Appendix B

Natural Environment Level 1 and 2
Terrastory Environmental Consulting Inc.





NATURAL ENVIRONMENT REPORT

Aggregate Resources Act Application Macpherson Pit, Municipality of Central Elgin 1 August 2022



NATURAL ENVIRONMENT REPORT

Aggregate Resources Act Application Macpherson Pit, Municipality of Central Elgin

Prepared for:

Talbot Sand and Gravel Ltd. RR#6 43371 Truman Line North St. Thomas, ON N5P 3T1

Prepared by:

Terrastory Environmental Consulting Inc. 171 Glen Road Hamilton, ON L8S 3N2 905.745.5398

> Tristan Knight, M.E.S., M.Sc. Senior Ecologist | President

> > Project No.: 1987 1 August 2022

This report has been prepared by Terrastory Environmental Consulting Inc. (hereinafter "Terrastory") for the client. All information, conclusions, and recommendations contained in this report are subject to the scope and limitations set out in the agreement between Terrastory and the client and qualifications contained in this report. This report shall not be relied upon by any third parties without the prior written consent of Terrastory. Terrastory is not responsible for any injury, loss, or damages arising from improper use of this report by third parties. Excerpts of this report or alterations to this report taken without the authorization of Terrastory invalidates the report and any conclusions therein.



TABLE OF CONTENTS

1	IN	TRODUCTION	1
	1.1	Study Background	1
	1.2	Study Purpose	2
2	AP	PROACH AND METHODS	2
	2.1	Background Biophysical Information Assessment	3
	2.2	Site Assessments and Surveys	4
	2.3	Significance Assessment	6
	2.3.	1 Definitions and Criteria	6
	2.3.	2 Determination	7
	2.4	Effects Assessment and Mitigation	7
	2.5	Natural Heritage Policy Context	8
3	EX	ISTING BIOPHYSICAL CONDITIONS	8
	3.1	Land-use and Landscape Setting.	9
	3.2	Physical Setting	9
	3.2.	1 Bedrock Geology	9
	3.2.	2 Surficial Geology and Groundwater Resources	9
	3.2.	3 Topography, Drainage, and Surface Water Features	9
	3.3	Ecological Setting	.10
	3.3.	1 Vegetation Communities	.10
	3.3.	2 Vascular Plants	.10
	3.3.	3 Breeding Anurans	.10
	3.3.	4 Overwintering Snakes	.11
	3.3.	5 Breeding Birds	.11
	3.3.	6 Incidental Wildlife	.12
4	SIC	SNIFICANCE ASSESSMENT	. 12
	4.1	Provincially Significant Wetlands	.12
	4.2	Significant Woodlands	.12
	4.3	Significant Wildlife Habitat	.13
	4.3.	1 Bat Maternity Colonies	.13
	4.3.	2 Amphibian Breeding Habitat (Woodlands)	.14
	4.3.	3 Eastern Wood-pewee	.14
	4.3.	4 Monarch	.14
	4.4	Habitat of Endangered and Threatened Species	.14
	4.4.	1 Endangered Bats	.15

TERRASTORY

environmental consulting inc.

	4.4	2 Bank Swallow	15
	4.4	3 Eastern Meadowlark	15
5	PH	ASING, OPERATIONS, AND REHABILITATION PLANS	16
6	EF	FECTS ASSESSMENT AND MITIGATION	16
	6.1	Provincially Significant Wetland	17
	6.2	Significant Woodlands	
	6.3	Significant Wildlife Habitat	18
	6.4	Habitat of Endangered and Threatened Species	19
	6.5	Natural Environment Technical Recommendations	20
7	AP	PLICABLE NATURAL HERITAGE AND ENVIRONMENTAL POLICIES	21
	7.1	Municipality of Central Elgin Official Plan (March 2013 office consolidation)	21
	7.2	Elgin County Official Plan (February 2015 office consolidation)	22
	7.3	Aggregate Resources Act, R.S. O. 1990, c. A.8	23
	7.4	Provincial Policy Statement 2020, pursuant to the Planning Act, R.S.O. 1990, c. P. 13	23
	7.5	Provincial Endangered Species Act, S.O. 2007, c. 6	24
	7.6	Federal Fisheries Act, R.S.C. 1985, c. F-14	25
	7.7	Federal Migratory Birds Convention Act, S.C. 1994, c. 22.	25
8	CC	NCLUSIONS	25
9	RE	FERENCES	27
F	igur	es	
F	igure 1	. Location of the Site.	29
F	igure 2	2. Biophysical Features and Conditions	30
F	igure 3	3. Significant Natural Features.	31
Τ	able	S	
T	able 1	Background Biophysical Information Acquired and Reviewed.	3
T	able 2	Site Assessments and Ecological Surveys performed within the Subject Property	4
T	able 3	Applicable Natural Heritage Policies	8
		Summary of the Assessment of Significant Natural Features within the Site and Adjacer	
\mathbf{L}	ands		12

Appendices

Appendix 1. Curriculum Vitae

TERRASTORY

environmental consulting inc

Appendix 2. Representative Photographs

Appendix 3. Vascular Plant List

Appendix 4. Anuran Calling Survey Results

Appendix 5. Breeding Bird Survey Results

Appendix 6. Significant Wildlife Habitat Assessment

Appendix 7. Endangered and Threatened Species Assessment

Appendix 8. Site Plans

1 INTRODUCTION

1.1 Study Background

Terrastory Environmental Consulting Inc. (hereinafter "Terrastory") was retained by Talbot Sand and Gravel Ltd. (hereinafter "the Applicant") to prepare this Natural Environment Report (NER) in support of a Class A (below-water) pit application pursuant to the *Aggregate Resources Act* (ARA) in the Municipality of Central Elgin (hereinafter "the Municipality"). The extraction area is referred to herein as "Macpherson Pit". The lands proposed for licensing are situated within an approximately 25.3 hectare (62.5 acre) parcel municipally known as 43371 Truman Line and located on the south side of Truman Line between Highbury Avenue and Dalewood Road. The proposed area to be licenced is legally described as Part Lot 6, Concession 12, in the Former Geographic Township of Yarmouth. The location of the Study Area within its broader landscape setting is shown in **Figure 1**.

The Site is primarily maintained for agricultural purposes (i.e., cash crops) and is adjacent to an existing licensed pit (No. 2134) owned and operated by the Applicant. An existing residence is situated in the northern portion of the Subject Property (i.e., near Truman Line) surrounded by amenity space.

The Subject Property is designated "Agricultural" per Schedule 1 (Land Use Structure) of the Municipality's Official Plan (OP). Schedule A (Land Use Plan) carries forward the "Agricultural" designation and also designates a mature deciduous woodland abutting the southeastern boundary of the Site as "Natural Heritage". Schedule A2 (Environmental Features) clarifies that the "Natural Heritage" designation reflects a "Wooded Area", and further indicates that a separate "Wooded Area" occurs in the northwest corner of the Subject Property which overlaps with an Environmentally Sensitive Area. Wetland units associated with the Provincially Significant Glanworth Wetland Complex (hereinafter "PSW") occur on Adjacent Lands to the west, which are designated likewise per Schedule A2 of the Municipality's OP. Schedule A (Land Use) of Elgin County's OP also designates the Subject Property as "Agriculture" and identifies an "Aggregate Resource Area" overlapping with the Site per Schedule C of the County's OP.

The following terminology is employed throughout this NER to describe certain noteworthy areas and features which are shown spatially on **Figure 1**:

- **Site** proposed area to be licensed.
- **Subject Property** parcel/property in which the ARA licence applies.
- Adjacent Lands areas within 120 metres of the Site.
- **Study Area** Site, Subject Property, and Adjacent Lands collectively.
- **Deciduous Woodland** approximately 9 hectare (22 acre) forest extending into the southeast corner of the Subject Property and abutting the Site boundary (i.e., proposed area to be licensed).
- **PSW** Provincially Significant Wetland (Glanworth Wetland Complex) which extends slightly into the western portion of the Study Area.

The ARA licence application considered herein incorporates a 23.4 ha licensed area and 20 ha extraction area. The operations plan consists of five phases of extraction/rehabilitation (A-E) overlapping with three discrete areas (Areas 1, 2 and 3) and proceeding generally from the existing licenced pit to the west in a southward direction, moving eastward then northward toward Truman

Line. Undisturbed portions of the Site (to be extracted in later phases) will remain in agricultural use until extraction commences. Entrance to and exit from the Site will be gained from the existing driveway servicing licence No. 2134 on Adjacent Lands to the west.

1.2 Study Purpose

This NER has been prepared to address the requirements of the ARA and its associated regulation (O. Reg. 244/97) and policy standards. ARA licence applications must be made in accordance with the Provincial Standards (i.e., Aggregate Resources of Ontario Standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act) per section 0.2 of O. Reg. 244/97. Section 2.2 of the compiled Aggregate Resources of Ontario Standards triggers the need for an NER in support of ARA applications involving Class A or Class B licences. The NER must identify the following natural heritage features and areas existing on the Site and within 120 m of the Site:

- a) Significant wetlands;
- b) Other coastal wetlands in Ecoregions 5E, 6E and 7E;
- c) Fish habitat;
- d) Significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- e) Habitat of endangered species and threatened species;
- f) Significant wildlife habitat;
- g) Significant areas of natural and scientific interest; and
- h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g).

"Site" is defined per subsection 1(1) of the ARA as "the land or land under water to which a licence or permit or an application therefor relates". The compiled Standards further clarify as follows (p. 28/29):

Where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the site or any of the features, included in (a) through (g), are located within a natural heritage system that has been identified by a municipality in ecoregions 6E and 7E or by the province as part of a provincial plan.

In addition to satisfying ARA requirements, this NER is also submitted in support of Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications to the Municipality to facilitate aggregate extraction. The overall scope of this NER is consistent with the general requirements for the preparation of Environmental Impact Study (EIS) reports per Section 3.4 of the Municipality's OP and Policy D1.2.8 of the Elgin County's OP. This NER further considers and assesses consistency of the licence application with other applicable natural heritage policies including the Provincial Policy Statement (PPS), provincial Endangered Species Act, and federal Fisheries Act.

APPROACH AND METHODS

This study is composed of five (5) discrete components which are bulleted below and further described in the following sections.

- environmental consulting inc.
 - Acquire background biophysical information and mapping available for the Study Area and local landscape (see Section 2.1).
 - Conduct site assessments and ecological surveys to field-verify the accuracy of the acquired background biophysical information and collect additional biophysical information as necessary (see Section 2.2).
 - Assess the significance of the biophysical information collected and natural features identified within the context of applicable natural heritage and environmental policies (see Section 2.3).
 - Predict the effects of the application on the identified significant natural features and natural
 environment, particularly the net effects once mitigation measures and technical recommendations are
 implemented (see Section 2.4).
 - Determine whether the proposed application addresses applicable natural heritage and environmental policies at municipal, provincial, and federal levels (see Section 2.5).

All items associated with the preparation of this NER – including background information gathering, site assessments and surveys, graphics, and reporting – were undertaken by Terrastory's Senior Ecologist/President (T. Knight). A curriculum vitae is provided in **Appendix 1**.

2.1 Background Biophysical Information Assessment

This study is supported by background biophysical information and mapping acquired and reviewed from a variety of sources which are listed below in **Table 1**.

Table 1. Background Biophysical Information Acquired and Reviewed.

Type of Information Acquired	Description	
Ortho-rectified Aerial Photographs	• 1954, 1963, 2006, 2009, 2911, 2013, 2015-2018.	
Natural Feature Mapping	• Municipality of Central Elgin Official Plan (March 2013 consolidation) Schedules A (Land Use Plan), A2 (Environmental Features), and A3 (Aggregate Resources).	
	• County of Elgin Official Plan (February 2015 consolidation) Schedules A (Land Use Plan) and C (Aggregate and Petroleum Resource Areas) and Appendix #1 (Natural Heritage Features and Areas).	
	• Land Information Ontario (LIO) accessed via MNRF's "Make a Map" web-based platform (accessed 30 March 2022).	
	• Kettle Creek Conservation Authority (KCCA) regulation mapping (accessed 30 March 2022).	
Physiographic Resource	Provincial Digital Elevation Model.	
Mapping and Datasets	Ontario Well Records (publicly-available).	
	Agricultural Information Atlas (accessed 30 March 2022).	
	• Bedrock Topography and Overburden Thickness Mapping (Gao et al. 2006).	
	• Paleozoic Geology of Southern Ontario (Armstrong and Dodge 2007).	
	• Surficial Geology of Southern Ontario (Ontario Geological Survey 2010).	
	• Physiography of Southern Ontario (Chapman and Putnam 1984).	
Ecological Resource Mapping and Datasets		

Type of Information Acquired	Description		
	• Natural Heritage Information Centre (NHIC) database accessed via MNRF's "Make a Map" web-based platform (squares: 17MH8444, 17MH8544, 17MH8644, 17MH8443, 17MH8543, 17MH8643, 17MH8542; accessed 30 March 2022).		
	• iNaturalist "(NHIC) Rare species of Ontario" project (accessed 30 March 2022).		
	• iNaturalist "Herps of Ontario" project (accessed 30 March 2022).		
	• Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005 (Cadman et al. 2007) (square: 17MH84).		
	• Ontario Butterfly Atlas database (square: 17MH84; accessed 30 March 2022).		
	 Aquatic Species at Risk Maps by Fisheries and Oceans Canada (accessed 30 March 2022). 		
	• Atlas of the Mammals of Ontario (Dobbyn 2005).		
Natural Heritage Objectives and Strategies	 Elgin Natural Heritage Systems Study, preliminary mapping (2019). Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2 (Henson 		

• Great Lakes Conservation Blueprint for Aquatic Biodiversity, Volume 2 (Phair et al.

2.2 Site Assessments and Surveys

The acquired background information per **Table 1** helped direct several site assessments and surveys carried out by Terrastory staff (T. Knight). **Table 2** below indicates the primary assessments/surveys performed during each site visit, weather conditions, and time on-site.

and Brodribb 2005).

Table 2. Site Assessments and Ecological Surveys performed within the Subject Property.

Date	Assessments/Surveys Performed	Terrastory Staff	Weather Conditions	Time On-site
27 March 2020	Site reconnaissance #1, snake emergence survey, anuran calling survey, incidental observations.	T. Knight	Air Temperature 6-10°C; Beaufort Wind 0-2; Cloud Cover 0-10%; No Precipitation.	14:45-17:45; 20:00-20:30
13 May 2020	Snake visual encounter survey #2, spring vascular plant survey, incidental observations.	T. Knight	Air Temperature 10-14°C; Beaufort Wind 1-2; Cloud Cover 0-10%; No Precipitation.	12:00-15:30
5 June 2020	Breeding bird survey #1, incidental observations.	T. Knight	Air Temperature 16-19°C; Beaufort Wind 0; Cloud Cover 100%; No Precipitation.	6:40-8:30
17 June 2020	Breeding bird survey #2, incidental observations.	T. Knight	Air Temperature 13-18°C; Beaufort Wind 0; Cloud Cover 0%; No Precipitation.	6:45-8:30
27 July 2020	Ecological Land Classification, vascular plant survey, incidental observations.	T. Knight	Hot.	10:30-15:00

Date	Assessments/Surveys Performed	Terrastory Staff	Weather Conditions	Time On-site
21 September 2020	Fall vascular plant survey, confirm natural feature boundaries, incidental observations.	T. Knight	Warm, light breeze, sunny.	10:30-12:30

The site assessments and surveys centred on characterizing the land use (e.g., historical development patterns, existing built features, land maintenance, etc.), physiographic (e.g., topography, drainage, surface water features, etc.), and ecological (e.g., vegetation, wildlife, habitats, etc.) conditions and features of the Subject Property and (where appropriate) Adjacent Lands. All land-use, physiographic, and ecological information described for Adjacent Lands was collected from either current aerial photographs or observations from inside the Subject Property and/or publicly-accessible areas (e.g., rights-of-way, etc.). The locations and boundaries of significant natural features and/or habitats were recorded on-site with a high-accuracy GPS (Mesa II) supported by representative photographs.

In addition to collecting general biophysical information, the following targeted assessments (i.e., feature- or species-specific surveys) were undertaken:

- Vegetation Mapping according to Ecological Land Classification (ELC): Vegetation
 communities on the Subject Property were characterized and mapped according to Ecological Land
 Classification (Lee et al. 1998) and the 2008 update to the Vegetation Type List (Lee 2008). Vegetation
 communities were initially identified based on current aerial photographs and then verified and refined
 (as necessary) on-site. ELC mapping was scaled to the finest level of resolution deemed appropriate (i.e.,
 either Ecosite or Vegetation Type). Vegetation communities mapped on Adjacent Lands were
 delineated predominantly via aerial photograph interpretation.
- Vascular Plant Survey: Vascular plants were recorded based on a comprehensive area search
 ("wandering transects") within naturally-occurring (i.e., non-planted) or naturalizing areas of vegetation.
 Particular effort was paid to areas with the greatest potential to support significant vascular plants (i.e.,
 designated Species at Risk, provincially rare, etc.) and areas with the greatest potential for impact based
 on the proposed development plan. Nomenclature and common names for the recorded vascular plant
 species are generally consistent with the Southern Ontario Vascular Plant Species List (Bradley 2013)
 except where a name change has more recently been adopted by NHIC.
- Anuran Calling Surveys according to the Marsh Monitoring Protocol: One round of Anuran calling surveys were conducted in accordance with the Marsh Monitoring Protocol (Bird Studies Canada et al. 2008) to record early season breeders. The survey occurred within the appropriate season (April), time of day (between 30 minutes after sunset and 12:00am), and weather conditions (minimal to no rain, wind speed ≤3 on the Beaufort Wind Scale). Due to unseasonably warm weather in late March, the first survey was completed slightly in advance of the typical timing window (i.e., March 27 rather than April 1-15). During the 27 March 2020 site visit it was determined that the Subject Property lacked Anuran breeding habitat, while the PSW was confirmed as significant Anuran breeding habitat (woodland). Given these results, no further targeted surveys were undertaken.
- Snake Emergence and Active Hand Surveys: Two (2) surveys were conducted to document
 potential snake emergence from hibernacula. Surveys were undertaken under appropriate weather

conditions (e.g., air temperatures between >10°C, sunny, limited wind, no rain), particularly following additional days of unseasonably warm, sunny weather. Where present, cover objects (e.g., rocks, debris, etc.) were overturned in an attempt to detect individuals beneath.

• Breeding Bird Surveys according to the Ontario Breeding Bird Atlas Protocol: Two (2) rounds of breeding bird surveys were conducted in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Bird Studies Canada et al. 2001). Surveys occurred within the appropriate season (May 24–July 10), time of day (between dawn and approximately 5 hours after dawn), and weather conditions (no rain, wind speed ≤3 on the Beaufort Wind Scale). While the OBBA protocol recommends that stations be situated at least 300 m apart (to avoid double counting), the stations established herein were often closer together to ensure more comprehensive survey coverage. Surveys occurred for a minimum duration of 10 minutes at each station.

2.3 Significance Assessment

2.3.1 Definitions and Criteria

"Significant natural features" as described herein represent natural features and habitats that have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant natural features are defined herein to include those outlined in the compiled Aggregate Resources of Ontario Standards, namely:

- a) Significant wetlands;
- b) Other coastal wetlands in Ecoregions 5E, 6E and 7E;
- c) Fish habitat;
- d) Significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- e) Habitat of endangered species and threatened species;
- f) Significant wildlife habitat;
- g) Significant areas of natural and scientific interest; and
- h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g).

The County OP provides a similar list of natural heritage features which are considered and protected through section D1.2 (Natural Heritage). Criteria used to determine the presence or absence of the above significant natural features within the Study Area were considered from a variety of sources including the Natural Heritage Reference Manual (MNR 2010a) and (for Significant Wildlife Habitat) the Ecoregion 7E Criteria Schedule (MNRF 2015b).

Like significant natural features, "significant species" represent individuals of wild species which have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant species are defined herein to include:

- Species designated Endangered, Threatened, or Special Concern under O. Reg. 230/08 pursuant to the provincial *Endangered Species Act*, 2007.
- Species designated Provincially Rare (i.e., S1, S2, or S3) by NHIC.
- Species considered Regionally Rare in Elgin County pursuant to the List of the Vascular Plants of Ontario's Carolinian Zone (Oldham 2017).

2.3.2 Determination

After collecting the background biophysical information and conducting the site assessments the data was interpreted to determine whether any significant natural features and/or significant species occur within the Study Area. If a natural feature or species met the significance criteria, it is considered "confirmed". If a natural feature or species may be present within the Study Area and/or Adjacent Lands given the prevailing biophysical or habitat conditions but was not confirmed based on either background or site-specific biophysical data, it is considered potential or "candidate". Candidate significant natural features and species are treated as confirmed where no additional information is available.

2.4 Effects Assessment and Mitigation

The potential ecological effects of an application can be understood spatially as zones that radiate outward from the direct project footprint (building envelope, etc.) and associated areas of site alteration (grading, etc.). While the greatest potential for effects typically occurs within areas directly subject to development or disturbance, surrounding areas may also be affected indirectly. Such indirect effects can include light or noise pollution that affects wildlife communities on Adjacent Lands, or degradation of water quality within a downstream receptor resulting from sediment runoff during extraction.

The following five-pronged approach is employed herein to assess the effects of an application on significant natural features and species and (where warranted) the natural environment in general:

- 1. **Scope** the effects assessment to environmental components that warrant consideration. The effects assessment herein centres principally on significant natural features and species (i.e., those that have policy significance within the planning jurisdiction, as defined in **Section 2.3**) but may also consider general environmental effects where warranted.
- 2. Identify the predicted direct and indirect effects of the application on each significant natural feature or species during all project stages (i.e., pre- to -post-development) in the absence of mitigation. Direct effects are those where there is a cause-effect relationship between a proposed activity and an effect on a natural feature or species (e.g., tree clearance within a building footprint, etc.). Indirect effects result when an activity is linked to a direct effect through a chain of foreseeable interactions or steps.
- 3. **Evaluate the significance** of the predicted effects for each environmental component based on their attributes (i.e., spatial extent, magnitude, timing, frequency, and duration) and likelihood (i.e., high, medium, low).
- 4. Where the potential for negative effects are anticipated, **recommend ecologically-meaningful mitigation measures** to avoid such impacts first (where possible), and where impacts cannot be avoided to minimize, compensate, and/or enhance as appropriate.
- 5. **Identify the predicted residual or net effect**s of the application assuming implementation of all recommended mitigation measures.

Per step 4, mitigation measures are offered where the potential for negative effects are anticipated to a degree that cannot be supported given the prevailing policy context. Whenever possible, Terrastory works iteratively with the project team as a means to identify extraction options that avoid negative effects first; options that would minimize or mitigate such negative effects are less preferred and considered secondarily. In general, avoidance measures that have already been

incorporated into the application or project design are not duplicated as technical recommendations herein. The Site Plans (phasing, operations, and rehabilitation) are described in **Section 5** while the effects assessment and recommended mitigation measures are provided in **Section 6**.

2.5 Natural Heritage Policy Context

There is an overlapping municipal, provincial, and federal policy framework respecting the protection of natural heritage features and areas across southern Ontario. These requirements include objectives, policies, and directives which are principally contained in federal and provincial statutes, regulations, policy statements, Official Plans, and guidance documents. The overarching natural heritage policy framework directing development activities within the Subject Property is outlined below in **Table 3**. A determination of whether the applications considered herein address such policies is provided in **Section 7**.

Table 3. Applicable Natural Heritage Policies.

Level of	Natural Heritage or Environmental Policy Requirements	
Government		
Municipal	Municipality of Central Elgin Official Plan (March 2013 consolidation).	
	County of Elgin Official Plan (February 2015 consolidation).	
Provincial	Aggregate Resources Act (ARA), R.S.O. 1990, c. A.8, including	
	 Ontario Regulation 244/97 – General 	
	 Aggregate Resources of Ontario Standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act 	
	Provincial Policy Statement 2020, pursuant to the Planning Act, R.S.O. 1990, c. P.13, including:	
	 Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (MNR 2010a). 	
	 Significant Wildlife Habitat Technical Guide (MNR 2010b). 	
	• Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015a).	
	 Significant Wildlife Habitat Mitigation Support Tool (MNRF 2014). 	
	Endangered Species Act (ESA), S.O. 2007, c. 6, including:	
	 Ontario Regulation 230/08 – Species at Risk in Ontario List. 	
	 Ontario Regulation 242/08 – General. 	
	Fish and Wildlife Conservation Act, S.O. 1997, c. 41.	
Federal	Fisheries Act, R.S.C. 1985, c. F-14, including:	
	 Fish and Fish Habitat Protection Policy Statement (DFO 2019). 	
	Migratory Birds Convention Act, S.C. 1994, c. 22, including:	
	• Migratory Birds Regulations, C.R.C., c. 1035.	

3 EXISTING BIOPHYSICAL CONDITIONS

The following is a description of the biophysical features and conditions of the Site, which are shown spatially on **Figure 2**. Representative photographs are provided in **Appendix 2**.

3.1 Land-use and Landscape Setting

The Site is situated in a predominantly rural landscape between St. Thomas and London. Parcels immediately adjacent to the Subject Property are primarily maintained for cash crops, while the parcel immediately west is subject to an existing ARA licence (No. 2134) owned and operated by the Applicant. Isolated deciduous woodlots and wetlands are scattered throughout the local landscape. The Site falls within the Upper Kettle Creek watershed.

3.2 Physical Setting

3.2.1 Bedrock Geology

The bedrock underlying the Subject Property is characterized as Devonian-aged (i.e., 458 to 470 million-year-old) fossiliferous limestone and minor dolostone associated with the Dundee Formation (Armstrong and Dodge 2007). In Ontario, the Dundee Formation subcrops (i.e., acts as the stratigraphic unit closest to the ground surface) from Long Point to the shoreline of Lake Huron across most of Huron County. Bedrock was found to be approximately 70-75 m below the ground surface based on publicly available water well records.

3.2.2 Surficial Geology and Groundwater Resources

The Site is situated within the Mount Elgin Ridges physiographic region (Chapman and Putnam 1984) which is nestled between the Thames Valley and Norfolk Sand Plain. The ridges represent morainal deposits and consist of pale brown calcareous clay or silty clay. Substrates within the Subject Property are mapped as gravelly sand deposits laid down in glacial Lake Maumee (Ontario Geological Survey 2010). A soils assessment undertaken in association with Ecological Land Classification vegetation mapping (see **Section 3.3.1**) found predominantly silty surficial substrate across the Site.

