



**Ottawa International Airport
Aggregate Pit – Parcel C –
Level 1 & 2 Natural Environmental
Report**

FINAL REPORT

February 14, 2020

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OTTAWA INTERNATIONAL AIRPORT AGGREGATE PIT – PARCEL C – LEVEL 1 & 2 NATURAL ENVIRONMENTAL REPORT

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1.0 INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

Stantec Consulting Ltd. (Stantec) was retained by Thomas Cavanaugh Construction Ltd. (Cavanaugh) to prepare a Natural Environment Level 1 & 2 Technical Report for a proposed aggregate pit located at 4788 Albion Road, Gloucester, Ontario, K1X 1A6 (the Site), within the City of Ottawa. The pit operation will be restricted to extracting aggregate material no closer than 1.5 metres (m) above the established groundwater table. Although the project is not subject to provincial licensing requirements under the *Aggregate Resources Act* (ARA), due to its location on federal land, Cavanaugh intends to prepare an application for aggregate extraction for submission to the City of Ottawa and Ottawa Airport Authority which meets the intent of the ARA.

Under the ARA, a Level 2 Natural Environment impact assessment and report is prepared when natural heritage features (e.g., wetlands, species at risk habitat) have been identified on, or within, 120 m of a Site during preliminary investigations (i.e., a Level 1 assessment). During Stantec's preliminary review of available data sources and initial site reconnaissance, natural heritage features were identified as occurring on the Site, or within 120 m of the Site (the Study Area). As such, this report has been prepared in keeping with the ARA standards for a Level 1 & 2 Natural Environment Report. The report is also intended to address the requirements of an Environmental Impact Statement (EIS) under the City of Ottawa's EIS guidelines (City of Ottawa 2015) and the City of Ottawa's Zoning By-law, in support of an application for a zoning amendment, and is intended to demonstrate that the application is consistent with the Provincial Policy Statement (PPS) (MMAH 2014).

1.2 SITE DESCRIPTION

Cavanaugh's Site is proposed to be developed on lands owned by the Ottawa Airport. The Site is approximately 63 ha in size and is known as Parcel C, an unaddressed parcel of land located on Albion Road (Ottawa Regional Rd 25) in the City of Ottawa, Ontario (Figure 1, Appendix A).

The Site is a semi-rectangular plot of agricultural / pastoral land bounded by Albion Road on the east, semi-vegetated former extraction lands to the south, mixed forest and wetland to the west, and a golf course to the north. The Site is bisected northwest to southeast by a hydroelectric right-of-way and includes three high voltage transmission towers. Topography ranges from about 110 m above mean sea level (AMSL) near the western boundary and about 114 m AMSL near the eastern boundary, with a central north-south mound extending up to 117 m AMSL (Gorrell 2006). The ground surface decreases to the west of the Site with the edge of the mapped wetland coinciding to an elevation of about 108 m AMSL.



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The Site is primarily located at the eastern boundary of the Lower Rideau River watershed within the Mosquito Creek subwatershed, with about 3 ha of the southeastern portion of the Site in the South Nation Watershed. Surface water flow within the Mosquito Creek subwatershed is to the west to the Rideau River.



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2.0 ENVIRONMENTAL POLICY CONTEXT

This report has been prepared to address policies and guidelines from legislation relevant to aggregate development on federal land in the City of Ottawa, including the federal Species at Risk legislation (*Species At Risk Act 2002 (SARA)*), the City of Ottawa Official Plan ([OP] City of Ottawa 2003), and the *Conservation Authorities Act, 1990* (Government of Ontario 1990). Although the project is not subject to provincial licencing requirements of the ARA, the reporting standards for a Level 2 Natural Environment impact assessment were used in development of this report.

The policy documents discussed below were used to assess the natural heritage features and functions of the Study Area, scope the study methodologies, and determine natural heritage constraints for the Project.

2.1 FEDERAL POLICY

2.1.1 Species at Risk Act

The federal *Species at Risk Act (SARA)*, 2002 was created to protect wildlife species at risk in Canada. SARA, which became law in June 2003, protects federally listed species at risk, their residences and their critical habitats. SARA also contains provisions to help manage species of special concern in order to prevent them from becoming endangered, extinct or extirpated. SARA is administered throughout Canada by Environment Canada in conjunction with provincial regulators.

The federal process through which species status are designated begins with an assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), involving a review of status reports and other available information. COSEWIC makes one of the following status designations: extinct, extirpated, endangered, threatened, special concern, or not at risk. They may also determine they do not have sufficient information to classify the species. The status designation is provided to the Minister of Environment and Canadian Endangered Species Conservation Council for review and consideration. The species status may then be added to a schedule of the SARA, which requires an amendment to the Act. Once the species has been added to a schedule, it is afforded legal protection under the SARA. There may be a timeline of several years between the COSEWIC status designation and addition to a SARA schedule.

SARA includes prohibitions against killing, harming, harassing, capturing or taking SAR, which makes it illegal to destroy their residences and/or critical habitats, and can impose restrictions on development and construction projects. Permits for prohibited activities may be issued under Section 73 of SARA.

2.1.2 Migratory Birds Convention Act

The federal *Migratory Birds Convention Act, 1994 (MBCA)* protects migratory birds and their nests (S. 4). Section 6 of the Migratory Bird Regulations (C.R.C., c. 1035) prohibits the disturbance, destruction or



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taking of a nest, egg, or nest shelter of a migratory bird. Nest disturbance during the course of vegetation clearing may be considered as “incidental take” and could be seen as a contravention of the MBCA.

2.2 PROVINCIAL POLICY

2.2.1 Aggregate Resources Act

This report has been prepared with reference to the provincial standards for a Class A Category 3 licence under the ARA above the water table. The standards require a Level 1 Natural Environment Technical Report to determine whether any of the following features exist on and/or within 120 m of the Site:

- Significant wetlands
- Significant habitat of endangered or threatened species
- Fish habitat
- Significant woodlands
- Significant valleylands
- Significant wildlife habitat (SWH)
- Significant Areas of Natural and Scientific Interest (ANSI)

If any of the seven natural heritage features are present, the ARA standards state that a Level 2 Natural Environment Technical Report is required to determine any negative impacts on the natural features or ecological functions for which they are identified and propose any preventative, mitigative or remedial measures that may be necessary. Based on the site characteristics including the presence of significant woodlands and potential for Endangered and Threatened species within 120 m of the site a Level II report was completed.

2.2.2 Conservation Authorities Act, 1990

The *Conservation Authorities Act* is the enabling legislation that provides the legal basis for the creation of conservation authorities (“CAs”) in Ontario (Government of Ontario 1990). Generally, the *Conservation Authorities Act* directs CAs to perform a number of critical functions regarding watershed planning and management including the prevention, elimination, or reduction of loss of life and property from flood hazards and erosion hazards, as well as the conservation and restoration of natural resources. Section 28 of the *Conservation Authorities Act* empowers CAs to make regulations in the area under its jurisdiction, including the prohibition, regulation or permitting for development if the control of flooding, erosion, or the conservation of land may be affected by the development.

Pursuant to *Ontario Regulation 174/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, May 2006*, prior permission is required from the Rideau Valley Conservation Authority (RVCA) for development within a floodplain, valleylands, wetland, or other hazardous land. Permission is also required from the RVCA for alteration to a river, creek, stream or watercourse or interference with the hydrological function of a wetland. Generally, development,



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interference or other alteration that may negatively impact the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land are not permitted (RVCA 2010).

Development and/or site alteration within the jurisdiction of the Authority and in, on or adjacent to natural heritage features must be in accordance with the policies and guidelines in Sections 1.2, 1.4, and 1.5 of the *RVCA Policies Regarding Development Including the Construction / Reconstruction of Building and Structures, Placing of Fill and Alterations to Waterways Under Section 28 of the Conservation Authorities Act of Ontario* and must be to the satisfaction of the Authority.

The RVCA (2010) policy with respect to development in wetlands is that it “may be permitted provided it will not have an adverse effect on the control of flooding, erosion, pollution or the conservation of land and, in the case of wetlands, the hydrologic function of the wetland.”

2.3 MUNICIPAL POLICY

2.3.1 City of Ottawa Official Plan

The City of Ottawa Official Plan (Plan) was adopted by Council on in May 2003. Schedules A, B, K, and L of the Plan designate the Natural Heritage System Features and Areas, which generally include features that are protected by the Provincial Policy Statement such as significant wetlands and woodlands, and other habitat features (City of Ottawa 2003).

Section 3.2.1 of the Plan states that development and site alteration shall not be permitted within Significant Wetlands, including Provincially Significant Wetlands (PSW). According to Section 3.2.1, development and site alterations are not permitted within 120 m of the boundary of a Significant Wetland unless an EIS demonstrates that there will be no negative impacts on the wetland or its ecological function.

Section 3.2.2 of the Plan states that development and site alteration shall not be permitted within Natural Environment Areas (i.e., wetlands, Significant Woodlands, Significant Wildlife Habitat (SWH), Areas of Natural and Scientific Interest (ANSIs)). According to Section 3.2.2, development and site alterations are not permitted within 120 m of a Natural Environment Area; unless an EIS demonstrates that there will be no negative impacts on the natural features within the area or their ecological functions.

According to Section 4.7.3, development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements. Proposed development near or adjacent to water bodies that provide fish habitat must demonstrate that the proposed development will not have a negative impact on fish habitat.

Section 4.7.4 of the Plan states that development and site alteration shall not be permitted in significant habitat of endangered and threatened species. According to Section 4.7.4, development and site alterations are not permitted within 120 m of the boundary of identified significant habitat of endangered and threatened species unless the ecological function of the adjacent lands has been evaluated and an



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EIS demonstrates that there will be no negative impacts on the significant habitat of endangered and threatened species or on its ecological functions.

Mineral aggregate resources policies are described in Section 3.7.4 of the OP. Important sand, gravel and bedrock resources areas are designated on OP schedules with the intent to protect aggregate resources close to markets, to protect aggregate operations from incompatible adjacent land uses and to minimize disruptions to communities and the environment from aggregate extraction activities (Policy 3.7.4.1). There are no implied restrictions to applications for aggregate operations outside the sand, gravel or bedrock resource areas. Policy 3.7.4.7 states that all pits and quarries licenced under the ARA must be zoned for mineral extractive use in the City's zoning bylaw. An environmental impact statement is required as part of an application for aggregate extraction in the City of Ottawa (Policy 3.7.4.9).



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3.0 APPROACH

3.1 LITERATURE REVIEW

As part of this Level 2 Natural Environment Report, the following background documentation and related information sources were reviewed to identify natural heritage features and constraints within 120 m of the Site:

- Ontario's Natural Heritage Information Centre (NHIC 2019)
- Land Information Ontario (LIO 2019)
- City of Ottawa's Official Plan (Ottawa 2003)
- geoOttawa (City of Ottawa 2019)
- Satellite imagery (Google Earth Pro 2019)
- Fisheries and Oceans Canada (DFO) Species at Risk Mapping (DFO 2018)
- Atlas of Breeding Birds of Ontario (OBBA) (Cadman 2007)
- eBird Canada (ebird 2019)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2020)
- Ontario Butterfly Atlas Online (Toronto Entomologists' Association 2019)
- Atlas of the Mammals of Ontario (Dobbyn 1994)

Some of the sources above provide data at a scale as large as 10 x 10 km. Results were therefore screened to assess their relevance to the Site and species were removed from consideration if no suitable habitat was observed on or adjacent to the Site (e.g., riverine fish species).

3.1.1 Species at Risk

For the purpose of this assessment, SAR are species listed as Threatened (THR) or Endangered (END) on SARA Schedule 1 or the Species at Risk in Ontario (SARO) list. SAR occurrences were obtained from the NHIC (MNRF 2019) and other online databases. These sources were used to determine if there were any significant floral or faunal species with potential to occur on, or within 120 m of, the Site.

3.1.2 Species of Conservation Concern

Species of conservation concern (SOCC) are considered at a number of levels, including globally, nationally, and provincially. For this report, SOCC includes species that are provincially rare (with a Provincial S-rank of S1 to S3) or listed as Special Concern (SC) on SARA Schedule 1 or SARO. Provincial ranks (S-ranks) are used by the NHIC to set protection priorities for rare species and vegetation communities. They are based on the number of factors such as abundance, distribution, population trends and threats in Ontario and are not legal designations. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be determined. Species with provincial ranks of S1 to S3, and those tracked by the MNRF, are considered SOCC. Provincial S-ranks are defined as follows:



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- S1: Critically imperiled; usually fewer than 5 occurrences
- S2: Imperiled; usually fewer than 20 occurrences
- S3: Vulnerable; usually fewer than 100 occurrences
- S4: Apparently secure; uncommon but not rare, usually more than 100 occurrences
- S5: Secure, common, widespread and abundant

S-rank followed by a “?” indicates the rank is still uncertain

3.2 AGENCY CONSULTATION

Pre-consultation meetings were held with the City of Ottawa and MNRF on September 24th, 2019. Staff at both meetings noted that as the project is on federal land, the protection of species at risk falls under SARA rather than the provincial ESA.

3.3 FIELD INVESTIGATIONS

In order to support the natural environment impact assessment and report for the Site, Stantec developed and initiated a field program in 2019 to identify and classify the existing conditions site conditions (e.g., vegetation communities, SAR habitat) as well as confirming the natural heritage features on, or within 120 m of, the Site that were identified through the literature review process. Stantec’s field program was completed in conjunction with both the wildlife active and vegetation growing seasons – typically between April and October in any given year.

Table 3-1 provides a summary of dates and environmental conditions during Stantec’s 2019 field program.

Table 3.1: ELC and Botanical Survey Dates and Environmental Conditions

Purpose of Investigation	Date	Start/End Time (24 hours)	Weather Conditions	Biologist
<ul style="list-style-type: none"> • General/SWH Wildlife Habitat Assessment • Breeding Amphibian Survey #1 	May 07, 2019	1730 – 2230 hrs.	Temperature: 11 – 13°C Wind (Beaufort scale): 1 – 3, NW Cloud Cover: 0% Precipitation: None 24/hr. Precipitation: None	Josh Mansell
<ul style="list-style-type: none"> • General/SWH Wildlife Habitat Assessment • Bat Maternity Roost Habitat Suitability Assessment 	May 21, 2019	0800 – 1230 hrs.	Temperature: 9°C Wind (Beaufort scale): 3 – 4, NW Cloud Cover: 50% Precipitation: Trace rain 24/hr. Precipitation: None	Josh Mansell



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Table 3.1: ELC and Botanical Survey Dates and Environmental Conditions

Purpose of Investigation	Date	Start/End Time (24 hours)	Weather Conditions	Biologist
<ul style="list-style-type: none"> Breeding Amphibian Survey #2 ELC/Botanical Survey #1 	May 31, 2019	1730 – 2300 hrs.	Temperature: 11 – 12°C Wind (Beaufort scale): 1 – 2, W Cloud Cover: 70 – 80% Precipitation: None 24/hr. Precipitation: ~1 – 3 mm	Josh Mansell
<ul style="list-style-type: none"> General/SWH Wildlife Habitat Assessment Breeding Bird Survey #1 SAR Grassland Breeding Bird Transect Survey #1 Bat Acoustic Monitor Deployment 	June 5, 2019	0530 - 1130	Temperature: 12 – 16°C Wind (Beaufort scale): 1, W Cloud Cover: 100% Precipitation: None 24/hr. Precipitation: ~5 mm	Brennan Obermayer
<ul style="list-style-type: none"> General/SWH Wildlife Habitat Assessment Breeding Bird Survey #2 	June 17, 2019	0630 - 0930	Temperature: 12°C Wind (Beaufort scale): 1, W Cloud Cover: 0% Precipitation: None 24/hr. Precipitation: n/a	Brennan Obermayer
<ul style="list-style-type: none"> General/SWH Wildlife Habitat Assessment Breeding Amphibian Survey #3 Crepuscular Breeding Bird Survey #1 	June 20, 2019	2000 – 0145 hrs.	Temperature: 15 – 17°C Wind (Beaufort scale): 1 – 2, SE Cloud Cover: 20 – 30% Precipitation: None 24/hr. Precipitation: ~1 – 3 mm Moon Rise: 2305 hrs. Moon Phase: Full, 91% illumination	Josh Mansell
<ul style="list-style-type: none"> General/SWH Wildlife Habitat Assessment ELC/Botanical Survey #2 Breeding Bird Survey #3 Bat Acoustic Monitor Retrieval 	July 9, 2019	0600 – 1300 hrs.	Temperature: 15 – 19°C Wind (Beaufort scale): 1 – 2, W Cloud Cover: 0% Precipitation: None 24/hr. Precipitation: None	Josh Mansell
<ul style="list-style-type: none"> General/SWH Wildlife Habitat Assessment ELC/Botanical Survey #3 	August 19, 2019	0600 – 1000 hrs.	Temperature: 28°C Wind (Beaufort scale): 2 – 3, W Cloud Cover: 20%	Josh Mansell



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Table 3.1: ELC and Botanical Survey Dates and Environmental Conditions

Purpose of Investigation	Date	Start/End Time (24 hours)	Weather Conditions	Biologist
			Precipitation: None 24/hr. Precipitation: ~1 – 3 mm	

The following surveys were completed during Stantec’s 2019 field program to identify and classify existing conditions and constraints at the Site.

3.3.1 Ecological Land Classification and Botanical Survey

Initial characterization of existing vegetation communities was completed by interpreting available aerial imagery. Vegetation was identified, and communities were verified and assessed in the field on, or within 120 m of, the Site following a meandering transect. Community characterizations (ecosites and vegetation types) were based on the Ontario Ecological Land Classification (ELC) system (Lee et. al., 1998).

Stantec completed vegetation community characterizations (ELC) and botanical surveys on May 31, July 9 and August 19, 2019; and were timed in order to maximize observations of species during their respective flowering periods (i.e., late spring/early summer and mid/late summer). A comprehensive vegetation inventory (botanical survey) was prepared for the Site and is presented in **Appendix C**. Dominant vegetation species within community were recorded on ELC data cards (see **Appendix D**). Common names and scientific nomenclature of the species observed follow the provincial *Ontario Species List - Vascular Plants*. Provincial significance of vegetation communities and plant species was based on the rankings assigned by the NHIC.

See **Table 3-1** for ELC and botanical survey dates and environmental conditions.

3.3.2 Breeding Amphibian Survey

Bird Studies Canada’s (BSC) Ontario *Marsh Monitoring Program* (MMP) survey protocol (BSC 2003), an industry standard protocol, was used at the Site to identify breeding anurans (frogs and toads) and their associated habitat. During the survey, observers approach each potential breeding habitat feature on foot and record the level of calling (call code) anuran species heard within a three-minute period.

The amphibian call codes record four levels of calling:

- 0 – No calls heard
- 1 – Individuals can be counted, and calls are not overlapping
- 2 – Numbers of some individuals can generally be estimated or counted, others overlapping
- 3 – Full chorus, calls continuous and overlapping, and individuals not distinguishable



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In accordance with the MMP protocol, surveys begin at least one-half hour after sunset and are completed before midnight. Appropriate survey conditions consist of winds less than 19 km/hr (Beaufort 3) and minimum night-time air temperatures of at least 8°C for the first survey (April 15 – 30), 13°C for the second survey (May 15 – 31) and 21°C for the third (June 15 – 30). However, surveys can be conducted at lower temperatures if there is strong calling activity observed within the general location of the study Area.

Stantec completed breeding amphibian surveys on May 7, May 31 and June 21, 2019 focusing on habitats features on, or within 120 m of, the Site. Though the first survey (May 7) was completed outside of the recommended window of April 15 – 30, the early calling species of spring peeper (*Pseudacris crucifer*), western chorus frog (*Pseudacris triseriata*) and wood frog (*Lithobates sylvaticus*) were still observed calling within the general location of the Site (pers. comm. Josh Mansell (Stantec) as of May 7, 2019. As such, it was determined by Stantec that the May 7 survey period was sufficient to capture any calls of the early calling species above that may be present on, or within 120 m of, the Site.

As there was only one potential anuran breeding habitat observed within the Site (e.g., vernal pool) (CAP19UJM004), the survey included three additional stations that focused on adjacent potential breeding habitats within 120 m of the Site.

See **Table 3-1** for breeding amphibian survey dates and environmental conditions.

3.3.3 Bat Maternity Roost Habitat Suitability Assessment

Trees on, or within 120 m of, the Site were assessed during leaf-off conditions on May 21, 2019 to identify trees that meet the criteria to support potential maternal roosts of bats (e.g., cavities, loose bark). This methodology and suitable habitat feature criteria are outlined in the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat* (2017) developed by the MNRF's Guelph district. Within the MNRF's (2017) protocol, there are four phases identified to determine the presence of SAR bats within a vegetation community or site:

1. Phase I: Bat Habitat Suitability Assessment
2. Phase II: Identification of Suitable Maternity Roost Trees
3. Phase III: Acoustic Surveys
4. Phase IV: Snag Density Survey

Phase I: Bat Habitat Suitability Assessment includes the identification of potentially suitable vegetation communities (e.g., FOD, FOM, FOC) based on the provincial Ecological Land Classification descriptions (Lee et. al., 1998) and was completed during the literature review phase. Phase II was completed by walking meandering transects through the adjacent (within 120 m) forested communities west and south of the Site and identifying potentially suitable maternity roost trees:

1. Standing live or dead tree greater than or equal (\geq) to 10 cm diameter at breast height (DBH) with cracks, crevices, hollows, cavities and/or loose or naturally exfoliating bark



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2. Oak (*Quercus* spp.) tree ≥ 10 cm DBH, any maple (*Acer* spp.) tree ≥ 10 cm DBH if the tree includes dead/dying leaf clusters and/or maple tree ≥ 25 cm DBH

Binoculars were used during this survey to confirm the presence of the above criteria.

When present, the location of potentially suitable maternity roost trees, identified by the criteria above, determined to be on, or within 120 m of, the Site were recorded on a handheld global positioning device (GPS).

As per the MNR (2017) protocol, survey timing for suitable maternity roost trees differs between little brown myotis and northern myotis (leaf-off conditions) versus tri-colored bat (leaf-on). The surveys were conducted during leaf-off conditions, meeting the protocol requirements for two of the three tree-roosting bat SAR. Recognizing that dead/dying leaf clusters may no longer be present on oak and maple trees due to environmental conditions (e.g., wind) during the prescribed leaf-off conditions, Stantec completed the maternity roost habitat surveys for tri-colored bat in conjunction with the little brown myotis and northern myotis surveys (and eastern small-footed myotis). This deviation from the MNR protocol is not considered to affect the reliability of the results, specifically for tri-colored bat, as all oak and maple trees, regardless if dead/dying leaf clusters were present, were identified and assessed.

See **Table 3-1** for bat maternity roost habitat suitability assessment dates and environmental conditions.

3.3.4 Bat Acoustic Monitoring Surveys

The bat acoustic monitoring surveys focused on the Site and suitable habitats within 120 m of the Site to determine if impacts to SAR bats are anticipated during site preparation, construction and/or aggregate extraction activities. The MNR (2017) protocol outlines an ecosite approach to determining the placement and density of monitoring stations on a given site. However, given the quality and general lack of potentially suitable maternity trees, Stantec determined that it was important to focus on high quality habitat features as well as providing ample coverage of the Site, including vegetation community OAGM4 (which is not considered a suitable vegetation community described in above in Section 3.3.3), as well as potentially suitable habitats within 120 m. This method of site selection is a deviation from the MNR's (2017) protocol. Five acoustic monitoring stations were established on, and within 120 m of, the Site.

Wildlife Acoustic SM4BAT FS detectors were deployed on June 5, 2019 in conjunction with breeding bird survey #1. The SM4BAT FS detectors allow for signal to noise ratio analysis. Settings on the detectors were set to:

- Gain: 12dB
- Sample Rate: 256kHz
- 16k High Filter: off
- Min Duration: 1.5ms
- Max Duration: None
- Min Trigger Frequency: 16kHz
- Trigger Level: 18dB



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- Trigger Window: 1 second
- Max Length: 15 seconds

The detectors were secured to selected trees at each of the five survey stations on, and within 120 m of, the Site. Microphones were positioned away from obstacles, and away from prevailing winds where possible, to maximize the range of bat detection.

Once retrieved, bat data was analyzed using Wildlife Acoustic's Kaleidoscope Pro version 5.1.3 identification software. First, the software was used to conduct an initial screening, which removed the recordings of background noise and automatically assigns each bat call recording with a likely species; or in some cases a call remained unidentified. As the software's automated identification has a high error rate, compared to person trained in bat identification, the bat calls were then visually assessed to confirm the identification. Visual assessment involves viewing sonograms (plots of frequency vs time) of each call in Kaleidoscope Pro. All high frequency calls, which would include all SAR (i.e., *Myotis* and *Perimyotis* spp.) were visually assessed to confirm identification of each call. Low frequency calls were spot checked to confirm the presence of each species identified by Kaleidoscope Pro. Low frequency calls that were unidentified by Kaleidoscope Pro were left as unidentified, as they would not include SAR.

The MNRF (2017) protocol recommends that acoustic monitoring for bats be conducted over a minimum of 10 nights between June 1 and June 30 on nights that are above 10°C, with low winds and no precipitation. The detectors were set to record each night from 2100 hrs. until 0500 hrs. the following morning. The SM4BAT FS detectors were deployed on June 5, 2019 and were retrieved on July 9, 2019.

See **Table 3-1** for SAR bat maternity roost acoustic monitoring deployment and retrieval dates and environmental conditions.

3.3.5 Breeding Bird Surveys

3.3.5.1 Breeding Bird Point Counts

Three breeding bird surveys at the Site were completed by Stantec during the breeding bird season (June – 1st week of July) using a standard 10-minute, point-count approach with an unlimited radius, except where adjacent count circles overlap. These methods are consistent with previously approved methods by the Canadian Wildlife Service (CWS). All birds heard or seen, with the assistance of binoculars, during the ten-minute "count" were recorded. The highest level of breeding evidence observed (e.g., carrying food, nest with young), as defined in the *Ontario Breeding Bird Atlas* (Cadman et. al. 2007), was recorded at each survey station for each species encountered. The total number of individuals of each species was recorded in order to develop an understanding of population dynamics in the Site. Incidental observations made while surveyors were moving between stations were also recorded.

