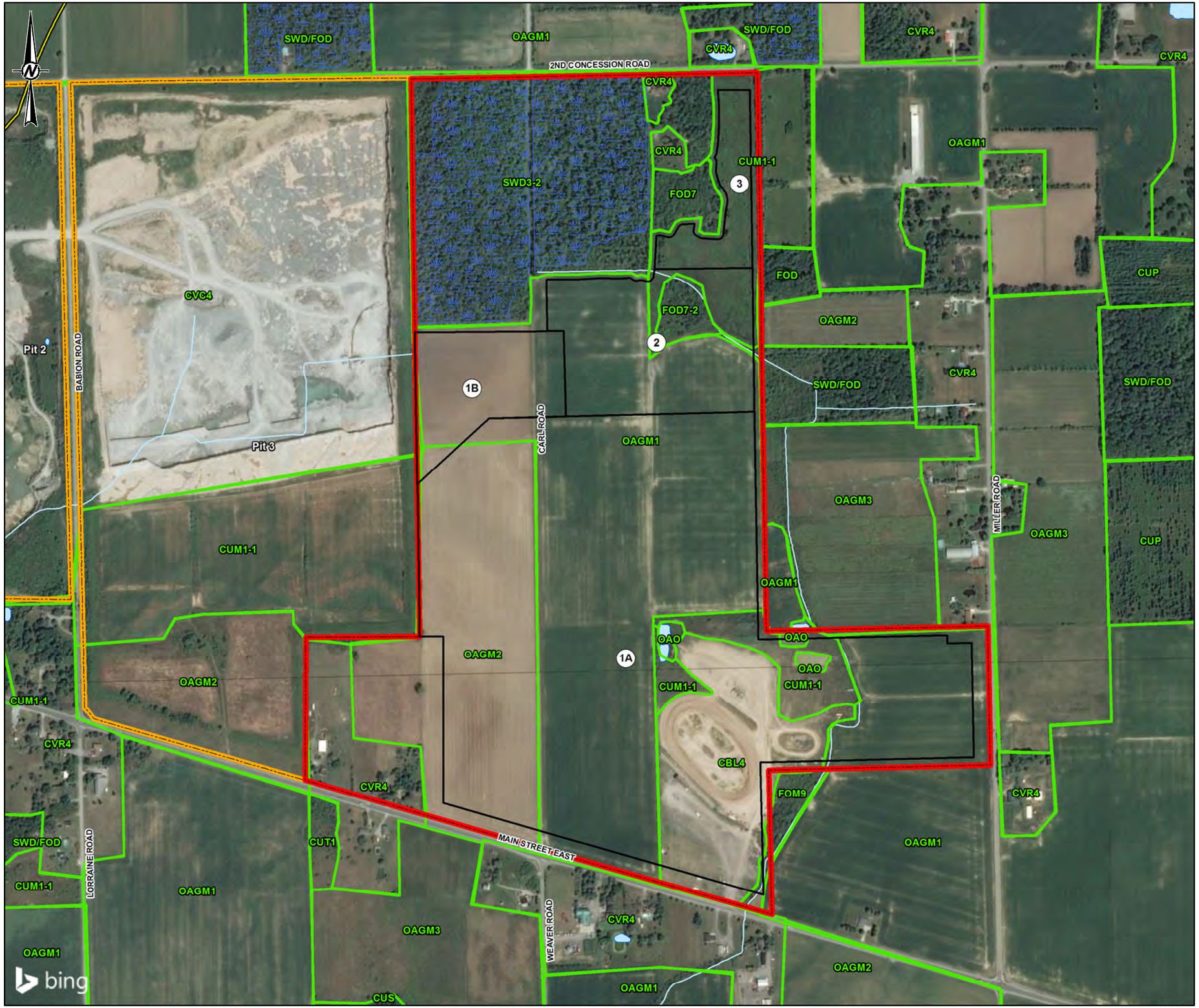
Figure 4 – Ecological Land Classification of the On-Site Plant Communities



LEGEND

- Roads
- Watercourse
- Wetland
- Waterbody
- Approximate Excavation Phasing Boundary
- Proposed Quarry Extension
- Property Boundary
- ELC Area
- Study Area (1000 m from Extraction Area Boundary)

ELC Code	Plant Community Name
CBL4	Recreational (Speedway)
CUM1-1	Old Field Cultural Meadow
CUP	Cultural Plantation
CUS	Cultural Savannah
CUT1	Cultural Thicket
CVC2	Light Industry
CVC4	Extraction
CVI3	Water and Sewage Treatment
CVR4	Rural Residential
FOD	Deciduous Forest
FOD2	Dry - Fresh Oak - Maple - Hickory Deciduous Forest
FOD7	Fresh - Moist Lowland Deciduous Forest
FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest
FOM9	Scot's Pine - Conifer - Green Ash Forest
OAGM1	Open Agriculture -annual row crop.
OAGM1	Annual Row Crop Ariculture
OAGM1	Annual Row Crop Agriculture
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OAGM3	Pasture
OAO	Open Water Aquatic
SWD/FOD	Deciduous Swamp / Deciduous Forest
SWD3	Maple Mineral Deciduous Swamp
SWD3-2	Silver Maple Mineral Deciduous Swamp

0 300 600

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REFERENCE(S)

1. BASE DATA: MNRF LIO 2016
2. IMAGERY: © 2020 MICROSOFT CORPORATION © 2020 MAXAR ©CNES (2020) DISTRIBUTION AIRBUS DS
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CLIENT
RANKIN CONSTRUCTION

PROJECT
PROPOSED PORT COLBORNE QUARRY EXTENSION

TITLE
ECOLOGICAL LAND CLASSIFICATION OF THE ON-SITE PLANT COMMUNITIES

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-26
DESIGNED	PR
PREPARED	PR
REVIEWED	LO
APPROVED	-

PROJECT NO. 1771656 | CONTROL 0017 | REV. | FIGURE 4

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APPENDIX A

Plant List

Scientific Name	Common Name	Origin[b]	Status[b]	G Rank[c]	S Rank[c]
Trees (28 taxa)					
Acer x freemanii	Freeman's maple	N	—	GNA	SNA
Acer rubrum	Red maple	N	—	G5	S5
Acer saccharinum	Silver maple	N	—	G5	S5
Betula papyrifera	White birch	N	—	G5	S5
Carya cordiformis	Bitternut hickory	N	—	G5	S5
Carya ovata	Shagbark hickory	N	—	G5	S5
Fagus granifolia	American beech	N	—	G5	S4
Fraxinus pennsylvanica	Green ash	N	—	G5	S5
Larix laricina	Tamarack	N	—	G5	S5
Malus pumila	Apple	N	—	G5	S5
Ostrya virginiana	Eastern hop-hornbeam	N	—	G5	S5
Picea abies	Norway spruce	I	—	G5	SNA
Picea glauca	White spruce	N	—	—	S5
Picea pungens	Blue spruce	I	—	G5	SNA
Pinus nigra	Austrian pine	I	—	GNR	SNA
Pinus strobus	White pine	N	—	G5	S5
Pinus sylvestris	Scots pine	I	—	GNR	SNA
Populus deltoides	Eastern cottonwood	N	—	G5T5	S5
Populus tremuloides	Trembling aspen	N	—	G5	S5
Quercus alba	White oak	N	—	G5	S5
Quercus bicolor	Swamp white oak	N	—	G5	S4
Quercus macrocarpa	Bur oak	N	—	G5	S5
Quercus muehlenbergii	Chinquapin oak	N	—	G5	S4
Quercus palustris	Pin oak	N	—	G5	S4
Quercus rubra	Red oak	N	—	G5	S5
Salix alba (var. tristis)	Golden willow	I	—	G5	SU
Tilia americana	Basswood	N	—	G5	S5
Ulmus americana	White elm	N	—	G5	S5
Small trees, shrubs and woody vines (34 taxa)					
Cornus alternifolia	Alternate-leaved dogwood	N	—	G5	S5
Cornus amomum	Silky dogwood	N	—	G5	S5
Cornus foemina	Gray dogwood	N	—	G5	S5
Cornus obliqua	Pale dogwood	N	—	G5T5	S5
Cornus sericea	Red-oiser dogwood	N	—	G5	S5
Crataegus sp.	Hawthorn sp.	N	—	—	—
Elaeagnus angustifolia	Russian olive	I	—	GNR	SNA
Frangula alnus	Glossy buckthorn	I	—	GNR	SNA
Ilex verticillata	Black holly	N	—	G5	S5
Juniperus virginiana	Eastern red cedar	N	—	G5	S5
Lindera benzoin	Spicebush	N	—	G5	S4
Lonicera tatarica	Tartarian honeysuckle	I	—	GNR	SNA
Parthenocissus vitacea	Thicket creeper	N	—	G5	S5
Prunus virginiana	Choke cherry	N	—	G5	S5
Rhamnus cathartica	Common buckthorn	I	—	GNR	SNA
Rhus typhina	Staghorn sumac	N	—	G5	S5
Ribes americanum	Wild black currant	N	—	G5	S5
Rosa multiflora	Multiflora rose	I	—	GNR	SNA

Scientific Name	Common Name	Origin[b]	Status[b]	G Rank[c]	S Rank[c]
Rubus allegheniensis	Mountain blackberry	N	—	G5	S5
Rubus idaeus	Red raspberry	N	—	G5T5	S5
Rubus pubescens	Dwarf raspberry	N	—	G5	S5
Salix discolor	Pussy willow	N	—	G5	S5
Salix eriocephala	Missouri river willow	N	—	G5	S5
Salix petiolaris	Slender willow	N	—	G5	S5
Sambucus canadensis	Common elderberry	N	—	G5	S5
Sambucus racemosa	Red-berried elderberry	N	—	G5	S5
Solanum dulcamara	Climbing nightshade	I	—	GNR	SNA
Spiraea alba	Meadowsweet	N	—	G5	S5
Toxicodendron radicans	Poison-ivy	N	—	G5T5	S5
Vaccinium corymbosum	Highbush blueberry	N	—	G5	S4
Viburnum lentago	Nannyberry	N	—	G5	S5
Viburnum recognitum	Southern arrowwood	N	—	G4G5	S4
Vitis riparia	Riverbank grape	N	—	G5	S5
Zanthoxylum americanum	Common prickly-ash	N	—	G5	S5
Ferns and allies (4 taxa)					
Dryopteris carthusiana	Spinulose woodfern	N	—	G5	S5
Equisetum sp.	Horsetail sp.	N	—	G5	S5
Onoclea sensibilis	Sensitive fern	N	—	G5	S5
Osmunda regalis	Royal fern	N	—	G5	S5
Graminoids (21 taxa)					
Bromus sp.	Bromus sp.	—	—	—	—
Calamagrostis canadensis	Canada blue-joint	N	—	G5	S5
Carex aurea	Golden sedge	N	—	G5	S5
Carex bebbii	Bebb's sedge	N	—	G5	S5
Carex crinita	Fringed sedge	N	—	G5	S5
Carex interior	Inland sedge	N	—	G5	S5
Carex lupulina	Hop sedge	N	—	G5	S5
Carex projecta	Necklace sedge	N	—	G5	S5
Carex scoparia	Pointed broom sedge	N	—	G5	S5
Carex stipata	Awl-fruited sedge	N	—	G5	S5
Carex vulpinoidea	Fox sedge	N	—	G5	S5
Cinna latifolia	Slender woodreed	N	—	G5	S5
Elymus repens	Creeping wildrye	I	—	GNR	SNA
Glyceria sp.	Grass sp.	—	—	—	—
Hordeum jubatum	Foxtail barley	N	—	G5	S5?
Juncus sp.	Rush sp.	—	—	—	—
Phalaris arundinacea	Reed canary grass	N	—	G5	S5
Phleum pratense	Common timothy	I	—	GNR	SNA
Phragmites australis ssp. *australis*	European reed	I	—	G5T5	SNA
Poa sp.	Grass sp.	—	—	—	—
Scirpus atrocinctus	Wool-grass	N	—	G5	S5
Forbs (67 taxa)					
Achillea millefolium	Common yarrow	I	—	G5	SNA
Actaea sp.	Baneberry sp.	N	—	—	—
Alliaria petiolata	Garlic mustard	I	—	GNR	SNA
Ambrosia artemisiifolia	Ragweed	N	—	G5	S5

Scientific Name	Common Name	Origin[b]	Status[b]	G Rank[c]	S Rank[c]
Aralia nudicaulis	Wild sarsaparilla	N	—	G5	S5
Arctium lappa	Giant burdock	I	—	GNR	SNA
Arisaema triphyllum	Jack-in-the-pulpit	N	—	G5	S5
Asclepias syriaca	Common milkweed	N	—	G5	S5
Bidens cernua	Beggar-ticks	N	—	G5	S5
Boehmeria cylindrica	False nettle	N	—	G5	S5
Butomus umbellatus	Flowering-rush	I	—	G5	SNA
Caltha palustris	Marsh-marigold	N	—	G5	S5
Centaurea stoebe	Spotted knapweed	I	—	GNR	SNA
Chenopodium album	Lamb's-quarters	I	—	G5T5	SNA
Cichorium intybus	Chicory	I	—	GNR	SNA
Circaea lutetiana	Enchanter’s nightshade	N	—	G5	S5
Cirsium arvense	Canada thistle	I	—	GNR	SNA
Cicuta maculata	Spotted water-hemlock	N	—	G5T5	S5
Convolvulus arvensis	Field bindweed	I	—	GNR	SNA
Daucus carota	Wild carrot	I	—	GNR	SNA
Dipsacus fullonum	Common teasel	I	—	GNR	SNA
Eutrochium purpureum	Joe-pye weed	N	—	G5	S4
Fragaria vesca	Woodland strawberry	N	—	G5	S5
Fragaria virginiana	Wild Strawberry	N	—	G5T5	SU
Galium asprellum	Rough bedstraw	N	—	G5	S5
Geranium maculatum	Spotted geranium	N	—	G5	S5
Glechoma hederacea	Ground ivy	I	—	GNR	SNA
Hesperis matronalis	Dame's rocket	I	—	G4G5	SNA
Hypericum perforatum	Common St. John's-wort	I	—	GNR	SNA
Impatiens capensis	Spotted jewelweed	N	—	G5	S5
Iris versicolor	Blue-flag	N	—	G5	S5
Lactuca canadensis	Canada lettuce	N	—	G5	S5
Leucanthemum vulgare	Oxeye daisy	I	—	GNR	SNA
Lotus corniculatus	Bird’s-foot trefoil	I	—	GNR	SNA
Maianthemum canadense	Wild lily-of-the-valley	N	—	G5T5	S5
Medicago sativa	Alfalfa	I	—	GNRTNR	SNA
Melilotus officinalis	Yellow sweet-clover	I	—	GNR	SNA
Mentha arvensis	Field mint	N	—	G5	S5
Oenothera biennis	Common evening primrose	N	—	G5	S5
Persicaria lapathifolia	Pale smartweed	N	—	G5	S5
Pilosella piloselloides ssp. praealta	King devil hawkweed	I	—	GNR	SNA
Plantago lanceolata	English plantain	I	—	G5	SNA
Plantago major	Common plantain	I	—	G5	SNA
Podophyllum peltatum	May-apple	N	—	G5	S5
Potentilla sp.	Cinquefoil sp.	—	—	—	—
Prunella vulgaris	Heal-all	N	—	G5T5	S5
Ranunculus acris	Tall buttercup	I	—	G5	SNA
Reynoutria japonica	Japanese Knotweed	I	—	GNR	SNA
Rudbeckia laciniata cv. Hortensia	Cut-leaved coneflower	I	—	—	—
Rumex crispus	Curled dock	I	—	GNR	SNA
Solanum dulcamara	Climbing nightshade	I	—	GNR	SNA
Solidago sp.	Goldenrod sp.	—	—	—	—

Scientific Name	Common Name	Origin[b]	Status[b]	G Rank[c]	S Rank[c]
Solidago canadensis	Canada goldenrod	N	—	G5T5	S5
Stellaria longifolia	Long-leaved stitchwort	N	—	G5	S5
Symphyotrichum lanceolatum	Panicled aster	N	—	G5T5	S5
Symphyotrichum lateriflorum	Calico aster	N	—	G5T?	S5
Symphyotrichum novae-angliae	New England aster	N	—	G5	S5
Taraxacum officinale	Common dandelion	I	—	G5	SNA
Thalictrum pubescens	Tall meadow-rue	N	—	G5	S5
Trifolium pratense	Red clover	I	—	GNR	SNA
Trifolium repens	White clover	I	—	GNR	SNA
Tussilago farfara	Colt's-foot	I	—	GNR	SNA
Typha angustifolia	Narrow-leaved catttail	I	—	G5	SNA
Typha latifolia	Common cattail	N	—	G5	S5
Urtica dioica	Stinging nettle	N	—	G5T?	S5
Vicia cracca	Tufted Vetch	I	—	GNR	SNA
Viola sp.	Violet sp.	—	—	—	—

[a] Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

[b] Status: F = Federal; P = Provincial; R = Regional (OMNR Central Region); L = Local (County or R.M.).
END= Endangered; THR = Threatened; SC = Special Concern.

[c] Ranks based upon determinations made by the Natural Heritage Information Centre (2017).
G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
NA = Not applicable [used mainly for abundance of non-natives; NR = Not ranked [used mainly for non-natives];
Q = Taxonomic questions not fully resolved; T = sub-specific taxon (taxa) present in the province; U = Uncertain.

APPENDIX B

Species at Risk Screening

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Fowler's toad	*Anaxyrus fowleri*	END	END	END	S2	In Ontario, Fowler's toad is only found along the north shore of Lake Erie including Pelee Island. Fowler's toad is adapted to areas in the early stages of ecological succession in sand dune and lake shore habitats. Fowler's toad breeds, lays eggs and the tadpoles develop in early successional wetlands, drains and stream mouths that open to sand beaches, bedrock pools, shallow bays and ponds. Breeding sites typically have sand or bedrock substrates, and sparse vegetation. Fowler's toad hibernates below the frost line in sand dunes or deep sand (Green et al. 2011)	Low	There is no suitable dune or sandy shoreline habitat on the site or within the study area. In addition, no individuals were observed during field surveys.
Monarch	*Danaus plexippus*	SC	SC	END	S2N, S4B	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (*Asclepius* 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).	High	Monarch was observed on site near pond 4 to the northeast of the race track, on a residential property north of Highway 3, and within the study area on the property to the southeast of the site during field surveys. Milkweed was also confirmed to be present during the field surveys
Rusty-patched bumble bee	*Bombus affinis*	END	END	END	S1	In Ontario, rusty-patched bumble bee is found in areas from the southern Great Lakes – St. Lawrence forest region southwards into the Carolinian forest. It is a habitat generalist, but it is typically found in open habitats, such as mixed farmland, savannah, marshes, sand dunes, urban and lightly wooded areas. It is cold –tolerant and can be found at high elevations. Most recent sightings in Ontario have been in oak savannah habitat with well-drained, sandy soils and moderately open canopy. It requires an abundance of flowering plants for forage. This species most often builds nests underground in old rodent burrows, but also in hollow tree stumps and fallen dead wood (Colla and Taylor-Pindar 2011). The only recent sightings in Ontario are from the Pinery Provincial Park.	Low	Although there may be suitable habitat on the site and within the study area, the only recent observations have been in Pinery Provincial Park, which is not in the vicinity of the study area.
West Virginia white	*Pieris virginiensis*	SC	—	—	S3	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).	Low	Potential suitable woodland habitat exists in the study area. However, no toothwort plants were observed during field surveys.
Acadian flycatcher	*Empidonax virescens*	END	END	END	S2S3B	In Ontario, Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size, and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Whitehead and Taylor 2002).	Low	There is some potential for woodland that is preferred habitat for this species in the study area, however the woodlands on site are not sufficient in size for the preference of the Acadian flycatcher. In addition, no individuals were observed during field surveys.
Bald eagle	*Haliaeetus leucocephalus*	SC	—	NAR	S2N,S4B	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low	There are no suitable large waterbodies bordered by forest with tall trees to provide suitable nesting habitat for bald eagle. In addition, no individuals were observed during the field surveys.