Six (6) boreholes were advanced in support of the Hydrogeological Assessment by Groundwater Science Corp. (June 2022); logs associated with historical boreholes drilled in 1994 (13 total) were also reviewed. There is some variability in the surficial strata beneath the topsoil, with some boreholes reporting a relatively thin layer of clayey material while others reporting silt/sand. It is known that clayey material occurs along the western edge of the existing pit on Adjacent Lands. Sand/gravel material (to be extracted) was found beneath the clayey or silty/sand material within several boreholes and extends to over 16 m (55 ft) in depth at BH3 (several older boreholes also found sand/gravel to that depth). The Hydrogeological Assessment concludes that the sand/gravel deposit is localized and appears to be inter-fingered by the surrounding clay/silt deposit.

The Hydrogeological Assessment further concludes that the sand/gravel unit is approximately >7 m lower than the surface elevation of the PSW (and associated drainage features) to the west of the Study Area. The wetland is likely underlain by a clay layer which restricts infiltration and promotes saturated soil conditions. Overall, the PSW and drainage features to the west are perched relative to the water table within the proposed area to be extracted.

3.2.3 Topography, Drainage, and Surface Water Features

The Site is relatively flat and sits primarily between 257.5 to 252.5 metres above sea level (masl), with overall relief of 5 m. Overland runoff is conveyed in a predominantly southern direction. There is an absence of surface water drainage features (e.g., ditches, swales, watercourses) within the Study Area,

suggesting that runoff is primarily conveyed as sheet flow. Drainage features (tributaries) are mapped by the province extending through the PSW on Adjacent Lands, flowing predominantly southward and eventually outletting to Kettle Creek.

3.3 Ecological Setting

3.3.1 Vegetation Communities

The majority of the Site was under active agricultural production (soybeans) in 2020. Vegetation communities with the Study Area are described below and mapped in **Figure 2**.

In the southeast corner of the Site is a Deciduous Woodland (FODM5-1) consisting of a mature, Sugar Maple (Acer saccharum) dominated forest. American Beech (Fagus grandifolia) and Black Cherry (Prunus serotina) are occasional in the canopy. The sapling and shrub layers are comprised of regenerating Sugar Maple, Bitternut Hickory (Carya cordifolia), and White Ash (Fraxinus americana), along with Red-berried Elderberry (Sambucus racemosa) and Allegheny Blackberry (Rubus allegheniensis) in the shrub layer. The ground cover is dominated by Canada Waterleaf (Hydrophyllum canadense), Enchanter's Nightshade (Circaea canadensis), Garlic Mustard (Alliaria petiolata), Herb Robert (Geranium robertianum), Jack-in-the-pulpit (Arisaema triphyllum), and Wild Leek (Allium tricoccum). The community exhibits level, pit-and-mound topography and contains predominantly silty substrate.

Along the western boundary of the Study Area (i.e., west of the existing pit) is a broad natural area consisting of PSW (SWD) and mature deciduous forest (FODM9). The PSW barely extends within the Study Area and consists of deciduous swamp.

A wooded area (WODM4-4) abutting Truman Line was found to be dominated by a nearly monotypic stand of Black Walnut (*Juglans nigra*). The understory consists of Grey Dogwood (*Cornus racemosa*) along with sapling-sized Black Walnut, Green Ash (*Fraxinus pennsylvanica*), and Sugar Maple. The ground layer contains Day-lily (*Hemerocallis fulva*), Enchanters Nightshade, Jack-in-the-pulpit, Wild Grape (*Vitis riparia*), and White Avens (*Geum candensis*). Overall, canopy coverage is relatively open (~60%) and the ground surface is rolling, conveying surface runoff towards Truman Line.

Between the Site and existing aggregate pit to the west are scrubby and regenerating communities consisting of cultural meadow (MEMM3) and deciduous thicket (THDM2-1). The cultural meadow is dominated by Wild Carrot (*Daucus carota*), Kentucky Bluegrass (*Poa pratensis*), Tall Goldenrod (*Solidago altissima*), and Smooth Brome (*Bromus inermis*). The thicket is dominated by Staghorn Sumac (*Rhus typhina*), Black Raspberry (*Rubus occidentalis*), and sapling Black Walnut, with a similar assemblage of herbaceous species.

3.3.2 Vascular Plants

A total of 159 vascular plant species were recorded within the Subject Property (see **Appendix 3**). No vascular plant species of conservation interest were documented.

3.3.3 Breeding Anurans

Anuran calling surveys were undertaken at two (2) stations on 27 March 2020 to ascertain habitat for early season breeders. As described in **Section 2.2**, due to unseasonably warm weather in late March the first survey was completed slightly in advance of the typical timing window (i.e., March 27 rather than April 1-15). During the 27 March 2020 site visit it was determined that the Site lacked Anuran

breeding habitat, while the PSW was confirmed as significant anuran breeding habitat (woodland) for early season breeders. Given these results (as described below), and the difficulties with ascertaining whether mid- or late-season anuran breeding is present in the PSW (i.e., permission to access this parcel had not been secured), no further targeted anuran surveys were undertaken. The locations of each survey station are shown on **Figure 2** while the full survey results are provided in **Appendix 4**.

Wetland communities forming part of the PSW were confirmed as significant amphibian breeding habitat on the basis of choruses (call code 3) of Wood Frog (*Lithobates sylvaticus*) and Western Chorus Frog (*Pseudacris triseriata*). Spring Peeper (*Pseudacris crucifer*) were also heard abundantly. The specific location of breeding sites within the PSW is unknown as the PSW occurs on Adjacent Lands and the choruses emanated from a considerable distance away.

3.3.4 Overwintering Snakes

Spring emergence surveys for snakes were undertaken on 27 March and 13 May 2020. The surveys focused on features with the greatest potential to support snake overwintering, particularly the foundation of an old grain silo south of the existing residence (Photo 3 in **Appendix 2**). No snakes were documented during the spring emergence surveys or incidentally during the course of other fieldwork in 2020.

3.3.5 Breeding Birds

Breeding bird surveys were undertaken at six (6) stations across the Subject Property on 5 June and 17 June 2021. A total of 40 bird species were recorded during the formal breeding bird surveys. Additional bird species were also recorded incidentally during the course of other fieldwork, particularly a Great Horned Owl (*Bubo virginianus*) nestling.

The assemblage and abundance of birds recorded generally reflects the prevailing structure and composition of on-site vegetation communities and variable habitats of the Study Area (e.g., deciduous forest, thicket, meadow, tilled agricultural fields). The locations of each survey station are shown on **Figure 2** while the full survey results indicating each species' breeding status by survey station can be found in **Appendix 5**. The locations of significant bird species recorded are shown on **Figure 3**.

Three (3) significant bird species were recorded during the targeted breeding bird surveys:

- 1. Bank Swallow (*Riparia riparia*) a colony was documented nesting along the southern vertical pit face on Adjacent Lands to the west. A minimum of eight (8) individuals were documented in association with this colony in 2020.
- **2.** Eastern Meadowlark (*Sturnella magna*) one (1) singing male was heard at BI-5 vocalizing from an agricultural field on Adjacent Lands to the south.
- **3.** Eastern Wood-pewee (*Contopus virens*) two (2) separate singing males were heard at station BI-6 vocalizing from the Deciduous Woodland. This species is considered a "probable" breeder within the Deciduous Woodland. Another singing male was noted vocalizing at BI-4 from west of the existing aggregate pit on Adjacent Lands.

3.3.6 Incidental Wildlife

A variety of wildlife were recorded incidentally during the course of the 2020 fieldwork program. A Great Horned Owl nestling was documented in an active nest to the southeast of the Subject Property (see **Figure 3** and Photo 8 in **Appendix 2**). A minimum of fourteen (14) Midland Painted Turtles (*Chrysemys picta marginata*) were documented in the westernmost pit pond on Adjacent Lands to the west (see **Figure 3**).

4 SIGNIFICANCE ASSESSMENT

Based on the biophysical information collected during background information gathering (per **Table 1**) and the results of the site assessments and surveys (per **Sections 2.2** and **3**), **Table 4** below provides a determination of the presence (or potential presence) of each significant natural feature considered herein. Shaded rows denote features which were confirmed or may be present within the Site or Adjacent Lands and are considered further as part of the effects assessment in **Section 5**. Significant natural feature mapping is provided in **Figure 3**.

Table 4. Summary of the Assessment of Significant Natural Features within the Site and Adjacent Lands.

Significant Natural Feature	Status within the Site	Status on Adjacent Lands (i.e., <120 m from the Site)				
Significant Natural Features per ARA	nificant Natural Features per ARA Provincial Standards					
Significant Wetlands	Absent.	Confirmed. See Section 4.1.				
Significant Woodlands	Confirmed. See Section 4.2.	Confirmed. See Section 4.2.				
Significant Valleylands	Absent.	Absent.				
Significant Wildlife Habitat	Candidate/Confirmed. See Section 4.3.	Candidate/Confirmed. See Section 4.3.				
Significant Areas of Natural and Scientific Interest	Absent.	Absent.				
Habitat of Endangered and Threatened Species (per ESA)	Absent. See Section 4.4.	Confirmed. See Section 4.4.				
Fish Habitat (per Fisheries Act)	Absent.	Absent.				

4.1 Provincially Significant Wetlands

The Provincially Significant Glanworth Wetland Complex occurs within a broader natural area west of the Site. Wetland units associated with the PSW barely extend within the Study Area and are separated from the Site by an active aggregate pit.

An assessment of potential effects to the PSW associated with the proposed pit operations plan is provided in **Section 6.1**.

4.2 Significant Woodlands

The Deciduous Woodland is designated "Natural Heritage" per Schedule A (Land Use Plan) of the Municipality's OP. On the basis of this designation the Deciduous Woodland is considered significant in the context of ARA and PPS requirements. The overall size (~9 ha), composition (i.e.,

late-successional), and structure (mature) of the Deciduous Woodland further support its designation as significant.

The Black Walnut dominated deciduous woodland (WODM4-4) in the northwest corner of the Subject Property (beyond the Site) is not designated "Natural Heritage" per Schedule A (Land Use Plan) of the Municipality's OP. This wooded area is small (~0.7 ha), early-successional, comprised of relatively common and disturbance tolerant vascular plant species, and abuts an existing road (Truman Line). On the basis of these conditions, the Black Walnut dominated deciduous woodland in the northwest corner of the Subject Property is not considered significant in the context of ARA and PPS policies.

An assessment of potential effects to the Significant Woodland (i.e., Deciduous Woodland) in the southeast corner of the Site associated with the proposed pit operations plan is provided in **Section 6.2**.

4.3 Significant Wildlife Habitat

An assessment of the likelihood that any candidate or confirmed SWH features or areas occur within the Study Area is provided in **Appendix 6**. Based on the results of this assessment, three (3) SWH types are considered further through this study:

- Seasonal Concentration Areas of Animals
 - 1. Bat Maternity Colonies
- Rare Vegetation Communities or Specialized Habitats for Wildlife
 - 2. Amphibian Breeding Habitat (woodlands)
- Habitat of Species of Conservation Concern
 - 3. Special Concern and Rare Wildlife Species

Also based on this assessment, a total of two (2) Special Concern or provincially rare species are considered to have a possible likelihood of occurrence on the Subject Property given their habitat associations and current distribution in southern Ontario (or were confirmed during the 2020 fieldwork program):

- 1) Eastern Wood-pewee (Contopus virens)
- 2) Monarch (Danaus plexippus)

A general description of each SWH type and Special Concern/provincially rare species and their habitats within the Study Area is offered below. An assessment of potential effects to the candidate/confirmed SWH features and Special Concern/provincially rare species associated with the proposed pit operations plan is provided in **Section 6.3**.

4.3.1 Bat Maternity Colonies

Big Brown Bat (*Eptesicus fuscus*) and Silver-haired Bat (*Lasionycteris noctivagans*) form maternity colonies that roost with pups in various features, particularly cracks, cavities, or loose bark associated with large-diameter trees (≥25 cm diameter at breast height), snags, and buildings. Snags/cavity trees in earlier stages of decay (i.e., decay classes 1-3) may be preferred.

The Deciduous Woodland contains larger-diameter snags and cavity trees. Neither roost tree density surveys nor ultrasonic acoustic monitoring were undertaken through this study as the Deciduous

Woodland will be protected from the proposed pit operations by an ecologically appropriate setback (see **Section 6.2**). The Black Walnut dominated deciduous woodland contains limited maternity roost habitat for bats and, regardless, is outside the proposed extraction limit.

4.3.2 Amphibian Breeding Habitat (Woodlands)

Significant breeding habitat for amphibians in woodlands (i.e., vernal pools, woodland ponds, and swamps) is determined on the basis of documenting at least two (2) separate anuran species vocalizing abundantly (i.e., call code 3), or evidence of breeding by mole salamanders. The results of the early-season anuran calling survey confirmed that the PSW to the west of the Site contains significant breeding habitat for Wood Frog and Western Chorus Frog, and also supports breeding by Spring Peeper. The precise location of breeding activity (i.e., pool/pond) is unknown as this area is under separate ownership.

4.3.3 Eastern Wood-pewee

Eastern Wood-pewee is designated Special Concern in Ontario per O. Reg. 230/08 pursuant to the Endangered Species Act (ESA) and is federally designated Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This species is most commonly associated with relatively open, deciduous and mixed forests of various sizes, as well as forest edges and other areas with relatively continuous canopy cover (e.g., parks, cemeteries, etc.). This species' preference for open forests and forest edges may be attributed to its aerial foraging behaviour (COSEWIC 2012). Territory sizes were shown to average approximately 1.75 ha (representing a circle with a radius of 75 m) in a study in southern Ontario (as cited in COSEWIC 2012).

Eastern Wood-pewee was documented as a probable breeder (i.e., recorded twice in suitable breeding habitat) in the Deciduous Woodland and as a possible breeder (i.e., recorded once in suitable breeding habitat) northwest of the Site in the vicinity of the PSW.

4.3.4 Monarch

Monarch is designated Special Concern in Ontario per O. Reg. 230/08 pursuant to the ESA and is federally designated Endangered by COSEWIC. Monarch is well-known to be host-specific and oviposits exclusively on species of milkweed (*Asclepias* spp.). This species is a generalist forager and may nectar in any area with wildflowers.

Monarch adults were observed foraging within the Subject Property.

4.4 Habitat of Endangered and Threatened Species

An assessment of the likelihood that any Endangered and Threatened species or their habitats occur within the Subject Property or Adjacent Lands is provided in **Appendix 7**. A total of five Endangered or Threatened species are considered to have a possible likelihood of occurrence on the Subject Property given their habitat associations and current distribution in southern Ontario (or were confirmed through the 2020 fieldwork program):

- 1) Little Brown Myotis (Myotis lucifugus)
- 2) Northern Myotis (Myotis septentrionalis)
- 3) Tri-colored Bat (Perimyotis subflavus)
- 4) Bank Swallow (Riparia riparia)
- 5) Eastern Meadowlark (Sturnella magna)

A general description of each Endangered/Threatened species and their habitat is offered below. An assessment of potential effects to these Endangered/Threatened species associated with the proposed pit operations plan is provided in **Section 6.4**.

4.4.1 Endangered Bats

Little Brown Myotis, Northern Myotis, and Tri-colored Bat have the potential to roost and forage within the Study Area. Each of these bat species is designated Endangered in Ontario per O. Reg. 230/08 pursuant to the ESA and are federally designated Endangered by COSEWIC. Little Brown Myotis and Northern Myotis form maternity colonies that roost in large-diameter trees with cracks, crevices, and/or exfoliating bark; Little Brown Myotis will also frequently roost in buildings (e.g., attics, barns, etc.). Roosting sites for Tri-colored Bat maternity colonies are less understood but have been documented in dead or dying leaf clusters of oaks (*Quercus* spp.) and maples (*Acer* spp.), along with live foliage and buildings (Humphrey and Fotherby 2019). Individuals (i.e., non-reproductive females and males) of all three bat species may roost in smaller diameter trees and other spaces (e.g., beneath house siding, etc.) which are not occupied by maternity colonies. Overwintering habitat includes caves and mines that maintain temperatures above 0°C. White Nose Syndrome (a fungal disease caused by an introduced pathogen) has devastated populations of each species across their ranges. The fungus causes hibernating individuals to become dehydrated, leading to excessive arousal, depleted fat reserves, and ultimately emaciation and/or death.

The Deciduous Woodland contains some larger-diameter snags and cavity trees, and therefore provides candidate roosting habitat for both maternity colonies and individuals of Little Brown Myotis and Northern Myotis. The Deciduous Woodland also contains an overstory dominated by Sugar Maple and therefore may also support roosting by Tri-colored Bat. Neither roost density surveys nor ultrasonic acoustic monitoring were undertaken through this study as Deciduous Woodland will be protected from pit operations by an ecologically appropriate setback.

4.4.2 Bank Swallow

Bank Swallow is designated Threatened in Ontario per O. Reg. 230/08 pursuant to the ESA and is federally designated Threatened by COSEWIC. This species is a colonial breeder which nests in exposed, sandy substrates on vertical or steep surfaces, including cliff/bluff faces, river-banks, and construction stockpiles. Foraging habitat includes a variety of open areas including agricultural lands, meadows, prairies, woodland clearings, marshes, and waterbodies.

Nest excavations associated with this species were documented along the southern vertical pit face of the existing aggregate pit on Adjacent Lands to the west. A minimum of eight (8) individuals were documented foraging within the general vicinity of the nesting site, with individuals documented at a total of four (4) different stations (BI-2 to BI-5) during breeding bird surveys in 2020.

4.4.3 Eastern Meadowlark

Eastern Meadowlark is designated Threatened in Ontario and federally designated Threatened by COSEWIC. This species may have been rare in southern Ontario prior to European settlement and was likely associated with tallgrass prairie habitats in the southwest. Eastern Meadowlark is considered area-sensitive and often does not breed in habitats which are less than 4 ha in size and may also be found in fields with a greater density of shrub cover (COSEWIC 2011).

Eastern Meadowlark was documented as a possible breeder (i.e., recorded once during the breeding season) in an agricultural field on Adjacent Lands to the south.

5 PHASING, OPERATIONS, AND REHABILITATION PLANS

The Applicant is applying for a new Class A pit licence application to facilitate below-water pit extraction within the Site. The ARA plans are provided in **Appendix 8**. The total area to be licensed, extracted, and rehabilitated is as follows:

Total area to be licensed: 23.4 ha
Total area to be extracted: 20.0 ha
Total area to be rehabilitated: 20.0 ha.

The operations plan consists of five phases of extraction/rehabilitation (A-E) overlapping with three discrete areas (Areas 1, 2 and 3) and proceeding generally from the existing licenced pit in a southward direction, moving eastward then northward toward Truman Line. Undisturbed portions of the Site (to be extracted in later phases) will remain in agricultural use until extraction commences. Entrance to and exit from the Site will be gained from the existing driveway servicing licence No. 2134 on Adjacent Lands to the west.

As a result of below-water pit extraction, the Site will largely become a back-flooded pond environment following extraction below the water table. Per the Hydrogeological Assessment, the pit pond is expected to have an average final elevation of 241.9 masl and an average pond depth of 12.9 m. The pit pond design incorporates shallow side slopes (10:1) to create a wetland environment along the northern and southern pond margins, which will be planted with a variety of native macrophytes.

6 EFFECTS ASSESSMENT AND MITIGATION

The purpose of this NER is to present a biophysical characterization of the Study Area as a means to identify the potential for adverse effects on the natural environment and natural heritage features stemming from the proposed pit extraction activities. Several significant natural features and species were documented (or may occur) within the Site pursuant to the assessments in **Section 3.3.6**. The following effects assessment provides an evaluation of the potential for the proposed pit application to result in negative effects to such environmental components and offers technical recommendations to mitigate such effects where warranted. Certain technical recommendations offered herein apply to several natural features and/or species simultaneously; as such, all technical recommendations should be read and considered in their entirety. The baseline or existing conditions against which the application is assessed are treated as the state of the Site at the time of the site assessments. The effects assessment herein is based on the Site Plans provided in **Appendix 8**.

All pits and quarries in Ontario are subject to a set of standards and conditions which are outlined in both O. Reg. 244/97and the Site Plan Standards (August 2020) per the compiled Aggregate Resources of Ontario Standards. The effects assessment herein assumes that all pit operations within the Site will be undertaken consistent with these requirements, which pertain to both Class A and Class B licences. Such conditions and standards that have bearing on protection of the natural environment are not duplicated as technical recommendations herein as they already represent

licence requirements. Relevant standards per subsections 0.12 and 0.13 of O. Reg. 244/97 include the following:

- Dust will be mitigated, and the use of dust suppressants will be applied to internal haul roads and processing areas as required.
- A Spills Contingency Program will be developed prior to site operations, and followed during operations.
- Fuel storage tanks will be installed and maintained according to the *Technical Standards and Safety Act*.
- If required, an Environmental Compliance Approval will be secured to carry out operations.
- If required, a Permit to Take Water will be secured.
- Topsoil will be stripped sequentially prior to aggregate extraction.
- Topsoil and overburden stripped during the operation will be stored separately with vegetated slopes to promote stability and control erosion.
- Adequate vegetation will be established and maintained to control erosion of any berm or stockpile.
- Scrap may only be stored temporarily and cannot be located within 30 m of any body of water or 30 metres from the boundary of the Site.
- Excavation is to be set back 15 metres from the boundaries of the Site and 30 metres from any body of water that is not the result of excavation below the water table.
- All excavation faces are to be stabilized to prevent erosion.
- All stripped topsoil or overburden will be used in the rehabilitation of the Site.
- Adequate vegetation is established and maintained to control erosion of any topsoil or overburden replaced for rehabilitation purposes.
- Rehabilitation will ensure adequate drainage and vegetation is provided and any compaction is alleviated.

Technical recommendations above and beyond the aforementioned conditions and standards are offered in **Section 6.5** to avoid and/or minimize impacts to the significant natural features identified. Certain technical recommendations apply to several natural features and/or species simultaneously; as such, all technical recommendations should be read and considered in their entirety. All technical recommendations offered herein are incorporated into the ARA Site Plans provided in **Appendix 8** while the recommended setback from the Deciduous Woodland are also shown on **Figure 3**.

6.1 Provincially Significant Wetland

Where development and/or site alteration activities are proposed adjacent to wetlands, adverse effects may occur via the following pathways:

- Alterations to surface water and/or groundwater contributions to the wetland from construction (e.g., dewatering, etc.), grading that modifies the existing topography or drainage, and/or increased coverage of impervious surfaces (e.g., roads, roofs, etc.);
- Increased sediment loadings and/or nutrient enrichment within the wetland via runoff exiting from development areas during and post construction. This may alter wetland water

quality and vegetation communities via increased turbidity, eutrophication, contamination by toxic substances, changes in pH, etc.

- Noise and/or light pollution that may adversely affect the ability of wetland wildlife to successfully carry out their life processes (e.g., breeding, feeding, etc.); and
- Increased human activity (i.e., encroachment) within the wetland which may result in soil compaction, dumping, etc.

The PSW extends no closer than approximately 100 m from the western Site limit. The results of the Hydrogeological Assessment confirmed that the PSW (and associated drainage features flowing southward) is perched relative to the groundwater table which prevails within the sand/gravel deposit beneath the Site, which is approximately 7 m or more below the ground surface. The Hydrogeological Assessment concluded that there is no groundwater contribution from the Site to the PSW. As there is also no surface water contribution to the PSW (overland runoff within the Site sheet flows in a predominantly southerly direction, away from the PSW), the Hydrogeological Assessment concluded that there is no direct hydrological relationship between the Site and adjacent PSW (or surface water drainage features therein).

6.2 Significant Woodlands

Where development and/or site alteration activities are proposed adjacent to forests or woodlands, adverse effects may occur via the following pathways:

- Mechanical injury to the trunk, roots, branches, and/or foliage of retained woody vegetation.
- Soil compaction from the use of heavy machinery.
- Smothering or exposure of roots due to changes in grade.
- Noise and/or light pollution that may adversely affect the ability of woodland wildlife to successfully carry out their life processes (e.g., breeding, feeding, etc.).
- Increased human activity (i.e., encroachment) within or adjacent to the woodland which may result in soil compaction, dumping, etc.

Per the assessment in **Section 4.1**, the Deciduous Woodland meets relevant criteria for significance pursuant to the Municipality's OP. The dripline of the Deciduous Woodland as delineated by Terrastory on-site is shown on **Figure 3**. The Operations Plan incorporates a 15 m dripline setback. As outlined in Terrastory's technical recommendations summarized in **Section 6.5**, this setback is to be well-marked (i.e., staked) prior to adjacent pit operations, planted with two rows of Eastern White Pine (*Pinus strobus*), and will become natural, self-sustaining vegetation to facilitate enhancement of the buffer area (which was planted in cash crops in 2020).

6.3 Significant Wildlife Habitat

Per the assessment in **Section 4.3**, a total of three (3) SWH types were considered further through this study:

- Seasonal Concentration Areas of Animals
 - 1. Bat Maternity Colonies
- Rare Vegetation Communities or Specialized Habitats for Wildlife
 - 2. Amphibian Breeding Habitat (woodlands)
- Habitat of Species of Conservation Concern

3. Special Concern and Rare Wildlife Species

Also based on this assessment, a total of two (2) Special Concern or provincially rare species are considered to have a possible likelihood of occurrence on the Subject Property (or were confirmed) given their habitat associations and current distribution in southern Ontario:

- 1) Eastern Wood-pewee (Contopus virens)
- 2) Monarch (Danaus plexippus)

All SWH types and Special Concern/provincially rare species associated with the Deciduous Woodland will be adequately protected by the recommended 15 m dripline setback (and additional technical recommendations outlined in **Section 6.5**). This includes candidate habitat for bat maternity colonies and probable breeding habitat for Eastern Wood-pewee.

As established in **Section 6.1**, no impacts to the PSW are anticipated given extraction activities within the Site as there is no direct hydrological relationship between the Site and PSW. By extension, significant amphibian breeding habitat within the PSW will not experience any negative impacts associated with pit extraction within the Site.

No specific recommendations are offered herein to minimize impacts to potential nectaring and/or ovipositing habitat for Monarch. This species is a habitat generalist and abundant nectaring and ovipositing habitat exists within the wider landscape surrounding the Subject Property.

6.4 Habitat of Endangered and Threatened Species

Per the assessment in **Appendix 7**, a total of five Endangered or Threatened species are considered to have a possible likelihood of occurrence on the Subject Property given their habitat associations and current distribution in southern Ontario (or were confirmed based on the 2020 fieldwork program):

- 1) Little Brown Myotis (Myotis lucifugus)
- 2) Northern Myotis (Myotis septentrionalis)
- 3) Tri-colored Bat (Perimyotis subflavus)
- 4) Bank Swallow (Riparia riparia)
- 5) Eastern Meadowlark (Sturnella magna)

Roosting habitat for Endangered bats (including both individuals and maternity colonies) is present within the Deciduous Woodland, which will be protected by a 15 m setback. Notwithstanding this, minor woody vegetation removal may be required (outside the woodland) during pit operations. As such, a timing restriction on vegetation removal is advised. To simplify the Site Plan requirements, the tree removal timing window recommended in **Section 6.5** combines both the principal bat activity period and bird nesting period (in Ecoregion 7E) to address overlapping requirements of the *Migratory Birds Convention Act* (protection of migratory bird nests) and *Fish and Wildlife Conservation Act* (protection of certain non-migratory bird nests).