A total of 7 breeding bird survey stations were established on, or within 120 m of, the Site. Four of the survey stations were located within the open, grassland habitat of the Site (CAP19BBJM001-002, 006-007); and three of the survey stations were placed in the adjacent woodland habitats, within 120 m of the



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Site (CAP19BBJM003-005). Furthermore, survey stations CAP19BBJM001-002, 006-007 were also located along established transects as part of the SAR grassland breeding bird transect surveys described in below Section 3.3.6.

See **Table 3-1** for breeding bird survey dates and environmental conditions.

3.3.5.2 Grassland Breeding Bird Transect Survey

In conjunction with breeding bird survey #2 and #3, Stantec completed SAR grassland breeding bird transect surveys on foot. Following the guidance in the draft MNRF *Bobolink Survey Methodology* (2011), two parallel transects 250 m apart were set-up lengthwise in a relative east-west fashion within the grassland habitats of the Site. Along each transect, point-count survey stations were established at 250 m intervals (CAP19BBJM001-002, 006-007) and were completed in combination with the breeding bird surveys described in Section 3.3.5.

Each survey station along both SAR grassland breeding bird transects were surveyed in the same manner as the survey stations in the breeding bird survey described in Section 3.3.5 including recording information on the sex and behavior SAR grassland species, specifically Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*). Locally known to breed in the general area, Grasshopper Sparrow (*Ammodramus savannarum*) was also considered during this survey. While walking between survey stations, observations of SAR grassland species are also recorded.

See **Table 3-1** for SAR grassland breeding bird transect survey dates and environmental conditions.

3.3.5.3 Crepuscular Breeding Bird Survey

Through the literature review process, the potential for crepuscular bird species (eastern whip-poor-will (*Antrostomus vociferous*) and common nighthawk (*Chordeiles minor*)) on lands in the vicinity of the Study Area was identified based on the species habitat preferences.

Although desktop and field assessments indicated that suitable habitat was not present in the Study Area, a single survey was completed in conjunction with Breeding Amphibian Survey #3 on June 20, 2019 to identify crepuscular breeding bird species in the vicinity of the Study Area. The MNRF's (2014) draft protocol *Survey Protocol for Eastern Whip-poor-will (Caprimulgus vociferus) in Ontario* was consulted to determine the acceptable date, timing and length of the survey as well as the environmental conditions that are considered to increase calling activity, specifically for eastern whip-poor-will. Moon phase, position and illumination percentage for the Ottawa area was obtained from the publicly available website: timeanddate.com.

A total of four (4) five-minute point counts (CAP19JMEW001-004) were completed at the exact same locations as the breeding amphibian survey stations within the Site. Additionally, three (3) supplementary survey stations (CAP19JMEW005-007) were completed along Rideau Road (2 stations) and Bowesville Road, south and west of the Site respectively, which is sufficient enough to assess the categorized



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habitat, if present, of eastern whip-poor-will identified in the MNRF's *General Habitat Description for the Eastern Whip-poor-will (Caprimulgus vociferous)*.

See **Table 3-1** for crepuscular breeding bird survey dates and environmental conditions.

3.3.6 General Wildlife Habitat Assessment

General wildlife habitat assessments were completed at the Site concurrently during each of the surveys above. These assessments focused on the identification of wildlife habitat features, specifically Significant Wildlife Habitat (SWH) features as outlined in the MNRF's Criteria Schedules for EcoRegion 6E (MNRF, 2015). When encountered, these features were identified, recorded and assessed for significance. All wildlife species were observed by sight, sound and/or through distinctive signs (e.g., tracks, scat).

Wildlife habitat suitability assessments were also completed for SARA and ESA protected species that may occur in the area, including species identified in the NHIC database and Ontario wildlife atlases during the literature review process.

See **Table 3-1** for general wildlife habitat assessment survey dates and environmental conditions.

3.3.7 Significant Wildlife Habitat

In order to ensure a comprehensive approach to identifying and evaluating SWH at the Site, significance has been determined based on guidance provided in the *Natural Heritage Reference Manual (NHRM)* (MNR, 2010) and criteria from the *Significant Wildlife Habitat EcoRegion 6E Criterion Schedule* (MNRF, 2015) with support from the *Significant Wildlife Habitat Technical Guide (SWHTG)* (MNR, 2000) as appropriate. The NHRM divides wildlife habitat into four broad categories:

1. Habitats of seasonal concentrations of animals;
2. Rare vegetation communities or specialized habitats for wildlife;
3. Habitats of species of conservation concern (excluding endangered and threatened species); and
4. Animal movement corridors

Field assessments identified candidate SWH using guidance from the SWHTG and the SWH Criteria Schedules for EcoRegion 6E (MNRF 2015). See **Table 3-1** for Significant Wildlife Habitat assessment survey dates and environmental conditions.



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4.0 ENVIRONMENTAL SITE DESCRIPTION

4.1 PHYSIOGRAPHY, GEOLOGY AND SOILS

Regional physiography is influenced by the historic Ottawa River valley and varies from clay plain to sand plain with extensive drumlins to the south (Chapman and Putnam 1984). The Study Area consists primarily of glaciofluvial deposits of sand and gravel with a small area of organic deposits underlying the forested wetland to the west of the Site (Ontario Geological Survey 2010). A linear feature of a beach ridge and near shore bar is mapped along the western boundary of the Site (Ontario Geological Survey 2010).

Investigations at the Site by Houle (2014) confirmed deposits of sands, and sands and gravels underlain by a silty clay. The top of the silty clay was encountered at a depth of approximately 10 m in the central portion of the Site in borehole BH14-5. The lateral extent of this silty clay is unknown. A lens of sandy silt was encountered on the eastern portion of the Site in borehole BH14-2 at approximately 4 m depth. These deposits represent ice-contact and near-shore sediments of the former Champlain Sea (Gorrell 2006). Ordovician-aged limestone/dolostone bedrock of the Oxford Formation is anticipated to be located at depths ranging between 3 m and 25 m, with thinner overburden cover along the southern boundary (Gorrell 2006, Houle 2014, Ontario Geological Survey 2011).

The Study Area is situated in the Kemptville Ecodistrict (6E-12) within the Lake Simcoe-Rideau Ecoregion. Over one third (37%) of this ecodistrict is under natural forest cover and an additional 22% of land cover is wetland, primarily swamp (Henson and Bodribo 2005). Land use in Ecodistrict 6E-12 is predominantly agricultural (60%); secondary uses are conservation land (6%), settlement or other developed lands (3%), and aggregate extraction (0.8%).

4.2 HYDROLOGY

Groundwater monitoring was initially completed as part of the 2006 and 2014 investigations, with additional monthly monitoring by Cavanagh at three boreholes (BH14-1, BH14-2 and BH14-5) in 2019 and provided to Stantec for interpretation (Stantec 2019). Gorrell (2006) reported groundwater at TP26-06 on April 12, 2006 at a depth of 6.7 m below ground surface (BGS) at an elevation of 105.3 m AMSL.

The groundwater levels appear to follow a seasonal trend, being higher after spring melt and declining over the summer months as is typical for shallow groundwater systems. Based on the available data, the groundwater elevation at the Site peaked in April 2019 at 109.3 m AMSL (Stantec 2019).



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Surface water and/or groundwater data is not available for the wetland located to the immediate west of the Site; however, based on available ground surface elevation of 108 m AMSL, similar water levels are anticipated to be present within the wetland. The wetland and the shallow groundwater are likely hydraulically connected (Stantec 2019). Regional mapping indicates that surface water flows are to the west (Stantec 2019).

4.3 DESIGNATED NATURAL AREAS

Unevaluated wetlands were identified within 120 m of the Site during the literature review. The nearest designated features to the Study Area are an unnamed significant ecological area (woodland, provincial designation) 400 m to the west of the Site and the Leitrim provincially-significant wetland (PSW), located approximately 750 m to the northeast. The locations of features identified through literature review are shown on **Figure 2, Appendix A**.

4.4 SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

Information gathered during the literature review process identified the potential for 16 SAR and nine SOCC to be found in the vicinity (1 km) of the Site (**Table 4-1**).

Table 4.1: Background List of Potential SAR and SOCC in the Study Area

Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
SAR				
Butternut	<i>Juglans cinerea</i>	S3?	END	END
Western Chorus Frog	<i>Pseudacris triseriata</i>	S3	NAR	THR
Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	THR	END
Bank Swallow	<i>Riparia riparia</i>	S4B	THR	THR
Barn Swallow	<i>Hirundo rustica</i>	S4B	THR	THR
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR
Chimney Swift	<i>Chaetura pelagica</i>	S4B, S4N	THR	THR
Common Nighthawk	<i>Chordeiles minor</i>	S4B	SC	THR
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	THR	THR
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	THR	THR
Olive-sided Flycatcher	<i>Contopus borealis</i>	S4B	SC	THR
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	THR
Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END	-
Little Brown Myotis	<i>Myotis lucifugus</i>	S4	END	END
Northern Myotis	<i>Myotis septentrionalis</i>	S3?	END	END
Tri-coloured Bat	<i>Perimyotis subflavus</i>	S3?	END	END



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Table 4.1: Background List of Potential SAR and SOCC in the Study Area

Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
SOCC				
Monarch	<i>Danaus plexippus</i>	S4B, S2N	SC	SC
Eastern Milksnake	<i>Lampropeltis triangulum</i>	S3	NAR	SC
Snapping Turtle	<i>Chelydra serpentina</i>	S3	SC	SC
Bald Eagle	<i>Haliaeetus leucocephalus</i>	S4B, S2N	SC	NAR
Eastern Wood-pewee	<i>Contopus virens</i>	S4B	SC	SC
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	SC	SC
Great Egret	<i>Ardea alba</i>	S2B	-	-
Peregrine Falcon	<i>Falco peregrinus</i>	S3B	SC	SC
Short-eared Owl	<i>Asio flammeus</i>	S2N, S4B	SC	SC

4.5 VEGETATION COMMUNITIES

Vegetation Communities located on, and within 120 m of, the Site were delineated into ELC units (see **Figure 3, Appendix A**). Four naturally occurring community types were identified on, and within 120 m of, the Site. Descriptions of these communities are found in **Table 4-2** below. Adjacent land uses (e.g., transportation) and anthropogenically influenced communities within 120 m of the Site (e.g., idle aggregate operation) were identified by air photo interpretation and confirmed during a roadside reconnaissance and are not described further in **Table 4-2**.

Table 4.2: Ecological Land Classification Vegetation Types

ELC TYPE	Community Description
Woodland (WO) and Forest (FO)	
Deciduous Woodland (WOD)	
Fresh - Moist Poplar Deciduous Woodland Type (WODM5-1)	This fresh-moist poplar community is located west and south of the OAGM4 community within 120 m of the Site. This community was previously cleared and formed a portion of the existing OAGM4 community historically, and is currently dominated by pioneer, non-native and/or thicket species with a well-developed understorey. Trembling aspen (<i>Populus tremuloides</i>) is the dominant tree within the varying canopy with clumps of Manitoba maple (<i>Acer negundo</i>) occurring throughout the feature. The thick brush understorey defines this feature as the vine Virginia creeper (<i>Parthenocissus quinquefolia</i>) is dominant with abundant associates of black raspberry (<i>Rubus occidentalis</i>), red raspberry (<i>Rubus idaeus idaeus</i>) and riverbank grape (<i>Vitis riparia</i>). The herbaceous layer was abundant with common plantain (<i>Plantago major</i>), Canada goldenrod (<i>Solidago canadensis canadensis</i>) and sensitive fern (<i>Onoclea sensibilis</i>) with brown-eyed susan (<i>Rudbeckia triloba triloba</i>), slender-leaved goldenrod (<i>Euthamia graminifolia</i>), heal-all (<i>Prunella vulgaris vulgaris</i>) and wool-grass (<i>Scirpus cyperinus</i>) being occasional associates.



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Table 4.2: Ecological Land Classification Vegetation Types

ELC TYPE	Community Description
Deciduous Forest (FOD)	
Naturalized Coniferous Plantation (FOCM6-1)	Along the northern border of the Site, south of the Falcon Ridge Golf Club, a large white pine (<i>Pinus strobus</i>) plantation was established between 1976 and 1991 and now forms a majority of the contiguous woodland within 120 m of the licence area. Now naturalized, this community also has the occasional trembling aspen and rare occurrences of green ash (<i>Fraxinus pennsylvanica</i>), eastern white cedar and silver maple (<i>Acer saccharinum</i>). Choke cherry (<i>Prunus virginiana</i>) is the most abundant shrub species with glossy buckthorn (<i>Frangula alnus</i>) and pagoda dogwood (<i>Cornus alternifolia</i>) found occasionally throughout. Sensitive fern, shinleaf (<i>Pyrola elliptica</i>), red raspberry (<i>Rubus idaeus idaeus</i>) are the abundant herbaceous species with associates of starflower, drooping woodland sedge (<i>Carex arctata</i>) and spinulose wood-fern.
Agriculture (AG)	
Open Agriculture (OAG)	
Coarse Mineral Open Pasture Type (OAGM4)	This large open pasture community is entirely within the Site and also located north of the Site. With rare occurrences of trees, both Manitoba maple and sugar maple (<i>Acer saccharum</i>) and shrubs (red raspberry), this feature is dominated by smooth brome (<i>Bromus inermis</i>) grass amongst a diverse variety of forage and cover crop species as well as typical weed species associated with these habitats. Abundant species observed included cow vetch (<i>Vicia cracca</i>), common timothy grass (<i>Phleum pratense pratense</i>), bird's-foot trefoil (<i>Lotus corniculatus</i>), common chickweed (<i>Stellaria media</i>) and occasional species included meadow goatsbeard (<i>Tragopogon pratensis</i>), red clover (<i>Trifolium pratense</i>), bladder campion (<i>Silene vulgaris</i>) and redtop grass (<i>Agrostis gigantea</i>). Livestock were not observed within the feature during Stantec's 2019 field program.
Swamp (SW)	
Coniferous Swamp (SWC)	
White Cedar Mineral Coniferous Swamp Type (SWCM1-1)	Further to the west and south of WODM5-1, within 120 m of the licence area, is a mature, mineral coniferous swamp community with an abundance of large diameter (≥50 cm diameter-at-breast height (DBH)) white cedar (<i>Thuja occidentalis</i>) and red maple (<i>Acer rubrum</i>) within the canopy. Occasional associates in the canopy include American elm (<i>Ulmus americana</i>), balsam fir (<i>Abies balsamea</i>), yellow birch (<i>Betula alleghaniensis</i>) and trembling aspen – many of which were also observed to be large diameter. Skunk currant (<i>Ribes glandulosum</i>) and Virginia creeper are abundant species in a lacking shrub layer. This swamp community was observed to have pockets of vernal pools with organic soils and a rich abundance and diversity of herbaceous species including the abundant spinulose wood-fern (<i>Dryopteris carthusiana</i>), northern starflower (<i>Lysimachia borealis</i>), interrupted fern (<i>Osmunda claytoniana</i>), poison ivy (<i>Toxicodendron radicans radicans</i>) and dew berry (<i>Rubus pubescens</i>). Other species of note observed within SWCM1-1 in varying abundance included royal fern (<i>Osmunda regalis spectabilis</i>), Jack-in-the-pulpit (<i>Arisaema triphyllum triphyllum</i>) and whorled wood aster (<i>Oclemena acuminata</i>). A review of aerial imagery as far back as 1976 shows this community has remained largely intact and the abundance and diversity of flora is indicative of the community's age.



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4.5.1 Vascular Plant Species

A total of 70 species of vascular plants was recorded on, or within 120 m of, the Site. Of these 70, 47 species (67%) are considered to be native and 23 species (33%) are considered exotic or non-native. Vegetation community OAGM4, 23 plant species, covers the entirety of the Site. All of the native plants observed in the licence area have an S-rank of S5, indicating they are common and secure within Ontario.

Of the 70 species, three observed native species (6%) observed within 120 m of the Site have an S-rank of S4 (or some variation) indicating they are uncommon but not rare and apparently secure in Ontario; these species are green ash (S4), whorled wood aster (S4) and Virginia creeper (S4?).

None of the vascular plant species observed within the Site had a Co-efficient of Conservatism (CC) value of 9 or 10, which is an indicator of floristic quality.

A complete list of plant species recorded on, or within 120 m of, the Site is provided in **Appendix C**.

4.6 WILDLIFE

4.6.1 Breeding Amphibians

The only breeding amphibian habitat feature within the Site was observed in the northeast corner of the property within a shallow, graminoid dominated vernal pool (CAP19UJM004, see **Figure 4, Appendix A**). A total of four (4) calling spring peepers were recorded calling within this feature during Breeding Amphibian Survey #1. Additionally, a single green frog (*Lithobates clamitans*) was observed calling in this feature and was recorded during Breeding Amphibian Survey #3. No amphibians were observed calling from this feature during Breeding Amphibian Survey #2.

Three additional survey stations were established within the Study Area. CAP19UJM001 surveyed an adjacent aggregate borrow pit south of the Site that has matured into a shallow, open-water marsh feature, CAP19UJM002 surveyed the unevaluated wetland associated with the wooded areas southwest of the Site and the seasonally flooded ponds associated with the Falcon Ridge Golf Club north of the Site were the emphasis of survey station CAP19UJM003.

Table 4-3 below outlines the breeding amphibian activity with highest call code observed within 120 m, or further, of the Site observed during Stantec's breeding amphibian surveys. Spring peeper, gray treefrog (*Hyla versicolor*), wood frog (*Lithobates sylvaticus*) and American toad (*Bufo americanus*) were observed within 120 m, or further, of the Site in varying call codes.



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Table 4.3: Breeding Amphibian Activity Observed within 120 m of Site

Survey Station	Species Observed	Call Code	Amphibian Survey No.
CAP19UJM001	Spring Peeper	3	Survey #1
	Gray Treefrog	3	Survey #2
CAP19UJM002	Spring Peeper	3	Survey #1
	American Toad	3	Survey #1
	Gray Treefrog	3	Survey #2
CAP19UJM003	Spring Peeper	3	Survey #1
	American Toad	3	Survey #1
	Wood Frog	2 – n/a	Survey #2
	Gray Treefrog	3	Survey #2
CAP19UJM004	Spring Peeper	1-4	Survey #1
	Green Frog	1-1	Survey # 3

All of these species observed during Stantec’s amphibian breeding survey are ranked as S5 (common and secure in the province). No provincially rare, endangered, threatened, or special concern species were observed on, or within 120 m of, the Site.

The high abundance of spring peepers observed on the adjacent, surrounding landscape made the identification of additional species difficult at times. As such, an accurate call code for wood frog was not obtained at survey station CAP19UJM003 during breeding amphibian survey #2.

4.6.2 Bat Maternity Roost Habitat Suitability

During the bat maternity roost habitat suitability surveys 6 trees meeting the necessary criteria, described above in Section 3.3.3, were identified within 120 m of the Site. No trees meeting the necessary criteria were identified within the Site (relatively open OAGM4 vegetation community). Three trees (trembling aspen and white pine) were identified within the naturalized plantation, FOCM6-1, two trees (trembling aspen) were identified in the WODM5-1 vegetation community and a single eastern white cedar was identified in the swamp community, SWCM1-1. The identified potential bat maternity roost habitat is shown on **Figure 5, Appendix A**.

4.6.3 Bat Acoustic Monitoring

The five SM4BAT FS acoustic detectors (CAP19BATJM001-005) strategically placed at locations in the Study Area (**Figure 4, Appendix A**) recorded a total of 8,740 bat calls identified to species over 30 nights. Of those calls, 8,714 were identified as low-frequency calls of non-SAR species including big brown bat (*Eptesicus fuscus*; 5,933 calls), silver-haired bat (*Lasionycteris noctivagans*; 1,686 calls) and hoary bat (*Aeorestes cinereus*; 1,095 calls). Twenty-one calls were identified as those of the red bat (*Lasiurus borealis*). Five calls at three stations (CAP19BATJM003-005) were identified as the high-



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frequency calls of little brown myotis (*Myotis lucifugus*). No SAR were recorded at stations CAP19BATJM001-002.

Table 4-4 below provides a summary of calls recorded on the SM4BAT FS acoustic detectors within the Study Area.

Table 4.4: Ultrasonic Bat Calls Recorded in the Study Area by Species at Five Acoustic Detectors

Species	CAP19BAT JM001	CAP19BATJ M002	CAP19BATJ M003	CAP19BATJ M004	CAP19BATJ M005
Big Brown Bat	n/a	613	1,095	1,219	3,006
Red Bat	n/a	1	4	2	14
Hoary Bat	129	138	251	219	358
Silver-haired Bat	7	314	190	188	987
Little Brown Myotis	n/a	n/a	2	1	2

The Little Brown Myotis is a widespread species that lives in a variety of habitats where water is found. This species requires an abundance of insects as its sole food source, and prefers to hunt low over water, although it also forages among trees (between 3 – 6 m), as well as over lawns, streets and built-up areas. In the Study Area, the few calls of Little Brown Myotis detected by ultrasonic recorders were in open areas in proximity to water, indicating that the species was likely moving through the Study Area to forage rather than resident. This species roosts in natural cavities (under loose bark and crevices), as well as in buildings (including attics, behind shutters, siding or shingles, and under bridges) (Eder 2002; van Zyll de Jong 1985). Based on the low detection rate of Little Brown Myotis over 30 nights of ultrasonic monitoring, and that only one call was recorded in potential woodland roost habitat, habitat for Little Brown Myotis is considered absent from the Study Area.

4.6.4 Breeding Birds

4.6.4.1 Breeding Bird Point Counts

Seven breeding bird survey stations were established in the Study Area (**Figure 4, Appendix A**). In total, 48 species of bird were recorded on, or within 120 m of, the Site during Stantec's breeding bird surveys. Forty-four (92%) of these species are considered to be breeding on, or within 120 m of, the Site licence. All of the species observed are ranked S5 (common and secure in the province) or S4 (apparently secure in the province; uncommon but not rare), with the exception of European starling (*Sturnus vulgaris*), which is an introduced species and ranked SNA.



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Six (6) bird SAR or SOCC were recorded on, or within 120 m of, the Site during Stantec's breeding bird surveys. Barn Swallow (*Hirundo rustica*) was observed foraging over vegetation community OAGM4, however, nesting habitat was not observed on, or within 120 m of, the Site. It is anticipated that this species is nesting within the available outbuildings associated with the adjacent rural properties; specifically, the paddock area of the Rideau Carleton Raceway east of Albion Road and the Site. Both Bobolink (fledged young observed) and Eastern Meadowlark (carrying food) were confirmed breeding within the OAGM2 vegetation community that comprises the Site (CAP19BBJM001-002, 006-007). Grasshopper Sparrow (*Ammodramus savannarum*) was also detected in this grassland community at CAP19BBJM001. Eastern Wood-pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*) were recorded as possible breeders (singing male) in the WODM5-1 vegetation community west of the Site at survey station CAP19BBJM004.

4.6.4.2 Grassland Breeding Bird Transect Survey

Similar to the results of the breeding bird surveys, Bobolink, Eastern Meadowlark and Grasshopper Sparrow were observed along both transects during Stantec's SAR grassland breeding bird transect surveys. Bobolink was observed to be the most abundant species observed during this survey, followed by Eastern Meadowlark and then Grasshopper Sparrow. The breeding evidence described above in Section 4.5.4. for these three species was consistent with the breeding evidence observed during the SAR grassland breeding bird transect surveys.

4.6.4.3 Crepuscular Breeding Bird Survey

Based on the habitat preferences of Eastern Whip-poor-will and Common Nighthawk and the vegetation communities observed in the Study Area, these species are not anticipated to be breeding on, or within 120 m of, the Site. During a supplementary crepuscular breeding bird survey no Eastern Whip-poor-will or Common Nighthawks were detected in the Study Area or at the three survey stations located outside of the Study Area. Eastern Whip-poor-will were observed calling widely across eastern Ontario south of the City of Ottawa on the evening of June 20, 2019 (pers. comm. Josh Mansell (Stantec)).

During Stantec's amphibian breeding survey #2, an incidental, aural observation of a Common Nighthawk flying overhead was recorded. As this species was only observed incidentally once during their migration period throughout Stantec's 2019 field program, it is anticipated that common nighthawk is not breeding in the Study Area.

4.6.5 Terrestrial Mammals

During Stantec's 2019 field program, observations of mammals were recorded as incidental observations on, or within 120 m of, the Site. The following three mammal species were observed: red squirrel (*Tamiasciurus hudsonicus*), eastern gray squirrel (*Sciurus carolinensis*) and white-tailed deer (*Odocoileus virginianus*). All of these species are ranked S5 (common and secure in the province). It is likely that other small mammal species common found in rural eastern Ontario (e.g., raccoon (*Procyon lotor*), striped



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skunk (*Mephitis mephitis*), North American porcupine (*Erethizon dorsatum*) and assorted rodents), are also found in the general area.

No provincially rare, endangered, threatened, or special concern species were found.

4.6.6 Reptiles

No reptile (snake or turtle) species were observed on the Site during Stantec's 2019 field program.

The adjacent shallow aquatic (OA) community, or ponds, associated with Falcon Ridge Golf Club north of the Site potentially provides suitable overwintering habitat for turtle species such as midland painted turtle (*Chrysemys picta marginata*) and snapping turtle (*Chelydra serpentina*), both of which are known to occur in the general area.

4.7 FISH AND FISH HABITAT

Fish habitat is not present on, or within 120 m of, the Site. The nearest confirmed fish habitat identified is the Flicko Municipal Drain located in excess of 120 m west of the licence area along Bowesville Road. The Flicko Municipal Drain is classified by the Department of Fisheries and Oceans Canada, under the Fisheries Act, as a Class F municipal drain, which is considered to have intermittent flow and is typically dry for at least 3 months and is usually void of sensitive fish species (e.g., top predators).