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Bank swallow	*Riparia riparia*	THR	THR	THR	S4B	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, 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).	Moderate	Bank swallow was observed foraging over the agricultural fields on the site during the field surveys. However, there is no potential nesting habitat on the site. Off-site, within the study area, stockpiles in the aggregate pits to the west of the site may provide suitable nesting habitat.
Barn owl	*Tyto alba*	END	END	END	S1	In Ontario, barn owl breeding habitat consists of open countryside, with a preference for pastures, hayfields, marshes and grassy roadsides. Suitable habitat contains suitable nesting sites and adequate mice and vole populations. Nesting occurs in a wide variety of human made structures including barns and nest boxes, as well as natural sites such as hollow trees and cavities in cliffs and riverbanks (Marti et al. 2005). In Ontario, anthropogenic nest sites such as barns may be preferred (COSEWIC 2010).	Low	Although there is open grassland habitat on the site, no individuals were observed during field surveys.
Barn swallow	*Hirundo rustica*	THR	THR	THR	S4B	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 right-of-ways, 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 1999).	High	Barn swallow was observed on the site and in the study area during field surveys. A barn swallow nest was observed in the trailer at the north end of the raceway property.
Bobolink	*Dolichonyx oryzivorus*	THR	THR	THR	S4B	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 (Martin and Gavin 1995).	High	Bobolink were observed on the site and within the study area during field surveys.
Canada warbler	*Cardellina canadensis*	SC	THR	THR	S4B	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	Although there is potentially suitable woodland habitat within the study area, no individuals were observed during field surveys.
Chimney swift	*Chaetura pelagica*	THR	THR	THR	S4B, S4N	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).	Moderate	No suitable habitat was identified on site during field surveys, however there is potential for chimneys within the study area that could provide suitable habitat.

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Common nighthawk	*Chordeiles minor*	SC	THR	SC	S4B	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)	Moderate	Suitable open habitat exists within the study area. Open habitat on the site is primarily actively farmed and is not likely to provide preferred nesting habitat conditions for common nighthawk.
Eastern meadowlark	*Sturnella magna*	THR	THR	THR	S4B	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 2003). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970)	High	Eastern meadowlark was observed on the site and within the study area during field surveys.
Eastern wood-pewee	*Contopus virens*	SC	SC	SC	S4B	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	Eastern wood-pewee was observed on the site and within the study area during field surveys.
Grasshopper sparrow *pratensis* subspecies	*Ammodramus savannarum* (*pratensis* subspecies)	SC	SC	SC	S4B	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	Grasshopper sparrow was observed on the site during field surveys.
Henslow's sparrow	*Ammodramus henslowii*	END	END	END	SHB	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	Grassland habitat on site and within the study area is likely too disturbed to provide suitable habitat. In addition, no individuals were observed during the field surveys.
Least bittern	*Ixobrychus exilis*	THR	THR	THR	S4B	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).	Low	There are no suitably sized marshes on site or within the site or study area.
Northern bobwhite	*Colinus virginianus*	END	END	END	S1	In Ontario, northern bobwhite breeds in early successional habitats. This species requires a combination of three habitat types: woody cover, cropland and grassland. Croplands provide foraging habitat, grassland and fields are used for nesting, and dense brush provides both winter forage and year round cover. These birds nest on the ground in a shallow depression lined with grasses and other dead vegetation (Brennan et al. 2014).	Low	Although there may be suitable habitat combinations within the study area, there are very limited observations of this species in the region (ebird 2019).

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Peregrine falcon (*anatum/tundrius* subspecies)	*Falco peregrinus anatum/tundrius*	SC	SC	NAR	S3B	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2007).	Low	There are no cliff faces or tall buildings on site or within the study area to provide suitable nesting habitat
Red-headed woodpecker	*Melanerpes erythrocephalus*	SC	THR	END	S4B	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 (Smith et al. 2000).	Low	Although the woodland edges on site and in the study area may provide suitable habitat, no individuals were observed during the field surveys.
Short-eared owl	*Asio flammeus*	SC	SC	SC	S2N,S4B	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clearcuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources (COSEWIC 2008). Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment (Gahbauer 2007).	Low	Although there is grassland habitat on the site, no individuals were observed during field surveys.
Whip-poor-will	*Antrostomus vociferus*	THR	THR	THR	S4B	In Ontario, whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed and eggs are laid directly on the leaf litter (Mills 2007).	Low	There is no suitable habitat on the site, and forests in the study area generally have closed canopies. Whip-poor-will are uncommon breeders in the Carolinian region, and no individuals were observed during field surveys.
Wood thrush	*Hylocichla mustelina*	SC	THR	THR	S4B	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).	High	Wood thrush was observed on the site and within the study area during field surveys.
Yellow-breasted chat	*Icteria virens virens*	END	END	END	S2B	In Ontario, yellow-breasted chat breeds in early successional, shrub-thicket habitats including woodland edges, regenerating old fields, railway and hydro right-of-ways, young coniferous reforestations, and wet thickets bordering wetlands. Tangles of grape (*Vitis* spp.) and raspberry (*Rubus* spp.) vines are features of most breeding sites. There is some evidence that the yellow-breasted chat is an area sensitive species. Nests are located in dense shrubbery near to the ground (COSEWIC 2011).	Low	Although there may be suitable shrubland habitat within the study area, individuals were observed during the field surveys.

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
American badger *jacksoni* subspecies - southwestern population	*Taxidea taxus jacksoni*	END	END	END	S2	In Ontario, American badger's preferred habitats include undisturbed grasslands, shrubby areas and open woodlands, but the species will also use old fields, pastures, edges of agricultural fields and roadsides. The key factor for habitat suitability for this species is presence of prey, comprised mainly of woodchuck and eastern cottontail, and Franklin's ground squirrel in northwestern Ontario (Ontario American Badger Recovery Team 2010).	Low	The majority of agricultural fields on the site and within the study area are actively managed for crop production and do not provide suitable habitat for badger. In addition, no evidence of burrows or individuals were observed on the site during field surveys. In addition, the region is not within the currently known distribution of American badger (Ontario American Badger Recovery Team 2010).
Eastern small-footed myotis	*Myotis leibii*	END	—	—	S2S3	This species is not known to roost within 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. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017).	Moderate	No suitable rock piles or exposed bedrock cracks were identified on the site and no individuals were observed during field surveys. There may be other features within the study area that provide suitable maternity roosting habitat.
Grey fox	*Urocyon cinereoargenteus*	THR	THR	THR	S1	While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes, and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist (COSEWIC 2002).	Low	While suitable habitat may be present on site, the only known population of grey fox is on Pelee Island, and unlikely to occur in the study area
Little brown myotis	*Myotis lucifugus*	END	END	END	S4	In Ontario, this specie's 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).	Moderate	Although there is potentially suitable forest habitat and anthropogenic structures on the site, no individuals were observed during field surveys. Deciduous forests and swamp within the study area may provide suitable maternity roosting habitat.
Northern myotis	*Myotis septentrionalis*	END	END	END	S3	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).	Moderate	Although there is potentially suitable forest habitat on the site, no individuals were observed during field surveys. Deciduous forests and swamp within the study area may provide suitable maternity roosting habitat.
Tri-colored bat	*Perimyotis subflavus*	END	END	END	S3?	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).	Moderate	Although there is potentially suitable forest habitat on the site, no individuals were observed during field surveys. Deciduous forests and swamp within the study area may provide suitable maternity roosting habitat.
Woodland vole	*Microtus pinetorum*	SC	SC	SC	S3?	In Ontario, woodland vole is associated with mature deciduous forests with soft, often sandy soils and a deep litter and humic layer, suitable for burrowing. Common associates include oaks, hickory, black walnut, American beech and tulip tree. This species is often found at woodland edges near roads, railway tracks and field edges. Woodland vole is restricted to the Carolinian forest zone (COSEWIC 2010).	Moderate	Suitable habitat may be present in the woodlands within the study area.

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Snuffbox	*Epioblasma triquetra*	END	END	END	S1	In Ontario, the snuffbox is typically found in small to medium-sized rivers in shallow riffle areas with clean, clear, swift-flowing water. Preferred substrates are firm rubble, gravel, or sand free of silt. It has been reported at depths of 0.5-2.5 m (Morris and Burridge 2010).	Low	The watercourse on site lacks the appropriate substrates and flow velocities suitable for this species
Eastern hog-nosed snake	*Heterodon platirhinos*	THR	THR	THR	S3	Eastern hog-nosed snake can be classified as a habitat generalist as it uses a variety of habitats across its range. In Ontario, this snake typically uses habitat with open vegetation cover, including open woodlands, wetlands, fields, forest edges, beaches and dunes, and disturbed sites, most often near water. In the Georgian Bay area, disturbed fields, rock barrens and forests appear to be preferred habitats. This species relies on sandy well drained soils. Hibernation occurs in sandy soils below the frost line. This species has been observed excavating hibernation sites in mixed intolerant upland forests. Nesting and oviposition has been noted in upland sandy areas and rock outcrops under large flat rocks. The majority of their diet is comprised of American toad and Fowler's toad (Kraus 2011).	Low	There are combinations of forest, wetland and agricultural patches within the study area that may provide suitable habitat for this species. However, no individuals were observed on the site during field surveys. Eastern hog-nosed snake is only historically known from the Niagara region (Ontario Nature 2019).
Gray ratsnake - Carolinian population	*Pantherophis spiloides*	END	END	END	S1	In Ontario, gray ratsnakes of the Carolinian population require a mosaic of habitats, showing a preference for a mixture of forest and open habitats with a strong preference for edge habitats. Microhabitats such as snags, hollow logs, rock crevices and rocks provide shelter. Communal hibernation takes place in underground sites, such as rock fissures, mammal burrows and root systems, often on south-facing, rocky slopes (Kraus et al. 2010).	Low	Although there appears to be suitable forest/meadow edge habitat for this species within the study area, no individuals were observed on the site during field surveys. In addition, the distribution of the Carolinian population is known to be extremely disjunct, small and isolated (Kraus et al. 2010). Gray ratsnake is only historically known from the Port Colborne region (Ontario Nature 2019). No potential hibernacula features were identified on the site or within the study area.
Massasauga rattlesnake - Carolinian population	*Sistrurus catenatus*	END	THR	THR	S3	In Ontario, Massasauga rattlesnake occurs in four separate regional populations: eastern Georgian Bay, Bruce peninsula and Manitoulin Island, Wainfleet bog, and the Ojibway Prairie complex in Windsor. This snake species uses a wide variety of habitats across its range, all of which share specific characteristics, including open areas for basking and areas of vegetation and rock for shelter. They are most typically associated with wetlands and damp areas/lowlands during the spring. They forage in shrubby fields and grasslands in the summer months. Hibernation sites are often associated with wetlands or wet depressions, in rock fissures, mammal and crayfish burrows, sphagnum hummocks and tree root systems, where snakes will access the area below the frost line, but above the water table. Gestation habitat includes areas with low canopy closure such as bedrock outcrops with vegetative cover and a large structure such as a table rock for refuge during this period (Massasauga Recovery Team 2005).	Low	Although there is a known population of Massassaga rattlesnake in the Wainfleet Bog to the west of the study area, the area of wetland on the site is isolated and unlikely to support this species.
Milksnake	*Lampropeltis triangulum*	NAR	SC	SC	S4	In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Moderate	The combination of open field, pond and wetland habitat on site and within the study area may support this species.

Common Name	Scientific Name	Endangered Species Act[1]	Species at Risk Act (Sch 1)[2]	COSEWIC[3]	Provincial (SRank)[4]	Habitat Requirements[5]	Potential to Occur on Site or in the Study Area	Rationale for Potential to Occur on Site or in the Study Area
Northern map turtle	*Graptemys geographica*	SC	SC	SC	S3	In Ontario, the 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).	Low	There are no suitable large waterbodies on site or within the study area
Snapping turtle	*Chelydra serpentina*	SC	SC	SC	S3	In Ontario, snapping turtle utilizes 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	Snapping turtle was observed on site in Pond 1 to the northeast of the race track.
Butternut	*Juglans cinerea*	END	END	END	S3?	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).	Low	The majority of woodlands within the study area are wetlands that are unlikely to provide preferred growing habitat for butternut. In addition, no butternut were observed during the field surveys
Common hoptree	*Ptelea trifoliata*	SC	SC	SC	S3	In Ontario, common hoptree grows in open woodlands, thickets, dry prairies and along dry, and rocky shorelines. It typically occurs in sunny areas with dry sandy or rocky soils (Farrar 1995).	Low	The majority of woodlands within the study area are wetlands that are unlikely to provide preferred growing habitat. In addition, no individuals were observed during the field surveys
Eastern flowering dogwood	*Cornus florida*	END	END	END	S2?	In Ontario, eastern flowering dogwood grows in the understory of dry to rich deciduous forests, especially on hillsides and riverbanks. It prefers sandy acidic soils but occasionally is found in loams, clays and organic soils (Waldron 2003). This species is restricted to the Carolinian zone of southern Ontario.	Low	The majority of woodlands within the study area are wetlands that are unlikely to provide preferred growing habitat. In addition, no individuals were observed during the field surveys.
Halberd-leaved tearthumb	*Persicaria arifolia*	—	—	—	S3	In Ontario, halberd-leaved tearthumb grows in a variety of moist habitats including moist woodlands, swamps and thickets (Oldham and Brinker 2009).	Moderate	Although there is suitable swamp habitat on the site, no individuals were observed during field surveys. Other deciduous swamps off-site, within the study area, may provide suitable growing habitat.
Shumard oak	*Quercus shumardii*	SC	—	SC	S3	In Ontario, Shumard oak occurs in mature deciduous woods on clay soil, silty loam and in swampy areas. This species is usually well spaced and never occurs in pure stands (Donley et al. 2013). It typically grows in southwestern Ontario.	Low	Although the woodlands on site and within the study area may provide suitable habitat, no individuals were observed during the field surveys.
Swamp rose-mallow	*Hibiscus moscheutos*	SC	SC	SC	S3	In Ontario, swamp rose mallow is restricted to shoreline marshes associated with lakes Erie, Ontario, and St. Clair. It is most commonly found in deep-water cattail marshes and meadow marshes, but is also found in dyked wetlands, open wet woods, thickets, spoil banks, and drainage ditches where it grows on organic or clay soils. Periodic water level fluctuations are necessary to sustain swamp rose mallow (Environment Canada 2013).	Low	There are no suitable shoreline marshes on the site or within the study area.
White wood aster	*Eurybia divaricata*	THR	THR	THR	S2S3	In Ontario, white wood aster grows in open, dry to moist, deciduous woodlands with well-drained soils. It seems to grow along trails in forests dominated by sugar maple and American beech, with associates such as red, white, and black oak, shagbark hickory, and basswood (COSEWIC 2002).	Low	The majority of woodlands within the study area are wetlands that are unlikely to provide preferred growing habitat. In addition, no individuals were observed during the field surveys.

[1] *Endangered Species Act* (ESA), 2007 (O.Reg 242/08 last amended 27 March 2018 as O.Reg 219/18). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 1 Aug 2018 as O. Reg 404/18, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

[2] *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 25 January 2020); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[3] Committee on the Status of Endangered Wildlife in Canada (COSEWIC) http://www.cosewic.gc.ca/

[4] 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 (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated). Last assessed November 2019.

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APPENDIX C

Wildlife List

Common Name	Scientific Name	S Rank[a]	G Rank[a]	ESA[b]
Birds				
American Crow	*Corvus brachyrhynchos*	S5B	G5	—
American Goldfinch	*Carduelis tristis*	S5B	G5	—
American Robin	*Turdus migratorius*	S5B	G5	—
American Woodcock	*Scolopax minor*	S4B	G5	—
Baltimore Oriole	*Icterus galbula*	S4B	G5	—
Bank Swallow	***Riparia riparia***	**S4B**	**G5**	**THR**
Barn Swallow	***Hirundo rustica***	**S5B**	**G5**	**THR**
Black-capped Chickadee	*Poecile atricapilla*	S5	G5	—
Blue Jay	*Cyanocitta cristata*	S5	G5	—
Blue-gray Gnatcatcher	*Polioptila caerulea*	S4B	G5	—
Bobolink	***Dolichonyx oryzivorus***	**S4B**	**G5**	**THR**
Brown-headed Cowbird	*Molothrus ater*	S4B	G5	—
Canada Goose	*Branta canadensis*	S5	G5	—
Carolina wren	*Thryothorus ludovicianus*	S4	G5	—
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5	—
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	G5	—
Chipping Sparrow	*Spizella passerina*	S5B	G5	—
Common Grackle	*Quiscalus quiscula*	S5B	G5	—
Common Yellowthroat	*Geothlypis trichas*	S5B	G5	—
Downy Woodpecker	*Picoides pubescens*	S5	G5	—
Eastern Bluebird	*Sialia sialis*	S5B	G5	—
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5	—
Eastern Meadowlark	***Sturnella magna***	**S4B**	**G5**	**THR**
Eastern Phoebe	*Sayornis phoebe*	S5B	G5	—
Eastern Wood-Pewee	***Contopus virens***	**S4B**	**G5**	**SC**
European Starling	*Sturnus vulgaris*	SNA	G5	—
Field Sparrow	*Spizella pusilla*	S4B	G5	—
Grasshopper Sparrow	***Ammodramus savannarum***	**S4B**	**G5**	**SC**
Gray Catbird	*Dumetella carolinensis*	S4B	G5	—
Great Blue Heron	*Ardea herodias*	S4	G5	—
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5	—
Hairy Woodpecker	*Picoides villosus*	S5	G5	—
Horned Lark	*Eremophila alpestris*	S5B	G5	—
House Sparrow	*Passer domesticus*	SNA	G5	—
House Wren	*Troglodytes aedon*	S5B	G5	—
Indigo Bunting	*Passerina cyanea*	S4B	G5	—
Killdeer	*Charadrius vociferus*	S5B, S5N	G5	—
Mallard	*Anas platyrhynchos*	S5	G5	—
Mourning Dove	*Zenaida macroura*	S5	G5	—
Northern Mockingbird	*Mimus polyglottos*	S4	G5	—
Northern Cardinal	*Cardinalis cardinalis*	S5	G5	—
Northern Flicker	*Colaptes auratus*	S4B	G5	—
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B	G5	—
Orchard Oriole	*Icterus spurius*	S4B	G5	—
Osprey	*Pandion haliaetus*	S5B	G5	—
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5	—
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5	—
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	—
Red-winged Blackbird	*Agelaius phoeniceus*	S4	G5	—

Common Name	Scientific Name	S Rank[a]	G Rank[a]	ESA[b]
Ring-billed Gull	*Larus delawarensis*	S5B,S4N	G5	—
Rock Pigeon	*Columba livia*	SNA	G5	—
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5	—
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5	—
Scarlet Tanager	*Piranga olivacea*	S4B	G5	—
Song Sparrow	*Melospiza melodia*	S5B	G5	—
Spotted Sandpiper	*Actitis macularius*	S5	G5	—
Tree Swallow	*Tachycineta bicolor*	S4B	G5	—
Turkey Vulture	*Cathartes aura*	S5B	G5	—
Tufted Titmouse	*Baeolophus bicolor*	S4	G5	—
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5	—
Warbling Vireo	*Vireo gilvus*	S5B	G5	—
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5	—
Wild Turkey	*Meleagris gallopavo*	S5	G5	—
Willow Flycatcher	*Empidonax traillii*	S5B	G5	—
Wood Thrush	***Hylocichla mustelina***	**S4B**	**G5**	**SC**
Yellow Warbler	*Setophaga petechia*	S5B	G5	—
Mammals				
Big Brown Bat	*Eptesicus fuscus*	S4	G5	—
Eastern Red Bat	*Lasiurus borealis*	S4	G3G4	—
Hoary Bat	*Lasiurus cinereus*	S4	G3G4	—
Silver-haired Bat	*Lasionycteris noctivagans*	S4	G3G4	—
White-tailed Deer	*Odocoileus virginianus*	S5	G5	—
Muskrat	*Ondatra zibethicus*	S5	G5	—
Amphibians				
American Toad	*Anaxyrus (Bufo) americanus*	S5	G5	—
American Bullfrog	*Lithobates catesbeianus*	S4	G5	—
Northern Green Frog	*Lithobates (Rana) clamitans*	S5	G5	—
Northern Leopard Frog	*Lithobates (Rana) pipiens*	S5	G5	—
Spring Peeper	*Pseudacris crucifer*	S5	G5	—
Western Chorus Frog (Carolinian pop'n)	*Pseudacris triseriata*	S4	G5TNR	—
Reptiles				
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5T5	—
Midland Painted Turtle	*Chrysemys picta marginata*	S4	G5T5	—
Snapping Turtle	***Chelydra serpentina***	**S4**	**G5**	**SC**
Invertabrates				
Black Swallowtail	*Papilio polyxenes*	S5	G5	—
Monarch	***Danaus plexippus***	**S2N, S4B**	**G5**	**SC**
Red Admiral	*Vanessa atalanta*	S5	G5	—

[a] Ranks based upon determinations made by the Ontario Natural Heritage Information Centre
G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

[b] *Endangered Species Act* (ESA), 2007 (O.Reg 242/08 last amended 27 March 2018 as O.Reg 219/18). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 1 Aug 2018 as O. Reg 404/18, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)
Bolded Species are Species at Risk

APPENDIX D

Correspondence

From: Sabourin, Amber
To: Owens, Luke
Subject: FW: Information Request - Port Colborne Quarry Site
Date: Tuesday, March 27, 2018 12:37:47 PM
Attachments: Port Colborne Quarry Expansion InfoRequestResponseTemplate_VinelandOffice.pdf
Port Colborne.pdf

Hi Luke,

Here is the info request for the Port Colborne site.