Bank Swallow nest excavations were documented along the southern vertical pit face on Adjacent Lands to the west during the 2020 breeding season. Best management practices to avoid impacting the nesting colony (and individuals) must be implemented when the southern pit face is removed during pit operations (see **Section 6.5**).

No impacts to individuals or the habitat of Eastern Meadowlark are anticipated through this application. Possible breeding habitat for this species occurs on Adjacent Lands to the south at a sufficient distance from the limit of pit operations.

6.5 Natural Environment Technical Recommendations

In addition to the 15 m dripline setback from the Deciduous Woodland, which is directly incorporated onto the Operations Plan, the following measures are recommended to protect this Significant Woodland during pit operations and are incorporated as Site Plan notes:

- > The 15 m setback from the dripline of the Deciduous Woodland will be well-marked (i.e., staked) under the direction of a qualified ecologist prior to the commencement of adjacent pit operations.
- > Operational activities and other disturbances are prohibited within the 15 m dripline setback of the Deciduous Woodland.
- Two (2) rows of Eastern White Pine (Pinus strobus) will be planted within the 15 m dripline setback from the Significant Woodland.
- The 15 m dripline setback from the Significant Woodland will become natural, self-sustaining vegetation (i.e., no vegetation maintenance or human activities).
- Any necessary lighting to support pit operations will be directed away from the Deciduous Woodland (i.e., northward) to the extent practicable.

Bank Swallow frequently nests in vertical or near-vertical (i.e., above 75°) aggregate stockpiles and pit faces containing sandy overburden. A nesting colony of this species was documented in 2020 along the southern pit face on Adjacent Lands to the west; it is not known if the colony continued to occupy this breeding site during the 2021 or 2022 breeding seasons. The ARA Site Plans indicate that extraction will proceed in a southerly direction from the existing pit through the pit face where the Bank Swallow colony was documented in 2020. Further, occupation by Bank Swallow of future aggregate stockpiles or pit faces under active extraction within the Site during the nesting season (i.e., approximately April to late August for this species) would likely result in the need for temporary cessation of nearby pit operations until the birds have completed nesting. To avoid impacts to this threatened species, the following measure is recommended:

> All aggregate operations within the Site will be undertaken consistent with the document titled "Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario" (OMNRF 2017).

To minimize impacts to generalized wildlife habitat and activities beyond the significant natural features and their associated buffers during future pit operations, the following measure is recommended:

Any necessary removal of vegetation to support pit operations will be completed outside the primary bird nesting and bat activity periods (i.e., to be completed between October 1 and March 31).

7 APPLICABLE NATURAL HERITAGE AND ENVIRONMENTAL POLICIES

The following sections summarize the various municipal, provincial, and federal environmental policies that apply to the proposed pit operations plan and describe how the recommendations provided in this study will address these policies (where applicable). The overall intent of the NER is to satisfy applicable natural heritage policies.

7.1 Municipality of Central Elgin Official Plan (March 2013 office consolidation)

The Municipality's OP is a legal document prepared as required under section 14.7(3) of the *Planning Act*. An OP sets out goals, objectives, and policies that direct and manage land-use and future development activities and their effects on the social and natural environment of a municipality. Provincial plans that offer direction on matters of provincial interest are implemented principally through the Municipality's OP. Provided herein is a description of relevant environmental and natural heritage policies contained within the Municipality's OP and an assessment of whether the application addresses such policies.

The Subject Property is designated "Agricultural" per Schedule 1 (Land Use Structure) of the Municipality's Official Plan (OP). Schedule A (Land Use Plan) carries forward the "Agricultural" designation and also designates a mature deciduous woodland abutting the southeastern boundary of the Site as "Natural Heritage". Schedule A2 (Environmental Features) clarifies that the "Natural Heritage" designation reflects a "Wooded Area", and further indicates that a separate "Wooded Area" occurs in the northwest corner of the Subject Property which overlaps with an Environmentally Sensitive Area. Wetland units associated with the Provincially Significant Glanworth Wetland Complex occur on Adjacent Lands to the west, which are designated likewise per Schedule A2 of the Municipality's OP.

The Municipality's natural heritage policy framework is outlined in section 3.1 of their OP. A list of key natural heritage provisions of the Municipality's OP that pertain to the pit licence application considered herein is provided below.

- **Section 3.1 preamble** states that designated Natural Heritage areas may consist of:
 - Significant Wetlands
 - Significant Woodlands
 - Fish Habitats
 - Habitat of Endangered Species or Threatened Species
 - Areas of Natural and Scientific Interests (ANSI's)
 - Significant Wildlife Habitats
 - Significant Valleylands
 - Environmentally Sensitive Areas (ESAs):
- Section 3.1.1 (Natural Heritage Policies) clarifies that new permitted uses, or expansions/enlargements to existing uses, buildings or structures within a Natural Heritage system designation which require a *Planning Act* approval may only be permitted if it can be demonstrated (through an EIS per section 3.4) that there will be no negative impacts to the natural heritage features and/or their ecological functions.

- Section 3.1.1.1 (Wetland Policies) clarifies that development and/or site alteration within a provincially or locally significant wetland is prohibited.
- Section 3.1.1.2 (Woodland Policies) requires that significant woodlands be protected from incompatible land uses.
- Section 3.1.1.4 (SAR Policies) states that development and site alteration shall not be permitted in the significant habitat of endangered/threatened species except where the activity has been permitted under the *Endangered Species Act*.
- Section 3.1.1.6 (Wildlife Habitat Policies) requires that the significance of wildlife habitat be evaluated in accordance with provincial criteria, and states that development and site alteration are not permitted in SWH unless it can be demonstrated that there will be no negative impacts on the feature or its ecological functions.
- **Section 3.1.2 (Adjacent Lands)** establishes that an application must demonstrate no negative impacts to natural features and/or functions on Adjacent Lands.

The results of this study have confirmed the presence of the following natural heritage area components:

- Significant Woodland (Deciduous Woodland).
- Provincially Significant Wetland (abutting the western boundary of the Study Area).
- Confirmed Significant Wildlife Habitat types (e.g., breeding habitat for Eastern Woodpewee, amphibian breeding habitat in the PSW on Adjacent Lands).
- Nest excavations associated with a Bank Swallow breeding colony along a near vertical pit face on Adjacent Lands to the west.
- Potential habitat for Endangered bat species.
- Environmentally Sensitive Area northwest of the Site and extending onto Adjacent Lands to the west.

Terrastory reviewed potential impacts to the documented natural heritage feature components in **Section 6** of this NER. The Site Plan incorporates ecologically appropriate setbacks from the Deciduous Woodland (15 m) which represents the highest value natural heritage feature within or abutting the Site. Per the results of the Hydrogeological Assessment, the PSW on Adjacent Lands west of the existing ARA licence is perched above the prevailing groundwater table in the Site; given this, and the fact that the PSW is >100 m from the limit of extraction, no negative impacts to the PSW are anticipated. Provided that Terrastory's recommended mitigation measures are implemented in full (per **Section 6.5**), no negative impacts are anticipated to any natural feature considered through section 3.1 of the Municipality's OP.

7.2 Elgin County Official Plan (February 2015 office consolidation)

Elgin County's natural heritage policy framework is predominantly outlined in Part D of the County OP. The County OP provides a similar policy framework (e.g., no negative impact) and list of natural heritage features and areas to be protected as the Municipality's OP (e.g., significant woodlands, significant habitat of endangered and threatened species, significant wetlands). Criteria for determining feature significance is outlined in Policy D1.2.2.8. Potential natural heritage corridors are also protected through the County OP per Policy D1.2.5.

The County's natural heritage policies are generally consistent with the Municipality's OP as described in **Section 7.1**. Given that Terrastory's technical recommendations as outlined in **Section 6.5** have been incorporated as Site Plan notes, no negative impacts to any significant natural heritage feature protected by the County's OP are anticipated.

7.3 Aggregate Resources Act, R.S. O. 1990, c. A.8

The information and recommendations provided in this report satisfy the requirements for completion of a Natural Environment Report pursuant to Section 2.2 of the compiled Aggregate Resources of Ontario Standards. The following significant natural features per ARA policies were identified within the Study Area:

- Significant Woodland (Deciduous Woodland).
- Provincially Significant Wetland (abutting the western boundary of the Study Area).
- Candidate or Confirmed Significant Wildlife Habitat, including:
 - o Bat Maternity Colonies (candidate);
 - o Amphibian Breeding Habitat (woodland) in the PSW (confirmed);
 - o Eastern Wood-pewee (confirmed);
 - Monarch (confirmed);
- Candidate or Confirmed Habitat of Endangered and Threatened Species, including:
 - o Little Brown Myotis, Northern Myotis, and Tri-colored Bat (candidate).
 - o Bank Swallow (confirmed nesting within the adjacent pit); and
 - o Eastern Meadowlark (confirmed, Adjacent Lands only).

Terrastory reviewed potential impacts to the documented natural heritage feature components in **Section 6** of this NER. The Site Plan incorporates ecologically appropriate setbacks from the Deciduous Woodland (15 m) which represents the highest value natural heritage feature within or abutting the Site. Per the results of the Hydrogeological Assessment, the PSW on Adjacent Lands west of the existing ARA licence is perched above the prevailing groundwater table in the Site; given this, and the fact that the PSW is >100 m from the limit of extraction, no negative impacts to the PSW are anticipated. Provided that Terrastory's recommended mitigation measures are implemented in full (per **Section 6.5**),

Terrastory's recommended mitigation measures (per **Section 6.5**), which have been incorporated as Site Plan notes, allow for appropriate protection of all significant natural features identified consistent with relevant ARA standards.

7.4 Provincial Policy Statement 2020, pursuant to the Planning Act, R.S.O. 1990, c. P. 13

The Provincial Policy Statement (PPS) is promulgated under the authority of the *Planning Act* and came into effect on 1 May 2020. The PPS provides direction to municipalities on land-use matters of provincial interest and sets the policy framework for regulating the use and development of land. Municipal OP's must be consistent with the PPS. Per its preamble, the PPS *provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment.*

The principal PPS policies that apply to natural heritage protection are outlined in section 2.1. While recognizing that the natural heritage protection framework is not intended to limit the ability of agricultural uses to continue (Policy 2.1.9), the PPS instructs that *natural features and areas shall be*

protected for the long term (Policy 2.1.1) and that their diversity and connectivity be maintained, restored or, where possible, improved (Policy 2.1.2). In Ecoregions 6E and 7E the PPS separates significant features into three categories:

- 1) Those in which development and site alteration are not permitted, including 1) Provincially Significant Wetlands and 2) Significant Coastal Wetlands (Policy 2.1.4);
- 2) Those in which development and site alteration are not permitted unless it can be demonstrated that no negative impacts on the significant natural feature and/or its functions will occur, including: 1) Significant Woodlands, 2) Significant Valleylands, 3) Significant Wildlife Habitat, 4) Significant Areas of Natural and Scientific Interest, 5) Non-significant Coastal wetlands, and 6) Adjacent Lands (Policy 2.1.5 and 2.1.8).
- 3) Those in which development and site alteration are not permitted except in accordance with federal/provincial requirements, including: 1) fish habitat (Policy 2.1.6) and 2) habitat of Endangered and Threatened Species (Policy 2.1.7).

In considering the aforementioned PPS policies, it has been determined that the proposed pit operations plan addresses relevant natural heritage provisions of the PPS for the following reasons:

- Per Table 4 of this report, no Significant Areas of Natural or Scientific Interest, Significant Valleylands, or Fish Habitat are present within the Study Area.
- Per Section 6 of this report, no negative impacts to the Significant Woodland and overlapping candidate/confirmed Significant Wildlife Habitat in the Deciduous Woodland are anticipated given the setbacks incorporated into the proposed pit operations plan.
- Per **Section 6** of this report, no negative impacts to the PSW are anticipated given the distance between this feature and the limit of extraction (>100 m), and the fact that there is no direct hydrological relationship (i.e., surface water or groundwater) between the Site and PSW.

Provincial Endangered Species Act, S.O. 2007, c. 6

The Endangered Species Act (ESA) is administered by MECP and protects designated Endangered and Threatened species in Ontario from being killed, harmed, or harassed (s. 9) or having their habitat damaged or destroyed (s. 10). The protection afforded to Endangered and Threatened species "habitat" is either prescribed by O. Reg. 832/21, or (for those species that lack regulated habitat) is defined as an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding. Activities that constitute habitat damage and/or destruction can only proceed subject to the requirements of ESA section 17, a notice of activity registration per O. Reg. 242/08 or O. Reg. 830/21 (where applicable), or (in limited circumstances) payment of a species conservation charge per O. Reg. 830/21.

A detailed assessment of potential Endangered and Threatened habitat within the Study Area is provided in Appendix 7. Per this assessment, and provided that relevant technical recommendations outlined in Section 6.5 are implemented in full (particularly the need to follow provincially-prescribed best management practices for Bank Swallow), it has been determined that the proposed development plan is consistent with the species and habitat protection provisions of the ESA.

7.6 Federal *Fisheries Act*, R.S.C. 1985, c. F-14

The amended federal Fisheries Act (Bill C-68) received Royal Assent in June 2019 while the updated fish and fish habitat protection provisions came into force in August 2019. Subsection 34.4(1) of the amended Fisheries Act prohibits all work, undertaking, or activity from causing the death of fish (other than fishing). Subsection 35(1) requires that project activities not result in the "harmful alteration, disruption or destruction of fish habitat" (HADD) unless undertaken in accordance with the requirements of a statutory exemption per subsection 35(2). Based on the Fish and Fish Habitat Protection Policy Statement (August 2019), HADD is interpreted by DFO to include "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish".

There are no fish-bearing watercourses within the Study Area, and (per the results of the Hydrogeological Assessment) there is no direct hydrological relationship between the Site and any watercourses to the west.

7.7 Federal *Migratory Birds Convention Act*, S.C. 1994, c. 22

Section 6 of the Migratory Birds Regulations under the *Migratory Birds Convention Act, 1994* (MBCA) prohibits the disturbance or destruction of nests, eggs, or nest shelters of a migratory bird. The provincial *Fish and Wildlife Conservation Act, 1997* extends the protection of bird nests and eggs to certain species not listed under the Migratory Birds Regulations (e.g., Corvids, Strigids, Accipitrids, etc.).

Provided that the recommendations outlined in **Section 6.5** are implemented in full (i.e., prohibition on vegetation removal during the bird breeding season), no impacts to breeding birds or bird nests protected by the MBCA or FWCA are anticipated.

8 CONCLUSIONS

In accordance with application standards for Class A pit licences pursuant to the Aggregate Resources Act, the preceding Natural Environment Report provides a detailed characterization of the natural environment occurring within and adjacent to the proposed Macpherson Pit at 43371 Truman Line in the Municipality of Central Elgin. This NER has been prepared in support of the ARA licence application along with Official Plan Amendment and Zoning By-law Amendment applications to the Municipality. Included herein is a comprehensive approach to identifying the presence or absence of several significant natural features afforded varying degrees of protection by applicable environmental policies, particularly the ARA Provincial Standards, PPS, Municipal/County OPs, and Endangered Species Act. Potential negative impacts to the documented significant natural features are described with mitigation measures and technical recommendations offered to avoid or minimize such impacts and/or offer enhancements as appropriate.

Based on the findings presented in this report, the following natural features with ecological and/or policy significance have been identified within the Study Area:

- A woodlot (Deciduous Woodland) in the southeastern corner of the Site was found to meet relevant criteria as **Significant Woodland**.
- The Deciduous Woodland contains confirmed **Significant Wildlife Habitat** (Eastern Wood-pewee) along with candidate SWH types (e.g., bat maternity roosting habitat).

- Bank Swallow (Threatened bird species) nest excavations were documented along the southern face of an existing licensed pit to the west, which will be extracted and removed as part of the licence application considered herein.
- Potential roosting and feeding habitat for Endangered Bats is present within the Significant Woodland.
- Possible breeding habitat for the **Eastern Meadowlark** (Threatened bird species) occurs on Adjacent Lands to the south.

The extraction limit incorporates a 15 m dripline setback from the Significant Woodland. This setback will become (or remain in) natural, self-sustaining vegetation, and no acoustic berms have been specified within the buffer, which will be planted with two rows of Eastern White Pine. Best management practices are to be implemented to protect the Bank Swallow colony when pit extraction advances southward from the adjacent licenced pit to the west.

Overall, it has been determined that no negative impacts to the above-noted significant natural features will occur provided that all technical recommendations offered in **Section 6.5** are implemented in full. The ARA Site Plan that directs and constrains pit operations (**Appendix 8**) incorporates all technical recommendations made herein.

9 REFERENCES

- Armstrong, D. K., and J. E. P. Dodge. 2007. "Paleozoic Geology of Southern Ontario."
- Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, and Ontario Ministry of Natural Resources Ontario Nature. 2001. "Ontario Breeding Bird Atlas: Guide for Participants."
- Bird Studies Canada, United States Environmental Protection Agency, and Environment Canada. 2008. "Marsh Monitoring Program Participant's Handbook for Surveying Amphibians."
- Bradley, D. J. 2013. "Southern Ontario Vascular Plant Species List."
- Cadman, M. D., D. A. Sutherland, G. G. Beck, D. Lepage, and A. R. Couturier. 2007. *Atlas of the Breeding Birds of Ontario*, 2001–2005.
- Chapman, L. J., and D. F. Putnam. 1984. "Physiography of Southern Ontario."
- COSEWIC. 2011. "COSEWIC Assessment and Status Report on the Eastern Meadowlark in Canada."
- ——. 2012. "COSEWIC Assessment and Status Report on the Eastern Wood-Pewee (Contopus Virens) in Canada."
- DFO. 2019. "Fish and Fish Habitat Protection Policy Statement."
- Dobbyn, J. S. 2005. Atlas of the Mammals of Ontario.
- Gao, C., J. Shirota, R.I. Kelly, F.R. Brunton, and S. van Haaften. 2006. "Bedrock Topography and Overburden Thickness Mapping, Southern Ontario."
- Henson, B. L., and K. E. Brodribb. 2005. "Great Lakes Conservation Blueprint for Terrestrial Biodiversity." Vol. 2.
- Humphrey, C., and H. Fotherby. 2019. "Little Brown Myotis, Northern Myotis and Tri-Colored Bat Recovery Strategy."
- Lee, H. T. 2008. "Southern Ontario Ecological Land Classification: Vegetation Type List."
- Lee, H. T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. "Ecological Land Classification for Southern Ontario: First Approximation and Its Application."
- MNR. 2010a. "Natural Heritage Reference Manual."
- ——. 2010b. "Significant Wildlife Habitat Technical Guide."
- MNRF. 2014. "Significant Wildlife Habitat Mitigation Support Tool."
- ——. 2015a. "Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E."

TERRASTORY

environmental consulting inc

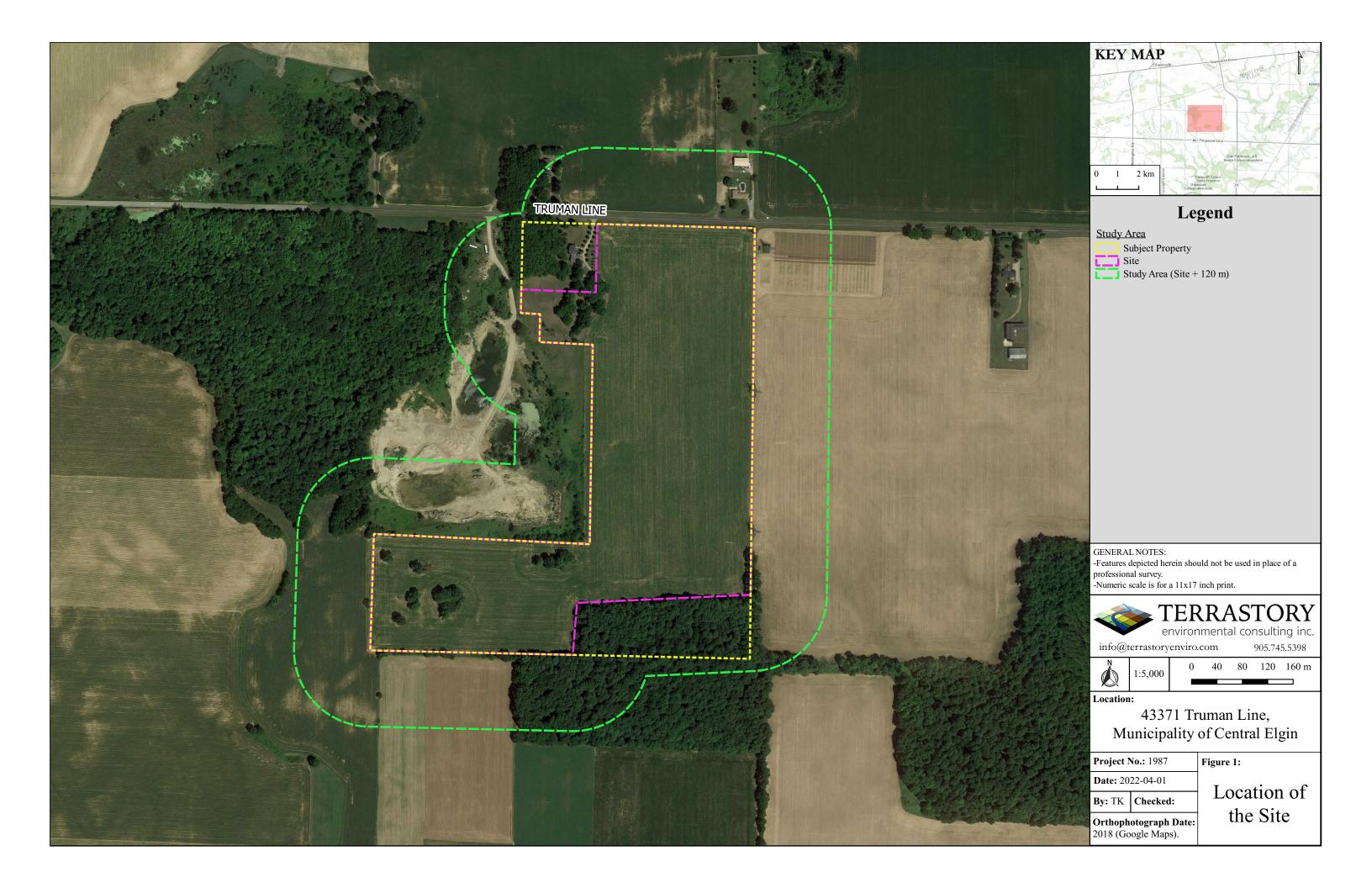
———. 2015b. "Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E," no. January.

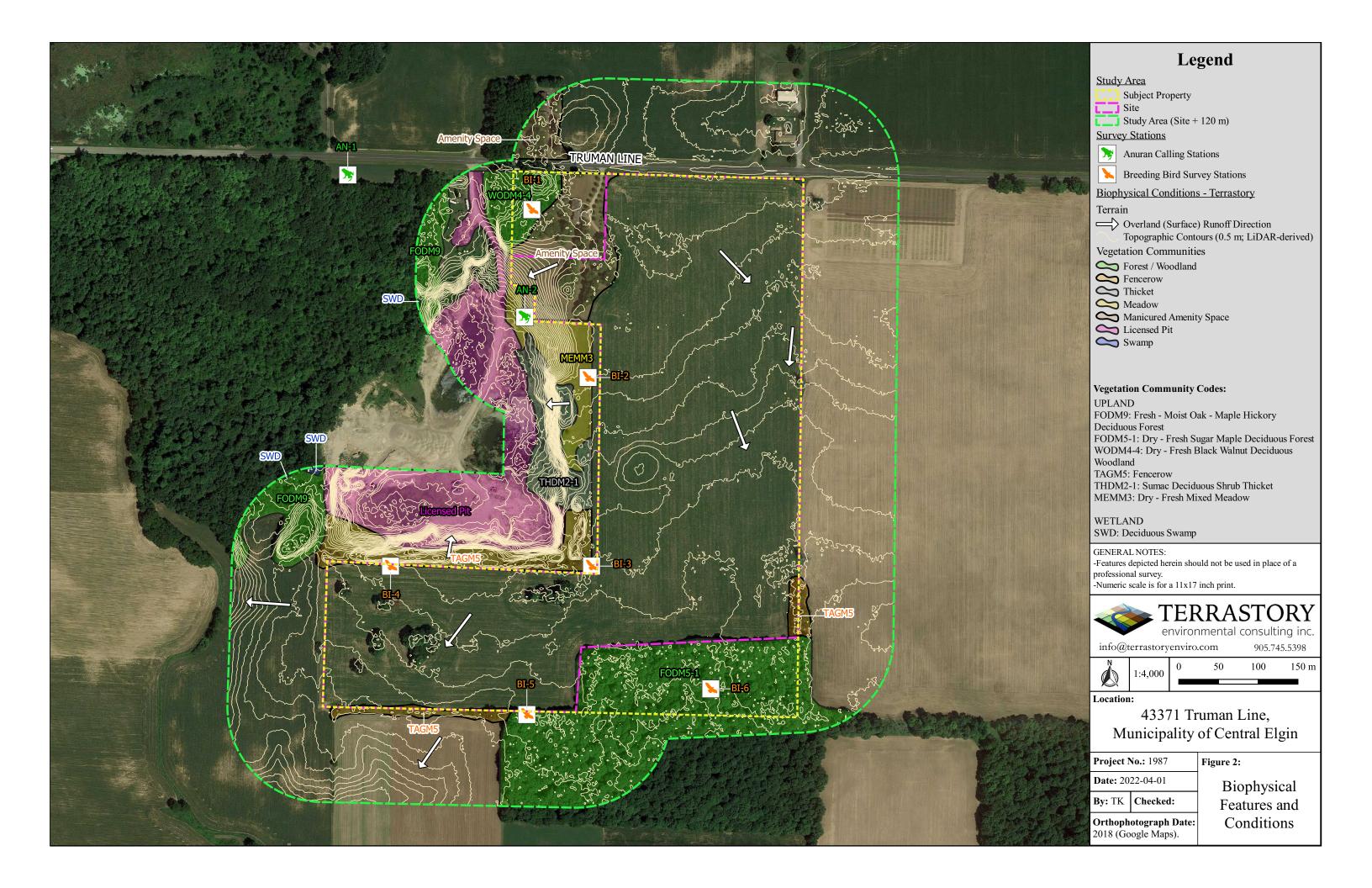
Oldham, M. 2017. "List of Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)."