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5.0 SIGNIFICANT NATURAL HERITAGE FEATURES

5.1 SIGNIFICANT WOODLANDS

Significant woodlands are designated at the municipal level where official plan policies are in place. Per the City of Ottawa's Official Plan significant woodland definition (Section 2.4.2), the Site is located within the Rural Area and is not subject to the Urban Area age and size threshold. Section 2.4.2 defines significant woodlands as communities assessed as forest using the Ontario Ecological Land Classification (ELC) system (Lee et. al., 1998) and meeting one of the criteria in Table 7.2, Section 7.0 of the NHRM.

The NHRM provides guidance with respect to the following woodland characteristics that indicate provincial significance:

- Woodland size
- Ecological functions including interior habitat, proximity, linkages, water protection and diversity
- Woodlands that provide uncommon features
- Woodland economic and social values

The following sections provide a framework for the evaluation of significant woodlands as it relates to the woodland communities within 120 m of the Site (WODM5-1, FOCM6-1, and SWCM1-1). This assessment is consistent with guidelines prepared by the City of Ottawa *Significant Woodlands: Guidelines for Identification, Evaluation and Impact Assessment* (City of Ottawa, undated).

5.1.1 Woodland Size

The woodland communities within 120 m of the Site have been identified on *Schedule L1 – Natural Heritage System Overlay (East)* of the City of Ottawa's Official Plan as a natural heritage system feature, which includes significant woodlands as defined in Section 2.4.2. Following the NHRM, the contiguous woodland west of the Site and within the Study Area would be considered a significant woodland based on size (> 50 ha) relative to forest cover in the surrounding region (38% cover in the Rideau River sub-watershed; City of Ottawa undated).

No woodlands occur within the Site.

5.1.2 Ecological Functions

5.1.2.1 Woodland Interior

Woodlands of a size and shape that create habitat more than 100 metres from the edge often provide habitat for species whose success depends on larger sizes and reduced disturbance; referred to as interior species.



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As forest in the Rideau River sub-watershed covers 38% of the landscape, application of the NHRM guidelines suggests that 8 ha or more of interior habitat would be required for a woodlot to be considered significant. The contiguous forest contains more than 8 ha of interior forest habitat; therefore, this woodland meets the criteria for significance based on presence of woodland interior.

There is no interior habitat in the Site. The proposed extraction limit is a minimum of 30 metres from the woodland edge, therefore no woodland interior is present within 120 m of the extraction footprint.

5.1.2.2 Proximity to Other Woodlands or Other Habitats

The NHRM indicates that woodlands should be considered significant if a portion of it is located within a specified distance (e.g., 30 m) of a significant natural feature (e.g., significant wetland) likely receiving ecological benefit from the woodland, and the entire woodland meets the minimum area threshold.

The consolidated woodland contains a provincially-designated but unnamed significant ecological area, identified as woodland in the LIO database. Based on this feature, the woodland could meet the criteria for significance for proximity to a significant natural feature.

5.1.2.3 Linkages

The NHRM indicates that woodlands should be considered significant if they are located within a defined natural heritage system or provide a connecting link between two other significant features (e.g., significant wetland) and the entire woodland meets the minimum area thresholds.

The contiguous woodland within 120 m of the Site has been identified as part of a natural heritage system on *Schedule L1 – Natural Heritage System Overlay (East)* in the City of Ottawa's Official Plan; however, the entire woodland is not contiguous and does not connect two other significant features. As such, it has been determined that there is no linkage function provided by the woodland.

5.1.2.4 Water Protection

The NHRM indicates that woodlands should be considered significant if they are located within a sensitive or threatened watershed or a specified distance of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds.

The woodland communities within 120 m of the Site are not located in, or in proximity to (e.g., 50 m), sensitive water features. The adjacent shallow aquatic (SA) communities north and south of the Site are not considered sensitive water features. As such, it has been determined that there is no water protection function provided by the woodland.

5.1.2.5 Woodland Diversity

The NHRM indicates that woodlands should be considered significant if they have a naturally occurring composition of native forest species that have declined significantly south and east of the Canadian



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Shield, or have a high native diversity through a combination of composition and terrain and meets the minimum area thresholds.

The woodland communities within 120 m of the Site are not considered to contain a naturally occurring composition of native forest species in decline (e.g., generally on deep-soiled uplands and fertile level plains where such locations have been largely cleared for other uses). Though vegetation community, SWCM1-1, is not considered a rare community and does not extend across a variety of terrain features, the community is considered to have a high diversity of plant species relative and is anticipated to provide increased wildlife habitat features. However, the SWCM1-1 community is a small portion of the larger woodland and on its own does not meet the minimum area threshold for Ecodistrict 6E-12, consequently it has been determined that there is no woodland diversity function provided by the woodland.

5.1.3 Uncommon Characteristics

The NHRM indicates that woodlands should be considered significant if they have: a unique species composition; a vegetation community with a provincial ranking of S1, S2 or S3; habitat of a rare, uncommon or restricted woodland plant species; or, characteristics of older woodlands. In the woodland communities within 120 m of the Site, there are no rare vegetation communities and none of the species are ranked between S1 – S3.

Vegetation community, SWCM1-1, is considered to have characteristics of older woodlands with large tree size structure, specifically the eastern white cedar and yellow birch observed in the community. However, the SWCM1-1 community is a small portion of the larger woodland and on its own does not meet the minimum area threshold for Ecodistrict 6E-12, consequently it has been determined that the larger woodland is not significant based on uncommon characteristics.

5.1.4 Economic and Social Functional Values

Economic use and social values of the woodland communities within 120 m of the Site are unknown. As the woodland is divided into multiple parcels owned by the Ottawa International Airport Authority or privately, it is unlikely to provide significant economic or social values beyond those enjoyed by the landowners.

5.1.5 Determination of Significance

Based on the above evaluation of significance, the contiguous woodland within 120 m of the Site meets the criteria for significance based on size, presence of interior forest and proximity to significant natural features. A summary is provided in **Table 5-1**.



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Table 5.1: Summary of Significant Woodland Assessment per NHRM Criteria

NHRM Criterion	Significant
1. Woodland Size	Y
2. Ecological Functions	
a. Woodland Interior	Y
b. Proximity to other natural heritage features	Y
c. Ecological linkages	N
d. Water protection	N
e. Woodland diversity	N
3. Uncommon Characteristics	N
4. Economic and social values	N

5.2 SIGNIFICANT VALLEYLANDS

There are no significant valleylands on, or within 120 m of, the Site as outlined on *Schedule K – Environmental Constraints* in the City of Ottawa’s Official Plan.

5.3 SIGNIFICANT WETLANDS

There are no designated significant wetlands on, or within 120 m of, the Site.

A shallow, graminoid dominated vernal pool was observed in the northeast corner of the property during amphibian surveys. This small feature provided very limited amphibian breeding habitat and is too small to be complexed into adjacent wetland features. As such, this feature is determined to be not significant.

An unevaluated wetland complex is located adjacent to the west Site boundary. This wetland complex covers an area of approximately 23 ha between Albion Road, Rideau Road and Bowesville Road. Based on vegetation community classification (ELC) within 120 m of the Site and satellite photo interpretation, the wetland consists primarily of treed swamp, a combination of cedar swamp and fresh moist poplar wetland. Both wetland types can be connected to the groundwater and based on hydrological assessment these features are anticipated to have groundwater connection. They are subject to wet periods in the spring and fall and drier periods in the summer. In the absence of a wetland functional assessment, unevaluated wetlands should be treated as significant features.

The feature is discussed further in Section 7.3.



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5.4 SIGNIFICANT WILDLIFE HABITAT

Wildlife habitat includes habitat for species listed as Special Concern under the ESA or ranked provincially rare (S1-S3) and the four categories of *Significant Wildlife Habitat*. The *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNR 2015) provide descriptions of wildlife habitats and guidance on criteria for determining the presence of candidate and confirmed wildlife habitats. This section discusses these categories of significant wildlife habitat relative to the Site. A full description of the evaluation of specific types of wildlife habitat is provided in **Table B-1, Appendix B**. Significant wildlife habitat (candidate and confirmed) is also shown on **Figure 5, Appendix A**.

5.4.1 Seasonal Concentration Areas

Seasonal concentration areas are sites where large numbers of a species gather together at one time of the year, or where several species congregate. Only the best examples of these concentration areas are typically designated as SWH. Review of the NHIC & LIO databases did not identify any confirmed seasonal concentration areas within the Study Area. The following seasonal concentration areas were identified in the Study Area:

- Raptor wintering area (candidate) within the grassland community (OAGM2 and MEGM3)
- Turtle wintering area (candidate) within open aquatic habitat (OA) outside the Site boundary
- Bat maternity colony (confirmed) within the woodland communities (FOCM6-1 and WODM5-1)

5.4.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

Rare Vegetation Communities or Specialized Habitats for Wildlife are defined as separate components of SWH. Rare habitats are habitats with vegetation communities that are considered rare (S1-S3) in the province. These habitats are generally at risk and may support wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. No rare vegetation communities were identified in the Study Area. The following specialized habitats for wildlife were identified:

- Amphibian breeding habitat (confirmed for woodland and wetland (OA, SWCM1-1) outside the Site boundary)

5.4.3 Habitat for Species of Conservation Concern

Habitat for species of conservation concern includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe. An evaluation of candidate habitats for species of conservation concern, including provincially designated Special Concern species that were identified during the background review, is provided in **Table B-1, Appendix B**. The following habitat for species of conservation concern were identified in the Study Area:



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- Open country bird breeding habitat (confirmed) within the grassland community (OAGM2 and MEGM3)
- Eastern Wood-pewee (confirmed) within the grassland community (OAGM2 and MEGM3)
- Grasshopper Sparrow (confirmed) within the grassland community (OAGM2 and MEGM3)
- Monarch (candidate) within the grassland community (OAGM2 and MEGM3)
- Eastern Milksnake (candidate) within the grassland community (OAGM2 and MEGM3)
- Snapping Turtle (candidate) within open aquatic habitats (OA) outside the Site boundary

5.4.4 Animal Movement Corridors

Animal movement corridors are distinct passageways or defined natural features that are used by wildlife to move between habitats, usually in response to seasonal requirements. Movement corridors are identified once the following seasonal concentration areas or specialized habitats are confirmed as SWH: amphibian breeding habitat and deer wintering habitat. Candidate animal movement corridors are discussed in **Table B-1, Appendix B**. As all open wetland and swamp forest habitat has been confirmed as amphibian breeding habitat, no additional movement corridors have been identified or mapped.

5.5 AREAS OF NATURAL AND SCIENTIFIC INTEREST

There are no Areas of Natural and Scientific Interest (ANSI) on, or within 120 m of, the Site.

5.6 FISH HABITAT

Fish habitat is not present on, or within 120 m of, the Site.

5.7 SPECIES AT RISK (THREATENED AND ENDANGERED SPECIES)

As described in Section 4.4, above, 16 species and/or their habitat were identified as potentially present in the Study Area based on a review of background documents and databases. Habitat assessments and targeted wildlife surveys undertaken in the field confirmed that breeding habitat for Bobolink and Eastern Meadowlark is present in the grassland community (OAGM2 and MEGM3) within the proposed extraction area. Habitat for Wood Thrush is present in the woodland outside the Site boundary.

An assessment of habitat presence and use for all 16 species is provided in **Table B-2, Appendix B**.



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5.8 SUMMARY OF NATURAL HERITAGE FEATURES

Table 5.2 provides a summary of the natural heritage features on, or within 120 m of, the Site.

Table 5.2: Natural Heritage Features Associated with the Site and Study Area

Natural Heritage Features	Present within Site	Present within 120 m of Site
Significant Woodlands	N	Y
Significant Valleylands	N	N
Significant Wetlands, including unevaluated wetlands	N	Y
Significant Wildlife Habitat		
Seasonal concentration areas	Y	Y
Rare vegetation communities or specialized habitats	N	Y
Habitats of species of conservation concern	Y	Y
Animal movement corridors	N	N
Areas of Natural & Scientific Interest	N	N
Fish habitat	N	N
Habitat of endangered and threatened species	Y	Y



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6.0 PROJECT DESCRIPTION

Cavanagh Construction is proposing to establish a gravel pit with extraction above the established water table. The site is approximately 63 ha, of which 33.8 ha are proposed for extraction. **Figure 4, Appendix A** illustrates the Site and extraction limits. This section should be read in conjunction with the Site Plans prepared by Harrington McAvan Ltd. as part of the aggregate application. The Site Plans provide specific details regarding the existing conditions, operational plan, rehabilitation plan and cross sections (e.g., pre- and post-licencing contours, drainage, etc.).

The application for the Ottawa Site will permit a maximum annual tonnage limit of 250,000 tonnes/year produced in a permanent plant site in the western portion of the property. Shipping will be from the property to Albion Rd. Extraction will occur sequentially in two areas in the direction shown in the Site plans. Stripping of topsoil and overburden will occur prior to extraction in areas large enough for a year's production. Topsoil and overburden will be used to build berms to create a visual barrier and which will be seeded immediately to prevent erosion and control dust. Following extraction each area will be progressively rehabilitated with a minimum of 1.5 m of soil above the established groundwater table and will be returned to grassland (pasture or hay).

Extraction will be by loaders and trucks at the face and transported to the plant site for processing and shipping. Processing may include crushing, screening, washing and stacking. Wash water will be cleansed in wash ponds and reused. There will be no offsite discharge of water. Fuel storage and scrap storage areas will be maintained in the plant site area. Final rehabilitation of the disturbed area will be to agriculture with maximum 3:1 side slopes. Dust will be mitigated on site for the duration of the operation.



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7.0 POTENTIAL ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION MEASURES

The potential impacts to natural features that might reasonably be expected to occur as a result of the proposed aggregate operation are identified and discussed in this section. Both direct and indirect impacts associated with the Project are considered and appropriate mitigation measures recommended. An assessment of overall net environmental impacts is also provided based on the implementation of appropriate mitigation, restoration and enhancement measures to improve the overall integrity of the natural system in the area. Where direct impacts to SAR habitat are expected to occur, an approach to authorization under the federal SARA is described.

This section should be read in conjunction with the Site Plans prepared by Harrington McAvan Ltd. as part of the aggregate extraction application. The Site Plans provide specific details regarding the existing conditions, operational plan, rehabilitation plan and cross sections (e.g., pre- and post-licencing contours, drainage, etc.).

7.1 VEGETATION REMOVAL

The Project is primarily located on agricultural lands (pasture); however, some grassland and tree removal will occur. A removal of 33.8 ha of grassland vegetation community OAGM2 is expected in two areas during aggregate extraction: 16.3 ha in Area A and 17.5 ha in Area B. Progressive and final rehabilitation will restore the lands to perennial grassland cover (pasture or hay) as shown on the Site Plan (Harrington McAvan 2020).

Feature edges that correspond with the limit of extraction may also experience indirect effects including inadvertent encroachment, sedimentation and erosion, and soil / root zone compaction. Indirect impacts on natural features will be mitigated through the implementation of standard environmental protection measures, which are discussed in Section 7.6, below.

7.2 SIGNIFICANT WOODLAND

A significant woodland is located in the Study Area, outside the Site boundary and separated from the proposed extraction area by a 30 m setback. No portion of the woodland will be cleared by the proposed development. A setback of 30 m is consistent with provincial policies protecting significant woodlands (MMAH 2017, Beacon 2012). This avoidance measure demonstrates that the Site will have no negative impacts on the values or ecological functions of the significant woodland. Mitigation for potential indirect impacts, such as noise or dust, is described in Section 7.6.



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7.3 WETLANDS

The unevaluated wetland complex covers an area of approximately 23 ha between Albion Road, Rideau Road and Bowesville Road, and based on satellite photo interpretation consists primarily of treed swamp. This wetland is outside the Site boundary and is separated from the extraction limit by a 30 m setback. No portion of the wetland will be cleared by the proposed development. As a result, there will be no direct impact to the wetland as a result of proposed aggregate extraction.

Regional mapping indicates that surface water flows are to the west, however there are no connecting surface water features between the Site and the unevaluated wetland. Overland surface runoff from the central high point of the Site (north-south ridge at 117 m AMSL) flows toward the wetland to the west at an elevation 108 m AMSL (Stantec 2019). As such, there will be no reduction in surface flow to the wetland from extraction in Area B, but some reduction in surface flow after completion of extraction in Area A.

Overland flow draining west to the wetland will be reduced by approximately 80% for all events in the following extraction and rehabilitation (Stantec 2020). Although this is a large reduction by comparison of peak flows, infiltration volumes account for a large component of runoff volume following storm events given that the majority of the site is sand. The surface runoff is further limited by the extensive forb and graminoid fallow field on the extraction area which slows surface flow and allows for direct infiltration under current conditions. Any reduction in surface water contributions to the wetland will be countered by the increase in groundwater contributions through infiltration across the site meaning the total volume of runoff to the adjacent wetland will remain the same post-extraction and rehabilitation (Stantec 2020). After completion of site rehabilitation, approximately 87% of the site will infiltrate runoff from all rainfall events to the groundwater and contribute to the preservation of wetland functions.

The hydrogeology technical memo also indicates that the wetland and shallow groundwater are likely hydraulically connected, and that flows may mimic surface water flow from east to west (Stantec 2019). The groundwater elevation at the Site reached a peak of 109.3 m AMSL in April 2019 (Stantec 2019), a season of record-setting rainfall and flooding in the City of Ottawa (CBC 2019, CTV 2019). As the proposed Ottawa Site is an above-water operation with a maximum excavation depth of 110.8 m AMSL which is at least 1.5 m above the water table and above the ground surface of the adjacent wetland to the west. Consequently, changes to groundwater flow to the wetland are not anticipated and wetland functions will be maintained.

No fugitive dust emissions resulting from extraction and vehicle traffic will leave the pit. Water quality controls for surface runoff are not necessary as roughly 87% of the Site will be clean water infiltrating and replenishing the groundwater, and flows leaving the perimeter of the Site are not exposed to sources of contamination or disturbance of site soils. Mitigation for potential indirect impacts is described in Section 7.6.



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Two open aquatic features are located within the 120 m Study Area to the north and south of the Site. A 15 m extraction setback will be maintained along the northern and southern extraction limits of the pit. In addition to the extraction setback, these aquatic communities are further separated from the proposed licence boundary by greater than 50 m of upland (WOD to the north, MEGM3 to the south), providing in excess of 80 m of separation from the pit.

Upon final rehabilitation, the vegetated buffer will remain intact, and side slopes prepared to a 3:1 ratio. Final rehabilitation will restore the lands to perennial grassland cover, either pasture or hay. This after-use will restore the historic activities that have occurred at this location for many years and is an appropriate land use in the context of the surrounding landscape. There will be no impact on the wetland from the post extraction land use.

7.4 SIGNIFICANT WILDLIFE HABITAT

Significant wildlife habitat within 120 m of the Site is primarily associated with grassland habitat, comprised of vegetation communities OAGM2, MEGM3 and OAGM4. Candidate and confirmed significant wildlife habitat associated with woodland or wetland is located outside the Site boundary, consequently no direct project impacts to habitat for turtle wintering, amphibian breeding and Eastern Wood-Pewee are anticipated. An assessment of potential impacts to significant wildlife habitat and recommended mitigation measures are provided below. Mitigation for potential indirect impacts to significant wildlife habitat are described in Section 7.6.

7.4.1 Grassland Habitat

Candidate significant wildlife habitat for wintering raptors and confirmed significant wildlife habitat for open country breeding birds and grasshopper sparrow (SOCC) is present within the grassland community (OAGM2 and MEGM3) on the Site. Progressive rehabilitation will return the extracted area to perennial grassland cover (pasture or hay) upon completion of extraction in each area (see Rehabilitation Plan, Sheet 2 of 2, Harrington McAvan 2020). Consequently, direct habitat impacts will be temporary in nature.

Online bird observation records (eBird) records from airport lands approximately 1 km to the north of the Study Area (between Earl Armstrong Rd and Leitrim Rd) indicate that this area provides significant habitat for raptor wintering and breeding grassland birds. With the availability of nearby, high-quality grassland habitat, and in consideration of the relatively small amount of habitat to be cleared on the Site at one time, as well as proposed grassland compensation on nearby airport lands, the temporary loss of habitat is unlikely to have an effect on any grassland species at the population level.



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7.4.2 Turtle Wintering Area

Candidate habitat for turtle overwintering is present in open aquatic (OA) community north of the Site. With the proposed 15 m extraction setback, this feature will be separated from the pit by over 75 m of upland habitat, consequently no direct impacts to the features are anticipated. General mitigation measures to avoid impacts to wildlife, including turtles, is described in Section 7.6.

7.4.3 Bat Maternity Colony

Confirmed habitat for roosting bats is present in the naturalized plantation (FOCM6-1) and deciduous woodland (WODM5-1) west of the Site. This habitat is outside the Site and a minimum of 30 m from the excavation area (see Section 7.1), consequently no direct impacts are anticipated as a result of proposed aggregate extraction.

7.4.4 Amphibian Breeding Habitat

The open aquatic (OA) communities to the north and south of the Site, and swamp forest (SWCM1-1) west of the Site, provide breeding habitat for amphibians as confirmed during field investigations. Species recorded during the amphibian breeding surveys included Spring Peeper, Gray Treefrog, American Toad, Wood Frog and Green Frog. Amphibian movement may occur between the wetland communities and the forested swamp outside the Site boundary and will not be directly impacted by aggregate extraction. Additionally, as there will be no water features on the Site during operations, the potential for the proposed license area to attract amphibians during aggregate operations is negligible. General mitigation measures to avoid impacts to wildlife, including amphibians, is described in Section 7.6.

7.4.5 Habitat for Species of Conservation Concern

Habitat for open country breeding birds and grasshopper sparrow has been addressed in Section 7.4.1, above. Other species of conservation concern for which habitat is present within Study Area are Monarch and Eastern Milksnake in the grassland community (OAGM2) on the Site, Snapping Turtle in the ponds (OA) north and south of the Site, and Eastern Wood-Pewee in the woodland community (WODM5-1) west of the Site.

No direct impacts to habitat of Snapping Turtle or Eastern Wood-Pewee are anticipated as a result of proposed aggregate extraction. The Snapping Turtle occurs throughout southern Ontario in ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms (COSEWIC 2008). Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC 2008). As noted in Section 7.4.2, above, Snapping Turtle habitat is separated from the proposed pit boundary by over 75 m of upland habitat. The Eastern Wood-Pewee is a forest bird of deciduous and mixed woods. Nest-site selection favors open space near the nest, typically provided by clearings, roadways, water, and forest edges (Cadman et al. 2007). Woodland breeding habitat for Eastern Wood-Pewee is outside the Site and a minimum of 30 m from the excavation area (see Section 7.1).



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Although Monarch and Eastern Milksnake were not observed during field investigations, suitable habitat is present within the Site. Eastern Milksnake is a generalist species typically reported in low densities in or around agricultural landscapes, but also found on rocky hillsides and in a wide variety of forest types and often in proximity to water. If Eastern Milksnake is present in the Study Area it is likely to occur at a very low density and consequently impacts can be limited through the implementation of standard mitigation measures for wildlife (Section 7.6.2).

The Monarch is typically found where milkweed and wildflowers (including goldenrods and asters) exist (COSEWIC 2010). Caterpillars are generally dependent on milkweed, whereas adults are more generalized in their habitat preference, feeding on a variety of wildflower nectar (MECP 2014). Habitat can include abandoned farmland, along roadsides, and other open spaces where these plants grow (COSEWIC 2010). As noted in Section 7.4.1, impacts to grassland habitat will be temporary in nature. Progressive rehabilitation will return the extracted area to perennial grassland cover (pasture or hay) upon completion of extraction in each area. Additional mitigation measures specific to Monarch and its habitat are provided below.

7.4.5.1 Mitigation Recommendations for Monarch

- Construction activities with the potential to harm Monarch eggs, caterpillar or pupae (e.g., vegetation clearing) should not be undertaken during the larval period which is approximately May 1 to September 30 (Mission-Monarch 2020);
- During operation, Common Milkweed (*Asclepias syriaca*) and nectar producing plants should be planted within the licence boundary but outside the extraction area and where habitat disturbance can be avoided, to provide habitat for Monarch.
- Common Milkweed and nectar producing plants should be incorporated into the rehabilitation seed mix described on the Site Plan (Sheet 2 of 2, Harrington McAvan 2020).

7.5 SPECIES AT RISK

Wood Thrush, Bobolink and Eastern Meadowlark are three federal SAR which were recorded in the Study Area during field investigations. SARA protects both the species and their residences (i.e., occupied nests) from harm or harassment. Although a formal residence description has not been prepared for these species, for other SAR birds (e.g., Hooded Warbler, Henslow's Sparrow) the residence is the nest. Any activity that disturbs a nest, changes the surrounding microclimate or blocks access to the nest could be considered damage or destruction of the residence under SARA. Nests should be protected as a residence during the breeding period (Government of Canada 2006). A permit may be issued by the Minister of Environment for an activity that is otherwise prohibited under SARA, such as harm to the species, their residence and/or critical habitat. Critical habitat has not been defined under SARA for any of these three species.



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The Wood Thrush nests in deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots. The presence of tall trees and a thick understory are preferred (Cadman et al. 2007). Woodland breeding habitat for Wood Thrush is outside the Site and a minimum of 30 m from the excavation area (see Section 7.1), consequently there is no anticipated risk of harm to Wood Thrush or its residence through aggregate operations.

The Bobolink nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Preferred ground cover species include grasses such as Timothy and Kentucky bluegrass and forbs such as clover and dandelion (COSEWIC 2010). The Eastern Meadowlark typically occurs in meadows, hayfields and pastures, however, it will utilize a wider range of habitat than most grassland species, including mown lawn (e.g., golf course, parks), wooded city ravines, young conifer plantations and orchards (Peck and James 1983).

There is potential for mortality of Bobolink or Eastern Meadowlark during site clearing in the grassland community prior to extraction (e.g., bird fatalities through nest destruction) if these activities occur during the nesting season (end of March to end of August). Avoidance measures are proposed in Section 7.5.1 in order to reduce the risk of mortality. During pit operation, grassland bird SAR may be at risk of collision with vehicular traffic (truck entrance/exit), however this risk of collision is anticipated to be very low. Generally, during aggregate operations, mobile and processing equipment will be sited in a cleared area that offers very little bird habitat. Furthermore, most vehicular traffic on the site will be at low speeds.