Amber Sabourin (H.B.Sc (Env))
Ecologist

6925 Century Avenue, Suite #100, Mississauga, Ontario, Canada L5N 7K2
T: +1 905 567 4444 | **D:** +1 905 567-6100 x1819 | **C:** +1 416-779-5711 | **golder.com**
LinkedIn | Facebook | Twitter

From: Parks, Amy (MNRF) [mailto:Amy.Parks@ontario.ca]
Sent: Tuesday, March 27, 2018 12:03 PM
To: Sabourin, Amber <Amber_Sabourin@golder.com>
Subject: RE: Information Request - Port Colborne Quarry Site

Hi Amber,

Please find the Information Request Response letter and a Municipality of Port Colborne Species list.

Let me know if you need clarification on anything,

Amy Parks
A/Resource Management Technician

Ministry of Natural Resources and Forestry
Guelph District - Vineland Field Office
P.O. Box 5000, 4890 Victoria Ave. N.
Vineland, ON L0R 2E0
Tel: (905) 562-0150

From: Sabourin, Amber [mailto:Amber_Sabourin@golder.com]
Sent: March 1, 2018 10:24 AM
To: Parks, Amy (MNRF)
Subject: RE: Information Request - Port Colborne Quarry Site

Hi Amy,

No, I don't believe we have gotten a response yet. Its been so long, I guess we forgot to follow up, so thanks for contacting me! We'd still appreciate any information you can provide.

Thanks,

Amber

Amber Sabourin (H.B.Sc (Env))
Ecologist

6925 Century Avenue, Suite #100, Mississauga, Ontario, Canada L5N 7K2
T: +1 905 567 4444 | **D:** +1 905 567-6100 x1819 | **C:** +1 416-779-5711 | **golder.com**
LinkedIn | Facebook | Twitter

From: ESA Guelph (MNRF) [mailto:ESAGUELPH@ontario.ca]
Sent: Thursday, March 01, 2018 10:18 AM
To: Sabourin, Amber <Amber_Sabourin@golder.com>
Subject: FW: Information Request - Port Colborne Quarry Site

Hi Amber,

Has anyone helped you with this information yet?

Please email me directly at amy.parks@ontario.ca

Amy Parks
A/Resource Management Technician

Ministry of Natural Resources and Forestry
Guelph District - Vineland Field Office
P.O. Box 5000, 4890 Victoria Ave. N.
Vineland, ON L0R 2E0
Tel: (905) 562-0150

From: Sabourin, Amber [mailto:Amber_Sabourin@golder.com]
Sent: May 18, 2017 3:59 PM
To: ESA Guelph (MNRF)
Cc: Owens, Luke
Subject: Information Request - Port Colborne Quarry Site

Hello,

Please find attached a completed information request form and site map for the Port Colborne Quarry Expansion Project.

Regards,
Amber

Amber Sabourin (H.B.Sc (Env)) | Ecologist | **Golder Associates Ltd.**
6925 Century Avenue, Suite #100, Mississauga, Ontario, Canada L5N 7K2
T: +1 (905) 567 4444 | **D:** +1 (905) 567-6100 x1819 | **F:** +1 (905) 567 6561 | **C:** +1 (416) 779-5711 | **E:** Amber_Sabourin@golder.com | **www.golder.com**

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Ministry of Natural Resources And Forestry

Ministère des Richesses naturelles et des Forets

Box 5000
4890 Victoria Ave. N.
Vineland Station, Ontario
LOR 2E0

Telephone: (905) 562-4147
Facsimile: (905) 562-1154

March 27, 2018

Ms. Amber Sabourin
Golder Associates Ltd
6925 Century Avenue, Suite #100
Mississauga, Ontario, Canada L5N 7K2

Via email only:
Amber_Sabourin@golder.com

RE: Port Colborne Quarry Expansion
Part of Lots 18 &19, Concession 2

Dear Ms. Sabourin,

The Ministry of Natural Resources and Forestry (MNRF), Guelph District – Vineland Field Office, has reviewed the natural heritage information available for the above-noted property and surrounding area (the "study area"), and offers the following comments:

WETLANDS

The Ministry notes that there are evaluated non-provincially significant wetlands within the study area:

- Upper Wignell Drain Wetland Complex

SPECIES AT RISK

There are records in the area for the following species at risk (SAR):

- Eastern Flowering Dogwood, *Cornus florida* (Endangered)
- Bobolink , *Dolichonyx oryzivorus* (Threatened)
- Bald Eagle, *Haliaeetus leucocephalus* (Special Concern)
- Shumard Oak, *Quercus shumardii* (Special Concern)
- Common Hoptree, *Ptelea trifoliate* (Special Concern)

Threatened and Endangered Species receive both individual species and habitat protection under the *Endangered Species Act, 2007* (ESA). SAR habitat prescribed under regulation is listed in Ont. Reg. 242/08 (https://www.ontario.ca/laws/regulation/080242).

Please be advised that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record does not necessarily indicate the absence of SAR from an area. To determine the presence of SAR for a given study area, the District's recommended approach is as follows:

I. Habitat Inventory

The Ministry recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. For aquatic habitats in the study area, we recommend that you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential SAR within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in the **City of Port Colborne** is attached for your reference. The species-specific COSEWIC status reports (https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario (SARO) List is a living document that is periodically amended as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO List can be accessed on the following webpage: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list.

COSSARO also maintains a list of species to be assessed in the future. It is recommended that you take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of an activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. This list can be viewed at: https://www.ontario.ca/page/how-comment-protecting-species-risk.

III. SAR Surveys

The Ministry recommends that each potential SAR identified under Step II is surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g., habitat within the study area is not suitable for a specific SAR). Please note that some targeted surveys may require provincial authorizations (e.g., ESA permit or Wildlife Scientific Collector's Permit).

ADDITIONAL INFORMATION

Natural heritage features (e.g. wetlands, ANSIs) can be viewed for a given study area through the MNRF's "Make a Map" web application: https://www.ontario.ca/page/make-natural-heritage-area-map. Digital data layers can be obtained through the Land Information Ontario (LIO) geowarehouse https://www.ontario.ca/page/land-information-ontario.

Additionally, the MNRF recommends contacting the municipality and the conservation authority to determine if they have any additional information or records of interest for the study area.

Please be advised that it is your responsibility to comply with all other relevant provincial or federal legislation, municipal by-laws, other MNRF approvals or required approvals from other agencies. If your investigations reveal the presence of Threatened or Endangered species, please contact the MNRF at esa.guelph@ontario.ca for further direction.

I trust that the above information is of assistance.

Sincerely,

A/Resources Management Technician

From: McFarland, Sean
To: Melcher, Heather
Cc: Owens, Luke
Subject: Re: PCQ - Preliminary Natural Environment ToR Comments
Date: Thursday, April 09, 2020 6:09:28 PM
Attachments: image001.jpg

NOTE: This email chain appears to contain email from outside Golder

Ok, thanks Heather and have a great Easter Weekend!

Get Outlook for iOS

From: Melcher, Heather <Heather_Melcher@golder.com>
Sent: Thursday, April 9, 2020 5:49:24 PM
To: McFarland, Sean <Sean_McFarland@golder.com>
Cc: Owens, Luke <Luke_Owens@golder.com>
Subject: RE: PCQ - Preliminary Natural Environment ToR Comments

NOTE: This email chain appears to contain email from outside Golder

Hi Sean,

Luke will look into this next week.

Thanks,
Heather

From: McFarland, Sean <Sean_McFarland@golder.com>
Sent: April 9, 2020 5:24 PM
To: Melcher, Heather <Heather_Melcher@golder.com>
Subject: RE: PCQ - Preliminary Natural Environment ToR Comments

NOTE: This email chain appears to contain email from outside Golder

Heather-could please put a cost estimate and change order together to address these comments?
Thanks,
Sean

Sean McFarland
Principal

110 Hannover Drive, Building A, Suite 203, St. Catharines, Ontario, Canada L2W 1A4
T: +1 905 688 8217 | **D:** +1 905 688 8217 ext. 6113 | **C:** +1 416 271 1486 | **golder.com**
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From: Norman, Sean <Sean.Norman@niagararegion.ca>
Sent: April 9, 2020 4:15 PM
To: 'David Sisco' <David.Sisco@IBIGROUP.COM>; Melcher, Heather <Heather_Melcher@golder.com>
Cc: 'John Maclellan' <jmaclellan@rankinconstruction.ca>; 'Shawn Tylee' <stylee@rankinconstruction.ca>; McFarland, Sean <Sean_McFarland@golder.com>; Acs, Erik <Erik.Acs@niagararegion.ca>; Busnello, Pat <pat.busnello@niagararegion.ca>; Fricke, Britney <Britney.Fricke@niagararegion.ca>; Boudens, Adam <Adam.Boudens@niagararegion.ca>; clampman@npca.ca; Dan Aquilina <danaquilina@portcolborne.ca>; davidschulz@portcolborne.ca
Subject: PCQ - Preliminary Natural Environment ToR Comments

EXTERNAL EMAIL

Hi David and Heather,

We have reviewed the Terms of Reference (ToR) prepared by Golder (dated March 13, 2020), for the natural heritage environment work program and offer the following **preliminary** comments.

We are offering these comments on a **preliminary** basis as there are spring field-work implications. Please update the ToR and we will provide final comments.

- The ToR proposes amphibian habitat assessment and call count surveys (one round conducted in late April). Staff note that amphibian surveys should follow the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Environment Canada, 2008). This protocol requires 3 rounds of surveys between the following dates at least 15 days apart (dates are provided as a guideline, as air and temperature and lack of wind are the most important variables):
    - April 15th – April 30th (when night-time air temp exceeds 5ºC)
    - May 15th – May 30th (when night-time air temp exceeds 10ºC)
    - June 15th – June 30th (when night-time air temp exceeds 17ºC)
- Botanical Inventories (three rounds, May, June/July and September) are proposed. Staff note that the Fall survey should be timed to ensure that the habitat for White Wood Aster can be assessed.

- Additional details are requested for the fish habitat assessment proposed (e.g., the protocol that will be followed, etc.).
- Snake surveys are not currently proposed. Staff request that rationale be provided in an updated TOR to address this omission.
- If S1-S3 species are found on site or within adjacent lands, their locations and habitat extent must also be mapped and included within the impact assessment to ensure no negative impact to the species or its habitat.
- If wetlands are identified on the subject property, a preliminary assessment following Ontario Wetland Evaluation System (OWES) protocols should be completed.
- Significant woodland boundaries should be staked in the field with Regional Environmental Planning staff.
- Please include all field survey data sheets (e.g., ELC Data Cards, etc.) as an appendix in the EIS.
- Please note that there are some Niagara-specific background studies/documents that could be consulted during the background review including the Natural Areas Inventory, prepared by the Niagara Peninsula Conservation Authority.
- Please include a Species at Risk (SAR) and Significant Wildlife Habitat (SWH) screening in the updated TOR submission. Attached is a SWH screening table which we prefer is used during ToR development. This will assist staff with scoping of field surveys. For example, the ToR notes that “general wildlife surveys” will be conducted in conjunction with other surveys. If the screenings indicate potential for SAR or SWH species, general surveys would not typically be acceptable. Rather, specific surveys according to accepted protocols should be used (e.g., Survey Protocol for Ontario’s SAR Snakes, etc.).

In addition, Environmental Planning staff are requesting permission to visit the site to assess the features and complete our review of the ToR. At that time, an EIS Scoping checklist will be provided for review and incorporation into the updated ToR. If this is acceptable could your please provide that permission in writing at your very earliest convenience.

Regards,
Sean Norman, PMP, MCIP, RPP
Senior Planner
Planning and Development Services, Niagara Region
Phone: 905-980-6000 ext. 3179 Toll-free: 1-800-263-7215
www.niagararegion.ca

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From:	Norman, Sean
To:	David Sisco
Cc:	McFarland, Sean; Shawn Tylee; "John Maclellan"; Melcher, Heather; Owens, Luke; Boudens, Adam; Fricke, Britney
Subject:	PCQ Pit 3 - Natural Environment ToR
Date:	Thursday, May 21, 2020 4:33:35 PM
Attachments:	1771656-PCQ Region TOR comment-response-15May2020.pdf

EXTERNAL EMAIL

Hi David,

We have reviewed the Terms of Reference Response Table prepared by Golder Associates Ltd., dated May 15, 2020.

As it relates to snake surveys, Regional Environmental Planning staff are satisfied with the response provided, however, we wish to clarify that in the absence of snake surveys following approved protocols, the search effort should be extensive enough to confirm that Snake Hibernacula is not present within the study area.

We have no additional comments to provide. Please include a copy of this e-mail within the agency correspondence section of the final Report.

Regards,
Sean Norman, PMP, MCIP, RPP
Senior Planner
Planning and Development Services, Niagara Region
Phone: 905-980-6000 ext. 3179 Toll-free: 1-800-263-7215

From: David Sisco <David.Sisco@IBIGROUP.COM>
Sent: Friday, May 15, 2020 10:15 AM
To: Norman, Sean <Sean.Norman@niagararegion.ca>
Cc: McFarland, Sean <Sean_McFarland@golder.com>; Shawn Tylee <stylee@rankinconstruction.ca>; 'John Maclellan' <jmaclellan@rankinconstruction.ca>; Melcher, Heather <Heather_Melcher@golder.com>; Owens, Luke <Luke_Owens@golder.com>
Subject: PCQ Inc. - Pit 3 Extension

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Sean,

This is a cleaned-up version of the TOR for the Natural Heritage Work Program that was sent earlier.

Enjoy the long-weekend.

David Sisco BA MCIP RPP

Sr. Planner
mob +1 519 577 6368

IBI GROUP
410 Albert Street, Suite 101
Waterloo ON N2L 3V3 Canada
tel +1 519 585 2255 ext 63210

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From:	Amy Parks
To:	Sabourin, Amber
Cc:	Lee-Ann Hamilton
Subject:	RE: Natural Heritage Information Request for Port Colborne Quarry
Date:	Monday, June 12, 2017 3:30:18 PM
Attachments:	Port Colborne Quarry.pdf Port Colborne Quarry 2.pdf Municipal Drain Michener Drain M2 .pdf

---

Hi Amber,

Below you will find information that the NPCA currently has for this site and the immediate adjacent areas.

NPCA Regulated Natural Heritage Features: (see attached maps “Port Colborne Quarry” and “Port Colborne Quarry 2”)

- Upper Wignell Drain Wetland Complex Non- Provincially Significant Wetland
- Regulated Floodplain
- Regulated Watercourses
- The property is adjacent to Type 2; Important fish habitat.

Region of Niagara Core Natural Heritage Mapping Natural Heritage Features:

- Mapped as Environmental Conservation Area (ECA): Significant Woodland

Other features that are found on the property or on adjacent lands:

- Municipal Drain: Michener Drain M-2 traverses the property on the east side of Carl Road.
- This property is adjacent to an area that is regarded to be the best representation of the Bertie Dolostone formation in the Niagara Peninsula.
- The property is part of the Lake Erie Northshore- Wignell Drain Subwatershed (see map: Municipal Drain)
- In close proximity to Humberstone Marsh Provincially Significant Wetland (PSW)

Species of Conservation Concern on site or on immediate adjacent lands may include:

Eastern Flowering Dogwood
Pin Oak
Bobolink
Eastern Meadow Lark
Barn Swallow
Eastern Mike Snake
Halberd-leaved Tearthumb
Pale False Mannagrass
Wood Thrush
Eastern Wood Peewee
Eastern Hognose Snake
Gray Fox
Eastern Small-footed Myotis
Northern Myotis
Little Brown Myotis
Tri-colored Bat
Monarch Butterfly

It is recommended that the Ministry of Natural Resources and Forestry (MNRF) is contacted to determine what Species at Risk may be on the site or on adjacent lands. Please contact esaguelph@ontario.ca for more information, as the MNRF is the appropriate agency to comment on Species at Risk.

Here is the link to the Lake Erie North Shore Watershed Plan.

https://npca.ca/sites/default/files/Lake_Erie_North_Shore_Watershed_Plan_Draf2t.pdf

I have attached a map with the NPCA Regulated Floodplain, Regulated Wetland and all of the NPCA regulated areas (teal colour on the map) associated with the above noted NPCA regulated features.

Historical fisheries information: At this time the NPCA does not have any fisheries information within a 3 km radius or greater from the site.

At this time the NPCA does not have any information on known significant or sensitive wildlife habitat (e.g. rookeries)

If you need clarification on any of the above, please do not hesitate to contact me.

WHAT IS THE ROLE OF THE NPCA?

- **Regulatory Authority**: *Section 28* of the *Conservation Authorities Act* empowers Conservation Authorities to prohibit, restrict, regulate or give permission for certain activities in and adjacent to watercourses, including valleylands, wetlands, shorelines and other hazardous lands. In this capacity, the NPCA acts as an approval authority for development within its regulated areas. Through Section 28-1 (c), Conservation Authorities have the power to prohibit, regulate or require permission for development, where flooding, erosion, dynamic beaches, pollution, or the conservation of land may be affected by the development. Section 28 of the Conservation Authorities Act is also applicable law under the Ontario Building Code. Building officials need to ensure that Section 28 of the *Conservation Authorities Act* is not contravened prior to issuing a building or demolition permit.

- **Representative of the Province of Ontario**: Conservation Authorities have delegated provincial interest for Section 3.1 of the *Provincial Policy Statement* (Natural Hazards) and act on behalf of the Province. In this capacity, the NPCA is responsible for providing comments on municipal policies (Official Plans) and zoning by-laws, as well as development applications submitted under the *Planning Act*. There is a Memorandum of Understanding (MOU) between the Ministry of Natural Resources and Forestry, Ministry of Municipal Affairs and Housing and Conservation Authorities in Ontario (January 2001) regarding delegated Provincial Responsibility.

- **Resource Management Agency:** Sections 20 and 21 of the *Conservation Authorities Act* empower conservation authorities to develop programs that reflect local resource management needs within the watershed. These programs and/or policies are approved by the conservation authority board.

- **Public Commenting Body:** Under the *Planning Act*, conservation authorities are considered a public commenting body and, as such, are to be notified of municipal policy plan changes and development applications. The NPCA provides comments within the context of the board-

approved policies (Policy Document).

- **Service Provider:** Conservation authorities may enter into agreements with other levels of government to undertake regulatory or approval responsibilities. The NPCA acts as a service provider to a number of area municipalities within the watershed through Memoranda of Understanding signed with Niagara Region, the City of Hamilton, and Haldimand County 2 March 30, 2017 respectively. All of these MOU's are approved by the NPCA Board. These agreements are generally for the review of planning act applications regarding environmental features. There is an additional service agreement with the Region of Niagara to implement and enforce the Region's Tree and Forest Conservation By-law.

- **Landowner:** Conservation authorities are also landowners, and can be involved in the planning and development process as either a proponent or as a landowner impacted by adjacent development.

For more information, please contact:
Michael Reles, Communications Specialist
905.788.3135 ext.263
Mobile: 905-325-7334
mreles@npca.ca

Amy Parks
Ecological Technician
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, Ontario L3C 3W2
Phone: 905-788-3135 ext. 273
Fax: 905-788-1121
aparks@npca.ca
www.npca.ca

From: Lee-Ann Hamilton
Sent: Monday, June 05, 2017 2:23 PM
To: Amy Parks <aparks@npca.ca>
Cc: amber_sabourin@golder.com
Subject: FW: Natural Heritage Information Request for Port Colborne Quarry

Hi Amy,

Sorry in the delay forwarding this to you, it's been sitting in my inbox for a couple of weeks and I'd lost track of it. Could you please take a look at this one and provide information to Amber for this site?

Thanks!

Lee-Ann Hamilton
Supervisor, Watershed Biology
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor

Welland, ON L3C 3W2
905.788.3135 x. 265
lhamilton@npca.ca

From: Sabourin, Amber [mailto:Amber_Sabourin@golder.com]
Sent: Thursday, May 18, 2017 4:11 PM
To: Lee-Ann Hamilton <lhamilton@npca.ca>
Subject: Natural Heritage Information Request for Port Colborne Quarry

Good afternoon,

I am writing to request any natural heritage/fisheries information you may have pertaining to a site Golder is working on in Port Colborne. The project is for a quarry expansion application on Part of Lots 18 & 19 Concession 2 in the City of Port Colborne. A figure showing the site boundary is attached for reference.