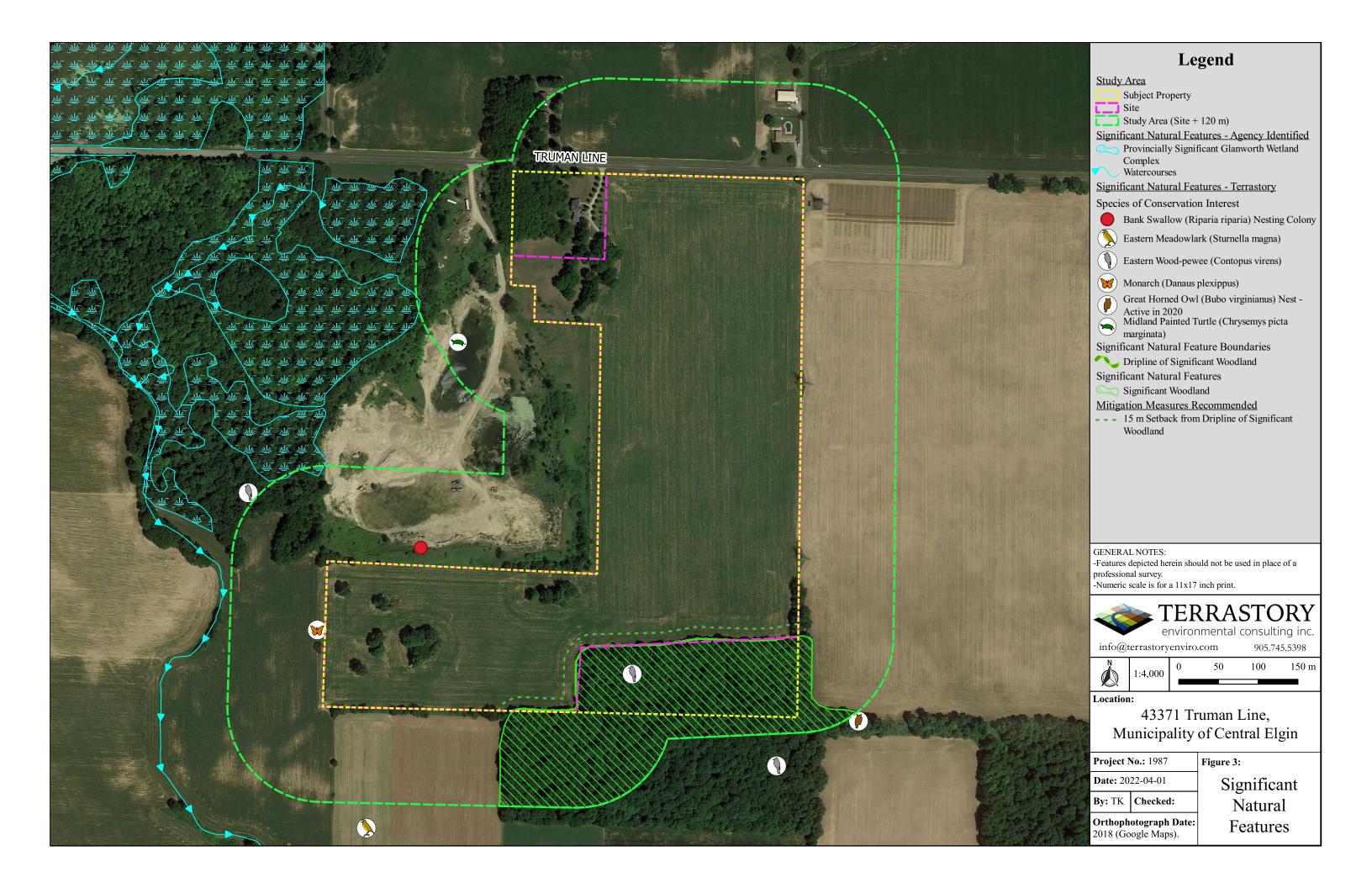
OMNRF. 2017. "Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario."

Ontario Geological Survey. 2010. "Surficial Geology of Southern Ontario."

Phair, C., B.L. Henson, and K.E. Brodribb. 2005. "Great Lakes Conservation Blueprint for Aquatic Biodiversity." Vol. 2.











Tristan L. Knight, M.E.S., M.Sc. Senior Ecologist / President Curriculum Vitae

CAREER HISTORY AND EDUCATION

2018–Present	Senior Ecologist / President, Terrastory Environmental Consulting Inc.
2014 - 2018	Ecologist / Botanist, RiverStone Environmental Solutions Inc.
2013-2014	Watershed Restoration Technician, Credit Valley Conservation Authority
2012-2013	Terrestrial Ecologist, Aquafor Beech Ltd.
2011-2012	Wetland Biologist / Asst. SAR Biologist, Ontario Ministry of Natural Resources
2009-2011	Master of Science, SUNY College of Environmental Science and Forestry, Syracuse, NY, USA
2007-2009	Master of Environmental Studies, York University, Toronto, ON
2003-2007	Hons. Bachelor of Arts, University of Western Ontario, London, ON

RELEVANT CERTIFICATIONS AND TRAINING

ISA Tree Risk Assessment Qualification (TRAQ) Renewal
Butternut Health Assessor (#268) Renewal
Managed Forest Plan Approver (#421)
Vegetation Sampling Protocol
Ontario Stream Assessment Protocol (OSAP)
Fish Identification "Level 2"
Electrofishing "Class 2"
ISA Certified Arborist #ON-1663A
Ontario Benthos Biomonitoring Network (OBBN)
Ontario Wetland Evaluation System (OWES) Instructor
Family-level Benthic Invertebrate ID Workshop
Ontario Wetland Evaluation System (OWES)
Ecological Land Classification (ELC)

PROFESSIONAL EXPERIENCE

Tristan has over ten years of experience as an environmental professional acting in diverse private- and public-sector roles. He applies intimate knowledge of the environmental policy context guiding development in Ontario to projects large and small. Tristan's regular client base spans the entire development industry and includes land developers, aggregate producers, municipal infrastructure, and green energy. Tristan is also a highly accomplished field ecologist with professional training in innumerable provincial collection protocols including Ecological Land Classification, Ontario Wetland Evaluation System, Ontario Stream Assessment Protocol, Ontario Benthos Biomonitoring Network, and Vegetation Sampling Protocol. He is an ISA-certified Arborist, ISA-qualified Tree Risk Assessor, Butternut Health Assessor, and Managed Forest Plan approver. He is also a former instructor of the Ontario Wetland Evaluation System certification course and a current instructor with the Ontario Master Naturalist Program (Lakehead University, Orillia Campus) and Ontario Natural Certification Course (Kortright Centre). Drawing on a diverse mixture of project management and field expertise, he is single-mindedly focused on generating high-quality deliverables that exceed expectations. Above all, Tristan undertakes his work with utmost integrity, objectiveness, and concern for detail.

The following is a selected list of Tristan's consulting project experience since founding Terrastory in February 2018.

Environmental Impact Studies for Land Development (Large Applications)

2018-present

Environmental Impact Statement in the Township of Severn in support of an estate residential subdivision.

- Three-season ecological surveys and assessments (amphibians, vascular plants, vegetation mapping, bats, etc.).
- Graphics, reporting, policy conformity assessments.

2019-present

Environmental Impact Statement in the City of Welland for an 870 unit residential and mixed-use subdivision.

- Three-season ecological surveys and assessments (amphibians, breeding birds, bat acoustic monitoring, vascular plants, vegetation mapping, etc.).
- Wetland and woodland enhancement/compensation plans.
- Rare species relocation plans and implementation.
- Graphics, reporting, policy conformity assessments.

2019

Environmental Impact Statement in the City of Orillia in support of a waterfront community.

- Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, vegetation mapping, bat habitat, aquatic habitat, etc.).
- Graphics, reporting, policy conformity assessments.

2020

Environmental Impact Statement in the City of Orillia in support of a waterfront community.

- Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, vegetation mapping, bat habitat, aquatic habitat, etc.).
- Butternut Health Assessment.
- Graphics, reporting, policy conformity assessments.

2020-present

Environmental Impact Statement in the Township of Wainfleet in support of an estate residential community.

- Ecological assessments and species at risk surveys.
- Graphics, reporting, policy conformity assessments.

2020-present

Subwatershed Impact Study in the Town of Halton Hills in support of a multi-phase warehouse distribution centre.

- Three-season ecological surveys and assessments (amphibians, breeding birds, owls, vascular plants, hawthorns, vegetation mapping, headwater drainage features, odonates, butterflies, etc.).
- Arborist Report and Tree Protection Plan.
- Graphics, reporting, policy conformity assessments.
- Review and integration of other technical disciplines including fluvial geomorphology, hydrogeology, hydrology and hydraulics, stormwater management, landscape architecture.

Environmental Impact Studies for Land Development (Small Applications)

2018

Environmental Impact Statement in the City of Kawartha Lakes in support of a site plan and Kawartha Conservation permit application.

- Ecological and species at risk surveys.
- Wetland delineation.
- Graphics, reporting, policy conformity assessments.

2018

Environmental Impact Statement in the Township of Ramara in support of a severance application.

- Ecological and species at risk surveys.
- Wetland staking.
- Graphics, reporting, policy conformity assessments.

2018 **Environmental Impact Statement** in the City of Orillia in support of a site plan application.

- Ecological and species at risk surveys.
- Graphics, reporting, policy conformity assessments.

2018-2019 **Natural Heritage Evaluation** in the City of Burlington in support of a severance application and Niagara Escarpment development permit.

- Ecological and species at risk surveys.
- Woodland dripline staking with agency staff.
- Graphics, reporting, policy conformity assessments.

2019 **Environmental Impact Statement** in the Town of Gravenhurst in support of a site plan application.

- Ecological and species at risk surveys.
- Graphics, reporting, policy conformity assessments.
- Environmental Impact Statement in the Township of Severn in support of a site plan application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- Natural Heritage Evaluation in the Town of Caledon in support of a site plan application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- Natural Heritage Evaluation in the Town of Whitchurch-Stouffville in support of a site plan and TRCA permit application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Township of Wainfleet in support of a site plan application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Township of Chatsworth in support of a site plan application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2020 **Environmental Impact Statement** in the City of Kawartha Lakes in support of a site plan application.
 - Ecological and species at risk surveys.
 - Wetland compensation plan.
 - Graphics, reporting, policy conformity assessments.
- 2021-present **Environmental Impact Statement** in the Town of Whitby in support of a site plan application and Conservation Authority permit.
 - Three-season biophysical assessments and surveys.
 - Graphics, reporting, policy conformity assessments.

Environmental Impact Studies for Land Development (Other)

- 2018-2019 **Environmental Impact Statement** in the Township of Woolwich in support of a site plan application and GRCA permit application to construct a boardwalk trail.
 - Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, wetland delineation, vegetation mapping, etc.).
 - Wetland delineation with GRCA staff.
 - Graphics, reporting, policy conformity assessments.
- 2018-2019 **Environmental Impact Statement** in the Town of Whitchurch-Stouffville in support of a site plan application to expand an existing cemetery.

environmental consulting inc.

- Tree inventory, terrestrial/wetland/aquatic surveys, Butternut Health Assessment.
- Graphics, reporting, policy conformity assessments.

2018 **Environmental Impact Statement** in the City of Welland in support of a site plan application to construct a storage facility.

- Ecological and species at risk surveys.
- Graphics, reporting, policy conformity assessments.

Natural Environment Reports for Aggregate Applications

2019-2020 **Natural Environment Report** in the Municipality of Thames Centre in support of an *Aggregate Resources Act* application and related *Planning Act* applications.

- Ecological and species at risk surveys (e.g., breeding birds, vegetation mapping, vascular plants, etc.).
- Graphics, reporting, policy conformity assessments.
- 2019-2020 **Natural Environment Report** in the Township of Huron East in support of an *Aggregate Resources Act* application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- Natural Environment Report in the County of Haldimand (Hagersville) in support of an Aggregate Resources Act application.
 - Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- Natural Environment Report in the Municipality of Thames Centre (Thorndale) in support of an Aggregate Resources Act application and related Planning Act applications.
 - Ecological and species at risk surveys (e.g., breeding birds, vegetation mapping, vascular plants, etc.).
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plans

- Arborist Report and Tree Preservation Plan in the Town of Whitchurch-Stouffville in support of a cemetery expansion.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Arborist Report and Tree Preservation Plan** in the City of Hamilton in support of a condominium development.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the City of Toronto in support of a cemetery expansion.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the Town of Milton in support of a new school and block development plan.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the Town of Caledon in support of a site plan application.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2019 Tree Saving Plan in the City of Thorold in support of a residential subdivision.
 - Tree inventory, health assessment, structural assessment.

environmental consulting inc.

- Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the Town of Ajax in support of a condominium development.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the City of Toronto in support of a condominium development.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the City of Hamilton in support of an Enbridge gas pipeline expansion.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the City of Kitchener in support of a church conversion to residential purposes.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020 **Arborist Report and Tree Preservation Plan** in the City of Toronto in support of a large distribution centre.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the City of Burlington in support of a residential apartment building.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- Arborist Report and Tree Preservation Plan in the Town of Oakville in support of a school construction.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020 Tree Management Plan in the Town of Oakville in support of a school construction.
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Municipal Class Environmental Assessments

2020- Municipal Class Environmental Assessment (Schedule A) in the Township of Severn in support of a culvert replacement.

- Ecological and species at risk surveys (e.g., fish habitat assessment, vegetation surveys, etc.).
- Ecological input to alternatives assessment.
- Graphics, reporting, policy conformity assessments.
- Natural Heritage Review in support of an Environmental Assessment of a proposed new Forcemain to an existing Wastewater Treatment plan in the City of Port Colborne.
 - Ecological and species at risk surveys (e.g., fish habitat assessment, vegetation surveys, etc.).
 - Ecological input to alternatives assessment.
 - Graphics, reporting, policy conformity assessments.

Natural Heritage Constraints Analyses

- Natural Heritage Constraints Analysis in the Town of Bracebridge to assess development potential.
 - Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.

	STORY consulting inc.
2018	Natural Heritage Constraints Analysis in the Township of Puslinch to assess development potential.
	Site reconnaissance assessment.
	Graphics, reporting, policy assessments.
2018	Natural Heritage Constraints Analysis in the Town of East Gwillimbury to assess development potential.
	Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2018	Natural Heritage Constraints Analysis in the County of Brant to assess potential to construct a wind turbine and secure a future Renewable Energy Approval.
	 Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2018	 Natural Heritage Constraints Analysis in the City of Hamilton to assess development potential. Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2019	Natural Heritage Constraints Analysis in the City of Kawartha Lakes to assess development potential to expand an existing aggregate quarry.
	 Terrestrial/wetland/aquatic surveys, species at risk surveys.
	 Graphics, reporting, policy assessments.
2019	 Natural Heritage Constraints Analysis in the Town of Oakville to assess development potential. Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2019	Natural Heritage Constraints Analysis in the City of Welland to assess development potential for a large-scale residential condominium application.
	• Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2019	Natural Heritage Constraints Analysis in the City of Kawartha Lakes to assess development potential for a large-scale residential subdivision.
	• Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
2019	Natural Heritage Constraints Analysis in the City of Welland to assess development potential on a brownfield for a large-scale residential subdivision.
	 Site reconnaissance assessment.
	 Graphics, reporting, policy assessments.
Species	s at Risk Surveys and Recovery
2018	Kentucky Coffee-tree Assessment in the Town of Niagara-on-the-Lake in support of a residential subdivision.
	 Inventory for Kentucky Coffee-tree.
	Graphics, reporting.
	Submission of Information Gathering Form to MNRF.
2018	Species at Risk Assessment in the County of Haldimand in support of a severance application.
	 Species at Risk surveys (e.g., vascular plants, habitat-based assessment for other taxa). Graphics, reporting.

- Graphics, reporting.
- Correspondence with MNRF.

2018 Butternut Health Assessment in the Town of Whitchurch-Stouffville in support of a cemetery expansion.

- Butternut Health Assessment.
- Submission of relevant reporting and correspondence with MNRF.
- 2018 Golden-eye Lichen (Great Lakes population) Recovery Strategy for the Ministry of the

environmental consulting inc.

Environment, Conservation, and Parks.

2019 Chimney Swift Surveys in the City of Hamilton in support of a redevelopment plan.

- Chimney Swift entrance surveys.
- Graphics, reporting.

2019 **Bat Habitat Assessment** in the City of Hamilton in support of a site plan application.

- Habitat-based surveys.
- Graphics, reporting.

2021-present

Spoon-leaved Moss Recovery Strategy for the Ministry of the Environment, Conservation, and Parks.

Fish Habitat Impact Assessments

Fish Habitat Impact Assessment in the Township of Muskoka Lakes in support of a site plan application.

- Aquatic habitat assessment.
- Graphics, reporting, policy conformity assessment.

Fish Habitat Impact Assessment in the Township of Georgian Bay in support of a site plan application.

- Aquatic habitat assessment.
- Graphics, reporting, policy conformity assessment.
- Fish Habitat Impact Assessment in the Town of Huntsville in support of a severance application.
 - Aquatic habitat assessment and fish habitat mapping.
 - Graphics, reporting, policy conformity assessment.
- Fish Habitat Impact Assessment in the Town of Huntsville in support of a severance application.
 - Aquatic habitat assessment and fish habitat mapping.
 - Graphics, reporting, policy conformity assessment.

Peer Review

2019 **Peer Review** in the Municipality of Clarington in reference to a subdivision application.

- Critical assessment of EIS in support of the subdivision.
- Presentation to Council (Oct. 2019).

2020- **Peer Review** in the Town of Huntsville in reference to an island-based development application.

ongoing

- Critical assessment of EIS in support of the subdivision.
- Presentation of expert opinion to LPAT.

Managed Forest Plans

2019	Managed Forest Plan in the City of Hamilton (Stoney Creek) for a private client.
2020	Managed Forest Plan in the City of Hamilton (Flamborough) for a private client.

2020 **Managed Forest Plan** in the Town of Erin for a private client.

Instruction

2018-	Instructor in Bryophyte Identification and Lichen Identification courses at the Master Naturalist
ongoing	Program at Lakehead University (Orillia campus).
2019-	Instructor in Bryophyte Identification at the Ontario Natural Certification Course in the Kortright
ongoing	Centre (City of Vaughan).
2021-	Workshop Development for Niagara Peninsula Conservation Authority staff to provide training in
ongoing	vascular plant identification in sensitive habitats (e.g., marshes, swamps, dunes).

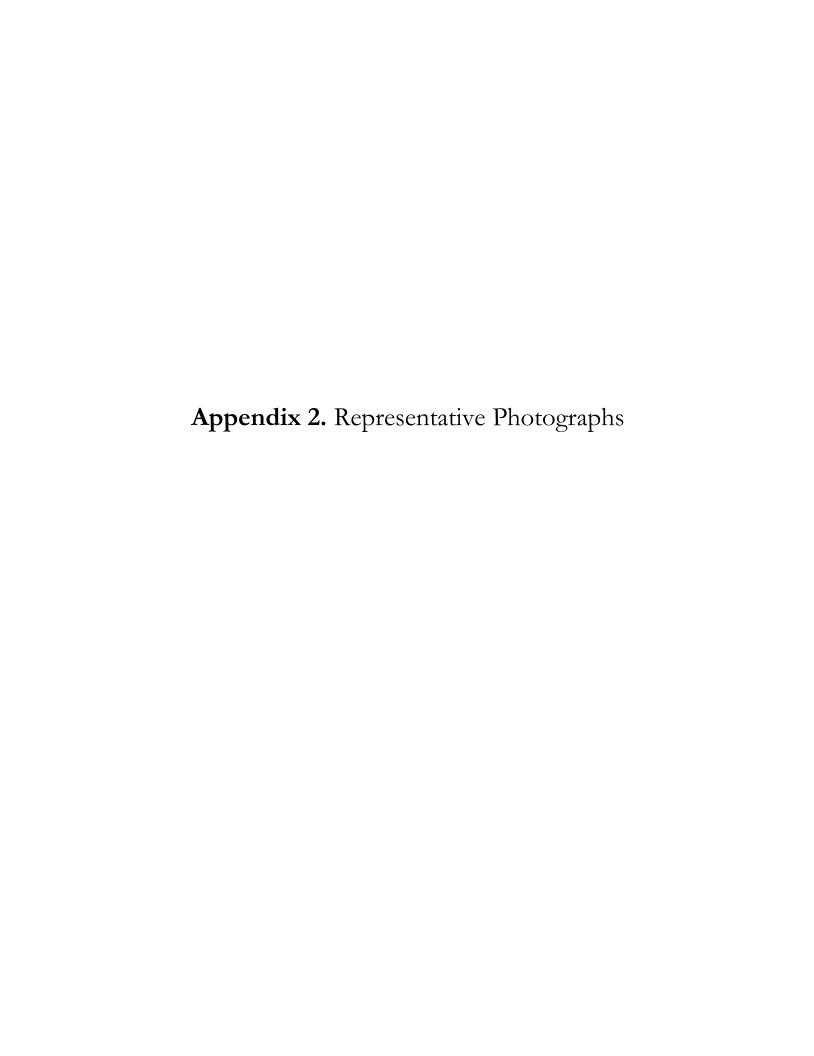




Photo 1. Manicured amenity space near the residence looking west towards the PSW (27 March 2020).



Photo 2. Manicured amenity space near the residence looking north towards Truman Line (27 March 2020).



Photo 3. Manicured amenity space near the residence looking northwest, along with an old grain silo which was found to lack emerging snakes in spring (13 May 2020).



Photo 4. Black Walnut dominated deciduous woodland looking northwest (13 May 2020).

environmental consulting inc



Photo 5. Meadow community east of the aggregate pit on Adjacent Lands looking south toward the Deciduous Woodland (27 July 2020).



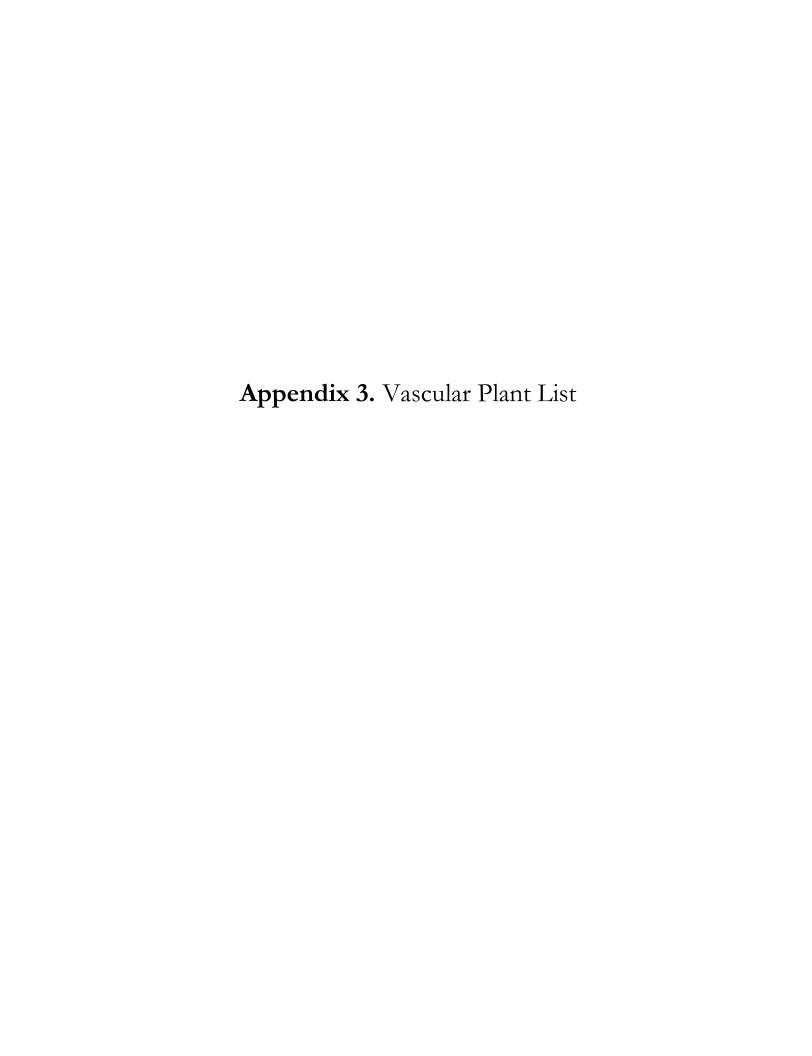
Photo 6. Soybean field and Deciduous Woodland looking southeast(27 July 2020).



Photo 7. Deciduous Woodland (27 July 2020).



Photo 8. Great Horned Owl nest with nestling (13 May 2020).