Grassland (OAGM2) within the Site provides habitat for Bobolink and Eastern Meadowlark. In total, 33.8 ha of grassland will be directly removed during site preparation, resulting in the temporary displacement of the residence of Bobolink and Eastern Meadowlark until progressive rehabilitation is undertaken. Consultation with Environment Canada is recommended in order to determine whether a permit is required under SARA Section 73 and, if so, what permit conditions would apply. Proposed avoidance and mitigation measures to reduce the risk of harm to Bobolink and Eastern Meadowlark or their residences are provided below. The commitment and implementation of the mitigations will be instrumental in avoiding harm to the species and their residences which confirms to SARA protections. Patches of Bobolink and Eastern Meadowlark habitat within the Study Area, but outside of the Site, are not anticipated to be directly affected by aggregate operations.

7.5.1 Mitigation Measures for Bobolink and Eastern Meadowlark

The following mitigation measures are recommended for implementation in order to minimize the potential effects of direct mortality and avoid contravention of SARA:

- Construction activities with the potential to remove residences of Bobolink or Eastern Meadowlark (e.g., vegetation clearing) should not be undertaken during the breeding season which is April 8 to August 28 in this region (Environment Canada 2014);
- Avoid all unnecessary vegetation clearing outside the extraction footprint and access roads wherever and whenever practicable. Retain natural vegetation outside the proposed licence;



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- Demarcate the extraction limit to avoid incidental encroachment into adjacent areas;
- Progressively rehabilitate the extraction area(s) to grassland habitat;
- Maintain construction and operations equipment in good order (e.g., mufflers);
- Where permissible under safety and navigation requirements, outdoor lights will be shielded to minimize light spillage beyond the required areas; and,
- Provide a mandatory wildlife education program for employees so they can respond appropriately to bird encounters.

7.6 INDIRECT IMPACTS AND MITIGATION

Inadvertent encroachment of heavy equipment, siltation and/or spills of deleterious substances, noise, and dust migration into natural features are potential indirect impacts from aggregate operations. These impacts may alter species composition by compacting and smothering vegetation and introducing substances that could be harmful to vegetation and wildlife, such as fuel used by construction equipment. Additional disturbance may be required to facilitate spill clean-up activities.

7.6.1 Erosion and Sediment Control

The potential indirect impacts associated with the Project are primarily from site clearing and extraction activities. Most of the potential impacts are common to aggregate operations and can be controlled using standard mitigation measures for erosion and sediment control. The primary principles associated with sedimentation and erosion protection measures are to:

- Minimize the duration of soil exposure
- Retain existing vegetation, where feasible
- Encourage re-vegetation
- Divert runoff away from exposed soils
- Keep runoff velocities low
- Trap sediment as close to the source as possible

To address these principles, mitigation measures recommended for implementation during construction are described below. Components of the ESC plan are shown on the Site Plan (Harrington McAvan 2020).

- Minimize the access and temporary work space to the extent possible to limit destabilization of soils near the work area.
- Silt fencing and/or barriers such as sediment logs could be used along all work zones where there is potential for sedimentation of wetlands. Based on the general flat topography silt fence requirements will be limited.



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- Dust could be controlled by using water instead of chemical suppressants in dust-sensitive areas such as the mapped natural heritage features.
- No equipment should be permitted to enter natural areas, limits of work zones will be demarcated with stakes..
- All exposed soil areas should be stabilized (native seed mixes; sourced locally if possible) and re-vegetated, through the placement of seed and mulching or seed and an erosion control blanket, promptly upon completion of construction activities.
- Equipment should be re-fueled 30 m away from sensitive natural features (e.g., wetlands) to avoid potential impacts if an accidental spill occurs.
- In addition to any specified requirements, additional silt fence and/or silt logs should be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- Sediment and erosion controls should be monitored regularly and properly maintained as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected or until cover is re-established.
- The limits of construction adjacent to natural features to be retained will be staked prior to construction and monitored during operations (along with sediment and erosion control measures) to make sure that the limits are maintained with respect to vehicular traffic and soil or equipment stockpiling.

7.6.2 Avoidance of Wildlife

The following mitigation measures are recommended to avoid impacts to wildlife during Project construction:

- Employees will be advised to take particular care when working in the period when most wildlife are active and instructed in how to respond appropriately to wildlife encounters. (generally April 1 to October 31).
- If wildlife is encountered, work at that location will stop, and the animal(s) will be permitted reasonable time to leave the work area on their own.
- If there are repeat observations of wildlife in the active pit (e.g., turtle nesting), barrier fencing may be used to direct wildlife away from the active work area(s) and toward natural wetland areas outside the licence boundary. All fencing materials should be wildlife-friendly to prevent accidental entanglement.
- Any observations of species at risk or species of conservation concern should be reported to Environment and Climate Change Canada within 48 hours. Species at risk should not be handled, harassed, or moved in any way, unless they are in immediate danger.



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7.6.3 Protection of Migratory Bird Nests

The federal *Migratory Birds Convention Act, 1994* (MBCA) provides legal protection of migratory birds and their nests in Canada (Government of Canada 1994). Construction timing must consider restrictions imposed by the MBCA. To avoid damaging or disturbing bird nests and contravening the MBCA, the timing of any vegetation clearing should occur outside of the primary nesting period (i.e., the period when the percent of total nesting species is greater than 10% based on Environment Canada's Nesting Calendars and the period for which due diligence mitigation measures are generally recommended). No vegetation removal is permitted during the primary nesting period where SAR are present.

The primary nesting period (PNP) identified for the Study Area is April 8 – August 28, although nesting also infrequently occurs outside of this period (Environment Canada 2014). Vegetation removal during this core nesting period is not recommended; however, if required, a nest survey may be carried out by a qualified person in simple habitats such as an urban park, a vacant lot with few possible nest sites, a previously cleared area, or a structure (Government of Canada 2019). If a migratory bird nest is located within the work area at any time, a no-disturbance buffer will be delineated. This buffer will be maintained for the entire duration of the nest activity, which will be determined using periodic checks by the avian biologist. The radius of the buffer generally varies from 5 m – 60 m depending on the sensitivity of the nesting species. The Project will not resume within the nest buffer until the nest is confirmed to be no longer active.



8.0 ENVIRONMENTAL MONITORING PROGRAM

Compliance and performance monitoring will be undertaken during the operation phases of aggregate extraction when environmental impacts are most likely. Monitoring is recommended during the operations to ensure the following:

- Boundaries of the extraction area are clearly demarcated and monitored to ensure the limits are respected.
- Construction activities remain outside of the recommended protection setbacks (30 m setback to significant woodland) and outside of key wildlife activity windows (bird nesting period).
- Erosion and sediment controls are to be installed and maintained at the edges of the extraction footprint.



9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 RECOMMENDATIONS

The following recommendations are made to assist in the protection of the natural environment features identified on site. These recommendations are incorporated into the Site Plan (Harrington McAvan 2020):

- Mitigation measures to protect natural heritage features from direct and indirect impacts, described in Section 7.0 of this report) will be implemented by the operator.
- Consultation with Environment Canada is recommended to confirm that a permit under SARA Section 73 is not required for Bobolink and Eastern Meadowlark provided vegetation clearing does not occur while the species is present during the core nesting period.
- A minimum 30 m setback should be established between the extraction footprint and the significant woodland to minimize impacts to wildlife and the forested wetland.
- Prior to stripping and operations in any area, the limits of the woodland buffer should be staked or otherwise clearly marked by a qualified person. The City of Ottawa will be notified, should City staff wish to confirm the boundaries.
- Vegetation planted for progressive and final rehabilitation should be maintained in a healthy vigorous growing condition.
- Silt fencing for internal sediment and erosion control during stripping operations as illustrated on the Site Plan should be installed and maintained.
- Silt barriers and erosion control measures will be monitored and regularly maintained during active operations.
- All excavated material requiring stockpiling should be stored in locations designated on the Site Plan and kept away from sensitive natural features.
- Topsoil and overburden should be stripped and stored separately in bermed stockpiles. Berms and stockpiles of topsoil should be graded to stable slopes and seeded to prevent erosion and minimize dust. Stockpiles shall be maintained in accordance with the Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario (MNR 2017).
- Dust control should be implemented as required.
- Fuel storage shall be in accordance with applicable fuel storage laws and standards. Refueling should be carried out in designated locations that are well away from natural features to avoid potential impacts in the event of an accidental spill.
- Rehabilitation will be implemented as specified in the Site Plan (Harrington-McAvan 2020).



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The mitigation measures noted above, as well as industry standard management practices have been included in the Site Plan and should be monitored and enforced.

9.2 CONCLUSIONS

Based on the information provided in this Natural Environment Level 1 & 2 Technical Report, and the Site Plans, Stantec has concluded the following:

- Significant natural heritage features within the Site for which direct impacts are anticipated are:
 - Significant Wildlife Habitat (raptor wintering area, open country breeding birds, habitat for SOCC: Monarch and Grasshopper Sparrow)
 - Habitat for SAR (Bobolink and Eastern Meadowlark)

Mitigation for the removal of grassland habitat is proposed.

- Significant natural heritage features within 120 m of the Site for which no direct impacts are anticipated are:
 - Significant woodland
 - Significant wildlife habitat (turtle wintering, amphibian breeding, bat maternity colony, habitat for SOCC: Eastern Wood-Pewee)
 - Habitat for SAR (Wood Thrush)

Potential indirect impacts to significant features within 120 m will be mitigated through appropriate measures specified in the Site Plans.

The phased extraction approach and progressive rehabilitation to grassland habitat being proposed by Cavanagh, along with mitigation measures described in this report, will ensure that potential impacts to natural heritage features on and within 120 m of the proposed Ottawa Site will be mitigated. The features and their ecological functions will be maintained over the long-term.



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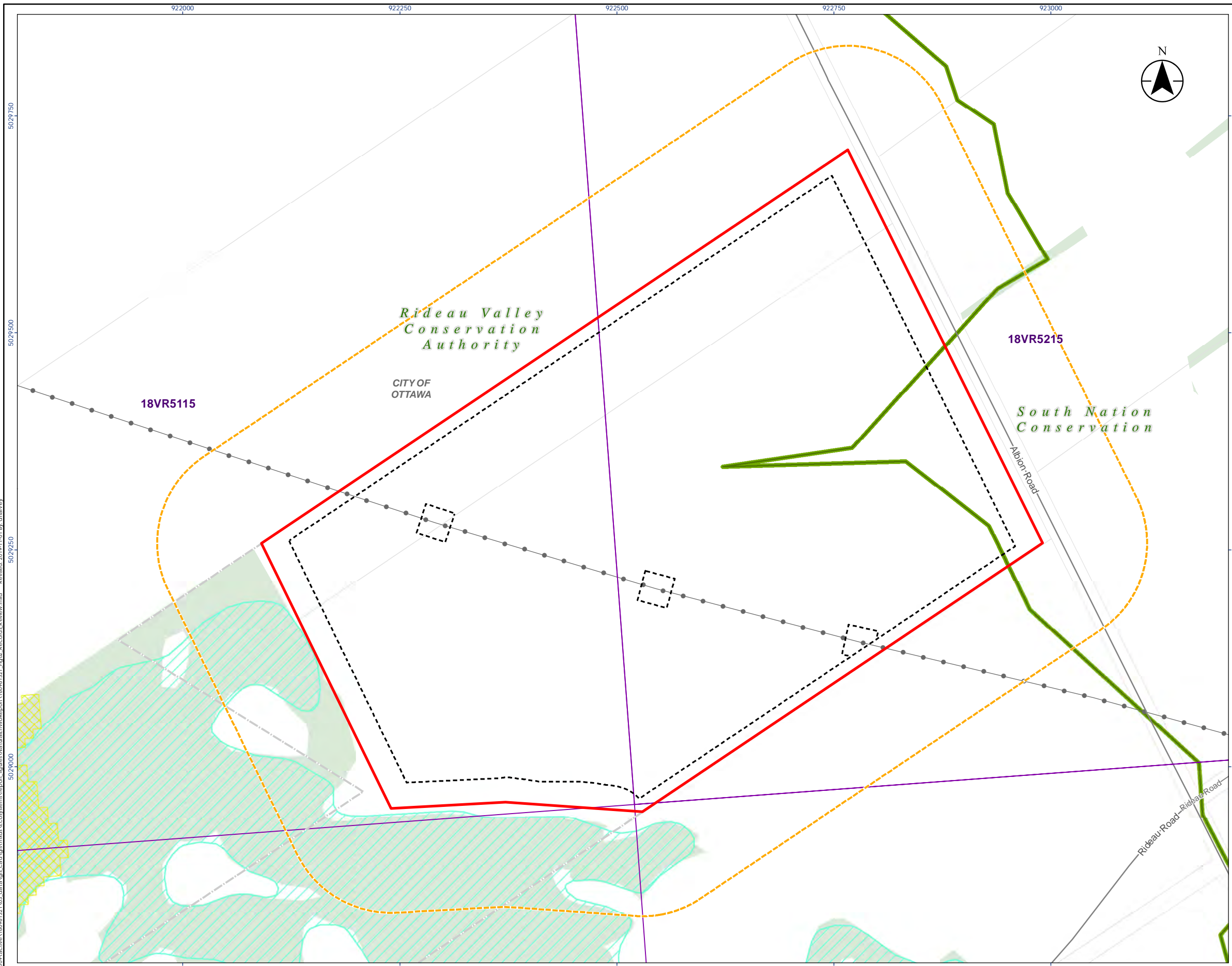
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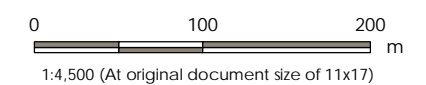
APPENDIX A

Figures

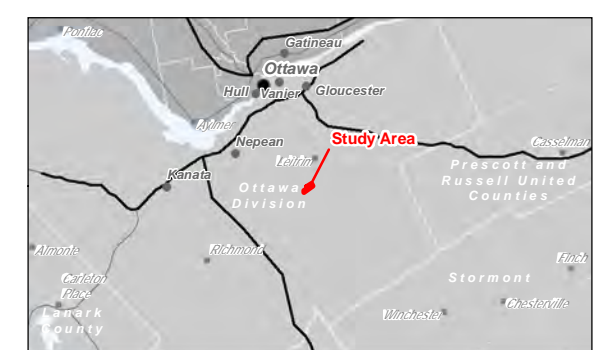




- Legend**
- Study Area (120 m)
 - Site Boundary
 - Setback Limit
 - Hydro Line
 - Watercourse (Permanent)
 - Conservation Area Administrative
 - Lot
 - Subject Property Boundary
 - Significant Ecological Area
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - 1 km NHIC Grid



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.



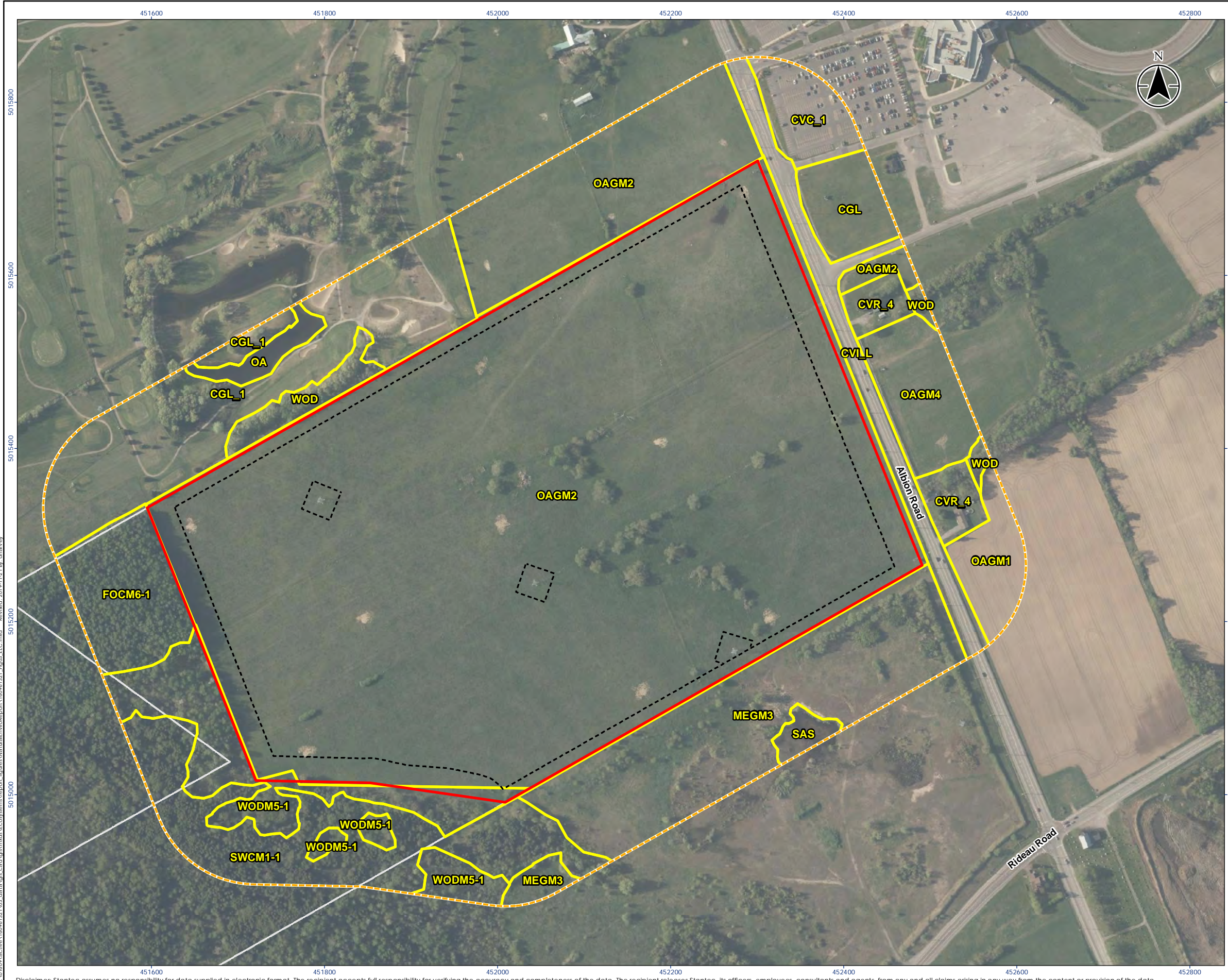
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 Independent Review by ABC on yyyy-mm-dd

Client/Project:
**OTTAWA INTERNATIONAL AIRPORT AUTHORITY
 EXTRACTION AND PROCESSING OF MINERAL
 AGGREGATE AT OMCIAA PARCEL C**

Figure No.:
2
 Title:
LIO Records Review and NHIC Search

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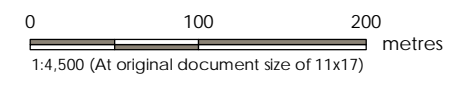


Legend

- Study Area (120 m)
- Site Boundary
- Setback Limit
- ELC Community Boundary
- Subject Property Boundary

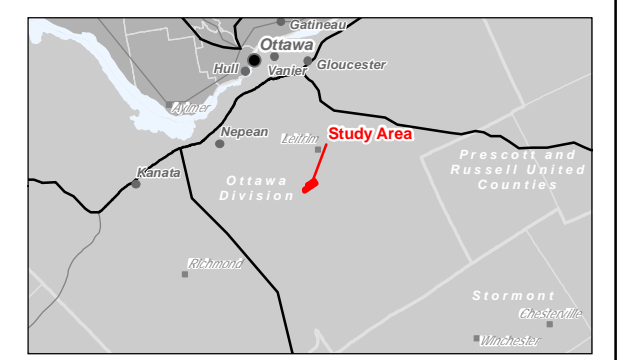
ELC Communities

- CGL**- Green Lands
- CGL_1**- Golf Course
- CVC_1**- Business Sector
- CVL_L**- Transportation
- CVR_4**- Rural Property
- FOCM6-1**- Dry - Fresh White Pine Naturalized Coniferous Plantation Type
- MEGM3** Dry - Fresh Graminoid Meadow Ecosite
- OA**- Open Aquatic
- OAGM1**- Annual Row Crops
- OAGM2**- Perennial Cover Crops
- OAGM4**- Open Pasture
- SAS**- Submerged Shallow Aquatic
- SWCM1-1**- White Cedar Mineral Coniferous Swamp Type
- WOD**- Deciduous Woodland
- WODM5-1**- Fresh - Moist Poplar Deciduous Woodland



Notes

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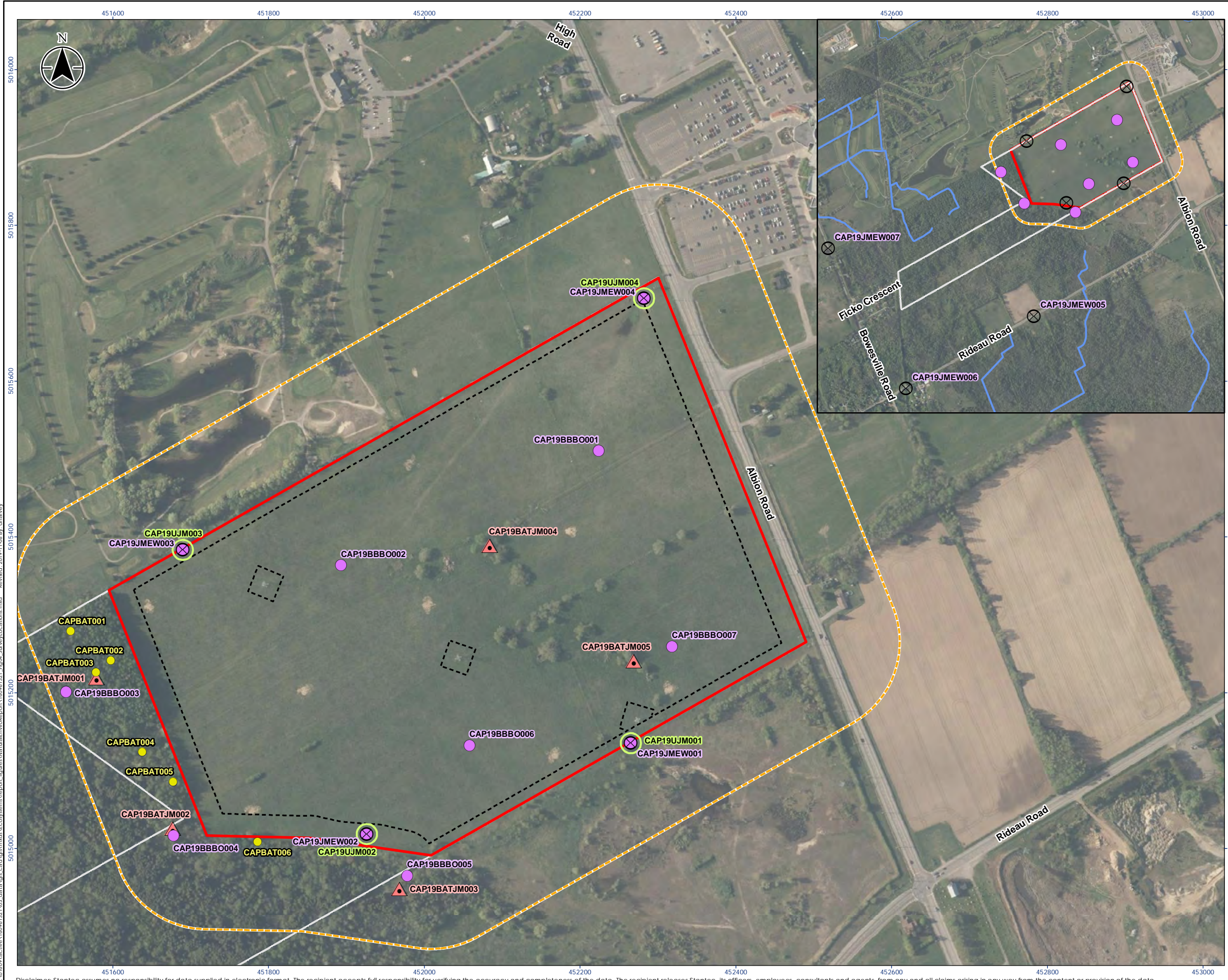
Project Location: City of Ottawa
 Prepared by DH on 2019-11-21
 Technical Review by ABC on yyyy-mm-dd
 160961321 REVA

Client/Project:
 OTTAWA INTERNATIONAL AIRPORT AUTHORITY
 EXTRACTION AND PROCESSING OF MINERAL
 AGGREGATE AT OMCIAA PARCEL C

Figure No.
 3

Title
 Ecological Land Classification

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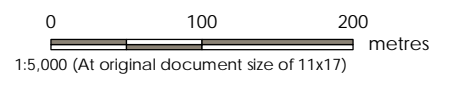


Legend

- Study Area (120 m)
- Site Boundary
- Setback Limit
- Subject Property Boundary

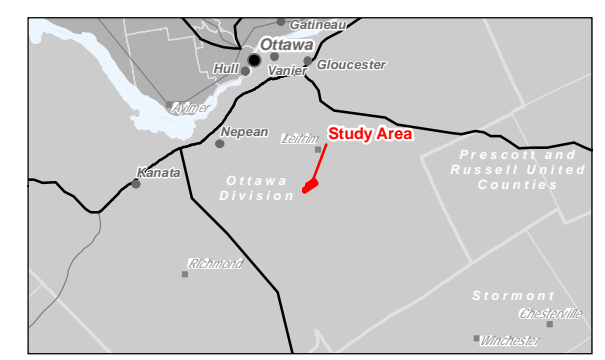
Survey Stations

- Breeding Amphibian Survey Station
- Breeding Bird Survey Station
- ⊗ Crepuscular Breeding Bird Survey
- ▲ SAR Bat Acoustic Monitoring Survey Station
- SAR Bat Maternity Roost Habitat Feature