We are looking for any natural heritage or fisheries information you may have for the site and adjacent properties, including:

- Historical fisheries information
- Known significant or sensitive wildlife habitat (e.g. rookeries)
- Species at risk (please note a separate request has been submitted to the MNRF)

Please let us know if you require any further information to fulfill this request.
Regards,
Amber

Amber Sabourin (H.B.Sc (Env)) | Ecologist | **Golder Associates Ltd.**
6925 Century Avenue, Suite #100, Mississauga, Ontario, Canada L5N 7K2
T: +1 (905) 567 4444 | **D:** +1 (905) 567-6100 x1819 | **F:** +1 (905) 567 6561 | **C:** +1 (416) 779-5711 | **E:** Amber_Sabourin@golder.com | **www.golder.com**

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Golder's response to comments received from the Region of Niagara on the Terms of Reference for the Natural Heritage Environment Work Program for the proposed Port Colborne Quarry Expansion	
Niagara Region Comments (Received April 9, 2020)	**Golder Response**
The Tour proposes amphibian habitat assessment and call count surveys (one round conducted in late April). Staff note that amphibian surveys should follow the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Environment Canada, 2008). This protocol requires 3 rounds of surveys between the following dates at least 15 days apart (dates are provided as a guideline, as air and temperature and lack of wind are the most important variables): April 15th – April 30th (when night-time air temp exceeds 5ºC), May 15th – May 30th (when night-time air temp exceeds 10ºC), June 15th – June 30th (when night-time air temp exceeds 17ºC).	Golder will conduct three rounds of call count surveys in 2020, noting that temperature is a more important consideration that date of survey.
Botanical Inventories (three rounds, May, June/July and September) are proposed. Staff note that the Fall survey should be timed to ensure that the habitat for White Wood Aster can be assessed.	The timing of the botanical inventories will consider white wood aster if suitable habitat is found to be present.
Additional detail are requested for the fish habitat assessment proposed (e.g., the protocol that will be followed, etc.)	The fish habitat assessment methods were based on Golder's internal technical procedure document, TP-8-.5-1 Watercourse Habitat Mapping System. The details of the methods will be included in the combined Natural Environment Level 1/2 /EIS report.
Snake surveys are not currently proposed. Staff request that rationale be provided in an updated TOR to address this omission.	A preliminary species at risk (SAR) screening has indicated that there is a low probability of occurrence for species at risk (SAR) snakes. As such no targeted snake surveys were included in the TOR. Snakes will be searched for during the general wildlife surveys conducted in conjunction with the other field surveys.
If S1-S3 species are found on site or within adjacent lands, their locations and habitat extent must also be mapped and included within the impact assessment to ensure no negative impact to the species or its habitat.	This will be included in the combined Natural Environment Level 1/2 /EIS report.
If wetlands are identified on the subject property, a preliminary assessment following Ontario Wetland Evaluation System (OWES) protocols should be completed.	The boundaries of any wetlands will be delineated according to OWES methods, and the ecological features listed on page 15 of the OWES Southern Manual will be searched for. A full OWES evaluation will not be completed.
Significant woodland boundaries should be staked in the field with Regional Environmental Planning staff.	Golder will conduct woodland boundary staking with Regional Environmental Planning staff.
Please include all field survey data sheets (e.g., ELC Data Cards, etc.) as an appendix in the EIS.	Field survey data sheets will be provided in an appendix of the report.
Please note that there are some Niagara-specific background studies/documents that could be consulted during the background review including the Natural Areas Inventory, prepared by the Niagara Peninsula Conservation Authority.	Golder will include a review of the NPCA Natural Areas Inventory and any other relevant Niagara-specific studies in the background review.
Please include a Species at Risk (SAR) and Significant Wildlife Habitat (SWH) screening in the updated TOR submission. Attached is a SWH screening table which we prefer is used during Tour development. This will assist staff with scoping of field surveys. For example, the Tour notes that "general wildlife surveys" will be conducted in conjunction with other surveys. If the screenings indicate potential for SAR or SWH species, general surveys would not typically be acceptable. Rather, specific surveys according to accepted protocols should be used (e.g., Survey Protocol for Ontario's SAR Snakes, etc.).	Our TOR includes a Species at Risk Screening and an assessment of Significant Wildlife Habitat. Species specific surveys are included for SAR and for SWH with potential to occur on the site, including birds, bats, plants, turtles and frogs. These surveys will follow standard protocols. General wildlife surveys are intended to augment the species-specific surveys, not replace them.

APPENDIX E

Field Data

Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658( )( ) Date: 24 Apr 2017 Station #: Frog01 Surveyor: LO Page: 2 of

Datum: 83 Zone: 17T Easting: 646478 Northing: 4752058 GPS Unit ID: → Photos:

Start Time: 2011 End Time: 2014 Temp: 1 °C Wind Speed: 10 kph Wind Dir: E Cloud: 5

Visibility (circle): ~~good~~ ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth:

Habitat Description: maple swamp, with oak pools of standing water

Incidental Wildlife: ~~NFOS~~, ENOFL, RBGU, AMRO BANS

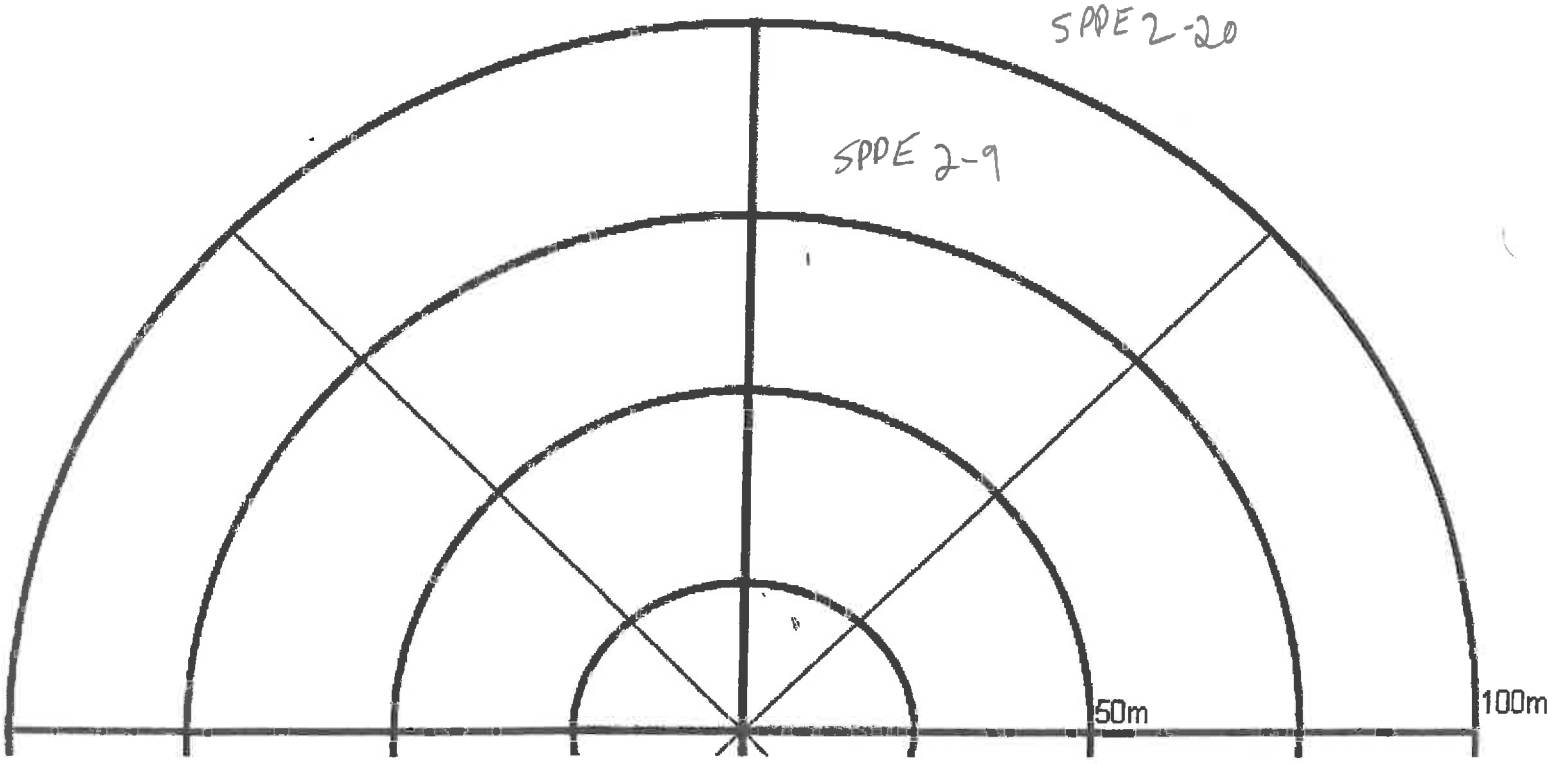
Comments: (other noises) distant intermittent traffic noise.

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 2 3	9/20	2/2
WOFO	1 2 3	1 2 3		

Call Levels:			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: X

Heading: 0



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 (____)(____) Date: 24APR2016 Station #: Frog 12 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646823 Northing: 4752019 GPS Unit ID: _____ Photos: _____

Start Time: 2021 End Time: 2024 Temp: 10 °C Wind Speed: 15 E Wind Dir: E Cloud: 10

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: old field with wetshrubby areas

Incidental Wildlife: AMWO, SOSP

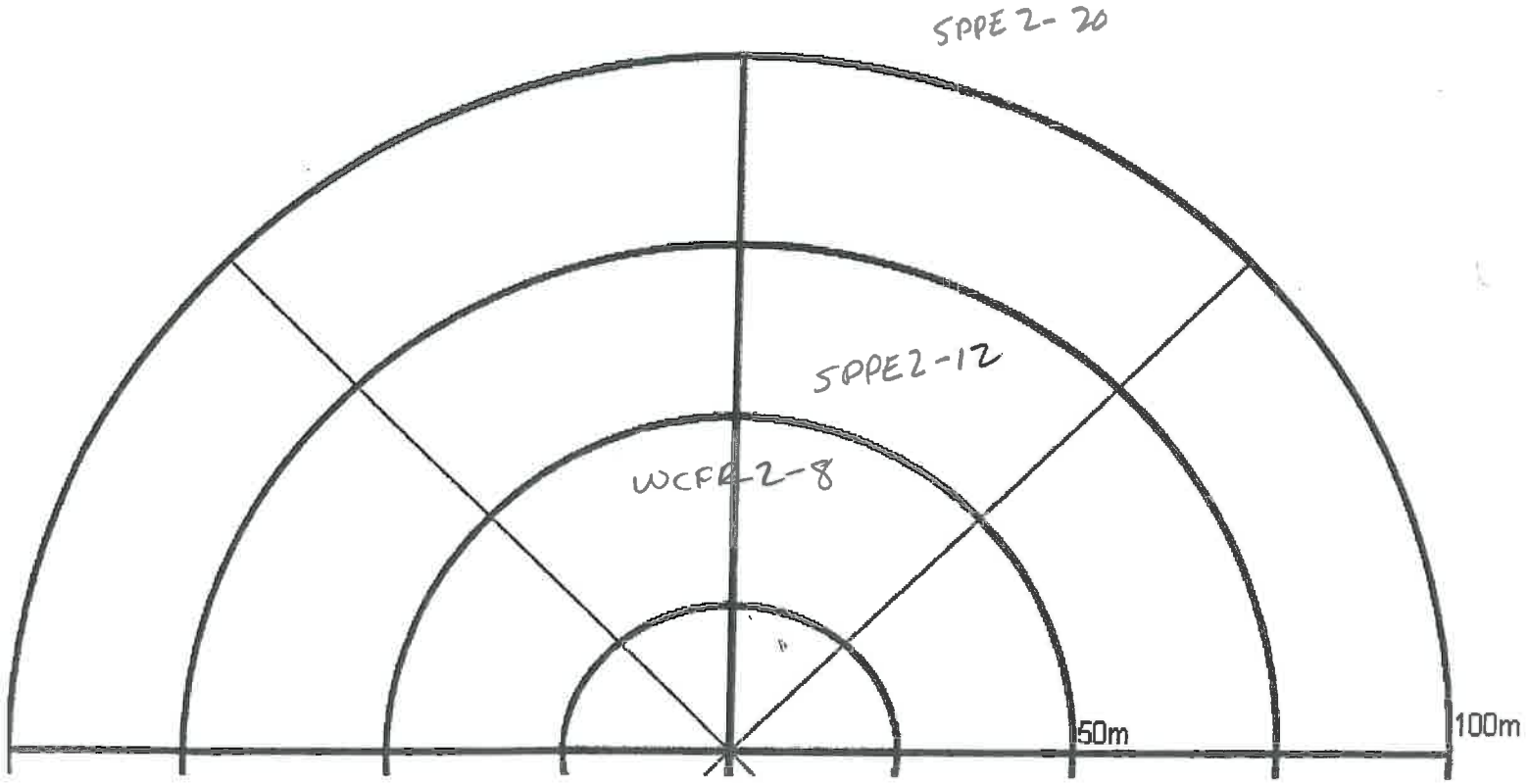
Comments: (other noises) distant intermittent traffic noise

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 (2) 3	1 2 3	8	2
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 (2) 3	12 / 20	2 / 2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:
90



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 (____)(____) Date: 24Apr2017 Station #: Frog02 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646734 Northing: 4752157 GPS Unit ID: — Photos: —

Start Time: 2030 End Time: 2033 Temp: 10 °C Wind Speed: 10 Wind Dir: E Cloud: 20

Visibility (circle): ~~good~~ ~~fair~~ poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: ____

Habitat Description: maple swamp with oaks and standing pools of water

Incidental Wildlife:

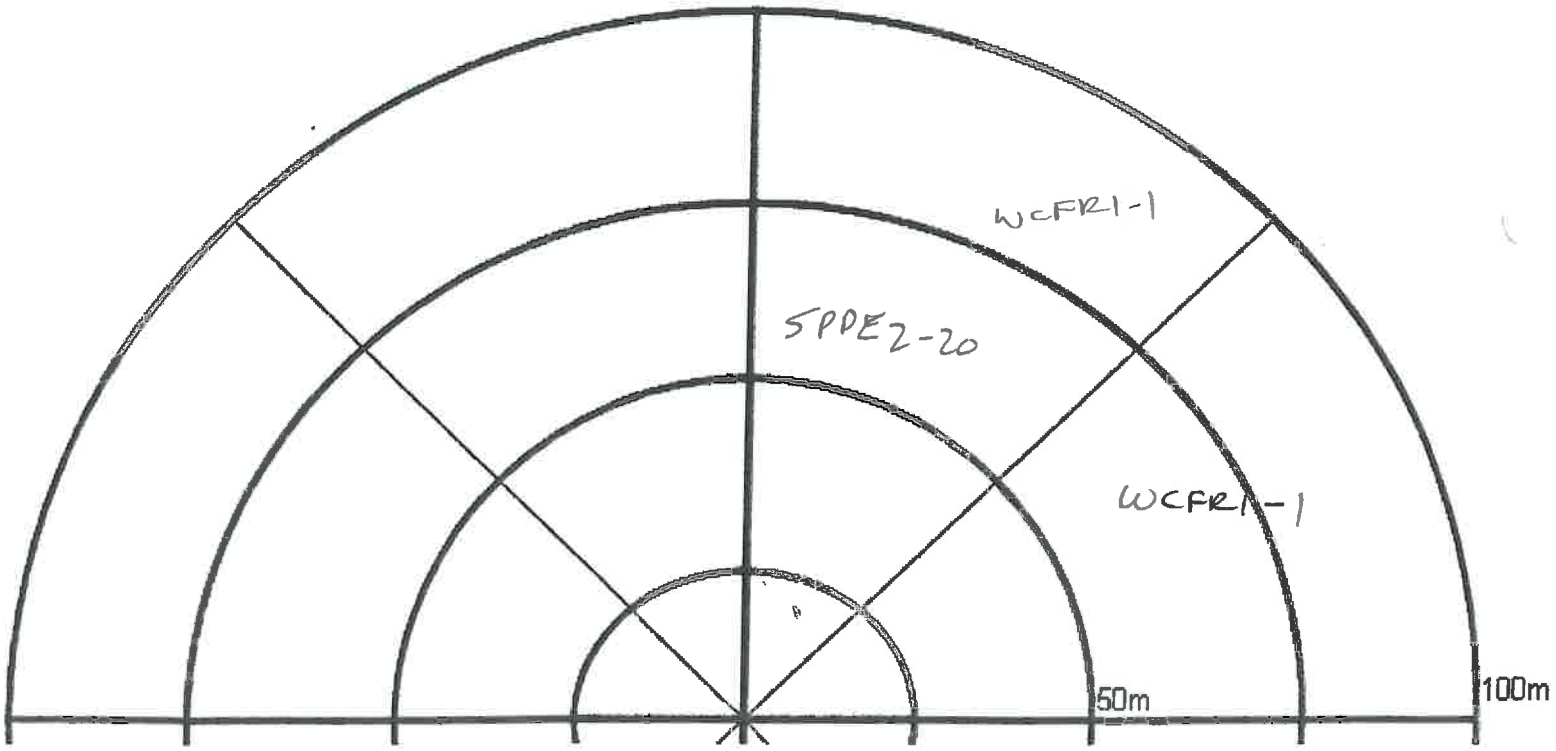
Comments: (other noises) train noise, distant traffic.

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 (2) 3	1 2 3	2	1
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 2 3	20	2
WOFO	1 2 3	1 2 3		

Call Levels:			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 0



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 ( )( ) Date: 24APR2016 Station #: Frog03 Surveyor: LO Page: of

Datum: 83 Zone: 17T Easting: 646501 Northing: 4752294 GPS Unit ID: Photos:

Start Time: 2043 End Time: Temp: °C Wind Speed: 20 Wind Dir: N Cloud: 20

Visibility (circle): ~~good~~ fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth:

Habitat Description: maple swamp with standing water

Incidental Wildlife:

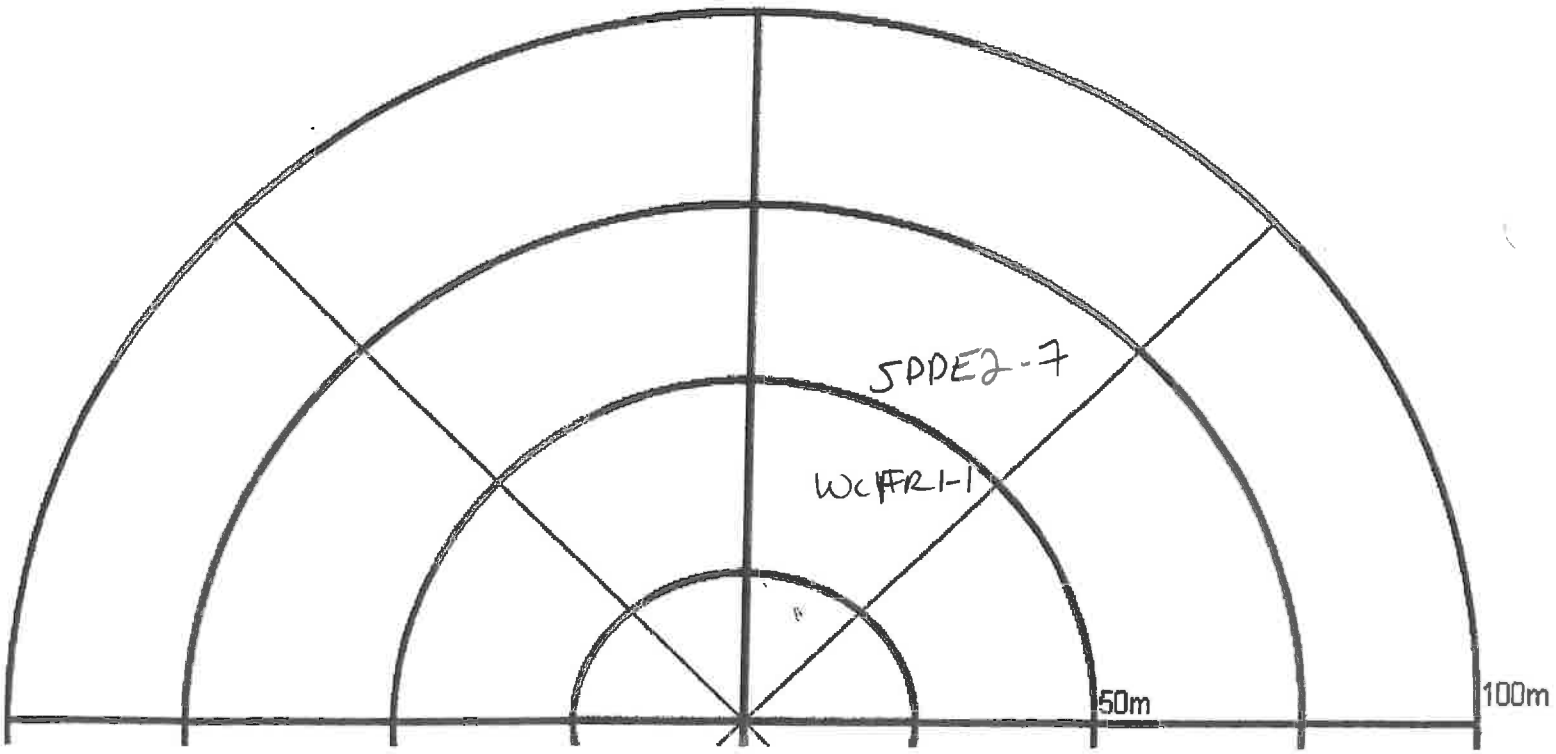
Comments: (other noises)