Appendix 3. Vascular Plant List

Scientific Name	Common Name	Family	S-Rank (per NHIC)	Coefficient of	Coefficient
				Conservatism	of Wetness
Abutilon theophrasti	Velvetleaf	Malvaceae	SNA	0	3
Acer negundo	Manitoba Maple	Aceraceae	S5	0	0
Acer saccharum	Sugar Maple	Aceraceae	S5	4	3
Achillea millefolium	Common Yarrow	Asteraceae	SNA	0	3
Agrimonia gryposepala	Hooked Agrimony	Rosaceae	S5	2	3
Agrostis gigantea	Redtop	Poaceae	SNA	0	-3
Alliaria petiolata	Garlic Mustard	Brassicaceae	SNA	0	0
Allium tricoccum	Wild Leek	Liliaceae	S4	7	3
Amaranthus retroflexus	Red-root Amaranth	Amaranthaceae	SNA	0	3
Ambrosia artemisiifolia	Common Ragweed	Asteraceae	S5	0	3
Arisaema triphyllum	Jack-in-the-pulpit	Araceae	S5	5	-3
Asclepias syriaca	Common Milkweed	Asclepiadaceae	S5	0	5
Athyrium filix-femina var. angustum	Northeastern Lady Fern	Dryopteridaceae	S5	4	0
Bidens vulgata	Tall Beggarticks	Asteraceae	S5	5	0
Boehmeria cylindrica	False Nettle	Urticaceae	S5	4	-5
Bromus hordeaceus	Soft Brome	Poaceae	SNA	0	5
Bromus inermis	Smooth Brome	Poaceae	SNA	0	5
Bromus japonicus	Japanese Brome	Poaceae	SNA	0	3
Bromus secalinus	Rye Brome	Poaceae	SNA	0	5
Calystegia sepium	Hedge False Bindweed	Convolvulaceae	S5	2	0
Cardamine diphylla	Two-leaved Toothwort	Brassicaceae	S5	7	3
Carex albursina	White Bear Sedge	Cyperaceae	S5	7	5
Carex blanda	Woodland Sedge	Cyperaceae	S5	3	0
Carex brunnescens	Brownish Sedge	Cyperaceae	S5	6	-3
Carex cephaloidea	Thin-leaved Sedge	Cyperaceae	S4	6	3
Carex gracillima	Graceful Sedge	Cyperaceae	S5	4	3
Carex hirtifolia	Pubescent Sedge	Cyperaceae	S4S5	5	5
Carex lupulina	Hop Sedge	Cyperaceae	S5	6	-5
Carex pedunculata	Long-stalked Sedge	Cyperaceae	S5	5	3
Carex pensylvanica	Pennsylvania Sedge	Cyperaceae	S5	5	5
Carex plantaginea	Plantain-leaved Sedge	Cyperaceae	S5	7	5
Carex radiata	Eastern Star Sedge	Cyperaceae	S5	4	0
Carex tribuloides	Blunt Broom Sedge	Cyperaceae	S4	5	-3
Carpinus caroliniana	Blue-beech	Betulaceae	S5	6	0
Carya cordiformis	Bitternut Hickory	Juglandaceae	S5	6	0
Caulophyllum giganteum	Giant Blue Cohosh	Berberidaceae	S5	5	5
Chenopodium album	White Goosefoot	Chenopodiaceae	SNA	0	3
Cichorium intybus	Chicory	Asteraceae	SNA	0	5
Circaea canadensis	Broad-leaved Enchanter's Nightshade	Onagraceae	S5	2	3
Cirsium arvense	Canada Thistle	Asteraceae	SNA	0	3
Cirsium vulgare	Bull Thistle	Asteraceae	SNA	0	3
Claytonia virginica	Narrow-leaved Spring Beauty	Portulacaceae	S5	5	3

NER – Macpherson Pit, Municipality of Central Elgin Project No.: 1987

Page 1 of 4

Appendix 3. Vascular Plant List

Scientific Name	Common Name	Family	S-Rank (per NHIC	Conservatism	Coefficient of Wetness
Cornus racemosa	Gray Dogwood	Cornaceae	S5	2	0
Crataegus coccinea var. pringlei	Pringle's Hawthorn	Rosaceae	S5	4	5
Dactylis glomerata	Orchard Grass	Poaceae	SNA	0	3
Daucus carota	Wild Carrot	Apiaceae	SNA	0	5
Dicentra cucullaria	Dutchman's Breeches	Fumariaceae	S5	6	5
Digitaria sanguinalis	Hairy Crabgrass	Poaceae	SNA	0	3
Draba verna	Spring Draba	Brassicaceae	SNA	0	5
Dryopteris carthusiana	Spinulose Wood Fern	Dryopteridaceae	S5	5	-3
Dryopteris clintoniana	Clinton's Wood Fern	Dryopteridaceae	S4	7	-3
Echinochloa crus-galli	Large Barnyard Grass	Poaceae	SNA	0	-3
Elymus repens	Creeping Wildrye	Poaceae	SNA	0	3
Elymus riparius	Eastern Riverbank Wildrye	Poaceae	S4	7	-3
Elymus virginicus var. virginicus	Virginia Wildrye	Poaceae	S5	5	-3
Epifagus virginiana	Beechdrops	Orobanchaceae	S5	6	5
Epipactis helleborine	Eastern Helleborine	Orchidaceae	SNA	0	3
Equisetum arvense	Field Horsetail	Equisetaceae	S5	0	0
Erigeron annuus	Annual Fleabane	Asteraceae	S5	0	3
Erigeron canadensis	Canada Horseweed	Asteraceae	S5	0	3
Erigeron strigosus	Rough Fleabane	Asteraceae	S5	4	3
Erysimum cheiranthoides	Wormseed Wallflower	Brassicaceae	S5	0	3
Erythronium americanum	Yellow Trout-lily	Liliaceae	S5	5	5
Euonymus obovatus	Running Strawberry Bush	Celastraceae	S4	6	5
Fallopia convolvulus	Black Bindweed	Polygonaceae	SNA	0	3
Fraxinus americana	White Ash	Oleaceae	S4	4	3
Fraxinus pennsylvanica	Green Ash	Oleaceae	S4	3	-3
Galium aparine	Cleavers	Rubiaceae	S5	4	3
Geranium robertianum	Herb-Robert	Geraniaceae	S5	2	3
Geum canadense	White Avens	Rosaceae	S5	3	0
Glechoma hederacea	Ground Ivy	Lamiaceae	SNA	0	3
Glyceria striata	Fowl Mannagrass	Poaceae	S5	3	-5
Hackelia virginiana	Virginia Stickseed	Boraginaceae	S5	5	3
Hemerocallis fulva	Orange Daylily	Liliaceae	SNA	0	5
Hydrophyllum canadense	Canada Waterleaf	Hydrophyllaceae	S4	8	0
Hydrophyllum virginianum	Virginia Waterleaf	Hydrophyllaceae	S5	6	0
Hypericum perforatum	Common St. John's-wort	Clusiaceae	SNA	0	5
Impatiens capensis	Spotted Jewelweed	Balsaminaceae	S5	4	-3
Impatiens pallida	Pale Jewelweed	Balsaminaceae	S4	7	-3
Juglans nigra	Black Walnut	Juglandaceae	S4?	5	3
Lactuca serriola	Prickly Lettuce	Asteraceae	SNA	0	3
Laportea canadensis	Wood Nettle	Urticaceae	S5	6	-3
Leonurus cardiaca subsp. cardiaca	Common Motherwort	Lamiaceae	SNA	0	5
Linaria vulgaris	Butter-and-eggs	Scrophulariaceae	SNA	0	5

NER – Macpherson Pit, Municipality of Central Elgin Project No.: 1987

Page 2 of 4

Appendix 3. Vascular Plant List Terrastory Environmental Consulting Inc.

Scientific Name	Common Name	Family	S-Rank (per NHIC)	Coefficient of Conservatism	Coefficient of Wetness
Lithospermum officinale	European Gromwell	Boraginaceae	SNA	0	5
Lonicera tatarica	Tartarian Honeysuckle	Caprifoliaceae SNA		0	3
Lotus corniculatus	Garden Bird's-foot Trefoil	Fabaceae			3
Maianthemum racemosum	Large False Solomon's Seal	Liliaceae	S5	4	3
Malus pumila	Common Apple	Rosaceae	SNA	0	5
Medicago lupulina	Black Medic	Fabaceae	SNA	0	3
Medicago sativa	Alfalfa	Fabaceae	SNA	0	5
Nepeta cataria	Catnip	Lamiaceae	SNA	0	3
Oenothera biennis	Common Evening Primrose	Onagraceae	S5	0	3
Onoclea sensibilis	Sensitive Fern	Dryopteridaceae	S5	4	-3
Oxalis stricta	Upright Yellow Wood-sorrel	Oxalidaceae	S5	0	3
Panicum dichotomiflorum	Fall Panicgrass	Poaceae	SNA	0	-3
Panicum virgatum	Old Switch Panicgrass	Poaceae	S4	6	0
Parthenocissus quinquefolia	Virginia Creeper	Vitaceae	S4?	6	3
Persicaria maculosa	Spotted Lady's-thumb	Polygonaceae	SNA	0	-3
Phalaris arundinacea	Reed Canary Grass	Poaceae	S5	0	-3
Physalis heterophylla	Clammy Ground-cherry	Solanaceae	S4	3	5
Phytolacca americana	Common Pokeweed	Phytolaccaceae	S4	3	3
Picea abies	Norway Spruce	Pinaceae	SNA	0	5
Pilea pumila	Dwarf Clearweed	Urticaceae	S5	5	-3
Plantago lanceolata	English Plantain	Plantaginaceae	SNA	0	3
Poa compressa	Canada Bluegrass	Poaceae	SNA	0	3
Poa pratensis subsp. pratensis	Kentucky Bluegrass	Poaceae	SNA	0	3
Podophyllum peltatum	May-apple	Berberidaceae	S5	5	3
Polystichum acrostichoides	Christmas Fern	Dryopteridaceae	S5	5	3
Populus deltoides	Eastern Cottonwood	Salicaceae	S5	4	0
Populus tremuloides	Trembling Aspen	Salicaceae	S5	2	0
Potentilla norvegica	Norwegian Cinquefoil	Rosaceae	S5	0	0
Prunus serotina	Black Cherry	Rosaceae	S5	3	3
Quercus rubra	Northern Red Oak	Fagaceae	S5	6	3
Ranunculus abortivus	Kidney-leaved Buttercup	Ranunculaceae	S5	2	0
Rhamnus cathartica	Common Buckthorn	Rhamnaceae	SNA	0	0
Rhus typhina	Staghorn Sumac	Anacardiaceae	S5	1	3
Ribes americanum	Wild Black Currant	Grossulariaceae	S5	4	-3
Ribes cynosbati	Prickly Gooseberry	Grossulariaceae	S5	4	3
Rosa multiflora	Multiflora Rose	Rosaceae	SNA	0	3
Rubus idaeus subsp. strigosus	Wild Red Raspberry	Rosaceae	S5	2	3
Rubus occidentalis	Black Raspberry	Rosaceae	S5	2	5
Rumex crispus	Curly Dock	Polygonaceae	SNA	0	0
Rumex obtusifolius	Bitter Dock	Polygonaceae	SNA	0	-3
Salix bebbiana	Bebb's Willow	Salicaceae	S5	4	-3
Salix eriocephala	Heart-leaved Willow	Salicaceae	S5	4	-3

NER – Macpherson Pit, Municipality of Central Elgin Project No.: 1987

Page 3 of 4

Appendix 3. Vascular Plant List

Scientific Name	Common Name	Family	S-Rank (per NHI	C) Coefficient of	Coefficient of Wetness
Salix interior	Sandbar Willow	Salicaceae	S5	Conservatism	-3
Salix x fragilis	(Salix alba X Salix euxina)	Salicaceae	SNA	0	0
Sambucus canadensis	Common Elderberry	Caprifoliaceae	S5	5	-3
Sambucus racemosa subsp. pubens	Red Elderberry	Caprifoliaceae	S5		3
Sanguinaria canadensis var. canadensis	Bloodroot	Papaveraceae	S5	<u>5</u>	3
Securigera varia	Common Crown-vetch	Fabaceae	SNA	0	5
Setaria faberi	Giant Foxtail	Poaceae	SNA	0	3
Setaria junila	Yellow Foxtail	Poaceae	SNA	0	0
Setaria pumua Setaria viridis	Green Foxtail	Poaceae	SNA	0	5
Sisymbrium officinale	Common Tumble Mustard	Brassicaceae	SNA	0	5
Solanum dulcamara	Bittersweet Nightshade	Solanaceae	SNA	0	0
Solanum ptychanthum	Eastern Black Nightshade	Solanaceae	S5	1	3
Solidago altissima	Tall Goldenrod	Asteraceae	S5	1	3
Sonchus arvensis subsp. arvensis	Smooth Sow-thistle	Asteraceae	SNA	0	3
Sonchus arvensis subsp. uliginosus	Smooth Sow-thistle	Asteraceae	SNA	0	3
Stellaria media	Common Chickweed	Caryophyllaceae	SNA	0	3
Symphiotrycum ericoides var. ericoides	Southern Succisella	Dipsacaceae	SNA	0	5
Symphyotrichum lanceolatum	Panicled Aster	Asteraceae	S5	3	-3
Symphyotrichum urophyllum	Arrow-leaved Aster	Asteraceae	S4	6	5
Tilia americana	American Basswood	Tiliaceae	S5	4	3
Torilis japonica	Erect Hedge-parsley	Apiaceae	SNA	0	3
Toxicodendron radicans	Poison Ivy	Anacardiaceae	S5	2	0
Trillium erectum	Red Trillium	Liliaceae	S5	6	3
Tussilago farfara	Colt's-foot	Asteraceae	SNA	0	3
Ulmus americana	American Elm	Ulmaceae	S5	3	-3
Urtica dioica subsp. gracilis	Slender Stinging Nettle	Urticaceae	S5	2	0
Verbascum thapsus	Common Mullein	Scrophulariaceae	SNA	0	5
Vicia cracca	Tufted Vetch	Fabaceae	SNA	0	5
Viola canadensis	Canada Violet	Violaceae	S5	6	3
Viola pubescens	Yellow Violet	Violaceae	S5	5	3
Viola sororia	Woolly Blue Violet	Violaceae	S5	4	0
Viola tricolor	Johnny-jump-up	Violaceae	SNA	0	5
Vitis riparia	Riverbank Grape	Vitaceae	S5	0	0

Appendix 4. Anuran Calling Survey Results

environmental consulting inc

Table 1. Results of Anuran Calling Surveys.

Station ID ¹	Feature or ELC Community Surveyed	Bearing (°)	Survey #1 – 27 March 2020 ²	Comments ²
AN-1	PSW	185	Spring Peeper (2-6) Chorus Frog (3) Wood Frog (3)	Survey #1: AN-1 surveyed wetlands on Adjacent Lands west of the Subject Property. Wood Frog chorus emanated from woodland pools and/or swamps to the southwest, while Chorus Frog chorus emanated due west along Truman Line. Spring Peeper calls emanated due south and southeast and appeared more scattered.
AN-2	Ponds on adjacent lands	192	Spring Peeper (1-3)	Survey #1: AN-2 surveyed a small open pond on Adjacent Lands within an existing licenced area. Spring Peeper vocalizations from this feature were limited.

¹Locations of Anuran Calling Stations are shown in **Figure 2**.

² Call Code 1 = Individuals can be counted; calls not simultaneous; Call Code 2 = Calls distinguishable; some simultaneous calling; Call Code 3 = Full chorus; calls continuous and overlapping. Second number after the call code indicates the estimated number of individuals calling; no estimate of individuals is provided for Call Code 3.

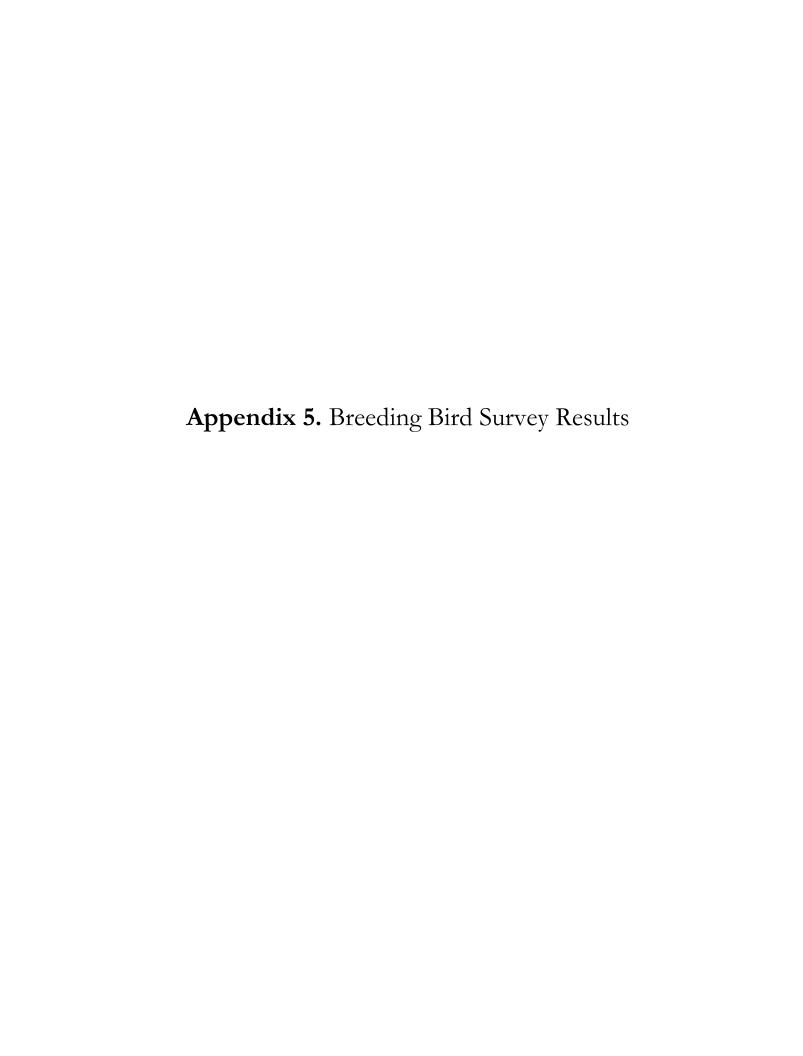


Table 1. Breeding Bird Survey Results.

Common Nome	Cairadifia Ni	Breeding Bird Stations ¹ and Breeding Status ²					
Common Name	Scientific Name	BI-1	BI-2	BI-3	BI-4	BI-5	BI-6
American Crow	Corvus brachyrhynchos	О	О	О	О	О	О
American Goldfinch	Spinus tristis	Po	Ро		Po		
American Robin	Turdus migratorius	Pr	Po			Po	Ро
Baltimore Oriole	Icterus galbula	Pr	Pr	Ро	Po	Po	Ро
Bank Swallow	Riparia riparia		О	Co	Co	О	
Belted Kingfisher	Megaceryle alcyon	Po					
Blue Jay	Cyanocitta cristata				Po	Po	
Brown-headed Cowbird	Molothrus ater		Pr	Po	Pr		Po
Canada Goose	Branta canadensis	О					
Cedar Waxwing	Bombycilla cedrorum	Pr					
Chipping Sparrow	Spizella passerina	Pr					
Common Grackle	Quiscalus quiscula	Po			Po		
Eastern Bluebird	Sialia sialis				Po		
Eastern Meadowlark	Sturnella magna					Po ³	
Eastern Wood-pewee	Contopus virens				Po ³		Pr
European Starling	Sturnus vulgaris	Po				Po	
Field Sparrow	Spizella pusilla		Со				
Gray Catbird	Dumetella carolinensis	Pr	Pr				
Great Crested Flycatcher	Myrarchus crinitus						Ро
Hairy Woodpecker	Dryobates villosus		Po				
Horned Lark	Eremophila alpestris					Po	
House Wren	Troglodytes aedon	Pr					
Indigo Bunting	Passerina cyanea		Po	Po	Po		Ро
Killdeer	Charadrius vociferus		Po				
Northern Cardinal	Cardinalis cardinalis		Po				
Northern Flicker	Colaptes auratus				Po		
Red-bellied Woodpecker	Melanerpes carolinus	Po			Pr		
Red-eyed Vireo	Vireo olivaceus	Po	Po	Po		Po	Ро
Red-tailed Hawk	Buteo jamaicensis					О	
Red-winged Blackbird	Agelaius phoeniceus		Po	Po	Pr	Pr	О
Rose-breasted Grosbeak	Pheucticus ludovicianus	Po				Po	Ро
Song Sparrow	Melospiza melodia	Pr	Pr		Pr	Po	
Spotted Sandpiper	Actitis macularius		Po				
Warbling Vireo	Vireo gilvis	Pr	Pr	Po			
White-breasted Nuthatch	Sitta carolinensis	Po					
Wild Turkey	Meleagris gallopavo		Po				
Willow Flycatcher	Empidonax traillii	Po	Po				
Wilson's Warbler	Cardellina pusilla	O					
Yellow-billed Cuckoo	Coccyzus americanus	Po					
Yellow Warbler	Setophaga petechia	Po	Pr		Pr	Po	

¹Locations of breeding bird survey stations are indicated on **Figure 3**.

 $^{{}^{2}}$ Co = Confirmed Breeder; Pr = Probable Breeder; Po = Possible Breeder; O = Observed (no evidence of breeding). Breeding status determined based on the results of the formal breeding bird surveys; where a higher level of breeding status was documented incidentally (i.e., during other field surveys), this is noted in within the main body of the report (where applicable).

³Documented on Adjacent Lands only.

Appendix 6. Significant Wildlife Habitat Assessment
represent of eigenment whether translate trans

 Table 1. Results of the Significant Wildlife Habitat Assessment.

Ecoregion 7E	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., "degradation that threatens the health and integrity" as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Seasonal Concentration Areas of	f Animals		
Waterfowl Stopover and Staging Areas (Terrestrial)	No. Meadows, fields, and/or thickets that annually flood during spring and could support significant congregations of migrating waterfowl are absent.		
Waterfowl Stopover and Staging Areas (Aquatic)	No. Large surface water features (e.g., ponds, lakes, bays, coastal inlets, large watercourses, etc.) and/or wetlands that annually flood during spring could support significant congregations of migrating waterfowl are absent.		
Shorebird Migratory Stopover Areas	No. Unvegetated open areas adjacent to surface water features (e.g., shorelines, beaches, mudflats, etc.) and could support significant congregations of migrating shorebirds are absent		
Raptor Wintering Areas	No. While forest and (to a lesser extent) meadow habitats are present, which may occasionally support wintering raptors, such habitats are too small to support significant congregations of wintering raptors. The agricultural fields are tilled and therefore provide minimal habitat for small mammals during winter (a major prey item).		
Bat Hibernacula	No. Natural features and habitats that could support hibernating bats (e.g., caves, mine shafts, crevices, karsts) are absent.		
Bat Maternity Colonies	Yes. Mature deciduous and mixed forests with a high-density (i.e., >10/ha) of large-diameter (i.e., ≥25 cm DBH) trees containing cracks/cavities are present.	<u>Unknown.</u> Acoustic monitoring devices not deployed as part of this study.	Negligible. Extraction and site alteration activities are restricted from the boundary (i.e., dripline) of the Deciduous Woodland (plus a 15 m setback), which has the greatest likelihood of supporting maternal colonies of this species. Any necessary removal of trees outside of this area, which are unlikely to support maternal roosting colonies but may support roosting by individual bats, will be subject to a timing restriction. See report for greater details.
Turtle Wintering Areas	No. Surface water features and/or wetlands with soft muddy substrate which do not freeze to the bottom during winter and are located outside of areas currently licensed for aggregate extraction are absent.		
Reptile Hibernaculum	Yes. Features (e.g., small mammal burrows, rock crevices, etc.) and/or habitats (e.g., certain wetlands with a fluctuating water table, etc.) that could provide snakes with access below the frost line are present.	No. Spring emergence surveys failed to document any individual snakes in close proximity to features (e.g., rock piles) which may have acted as hibernacula.	
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	No. Features that could support nesting by Cliff Swallow and Northern Rough-winged swallow (e.g., eroding banks, sandy hills, borrow pits, steep slopes, cliff faces, etc.) outside of areas currently licensed for aggregate extraction are present.		
Colonially - Nesting Bird Breeding Habitat Breeding Habitat (Tree/Shrubs)	Yes. Swamp and treed fen communities are present.	No. Portions of the PSW which extend slightly within the Study Area are not expected to support colonially nesting birds.	

Ecoregion 7E	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., "degradation that threatens the health and integrity" as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Colonially - Nesting Bird Breeding Habitat (Ground)	No. Rocky islands or peninsulas along lakes or large rivers are absent.		
Migratory Butterfly Stopover Areas	No. A mixture of fields and forests within 5 km from the shoreline of Lake Erie or Lake Ontario are absent.		
Landbird Migratory Stopover Areas	No. While migrating landbirds may temporarily stopover to feed and rest, the Subject Property is unlikely to support significant congregations of migrating landbirds as it is greater than 5 km from the shoreline of Lake Erie.		
Deer Winter Congregation Areas	No. The Subject Property and/or Adjacent Lands have not been identified as a deer wintering area by MNRF.		
Rare Vegetation Communities	or Specialized Habitats for Wildlife		
Cliffs and Talus Slopes	No. Cliffs and talus slope communities are absent.		
Sand Barren	No. Sand barren communities are absent.		
Alvar	No. Flora characteristic of alvars are absent.		
Old Growth Forest	Yes. Based on a review of historical aerial photographs, the Deciduous Woodland appears to represent a pre-settlement feature and may exhibit old-growth characteristics.	No. The Deciduous Woodland has been harvested relatively recently and exhibits insufficient old-growth characteristics (e.g., old trees, abundant snags and downed woody debris, canopy gaps caused by species turnover, limited disturbance, etc.).	
Savannah	No. Flora characteristic of savannahs are absent.		
Tallgrass Prairie	No. Flora characteristic of tallgrass prairies are absent.		
Other Rare Vegetation Community	No. Provincially rare vegetation communities are absent.		
Waterfowl Nesting Area	Yes. Wetland communities are present.	No. Portions of the PSW which extend slightly within the Study Area are not expected to support waterfowl nesting.	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	No. Forest communities adjacent to large surface water features are absent.		
Woodland Raptor Nesting Habitat	Yes. On-site forest communities may support nesting raptors.	<u>No.</u> While an active Great Horned Owl nest and nestling were documented along the southeastern boundary of the Study Area, this species is not an indicator of this SWH type. No other active stick nests were documented.	
Turtle Nesting Areas	No. Exposed mineral soils adjacent to surface water features (e.g., lakes, ponds, etc.) and/or wetlands that may support turtles <u>outside of areas</u> <u>currently licensed for aggregate extraction</u> are absent.		
Seeps and Springs	<u>No.</u> Areas where groundwater emerges at the surface and may support specialized habitat for plants and wildlife are absent.		



Ecoregion 7E	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Subject Property or Adjacent Lands meet relevant criteria (Ecoregion 7E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., "degradation that threatens the health and integrity" as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Amphibian Breeding Habitat (Woodland)	Yes. Forests with wetlands, ponds, and/or pools that may support significant congregations of breeding amphibians may be present.	Yes. The PSW appears to contain significant breeding populations of Western Chorus Frog and Wood Frog.	Negligible. The PSW is a minimum of approximately 100 m from the proposed licence boundary. The results of the Hydrogeological Assessment confirmed that the groundwater table beneath the PSW is perched; as such, no impacts associated with below-water extraction within the Site are anticipated.
Amphibian Breeding Habitat (Wetlands)	No. Wetlands and surface water features (e.g., ponds, lakes, etc.) that may support significant congregations of breeding amphibians <u>outside</u> of areas <u>currently licensed for aggregate extraction</u> are absent.		
Woodland Area-Sensitive Bird Breeding Habitat	Yes. The Deciduous Woodland could support breeding by woodland areasensitive bird species.	No. The results of the breeding bird surveys confirmed the absence of this SWH type within the Deciduous Woodland.	
Habitat for Species of Conserva	ation Concern		
Marsh Bird Breeding Habitat	No. Wetlands with shallow water and emergent aquatic vegetation are absent.		
Open Country Bird Breeding Habitat	No. Meadow habitats of sufficient size are absent.		
Shrub/Early Successional Bird Breeding Habitat	No. Shrub/early-successional habitats of sufficient size are absent.		
Terrestrial Crayfish	No. Marsh and swamp communities and/or wet fields are present		
Special Concern and Rare Wildlife Species	Yes. See Table 2 below.	Yes. See Table 2 below.	<u>Possible.</u> See Table 2 below.
Animal Movement Corridors			
Amphibian Movement Corridors	No. Site is separated from the significant amphibian breeding habitat (i.e., PSW) by an area licensed for aggregate extraction, which overall is not expected to act as a significant movement corridor between breeding and summer habitat.		

Table 2. Results of the Special Concern and Provincially Rare Species Assessment.

Species	Status per O. Reg. 230/08 under the ESA and/or NHIC	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy or Use within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., "degradation that threatens the health and integrity" as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Birds					
Canada Warbler (Cardellina canadensis)	SC	OBBA	Breeds and forages in a wet thickets, swamps, and mature deciduous forest.	Negligible. Species not documented during breeding bird surveys.	
Eastern Wood-pewee (Contopus virens)	SC	NHIC, OBBA	 Breeds and forages in relatively open, deciduous and mixed forests of various sizes (including urban forest fragments) and along forest edges. 	Confirmed. Three (3) singing males documented within deciduous woodlands surrounding the Study Area.	Negligible. Extraction and site alteration activities are restricted from the boundary (i.e., dripline) of the Deciduous Woodland (plus a 15 m setback).
Golden-winged Warbler (Vermivora chrysoptera)	SC	OBBA	 Breeds and forages in thickets and early-successional forests/thickets adjacent to deciduous or mixed forest. 	Negligible. Species not documented during breeding bird surveys.	
Wood Thrush (Hylocichla mustelina)	SC	NHIC, OBBA	 Breeds and forages in second-growth and mature deciduous and mixed forests with a well-developed understory. 	Negligible. Species not documented during breeding bird surveys.	
Insects					
Monarch (<i>Danaus plexippus</i>)	SC	Ont. Butterfly Atlas	 Oviposits on Milkweeds (Asclepias spp.). Generalist foraging that nectars in most areas with wildflowers. 	<u>Confirmed.</u> Adults documented foraging within the Site.	Negligible. The landscape surrounding the Study Area provides nectaring and ovipositing sites for this species.
Plants					
Broad Beech Fern (Phegopteris hexagonoptera)	SC	NHIC	Occupies mature, moist to wet deciduous forests.	Negligible. Species not documented during vascular plant surveys.	
Dwarf Earth Moss (Acaulon muticum)	S1	NHIC	Known to occupy bare soil, gravel pits, pasture, lawn.	<u>Unlikely.</u> Species is extremely rare in Ontario based on existing records. Much of the proposed extraction area overlaps with tilled agricultural land.	
Black-toothed Nodding Moss (Pohlia mealnodon)	S1	NHIC	Known to occupy disturbed clay or rarely sandy soil, path banks, along streams.	<u>Unlikely.</u> Species is extremely rare in Ontario. Much of the proposed extraction area overlaps with tilled agricultural land.	
Reptiles					
Eastern Ribbonsnake (<i>Thamnophis saurita</i>)	SC	Distribution and on-site habitats	Occupies edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation.	<u>Unlikely.</u> Species may occur within the PSW to the west, though this feature barely extends within the Study Area.	
Snapping Turtle (Chelydra serpentina)	SC	NHIC, Ont. Herp. Atlas	 Occupies a variety of aquatic habitats with slow moving water. Nests in exposed, usually coarse, friable substrate. Known to make long-distance overland movements (i.e., several kilometers) between habitats. 	Unlikely. Species may occur within the PSW to the west, though this feature barely extends within the Study Area. Individuals may also be documented within the pit pond to the west, though this area is undergoing active extraction through an existing aggregate licence.	

¹ Likelihood categories should be interpreted as follows:

Negligible: so limited that the assessed species can be assumed absent.

<u>Unlikely</u>: while theoretically conceivable, species presence very improbable or temporary based on available information (e.g., habitat conditions, range, abundance in local landscape, etc.).



environmental consulting in

Possible: species presence plausible based on available information; no convincing evidence suggesting species could not occur on-site.

<u>Probable</u>: while not confirmed, available information suggests species has a high likelihood of being present.

Confirmed: species observed and/or evidence of occupation (e.g., tracks, etc.) documented.

Appendix 7. Endangered and Threatened Species Assessment

Species	Status per O. Reg. 230/08 of the ESA	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., "Damage" or "Destruction" as defined in the ESA) will occur based on the Proposed Development Plan and any related Site Alteration Activities
Birds					
Bank Swallow (<i>Riparia riparia</i>)	THR	OBBA	 Nests in natural or anthropogenically derived exposed, sandy substrates on vertical or steep surfaces. Forages in a variety of open areas including agricultural lands, meadows, prairies, woodland clearings, marshes, and above waterbodies. 	Confirmed. Nest excavations documented within the southern face of the existing pit wall on Adjacent Lands to the west, and a minimum of eight (8) individuals were observed.	Negligible. Aggregate extraction will be undertaken consistent with the "Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario". See report for greater details.
Barn Swallow (<i>Hirundo rustica</i>)	THR	OBBA	 Nests in barns, bridge/culvert undersides, awnings/overhangs on sides of buildings, and (historically) tree cavities. Forages in a variety of open areas including agricultural lands, meadows, prairies, woodland clearings, marshes, and above waterbodies. 	Negligible. While this species may forage over open areas on the Subject Property for brief periods during migration or forays from adjacent breeding sites, suitable breeding sites are absent from the Site.	
Bobolink (<i>Dolichonyx oryzivorus</i>)	THR	OBBA	 Breeds and forages in hayfields, pastures, meadows, grasslands, and prairies which are often (but not always) greater 4 ha. May be found in more marginal habitats (e.g., shrubby fields, smaller fields, etc.) during migration or following disturbance to breeding habitats (e.g., hay cutting). 	Negligible. Species not documented during breeding bird surveys.	
Cerulean Warbler (Setophaga cerulea)	THR	OBBA	Breeds and forages in mature and second-growth deciduous forest with a relatively open understory.	Negligible. Species not documented during breeding bird surveys.	
Eastern Meadowlark (Sturnella magna)	THR	OBBA	Breeds and forages in hayfields, savannahs, pastures, meadows, grasslands, prairies, and shrubby fields.	Negligible. Species only documented vocalizing south of the Study Area from an agricultural field.	
Least Bittern (Ixobrychus exilis)	THR	OBBA	 Breeds and forages in marshes dominated by robust emergent vegetation containing areas of open water (i.e., interspersion). 	Negligible. Species not documented during breeding bird surveys.	
Red-headed Woodpecker (Melanerpes erythrocephalus)	END	OBBA	Breeds and forages in open forests, savannahs, and forest edges that tend to contain large, mature trees.	Negligible. Species not documented during breeding bird surveys.	
Mammals					
American Badger (<i>Taxidea taxus</i>)	END	NHIC	 Occupies a variety of habitats, such as tallgrass prairie, sand barrens, and agricultural lands. Breeds and sleeps in burrows. 	Negligible. Species is extremely rare and not known to occur in the immediate landscape. No evidence of features associated with this species (e.g., burrows) was documented.	
Little Brown Myotis (<i>Myotis lucifugus</i>)	END	Species distribution and on-site habitats	 Maternity roosts sites most often include buildings and large diameter trees with cracks, crevices, and/or exfoliating bark. Overwinters in caves and mines that maintain temperatures above 0°C. 	Possible. Species may roost within the Deciduous Woodland and/or forage within open areas (particularly edge habitats) within the Study Area.	Negligible. Extraction and site alteration activities are restricted from the boundary (i.e., dripline) of the Deciduous Woodland (plus a 15 m setback), which has the greatest likelihood of supporting maternal colonies of this species. Any necessary removal of trees outside of this area, which are unlikely to support maternal roosting colonies but may support roosting by individual bats, will be subject to a timing restriction. See report for greater details.

Species	Status per O. Reg. 230/08 of the ESA	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., "Damage" or "Destruction" as defined in the ESA) will occur based on the Proposed Development Plan and any related Site Alteration Activities
Northern Myotis (<i>Myotis septentrionalis</i>)	END	Species distribution and on-site habitats	 Maternity roosts most often include large diameter trees with cracks, crevices, and/or exfoliating bark (buildings rarely used). Overwinters in caves and mines that maintain temperatures above 0°C. 	Possible. Species may roost within the Deciduous Woodland and/or forage within open areas (particularly edge habitats) within the Study Area.	Negligible. Extraction and site alteration activities are restricted from the boundary (i.e., dripline) of the Deciduous Woodland (plus a 15 m setback), which has the greatest likelihood of supporting maternal colonies of this species. Any necessary removal of trees outside of this area, which are unlikely to support maternal roosting colonies but may support roosting by individual bats, will be subject to a timing restriction. See report for greater details.
Tri-colored Bat (Perimyotis subflavus)	END	Species distribution and on-site habitats	 Maternal roosting sites include Maple (Acer spp.) and Oak (Quercus spp.) with dead/dying leaf clusters. Overwinters in caves and mines that maintain temperatures above 0°C. 	Possible. Species may roost within the Deciduous Woodland and/or forage within open areas (particularly edge habitats) within the Study Area.	Negligible. Extraction and site alteration activities are restricted from the boundary (i.e., dripline) of the Deciduous Woodland (plus a 15 m setback), which has the greatest likelihood of supporting maternal colonies of this species. Any necessary removal of trees outside of this area, which are unlikely to support maternal roosting colonies but may support roosting by individual bats, will be subject to a timing restriction. See report for greater details.
Plants					
American Ginseng (Panax quinquefolius)	END	Species distribution and on-site habitats	Occupies rich, relatively undisturbed deciduous forests.	Negligible. Species not documented during vascular plant surveys	
Black Ash (Fraxinus nigra)	END	Species distribution and on-site habitats	Occupies deciduous swamps (often peaty), floodplains, and wet woods.	Negligible. Species not documented during vascular plant surveys.	
Butternut (Juglans cinerea)	END	Species distribution and on-site habitats	Occupies a variety of treed habitats including mature forests, early- successional forests, and hedgerows.	Negligible. Species not documented during vascular plant surveys.	

¹ Likelihood categories are to be interpreted as follows:

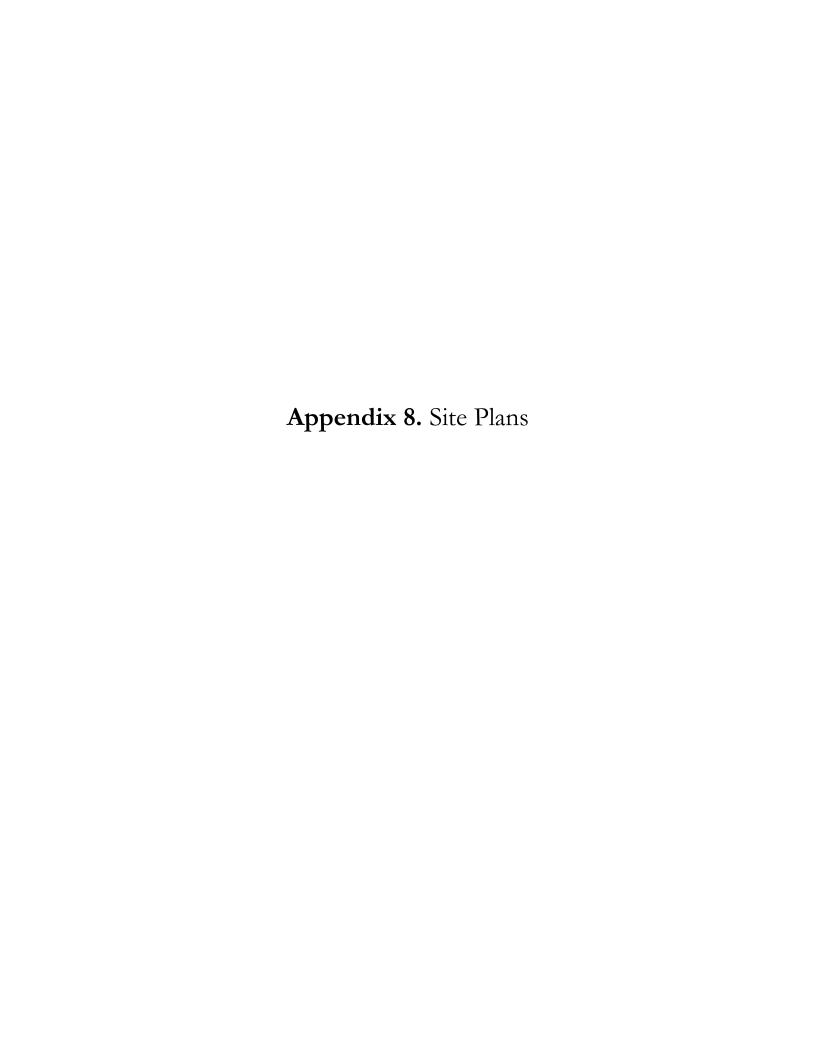
Negligible: so limited that the assessed species can be assumed absent.

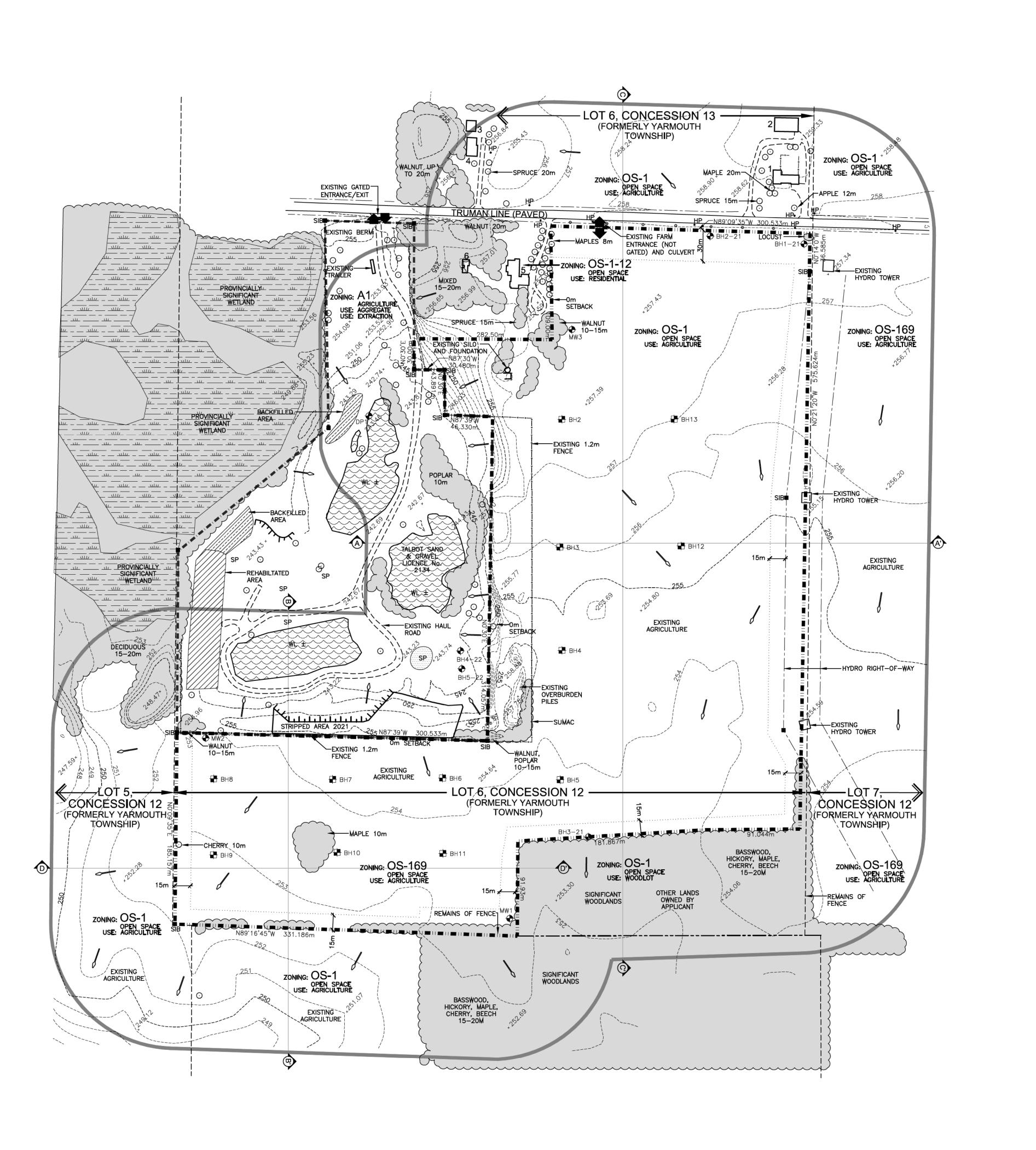
<u>Unlikely</u>: while theoretically conceivable, species presence very improbable or temporary based on available information (e.g., habitat conditions, range, abundance in local landscape, etc.).

Possible: species presence plausible based on available information; no convincing evidence suggesting species could not occur on-site.

<u>Probable</u>: while not confirmed, available information suggests species has a high likelihood of being present.

<u>Confirmed:</u> species observed and/or evidence of occupation (e.g., tracks, etc.) documented.





KEYMAP n.t.s



EXISTING FEATURES NOTES

GENERAL SITE PLAN INFORMATION

1. THIS SITE PLAN CONSISTS OF 5 DRAWINGS AND MUST BE READ COLLECTIVELY. 2. ALL MEASUREMENTS SHOWN ON THIS SITE PLAN ARE IN METRES.

LICENCE INFORMATION

3. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NORTHERN DEVELOPMENT, MINES, NATURAL RESOURCES AND FORESTRY UNDER THE AGGREGATE RESOURCES ACT FOR A CATEGORY 1 LICENCE, PIT BELOW THE WATER TABLE.

TALBOT SAND AND GRAVEL RR 6 ST.THOMAS, ONTARIO

5. TOTAL AREA TO BE LICENCED:

TOTAL AREA TO BE EXTRACTED: 20.0 ha TOTAL AREA TO REHABILITATED:

BASE INFORMATION

6. TOPOGRAPHIC INFORMATION FOR LOT 6, CONCESSION 12 NER WAS OBTAINED FROM SURVEY COMPLETED BY FIRST BASE SOLUTIONS DATED JANUARY 6, 2021

THE SITE WAS FIELD CHECKED BY HARRINGTON MCAVAN LTD., JANUARY 5, 2021

PROVINCIALLY SIGNIFICANT WETLAND INFORMATION OBTAINED FROM MNRF MAKE A MAP: NATURAL HERITAGE AREAS, JANUARY 2021.

7. ZONING INFORMATION OBTAINED FROM THE MUNICIPALITY OF CENTRAL ELGIN JANUARY 2021. EXISTING LICENCE No. 2321 IS ZONED E - EXTRACTIVE RESOURCE. PROPOSED LICENCE AREA IS PRESENTLY ZONED A- AGRICULTURE.

HYDROGEOLOGICAL INFORMATION

8. THE WATER TABLE ELEVATION VARIES ACROSS THE EXTRACTION AREA FROM ± 242.4 TO 242.5m ABOVE SEA LEVEL (A.S.L.)

9. SOURCE WATER PROTECTION POLICIES DO NO NOT APPLY TO THIS SITE (REFER TO HYDROGEOLOGICAL REPORT)

TECHNICAL REPORTS

10. NATURAL ENVIRONMENT TECHNICAL REPORT BY TERRASTORY ENVIRONMENTAL CONSULTING INC. DATED JUNE 2022 (REFER TO SHEET 3 OF 5 FOR TECHNICAL

13. NOISE INFORMATION WAS OBTAINED FROM REPORT BY HGC ENGINEERING

11. ARCHAEOLOGICAL INFORMATION WAS OBTAINED FROM REPORT BY TIMMINS MARTELLE HERITAGE CONSULTANTS INC. DATED JANUARY 2021 (REFER TO SHEET 3 OF 5 FOR

TECHNICAL RECOMMENDATIONS). 12. HYDROGEOLOGICAL INFORMATION WAS OBTAINED FROM REPORT BY

GROUNDWATER SCIENCE CORP. DATED JUNE 2022 (REFER TO SHEET 3 OF 5 FOR TECHNICAL RECOMMENDATIONS).

DATED APRIL1, 2022 (REFER TO SHEET 3 OF 5 FOR TECHNICAL RECOMMENDATIONS).

BUILDING LIST

No.	
1.	HOUSE
2.	DRIVE SHED
3.	SHED
4.	HOUSE
5.	HOUSE
6.	ABANDONED BUILDING

LEGEND

LOT/CONCESSION LINE REGULATORY SETBACK AND EXTRACTION LIMIT LINE

EXISTING BUILDING

WATER DRAINAGE

DIRECTION OF SURFACE

GEOTECHNICAL BOREHOLES

WELL\PIEZOMETER INSTALLED

GROUNDWATER SCIENCE CORP

GROUNDWATER SCIENCE CORP

DUG IN 1994 BY ATKINSON

BOREHOLE\MONITORING

FEBRUARY 25. 2022 BY

JANUARY 2021 BY

⊕ BH5−22 **BOREHOLE INSTALLED MAY 2022**

⊕ BH4−22 **BOREHOLE INSTALLED**

BOUNDARY OF EXISTING LICENCES

PROPERTY LINE EXISTING HYDRO EASEMENT

EXISTING FENCE EXISTING 5m CONTOUR LINE EXISTING 1m CONTOUR LINE **EXISTING SPOT ELEVATION**

EXISTING PIT FACE EXISTING PIT ENTRANCE/EXIT

LOCATION OF CROSS

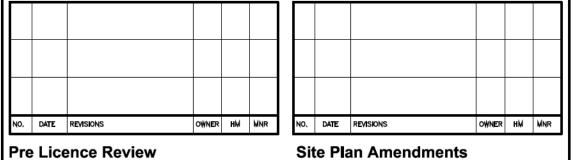
SECTION **EXISTING VEGETATION**

BY MARATHON DRILLING EXISTING WETLAND

HYDRO POLE EXISTING FARM ENTRANCE

EXISTING STOCKPILE

EXISTING FARM ENTRANCE



Terrington AvanLtd

> 41 Main Street, Unit 102 Unionville, Ontario L3R 2E5 Tel: 905-294-8282 Fax: 905-294-7623 www.harringtonmcavan.com

Project Name

TALBOT SAND **AND GRAVEL**

MACPHERSON PIT EXPANSION

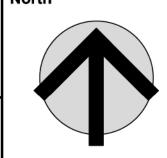
LICENCEE SIGNATURE

LICENCE No. PART LOT 6, CONCESSION 12

MUNICIPALITY OF CENTRAL ELGIN (FORMERLY TOWNSHIP OF YARMOUTH), COUNTY OF ELGIN

Scale 1:2000 Drawing Status SUBMITTED FOR

LICENCE APPROVAL





Drawn SB Drawing Title

Checked BJ

EXISTING

FEATURES

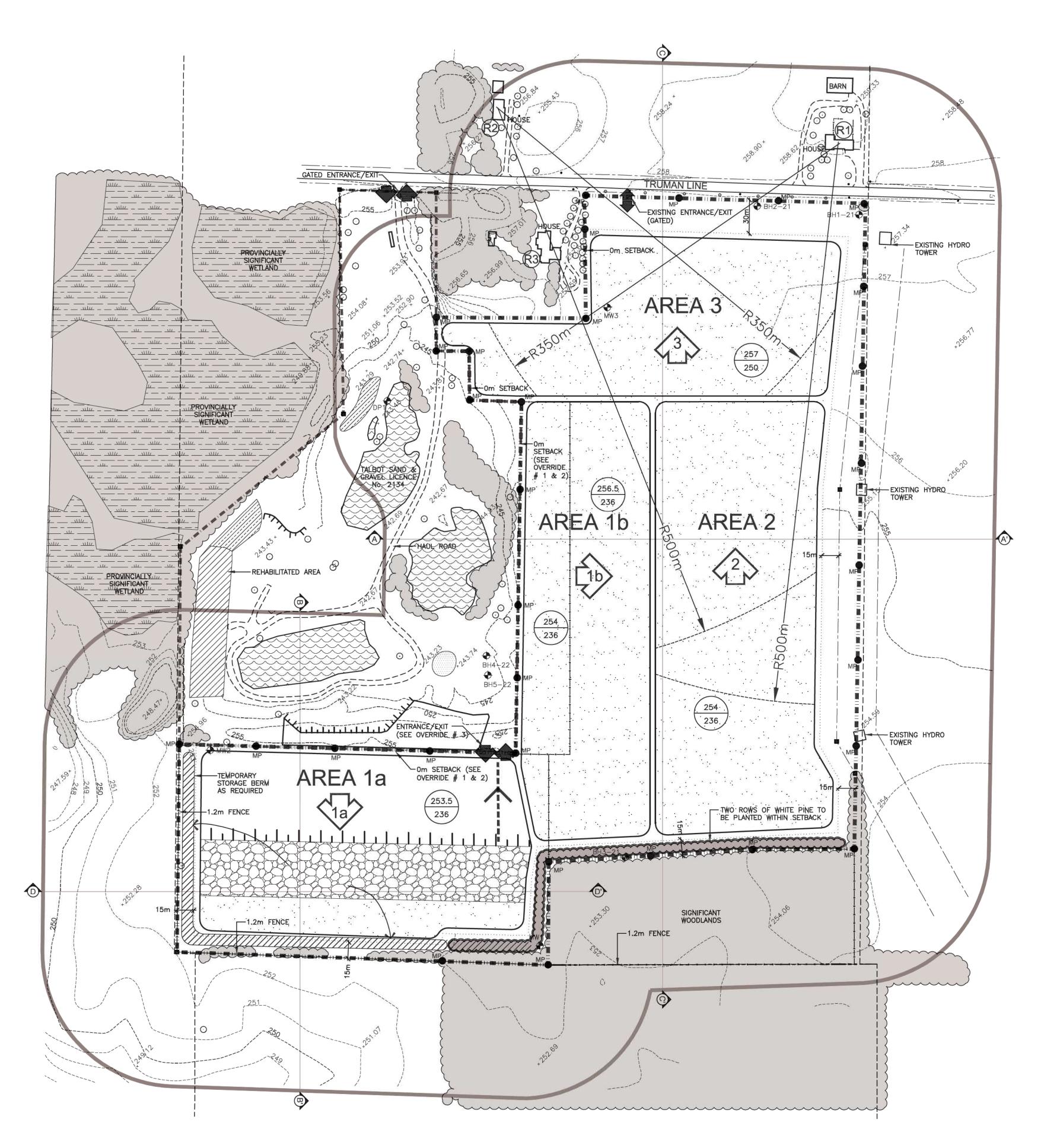
PLAN

Issue Date JULY 2022 **Project Number**

20-03

Drawing Number

OF 5



OPERATIONS NOTES

GENERAL INFORMATION

THIS PLAN DEPICTS A SCHEMATIC OPERATIONS AND REHABILITATION SEQUENCE FOR THIS PROPERTY BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION, PHASES SHOWN ARE SCHEMATIC AND MAY SLIGHTLY VARY WITH MATERIAL QUALITY, SITE HYDROLOGY AND HYDROGEOLOGY OR MARKET DEMAND. PHASES DO NOT REPRESENT ANY SPECIFIC OR EQUAL TIME PERIOD.

EXTRACTION SHALL FOLLOW THE SEQUENCE SHOWN. WHEN PARTIAL REHABILITATION OF A PHASE IS POSSIBLE IT SHALL BE CARRIED OUT. NOT WITHSTANDING THE EXTRACTION AND REHABILITATION PROCESS ABOVE, DEMAND FOR CERTAIN PRODUCTS OR BLENDING OF MATERIALS MAY REQUIRE SOME DEVIATION IN THE EXTRACTION AND REHABILITATION PHASING. ANY DEVIATIONS FROM THE OPERATIONS SEQUENCE SHOWN WILL REQUIRE APPROVAL FROM NDMNRF.

- 2. REFER TO DRAWING 1 OF 5, EXISTING FEATURES, FOR A DESCRIPTION OF EXISTING VEGETATION AND BUILDINGS WITHIN THE 120 METRE BOUNDARY AND ON SITE.
- 3. SITE PLAN OVERRIDES ARE LISTED IN THE SITE PLAN OVERRIDE TABLE SHOWN ON THIS PAGE.

EXTRACTION/PROCESSING/HAULING INFORMATION 4. TOTAL AREA TO BE EXTRACTED IS 20.0 HECTARES.

5. MAXIMUM NUMBER OF TONNES OF AGGREGATE TO BE REMOVED FROM THE SITE IN ANY CALENDAR YEAR IS 250,000 TONNES.

EXTRACTION OF SAND AND GRAVEL ABOVE WATER TABLE WILL TAKE PLACE IN ONE OR TWO BENCHES, WITH A MAXIMUM HEIGHT OF ± 8 METRES. THE GROUNDWATER TABLE IS ESTIMATED TO BE BETWEEN 242.2 AND 242.5 m ASL. THERE WILL BE ONE LIFT BELOW THE WATER TABLE TO A DEPTH OF 229 m ASL TO BE EXTRACTED BY EXCAVATOR OR BACKHOE. FRONT END LOADERS WILL BE USED TO EXTRACT MATERIAL AND HAUL TRUCKS OR CONVEYORS WILL CARRY MATERIAL TO THE PLANT FOR FURTHER PROCESSING. REFER TO SECTIONS A-A', B-B', AND C-C' ON DRAWING 4 OF 5 FOR FURTHER DETAILS.

PORTABLE PROCESSING EQUIPMENT, FOR CRUSHING, SCREENING, AND WASHING WILL BE USED ON SITE AND WILL BE LOCATED ON THE PIT FLOOR IN THE PROCESSING AREA OR AREA 1 (WHERE SHOWN) AT START UP, IN ADDITION TO PROCESSING. SITE ACTIVITIES WILL INCLUDE STRIPPING AND REHABILITATION. OPERATIONAL EQUIPMENT MAY INCLUDE TRUCKS, LOADERS, EXCAVATOR, DRAGLINE, BACKHOES, BULLDOZERS, SCRAPERS, CONVEYORS AND OTHER RELATED EQUIPMENT. PROCESSING EQUIPMENT, STACKERS AND PRODUCT STOCKPILES WILL NOT EXCEED ±15 METRES IN HEIGHT AND WILL BE LOCATED IN THE PROCESSING AREA AND/OR CLOSE TO PIT FACES. MATERIAL FROM OTHER PROPERTIES MAY BE IMPORTED INTO THE SITE FOR BLENDING, CUSTOM PRODUCTS AND/OR RESALE. THIS MAY INCLUDE AGGREGATE (IN THE PROCESSING AREA AND/OR PEAT AND TOPSOIL (IN AREA 1).

6. OFFICE/STORAGE BUILDING AND/OR SCALE/SCALEHOUSE MAY BE CONSTRUCTED WHERE SHOWN.

AGGREGATE RECYCLING

THERE MAY BE RECYCLING OF MATERIAL (ASPHALT AND CONCRETE) ON THIS SITE, MATERIAL IMPORTED FOR RECYCLING WILL BE STORED IN SEGREGATED STOCKPILES WITHIN THE PROCESSING AREA. RECYCLABLE ASPHALT MATERIALS WILL NOT BE STOCKPILED WITHIN 30M OF ANY WATER BODY OR MAN-MADE POND; OR 2M OF THE SURFACE OF THE ESTABLISHED WATER TABLE. ANY REBAR AND OTHER STRUCTURAL METAL MUST BE REMOVED FROM THE RECYCLED MATERIAL DURING PROCESSING AND PLACED IN A DESIGNATED SCRAP PILE ON SITE WHICH WILL BE REMOVED ON AN ON-GOING BASIS. REMOVAL OF RECYCLED AGGREGATE IS TO BE ONGOING. ONCE THE AGGREGATE ON SITE HAS BEEN DEPLETED THERE WILL BE NO FURTHER IMPORTATION OF RECYCLABLE MATERIALS PERMITTED. ONCE FINAL REHABILITATION HAS BEEN COMPLETED AND APPROVED IN ACCORDANCE WITH THE SITE PLAN, ALL RECYCLING OPERATIONS MUST CEASE.

8. EQUIPMENT, SCRAP AND MACHINERY ASSOCIATED WITH THE EXTRACTION OPERATIONS WILL BE REMOVED UPON COMPLETION

HYDROGEOLOGICAL INFORMATION

BASED ON THE ———— HYDROGEOLOGICAL REPORT (SEE ABOVE). REFER TO SECTIONS ON SHEET 4 OF 5.

10. SURFACE DRAINAGE WILL BE DIRECTED TO THE POND AND/ OR LOW AREAS FOR WATER TO INFILTRATE INTO THE GRANULAR MATERIALS ON THE PIT FLOOR. THERE WILL BE NO OFF-SITE DITCHING/ DISCHARGE.

NOISE MITIGATION INFORMATION

EXCAVATION AND PROCESSING

11. HOURS OF OPERATION:
SITE PREPARATION AND REHABILITATION:
07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS 07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS 07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS

AIR QUALITY INFORMATION

12. WATER OR CALCIUM CHLORIDE WILL BE APPLIED TO INTERNAL HAUL ROADS AND PROCESSING AREAS AS OFTEN AS REQUIRED TO MITIGATE DUST.

SITE MANAGEMENT INFORMATION

MAINTENANCE/ PROTECTION OF VEGETATION INFORMATION

13. EXISTING VEGETATION WITHIN THE LICENCED AREA SHALL BE MAINTAINED IN A HEALTHY VIGOROUS GROWING CONDITION UNTIL SEQUENTIAL STRIPPING BEGINS OR UNTIL THE REHABILITATION IS COMPLETE, ANY VEGETATION PLANTED AS PART OF SITE IMPROVEMENTS OR PROGRESSIVE AND FINAL REHABILITATION WILL ALSO BE MAINTAINED IN A HEALTHY, VIGOROUS GROWING CONDITION.

14. BOUNDARIES OF THE AREA TO BE LICENCED THAT ARE PRESENTLY FENCED ARE SHOWN ON DRAWING 1 OF 4 EXISTING FEATURES. PRIOR TO ANY STRIPPING OR PREPARATION, FENCING ON THE LICENCED BOUNDARIES WILL BE UPGRADED TO 1.2m HIGH POST AND WIRE TO COMPLY WITH THE AGGREGATE RESOURCES ACT WHERE REQUIRED.

5. TOPSOIL AND OVERBURDEN SHALL BE STRIPPED AND STORED SEPARATELY IN BERMS WHERE SHOWN AND STOCKPILES ON PIT FLOOR CLOSE TO EXTRACTION FACE.

16. BERMS SHALL BE CONSTRUCTED AS SPECIFIED IN THE HGC ENGINEERING LIMITED NOISE ASSESSMENT REPORT DATED JANUARY 2022 AND SHOWN ON OPS PLAN AND AS TO HEIGHTS REQUIRED FOR STORAGE BERMS, BERMS SHALL NOT EXCEED 2:1. REFER TO TYPICAL BERM CROSS SECTION ON DRAWING 4 OF 5 DETAILS AND SECTIONS, ALL BERMS SHALL BE SEEDED (USING GRASS/ LEGUME MIXTURE, SEE REHABILITATION PLAN, NOTE #7) IMMEDIATELY UPON COMPLETION TO MINIMIZE NOISE,

17. ON COMPLETION OF THE BERMS, EXCESS ON-SITE OVERBURDEN WILL BE USED TO PROGRESSIVELY BACKFILL AND REHABILITATE THE SITE, TOPSOIL CAN BE TEMPORARILY STOCKPILED ON THE PIT FLOOR,

18. ALL SCRAP AND USED MACHINERY GENERATED THROUGH THE OPERATIONS WITHIN THIS LICENCE SHALL BE DISPOSED OF ON AN ONGOING BASIS. STUMPS/ WOODY MATERIAL MAY BE CHIPPED AND USED FOR SOIL ENHANCEMENT DURING PROGRESSIVE REHABILITATION. TREES WILL BE HARVESTED AND SOLD AS LUMBER OR UTILIZED FOR FIREWOOD AND/ OR THEIR BEST USE. UPON COMPLETION OF EXTRACTION, ALL SCRAP EQUIPMENT AND USED MACHINERY SHALL BE REMOVED.

9 FUEL, OIL, RADIATOR AND HYDRAULIC FLUID, AND OTHER CHEMICALS NEEDED FOR THE MAINTENANCE AND FUNCTIONING OF ON-SITE AGGREGATE PROCESSING EQUIPMENT SHALL BE APPROPRIATELY STORED IN ABOVE-GROUND CONTAINERS AND SHALL MEET THE REQUIREMENTS OF THE GASOLINE HANDLING ACT, AS AMENDED, AND THE GASOLINE HANDLING CODE AND REGULATIONS, AS AMENDED BY THE TECHNICAL STANDARDS AND SAFETY ACT (TSSA) AND LIQUID FUELS HANDLING CODE. AND IN ACCORDANCE WITH THE MINISTRY OF THE ENVIRONMENT, CONSERVATION, AND PARK'S CHEMICAL STORAGE GUIDELINES. ALL SPILLS TO THE ENVIRONMENT MUST BE REPORTED TO THE SPILLS ACTION CENTRE OF MECP. ANY SPILL SHALL BE REMOVED AND DISPOSED OF AT AN APPROPRIATE MECP APPROVED FACILITY.

MPORTATION OF FILL INFORMATION

- 20. MATERIAL FROM OTHER PROPERTIES (EG. MANURE AND/ OR TOPSOIL) MAY BE IMPORTED INTO THE SITE FOR SOIL ENHANCEMENT USING STANDARD AGRICULTURAL PRACTICES.
- 1. EXCESS SOIL, AS DEFINED IN ONTARIO REGULATION 406/19 UNDER THE ENVIRONMENTAL PROTECTION ACT, MAY BE IMPORTED TO THIS SITE FOR THE FOLLOWING REHABILITATION PURPOSES: CREATION OF 3:1 SLOPES
- ii. TOP DRESSING TO ESTABLISH VEGETATION
- 2. EXCESS IMPORTED FOR THE REHABILITATION PURPOSES DESCRIBED ABOVE SHALL MEET THE SOIL QUALITY STANDARDS SET OUT IN TABLE 1: "FULL DEPTH BACKGROUND SITE CONDITION STANDARDS", OF THE RULES FOR SOIL MANAGEMENT AND EXCESS SOIL QUALITY STANDARDS PUBLISHED BY THE MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS, AS AMENDED FROM TIME TO TIME.
- 3. THE MAXIMUM TOTAL AMOUNT OF EXCESS SOIL THAT MAY BE IMPORTED TO THIS SITE FOR REHABILITATION PURPOSES IS
- 4. THE LICENSEE SHALL ENSURE THAT THE ACCEPTANCE AND REUSE OF EXCESS SOIL IMPORTED FOR REHABILITATION PURPOSES IS COMPLIANT WITH PART I: RULES FOR SOIL MANAGEMENT OF THE "RULES FOR SOIL MANAGEMENT AND EXCESS SOIL QUALITY STANDARDS PUBLISHED BY THE MINISTRY OF ENVIRONMENT, CONSERVATION AND PARK AND AS AMENDED FROM TIME TO TIME

PHASE A

PHASE A NOTES

- 1. PRIOR TO ANY ON SITE OPERATIONS, CONSTRUCT OR UPGRADE THE FENCING ON THE PERIMETER OF AREA 1A TO THE STANDARDS OF THE AGGREGATE RESOURCES ACT (1,2m HIGH POST AND WIRE FENCE) TO RESTRICT ACCESS, EXCEPT WHERE SITE PLAN VARIANCES ARE NOTED. ALL FENCING SHALL BE MAINTAINED.
- 2. CONSTRUCT THE HAUL ROAD THROUGH AREA 1a AND STORE STRIPPED MATERIAL IN STORAGE BERMS AS SHOWN.
- 3. PLANT TWO ROWS OF WHITE PINE ALONG THE SIGNIFICANT WOODLAND PER TECHNICAL RECOMMENDATIONS (PAGE 3 OF 5).
- 4. PRIOR TO EXTRACTION IN AREA 1a, STRIP TOPSOIL AND OVERBURDEN SEPARATELY AND STORE MATERIALS IN STORAGE BERMS AS
- 5, BEGIN ABOVE WATER EXTRACTION OF AREA 1a IN DIRECTION SHOWN, PORTABLE PROCESSING PLANT AND STOCKPILING AREA MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE.
- 6. UNDISTURBED PORTIONS OF AREAS 1a, 1b, 2, AND 3 REMAIN IN AGRICULTURAL USE.

LEGEND

120m INFORMATION BOUNDARY **BOUNDARY OF EXPANSION BOUNDARY OF EXISTING LICENCES** LOT/CONCESSION LINE

REGULATORY SETBACK AND EXTRACTION LIMIT LINE PROPERTY LINE

WELL\PIEZOMETER INSTALLED

GROUNDWATER SCIENCE CORP.

GROUNDWATER SCIENCE CORP.

JANUARY 2021 BY

BH5-22 BOREHOLE INSTALLED MAY 2022

MARKER POST

HYDRO POLE

FEBRUARY 25, 2022 BY

BY MARATHON DRILLING

DIRECTION OF EXTRACTION

DIRECTION OF TOPSOIL AND

PRODUCT TRANSPORTATION

OVERBURDEN MOVEMENT

EXISTING FENCE

EXISTING BUILDING DIRECTION OF SURFACE WATER DRAINAGE

EXISTING HYDRO EASEMENT

EXISTING 5m CONTOUR LINE EXISTING 1m CONTOUR LINE **EXISTING SPOT ELEVATION** BH1-21 BOREHOLE\MONITORING EXISTING PIT FACE → MW1 ENTRANCE/EXIT BH4-22 BOREHOLE INSTALLED

LOCATION OF CROSS

EXISTING VEGETATION

EXISTING WETLAND BERM (MIN. HEIGHT AS SHOWN)

UNDISTURBED AREA AREA STRIPPED OF TOPSOIL AND OVERBURDEN

EXISTING ELEVATION PROPOSED ELEVATION

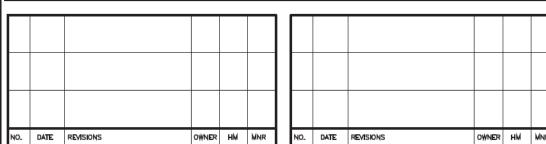
LOCATION OF NOISE

VIA HAUL ROAD

SITE PLAN VARIANCES

THE FOLLOWING CONDITIONS ILLUSTRATED ON THESE PLANS VARY FROM THE OF THE PROVINCIAL STANDARDS MADE UNDER THE AGGREGATE RESOURCES ACT

1. SETBACK REDUCED TO 0m ALONG BOUNDARY ABUTTING LICENCE No. 2134, LICENCE No. 0.13(1)10i 2134 IS SAME LICENSEE AND BOUNDARY ABUTTING RESIDENCE, PROPERTY UNDER SAME | 0.13(1)10iiB OWNERSHIP. 2. NO FENCING ALONG BOUNDARY ABUTTING: LICENCE No. 2134, LICENCE No. 2134 IS SAME 0.13(3)a LICENSEE; RESIDENCE, PROPERTY IS UNDER SAME OWNERSHIP; NORTH/WEST SIDE OF SOUTHEAST WOODED AREA, EXISTING VEGETATION AND FENCE ALONG PROPERTY LINE PREVENT ENTRANCE TO SITE. 3. NO GATE AT ENTRANCE/EXIT TO ADJACENT LICENCE No. 2134. LICENCE No. 2134 IS SAME | 0,13(1)1 LICENSEE AND ENTRANCE/EXIT TO LICENCE No. 2134 AT TRUMAN LINE IS GATED. I. STOCKPILES AND PORTABLE PROCESSING PLANT MAY BE LOCATED WITHIN 30m OF 0.13(1)13i BOUNDARY ABUTTING LICENCE No. 2134, LICENCE No. 2134 IS SAME LICENSEE AND 0.13(1)13iiA BOUNDARY ABUTTING RESIDENCE, PROPERTY UNDER SAME OWNERSHIP.



Pre Licence Review

Site Plan Amendments



Project Name

TALBOT SAND **AND GRAVEL**

Tel: 905-294-8282 Fax: 905-294-7623

www.harringtonmcavan.com

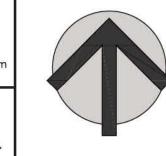
MACPHERSON PIT EXPANSION

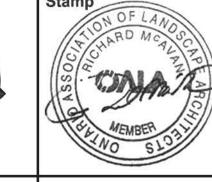
PART LOT 6, CONCESSION 12 MUNICIPALITY OF CENTRAL ELGIN (FORMERLY TOWNSHIP OF YARMOUTH), COUNTY OF ELGIN

Drawing Status SUBMITED FOR

LICENCE APPROVAL

Scale 1:2000





Drawn SB Checked BJ Drawing Title

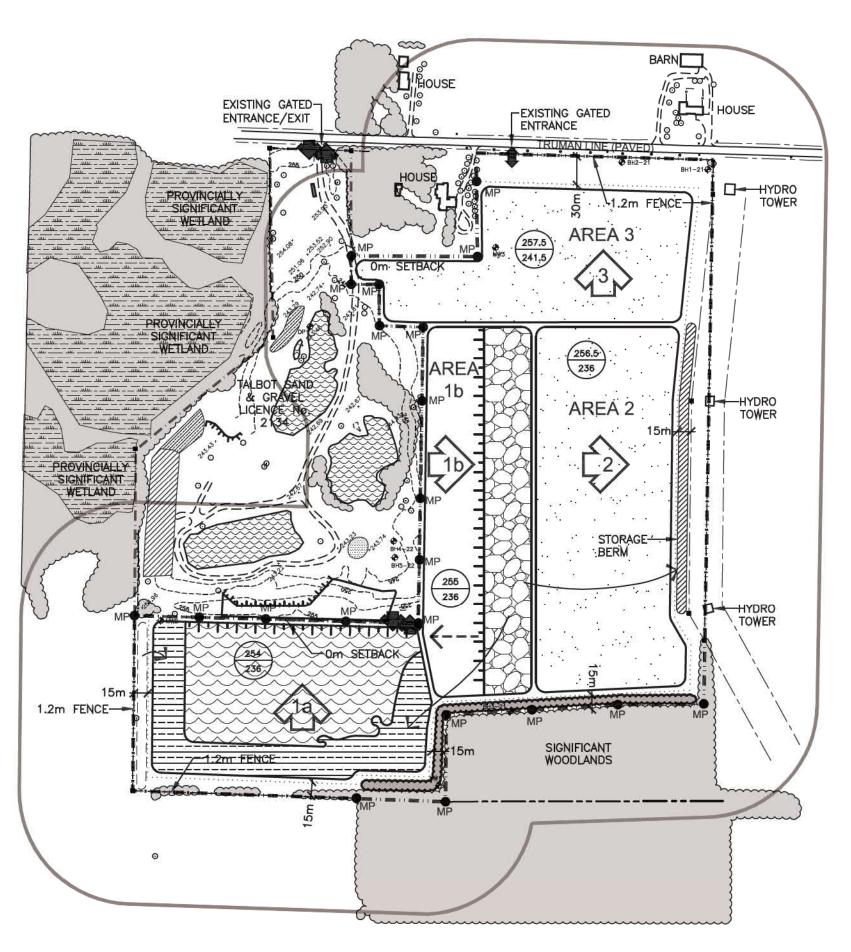
PLAN

Project Number OPERATIONAL

20-03

Drawing Number

Issue Date JULY 2022



EXISTING GATED-

ENTRANCE/EXIT

AREA 1

15m 🖈

1.2m FENCE

PHASE B

PHASE B NOTES

PHASE D

PHASE D NOTES

1. COMPLETE ABOVE WATER EXTRACTION IN AREA 2.

2. BEGIN BELOW WATER EXTRACTION OF AREA 2 IN DIRECTION

3. BEGIN REHABILITATION OF SOUTH/SOUTHEAST SHORELINE OF AREA 2 USING MATERIAL STORED IN EAST STORAGE BERM.

4. PRIOR TO EXTRACTION IN AREA 3, STRIP TOPSOIL AND

COMPLETE REHABILITATION OF AREA 2 SHORELINE.

5. BEGIN ABOVE WATER EXTRACTION OF AREA 3 IN DIRECTION

MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE.

PHASE E (NOT SHOWN)

1. COMPLETE ABOVE WATER EXTRACTION IN AREA 3.

PHASE E NOTES

ACOUSTIC BERM.

STOCKPILED IN BERMS.

4. REMOVE ALL SCRAP AND EQUIPMENT.

TOWFR

SIGNIFICANT

WOODLANDS

SHOWN. MATERIAL EXTRACTED FROM BELOW WATER WILL BE

PLACED IN WINDROWS ON THE PIT FLOOR TO DRAIN BEFORE BEING

TRANSPORTED FOR PROCESSING, SHIP MATERIAL TO TEMPORARY

PLANT SITE (NOT SHOWN, PORTABLE PROCESSING EQUIPMENT TO

OVERBURDEN SEPARATELY AND USE MATERIALS TO CONSTRUCT

SHOWN, PORTABLE PROCESSING PLANT AND STOCKPILING AREA

2. BEGIN BELOW WATER EXTRACTION OF AREA 3 IN DIRECTION SHOWN.

MATERIAL EXTRACTED FROM BELOW WATER WILL BE PLACED IN

SHOWN, PORTABLE PROCESSING EQUIPMENT TO BE USED).

3. COMPLETE BELOW WATER EXTRACTION OF AREA 3 AND BEGIN

WINDROWS ON THE PIT FLOOR TO DRAIN BEFORE BEING TRANSPORTED

FOR PROCESSING. SHIP MATERIAL TO TEMPORARY PLANT SITE (NOT

REHABILITATION OF AREA 3 SHORELINE USING MATERIAL STORED IN

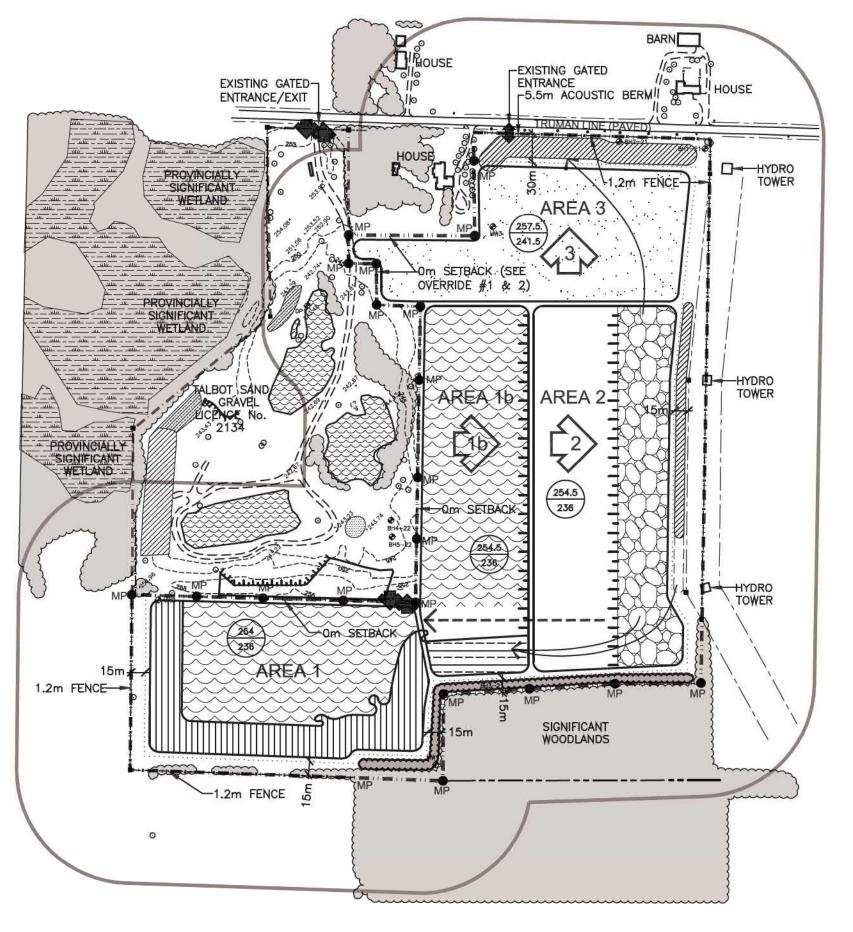
5. COMPLETE REHABILITATION OF ALL REMAINING AREAS (INCLUDING

6. REHABILITATION WILL BE TO POND AND NATURAL AREAS.

ALL INTERNAL HAUL ROADS) USING TOPSOIL AND OVERBURDEN

NORTH ACOUSTIC BERM. EXCESS MATERIALS MAY BE USED TO

- 1. COMPLETE ABOVE WATER EXTRACTION IN AREA 1.
- BEGIN BELOW WATER EXTRACTION IN AREA 1 IN DIRECTION SHOWN. MATERIAL EXTRACTED FROM BELOW WATER WILL BE PLACED IN WINDROWS ON THE PIT FLOOR TO DRAIN BEFORE BEING TRANSPORTED FOR PROCESSING, SHIP MATERIAL TO TEMPORARY PLANT SITE (NOT SHOWN, PORTABLE PROCESSING EQUIPMENT TO BE USED).
- PRIOR TO EXTRACTION IN AREA 1b, STRIP TOPSOIL AND OVERBURDEN SEPARATELY AND USE MATERIALS TO BEGIN REHABILITATION OF SOUTH/SOUTHEAST SHORELINE IN AREA 1A. EXCESS MATERIAL MAY BE STORED IN TEMPORARY STORAGE BERM ALONG EAST BOUNDARY.
- COMPLETE BELOW WATER EXTRACTION IN AREA 1a.
- 5. COMPLETE REHABILITATION OF SHORELINE IN AREA 1a USING MATERIAL STORED IN STORAGE BERMS.
- BEGIN ABOVE WATER EXTRACTION OF AREA 1b IN DIRECTION SHOWN. PORTABLE PROCESSING PLANT AND STOCKPILING AREA MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE.
- 7. UNDISTURBED PORTIONS OF AREA 2 AND 3 REMAIN IN AGRICULTURAL



PHASE C

PHASE C NOTES

PARKS, ACCORDING TO EXISTING WATER WELL INTERFERENCE COMPLAINT PROTOCOLS, HAS

HAS CAUSED ANY WELL WATER TO BE ADVERSELY AFFECTED, THE LICENSEE SHALL, AT THE

HISTORIC WATER PRODUCTION QUALITY STANDARDS ARE MAINTAINED FOR THAT WELL, IF THIS

IN ORDER TO TRACK WATER TABLE ELEVATIONS AND GROUNDWATER QUALITY AT THE SITE, THE

1. WATER LEVEL MEASUREMENTS SHALL BE OBTAINED ON A QUARTERLY (SEASONAL) BASIS AT

2. ANNUAL WATER QUALITY SAMPLES FOR GENERAL PARAMETERS (ANIONS AND METALS) AND

3. THE MONITORING RESULTS WILL BE SUMMARIZED AND SUBMITTED IN AN ANNUAL REPORT TO

THE MINISTRY OF NORTHERN DEVELOPMENT, MINES, NATURAL RESOURCES AND FORESTRY.

NATURAL ENVIRONMENT ASSESSMENT - TERRASTORY ENVIRONMENTAL CONSULTING INC., DATED

WELL-MARKED (I.E., STAKED) UNDER THE DIRECTION OF A QUALIFIED ECOLOGIST PRIOR TO

2. OPERATIONAL ACTIVITIES AND OTHER DISTURBANCES ARE PROHIBITED WITHIN THE 15 M

3. TWO (2) ROWS OF EASTERN WHITE PINE (PINUS STROBUS) WILL BE PLANTED WITHIN THE 15 M

SELF-SUSTAINING VEGETATION (I.E., NO VEGETATION MAINTENANCE OR HUMAN ACTIVITIES).

5. ANY NECESSARY LIGHTING TO SUPPORT PIT OPERATIONS WILL BE DIRECTED AWAY FROM THE

6. ALL AGGREGATE OPERATIONS WITHIN THE SITE WILL BE UNDERTAKEN CONSISTENT WITH THE DOCUMENT TITLED "BEST MANAGEMENT PRACTICES FOR THE PROTECTION, CREATION AND

COMPLETED OUTSIDE THE PRIMARY BIRD NESTING AND BAT ACTIVITY PERIODS (I.E., TO BE

4. THE 15 M DRIPLINE SETBACK FROM THE SIGNIFICANT WOODLAND WILL BECOME NATURAL,

DECIDUOUS WOODLAND (I.E., NORTHWARD) TO THE EXTENT PRACTICABLE.

MAINTENANCE OF BANK SWALLOW HABITAT IN ONTARIO" (OMNRF 2017).

7. ANY NECESSARY REMOVAL OF VEGETATION TO SUPPORT PIT OPERATIONS WILL BE

1. THE 15 M SETBACK FROM THE DRIPLINE OF THE DECIDUOUS WOODLAND WILL BE

THE COMMENCEMENT OF ADJACENT PIT OPERATIONS.

DRIPLINE SETBACK OF THE DECIDUOUS WOODLAND.

DRIPLINE SETBACK FROM THE SIGNIFICANT WOODLAND.

COMPLETED BETWEEN OCTOBER 1 AND MARCH 31).

PETROLEUM HYDROCARBONS SHALL BE OBTAINED AT MW1 AND MW3 (AS ACCESSIBLE) ON

LICENSEE'S EXPENSE, EITHER DEEPEN THE WELL OR REPLACE THE WELL TO ENSURE THAT

PIT OPERATION HAS CAUSED A WATER SUPPLY PROBLEM, THE LICENSEE SHALL, AT THEIR EXPENSE, ENSURE A CONTINUOUS SUPPLY OF POTABLE WATER TO THE AFFECTED LANDOWNER.

DETERMINED THAT THE OPERATION OF THE PIT

MW1, MW2 AND MW3, AS ACCESSIBLE.

AN ANNUAL BASIS.

JUNE 2022 SIGNIFICANT WOODLAND

BANK SWALLOW

OTHER WILDLIFE

FOLLOWING MONITORING PROGRAM IS RECOMMENDED:

- 1. COMPLETE ABOVE WATER EXTRACTION IN AREA 1b.
- 2. BEGIN BELOW WATER EXTRACTION OF AREA 1b IN DIRECTION SHOWN, MATERIAL EXTRACTED FROM BELOW WATER WILL BE PLACED IN WINDROWS ON THE PIT FLOOR TO DRAIN BEFORE BEING TRANSPORTED FOR PROCESSING. SHIP MATERIAL TO TEMPORARY PLANT SITE (NOT SHOWN, PORTABLE PROCESSING EQUIPMENT TO
- 3. BEGIN REHABILITATION OF SHORELINE IN AREA 1b USING MATERIAL STORED IN STORAGE BERM.
- 4. PRIOR TO EXTRACTION IN AREA 2, STRIP TOPSOIL AND OVERBURDEN SEPARATELY AND USE MATERIALS TO COMPLETE REHABILITATION OF SOUTH SHORELINE IN AREA 15 AND BEGIN CONSTRUCTION OF ACOUSTIC BERM.
- 5. BEGIN ABOVE WATER EXTRACTION OF AREA 2 IN DIRECTION SHOWN. PORTABLE PROCESSING PLANT AND STOCKPILING AREA MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE.
- 6. UNDISTURBED PORTIONS OF AREA 3 REMAIN IN AGRICULTURAL

LEGEND

LOT/CONCESSION LINE REGULATORY SETBACK AND EXTRACTION LIMIT LINE

BOUNDARY OF EXISTING LICENCES

120m INFORMATION BOUNDARY

BOUNDARY OF EXPANSION

EXISTING FENCE EXISTING 5m CONTOUR LINE **EXISTING 1m CONTOUR LINE**

EXISTING SPOT ELEVATION EXISTING PIT FACE EXISTING PIT ENTRANCE/EXIT

EXISTING VEGETATION

EXISTING WETLAND EXISTING POND

> UNDISTURBED AREA AREA STRIPPED OF TOPSOIL AND OVERBURDEN

> > BELOW WATER EXTRACTION

PROGRESSIVE REHABILIATION

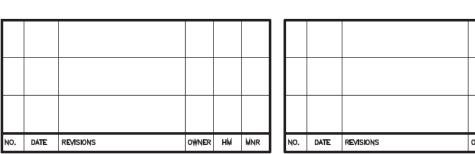
REHABILITATED AREA

PROPERTY LINE _____ EXISTING HYDRO EASEMENT _______ **EXISTING BUILDING DIRECTION OF SURFACE** WATER DRAINAGE BOREHOLE\MONITORING WELL\PIEZOMETER INSTALLED **JANUARY 2021 BY** GROUNDWATER SCIENCE CORP BOREHOLE INSTALLED **FEBRUARY 25, 2022 BY** GROUNDWATER SCIENCE CORF BH5-22 BOREHOLE INSTALLED MAY 2022 BY MARATHON DRILLING MARKER POST HYDRO POLE EXISTING STOCKPILE BERM (MIN. HEIGHT AS SHOWN) DIRECTION OF EXTRACTION DIRECTION OF TOPSOIL AND OVERBURDEN MOVEMENT

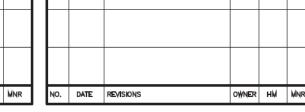
PRODUCT TRANSPORTATION

VIA HAUL ROAD

EXISTING ELEVATION



Pre Licence Review



Site Plan Amendments

www.harringtonmcavan.com



Project Name

TALBOT SAND **AND GRAVEL**

MACPHERSON PIT EXPANSION

(FORMERLY TOWNSHIP OF YARMOUTH), COUNTY OF ELGIN

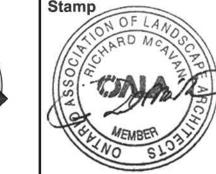
PART LOT 6, CONCESSION 12 MUNICIPALITY OF CENTRAL ELGIN

Scale 1:4000

Drawing Status

SUBMITTED FOR

LICENCE APPROVAL



Drawn SB Drawing Title

Checked BJ

Issue Date JULY 2022 **Project Number**

Drawing Number

OPERATIONAL PHASES B-D

TECHNICAL RECOMMENDATIONS

THE FOLLOWING ARE THE TECHNICAL RECOMMENDATIONS FROM ALL OF THE EXPERTS' REPORTS AS OF JANUARY 2021. ADDITIONAL RECOMMENDATIONS MAY BE INCLUDED AS A RESULT OF THE LICENCE REVIEW PROCESS.

SHOULD PREVIOUSLY UNDOCUMENTED (I.E., UNKNOWN OR DEEPLY BURIED) ARCHAEOLOGICAL RESOURCES BE DISCOVERED, THEY MAY BE A NEW ARCHAEOLOGICAL SITE AND THEREFORE SUBJECT TO SECTION 48(1) OF THE ONTARIO HERITAGE ACT. THE PROPONENT OR PERSON DISCOVERING THE ARCHAEOLOGICAL RESOURCES MUST CEASE ALTERATION OF THE SITE IMMEDIATELY AND ENGAGE A LICENSED CONSULTANT ARCHAEOLOGIST TO CARRY OUT ARCHAEOLOGICAL FIELDWORK, IN COMPLIANCE WITH SECTION 48(1) OF THE ONTARIO HERITAGE ACT.

SITES, WAR GRAVES, ABANDONED CEMETERIES AND CEMETERY CLOSURES, ONTARIO MINISTRY OF INFORMATION IS: 416-212-7499, CRYSTAL.FORREST@ONTARIO.CA

EQUIPMENT	SOUND POWER LEVEL dBA re: 10 ⁻¹² W
CRUSHING PLANT WITH AND ASSOCIATED LOADER	115
SCREENING PLANT WITH AND ASSOCIATED LOADER	108
EXCAVATOR/DRAGLINE	107
TRUCKS	101

SOUND LEVELS OR ADDITIONAL MITIGATION MEASURES MAY BE REQUIRED.

- PROCESSING ACTIVITIES IN AREA 3.
- A MINIMUM 7.0 M HIGH LOCAL ACOUSTICAL BARRIER SHALL BE CONSTRUCTED AND MAINTAINED ON THE PIT FLOOR BESIDE THE SCREENING PLANT IN THE DIRECTION OF R1 AND R2 ONCE EXTRACTION IN
- 5. THE CRUSHING PLANT SHALL NOT OPERATE WITHIN 350 M OF R1 AND R2 ONCE EXTRACTION IN AREA 3 HAS COMMENCED.
- IT IS UNDERSTOOD THAT THE OWNERS OF R3 ALSO OWN THE LANDS OF THE EXISTING PIT AND THE EXPANSION LANDS TO BE LICENSED FOR AGGREGATE EXTRACTION. WE UNDERSTAND THAT THEY HAVE SIGNED AN AGREEMENT THAT GRANTS THE PIT OPERATOR RELIEF FROM IMPLEMENTING ANY NOISE MITIGATION MEASURES WITH REGARD TO R3.
- WITH THE NEW OWNERS/OCCUPANTS OR MITIGATION MEASURES SHALL BE IMPLEMENTED WITH RESPECT TO R3, THOSE MITIGATION MEASURES INCLUDE:
- THE CONSTRUCTION OF THE MINIMUM 7.0 M HIGH LOCAL ACOUSTICAL BARRIER ON THE PIT FLOOR BESIDE THE CRUSHING PLANT IN THE DIRECTION OF R3.
- EQUIPMENT IS LOCATED LESS THAN 100 M FROM THE PIT FACE; OR COULD BE COMPRISED OF AN EARTH BERM, A NOISE WALL, AGGREGATE STOCKPILES OR ANY OTHER CONSTRUCTION WITH A MINIMUM SURFACE DENSITY OF 20 KG/M2.
- CONSTRUCTION OF BERMS, OR ACTIVITIES RELATED TO THE REMEDIATION OF THE SITE ARE CONSIDERED TO BE CONSTRUCTION ACTIVITIES. THEY ARE REGULATED UNDER MUNICIPAL BYLAWS AND NPC=115 "SOUND LEVEL LIMITS FOR MOTORIZED CONSTRUCTION EQUIPMENT".

WHERE THE MINISTRY OF NORTHERN DEVELOPMENT, MINES, NATURAL RESOURCES AND FORESTRY WITH THE ASSISTANCE OF THE MINISTRY OF THE ENVIRONMENT CONSERVATION AND

<u>OGICAL ASSESSMENT - TIMMINS MARTELLE HERITAGE CONSULTANTS INC. DATED JANUARY</u>

THE FUNERAL, BURIAL AND CREMATION SERVICES ACT, 2002, S.O. 2002, C.33 REQUIRES THAT ANY PERSON DISCOVERING HUMAN REMAINS MUST NOTIFY THE POLICE OR CORONER AND THE REGISTRAR OF BURIAL GOVERNMENT AND CONSUMER SERVICES. AS OF DECEMBER 2020, CRYSTAL FORREST IS SERVING AS A/REGISTRAR, BURIAL SITES, REPLACING NANCY WATKINS IN THIS ROLE, THE NEW REGISTRAR'S CONTACT

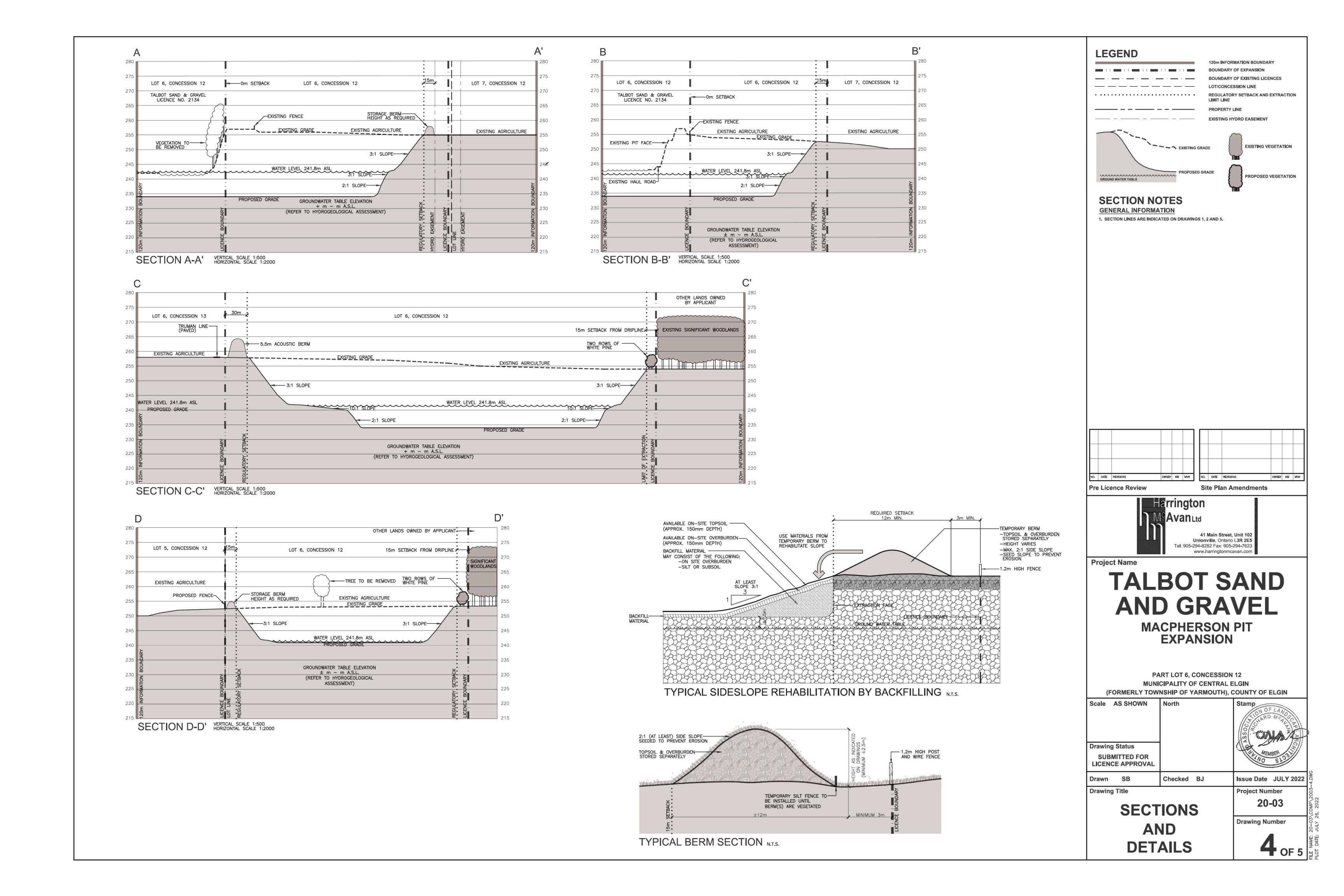
NOISE ASSESSMENT - HGC ENGINEERING DATED APRIL 1, 2022 THE FOLLOWING TABLE PRESENTS THE REFERENCE SOUND LEVELS USED FOR THE ACOUSTIC MODELING PRESENTED HEREIN. THESE SOUND LEVELS WERE BASED ON SITE MEASUREMENTS OF SIMILAR PROCESSING EQUIPMENT TO BE USED IN THIS PIT.

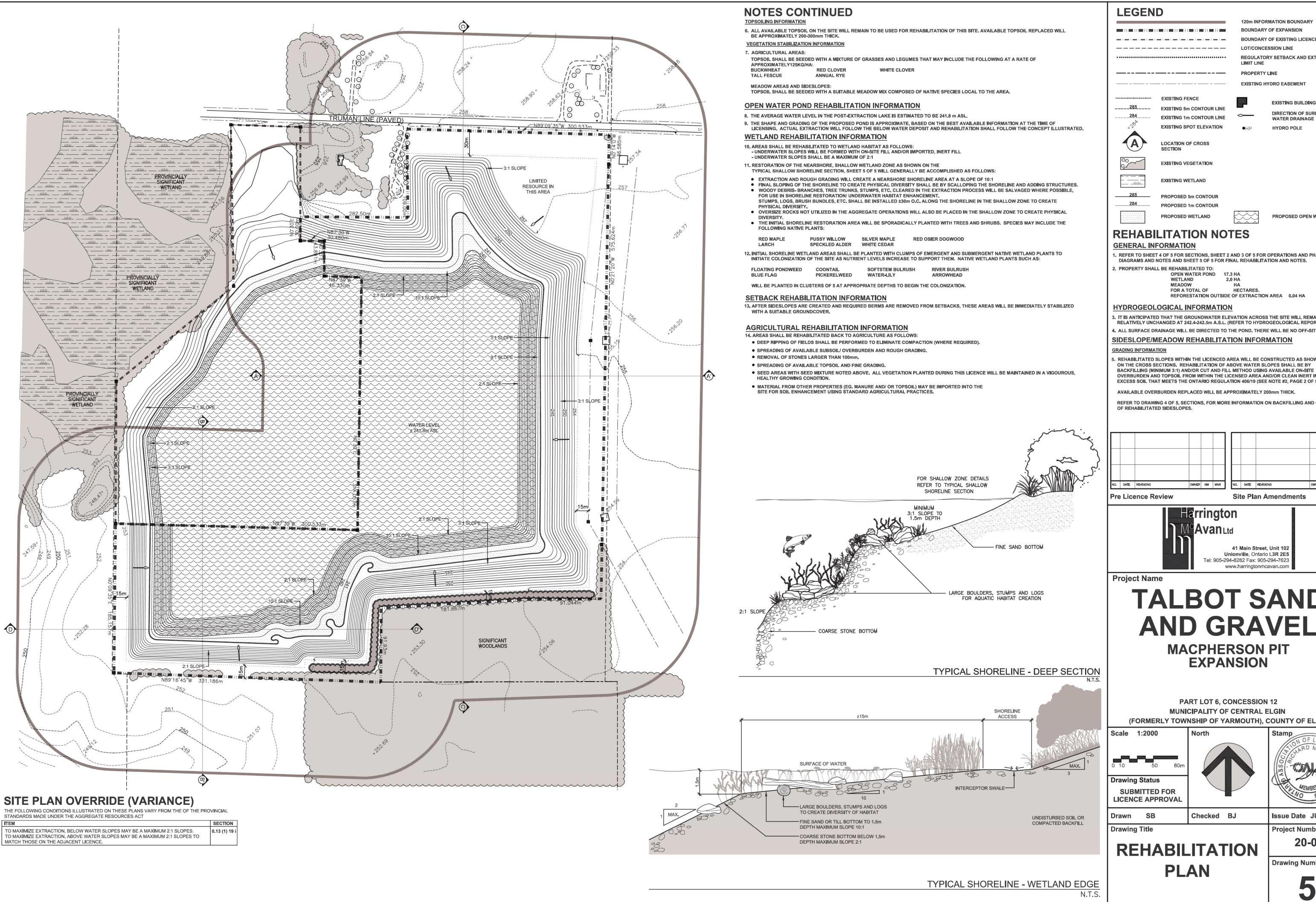
EQUIPMENT	SOUND POWER LEVEL dBA re: 10-12 W
CRUSHING PLANT WITH AND ASSOCIATED LOADER	115
SCREENING PLANT WITH AND ASSOCIATED LOADER	108
EXCAVATOR/DRAGLINE	107
TRUCKS	101

IF OTHER EQUIPMENT IS PROPOSED FOR OPERATION IN THE GRAVEL PIT, IT SHALL BE CONFIRMED THROUGH MEASUREMENT TO PRODUCE SOUND LEVELS CONSISTENT WITH THE ABOVE REFERENCED

- A MINIMUM 7.0 M HIGH LOCAL ACOUSTICAL BARRIER SHALL BE CONSTRUCTED AND MAINTAINED ON THE PIT FLOOR BESIDE THE CRUSHING PLANT IN THE DIRECTION OF R1 AND R2 WHEN OPERATING WITHIN 500 M OF R1 AND R2 IN AREA 2.
- A MINIMUM 5.5 M HIGH PERIMETER BERM (ABOVE EXISTING GRADE) SHALL BE CONSTRUCTED ALONG THE NORTHERN BOUNDARY ADJACENT TO AREA 3, PRIOR TO THE COMMENCEMENT OF EXTRACTION OR

- SHOULD THE OWNERSHIP OR OCCUPANCY OF R3 CHANGE, A SIMILAR AGREEMENT SHALL BE REACHED
- THE CONSTRUCTION OF A MINIMUM 6.0 M HIGH PERIMETER BERM TO THE SOUTH AND EAST OF R3 PRIOR TO COMMENCEMENT OF PROCESSING ACTIVITIES IN AREA 1A,
- THE LOCAL ACOUSTICAL BARRIERS MENTIONED ABOVE COULD BE THE PIT FACE WHEN THE
- 8. ACTIVITIES USED TO PREPARE THE SITE FOR EXCAVATION, SUCH AS THE STRIPPING OF TOPSOIL,





LEGEND 120m INFORMATION BOUNDARY BOUNDARY OF EXPANSION BOUNDARY OF EXISTING LICENCES LOT/CONCESSION LINE _____ REGULATORY SETBACK AND EXTRACTION LIMIT LINE PROPERTY LINE _____ EXISTING HYDRO EASEMENT ______ EXISTING FENCE EXISTING BUILDING **EXISTING 5m CONTOUR LINE** DIRECTION OF SURFACE EXISTING 1m CONTOUR LINE WATER DRAINAGE EXISTING SPOT ELEVATION **HYDRO POLE** LOCATION OF CROSS SECTION **EXISTING VEGETATION** EXISTING WETLAND PROPOSED 5m CONTOUR PROPOSED 1m CONTOUR

REHABILITATION NOTES

PROPOSED WETLAND

GENERAL INFORMATION

1. REFER TO SHEET 4 OF 5 FOR SECTIONS, SHEET 2 AND 3 OF 5 FOR OPERATIONS AND PHASING

2. PROPERTY SHALL BE REHABILITATED TO: OPEN WATER POND 17.3 HA

WETLAND MEADOW

HECTARES.

FOR A TOTAL OF REFORESTATION OUTSIDE OF EXTRACTION AREA 0.04 HA

HYDROGEOLOGICAL INFORMATION

. IT IS ANTICIPATED THAT THE GROUNDWATER ELEVATION ACROSS THE SITE WILL REMAIN RELATIVELY UNCHANGED AT 242.4-242.5m A.S.L. (REFER TO HYDROGEOLOGICAL REPORT).

. ALL SURFACE DRAINAGE WILL BE DIRECTED TO THE POND. THERE WILL BE NO OFF-SITE DISCHARGE.

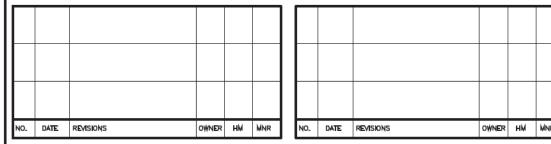
SIDESLOPE/MEADOW REHABILITATION INFORMATION

. REHABILITATED SLOPES WITHIN THE LICENCED AREA WILL BE CONSTRUCTED AS SHOWN

BACKFILLING (MINIMUM 3:1) AND/OR CUT AND FILL METHOD USING AVAILABLE ON-SITE OVERBURDEN AND TOPSOIL FROM WITHIN THE LICENSED AREA AND/OR CLEAN INERT IMPORTED EXCESS SOIL THAT MEETS THE ONTARIO REGULATION 406/19 (SEE NOTE #2, PAGE 2 OF 5)

AVAILABLE OVERBURDEN REPLACED WILL BE APPROXIMATELY 200mm THICK.

REFER TO DRAWING 4 OF 5, SECTIONS, FOR MORE INFORMATION ON BACKFILLING AND CREATION OF REHABILITATED SIDESLOPES.



Pre Licence Review

Site Plan Amendments

PROPOSED OPEN WATER POND



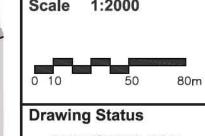
41 Main Street, Unit 102 Unionville, Ontario L3R 2E5 Tel: 905-294-8282 Fax: 905-294-7623

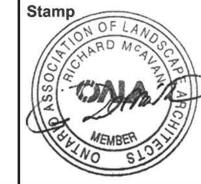
www.harringtonmcavan.com

TALBOT SAND **AND GRAVEL**

MACPHERSON PIT EXPANSION

PART LOT 6, CONCESSION 12 **MUNICIPALITY OF CENTRAL ELGIN** (FORMERLY TOWNSHIP OF YARMOUTH), COUNTY OF ELGIN





PLAN

Checked BJ

Issue Date JULY 2022 **Project Number**

20-03

Drawing Number