Notes

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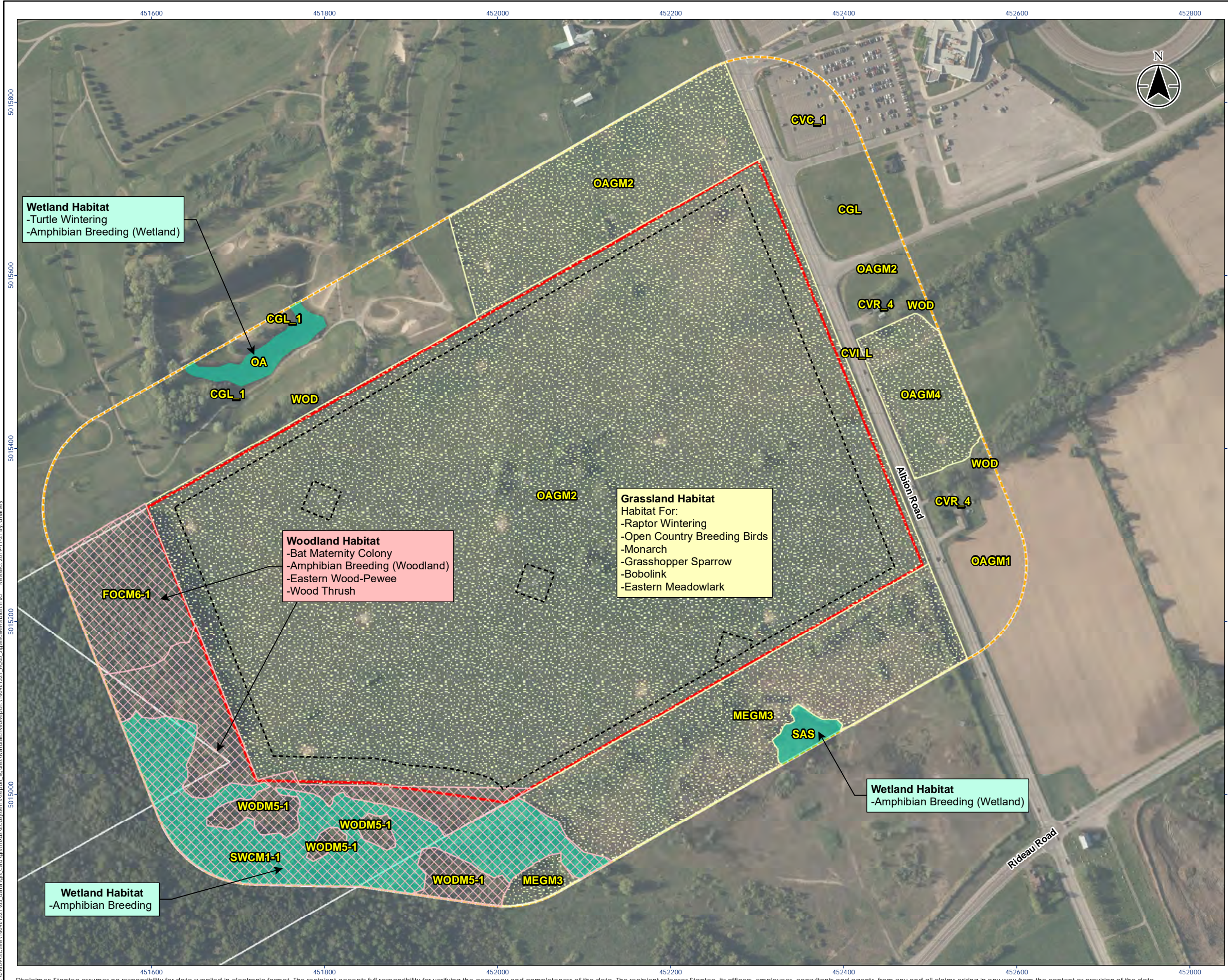
Project Location: City of Ottawa
 Prepared by DH on 2019-11-08
 Technical Review by ABC on yyyy-mm-dd

Client/Project: OTTAWA INTERNATIONAL AIRPORT AUTHORITY
 EXTRACTION AND PROCESSING OF MINERAL
 AGGREGATE AT OMCIAA PARCEL C

Figure No.: 4

Title: Survey Locations

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Wetland Habitat
 -Turtle Wintering
 -Amphibian Breeding (Wetland)

Woodland Habitat
 -Bat Maternity Colony
 -Amphibian Breeding (Woodland)
 -Eastern Wood-Pewee
 -Wood Thrush

Grassland Habitat
 Habitat For:
 -Raptor Wintering
 -Open Country Breeding Birds
 -Monarch
 -Grasshopper Sparrow
 -Bobolink
 -Eastern Meadowlark

Wetland Habitat
 -Amphibian Breeding

Wetland Habitat
 -Amphibian Breeding (Wetland)



Legend

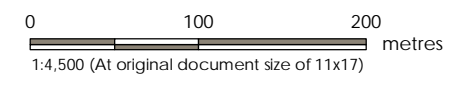
- Study Area (120 m)
- Site Boundary
- Setback Limit
- Grassland Habitat
- Woodland Habitat
- Wetland Habitat
- Subject Property Boundary

Significant Wildlife Habitat

- Seasonal Concentration Areas**
- Raptor wintering area (candidate)
 - Bat maternity colony (confirmed)
 - Turtle wintering area (candidate)
- Specialized Habitat**
- Amphibian breeding habitat – wetland (confirmed)
 - Amphibian breeding habitat – woodland (confirmed)
- Species of Conservation Concern**
- Open country breeding birds (confirmed)
 - Monarch (candidate)
 - Eastern Wood-Pewee (confirmed)
 - Grasshopper Sparrow (confirmed)

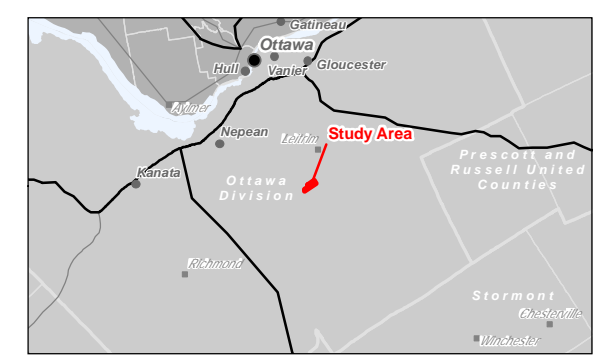
Habitat for Species at Risk

- Bobolink (confirmed)
- Eastern Meadowlark (confirmed)
- Wood Thrush (confirmed)



Notes

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Project Location: City of Ottawa
 Prepared by DH on 2019-11-21
 Technical Review by ABC on yyyy-mm-dd

Client/Project:
 OTTAWA INTERNATIONAL AIRPORT AUTHORITY
 EXTRACTION AND PROCESSING OF MINERAL
 AGGREGATE AT OMCIAA PARCEL C

Figure No.
 5

Title
 Significant Wildlife Habitat and SAR
 Habitat

APPENDIX B

Tables



Table B-1: Wildlife Habitat Assessment for the Ottawa Airport Pit Study Area (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Results of Desktop Habitat Assessment	Results of Field Investigations
SEASONAL CONCENTRATION AREAS				
Waterfowl Stopover and Staging Area (Terrestrial and Aquatic)	Field with evidence of annual spring flooding from meltwater or runoff; aquatic habitats such as ponds, marshes, lakes, bays, and watercourses used during migration, including large marshy wetlands.	ELC surveys, wildlife habitat assessments, and air photo interpretation were used to assess features within the Study Area that may support waterfowl stopover and staging areas.	To be determined during 2019 field investigations.	Absent. No flooded fields were observed during spring 2019 field investigations. No concentrations of waterfowl were observed.
Shorebird Migratory Stopover Area	Beaches and un-vegetated shorelines of lakes, rivers, and wetlands.	ELC surveys and air photo interpretation were used to assess features within the Study Area that may support migratory shorebirds.	Absent. Natural unvegetated shoreline habitat was absent from the Study Area.	n/a
Raptor Wintering Area	Combination of fields and woodland (>20 ha).	ELC surveys and air photo interpretation were used to assess features within the Study Area that may support wintering raptors.	Candidate. The Study Area includes a combination of fields and woodland > 20 ha.	Candidate. Winter raptor surveys were not undertaken. Online bird observation records (eBird 2019) records from airport lands approximately 1 km to the north of the Study Area (between Earl Armstrong Rd and Leitrim Rd) indicate that those areas are a significant raptor wintering area. Mitigation for the removal of grassland habitat is proposed.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts.	ELC surveys, wildlife habitat assessments, and air photo interpretation were used to assess features within the Study Area that may support bat hibernacula.	Absent. Crevices, caves or abandoned mines were absent from the Subject Property and Study Area.	n/a
Bat Maternity Colonies	Maternity colonies considered significant wildlife habitat are found in forested ecosites.	ELC surveys, wildlife habitat assessments, and air photo interpretation were used to assess features within the Study Area that may support bat maternity colonies.	To be determined during 2019 field investigations.	Present. Forest habitat was present in the Study Area which had suitable characteristics to support bat maternity colonies, and the presence of indicator bat species (Big Brown Bat and Silver-haired Bat) was confirmed. No tree removal is proposed in forest habitat.
Turtle Wintering Areas	Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen. Water has to be deep enough not to freeze and have soft mud substrate.	ELC surveys, wildlife habitat assessments and air photo interpretation were used to assess features within the Study Area that may support areas of permanent standing water but not deep enough to freeze.	Candidate. A golf course pond is present in the Study Area, north of the proposed licence area.	Candidate. Suitable overwintering habitat for turtles may be present in the golf course pond, however basking surveys were not undertaken on this property. No impacts to an offsite pond are anticipated. General mitigation to avoid impacts to wildlife, including turtles, is proposed.
Reptile Hibernaculum	Rock piles or slopes, stone fences, crumbling foundations.	ELC surveys and wildlife habitat assessments were used to document features that may support snake hibernacula.	To be determined during 2019 field investigations.	Absent. Suitable hibernation sites for snakes (e.g. rock piles, riprap along culverts, tree stumps) were not observed during field investigations. General mitigation to avoid impacts to wildlife, including snakes, is proposed.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles.	ELC surveys, wildlife habitat assessments, and air photo interpretation were used to assess features within the Study Area that may support colonial bird breeding habitat.	To be determined during 2019 field investigations.	Absent. No eroding features, or exposed slopes were observed during field investigations.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of colonially nesting heron species.	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs).	Absent. Large marshes and lakes were absent from the Study Area.	n/a
Colonial-Nesting Bird Breeding Habitat (Ground)	Rock islands and peninsulas in a lake or large river.	ELC surveys and air photo interpretation were used to assess features within the Study Area that may support colonial bird breeding habitat (Ground).	Absent. Large lakes or rivers were absent from the Study Area.	n/a
Migratory Butterfly Stopover Areas	Meadows and forests that are a minimum of 10 ha and are located within 5 km of Lake Ontario.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	Absent. The Study area is > 5 km from the Lake Ontario shoreline.	n/a
Landbird Migratory Stopover Areas	Woodlands of a minimum size located within 5 km of Lake Ontario.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	Absent. The Study area is > 5 km from the Lake Ontario shoreline.	n/a

Table B-1: Wildlife Habitat Assessment for the Ottawa Airport Pit Study Area (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Results of Desktop Habitat Assessment	Results of Field Investigations
Deer Yarding Areas	Deer yarding areas are mapped by MNRF and species use surveys are not required.	The LIO database and MNRF consultation were used to identify deer yarding areas.	Absent. Records of deer yarding areas were not identified by MNRF in the Study Area.	
Deer Winter Congregation Areas	Deer winter congregation's areas are mapped by MNRF and species use surveys are not required.	The LIO database and MNRF consultation were used to identify deer winter congregation areas.	Absent. Records of deer winter congregation areas were not identified by MNRF in the Study Area.	n/a
RARE VEGETATION COMMUNITIES				
Sand Barren, Alvar, Cliffs and Talus Slopes	Sand barren, Alvar, Cliff and Talus ELC Community Classes, and other areas of exposed bed rock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	Absent. These communities were absent from the Study Area.	n/a
Old-growth Forest	Relatively undisturbed, structurally complex; dominant trees > 100 years' old.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	To be determined during 2019 field investigations.	Absent. Old growth characteristics were not observed within woodlands in the Study Area.
Tallgrass Prairie and Savannah	Open canopy habitats (tree cover < 60%) dominated by prairie species.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	To be determined during 2019 field investigations.	Absent. Tallgrass Prairie and Savannah communities or indicator plants were not observed during field investigations.
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities listed by the NHIC.	ELC surveys and air photo interpretation were used to assess vegetation communities in the Study Area.	To be determined during 2019 field investigations.	Absent. No rare vegetation communities were observed during field investigations.
SPECIALIZED HABITAT FOR WILDLIFE				
Waterfowl Nesting Area	Upland habitats adjacent to wetlands (within 120 m).	ELC surveys, wildlife habitat assessment, and airphoto interpretation were used to assess features within the Study Area that may support nesting waterfowl.	To be determined during 2019 field investigations.	Absent. Wetland communities were limited in the Study Area and no breeding waterfowl were observed during field investigations. The Project has been designed to avoid disturbance to wetlands.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Treed communities adjacent to rivers, lakes, ponds, and other wetlands with stick nests of Bald Eagle or Osprey.	ELC surveys, air photo interpretation and wildlife habitat assessment were used to assess features within the Study Area that may support nesting, foraging and perching habitat for large raptors.	Absent. Suitable large bodies of water were absent from the Study Area.	n/a
Woodland Raptor Nesting Habitat	Forested ELC communities >30 ha with 10 ha of interior habitat.	ELC surveys, wildlife habitat assessment, and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors.	Candidate. Interior forest habitat is present at the western edge of the Study Area.	Absent. Stick nests were not observed during field investigations.
Turtle Nesting Areas	Exposed soil, including sand and gravel in open sunny areas near wetlands.	ELC surveys, wildlife habitat assessment and air photo interpretation were used to assess features within the Study Area that may support turtle nesting areas.	To be determined during 2019 field investigations.	Absent. Suitable habitat for turtle nesting is present on the road shoulder and in agricultural fields, however anthropogenic features do not qualify for protection as significant wildlife habitat.
Seeps and Springs	Any forested area with groundwater at surface within the headwaters of a stream or river system.	Evidence of groundwater upwelling, including seeps and springs, was recorded during ELC surveys.	To be determined during 2019 field investigations.	Absent. No evidence of groundwater upwelling, seeps or springs was observed during field investigations.
Amphibian Breeding Habitat (Woodland and Wetland)	Treed uplands with vernal pools, and wetland ecosites.	ELC surveys were used to assess features within the Study Area that may support breeding amphibians.	To be determined during 2019 field investigations.	Present. Suitable habitat for breeding amphibians is present in wetlands and ponds outside the licence boundary and amphibian breeding in these features was confirmed during targeted field investigations. The Project has been designed to avoid wetlands and no below-water extraction is proposed.
Woodland Area-sensitive Bird Breeding Habitat	Large mature forest stands, woodlots >30 ha and >200 m from the forest edge.	ELC surveys, air photo interpretation, and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge).	Absent. No portion of the Study Area is > 200 m from a forest edge.	n/a
HABITAT FOR SPECIES OF CONSERVATION CONCERN				
Marsh Bird Breeding Habitat	Wetlands with shallow water and emergent aquatic vegetation.	ELC surveys and air photo interpretation were used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.	Absent. Marsh wetlands are absent from the Study Area.	n/a

Table B-1: Wildlife Habitat Assessment for the Ottawa Airport Pit Study Area (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Results of Desktop Habitat Assessment	Results of Field Investigations
Open Country Bird Breeding Habitat	Large grasslands and fields (>30 ha).	ELC surveys, air photo interpretation, and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds.	Candidate. A 38 ha grassland is present in the Study Area.	Present. Breeding bird surveys confirmed use of the grassland habitat by three indicator species (Grasshopper Sparrow, Vesper Sparrow and Savannah Sparrow). Mitigation for the removal of grassland breeding bird habitat is proposed.
Shrub/Early Successional Bird Breeding Habitat	Large shrub and thicket habitats (>10 ha).	ELC surveys, air photo interpretation and GIS analysis were used to identify large communities that may support shrub/early successional breeding birds.	Absent. Early successional communities > 10 ha were absent from Study Area.	n/a
Terrestrial Crayfish	Wet meadows and edges of shallow marshes.	ELC surveys were used to identify shallow marsh and meadow marsh communities that occurred within the Study Area; searches for crayfish chimneys were conducted during wildlife habitat assessments.	To be determined during 2019 field investigations.	Absent. No crayfish chimneys were observed in the Study Area.
SPECIES OF CONSERVATION CONCERN				
Monarch (SARA Special Concern)	Forage and nest in open habitat (i.e., meadows, grasslands and pastures) with various milkweed species (<i>Asclepias</i> spp.) and/or wildflowers such as goldenrods (<i>Solidago</i> spp.), asters (<i>Aster</i> spp.) and yarrow (<i>Achillea millefolium</i>) (COSEWIC 2010).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations.	Candidate. Suitable habitat for Monarch is present in the Study Area in meadow communities as well as along the edges of agricultural fields and natural vegetation communities where milkweed plants were observed and nectar-producing wildflowers may be present. However, the species was not observed during 2019 field investigations. Mitigation for removal of milkweed and nectar-producing wildflowers is proposed.
Eastern Milksnake (SARA Special Concern)	Frequently reported in and around buildings, especially old structures, however, it is found in a variety of habitats, including prairies, pastures, hayfields, rocky hillsides and a wide variety of forest types. Two important features of ideal habitat are proximity to water, and suitable locations for basking and egg-laying, nesting sites may include compost or manure piles, stumps, under boards, or in loose soil (COSEWIC 2002a).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations.	Candidate. Suitable habitat is present, however the species was not observed during field investigations. General mitigation to avoid impacts to wildlife, including snakes, is proposed.
Snapping Turtle (SARA Special Concern)	Ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms. Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC 2008).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations.	Candidate. Suitable habitat is present in the Study Area, outside the proposed licence area in ponds on the Golf Course property, however the species was not observed during field investigations. General mitigation to avoid impacts to wildlife, including turtles, is proposed.
Bald Eagle (SARA Special Concern)	Almost always nests near water. Large stick nests are placed in trees located within mature woodlots. They usually prefer 250 ha of mature forest for breeding, however, along Lake Erie, where the lake provides a valuable food source, the eagles will nest in smaller woodlots or even single trees (Sandilands 2005).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	Absent. Suitable large trees near large waterbodies are absent from the Study Area.	n/a
Eastern Wood-Pewee (SARA Special Concern)	Eastern Wood-pewee is found in the mid-canopy layer of deciduous and mixed wood forests with open understories and is commonly associated with edges and clearings (MECP 2014).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations.	Present. The species was observed in suitable habitat in the Study Area, outside the proposed licence area. Mitigation to avoid disturbance to breeding birds is proposed.
Grasshopper Sparrow (SARA Special Concern)	Grasshopper Sparrows prefer short, sparse grass with patches of exposed ground in rough or unimproved pastures and in drier, sparsely vegetated grasslands at least 30 ha in size (Cadman et al. 2007).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations.	Present. The species was observed in suitable habitat in the proposed licence area. Mitigation for the removal of grassland breeding bird habitat is proposed.

Table B-1: Wildlife Habitat Assessment for the Ottawa Airport Pit Study Area (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Results of Desktop Habitat Assessment	Results of Field Investigations
Great Egret (S2B)	Nesting colonies on lakes, ponds, marshes, estuaries, impoundments, and islands (Cadman et al. 2007).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	Absent. No lakes, large ponds or marshes are present in the Study Area.	n/a
Peregrine Falcon (SARA Special Concern)	The Peregrine Falcon traditionally prefers rock cliffs, particularly those adjacent to water (MECP 2017). More recently, this species has been released in various urban centres in Ontario where it successfully nests on tall buildings (Cadman et al. 2007; MECP 2017).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	Absent. Suitable large cliffs are absent from the Study Area.	n/a
Short-eared Owl (SARA Special Concern)	Open habitats such as agricultural lands, wetlands, and grasslands. This area sensitive species nests on the ground usually in tall vegetation and typically prefers 75 hectares of suitable habitat in order for nesting to occur (Cadman et al. 2007).	ELC surveys, wildlife habitat assessment, botanical inventory and breeding bird surveys were used to assess features within the Study Area that may support species of conservation concern.	To be determined during 2019 field investigations; however, at 38 ha the grassland habitat is smaller than is typically preferred by the species.	Absent. Although suitable grassland habitat is present in the Study Area, the species was not observed during crepuscular breeding bird surveys.
ANIMAL MOVEMENT CORRIDORS				
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	To be determined during 2019 field investigations.	Present. However, as all wetland and woodland habitat has been identified as amphibian breeding habitat, no defined movement corridors have been mapped.
Deer Movement Corridor	Corridors may be found in all forest ecosites. Determined based on identifying significant deer wintering habitat.	Identified after deer wintering habitat is confirmed. Movement corridors should be considered when deer wintering habitat is confirmed as SWH based on MNR data.	Absent. No deer wintering areas were identified in the Study Area.	n/a

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Table B-2: Habitat Potential in the Study Area for Threatened or Endangered Species Identified During Background Review

Species	Habitat Preference	Desktop Assessment of Habitat Potential	Results from Habitat and Species Surveys
PLANTS			
Butternut	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar 1995).	Suitable habitat exists for this species in the Study Area within the mixed woodland and open pasture. A botanical inventory was completed to confirm species presence or absence.	Absent. No Butternut trees were recorded by Stantec in the Study Area during field investigations.
AMPHIBIANS AND REPTILES			
Western Chorus Frog	Small, ephemeral wetlands disconnected from other water sources for breeding (Environment Canada 2014; COSEWIC 2008). The vegetation composition in breeding ponds is typically herbaceous with the presence of occasional shrubs or partially submerged trees forming a discontinuous or open canopy (Environment Canada 2014).	Suitable habitat for this species may be present in shallow, temporary pools of water. Potential habitat will be identified during field surveys in 2019.	Absent. Western Chorus Frog was not detected during amphibian breeding surveys.
Blanding's Turtle	Lakes, ponds, and marshes; prefers shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch 2002).	Suitable open wetland habitat for this species is not present in the Study Area. Although the species may travel up to 2 km between wetlands, there are no records of the species within 5 km of the Study Area.	Absent. Suitable habitat for the species was not observed during field investigations.
BIRDS			
Bank Swallow	Bank Swallows excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits (Falconer et al. 2016). Any suitable habitat may be present if stockpiles of soil are present or in areas of sand/gravel extraction.	Potential habitat to be identified during field surveys in 2019.	Absent. Suitable habitat for the species was not observed during field investigations. The species was not observed during field investigations.
Barn Swallow	Nest on walls or ledges of barns and other human-made structures such as bridges, culverts or other buildings; forages in open areas for flying insects (COSEWIC 2011a).	Suitable nesting habitat is available in barns and old structures; however, no structures are present in the proposed licence area.	Absent. The species was observed during field investigations, however no suitable nesting habitat was observed in the Study Area.
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010).	Suitable habitat is present within the Study Area. Habitat use will be determined through breeding bird surveys conducted in June 2019.	Present. The species and its habitat were observed during targeted breeding bird surveys. Consultation with ECCC is recommended to avoid impacts to the species.
Chimney Swift	Chimney Swifts primarily use chimneys for roosting and nesting, and only rarely nest in large hollow trees (Fitzgerald et al. 2014; Zanchetta et al. 2014).	There may be suitable chimneys in the Study Area, but no structures are present in the proposed licence area.	Absent. Suitable habitat for the species was not observed during field investigations. The species was not observed during field investigations.
Common Nighthawk	Nests on the ground in open habitats with rocky or graveled substrate and will even nest on gravel roofs in the city (Cadman et al. 2007). The regeneration or succession of forest clearings and the destruction of grassland habitats appear to play a major role in this species' decline along with the non-selective spraying for mosquitoes (Cadman et al. 2007).	Suitable habitat may be present within the Study Area. Habitat use will be determined through crepuscular breeding bird surveys conducted in June 2019.	Absent. Suitable habitat for the species was not observed during field investigations. The species was observed as a flyover once during the migration period (May 31, 2019) but not during a targeted crepuscular breeding bird survey in June 2019.
Eastern Meadowlark	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011b). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011b).	Suitable habitat is present within the Study Area. Habitat use will be determined through breeding bird surveys conducted in June 2019.	Present. The species and its habitat were observed during targeted breeding bird surveys. Consultation with ECCC is recommended to avoid impacts to the species.
Eastern Whip-poor-will	Open woodlands with frequent clearings. Preferred nesting sites contain shaded leaf litter or pine needles and generally occur along wooded edges or in clearings without any herbaceous growth. The species is considered to be area-sensitive, preferring 100 hectares of suitable habitat for breeding (Cadman et al. 2007).	Suitable large, open woodlands are absent from the Study Area.	Absent. Suitable habitat for the species was not observed during field investigations.

Table B-2: Habitat Potential in the Study Area for Threatened or Endangered Species Identified During Background Review

Species	Habitat Preference	Desktop Assessment of Habitat Potential	Results from Habitat and Species Surveys
Olive-sided Flycatcher	Natural and man-made openings in coniferous or mixed forests with nearby water or wetlands are preferred and the presence of tall trees or snags for perching and foraging are essential (COSEWIC 2018). Breeds in the boreal forest, where it primarily uses coniferous trees to support its cup-shaped nest (Cadman et al. 2007). Only a handful of Olive-sided flycatchers have been found to breed below the Canadian Shield in Ontario.	Potential habitat to be identified during field surveys.	Absent. Suitable habitat for the species was not observed during field investigations. The species was not observed during field investigations.
Wood Thrush	Deciduous and mixed forests with a developed understory and tall trees (MECP 2014). While it prefers large forest tracts, it will utilize smaller forest fragments (MECP 2014). Nests are constructed in shrubs or saplings, typically Sugar Maple or American Beech (MECP 2014).	Potential habitat to be identified during field surveys.	Present. The species was observed in suitable woodland habitat in the west of the Study Area during field investigations. A setback of 15 m from the woodland is proposed.
MAMMALS			
Small-footed Myotis	Small-footed myotis hibernate in caves and abandoned mines in winter, and roost under rocks, in rock outcrops, buildings, under bridges, or in caves, mines, or hollow trees in the spring and summer (MNRF 2017).	Suitable roosting habitat may be available in barns and old structures in the Study Area; however, no structures are present in the proposed licence area. Potential habitat to be identified during field surveys.	Absent. Habitat for the species is absent in the Study Area.
Little Brown Myotis	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).	Suitable roosting habitat may be available in barns and old structures in the Study Area; however, no structures are present in the proposed licence area. Candidate maternity roost trees may be present within treed ELC communities or individual large trees. Potential habitat to be identified during field surveys.	Absent. Six trees providing candidate roost habitat for the species were observed during field investigations, however due to the low number of acoustic detections (5 calls over 30 nights in June) the species is considered absent from the Study Area.
Northern Myotis	Caves provide overwintering habitat (COSEWIC 2013). Rarely uses human-made structures for roosting (COSEWIC 2013).	Suitable roosting habitat may be available in barns and old structures in the Study Area; however, no structures are present in the proposed licence area. Candidate maternity roost trees may be present within treed ELC communities or individual large trees. Potential habitat to be identified during field surveys.	Absent. Six trees providing candidate roost habitat for the species were observed during field investigations, however the species was not detected during targeted field investigations.
Tri-colored Bat	Found in a variety of habitats; caves provide overwintering habitat (COSEWIC 2013). Prefers oak and sugar maple trees with clusters of dead leaves (MECP 2019).	Suitable roosting habitat may be available in barns and old structures in the Study Area; however, no structures are present in the proposed licence area. Candidate maternity roost trees may be present within treed ELC communities or individual large trees. Potential habitat to be identified during field surveys.	Absent. Suitable oak and sugar maple trees were not observed during field investigations. The species was not detected during targeted field investigations.

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APPENDIX C

Species Lists



Vegetation Community				Scientific Name	Common Name	Establishment Means	Coefficient of Conservatism	Wetness Index	Wetland Plant Species	Weediness Index	Provincial Rank	SARO Status	COSEWIC Status
OAGM4	TAGM2-1	SWM	WOD										
		x		<i>Gymnocarpium dryopteris</i>	common oak fern	native	7	0	T		S5		
	x			<i>Pteridium aquilinum latiusculum</i>	eastern bracken fern	native	2	3			S5		
	x	x		<i>Dryopteris carthusiana</i>	spinulose wood fern	native	5	-2	T		S5		
	x			<i>Equisetum sp.</i>									
	x	x	x	<i>Onoclea sensibilis</i>	sensitive fern	native	4	-3	I		S5		
		x		<i>Osmunda claytoniana</i>	interrupted fern	native	7	-1	T		S5		
		x		<i>Osmunda regalis spectabilis</i>	royal fern	native	7	-5	I		S5		
	x	x		<i>Thuja occidentalis</i>	eastern white cedar	native	4	-3	T		S5		
		x		<i>Abies balsamea</i>	balsam fir	native	5	-3	T		S5		
	x			<i>Pinus strobus</i>	eastern white pine	native	4	3	T		S5		
		x		<i>Sambucus racemosa pubens</i>	red elderberry	native	5	2			S5		
		x		<i>Toxicodendron radicans radicans</i>	eastern poison ivy	native	5	-1	T		S5		
x				<i>Asclepias syriaca</i>	common milkweed	native	0	5			S5		
		x		<i>Aralia nudicaulis</i>	wild sarsaparilla	native	4	3			S5		
x				<i>Achillea millefolium</i>	common yarrow	introduced	0	3			SE		
x		x		<i>Arctium minus</i>	common burdock	introduced		5			-2	SE5	
x				<i>Cirsium arvense</i>	Canada thistle	introduced		3			-1	SE5	
			x	<i>Euthamia graminifolia</i>	grass-leaved goldenrod	native	2	-2			S5		
		x		<i>Oclemea acuminata</i>	whorled wood aster	native	9	5			S4		
	x			<i>Pilosella caespitosa</i>	meadow hawkweed	introduced	-?	-?	-?	-?	SE5		?
			x	<i>Rudbeckia triloba triloba</i>	brown-eyed Susan	introduced		1			-1	SE4	
x		x	x	<i>Solidago canadensis canadensis</i>	Canada goldenrod	native	1	3			-?	-?	
x				<i>Tragopogon pratensis</i>	meadow goatsbeard	introduced		5			-1	SE5	
		x		<i>Impatiens capensis</i>	spotted jewelweed	native	4	-3	I		S5		
		x		<i>Betula alleghaniensis</i>	yellow birch	native	6	0	T		S5		
x				<i>Berteroa incana</i>	hoary alyssum	introduced		5			-3	SE5	
x			x	<i>Lonicera sp.</i>									
x				<i>Silene vulgaris</i>	bladder campion	introduced		-?				SE5	
x				<i>Stellaria media</i>	common chickweed	introduced		3			-1	SE5	
	x		x	<i>Cornus alternifolia</i>	alternate-leaved dogwood	native	6	5			S5		
	x			<i>Pyrola elliptica</i>	shinleaf	native	5	5			S5		
x				<i>Lotus corniculatus</i>	garden bird's-foot trefoil	introduced		1			-2	SE5	
x				<i>Trifolium pratense</i>	red clover	introduced		2			-2	SE5	
x				<i>Vicia cracca</i>	tufted vetch	introduced		5			-1	SE5	
		x		<i>Ribes glandulosum</i>	skunk currant	native	6	-3	I		S5		
x				<i>Leonurus cardiaca cardiaca</i>	common motherwort	introduced		5			-2	SE5	
			x	<i>Lycopus americanus</i>	American water-horehound	native	4	-5	I		S5		
			x	<i>Prunella vulgaris vulgaris</i>	common self-heal	introduced		0			-1	-?	-?
x				<i>Fraxinus pennsylvanica</i>	red ash	native	3	-3	T		S4		
x				<i>Circaea canadensis canadensis</i>	Canada enchanter's nightshade	native	3	3			S5		
			x	<i>Plantago major</i>	common plantain	introduced		-1			-1	S5	
	x	x		<i>Lysimachia borealis</i>	northern starflower	native	-?	-?	-?	-?	-?	-?	?
	x		x	<i>Fragaria virginiana virginiana</i>	wild strawberry	native	2	1			S5		
x				<i>Malus sp.</i>									
	x	x	x	<i>Prunus virginiana virginiana</i>	chokecherry	native	2	1			S5		
x	x	x	x	<i>Rubus idaeus idaeus</i>	red raspberry	introduced		-?				SNA	-?
			x	<i>Rubus occidentalis</i>	black raspberry	native	2	5			S5		
		x		<i>Rubus pubescens</i>	dewberry	native	4	-4	I*		S5		
	x			<i>Galium triflorum</i>	three-flowered bedstraw	native	4	2			S5		
			x	<i>Populus alba</i>	white poplar	introduced		5			-3	SE5	
	x	x	x	<i>Populus tremuloides</i>	trembling aspen	native		0	T		S5		
		x		<i>Salix sp.</i>									
x			x	<i>Acer negundo</i>	Manitoba maple	native	0	-2	T		S5		
		x		<i>Acer rubrum</i>	red maple	native	4	0	T		S5		
	x			<i>Acer saccharinum</i>	silver maple	native	5	-3	I		S5		
x				<i>Acer saccharum</i>	sugar maple	native	4	3			S5		
		x		<i>Tiarella cordifolia</i>	heart-leaved foamflower	native	6	1	T		S5		
x				<i>Verbascum thapsus thapsus</i>	-?	introduced		5			-2	SE5	
		x		<i>Solanum dulcamara</i>	bittersweet nightshade	introduced		0	T		-2	SE5	
	x	x		<i>Ulmus americana</i>	white elm	native	3	-2	T		S5		
		x		<i>Urtica dioica gracilis</i>	slender stinging nettle	native	2	-1	T		-?	-?	
		x	x	<i>Parthenocissus quinquefolia</i>	Virginia creeper	native	6	1			S4?		

Vegetation Community				Scientific Name	Common Name	Establishment Means	Coefficient of Conservatism	Wetness Index	Wetland Plant Species	Weediness Index	Provincial Rank	SARO Status	COSEWIC Status
OAGM4	TAGM2-1	SWM	WOD										
	x	x	x	<i>Vitis riparia</i>	riverbank grape	native	0	-2			S5		
		x		<i>Arisaema triphyllum triphyllum</i>	Jack-in-the-pulpit	native	5	-2	T		S5		
		x		<i>Maianthemum canadense canadense</i>	wild lily-of-the-valley	native	5	0			S5		
	x			<i>Carex arctata</i>	drooping woodland sedge	native	-?	-?	-?	-?	S5		-?
			x	<i>Scirpus cyperinus</i>	common woolly bulrush	native	4	-5	I		S5		
x				<i>Agrostis gigantea</i>	redtop	introduced		-3	T		SE5		
x		x	x	<i>Bromus inermis</i>	smooth brome	introduced		5		-3	SE5		
x				<i>Elymus repens</i>	quackgrass	introduced		3		-3	SE5		
x				<i>Phalaris arundinacea arundinacea</i>	reed canarygrass	native	0	-4	T		S5		
x				<i>Phleum pratense pratense</i>	common timothy	introduced		3		-1	SE5		

Species Diversity			
Vascular Plants Listed:			74
Identified to species or ssp/var			70
Identified to Genus (not included in calculations below)			4
Provincial Status		Total Number	Percentage
S1-S3 Species:	rare in Ontario	0	0%
S4 Species:	uncommon in Ontario	3	4%
S5 Species:	common in Ontario	40	57%
Other:		23	33%
Not listed:		0	0%
Not defined ("?-?"):		4	6%
Means of Establishment			
Native Species:		45	64%
Introduced Species:		25	36%
Not listed:		0	0%
Not defined ("?-?"):		0	0%
Co-efficient of Conservatism (C) and Floristic Quality Index(FQI)			
C 0 to 3	lowest sensitivity	15	21%
C 4 to 6	moderate sensitivity	24	34%
C 7 to 8	high sensitivity	3	4%
C 9 to 10	highest sensitivity	1	1%
Not listed:		24	34%
Not defined ("?-?"):		3	4%
Average C		3.9	
FQI		49.7	
Presence of Weedy & Invasive Species			
weediness = 0	Not invasive	0	0%
weediness = -1	low potential invasiveness	8	11%
weediness = -2	moderate potential invasiveness:	6	9%
weediness = -3	high potential invasiveness	6	9%
Not listed:		47	67%
Not defined ("?-?"):		3	4%
Average weediness		-1.9	
Wetness Index			
upland	W of 5	13	19%
facultative upland	W of 4, 3 or 2	15	21%
facultative	W of 1, 0 or -1	18	26%
facultative wetland	W of -2, -3 or -4	16	23%
obligate wetland	W of -5	3	4%
Not listed:		0	0%
Not defined ("?-?"):		5	7%
Average wetness value		0.8	
Presence of Wetland (W) Species			
Total Wetland Tolerant (T) Plant Species as identified in OWES Manual		21	30%
Total Wetland Indicator (I) Plant Species as identified in OWES Manual		8	11%
Not listed:		38	54%
Not defined ("?-?"):		3	4%

Wildlife List for Ottawa Airport Pit - Parcel C - Stantec 2019

COMMON NAME	SCIENTIFIC NAME	ONTARIO RANK	RANK	SARO	SARA	COMMENTS
AMPHIBIANS						
American Toad	<i>Anaxyrus americanus</i>	S5	G5			
Tetraploid Gray Treefrog	<i>Hyla versicolor</i>	S5	G5			
Spring Peeper	<i>Pseudacris crucifer</i>	S5	G5			
Wood Frog	<i>Lithobates sylvatica</i>	S5	G5			
BIRDS						
Canada Goose	<i>Branta canadensis</i>	S5	G5			
Mallard	<i>Anas platyrhynchos</i>	S5	G5			
American Black Duck	<i>Anas rubripes</i>	S4	G5			
Wild Turkey	<i>Meleagris gallopava</i>	S5	G5			
Mourning Dove	<i>Zenaida macroura</i>	S5	G5			
Common Nighthawk	<i>Chordeiles minor</i>	S4B	G5	SC	THR	COSEWIC recommended SC, May 2018
Wilson's Snipe	<i>Gallinago delicata</i>	S5B	G5			
Ring-billed Gull	<i>Larus delawarensis</i>	S5B,S4N	G5			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	S5B	G5	NAR	NAR	
Turkey Vulture	<i>Cathartes aura</i>	S5B	G5			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5	G5	NAR	NAR	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	S5B	G5			
Hairy Woodpecker	<i>Dryobates villosus</i>	S5	G5			
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	G5	SC	SC	
Alder Flycatcher	<i>Empidonax alnorum</i>	S5B	G5			
Least Flycatcher	<i>Empidonax minimus</i>	S4B	G5			
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	S4B	G5			
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4B	G5			
Warbling Vireo	<i>Vireo gilvus</i>	S5B	G5			
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B	G5			
Blue Jay	<i>Cyanocitta cristata</i>	S5	G5			
American Crow	<i>Corvus brachyrhynchos</i>	S5B	G5			
Common Raven	<i>Corvus corax</i>	S5	G5			
Barn Swallow	<i>Hirundo rustica</i>	S4B	G5	THR	THR	
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5	G5			
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5	G5			
Winter Wren	<i>Troglodytes hiemalis</i>	S5B	G5			
Veery	<i>Catharus fuscescens</i>	S4B	G5			
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	G5	SC	THR	
American Robin	<i>Turdus migratorius</i>	S5B	G5			
Gray Catbird	<i>Dumetella carolinensis</i>	S4B	G5			
Brown Thrasher	<i>Toxostoma rufum</i>	S4B	G5			
European Starling	<i>Sturnus vulgaris</i>	SNA	G5			
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B	G5			
Red Crossbill	<i>Loxia curvirostra</i>	S4B	G5			
American Goldfinch	<i>Spinus tristis</i>	S5B	G5			
Vesper Sparrow	<i>Poocetes gramineus</i>	S4B	G5			
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S4B	G5			
Grasshopper Sparrow	<i>Ammodramus saviannarum</i>	S4B	G5	SC	SC	
White-throated Sparrow	<i>Zonotrichia albicollis</i>	S5B	G5			
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	G5	THR	THR	
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	G5	THR	THR	
Baltimore Oriole	<i>Icterus galbula</i>	S4B	G5			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4	G5			
Common Grackle	<i>Quiscalus quiscula</i>	S5B	G5			
Ovenbird	<i>Seiurus aurocapilla</i>	S4B	G5			
Northern Waterthrush	<i>Parkesia noveboracensis</i>	S5B	G5			
Black-and-white Warbler	<i>Mniotilta varia</i>	S5B	G5			
Mourning Warbler	<i>Geothlypis philadelphia</i>	S4B	G5			
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B	G5			
American Redstart	<i>Setophaga ruticilla</i>	S5B	G5			
Yellow Warbler	<i>Setophaga petechia</i>	S5B	G5			
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	S5B	G5			
Yellow-rumped Warbler	<i>Setophaga coronata</i>	S5B	G5			
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S4B	G5			
Indigo Bunting	<i>Passerina cyanea</i>	S4B	G5			
MAMMALS						
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5	G5			

SUMMARY

Total Amphibians:	4
Total Birds:	56
Total Mammals:	1

SIGNIFICANT SPECIES

Global:	0
National:	7
Provincial:	7

Explanation of Status and Acronyms

COSSARO: Committee on the Status of Species at Risk in Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
REGION: Rare in a Site Region
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S5: Secure—Common, widespread, and abundant in the province
SX: Presumed extirpated
SH: Possibly Extirpated (Historical)
SNR: Unranked
SU: Unrankable—Currently unrankable due to lack of information
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species
S#B- Breeding status rank
S#N- Non Breeding status rank
?: Indicates uncertainty in the assigned rank
G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range
G1G2: Extremely rare to very rare globally
G2: Very rare globally; usually between 5-10 occurrences in the overall range
G2G3: Very rare to uncommon globally
G3: Rare to uncommon globally; usually between 20-100 occurrences
G3G4: Rare to common globally
G4: Common globally; usually more than 100 occurrences in the overall range
G4G5: Common to very common globally
G5: Very common globally; demonstrably secure
GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
GNR: Unranked—Global rank not yet assessed.
T: Denotes that the rank applies to a subspecies or variety
Q: Denotes that the taxonomic status of the species, subspecies, or variety is **questionable**.
END: Endangered
THR: Threatened
SC: Special Concern
2, 3 or NS after a COSEWIC ranking indicates the species is either on Schedule 2, Schedule 3 or No Schedule of the Species At Risk Act (SARA)
NAR: Not At Risk
IND: Indeterminant, insufficient information to assign status
DD: Data Deficient

LATEST STATUS UPDATE

Odonata: Sept 2019
Butterflies: Jan 2018
Bumble Bees: Sept 2019
Other Arthropods: Sept 2019
Terrestrial Molluscs: Sept 2019
Amphibians: Sept 2019
Reptiles: Sept 2019
Birds: Sept 2019
Mammals: May 2018
S and G ranks and explanations: December 2011

NOTE

All rankings for birds refer to breeding birds unless the ranking is followed by N

REFERENCES

COSSARO Status

Endangered Species Act, 2007 (Bill 184). Species at Risk in Ontario List.

COSEWIC Status

COSEWIC. 2007. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada.

APPENDIX D

Field Notes





Stantec Consulting Ltd.
400-1331 Clyde Ave.,
Ottawa, ON K2C 3G4
Tel: (613) 738-0708

**Bat Maternity Roost -
Bat Maternity Roost Habitat Assessment
Data Form**

Project Number: 160961321

Project Name: Carrington - Ottawa Airport Pit

<u>May 21 / 2019</u>	<u>0800hrs</u>	<u>1130hrs</u>	<u>J. Marsell</u>		
DATE	TIME (start)	TIME (end)	Field Personnel		
<u>n/a.</u>	<u>9</u>	<u>3-4</u>	<u>50%</u>	<u>spitting rain</u>	<u>0mm</u>
FEATURE #	TEMP (°C)	WIND	CLOUD	PPT	PPT (in last 24 hrs)

Weather Conditions:

NOTES ABOUT ENTIRE FEATURE

Age/Maturity:

Dominant tree species:

Feature includes wooded sections within 120m of Study Area.
Individual trees within Study Area surveyed.
↳ White Pine Plantation ↳ Trembling Aspen Swamp
↳ White Cedar Swamp

RECORD DETAILS OF ALL SNAG/CAVITY TREES >10 CM DBH BELOW:

Tree No.	Species	Notes	DBH (cm) (>10cm only)	Tree height (m)	Cavity Height (m)	Photo Number(s)	UTM (Zone:)	One of tallest trees in community	Exhibits cavities /crevices/scars/woodpe	Largest DBH in community	Cavity or crevice is high up in tree (>10 m)	Within highest density or cluster of cavity trees	Large amount of loose, peeling bark	Open canopy	Early stages of decay (class 1-3)	
EX	Sugar maple		40	12	9	1, 2	123456 / 1234567	X		X			X		X	
	* All data collected on Collector App							/								
	on May 21 / 2019 *							/								
	Trees COBATool - 005.							/								
								/								

Signature: JM
(Field Person(s))

Quality Control: This form is complete & legible .

Signature: _____
(Project Manager)

Station: BBS2

Feature: _____

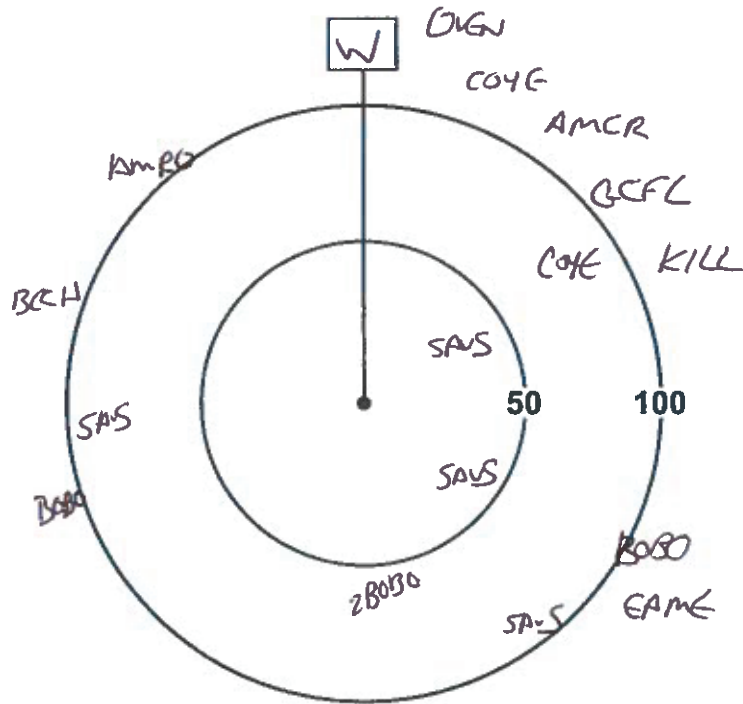
UTM: _____

Start Time: 6:22

End Time: 6:37

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

Species	<50m	50-100m	>100m	Flyovers	Height*
SAS	2	2	-	-	-
BOBO	-	2	2	-	-
COYE	-	1	+	-	-
GCFL	-	-	1	-	-
AMCR	-	-	1	-	-
OVEN	-	-	1	-	-
EAME	-	-	1	-	-
AMRO	-	-	1	-	-
BCCH	-	-	1	-	-



* Height of blade sweep will vary from project to project; check with project manager
 O-On ground, A-Below height of blade sweep, B-At height of blade sweep,
 C-Above height of blade sweep, D-Well above height of blade sweep

Station: BBS3

Feature: _____

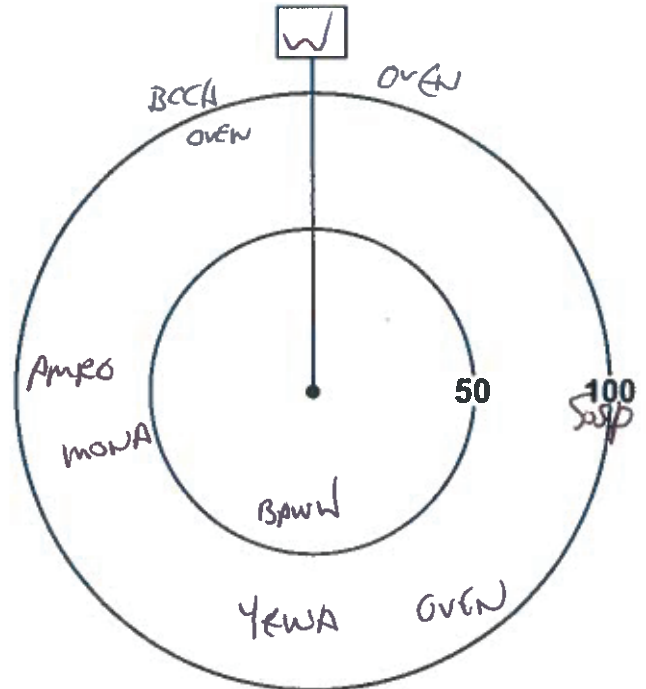
UTM: _____

Start Time: 6:53

End Time: 7:03

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

Species	<50m	50-100m	>100m	Flyovers	Height*
BAWW	1	-	-	-	-
MONA	-	1	-	-	-
AMRO	-	1	-	-	-
OVEN	-	2	1	-	-
YKWA	-	1	-	-	-
BCCH	-	-	1	-	-
SOSP	-	1	-	-	-



* Height of blade sweep will vary from project to project; check with project manager
 O-On ground, A-Below height of blade sweep, B-At height of blade sweep,
 C-Above height of blade sweep, D-Well above height of blade sweep

Page 2 of 4

Signature: _____

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2011-05-04 / FORM 020

Station: BBS5

Feature: _____

UTM: _____

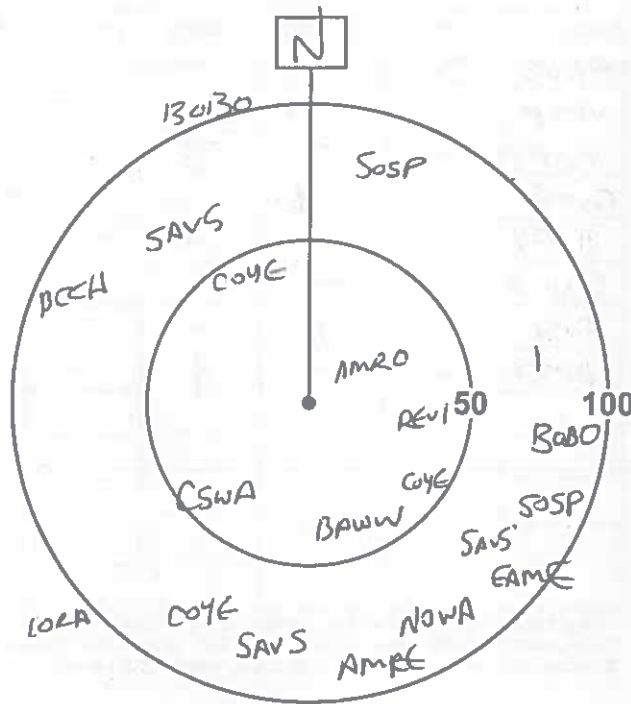
Start Time: 7:30

End Time: 7:40

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

NOISE 3

Species	<50m	50-100m	>100m	Flyovers	Height*
COYE	2	1	-	-	-
AMRO	1	-	-	-	-
REVI	1	-	-	-	-
BAWW	1	-	-	-	-
CSWA	1	-	-	-	-
SAVS	-	2	-	-	-
SOSP	-	2	-	-	-
BCCH	-	1	-	-	-
NOWA	-	1	-	-	-
AMRE	-	1	-	-	-
SOSP	2	2	-	-	-
BOBO	-	1	1	-	-
EAME	-	1	-	-	-



* Height of blade sweep will vary from project to project; check with project manager.
 O-On ground; A-Below height of blade sweep; B-At height of blade sweep;
 C-Above height of blade sweep; D-Well above height of blade sweep
 COYA 1

Station: BBS4

Feature: _____

UTM: _____

Start Time: BBS 7:10

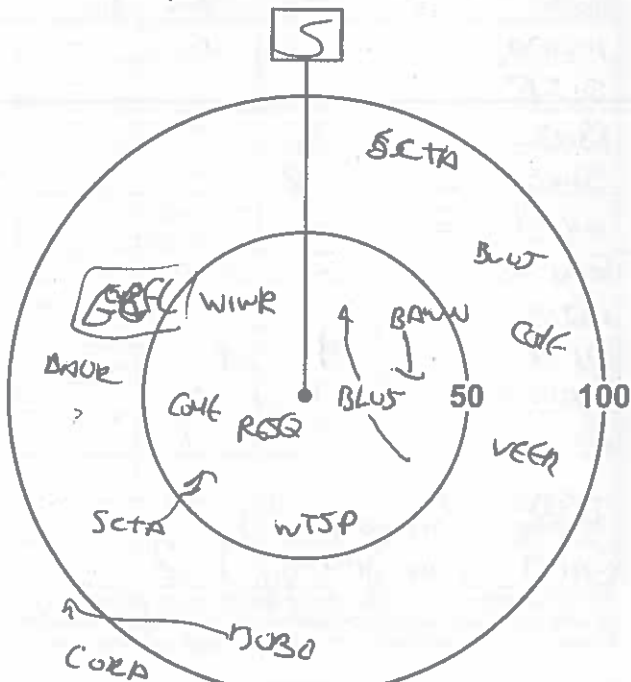
End Time: 7:20

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

Species	<50m	50-100m	>100m	Flyovers	Height*
RESQ	-	+	-	1	-
BLUS	1	1	-	-	-
BAWW	-	-	-	-	-
COYE	1	1	-	-	-
WIWR	1	-	-	-	-
WTSP	1	-	-	-	-
SCTA	1	1	-	-	-
GCFL	-	1	-	-	-
BAOR	-	1	-	-	-
VEGR	-	1	-	-	-
COYA	-	-	1	-	-
WETU	INCIDENTAL (2)				
WOTH	INCIDENTAL (1)				

* Height of blade sweep will vary from project to project; check with project manager.
 O-On ground; A-Below height of blade sweep; B-At height of blade sweep;
 C-Above height of blade sweep; D-Well above height of blade sweep
 RESQ 1

NOISE 3



Page 3 of 4

Signature: _____

[Signature]
(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

REV: 2011-05-04 / FORM 020

Station: BBS6

Feature: _____

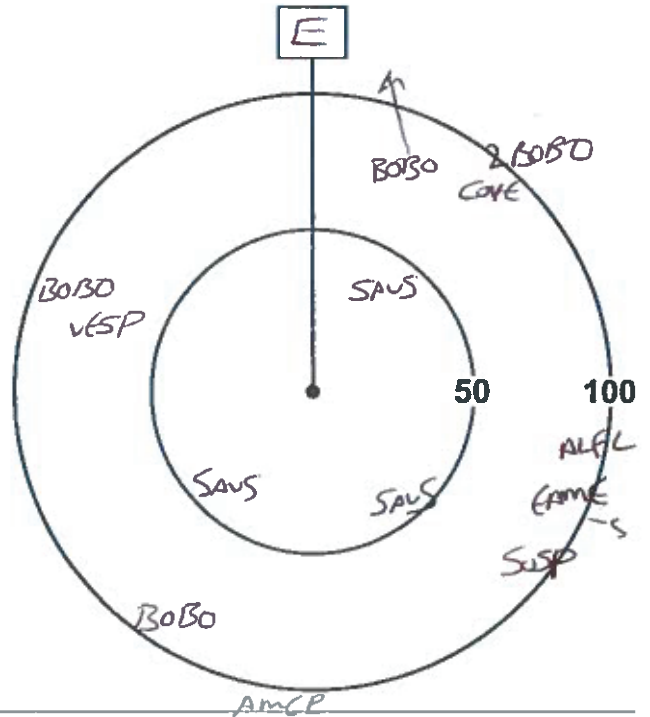
UTM: _____

Start Time: 7:47

End Time: 7:57

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

Species	<50m	50-100m	>100m	Flyovers	Height*
SAVS	3	-	-	-	-
VESP	-	1	-	-	-
BOBO	-	2	3	-	-
COYE	-	4	-	-	-
ALFL	-	-	1	-	-
EAME	-	-	1	-	-
SOSP	-	1	-	-	-
AMCR	-	-	4	-	-



* Height of blade sweep will vary from project to project, check with project manager.
 O-On ground, A-Below height of blade sweep, B-At height of blade sweep,
 C-Above height of blade sweep, D-Well above height of blade sweep

Station: BBS7

Feature: _____

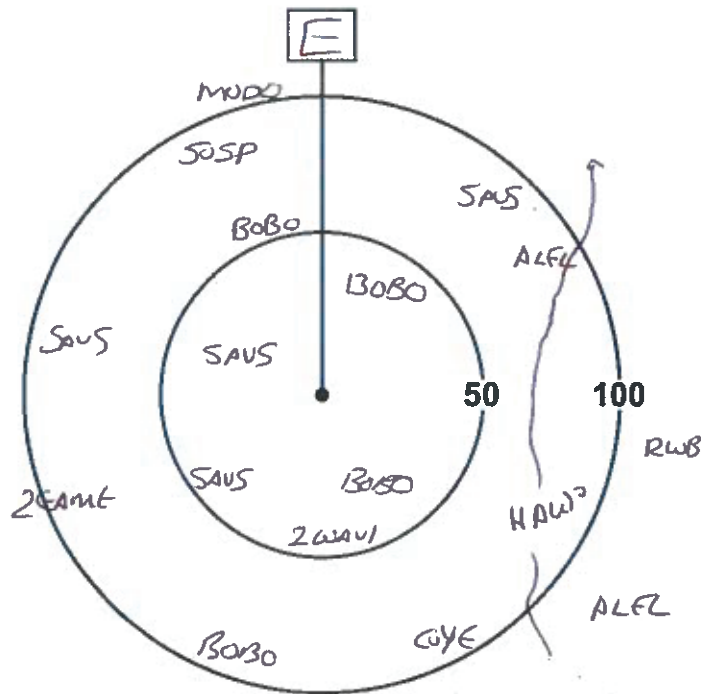
UTM: _____

Start Time: 8:02

End Time: 8:12

Habitat: Forest / Swamp / Marsh / Hay / Pasture / Crop

Species	<50m	50-100m	>100m	Flyovers	Height*
MUDO	-	-	1	-	-
SOSP	-	1	-	-	-
BOBO	2	2	-	-	-
SAVS	2	2	-	-	-
WAUI	2	-	-	-	-
EAME	-	2	-	-	-
COYE	-	1	-	-	-
ALFL	-	4	1	-	-
HAWO	-	1	-	-	-
RWBL	-	-	1	-	-
TRUV TRUV (INCIDENTAL)			1		
EAKI (INCIDENTAL)			2		



* Height of blade sweep will vary from project to project, check with project manager.
 O-On ground, A-Below height of blade sweep, B-At height of blade sweep,
 C-Above height of blade sweep, D-Well above height of blade sweep

Page 4 of 4

Signature: _____

[Handwritten Signature]

(Field Personnel)

Quality Control: This form is complete & legible .

Signature: _____

(Project Manager)

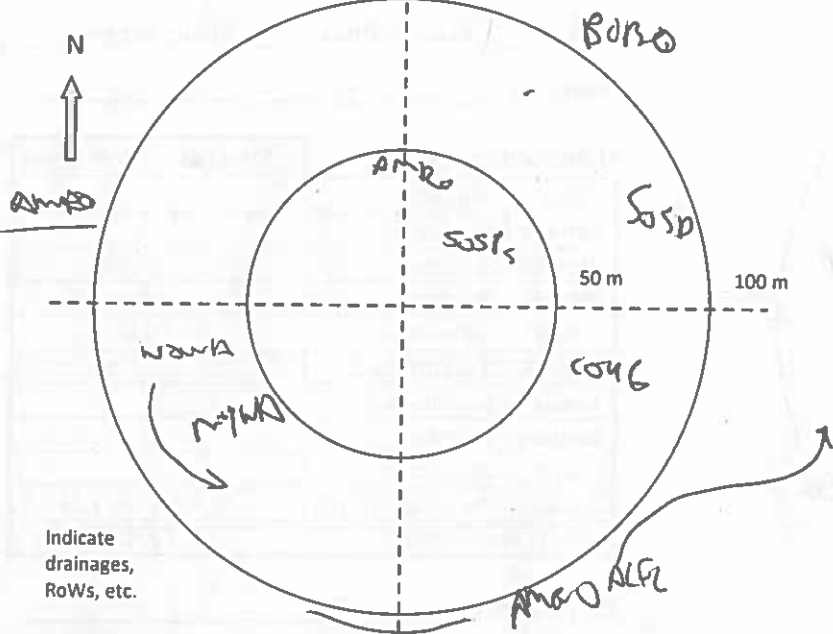
REV: 2011-05-04 / FORM 020

Prairie Breeding Bird Survey

Project Name: Airport Pt Project Number: 160961321 Biologist: RO Date: JUNE 19 2005

Start time: 6:51 UTM Zone: _____ Easting: _____ Northing: _____ Waypoint: 015005

Temp(°C): 12 Wind (Beaufort): 1 Precipitation: _____ Cloud cover: _____ %



Noise level: 1 LLD: _____

_____ % grassland _____ % shrub
 _____ % pasture _____ % wetland/riparian
 _____ % tilled _____ % anthropogenic
 _____ % other (e.g., CWG): _____

Wetlands:
 Class: _____ Inundation: _____
 Cover: _____ Size: _____
 Plot visible: _____ % (50 m) _____ % (100 m)

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Wetland?	Behaviour / comments
AMRO	1	U	A		Y	100+					
BOBO	1	M	A		Y	↓					
ALFI	1	M	A		Y	↓					
AMRO	1	U	A		Y	↓					
MYWA	1	M	A		Y	50-100					
NOWA	1	M	A		Y	↓					
COYG	1	M	A		Y	↓					
SOSP	1	M	A		Y	↓					
SOSP	1	U	A	Y	Y	50					
AMRO	1	U	A	Y	Y	50					

¹ - adult (A), juvenile (J), or unknown (U)
² - only required for species of management concern
³ - check off this column if the observation is an incidental (>100 m from observation point)

Forest Breeding Bird Survey

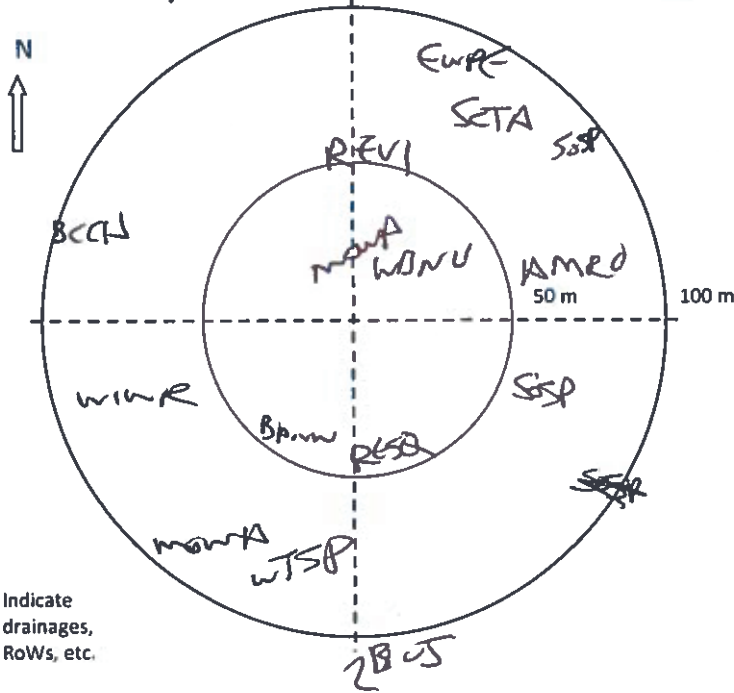
Project Name: _____ Project Number: 160961321 Biologist: BO Date: June 17, 2016

Start time: 7:11 UTM Zone: _____ Easting: _____ Northing: _____ Waypoint: BBS04

Temp(°C): 14 Wind (Beaufort): _____ Precipitation: _____ Cloud cover: 0 %

Noise: Ecosite Phase: _____ Struc. Stage: _____

Photos: _____



Dominant vegetation:		Species	% of layer
Tree canopy	Primary		
	Secondary		
Total canopy cover			%
Shrub layer	Primary		
	Secondary		
High (>3m) shrub cover			%
Low (<3m) shrub cover			%
Ground cover	Primary		
	Secondary		
Snag density within 100 m		N / L / M / H	
Coarse woody debris		Y / N	

Other notes: _____

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Behaviour / comments
EWPE										
BLUS	2	-	A		4	100+				
EWPE	1	♂	A		4	50-100				
WTSP	1	♂	A		4	50-100				
MOWA	1	m	A		4	50-100				
WINK	1	m	A		4	50-100				
BCCA	1	♀	A			50-100				
SETA	1	m	A							
SOSP	1	↓	↓							
REVI	1	↓	↓							
MOWA	1	F	A	4	4	50				
WONU	1	m	A		4	50				
BAWW	1	m	A		4	50				
RESQ	1					50				

¹ - adult (A), juvenile (J), or unknown (U)

² - only required for species of management concern

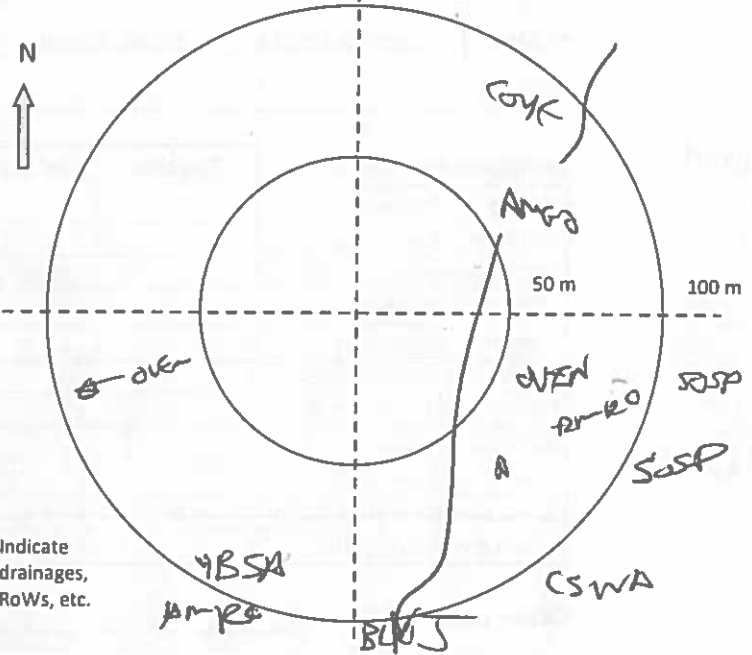
³ - check off this column if the observation is an incidental (>100 m from observation point, or before/after the count)

Prairie Breeding Bird Survey

Project Name: Airport Pit Project Number: 160961321 Biologist: Robermayer Date: June 18

Start time: 7:32 UTM Zone: Easting: Northing: Waypoint: BUSO3

Temp(°C): 13 Wind (Beaufort): 1 Precipitation: Cloud cover: 0 %



Indicate drainages, RoWs, etc.

Noise level: LLD:

 % grassland % shrub

 % pasture % wetland/riparian

 % tilled % anthropogenic

 % other (e.g., CWG):

Wetlands:

Class: Inundation:

Cover: Size:

Plot visible: % (50 m) % (100 m)

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Wetland?	Behaviour / comments
COYK	1	M	A		Y	50-100					
AMGO	1	U	A		Y				Y		
OVEN	2	M	A		Y						
AMRO	1	U	A		Y						
SOSP	2	M	A		Y	100+					
CSWA	1	M	A		Y	100+					
BLUS	1	U	A		Y	100+					
AMRO	1	U	A		Y	100+					
YBSA	1	U	A		Y	50					

¹ - adult (A), juvenile (J), or unknown (U)
² - only required for species of management concern
³ - check off this column if the observation is an incidental (>100 m from observation point)

Forest Breeding Bird Survey

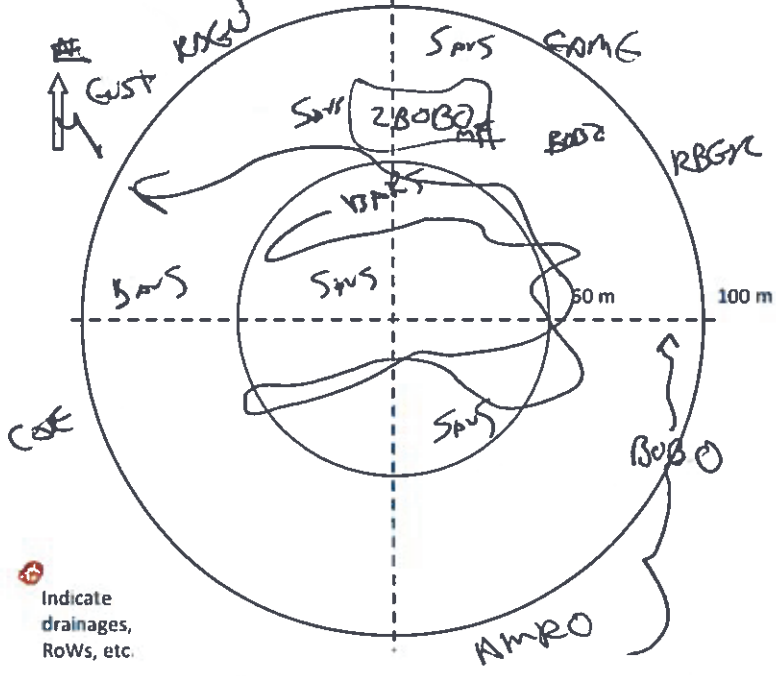
Project Name: Airport Pit Project Number: 16961321 Biologist: Robert May Date: June 17

Start time: 7:52 UTM Zone: Easting: Northing: Waypoint: BBS 5008

Temp(°C): 10 Wind (Beaufort): Precipitation: Cloud cover: 0 %

Noise: Ecosite Phase: Struc. Stage:

Photos:



Dominant vegetation:		Species	% of layer
Tree canopy	Primary		
	Secondary		
Total canopy cover			%
Shrub layer	Primary		
	Secondary		
High (>3m) shrub cover			%
Low (<3m) shrub cover			%
Ground cover	Primary		
	Secondary		
Snag density within 100 m		N / L / M / H	
Coarse woody debris		Y / N	

Other notes:

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Behaviour / comments
EUST	4	U	U		Y	100+				
RBGR	1	U	U		Y	100+				
COYE	1	m	A		Y					
AMRO	1	U	U		Y					
RBGR	1	m	A		Y					
EAME	1	U	A		Y					
BOBO	1	m	A		Y	100+				
SAVS	3	U	A	Y	Y	50-100				
BOBO	2	m	A	Y	Y	50-100				
BOBO	1	F	A	Y	Y					
BARS	1	m	A	Y	Y	50				
SAVS	2	U	A	Y	Y	50				

¹ - adult (A), juvenile (J), or unknown (U)

² - only required for species of management concern

³ - check off this column if the observation is an incidental (>100 m from observation point, or before/after the count)

incidental BARS

BOBO IIII
EAME IIII

Prairie Breeding Bird Survey

Project Name: Airport Pit Project Number: 60961321 Biologist: B. Berninger Date: June 17

Start time: 06:12 UTM Zone: _____ Easting: _____ Northing: _____ Waypoint: BBS007

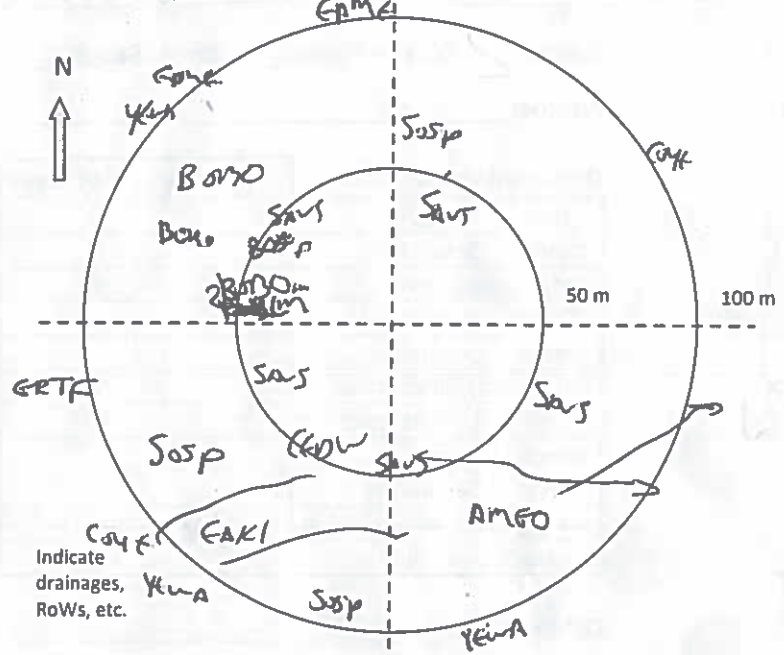
Temp (°C): 90 Wind (Beaufort): 1 Precipitation: — Cloud cover: 0 %

Noise level: 2 LLD: _____

_____ % grassland _____ % shrub
 _____ % pasture _____ % wetland/riparian
 _____ % tilled _____ % anthropogenic
 _____ % other (e.g., CWG): _____

Wetlands:
 Class: _____ Inundation: _____
 Cover: _____ Size: _____

Plot visible: _____ % (50 m) _____ % (100 m)



Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Wetland?	Behaviour / comments
EMEX	2	U	A	—	Y	100+					
EAKI											
YEWA	2	m	A		Y	100+					
COYE	2	m	A		Y	100+					
BOYSO	2	M	A		Y	50-100					
BOBO	2	m	A	Y	Y	50					
BOBO	1	F	A	Y	Y	50					
EAKI	1	U	A	Y	—	50-100					
SOSP	3	U	A	W	Y	50-100					
AMFO	1	U	A	N	Y	50-100			Y		
SAYS	1	U	A	N	Y	50-100					
SAYS	4	U	A	Y	Y	50					
CCDW	1	U	A	Y	Y	50			Y		
GRTF											

¹ - adult (A), juvenile (J), or unknown (U)
² - only required for species of management concern
³ - check off this column if the observation is an incidental (>100 m from observation point)

BOBO HTM III
 III

13 PT
 SPA 4132.

Forest Breeding Bird Survey

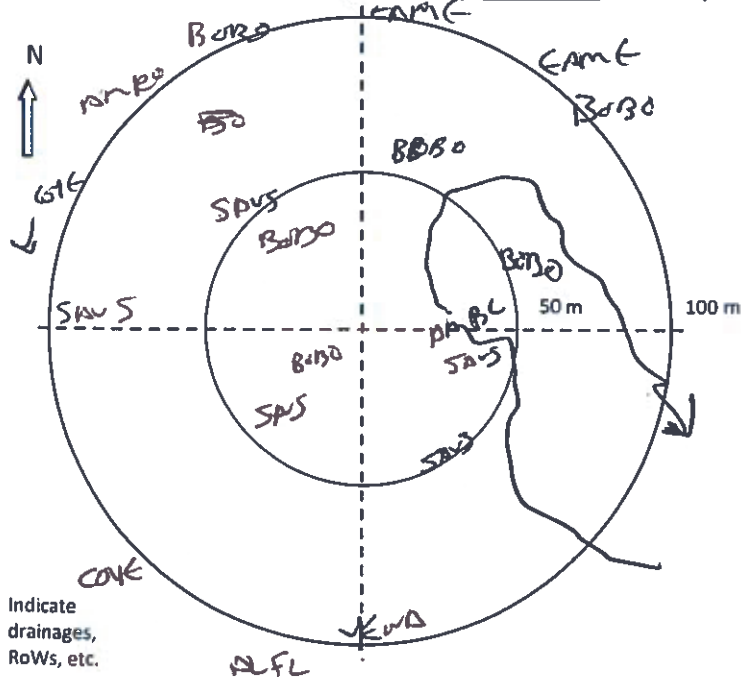
Project Name: Airport Pit Project Number: 160961321 Biologist: BO Date: June 18, 2014

Start time: 6:32 UTM Zone: Easting: Northing: Waypoint: BBS006

Temp(°C): 11 Wind (Beaufort): Precipitation: Cloud cover: 0 %

Noise: 2 Ecosite Phase: Struc. Stage:

Photos:



Dominant vegetation:		Species	% of layer
Tree canopy	Primary		
	Secondary		
Total canopy cover			%
Shrub layer	Primary		
	Secondary		
High (>3m) shrub cover			%
Low (<3m) shrub cover			%
Ground cover	Primary		
	Secondary		
Snag density within 100 m		N / L / M / H	
Coarse woody debris		Y / N	

Other notes:

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Behaviour / comments
BOBO	2	m	A		Y	100+				
EAME	2	U	A		Y	↓				
AmRO	1	m	A		Y	↓				
COYE	2	m	A		Y	↓				
AMBL	1	m	A		Y	↓				
BOBO	2	m	A	Y	Y	50-100				
YEW	1	m	A		Y	↓				
SAUS	2	m	A		Y	↓				
BOBO	1	F	A	Y	Y	50				
↓	1	m	J	Y	Y	↓				
AMBL	1	U	A	Y	N	↓				
SAUS	3	U	A	Y	Y	↓				

¹ - adult (A), juvenile (J), or unknown (U)

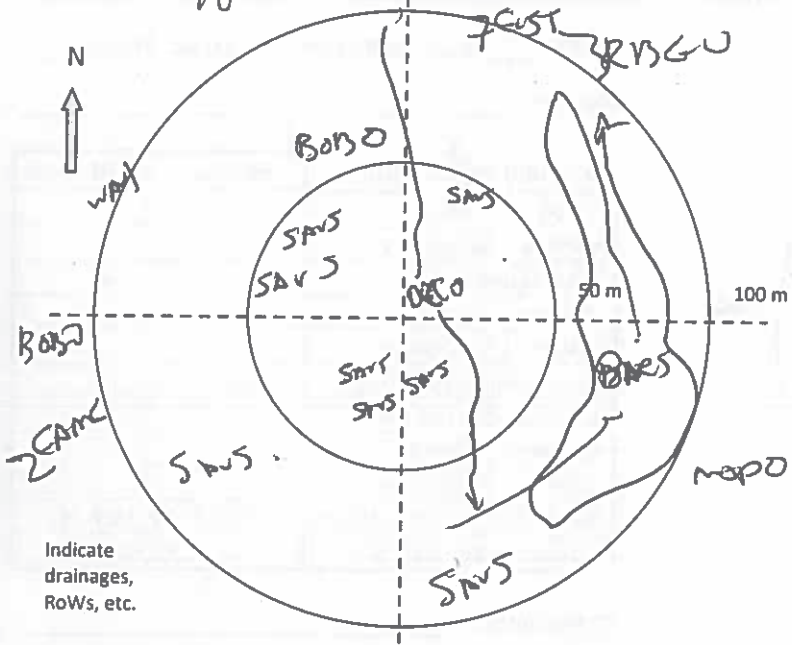
² - only required for species of management concern

³ - check off this column if the observation is an incidental (>100 m from observation point, or before/after the count)

Prairie Breeding Bird Survey

Project Name: Airport Pit Project Number: 16961321 Biologist: Bobenmyer Date: June 18
 Start time: 8:15 UTM Zone: Easting: Northing: Waypoint: BRS001

Temp(°C): 16 Wind (Beaufort): Precipitation: Cloud cover: 0 %



Noise level: 7 LLD:
 ___% grassland ___% shrub
 ___% pasture ___% wetland/riparian
 ___% tilled ___% anthropogenic
 ___% other (e.g., CWG):

Wetlands:
 Class: Inundation:
 Cover: Size:

Plot visible: ___% (50 m) ___% (100 m)

Species	#	Sex	Age ¹	Seen	Heard	Dist. (m)	Bearing ²	Inc. ³	Fly-by	Wetland?	Behaviour / comments
EUST	7	U	U	Y	Y	100+					
RBGU	3	U	U	Y	Y						
MOPD	1	U	A		Y						
EAME	2	U	A		Y						
BOBO	1	M	A		Y						
WPU1	1	M	A		Y						
BOBO	1	M	A		Y	50-100					
BARNS	1	U	A		Y	50-100					
SAUS	2	U	A	Y	Y	50-100					
SAUS	5	U	A	Y	Y	50					
DCCO	1	U	A	Y	N	50			Y		

¹ - adult (A), juvenile (J), or unknown (U)
² - only required for species of management concern
³ - check off this column if the observation is an incidental (>100 m from observation point)



Stantec Consulting Ltd.
 1 - 70 Southgate Drive
 Guelph, ON
 Canada N1G 4P5
 Tel: (519) 836-6050
 Fax: (519) 836-2493

Bobolink and Eastern Meadowlark Breeding Survey Form

Stantec

Project Number: 160961321

Project Name: LAVANRUCH OTTAWA AIRPORT PTT

Date: JUNE 5, 2019

Field Personnel: BRET WARDEN & BRYAN RYAN

Weather Conditions:	TEMP (°C): <u>12-16</u>	WIND: <u>1</u>	CLOUD: <u>100</u>	PPT: <u>0</u>	PPT (in last 24 hrs): <u>RAIN</u>
---------------------	----------------------------	-------------------	----------------------	------------------	--------------------------------------

Please mark transect location on map and indicate areas of species observations on map.