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	(1) 2 3	1 2 3	1	1
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 2 3	7	2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading: 180



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658( )( ) Date: 24 APR 2017 Station #: Frog 11 Surveyor: LO Page: __of__

Datum: D3 Zone: 17T Easting: 647422 Northing: 4750255 GPS Unit ID: _____ Photos: _____

Start Time: 2115 End Time: 2118 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: —

Visibility (circle): good fair poor Precipitation: ~~none~~ light rain rain storm snow sleet hail other Snow Depth: —

Habitat Description: _____

Incidental Wildlife: _____

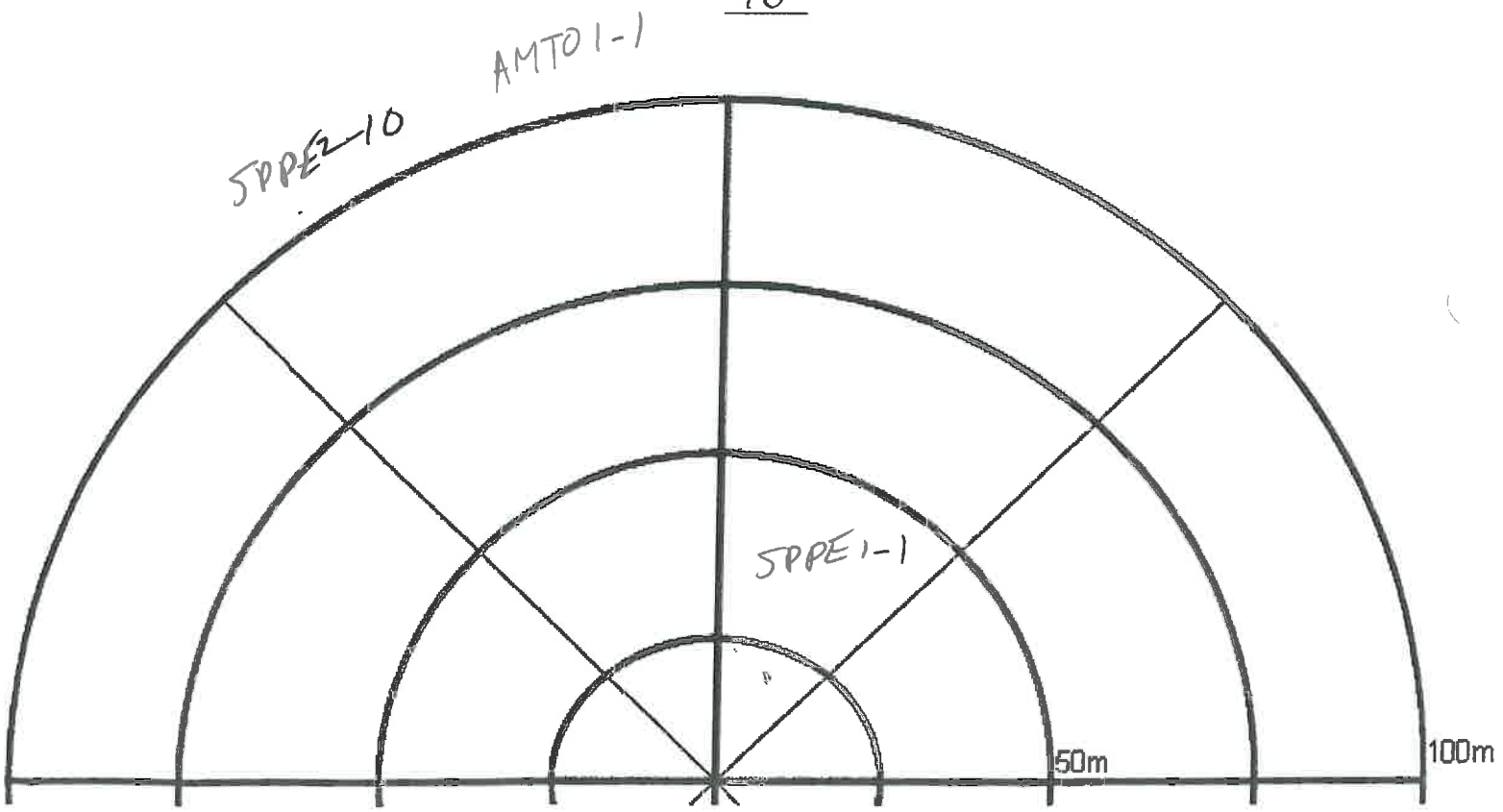
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	(1) 2 3	1	1
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	(1) 2 3	1 (2) 3	1/10	1/2
WOFO	1 2 3	1 2 3		

Call Level			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 90



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 (____)(____) Date: 24 APR 2016 Station #: Frog 13 '05 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 647443 Northing: 4751814 GPS Unit ID: _____ Photos: —

Start Time: 2107 End Time: 2110 Temp: 8 °C Wind Speed: 15-20 Wind Dir: E Cloud: —

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: —

Habitat Description: _____

Incidental Wildlife: _____

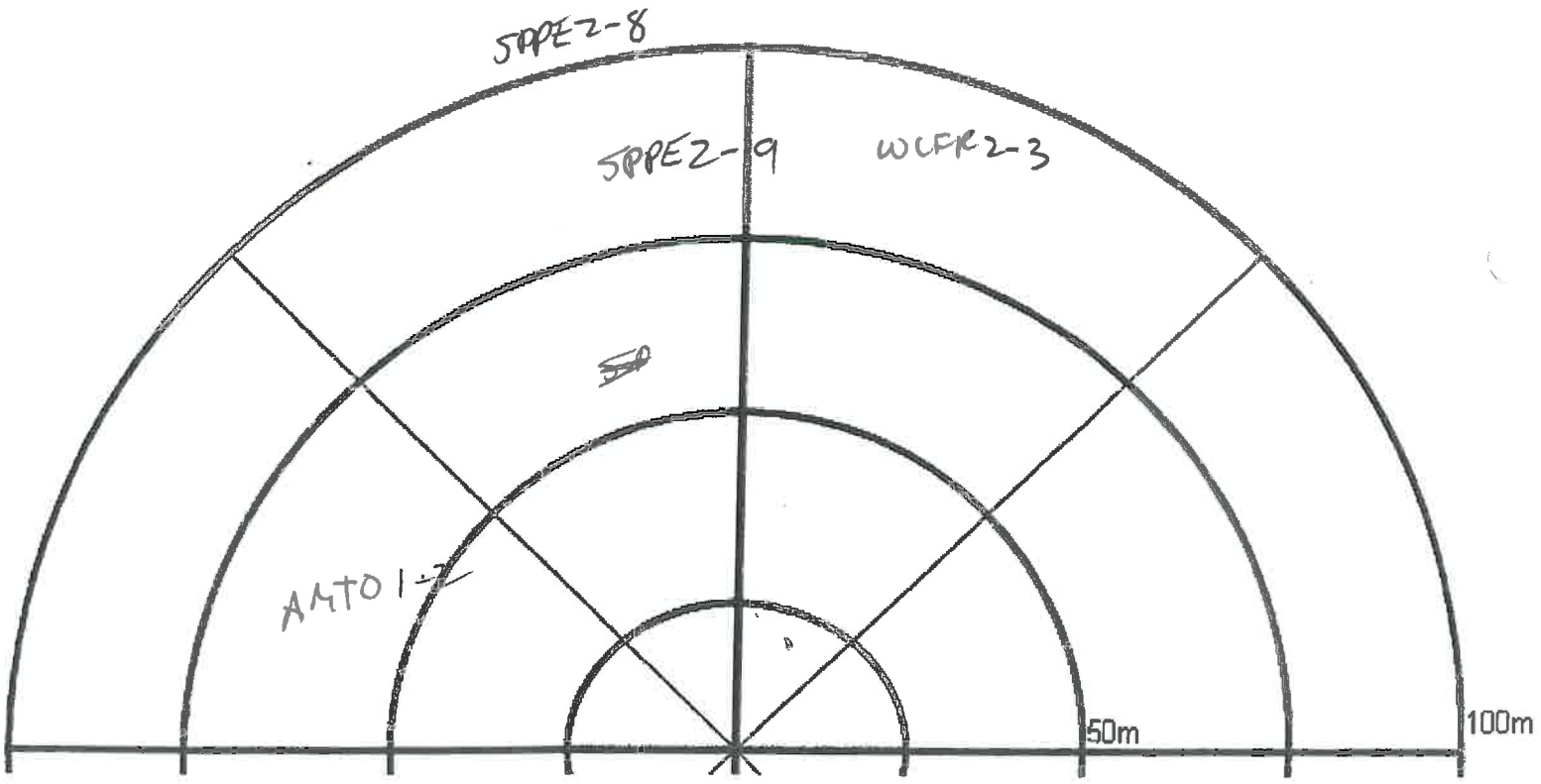
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance	Scale
AMTO	(1) 2 3	1 2 3	2	1
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 (2) 3	1 2 3	3	2
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 (2) 3	9/8	2/2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 90



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 (____)(____) Date: 24APR2017 Station #: Frog06 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646875 Northing: 4751345 GPS Unit ID: _____ Photos: _____

Start Time: 2144 End Time: 2147 Temp: 7 °C Wind Speed: 20 Wind Dir: E Cloud: _____

Visibility (circle): ~~good~~ ~~fair~~ poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

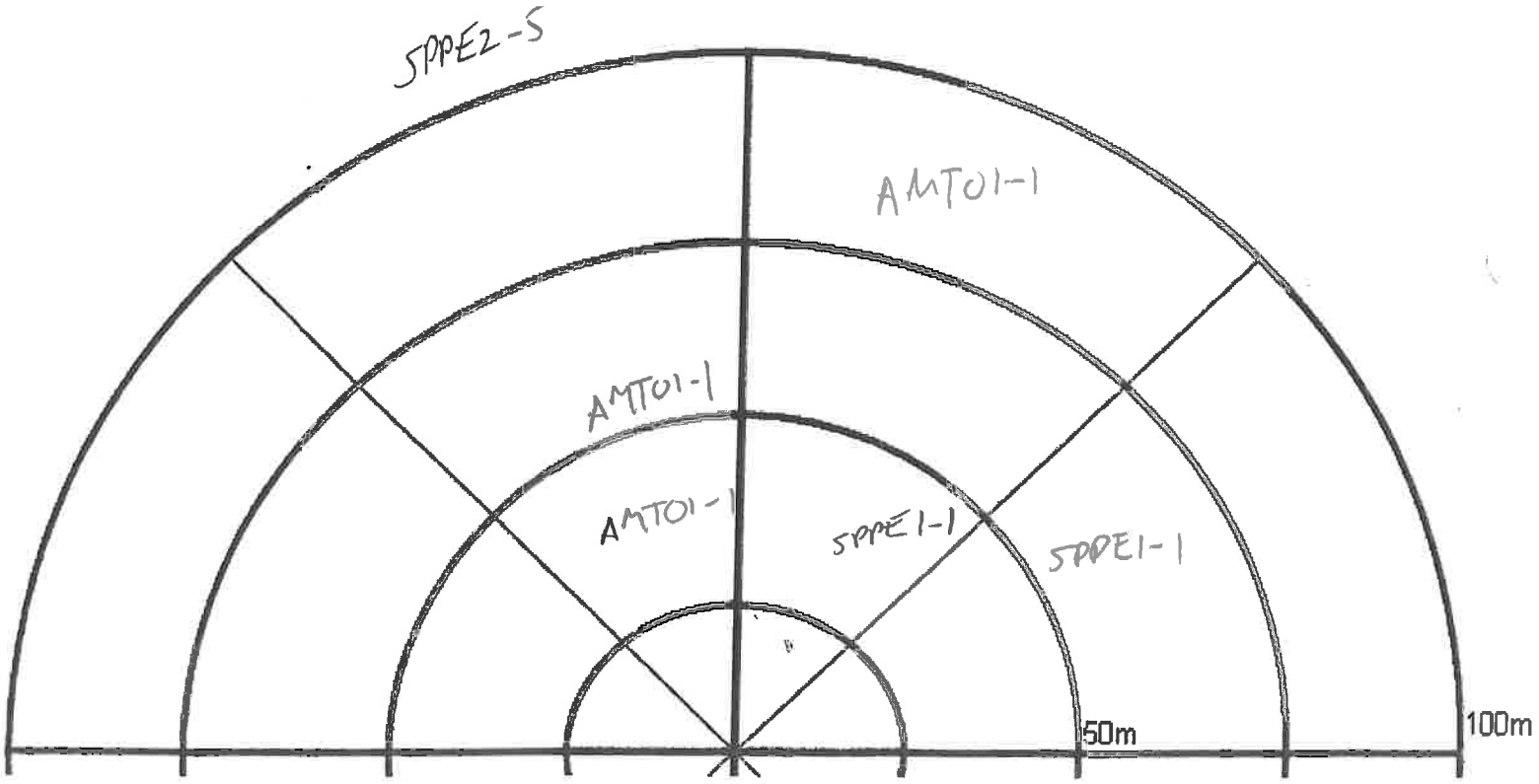
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance	Scale
AMTO	(1) 2 3	1 2 3	3	1
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	(1) 2 3	1 (2) 3	2/5	1/2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 90



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 ( )( ) Date: 24 APR 2019 Station #: Frog 07 Surveyor: _____ Page: __of__

Datum: 83 Zone: 17 Easting: 646787 Northing: 4750947 GPS Unit ID: — Photos: —

Start Time: 2134 End Time: 2137 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: —

Visibility (circle): good fair poor Precipitation: ~~none~~ light rain rain storm snow sleet hail other Snow Depth: —

Habitat Description: _____

Incidental Wildlife: _____

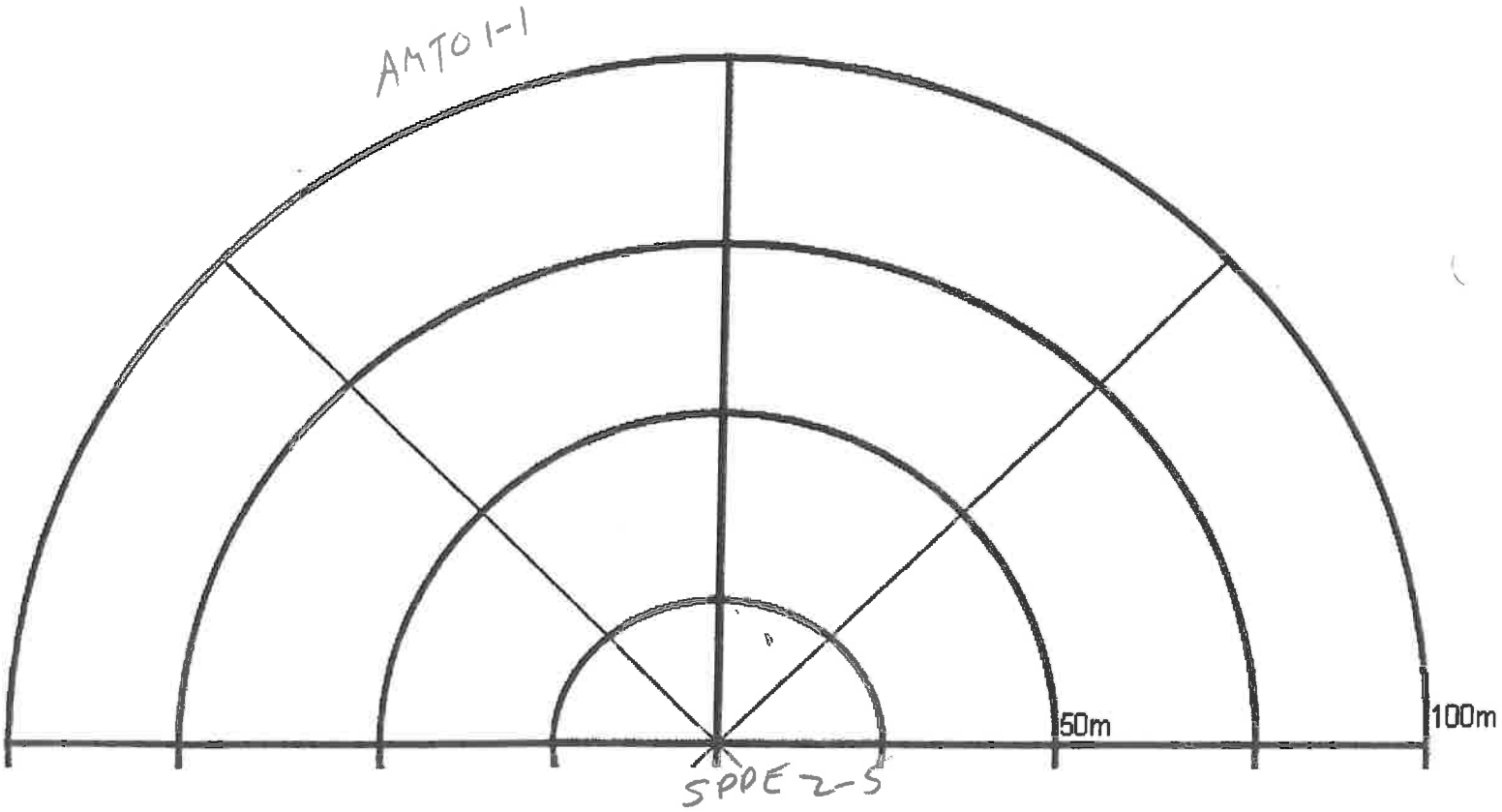
Comments: (other noises) Regular traffic

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	(1) 2 3	1	1
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 2 3	1 (2) 3	5	2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 180



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771650 (____)(____) Date: 24 APR 2017 Station #: Frog 10 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646120 Northing: 4750366 GPS Unit ID: _____ Photos: _____

Start Time: 2127 End Time: 2130 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: –

Visibility (circle): ~~good~~ ~~fair~~ poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

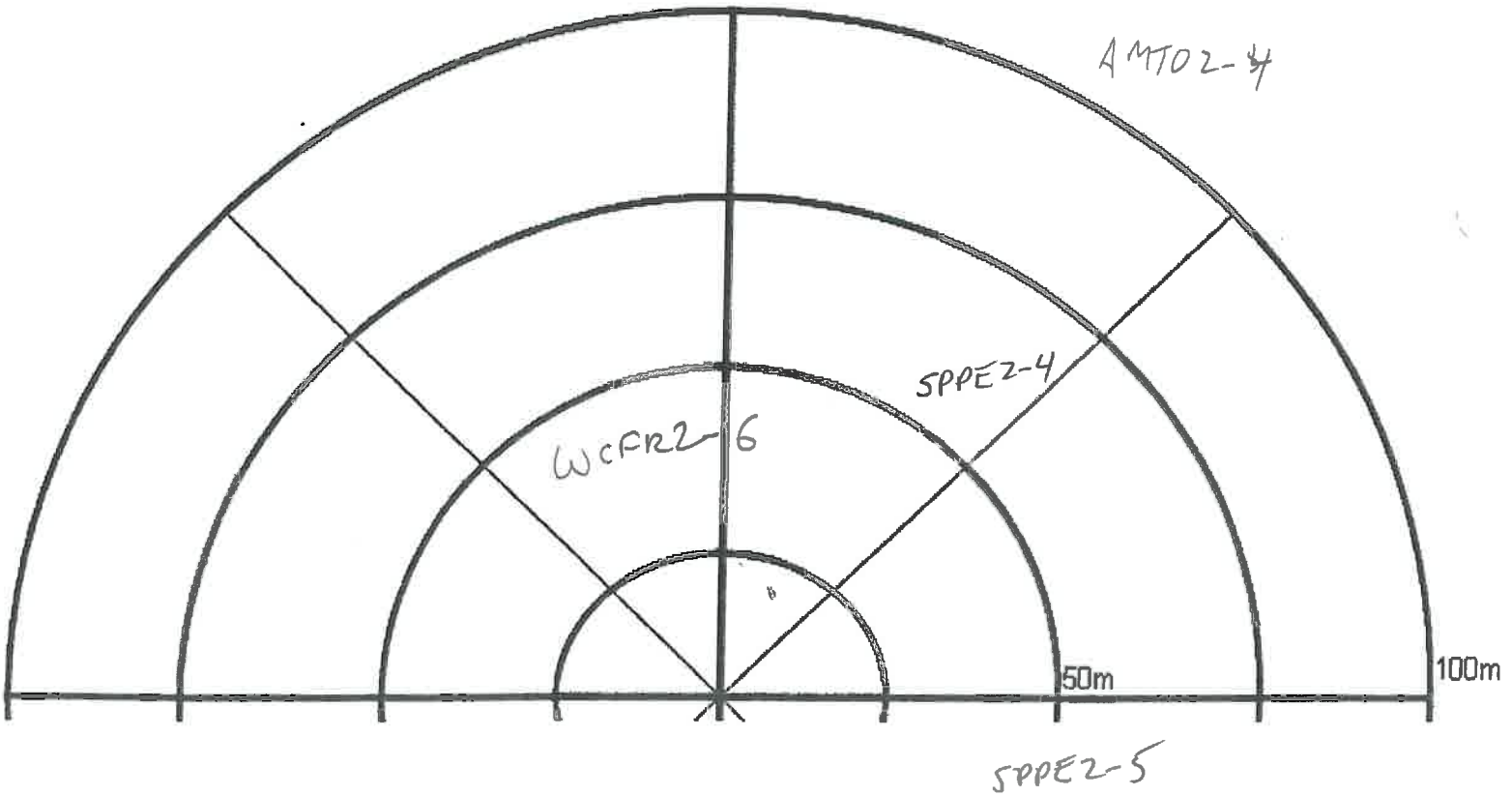
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 (2) 3	4	2
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 (2) 3	1 2 3	6	2
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 (2) 3	4/5	2/2
WOFO	1 2 3	1 2 3		

Call Levels:			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 0



Golder Associates

Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 (____)(____) Date: 24 APR 2017 Station #: Prog 09 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 647086 Northing: 4750396 GPS Unit ID: — Photos: —

Start Time: 2121 End Time: 2124 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: —

Visibility (circle): good fair poor Precipitation: ~~none~~ light rain rain storm snow sleet hail other Snow Depth: ____

Habitat Description: _____

Incidental Wildlife: _____

Comments: (other noises) intermittent traffic

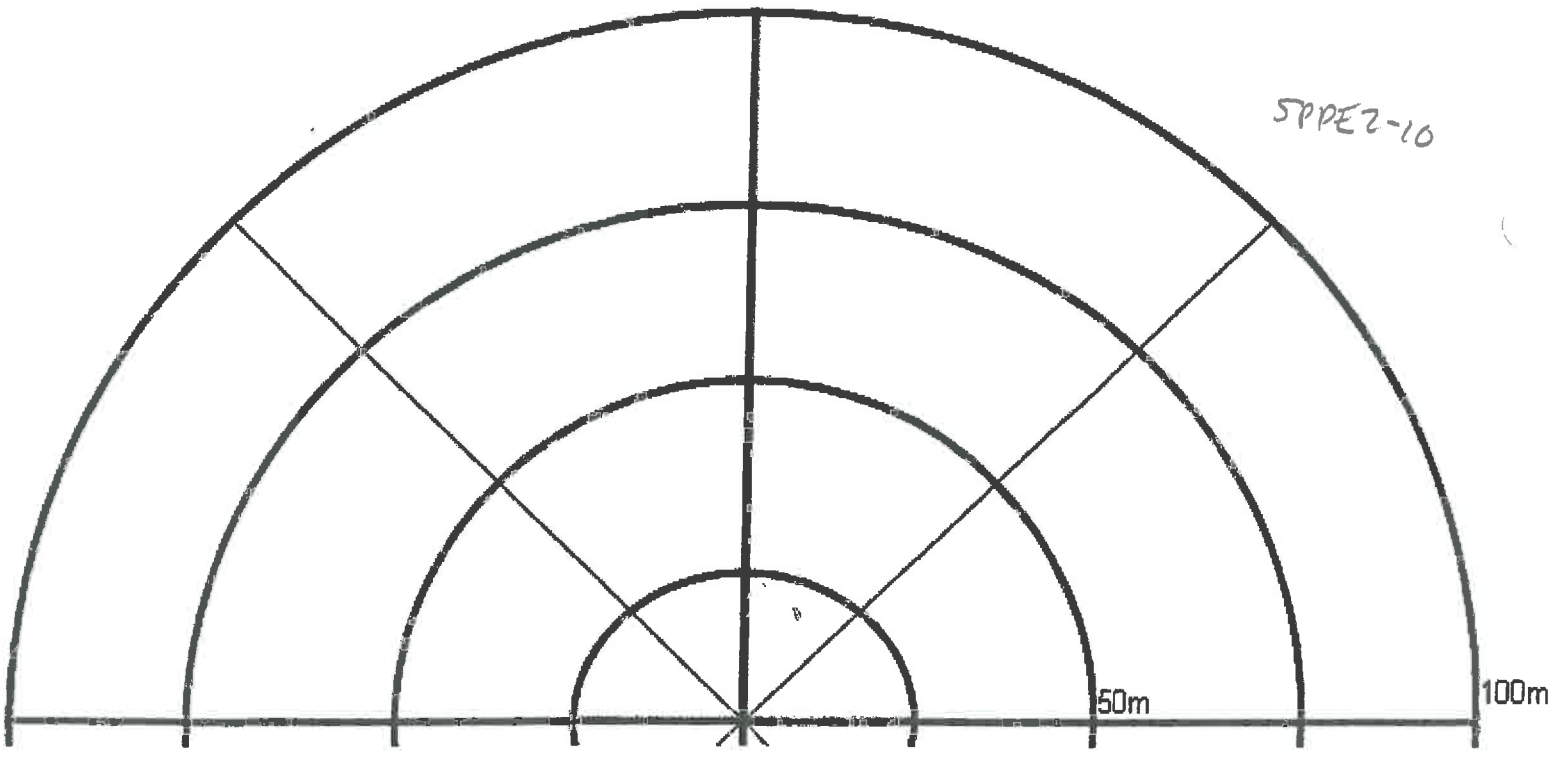
Species	Direction		Abundance	Scale
	A	B		
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 2 3	1 (2) 3	13	2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:

0



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 ( )( ) Date: 24APR2017 Station #: Frog 08 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646936 Northing: 4752423 GPS Unit ID: — Photos: —

Start Time: 2100 End Time: 2103 Temp: 9 °C Wind Speed: 10 Wind Dir: E Cloud: —

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: old wet field

Incidental Wildlife:

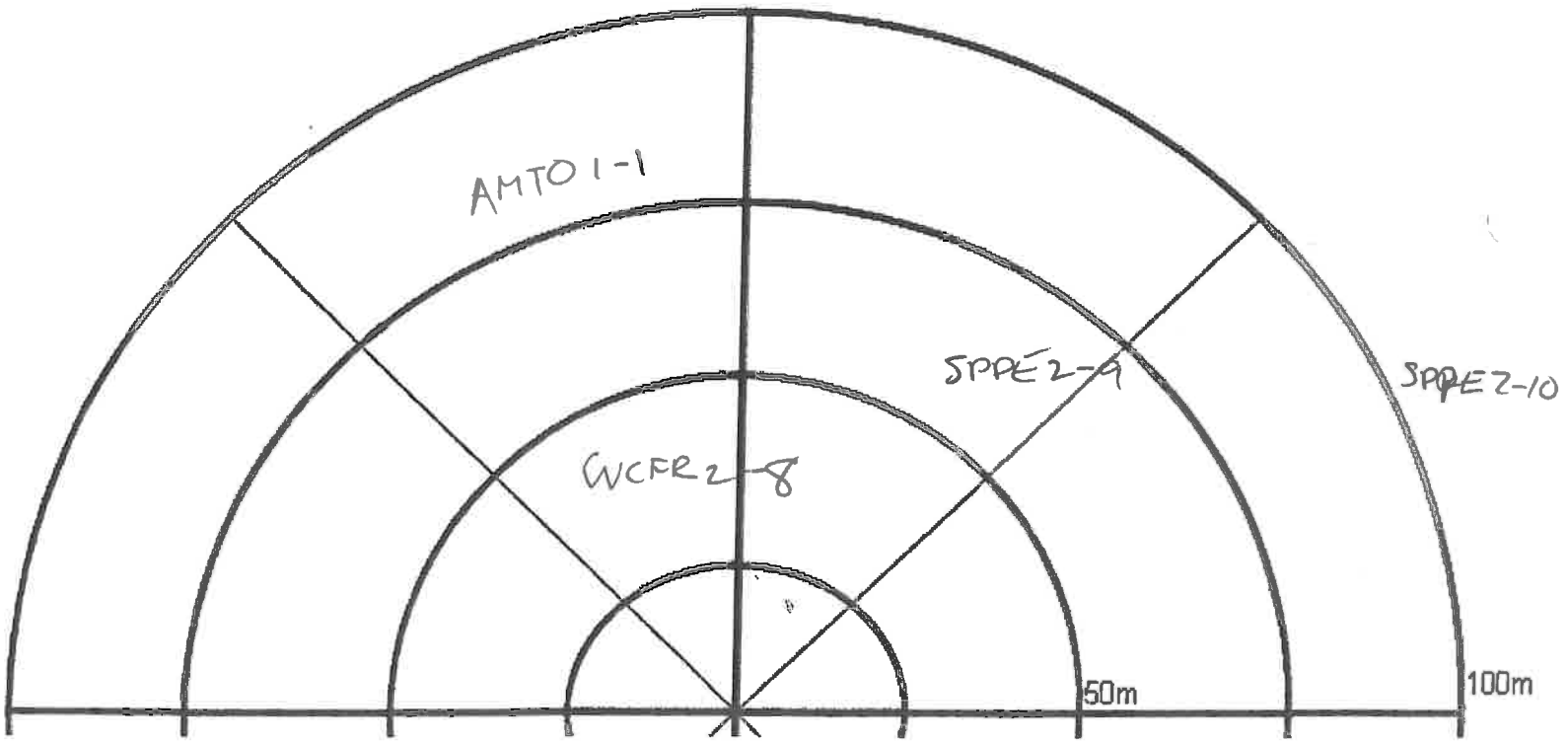
Comments: (other noises) Intermittent traffic.

Species	Direction A	Direction B	Abundance	Scale
AMTO	(1) 2 3	1 2 3	1	1
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 (2) 3	1 2 3	8	2
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 (2) 3	1 (2) 3	9/10	2/2
WOFO	1 2 3	1 2 3		

Call Levels	1	Individuals do not overlap, can be counted	Direction	A	Inside boundary	Scale	1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 180



Port Colborne Quarry

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 ( )( ) Date: 24 APR 2017 Station #: Frog 04 Surveyor: LG Page: of

Datum: 83 Zone: 17T Easting: 646224 Northing: 4752408 GPS Unit ID: Photos:

Start Time: 2054 End Time: 2057 Temp: 9 °C Wind Speed: 10 Wind Dir: E Cloud: 20

Visibility (circle): ~~good~~ fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth:

Habitat Description:

Incidental Wildlife: ;

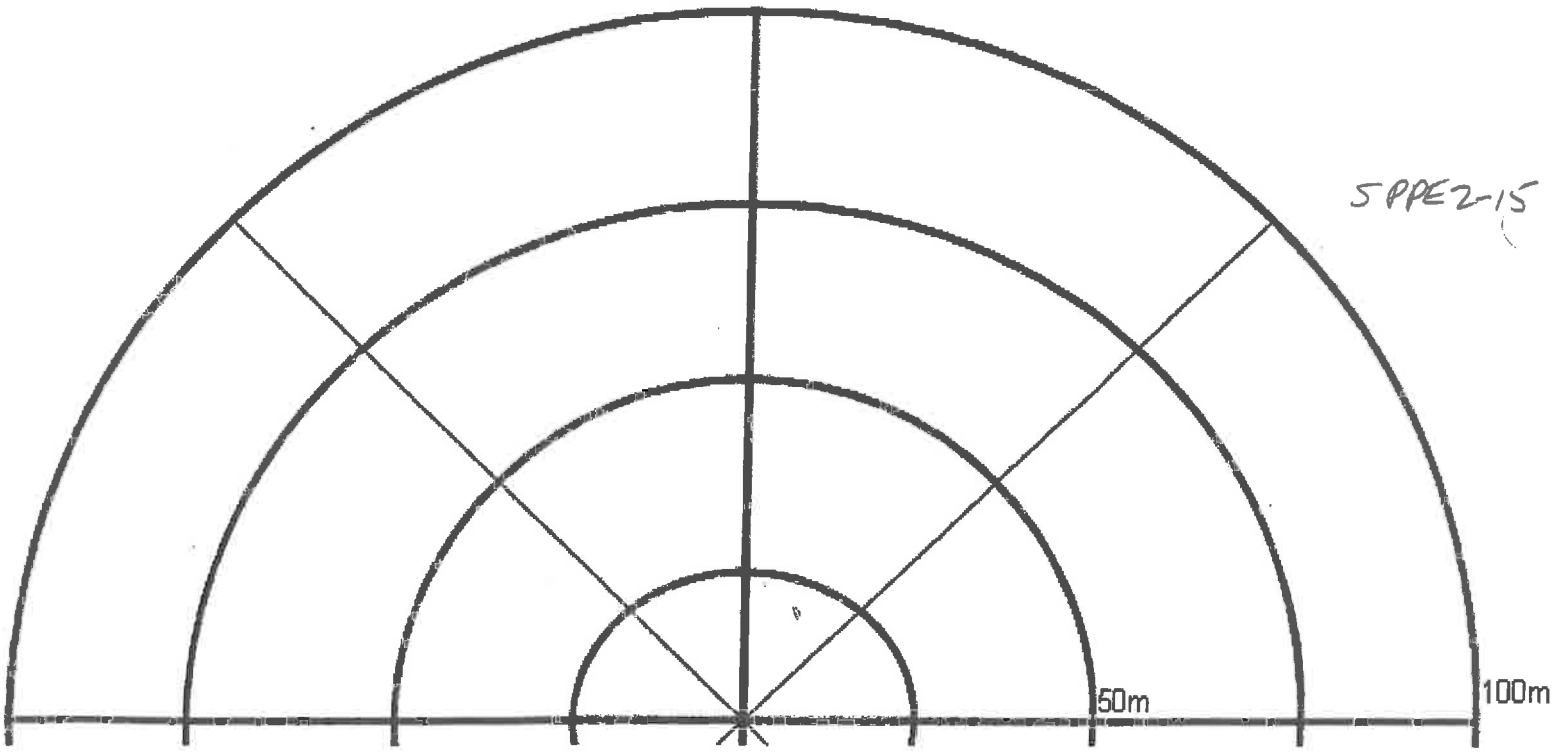
Comments: (other noises) intermittent traffic

Species	Direction A	Direction B	Abundance	Scale
AMTO	1 2 3	1 2 3		
~~BCFR~~	1 2 3	1 2 3		
BULL	1 2 3	1 2 3		
CHFR	1 2 3	1 2 3		
CGTF	1 2 3	1 2 3		
~~FOTO~~	1 2 3	1 2 3		
GRFR	1 2 3	1 2 3		
MIFR	1 2 3	1 2 3		
NLFR	1 2 3	1 2 3		
PIFR	1 2 3	1 2 3		
SPPE	1 2 3	1 (2) 3	15	2
WOFO	1 2 3	1 2 3		

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading: 0



BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC12 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0855 - 0905

GPS file name: PC12 **Datum:** NAD83 **Zone:** 17T

UTM: E: 647462 **N:** 4750586

Temperature: 15 **Wind Speed:** B-2 **Cloud Cover:** 30 **Photo #:** 6209 - 6212

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : Hay

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

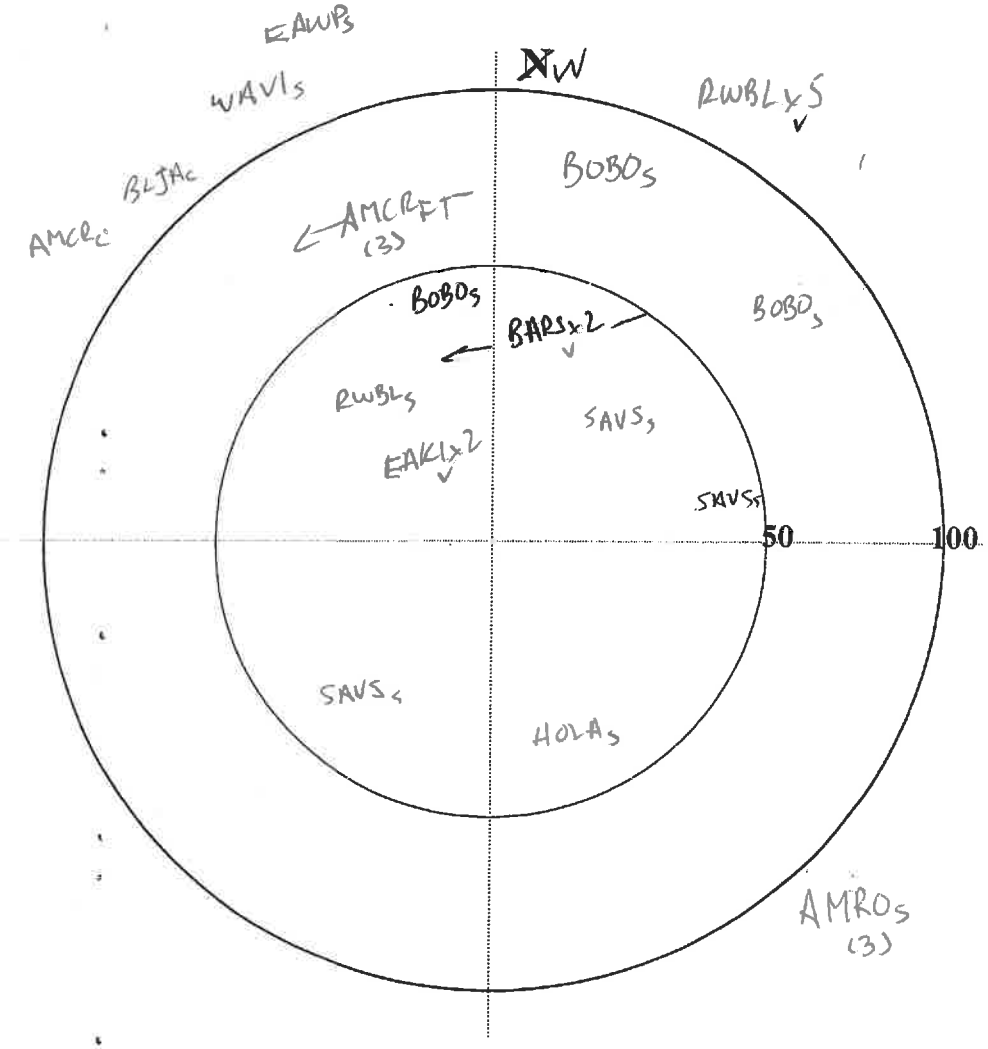
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	<50	50-100	>100	<50	50-100	>100	<50	50-100	>100	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

_____

Notes: _____

_____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC11 **Observer:** LO **Date (dd/mon/yy):** 24May2018 **Time:** 0909-0919

GPS file name: PC11 **Datum:** NAD83 **Zone:** 17T

UTM: E: 645794 **N:** 4751878

Temperature: 16 **Wind Speed:** B-2 **Cloud Cover:** 20 **Photo #:** 6216213-6216