Transect No.: 1

Habitat: PASTURE

Start Time: 6:00

End Time: 6:45

Start Point UTM: _____

End Point UTM: _____

Species	Tally
Bobolink	<u> </u>
Eastern Meadowlark	<u> </u>

Transect No.: 2

Habitat: PASTURE

Start Time: 7:43

End Time: 8:06

Start Point UTM: _____

End Point UTM: _____

Species	Tally
Bobolink	<u> </u>
Eastern Meadowlark	<u> </u>

Pg ___ of ___

Quality Control: This form is complete & legible .

Signature: _____
 (Field Personnel)

Signature: _____
 (Project Manager)

Amphibian Breeding Survey

Project Name: Covernagh - Airport/Albion Project Number: 160961321 Date: 11/4/2019 Zone: 18T

Biologist: Josh Mansell Waypoint prefix: CAPIQUJM Moon phase: Waning Crescent - 15%

Weather during previous 24 hours (precipitation, temperature range): No precip - 2/hrs. Range 5 - 23°

Survey locations:

Time	Broadcast location			Wetland type	Environment							Notes
	Wpt	Easting	Northing		Temp	Wind	% cloud	Precip	Noise	Moon (Y/N)	Aurora (Y/N)	
0836	001	452965	545195	MA	13	3	0	0	1-2	4	N	Former pit.
0847	002	451926	545516	SW	13	1	0	0	1	4	N	Cont. see lecture
0915	003	451690	545383	Sw/Pond	12	1	0	0	1	4	N	Flooded swamp / call <small>calls pond</small>
0940	004	452282	545706	MA	11	2	0	0	2	4	N	Flooded field.

Detection data:

Wpt	Species	#	Amphib Detectability ¹	Detection location		Triangulation location					Notes ⁴	
				Bearing	Distance	Wpt	Easting	Northing	Bearing	Distance		
001	SPPE	n/a	3	84°	100	n/a						
002	SPPE	n/a	3	180°	150	n/a						
002	AMTO	n/a	3	200°	50	n/a						
003	SPPE	n/a	3	307°	50	n/a						
003	AMTO	n/a	3	307°	50	n/a						
003	WGR	n/a	2	307°	50	n/a					SPPE too loud #	
004	SPPE	4	1	250°	5	n/a						

¹ - Amphibian detectability: 1 - calls not overlapping 2 - calls overlapping but distinguishable 3 - full chorus with individuals indistinguishable
² - Behaviour: 1 - Vocalizing on arrival at station 4 - Flying by after interspecific call 6 - Arriving in silence after interspecific call
 2 - Vocalizing after interspecific call 5 - Flying by after conspecific call 7 - Arriving in silence after conspecific call
 3 - Vocalizing after conspecific call 8 - Aggressive response
³ - Stimulus: last species broadcast prior to response
⁴ - Number any additional notes and expand on them in the space below

Additional comments: 001 - Vocalizing on arrival. REER (G) CAGO
 002 - same AMRO 2:50 SAS
 003 - same MALL + EAME #
 004 - same RTHA (G) 3:24

001 - former aggregate pit
- appears to be shallow.
- hard-stemmed bulrush riparian.

002 - Mixed Forest swamp
- conditions unknown.

003 - flooded Golf Course + ponds
- former swampland
- depth unknown

004 - vernal pool within active pasture
- ~ 15cm depth.

2 of 2

JM

Amphibian Breeding Survey

Project Name: Carrington - Airport Project Number: 1609601321 Date: June 20/19 Zone: 1BT
 Biologist: J. Marshall Waypoint prefix: CAP190JM Moon phase: Full Moon - 9106

Weather during previous 24 hours (precipitation, temperature range): ~1-3mm rain, 14-18°C range

Survey locations:

Time	Broadcast location			Wetland type	Environment							Notes
	Wpt	Easting	Northing		Temp	Wind	% cloud	Precip	Noise	Moon (Y/N)	Aurora (Y/N)	
2135	001	452965	505595	MA	17	2	20	0	2	N	N	-
2155	002	451926	505518	SW	16	1	30	0	2	N	N	-
2215	003	451690	505589	Pond	16	2	20	0	2	N	N	-
2240	004	452982	505706	MA	16	2	20	0	2	N	N	-

Detection data:

Wpt	Species	#	Amphib Detectability ¹	Detection location		Triangulation location					Notes ⁴
				Bearing	Distance	Wpt	Easting	Northing	Bearing	Distance	
001	SPPE	1	1	134°	100	n/a	—	—	—	—	Drawn out by GRTR
001	GRTR	3	1	243°	150+	n/a	—	—	—	—	-
002	GRTR	3	1	190°	50	n/a	—	—	—	—	-
003	GRTR	3	1	275°	50	n/a	—	—	—	—	-
004	GRTR	3	1	191°	100	n/a	—	—	—	—	Same as 003
004	GRTR	2	1	45°	50	n/a	—	—	—	—	-

¹ - Amphibian detectability: 1 - calls not overlapping 2 - calls overlapping but distinguishable 3 - full chorus with individuals indistinguishable
² - Behaviour: 1 - Vocalizing on arrival at station 4 - Flying by after interspecific call 6 - Arriving in silence after interspecific call
 2 - Vocalizing after interspecific call 5 - Flying by after conspecific call 7 - Arriving in silence after conspecific call
 3 - Vocalizing after conspecific call 8 - Aggressive response
³ - Stimulus: last species broadcast prior to response
⁴ - Number any additional notes and expand on them in the space below

Additional comments:
 Gray tree frog chorus drawn out most other calls.
 Under airport approach → loud!!



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Fax: (519) 836-2493

Wildlife Habitat Assessment Form

Project Number: V00261921 Polygon No.: Pasture Field
Assessment Type: Visual; no access / Entire; walk through feature / Partial access (indicate on map)

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (last 24 hrs):
	19	1-2	0	0	0

NOTES & SPECIES OBSERVATIONS (list species and type of observation, indicate on map):

See PBS results

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den;
OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Wildlife Habitat Type & Description	Site Assessment	Photo ID	Map ID	UTM Coordinates		
				Zone	Easting	Northing
ALL SITES						
Bat Hibernacula: Caves, abandoned mines, underground foundations, karst features	Size of opening(s) Bedrock Type Depth of feature (if possible)					
Snake Hibernacula: Burrows, rock crevices, fissures that extend below the frost line (i.e. at least 1 m)	Number of access points Size of opening(s) Substrate					
Bank / Cliff Colonial Bird Nesting Habitat: Exposed soil banks, undisturbed, naturally eroding, steep slopes, cliff faces with evidence of nests or burrows	Size of burrow Number of burrows					
Stick Nests: Stick nests found in any forest/ woodland/swamp; includes heron colonies and bald eagle/ osprey/other raptor nests	Tree species Nest size					
WOODLANDS						
Vernal Pools: Permanent or semi-permanent pool or pond. Evidence of holding water in most years through late spring (i.e. late May) or into summer	Number of features Feature size (diameter) Water depth					
Seeps and Springs: Locations where groundwater comes to the surface in forests (see document for indicator species)	Sub/emergent veg present Shrubs/logs at edge present Water permanency					
WETLANDS						
Turtle Wintering Areas: Permanent water bodies, large wetlands, bogs, or fens with soft substrates and deep enough not to freeze solid	Feature size (diameter) Water depth Substrate of water body Water permanency					
Turtle Nesting Habitat: Exposed mineral soil (sand or gravel) areas adjacent (<100 m) to MAM/SA/BOO/ FEO (note if man-made)	Type of substrate Distance to wetland Size of feature					
Terrestrial Crayfish Habitat: Edges of shallow marshes and meadows (no minimum size) with crayfish chimneys	Number of chimneys					

Page 2 of 2

Print Name: J. Marshall

(Field Notes Author)

Quality Control: This form is complete & legible

Signature: _____

(Field Notes QA/QC personnel)

REV: 2016-09-07



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Wildlife Habitat Assessment Form

Project Number: 16CA60921 Polygon No.: P1-1-10
Assessment Type: Visual; no access/ Entire; walk through feature/ Partial access (indicate on map)

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (last 24 hrs):
	20	1-2	0	0	0

NOTES & SPECIES OBSERVATIONS (list species and type of observation, indicate on map):

See BBS.

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den;
OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Wildlife Habitat Type & Description	Site Assessment	Photo ID	Map ID	UTM Coordinates		
				Zone	Easting	Northing
ALL SITES						
Bat Hibernacula: Caves, abandoned mines, underground foundations, karst features	Size of opening(s) Bedrock Type Depth of feature (if possible)					
Snake Hibernacula: Burrows, rock crevices, fissures that extend below the frost line (i.e. at least 1 m)	Number of access points Size of opening(s) Substrate					
Bank / Cliff Colonial Bird Nesting Habitat: Exposed soil banks, undisturbed, naturally eroding, steep slopes, cliff faces with evidence of nests or burrows	Size of burrow Number of burrows					
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WOODLANDS						
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Seeps and Springs: Locations where groundwater comes to the surface in forests (see document for indicator species)	Sub/emergent veg present Shrubs/logs at edge present Water permanency					
WETLANDS						
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Terrestrial Crayfish Habitat: Edges of shallow marshes and meadows (no minimum size) with crayfish chimneys	Number of chimneys					

Page 2 of 2

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JMG-1960-1970

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE (project no./name): <u>Carronagh - Airport HT</u>	POLYGON: <u>SW feature</u>	
	SURVEYOR(S): <u>J. Marshall</u>	DATE: <u>August 19, 2009</u>	PHOTO No.:
	START: <u>1100</u>	END: <u>1400</u>	ZONE & UTM: <u>1ST 4STAGE, SCHAMMAY</u>

POLYGON DESCRIPTION

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

STAND DESCRIPTION:

LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1 CANOPY	2	4	THUCCCT > ACER ROR > BETALLE > ABIBALS
2 SUB-CANOPY	3	2	THUCCCT > ULMAMER > ACER ROR
3 UNDERSTOREY	4	2	PRVTRG > PAROUTU > VITPRA > RUSIDEA
4 GRD. LAYER	5	4	Incorporated Com = DRYCART > Skunk Current

HT CODES: 1=>25m 2=10<HT<25m 3=2<HT<10m 4=1<HT<2m 5=0.5<HT<1m 6=0.2<HT<0.5m 7=HT<0.2m
CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: THUCCCT, ACER ROR, ULMAMER. BA: na.

SIZE CLASS ANALYSIS: R <10 O 10-24 A 25-50 B >50

STANDING SNAGS: R <10 R 10-24 R 25-50 N >50

DEADFALL/LOGS: R <10 O 10-24 O 25-50 R >50

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

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

SOIL ANALYSIS: na

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

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS: <u>Syrm</u>	CODE: <u>SW</u>
COMMUNITY SERIES: <u>Carronagh SW</u>	CODE: <u>SWC</u>
ECOSITE: <u>White Cedar Mosaic</u>	CODE: <u>SWCM1</u>
VEGETATION TYPE: <u>White Cedar</u>	CODE: <u>SWCM1-1</u>
INCLUSION: <u>na</u>	CODE: <u>-</u>
COMPLEX: <u>na</u>	CODE: <u>-</u>

Notes: (e.g. disturbance, surface water depths, etc.)

CEVA
Red Squirrel
SCOP

BLJA
RWBB
BCH.

*No pooling water (canal pools)
+ saturated soils observed

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER				COLL.	SPECIES CODE	LAYER				COLL.
	1	2	3	4			1	2	3	4	
<u>ACE ROR</u>	<u>A</u>	<u>R</u>				<u>ScL CANA</u>				<u>D</u>	
<u>ULMAMER</u>	<u>O</u>	<u>O</u>				<u>Smooth Borage</u>				<u>D</u>	
<u>ABIBALS</u>	<u>O</u>					<u>Japanese Wf</u>				<u>A</u>	
<u>SALIX SP</u>		<u>R</u>				<u>Shardleaf</u>				<u>A</u>	
<u>PEPTREM</u>	<u>O</u>					<u>Incorporated Com</u>				<u>A</u>	
<u>BETALLE</u>	<u>O</u>					<u>RUBUSIDEA PUDE</u>				<u>A</u>	
<u>THUCCCT</u>	<u>A</u>	<u>A</u>				<u>Poplar Skunk</u>				<u>A</u>	
						<u>Rasperry + Current</u>				<u>A</u>	
						<u>Royal Fern</u>				<u>O</u>	<u>R</u>
						<u>Sensitive Fern</u>				<u>O</u>	<u>O</u>
						<u>BS Nightshade</u>				<u>O</u>	<u>O</u>
						<u>White Trillium</u>				<u>O</u>	<u>O</u>
						<u>Jack N-pit</u>				<u>O</u>	<u>O</u>
						<u>Antennaria</u>				<u>O</u>	<u>O</u>
						<u>Quilfer</u>				<u>O</u>	<u>O</u>
						<u>Iron Flower</u>				<u>O</u>	<u>O</u>
						<u>MAI CANA</u>				<u>O</u>	<u>O</u>
						<u>White Aster</u>				<u>O</u>	<u>O</u>
						<u>Jerspanik</u>				<u>O</u>	<u>O</u>
						<u>Pison Ivy</u>				<u>O</u>	<u>O</u>
						<u>Sealed</u>				<u>O</u>	<u>O</u>
						<u>Tail Nettle</u>				<u>O</u>	<u>O</u>
						<u>Burdock</u>				<u>O</u>	<u>O</u>
						<u>Red Elderberry</u>				<u>R</u>	
						<u>VITRIPA</u>				<u>O</u>	
						<u>Virginian Creeper</u>				<u>A</u>	
						<u>Choke Cherry</u>				<u>O</u>	
						<u>Red Raspberry</u>				<u>O</u>	
						<u>Arcocarpus p.</u>					<u>O</u>

Page 1 of 2

Print Name: J. Marshall
(Field Notes author)

Quality Control: This form is complete & legible

Signature: _____
(Field Notes QA/QC personnel)



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Canada N1G 4P5
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Fax: (519) 836-2493

Wildlife Habitat Assessment Form

Project Number: 16062391 Polygon No.: SWP
Assessment Type: Visual; no access/ Entire; walk through feature/ Partial access (indicate on map)

Weather Conditions:

TEMP (°C): <u>26</u>	WIND: <u>2-3</u>	CLOUD: <u>20%</u>	PPT: <u>0</u>	PPT (last 24 hrs): <u>1-3mm</u>
-------------------------	---------------------	----------------------	------------------	------------------------------------

NOTES & SPECIES OBSERVATIONS (list species and type of observation, indicate on map):

Red Squirrel
White-tailed Deer

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den;
OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Wildlife Habitat Type & Description	Site Assessment	Photo ID	Map ID	UTM Coordinates		
				Zone	Easting	Northing
ALL SITES						
Bat Hibernacula: Caves, abandoned mines, underground foundations, karst features	Size of opening(s) Bedrock Type Depth of feature (if possible)					
Snake Hibernacula: Burrows, rock crevices, fissures that extend below the frost line (i.e. at least 1 m)	Number of access points Size of opening(s) Substrate					
Bank / Cliff Colonial Bird Nesting Habitat: Exposed soil banks, undisturbed, naturally eroding, steep slopes, cliff faces with evidence of nests or burrows	Size of burrow Number of burrows					
Stick Nests: Stick nests found in any forest/ woodland/swamp; includes heron colonies and bald eagle/ osprey/other raptor nests	Tree species Nest size					
WOODLANDS						
Vernal Pools: Permanent or semi-permanent pool or pond. Evidence of holding water in most years through late spring (i.e. late May) or into summer	Number of features Feature size (diameter) Water depth					
Seeps and Springs: Locations where groundwater comes to the surface in forests (see document for indicator species)	Sub/emergent veg present Shrubs/logs at edge present Water permanency					
WETLANDS						
Turtle Wintering Areas: Permanent water bodies, large wetlands, bogs, or fens with soft substrates and deep enough not to freeze solid	Feature size (diameter) Water depth Substrate of water body Water permanency					
Turtle Nesting Habitat: Exposed mineral soil (sand or gravel) areas adjacent (<100 m) to MAM/SA/BOO/ FEO (note if man-made)	Type of substrate Distance to wetland Size of feature					
Terrestrial Crayfish Habitat: Edges of shallow marshes and meadows (no minimum size) with crayfish chimneys	Number of chimneys					

Page 2 of 2

Print Name: J. Masell

(Field Notes Author)

Quality Control: This form is complete & legible

Signature: _____

(Field Notes QA/QC personnel)

REV: 2016-09-07



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Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Wildlife Habitat Assessment Form

Project Number: 160901921 Polygon No.: WCDMS-1
Assessment Type: -Visual; no access/-Entire; walk through feature/-Partial access (indicate on map)

Weather Conditions: TEMP (°C): 27 WIND: 2-3 CLOUD: 0 du PPT: 0 PPT (last 24 hrs): 1-2mm

NOTES & SPECIES OBSERVATIONS (list species and type of observation, indicate on map):

None.

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den;
OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Wildlife Habitat Type & Description	Site Assessment	Photo ID	Map ID	UTM Coordinates		
				Zone	Easting	Northing
ALL SITES						
Bat Hibernacula: Caves, abandoned mines, underground foundations, karst features	Size of opening(s) Bedrock Type Depth of feature (if possible)					
Snake Hibernacula: Burrows, rock crevices, fissures that extend below the frost line (i.e. at least 1 m)	Number of access points Size of opening(s) Substrate					
Bank / Cliff Colonial Bird Nesting Habitat: Exposed soil banks, undisturbed, naturally eroding, steep slopes, cliff faces with evidence of nests or burrows	Size of burrow Number of burrows					
Stick Nests: Stick nests found in any forest/ woodland/swamp; includes heron colonies and bald eagle/ osprey/other raptor nests	Tree species Nest size					
WOODLANDS						
Vernal Pools: Permanent or semi-permanent pool or pond. Evidence of holding water in most years through late spring (i.e. late May) or into summer	Number of features Feature size (diameter) Water depth					
Seeps and Springs: Locations where groundwater comes to the surface in forests (see document for indicator species)	Sub/emergent veg present Shrubs/logs at edge present Water permanency					
WETLANDS						
Turtle Wintering Areas: Permanent water bodies, large wetlands, bogs, or fens with soft substrates and deep enough not to freeze solid	Feature size (diameter) Water depth Substrate of water body Water permanency					
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Terrestrial Crayfish Habitat: Edges of shallow marshes and meadows (no minimum size) with crayfish chimneys	Number of chimneys					

Page 2 of 2

Print Name: J. Marshall

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Wildlife Habitat Assessment Form

Project Number: 160961891 Polygon No.: TAGND-1
Assessment Type: -Visual; no access/-Entire; walk through feature/-Partial access (indicate on map)

Weather Conditions: TEMP (°C): 27 WIND: 2-3 CLOUD: 100% PPT: 0 PPT (last 24 hrs): rain

NOTES & SPECIES OBSERVATIONS (list species and type of observation, indicate on map):

AAWO Bach
NCH
Sawo

CA=carcass; DP=distinctive parts; FE=feeding evidence; FY=eggs/nest; HO=house/den;
OB=observed; SC=scat; SI=other sign; TK=track; VO=vocalization

Wildlife Habitat Type & Description	Site Assessment	Photo ID	Map ID	UTM Coordinates		
				Zone	Easting	Northing
ALL SITES						
Bat Hibernacula: Caves, abandoned mines, underground foundations, karst features	Size of opening(s) Bedrock Type Depth of feature (if possible)					
Snake Hibernacula: Burrows, rock crevices, fissures that extend below the frost line (i.e. at least 1 m)	Number of access points Size of opening(s) Substrate					
Bank / Cliff Colonial Bird Nesting Habitat: Exposed soil banks, undisturbed, naturally eroding, steep slopes, cliff faces with evidence of nests or burrows	Size of burrow Number of burrows					
Stick Nests: Stick nests found in any forest/ woodland/swamp; includes heron colonies and bald eagle/ osprey/other raptor nests	Tree species Nest size					
WOODLANDS						
Vernal Pools: Permanent or semi-permanent pool or pond. Evidence of holding water in most years through late spring (i.e. late May) or into summer	Number of features Feature size (diameter) Water depth					
Seeps and Springs: Locations where groundwater comes to the surface in forests (see document for indicator species)	Sub/emergent veg present Shrubs/logs at edge present Water permanency					
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Turtle Wintering Areas: Permanent water bodies, large wetlands, bogs, or fens with soft substrates and deep enough not to freeze solid	Feature size (diameter) Water depth Substrate of water body Water permanency					
Turtle Nesting Habitat: Exposed mineral soil (sand or gravel) areas adjacent (<100 m) to MAM/SA/BOO/ FEO (note if man-made)	Type of substrate Distance to wetland Size of feature					
Terrestrial Crayfish Habitat: Edges of shallow marshes and meadows (no minimum size) with crayfish chimneys	Number of chimneys					

Page 2 of 2

Print Name: J. Maselli

(Field Notes Author)

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Signature: _____

(Field Notes QA/QC personnel)

REV: 2016-09-07

Nocturnal Nightjar Survey

*Survey locations the same as
CAPIAUSM - breeding amphibians.

Project Name: Carruthers - Airport Pt Project Number: 160961921 Province: ON UTM Zone: 18T Date: June 26/2019

Biologist: S. Mansell Waypoint prefix: CAPIAUSM Moon phase: Full - 91% illumination Moonrise = 23:05 hrs

Station	Time	Station location		Environment						Habitat			Observation					Notes	
		Easting	Northing	Temp.	Wind	% cloud	Precip	Noise	Moon (Y/N)	Ecosite Phase	SS	Dom Tree	Species	#	Dist. (m)	Dir ¹	Type ²		Sex ³
001	2300	4522165	5015195	17	1	20	0	1-2	Y	Open	nk	nk	nk						-
002	2318	451926	5015018	16	1	20	0	1-2	Y	SWD	nk	nk	nk						-
003	2340	451696	5015389	15	1	20	0	1-2	Y	SWD	nk	nk	nk						-
004	2356	450992	5015706	15	2	30	0	1-2	Y	AG	nk	nk	nk						-
<p>* After completion of the above stations, the following adjacent roads were driven for EWPV occurrences:</p> <p>① Redcar Road</p> <p>② Baverly Road</p> <p>Survey completed at 0145 hrs.</p>																			
<p>* No EWPV observed *</p>																			

¹ Direction in degrees; ² Visual (V), Auditory (A), or both (A/V); ³ for CONI, boom from males (M), peent from either sex (U), females not distinguishable unless on nest.