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

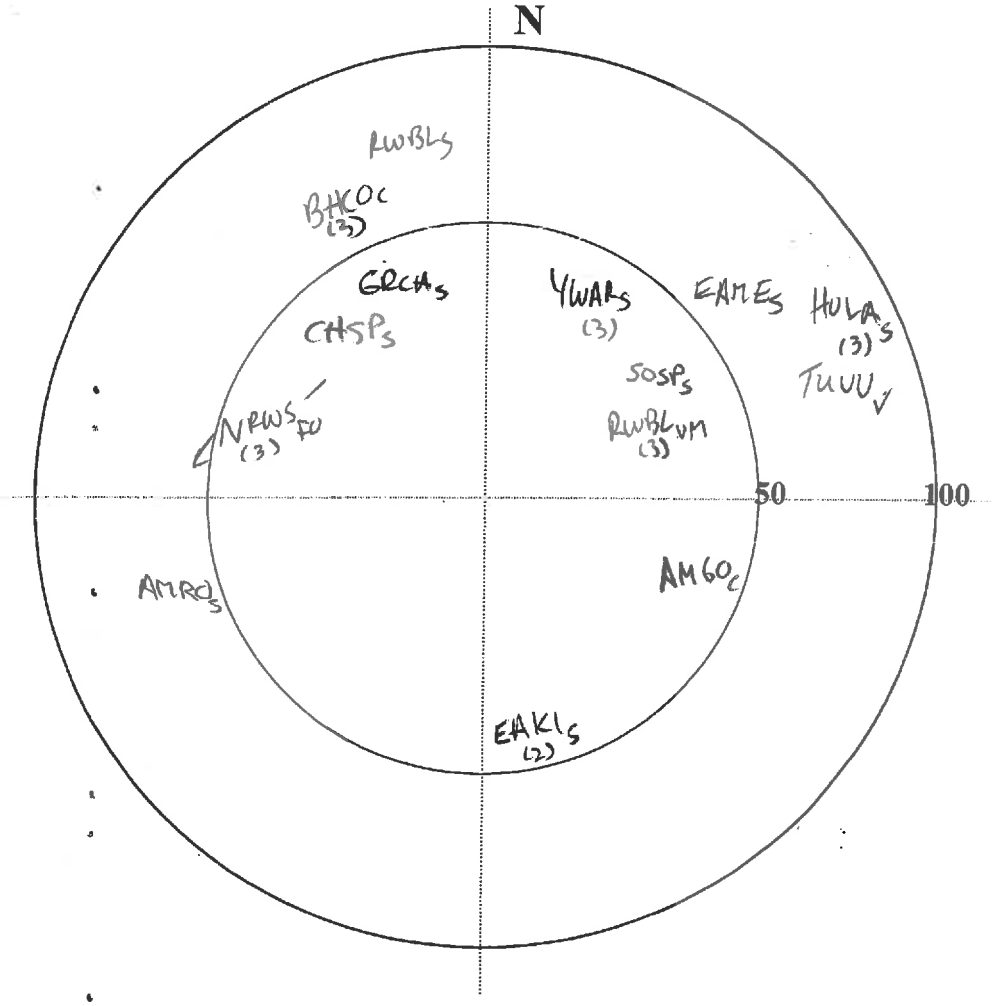
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

Notes: traffic noise

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC13 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0925-0935

GPS file name: PC13 **Datum:** NAD83 **Zone:** 17

UTM: E: 646118 **N:** 4750363

Temperature: 16 **Wind Speed:** B-2 **Cloud Cover:** 15 **Photo #:** 6217 · 6220

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) **Hab 1:** _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

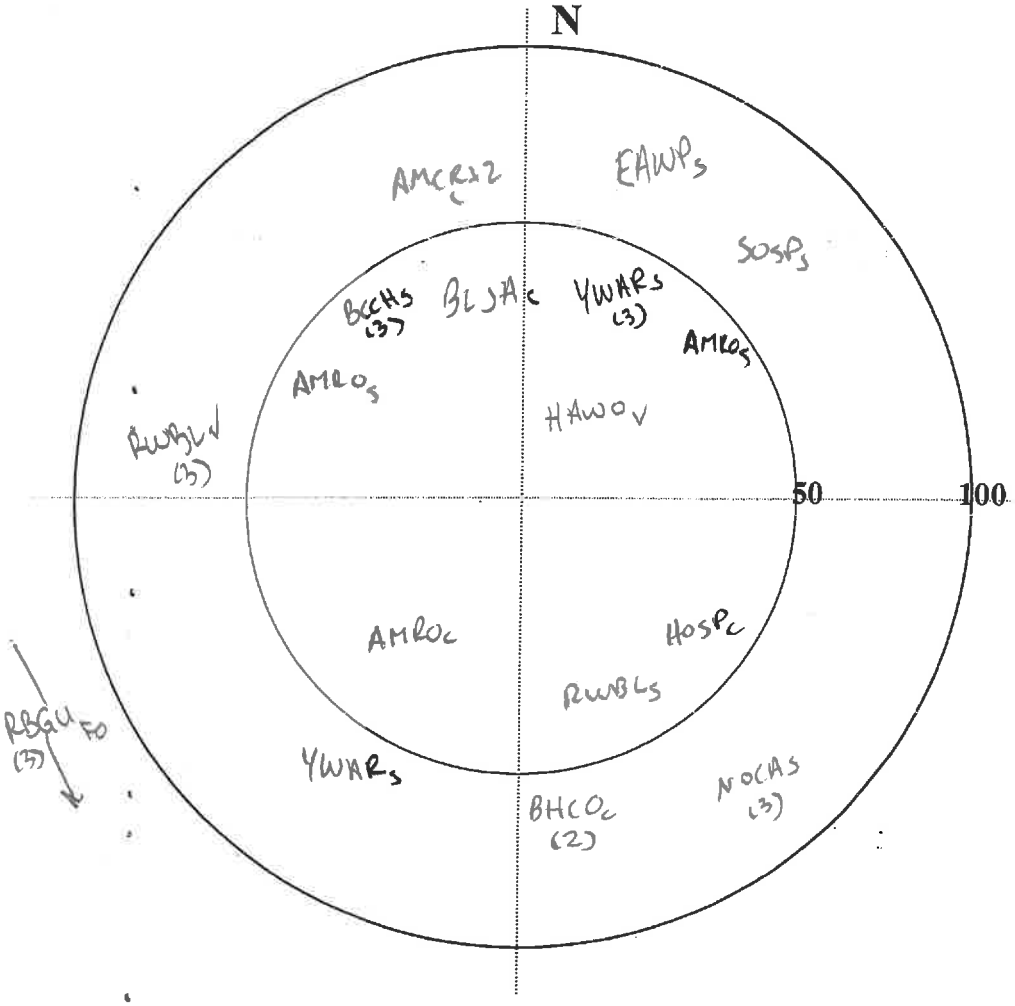
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY: _____

DATE: _____

DATA QA/QC BY: _____

DATE:



Incidental Observation: _____

Notes: Traffic noise

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC14 **Observer:** LO **Date (dd/mon/yy):** 24May2017 **Time:** 0941-0951

GPS file name: PC14 **Datum:** NAD83 **Zone:** 17

UTM: E: _____ **N:** _____

Temperature: 16 **Wind Speed:** B-2 **Cloud Cover:** 10 **Photo #:** 6221 - 6224

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) **Hab 1:** _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

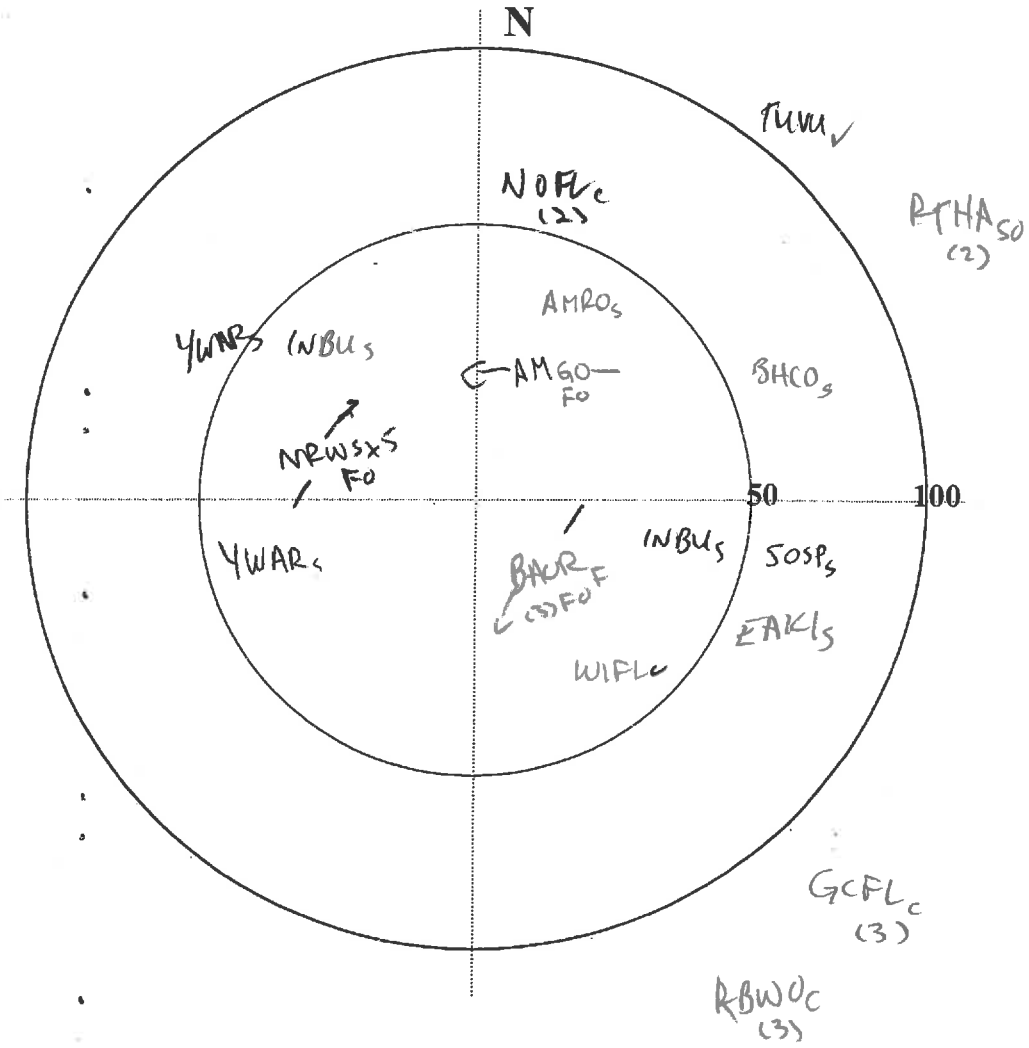
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY: _____

DATE: _____

DATA QA/QC BY: _____

DATE: _____



Incidental Observation: _____

Notes: traffic

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1471656

Point #: PC01 **Observer:** LO **Date (dd/mon/yy):** 24May2017 **Time:** 0556-0606

GPS file name: PC01 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646502 **N:** 4752296

Temperature: 14 **Wind Speed:** Bft-1 **Cloud Cover:** 100 **Photo #:** 6168 - 6171

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : SWD

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:**_____( ) **Hab 4 :**_____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

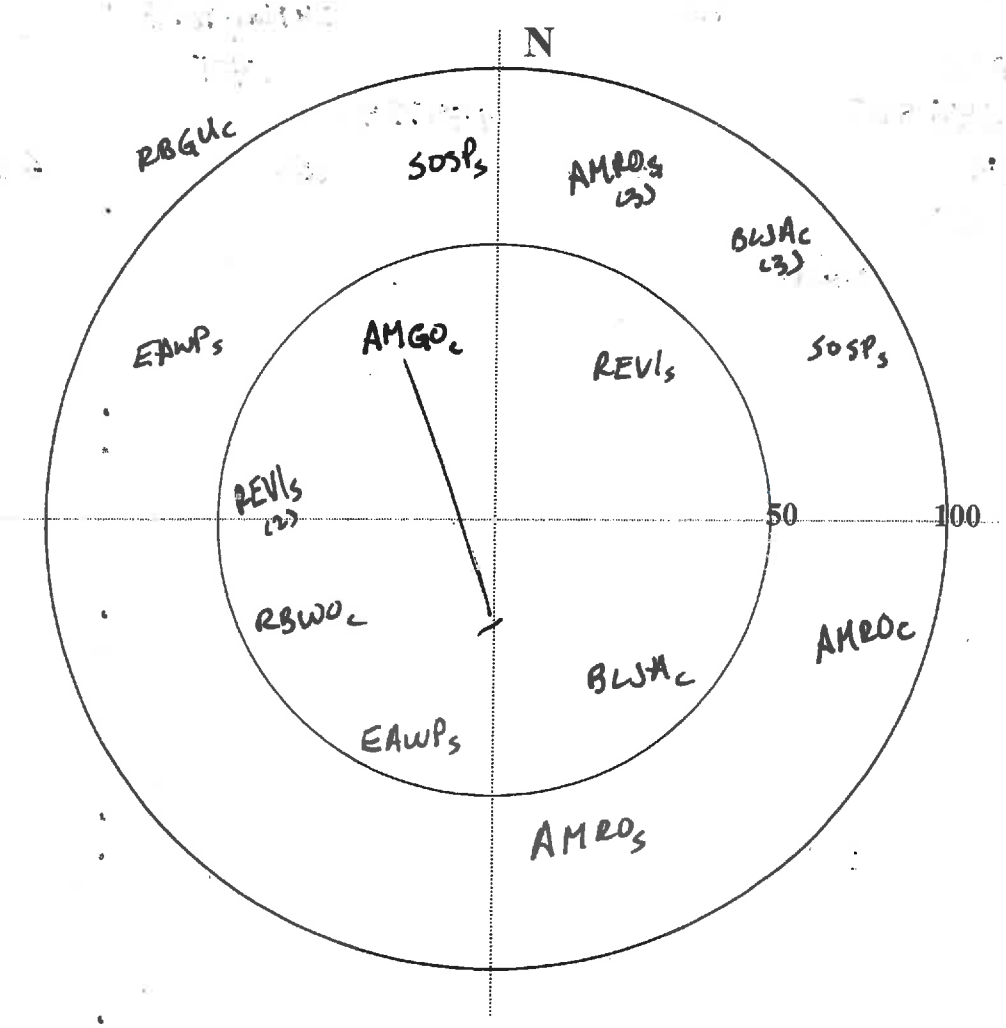
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

_____

Notes: _____

_____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC02 **Observer:** LO **Date (dd/mon/yy):** 24May2017 **Time:** 0614-0624

GPS file name: PC02 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646499 **N:** 4752048

Temperature: 14 **Wind Speed:** BF-1 **Cloud Cover:** 1 **Photo #:** 6172-6175

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : SWD

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

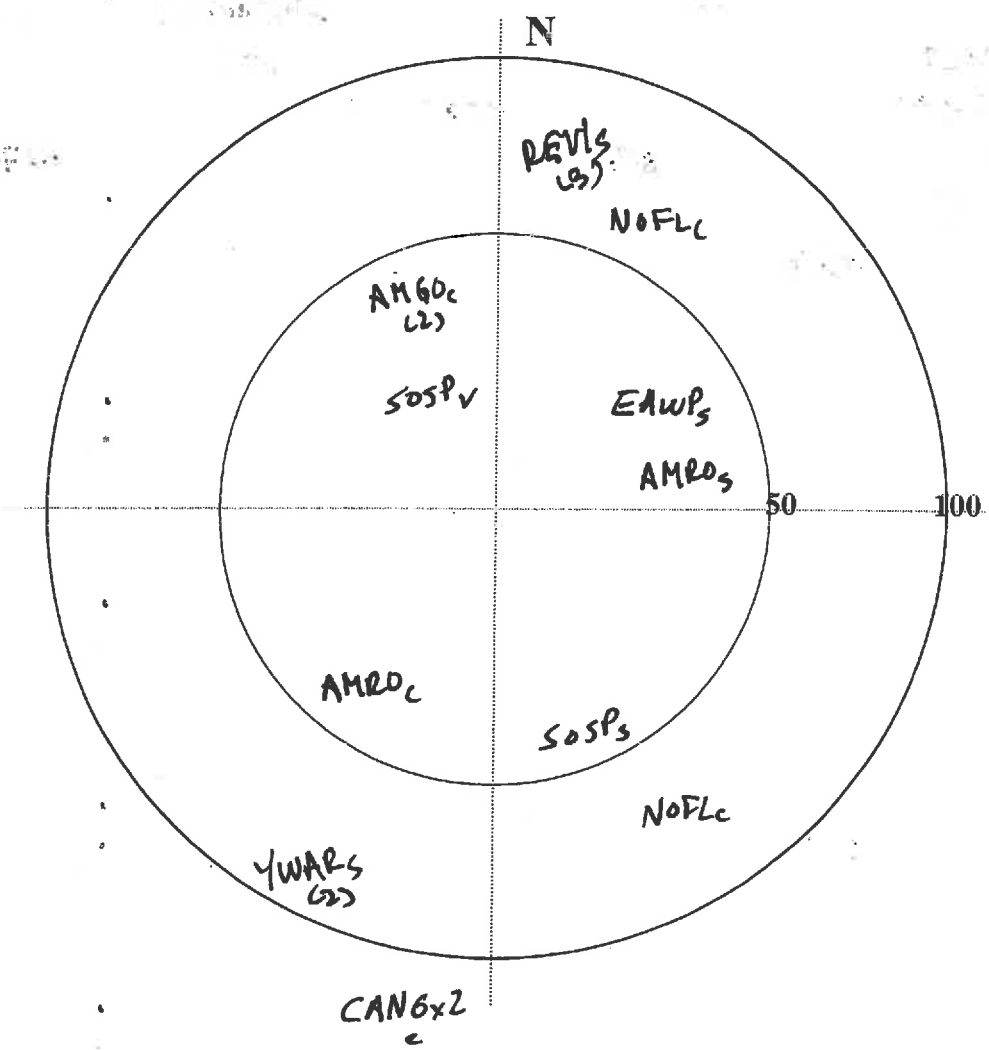
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: DOWO

Notes: Quarry noise

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC04 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0631-0641

GPS file name: PC04 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646511 **N:** 4751789

Temperature: 14 **Wind Speed:** BF 1 **Cloud Cover:** 90 **Photo #:** 6176 - 6179

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : hay field

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:**_____( ) **Hab 4 :**_____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

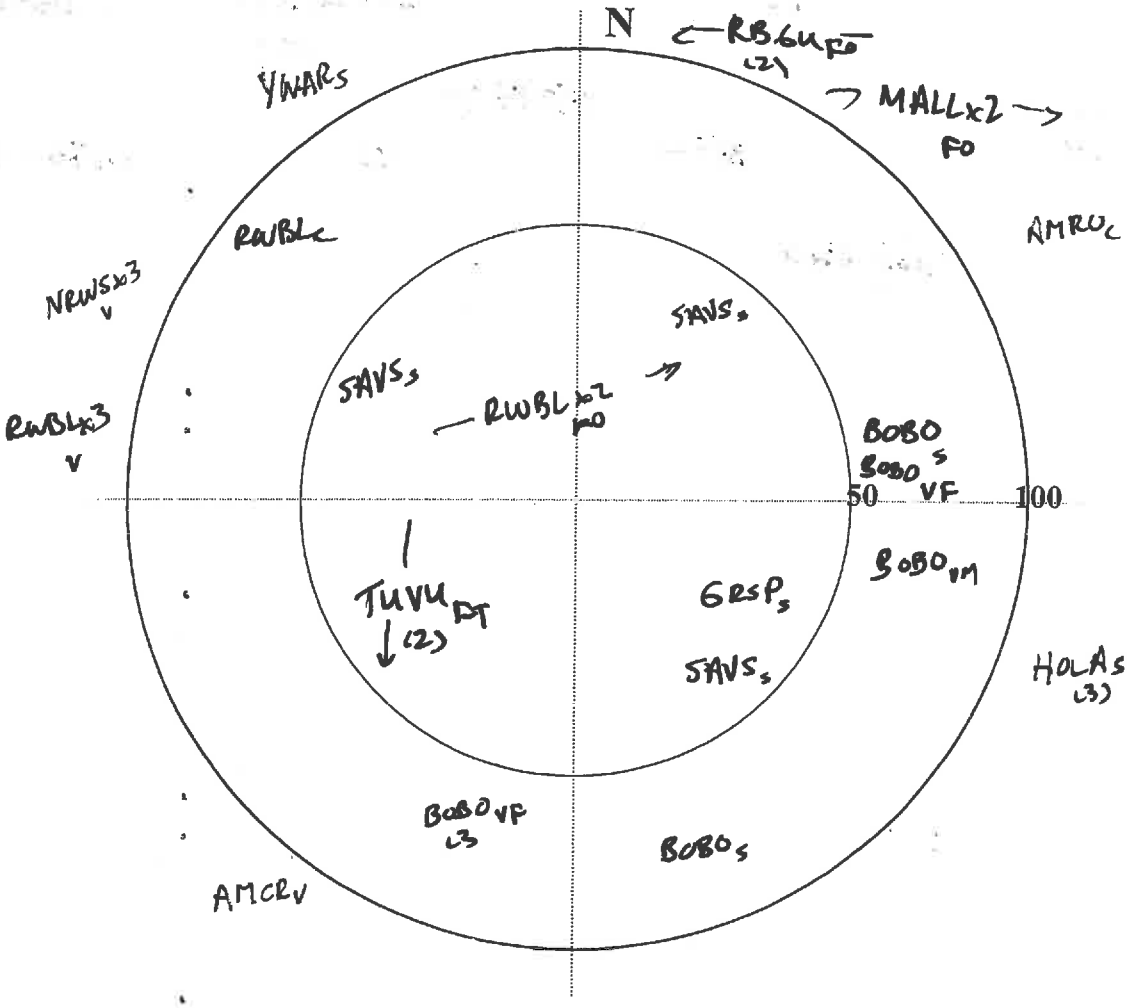
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

_____

Notes: _____

_____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC07 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0647 - 0657

GPS file name: PC07 **Datum:** NAD83 **Zone:** 17

UTM: E: 646627 **N:** 4751483

Temperature: 14 **Wind Speed:** BFT-1 **Cloud Cover:** 90 **Photo #:** 6180 - 6183

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : abandoned row crop agr

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

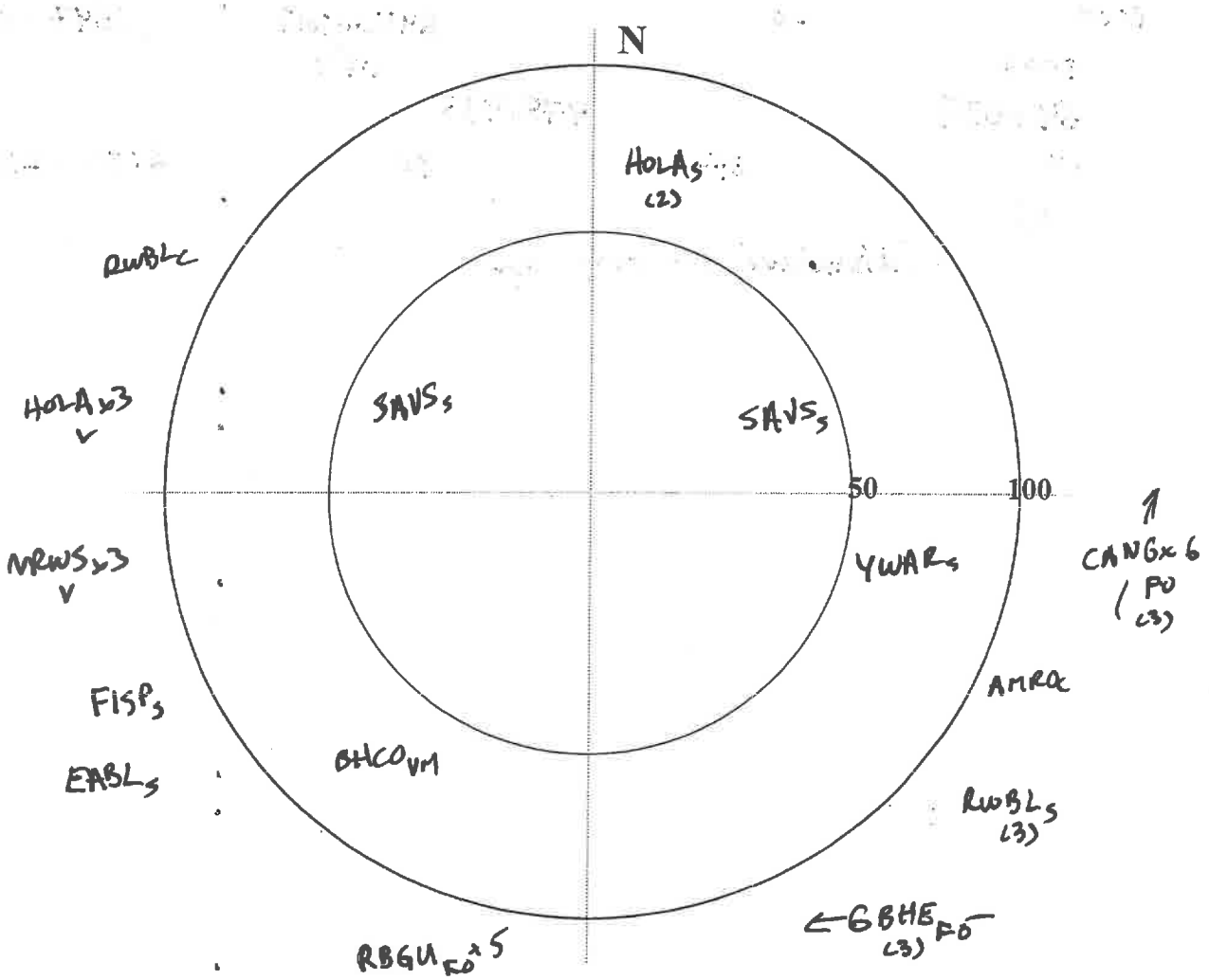
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

_____

Notes: _____

_____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC08 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0704-0714

GPS file name: PC08 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646794 **N:** 4751235

Temperature: 14 **Wind Speed:** B - 1 **Cloud Cover:** 100 **Photo #:** 61-84-6187

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : old wheat field

Habitat Codes (%) **Hab 1:**_____( ) **Hab 2:**_____( ) **Hab 3:**_____( ) **Hab 4 :**_____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

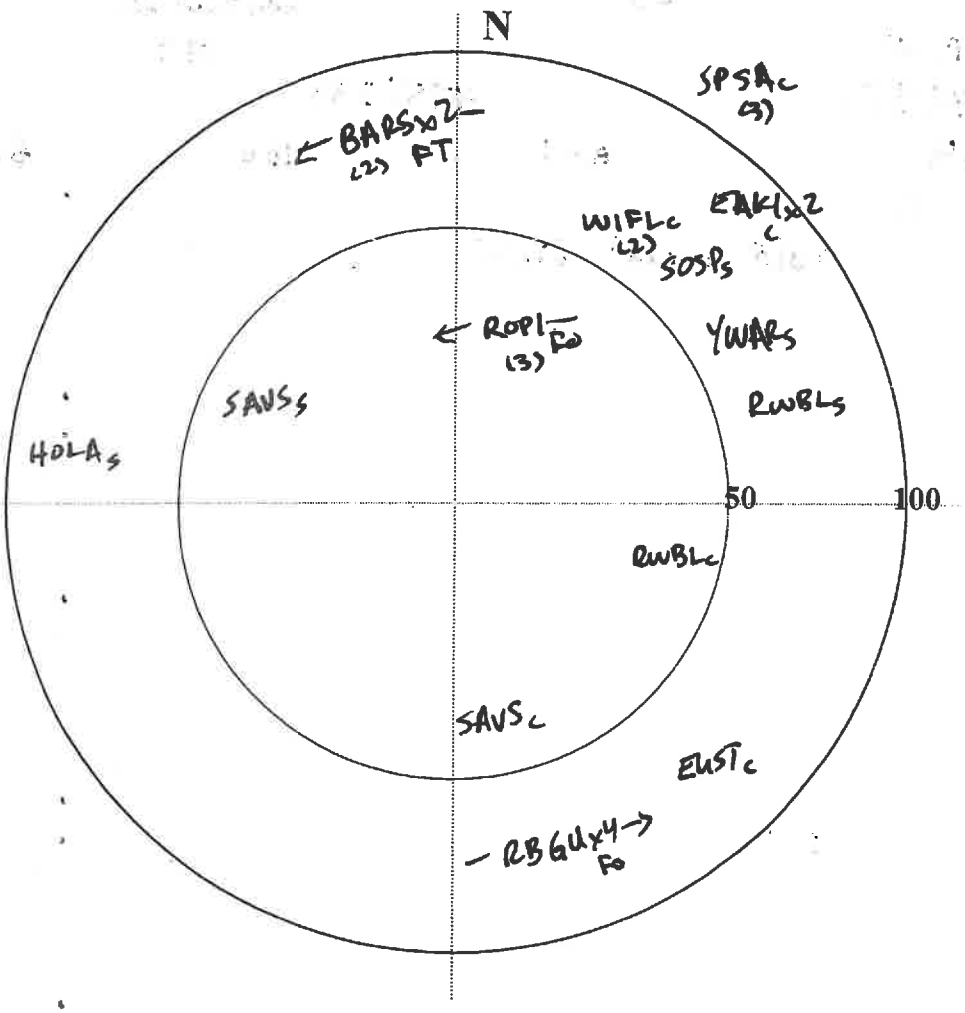
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

Notes: _____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC05 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0731-0741

GPS file name: PC05 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646819 **N:** 4751961

Temperature: 14 **Wind Speed:** B-1 **Cloud Cover:** 90 **Photo #:** 6188-6191

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) **Hab 1:** _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

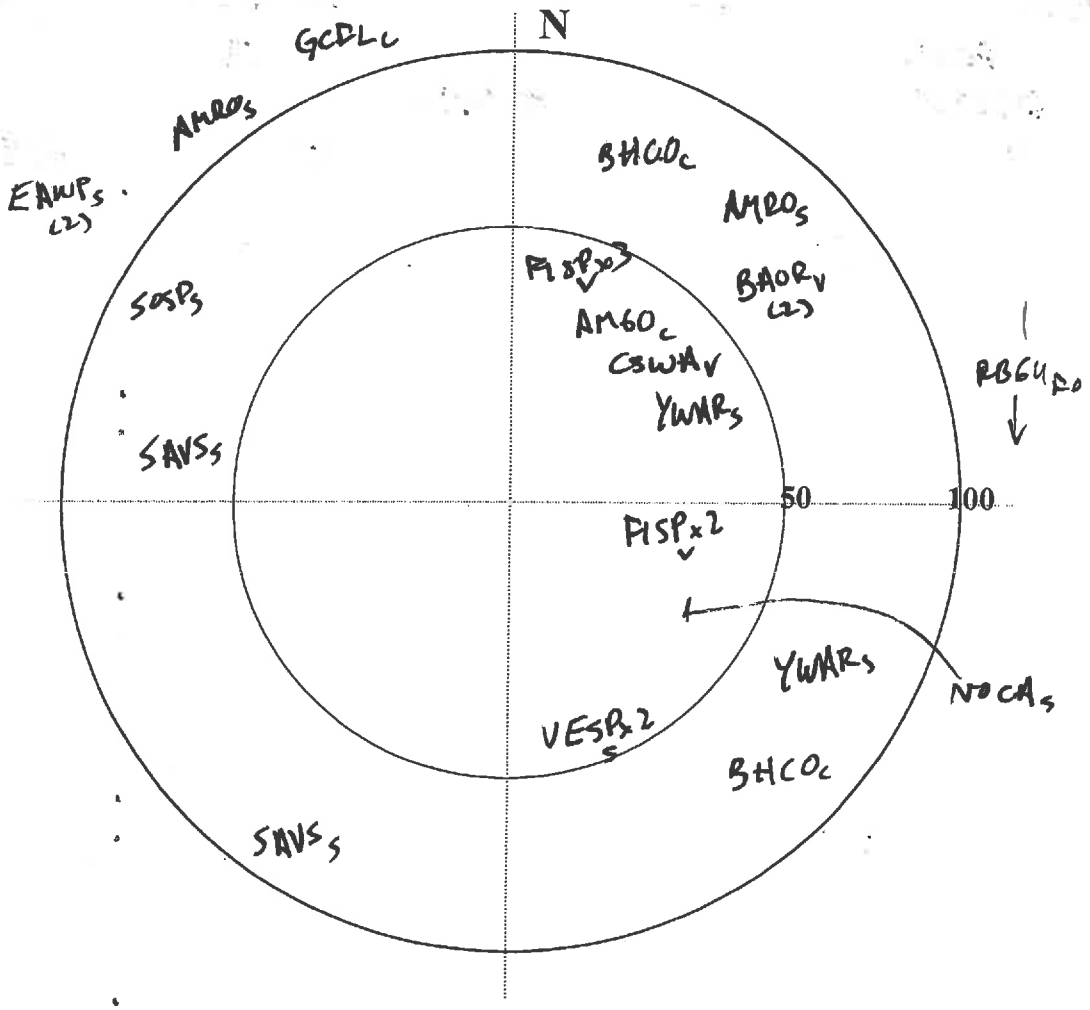
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	<50	50-100	>100	<50	50-100	>100	<50	50-100	>100	

DATA ENTRY BY: _____

DATE: _____

DATA QA/QC BY: _____

DATE:



Incidental Observation: EAME singing from two fields over east of site.

Notes:

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771650

Point #: PC03 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0745-0758

GPS file name: PC03 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646746 **N:** 4752208

Temperature: 14 **Wind Speed:** B-1 **Cloud Cover:** 80 **Photo #:** 6193-6196

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : SWD

Habitat Codes (%) **Hab 1:** ( ) **Hab 2:** ( ) **Hab 3:** ( ) **Hab 4 :** ( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain:

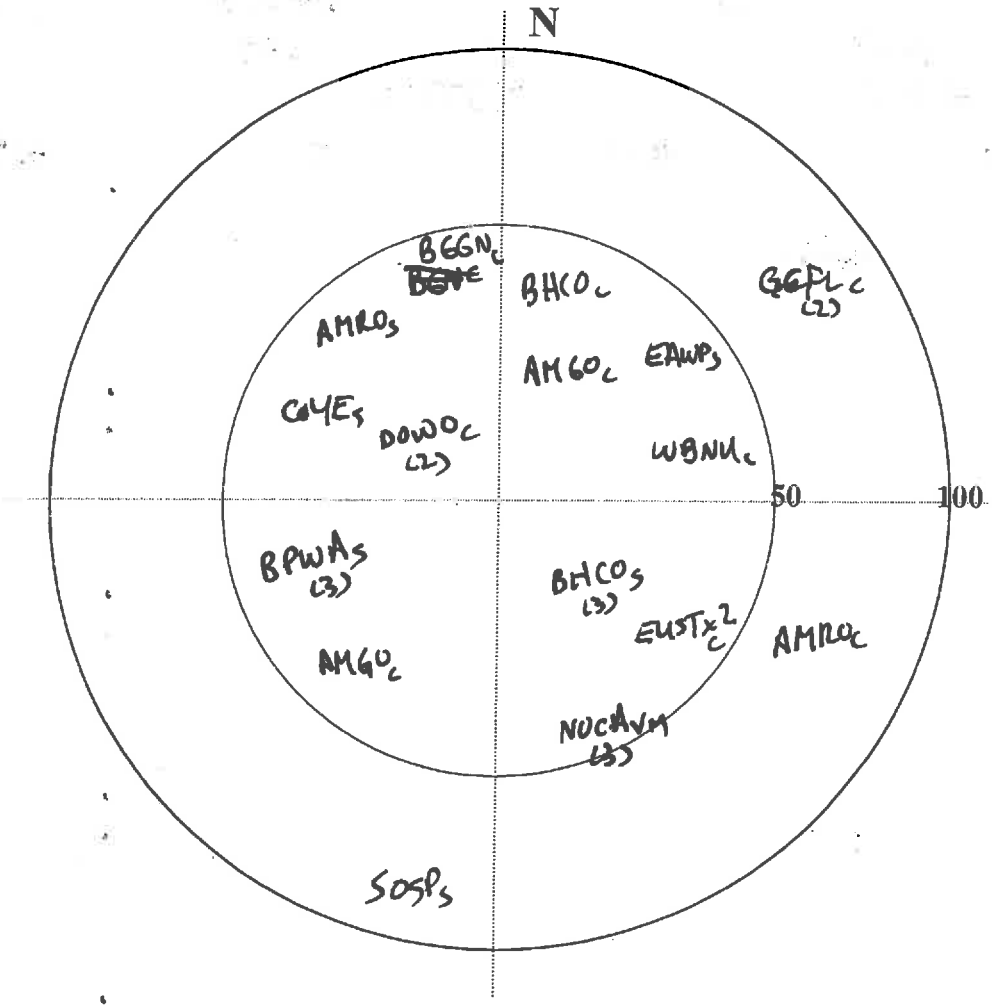
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE:



Incidental Observation: _____

Notes: _____

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC06 **Observer:** LO **Date (dd/mon/yy):** 24May2016 **Time:** 0812-0822

GPS file name: PC06 **Datum:** NAD83 **Zone:** 17T

UTM: E: 646989 **N:** 4752422

Temperature: 15 **Wind Speed:** B-1 **Cloud Cover:** 70 **Photo #:** 6197-6200

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) **Hab 1:** _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

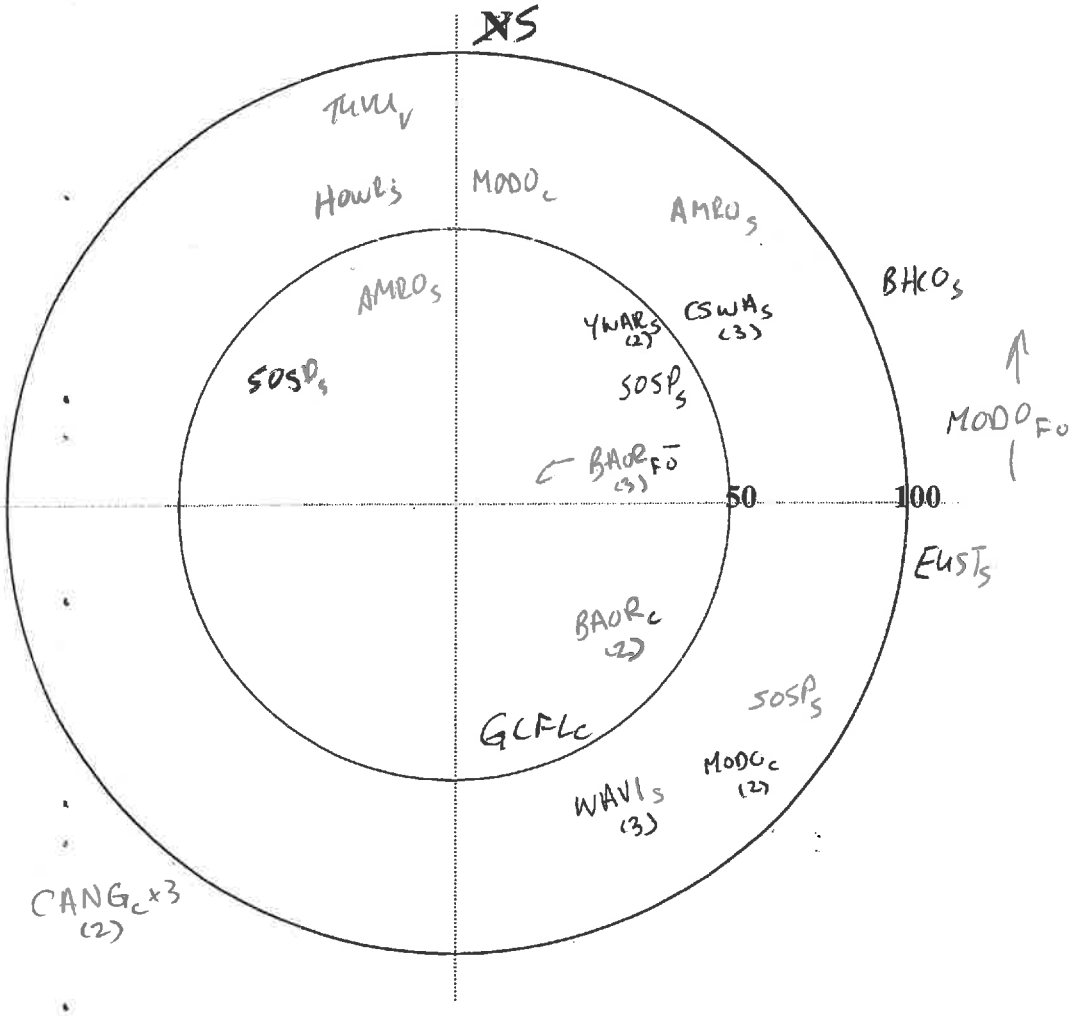
	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	**<50**	**50-100**	**>100**	

DATA ENTRY BY: _____

DATE: _____

DATA QA/QC BY: _____

DATE:



Incidental Observation: Green Frog, Bull frog from pond north of Concession 2

Notes:

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
Aquatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
Cultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: PC09 **Observer:** LO **Date (dd/mon/yy):** 24 May 2017 **Time:** 0827-0937

GPS file name: PC09 **Datum:** NAD83 **Zone:** 17

UTM: E: 647443 **N:** 4751790

Temperature: 14 **Wind Speed:** B-1 **Cloud Cover:** 70 **Photo #:** 6201 - 6204

Precipitation Type: None Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) Hab 1:_____( ) **Hab 2:**_____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	<50	50-100	>100	<50	50-100	>100	<50	50-100	>100	

DATA ENTRY BY:_____

DATE:_____

DATA QA/QC BY:_____

DATE: