

SCOPED ENVIRONMENTAL IMPACT STUDY

Proposed Development at 10th Ave East, City of Owen Sound, Ontario

Prepared by EcoTec Environmental Consultants Inc. on behalf of Cobide Engineering Inc.

DRAFT REPORT

December 2021



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for

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10th Ave East, City of Owen Sound, Ontario

Prepared by EcoTec Environmental Consultants Inc.
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1.0 INTRODUCTION

1.1 General

EcoTec Environmental Consultants Inc. (EcoTec) was retained by Cobide Engineering Inc. (Cobide) in order to complete a scoped Environmental Impact Study (EIS) at a property located within the City of Owen Sound. It is understood by EcoTec that the property owners are proposing to develop the lot located at 10th Avenue East to include a residential subdivision (Figure 1).

The property of the proposed subdivision is 2.62 hectares in size. The *City of Owen Sound Official Plan* (Owen Sound OP) indicates that the property is surrounded by a number of property types including industrial development and open space to the south, and residential development to the north and west. The Kenny Drain and associated buffer is identified as Hazard Lands and is located adjacent to the eastern perimeter of the study area, with the Hazard Lands encroaching on approximately 0.1 hectares of the property. The Hazard Lands are regulated by the Grey Sauble Conservation Authority (GSCA). The study area has been identified as having potential for significant wildlife habitat, and for habitat of a threatened species, the eastern meadowlark (*Sturnella magna*). The property is located within 120 m of fish habitat (Kenny Drain).

Due to the potential development's proximity to sensitive environmental features, a scoped EIS is required to evaluate whether any negative impacts to the surrounding sensitive natural environment would occur as a result of the proposed development.



Figure 1. Map of proposed development area at 10th Avenue East, Owen Sound

1.2 Site Description and Location

The subject property is located at the end of 10th Avenue East, within the City of Owen Sound. The property is identified by Municipal roll number 425901000633806; Lot 7. The property spans 2.62 hectares and is currently vacant, containing only natural environment features.

1.3 Environmental Policy

Relevant planning policies, legislation, and regulatory requirements pertinent to the study area are summarized in the following section.

1.3.1 Provincial Policy Statement

The *Provincial Policy Statement, 2020* (PPS) guides the planning policies for municipalities for the protection of natural heritage features (Ontario Ministry of Municipal Affairs and Housing, 2020). Section 2.1 of the PPS defines natural heritage features and adjacent lands and provides planning policy for each. The PPS defines the following NHF as being non-developable:

- Significant Coastal Wetlands;
- Significant Wetlands in Ecoregions 5E, 6E and 7E;
- Fish Habitat, except in accordance with provincial and federal requirements;
- Habitat of species designate as Endangered and Threatened, except in accordance with provincial and federal requirements.

An EIS must be completed to demonstrate that there will be no negative impact on natural features of their ecological function if development is proposed in one of the following:

- Significant Wetlands in the Canadian Shield;
- Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant wildlife habitat;
- Significant Areas of Natural and Scientific Interest;
- Other Coastal Wetlands in Ecoregions 5E, 6E and 7E; and
- Lands defined as Adjacent Lands to all the above natural heritage features.

Each natural heritage feature assumes varying levels of protections, guidelines and sometimes regulations. The study area is located within Ecoregion 6E (NHIC, 2021). The Kenny Drain is located adjacent to the property (within 120m), and a woodland is identified as being part of the study area, according to the NHIC Biodiversity Mapping (Figure 2) (MNDMNR, 2021).



Figure 2. NHIC map of study area at 10th Avenue East, Owen Sound

1.3.2 City of Owen Sound Official Plan, 2021

The purpose of the Owen Sound OP is to “guide the development and redevelopment of lands within the City for a period of 25 years” and “ensure that land use planning is consistent with the Provincial Policy Statement”.

Schedule ‘A’ – Land Use of the Owen Sound OP recognizes the bulk of the 10th Avenue East property (approximately 2.5 hectares) as having the land use designation of low density residential (Figure 3).

The Kenny Drain is located approximately 30 metres from the eastern perimeter of the study area, with the surrounding lands designated as Hazard Lands. Approximately 0.12 hectares of the eastern portion of the property would fall under the Hazard Lands designation but would require confirmation from the GSCA. A review of the Owen Sound OP indicates that Hazard Lands designation is “intended primarily for the preservation and conservation of lands in their natural state”.

The Hazard Lands that are associated with the Kenny Drain east of 9th Avenue East are part of the flood plain of the Kenny Drain. These lands are to be developed to handle the regional storm events to control erosion. Tree planting and a trail system is encouraged to provide alternative recreation activities for the area residents as indicated with the Owen Sound OP.

The Owen Sound OP does not identify any significant wetlands or woodlands as being located within the study area.

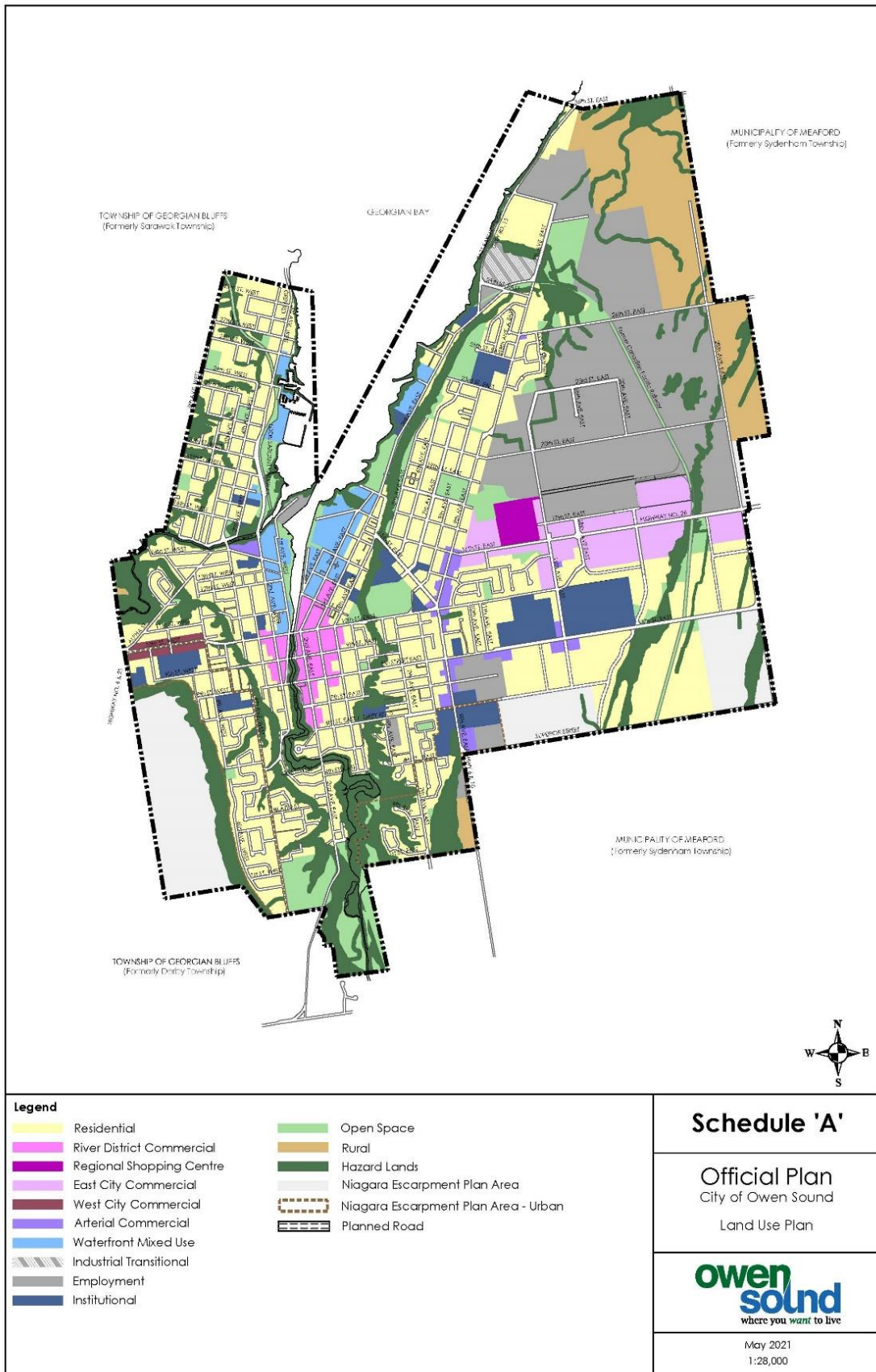


Figure 3. Owen Sound Official Plan Schedule 'A' Map

1.3.3 Grey County Official Plan, 2019

The *Grey County Official Plan, 2019* (Grey County OP) Schedule A recognizes approximately 2.5 hectares of the property as having the Land Use Designation of Primary Settlement area, with approximately 0.12 hectares designated as Hazard Lands as per Schedule 'A'.

The Kenny Drain is located approximately 30 metres from the eastern perimeter of the study area. A review of the Grey County OP indicates that development or site alterations are not permitted within 30 metres of fish habitat unless it is demonstrated through an EIS that there will be no negative impact on the natural feature or its ecological function. Landowners are encouraged to forest the areas within 30 metres of any stream as per the Grey County OP.

The Grey County OP does not identify any significant wetlands or woodlands as being located within the study area.

1.3.4 Grey Sauble Conservation Authority - Ontario Regulation 151/06

The Hazard Lands associated with the Kenny Drain are regulated by the Grey Sauble Conservation Authority (GSCA), and as such development must not occur within the Riverine Erosion Hazard Allowance in accordance with the policies in Section 8.2.2 of the *Grey Sauble Conservation Authority Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation Ontario Regulation 151/06*, and the development must provide a setback of no less than 6 metres from the Riverine Erosion Hazard.

1.3.5 Endangered Species Act, 2007

Species that are designated as *Endangered* or *Threatened* by the *Committee of the Status of Species at Risk in Ontario* (COSSARO, 2007) are listed as *Species at Risk in Ontario* (SARO). These species at risk (SAR) and their associated essential habitats (areas deemed essential for breeding, rearing, hibernating, and migrating) are protected under the *Endangered Species Act* (ESA) (Government of Ontario, 2007).

Species listed as *Special Concern* may be afforded protection through policies aimed at protecting significant wildlife habitat as defined by the province, relevant authorities, or policies within Official Plans.

The Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) online mapping tool (Make-a-Map: Natural Heritage Areas) identifies the property to be located within the Natural Heritage Information Centres (NHIC) square 17NK063. Mapping for this property indicates that the narrow band of trees located in the western portion of the property to be classified as woodland. The NHIC records for square 17NK063 indicate potential for habitat for the eastern meadowlark. The Species at Risk Ontario Act (SARO) lists this species as Threatened.


1.3.6 Federal Fisheries Act, 1985

The *Fisheries Act* aims to protect all fish and fish habitat against the death of fish caused by means other than fishing, as well as the “harmful alteration, disruption or destruction of fish habitat” (HADD). The Kenny Drain is a fish bearing watercourse located within 120 metres of the property boundary.

1.3.7 Migratory Birds Convention Act, 1994

The *Migratory Birds Convention Act (1994)* (MBCA) protects most species of migratory birds, along with their nests and eggs from harm or destruction. Compliance with the MBCA can be achieved through adherence to the Avoidance Guidelines and Best Management Practices by Environment Canada.

1.4 Proposed Site Development

It is understood by EcoTec that Walker Homes Ltd. is proposing a multi-lot residential development located at 10th Avenue East, within the City of Owen Sound. At the time of EIS preparation, no formal development plan has been  mitted, but it is understood by EcoTec that the proposed development is comprised of ~~approximately 30 lots~~, with a stormwater management block being proposed at the north-eastern corner of the study area. An initial schematic has been provided to EcoTec by Cobide Engineering can be found in Appendix A.

2.0 METHODOLOGY

2.1 Field Methodologies and Survey Area

In order to acquire current information on the biophysical conditions of the subject property area, EcoTec's ecologists carried out three (3) field surveys of the subject properties on April 23rd, June 2nd and July 9th, 2021. A photographic record of the site visits is included in Appendix A.

The survey conducted within the subject area included identification of the following:

- Existing vegetation communities;
- Resident and migratory bird and wildlife species;
- Species at Risk; and
- Fish and fish habitat.

2.1.1 Survey Area

The entirety of the study area located at 10th Avenue East, Owen Sound was surveyed for environmental features.

2.1.2 Vegetation Surveys

Vegetation data was collected using a modified Ecological Land Classification Protocol (Lee *et al.* 1998). Vegetation communities were first identified using satellite imagery and verified in the field. During field surveys, each vegetation community was then sampled for their species composition and habitat characteristics.

2.1.3 Wildlife Surveys

Mammal, herpetofauna, and bird species noted during field investigations were identified using visual observations and vocalizations. Birds and animals identified within the subject area, and in the areas adjacent to the subject area, were both recorded as animal movement patterns may utilize areas within and outside of the subject area.

2.1.4 Breeding Bird Point Count Surveys

Breeding bird surveys were conducted in accordance with the Ontario Breeding Bird Atlas (OBBA; Cadman and Kopysh, 2001) point survey protocol. Surveys were conducted within the first five (5) hours after dawn, with suitable wind (Winds <19 km/hr.), no thick fog, and no precipitation. Three (3) surveys were conducted at one (1) count station on the property (Figure 4). The count station was located in a meadow adjacent to forest edge. The point station was surveyed for ten (10) minutes for birds within the study area. Any evidence of breeding behavior including nest incubation or nest building were also noted. Surveys were conducted on May 5th, June 25th, and July 9th, 2021.

Following the completion of the field surveys, each species was reviewed to determine their provincial, national, and global conservation status using the Natural History Information Center. Each species was also cross referenced with *the Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* to determine if they were an indicator of significant wildlife habitat.

2.1.5 Anuran Call Survey

One (1) anuran call survey was completed on May 5th, 2021, in accordance with the Terms of Reference agreed upon by the City of Owen Sound and the Grey Sauble Conservation Authority. The survey was conducted according to the Marsh Monitoring Program Protocol, with the study area being surveyed one half hour after sunset and ending before midnight. One (1) station was surveyed (Figure 4) within the middle of the study area within 100 metres of the Kenny Drain. The survey took place from 2104 - 2107 hrs, with an ambient temperature of 7°C, with the winds categorized as a 2 on the Beaufort Wind Scale, no precipitation, and an estimated cloud cover of 5 percent.



Figure 4. Map indicating breeding bird point survey, anuran call survey, and aquatic habitat survey locations at the 10th Avenue East property, Owen Sound

2.1.6 Aquatic Habitat and Fisheries Assessment

The Owen Sound OP and the GSCA both indicate that the Kenny Drain flows adjacent to the study area, approximately 30 metres from the proposed development. The watercourse was assessed using the Rapid Assessment Methodology for Channel Structure outlined in the Ontario Stream Assessment Protocol (OSAP; Stanfield, 2005).

Using this methodology, a sample site must begin and end at stream crossovers and be at least 40 metres in length (Figure 4). Along the stream sample site, transects are evenly spaced, with observation points evenly spaced across each transect. As per OSAP protocol, as the stream had a minimum width of less than 1m, 10 transects were used with 2 observation points at each transect. Bank stability data was collected at each transect, while hydraulic head, in-stream cover, and substrate data are collected at each observation point. The fish community present within the stream was assessed by electrofishing the sample site using a Smith-Root LR20B. Fish were collected, measured, weighed, and identified before being released back into the stream.

2.2 Desktop Analysis

Historical background information and field data were gathered from numerous sources to determine the existing condition of the natural resource features within the subject area. Background information sources included the following:

- Natural Heritage Information Center (NHIC);
- Atlas of the Breeding Birds of Ontario (OBBA);
- Ontario Butterfly Atlas (OBA);
- Ontario Reptile & Amphibian Atlas (ORAA);
- Aquatic resource area line segment, Land Information Ontario (LIO);
- Department of Fisheries and Oceans Canada (DFO) aquatic species at risk mapping; and
- Aerial photography

3.0 EXISTING CONDITIONS

3.1 Topography and Drainage

Following a review of topographic map as well as conducting field studies, it is evident that the property drains from the southwest corner of the study area towards the Kenny Drain (northeast) located just outside the eastern extent of the property. There is a noticeable change in grade commencing to the west of the tree line, extending to just east of the tree line. EcoTec noted that standing water (5 – 15 cm in depth) and saturated soils were both present during all field surveys throughout the property.

3.2 Superficial Geology

Within the subject limits, the underlying bedrock is the Clinton-Cataract Group consisting of the Whirlpool, Manitoulin, Cabot Head, and Reynales and/or Fossil Hill formations. Based on available records from the Ontario Geological Survey, the bedrock consists of mostly sandstone, shale, dolostone, and siltstone.

3.3 Vegetation

Under the Ecological Land Classification (ELC)- First Approximation and Applications (1998), the subject site is classified as Zone 6E. Three (3) distinct plant communities were identified during the site survey within the subject area; maintained lawn, cultural meadow, and a white ash dominant woodlot (Figure 5).

Approximately 1.1 hectares of the study area had been cleared of existing vegetation prior to being surveyed, this area was mapped upon the first site visit on May 5th, 2021 (Figure 6). The City of Owen Sound and GSCA included in the Terms of Reference that EcoTec was to give a summary of assumed pre-existing conditions for the bulldozed area. Given the disturbance caused by the clearing and removal of all vegetation within the mapped area (Figure 6), we are unable to determine with certainty which type of vegetative community was present.

Over the course of the next two (2) field visits, EcoTec attempted to collect information about the pre-existing conditions by observing the vegetation that was re-colonizing the disturbed area. Vegetation that was noted on the field visits throughout the bulldozed area were largely uniform, with an abundance of red-osier dogwood and inclusions of cattail sp. and reed canary grass. The dominant vegetation types left intact within the bulldozed footprint included red-osier dogwood (*Cornus sericea*), staghorn sumac (*Rhus typhina*), willow sp. (*Salix sp.*), and common hawthorn (*Crataegus monogyna*).

3.3.1 Maintained Lawn

Within the maintained lawn area, no natural vegetation remains. This area is approximately 0.05 hectares and is adjacent to the homes at the south-western extend of the property.



Figure 5. Map of vegetation communities identified within the study area located at 10th Avenue East, Owen Sound.

3.3.2 Cultural Meadow (CUM1-1)

Approximately 2.25 hectares of the study area is covered in culturally meadow habitat. The vegetative community of the CUM-1 community to the west of the FOD4-2 is a dry CUM1-1 ecosite primarily composed of weedy generalist species such as cow vetch (*Vicia cracca*), common milkweed (*Asclepias syriaca*), ox-eye daisy (*Leucanthemum vulgare*), asters species (*Asteraceae*), grass sp. (*Poaceae*), and goldenrod (*Solidago sp.*).

The vegetation present to the east of the FOD4-2 ecosite exhibits evidence of being a wet meadow with hydrophilic species present within the study area such as red-osier dogwood, a variety of sedges and grass species, including the invasive reed canary grass (*Phalaris arundinacea*), asters and goldenrod species.

Cultural communities are often established because of anthropogenic disturbance. They generally consist of species considered as weedy, and non-native plants that will establish themselves after a disturbance has occurred. These plant species are not considered to be sensitive to development.

3.3.3 Dry-Fresh White Ash Deciduous Forest Type (FOD4-2)

A deciduous woodlot extends through the property, in a north to south direction, east of a cultural meadow, and west of a thicket swamp. The woodlot is dominated by white ash (*Fraxinus americana*), with occurrences of sugar maple (*Acer saccharum*), ironwood (*Ostrya virginiana*), hawthorn (*Crataegus spp.*), and invasive European buckthorn (*Rhamnus cathartica*). Herbaceous plants within the woodlot include species such as geranium sp (*Geraniaceae sp.*), and woodland strawberry (*Fragaria vesca*).

Globally and provincially, FOD4-2 ecosite type ranks as secure, with widespread distribution across Ontario and as such is not considered sensitive to development.

A complete list of vegetation identified on-site, their locations, abundance, conservation status, and wetness coefficient can be found within Appendix B.



Figure 6. Map delineating the area of vegetation cleared by the landowner within the study area located at 10th Avenue East, Owen Sound.

3.4 Wildlife Observations

3.4.1 Birds and Bird Habitat

The study area is suitable for nesting for a variety of scrubland bird species. While on site, EcoTec located one (1) inactive American robin nest (*Turdus migratorius*) in a hawthorn sp. tree.

During field surveys, twenty-two (22) species of bird were recorded. Of the 22 species observed, 15 were possible breeders and the remaining 7 were considered flyovers. A list of species encountered is included in Table 1 of Appendix C. A table including results of breeding bird species identified within a 10 km by 10 km square (ID 17NK0637 Ontario Breeding Bird Atlas) encompassing the subject lands are also included in Appendix D.

Overall, the study area provides nesting habitat for several bird species, with a variety of cover provided for nesting birds including a low shrub thicket, and a deciduous woodlot with trees of varying decay classes. The shrubland and forest also provide an important food source with the presence of ample fruit-bearing shrubs (ie. red-osier dogwood, staghorn sumac and hawthorn), as well as good habitat for insects.

3.4.2 Herpetofauna

One anuran call survey was completed on May 5, 2021. EcoTec did not detect any frogs calling on site within 100 metres of the survey location for the duration of the survey within the study area. A table summarizing the herpetofauna identified within a 10 km by 10 km square (ID 17NK0637 Ontario Reptile and Amphibian Atlas) encompassing the subject lands are included in Appendix E.

The survey occurred a few weeks after the landowner had disturbed the site by bulldozing what is assumed to have been low lying thicket on the property (Correspondence, City of Owen Sound, 2021). Though there was standing water evident throughout the bulldozed area, EcoTec was unable to determine at the time of the survey if the saturated areas were suitable for breeding habitat for anurans due to a lack of vegetation.

Over the progression of the summer, as vegetation re-colonized the bulldozed area, standing water was observed throughout the study area at varying depths. However, since the ground had been disturbed by heavy machinery, EcoTec is unable to determine whether deeper pools have historically occurred on the site that would provide breeding potential.

The study area is bordered by the Kenny Drain, however this particular reach of the watercourse contains little to no vegetative cover, providing low quality habitat for wetland breeding amphibians. The NHIC mapping suggests that the closest mapped wetland to the study area occurs approximately 435 metres to the west.

3.4.3 Mammal and Butterfly Observations

During site investigations, evidence of five (5) mammal species was observed within the subject area. The mammal species were as follows: eastern cottontail (*Sylvilagus floridanus*), eastern coyote (*Canis latrans*), eastern grey squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*).

No butterflies were observed during site visits; however, common milkweed was noted to exist throughout the property, providing potential habitat for the monarch butterfly (*Danaus plexippus*) (a designated species at risk both provincially and federally).

3.5 Species at Risk (SAR)

3.5.1 Natural Heritage Information Center

The NHIC records for square number 17NK0637 indicate that one (1) species at risk, the eastern meadowlark, potentially occurs within a 1 km by 1 km square encompassing the study area.

3.5.2 Ontario Breeding Bird Atlas

Based on the breeding bird survey data provided by the Ontario Breeding Bird Atlas, twelve (12) avian species at risk were identified to potentially occur within a 10 km by 10 km square encompassing the subject lands. Existing records of avian SAR within the subject area include barn swallow (*Hirundo rustica*), bobolink (*Dolichonyx oryzivorus*), Canada warbler (*Cardellina canadensis*), chimney swift (*Chaetura pelagica*), common nighthawk (*Chordeiles minor*), eastern meadowlark, eastern wood-peewee (*Contopus virens*), evening grossbeak (*Coccothraustes vespertinus*), grasshopper sparrow (*Ammodramus savannarum pratensis*), loggerhead shrike (*Lanius ludovicianus excubitorides*), wood thrush (*Hylocichla mustelina*). Table 1 below provides a summary of each species habitat requirements and whether the specified requirements are available within the subject area. All the species listed in Table 1 are protected under the provincial *Endangered Species Act* (2007) and/or federal *Species at Risk Act* (2002).

Table 1. Species at Risk (SAR) birds recorded during the OBBA surveys within a 10 km by 10 km area that encompasses the subject lands (OBBA, 2005).

Common Name	Scientific Name	Breeding Evidence	ESA/SARA Status	Suitable Habitat Present?	Habitat Requirements
Barn Swallow	<i>Hirundo rustica</i>	Confirmed	THR/THR	No	Artificial structures with a horizontal nesting surface or a vertical face (COSEWIC _a , 2011).
Bobolink	<i>Dolichonyx oryzivorus</i>	Probable	THR/THR	No	Tallgrass prairie, open meadows and hayfields, nesting in dense grass (COSEWIC, 2010).
Canada Warbler	<i>Cardellina canadensis</i>	Observed	SC/THR	No	Range of wet forests with a well-developed, dense shrub layer (COSEWIC, 2015)
Chimney Swift	<i>Chaetura pelagica</i>	Probable	THR/THR	No	Hollow trees or concentration of chimneys. (COSEWIC, 2007)
Common Nighthawk	<i>Chordeiles minor</i>	Probable	SC/THR	No	Open habitat with ground devoid of vegetation, (COSEWIC, 2007)
Eastern Meadowlark	<i>Sturnella magna</i>	Confirmed	THR/THR	No	Tall grasslands, orchards, shrubby overgrown fields (COSEWIC _b , 2011).
Eastern Wood-pewee	<i>Contopus virens</i>	Probable	SC/SC	No	Mature to intermediate aged deciduous and mixed-wood forest and is associated with forest clearings (COSEWIC _b , 2012).
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Confirmed	SC/SC	No	Open, mature mixedwood forest with fir species and White Spruce. (COSEWIC, 2016)
Grasshopper Sparrow	<i>Ammodramus savannarum pratensis</i>	Probable	SC/SC	No	Large, created grasslands (>5 ha) characterized by

					well-drained soils. (COSEWIC, 2013)
Loggerhead Shrike	<i>Lanius ludovicianus excubitorides</i>	Observed	END/THR	No	Pasture or grasslands with exposed bed-rock and short grass. (COSEWIC, 2004)
Wood Thrush	<i>Hylocichla mustelina</i>	Observed	SC/THR	No	Deciduous or mixed-wood forests with dense understory (COSEWIC _a , 2012)

3.5.3 Ontario Reptile and Amphibian Atlas

Based on amphibian and reptile SAR occurrence records provided by the Ontario Reptile and Amphibian Atlas, the three (3) following herpetofauna species at risk were identified to occur within a 10 km by 10 km square encompassing the study area; midland painted turtle (*Chrysemys picta marginata*), eastern milksnake (*Lampropeltis Triangulum*), and snapping turtle (*Thamnophis sauritus*). Table 2 below provides a summary of each species habitat requirements and whether the specified requirements are available within the proposed development. All the species listed in Table 2 are protected under the provincial *Endangered Species Act* (2007) and/or federal *Species at Risk Act* (2002).

Table 2. SAR herpetofauna species recorded by the Ontario Reptile and Amphibian Atlas within a 10 km x 10 km area that encompasses the subject lands (Ontario Nature, 2020).

Common Name	Scientific Name	Year of Observation	ESA/SARA Status	Suitable Habitat Present?	Habitat Requirements
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	2019	-/SC	No	Slow moving, shallow, vegetated wetlands and waterbodies with organic substrate and basking sites (COSEWIC, 2018).
Eastern Milksnake	<i>Lampropeltis triangulum</i>	2019	NA /SC	Yes	Habitat generalist preferring open habitats, such as outcrops, meadows, and old agricultural fields.
Snapping Turtle	<i>Thamnophis sauritus</i>	2019	SC/SC	No	Slow moving water with soft substrate, and dense aquatic vegetation (COSEWIC, 2008)

3.6 Environmentally Significant Areas

3.6.1 Hazard Lands

The Owen Sound OP identifies the lands directly within 30 metres of the Kenny Drain as Hazard Lands and indicates that Hazard Lands designation is intended for the “preservation and conservation of lands in their natural state”. The Hazard Lands encroach on approximately 0.1 hectares of the eastern border of the study area (Figure 7).

Permitted uses within Hazard Lands pertinent to the proposed development as stated by the City of Owen Sounds OP (2020) include:

- No buildings or structures other than those necessary for flood or erosion control, and conservation purposes and related private access;
- Passive and active recreational uses, provided they operate without adversely affecting the Hazard Lands or be subject to damage due to potential hazards.

Additionally, where development lands are adjacent to Hazard Lands, the Owen Sound OP states that development is subject to the following:

- Hazard Lands shall be set aside for environmental protection purposes, and that no building or structures shall be located within Hazard Lands;
- New subdivisions located adjacent to steep slopes should be designed in accordance with the following: lot lines should not extend into the hazard zone and should be set back where possible to prevent erosion from impacting landowners. Additionally, lots adjacent to steep slopes should be deepened, with ample space between the proposed building and the slope. Lot setbacks are subject to conditions of approval should it be deemed that a potential of slope failure exists; an impact study is to be completed if the City and Conservation Authority deem there is potential for negative impact to the Hazard Lands.

3.6.2 Significant Woodlands

The Owen Sound OP states that a significant woodland is a developmental constraint. The criteria for a woodland to be considered significant is that it be greater than 4 hectares in size.

The woodlot located within the study area is part of a larger, contiguous woodlot that extends north and south of the study area. Using aerial imagery, the area of the entire woodlot was estimated at 1.02 hectares, thus not meeting the criteria for a significant woodland. Additionally, although the woodland extends past the study area, it does not provide connectivity to significant habitats surrounding the study area.

The City of Owen Sounds OP states that where a new development is proposed, consideration of existing trees, and the retention of as many trees as possible should be considered during site planning.



Figure 7. Map of Hazard Lands with applicable 6 metre buffer adjacent to the study area located at 10th Avenue East, Owen Sound.

3.6.3 Fish and Fish Habitat

The Kenny Drain is classified as a drainage system located in the eastern portion of the City of Owen Sound. It is considered a permanent water feature in accordance to the Grey County OP and the City of Owen Sound OP, as well as a watercourse by the GSCA. Due to its classification as potential fish habitat, a Rapid Assessment Methodology for Channel Structure outlined in Ontario Stream Assessment Protocol (OSAP; Stanfield, 2005) was completed on June 25th, 2021 within the reach adjacent to the study area. This was completed in order to assess the channel structure as well as the fish community within the Kenny Drain. Water was observed within the defined channel during each site visit.

A total of 20 observation points were used to collect stream and bank data. Water velocities within the study reach consisted mostly of pools (12 points) and the remaining 8 points consisted of fast riffles, slow riffles, and glides. In stream cover was present at 10 points, consisting of flat rock and sparse macrophyte cover. In stream substrate consisted of fines (less than 2mm in size), cobble (101 mm – 1000 mm) and bedrock (>1000 m).

The banks of the section of the Kenny Drain that were sampled exhibited eroding banks and deposition zones. On June 25th, 2021, the temperature of this section of stream was 19°C. The depth of the channel ranged from 0 mm to 600 mm, with an average depth of approximately 49.4 mm, with a maximum and average width of 4.1 metres and 2.5 metres respectively.

The section of the Kenny Drain adjacent to the study area can be described as a flashy watercourse that primarily receives stormwater via stormwater drains and overland flow from adjacent lands. Overall, the stream within the sample site can be summarized as a permanent shale dominated watercourse, with little to no in-stream cover, and steep unstable slopes.

Two passes of the entire length of the sample site were conducted with a backpack electrofisher and dip nets, and two species of fish were captured, creek chub (*Semotilus atromaculatus*) and brook stickleback (*Culaea inconstans*).

3.6.4 Significant Wildlife Habitat

The possibility of significant habitat being present within the study area was considered by consulting the *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E*.

The following habitats were considered due to site characteristics:

- Bat Maternity Colonies;
- Open Country Bird Breeding Habitat;
- Amphibian Breeding Habitat (Wetlands)

Bat Maternity Colonies

A portion (0.23 hectares) of a larger deciduous forest community (FOD) woodlot is located within the boundaries of the study area. The *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* classifies FOD habitat with greater than 10 large wildlife trees per hectare, or trees having reached greater than 25 cm diameter at-breast height (DBH) as candidate significant wildlife habitat, with female bats preferring wildlife trees in early stages of decay.

On September 30th, 2021, EcoTec completed a tree inventory within the study area and located 16 deciduous trees that were greater than 25 cm DBH within the portion of the contiguous woodlot. The trees over 25 cm DBH ranged in decay classes. Aerial photography of the woodlot was evaluated, and it is assumed that the remainder of the 1.02-hectare woodlot has similar composition than that of the 0.23-hectare section that was surveyed by EcoTec. Based on this assumption, the woodlot could be considered candidate significant wildlife habitat, and further studies may be required.

Open Country Bird Breeding Habitat

The *Ontario Breeding Bird Atlas* was consulted for records of species at risk that could be present within a 10 x 10 km square of the study area. Records for OBBA square 17NK0637 indicated that there is potential for Grasshopper Sparrow to be present within the area.

Within the boundaries of the study area there is approximately 2.25 hectares of cultural meadow habitat (CUM) ecosite present. The *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* classifies CUM ecosite habitat greater than 30 hectares to be considered candidate significant wildlife habitat for Open Country Bird Breeding, and defining criteria requires it to be contiguous CUM ecosite habitat.

Due to a lack of presence of contiguous habitat within the study area and the surrounding lands, the CUM ecosite located within the boundaries of the study area does not meet the requirements for significant wildlife habitat.

Amphibian Breeding Habitat (Wetlands)

The *Ontario Reptile and Amphibian Atlas* was consulted for records of amphibians that could be present within a 10 x 10 km square of the study area. Records for the ORAA square 17NK0637 indicated that there is potential for the following wetland breeding amphibians to be present within the area: gray treefrog (*Dryophytes versicolor*), green frog (*Rana clamitans*), northern leopard frog (*Lithobates pipiens*), American toad (*Anaxyrus americanus*), and spotted salamander (*Ambystoma maculatum*).

The *Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E* classifies wetlands greater than 500 metres² in area, supporting high species diversity, and with presence of shrubs and logs as candidate significant wildlife habitat.

Due to the disturbance that occurred within the study area, most of the shrubs and vegetation were cleared by the time the anuran call survey was completed on May 5th, 2021. EcoTec noted that water was present within the study area. No breeding populations of any of the listed species were observed during the anuran call survey, or on subsequent site visits. Additionally, the section of the Kenny Drain adjacent to the study area lacks in-stream vegetation making it unlikely that this reach is used by any of the above-mentioned amphibians.

It is therefore unlikely that the wet areas within the study areas are Amphibian Breeding Habitat (Wetlands).

4.0 POTENTIAL IMPACTS AND MITIGATION

This section of report outlines the potential impacts on the biophysical environment associated with the proposed property development. Also included within this section are proposed mitigation measures to prevent and minimize any deleterious effects from construction activities on the natural environment.

4.1 Vegetation Removal

Based on the schematics of the proposed development provided to EcoTec by Cobide, it is assumed that all existing vegetative cover within the study area would be removed to accommodate the ~~30-lot residential development~~. This includes the entirety of the existing deciduous woodlot within the study area, including some large DBH trees of varying decay classes that provide cover and habitat for a variety of birds.

The development would create an increase in impervious surfaces, and it is assumed that all natural ground cover would be replaced by manicured grass, eliminating the buffering capacity of the lands adjacent to the Kenny Drain. Removed vegetation from the study area should be replaced using native vegetation, with the possibility of creating a vegetative buffer strip between the study area and the top of the slope of the Kenny Drain. This would provide additional stability to the slope, protecting it from further degradation of the Hazard Lands.

Additionally, due to the removal of vegetation throughout the study area, an Erosion and Sediment Control Plan should be developed to ensure that no deleterious substances enter the adjacent watercourse throughout construction of the development.

A stormwater management block has been proposed for the northeastern most corner of the study area, EcoTec recommends that the pond design be naturalized, incorporating the use of native riparian vegetation to replace lost bird habitat. In order to further stabilize, and replace lot bird habitat, EcoTec recommends the implementation of offset planting along the eastern edge of the study area, south of the stormwater management block.

EcoTec also recommends the incorporation of a native riparian seed mix that includes common milkweed (*Asclepias syriaca*) to compensate for the loss of potential butterfly habitat within the existing meadow.

4.2 Impacts on Wildlife Species

Due to the proximity of the study area to adjacent residential and industrial properties, EcoTec does not have any concerns regarding the loss of habitat connectivity for wildlife inhabiting the area due to the removal of 0.23 hectares of deciduous woodlot. Land use to the south and west of the study area are currently residential and industrial areas, with naturalized areas occurring to the north and the east. A connectivity corridors runs adjacent to the Kenny Drain that allows for wildlife passage between naturalized areas that aren't interrupted by roads or settlement areas.

Due to the presence of similar habitat in the adjacent lands, the clearing of vegetation within the subject area is not likely to cause a loss of significant habitat, or impact SAR habitat.

If vegetation clearing must occur for site access, no clearing should occur between April 1st to August 31st (the breeding bird window) to avoid impacts during the breeding bird window. If clearing must be completed within the breeding bird window, an avian biologist must be on-site to complete a nest survey.

4.3 Species at Risk

Birds

No species at risk birds were observed during field observations. Based on natural heritage surveys of vegetation and habitable structures within the study area, suitable habitat conditions are not present on-site for any of the SAR birds listed in Table 1.

According to the MNDMNR, eastern meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields and the weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.

Based on the existing conditions, and an evaluation of aerial imagery, it is unlikely that the habitat that existed prior to land clearing was suitable for the eastern meadowlark, as it has been determined that the site was likely primarily a moist shrub thicket that covers greater than 35% of the study area. Low shrub/woody vegetation would be too dense to consider the study area optimal habitat for the eastern meadowlark. It is likely that observations within the 1 km by 1 km NHIC square occurred within suitable habitat comprised of moderately tall grasslands and overgrown fields with open areas to the north, or the east of the study area.

No eastern meadowlarks were observed or heard calling within the study area during any of the site visits or breeding bird surveys conducted.

Herpetofauna

It is unlikely for snapping turtles or midland painted turtles to occur within the subject area that would be impacted by construction activities. As both turtle species are highly aquatic in nature, there is an insufficient amount of water within the surveyed area for both general habitat requirements, and hibernation.

There is potential for eastern milksnakes to be present within the meadow area, given that there is suitable habitat required for thermoregulation and foraging. Eastern milksnakes are often associated with areas with high forest cover, moving to open and edge microhabitats where there is suitable thermoregulation habitat available, using riparian corridors to facilitate movement. In consulting aerial photography, it has been noted that the nearest heavily forested area is located approximately 225 metres to the east of the study area.

Due to the fragmented nature of the habitat located between the forest edge and the study area, it is unlikely that the study area is significant habitat for the eastern milksnake. There may be indirect impacts of construction activities due to the disturbance of vegetation, however these concerns can be mitigated by ensuring that land clearing activities occur during the inactive period, between November 1st and March 1st, and by implementing the use of reptile and amphibian exclusion fencing prior to the commencement of construction activities.

4.4 Wetland Habitat

It should be noted that there are no wetlands mapped within the study area, including on the MNDMNRF's NHIC mapping, the Grey County OP, the Owen Sound OP, or on the GSCA's mapping. Throughout the duration of the study, EcoTec did note that the study area was saturated on all site visits occurring from May 5th, 2021 to September 30th, 2021, with inclusions of wetland indicator species dispersed throughout the study area. It is assumed that due to poor habitat connectivity to significant habitat, the areas with standing water do not provide suitable habitat for wetland breeding amphibians.

4.5 Environmentally Significant Areas

No Areas of Natural and Scientific Interest (ANSI) were located within the subject property.

Additionally, EcoTec consulted the *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* and concluded that the study area contained no SWH.

4.6 Fish and Fish Habitat

The DFO mapping for the Kenny Drain adjacent to the study area indicates that there are no records of SAR species, or critical habitats within the watercourse adjacent to the proposed development. The Kenny Drain is considered fish habitat and is protected under the *Fisheries Act*. Grey County OP states that no development will be permitted within 30 metres of the banks of a watercourse unless an environmental impact study determines an alternative set back.

Altering the land use from natural features to a housing development creates an increase in impervious surface. Altering the hydrological regime which could impact the fish community and water quality in the Kenny Drain, as well as receiving waterbodies, if appropriate setbacks and mitigation are not implemented. Stormwater quality can be improved using Low Impact Development practices listed in the Credit Valley Conservation and Toronto and Region Conservation's *Low Impact Development Stormwater Management Planning and Design Guide*. This can include the installation and maintenance of oil and grit separators as pre-treatment tools for stormwater management ponds

5.0 EROSION AND SEDIMENT CONTROL (ESC)

The following is a summary of recommendations for erosion and sediment control measures for the construction of the proposed 30-lot residential development. These recommendations are based on those outlined within the Sustainable Technologies Evaluation Program (STEP)'s *Erosion and Sediment Control Guide for Urban Construction* and the Greater Golden Horseshoe Area Conservation Authorities' (GGHACA) *Erosion and Sediment Control Guidelines for Urban Construction*. The aim of these recommendations is to reduce any environmental impacts associated with erosion and sedimentation resulting from development.

5.1 Grading Requirements and Development Limits

In order to ensure that there are no negative impacts on the surrounding natural features, including the Hazard Lands and the Kenny Drain, the following measures must be employed:

- The development should maintain the same grade (or less) to ensure an effective buffer is maintained between the development and surrounding properties.
- All grading and excavation shall not go beyond the proposed buffer and setback limits outlined in Section 6.
- Only clean fill should be used on-site to prevent the introduction of any invasive species.
- All stockpiled materials must be placed at least 15 meters away from the top of any slope (GGHAC, 2006; STEP, 2019).
- All earth material stockpiles must be surrounded with ESC measures such as silt soxx (12" diameter or greater) or silt fence barrier, until they are removed from site or blended into the existing site grading.
- Construction vehicles are prohibited from entering the Hazard Lands and its prescribed buffer zones.
- All disturbed soils will be stabilized once final grade has been achieved using sod or seed. Where possible, the incorporation of native seed mix is encouraged to stabilize exposed soil surfaces. Seed mix should be applied at a rate of 250g/90 m² (STEP, 2019).

5.2 Erosion and Sediment Control Plans

In order to mitigate any environmental impacts arising from erosion and sedimentation caused by construction activities, the following must be implemented as a part of an erosion and sediment control plan prior to starting any construction activities:

- Double-row silt fence barrier must be installed in accordance with *Ontario Provincial Standard Specifications (OPSS) 805* along the perimeter of the construction site prior to commencing any construction activities. Straw bales must be placed between the rows of silt fence barrier to provide additional treatment capacity and improve stability of the silt fence. Silt fence shall remain in place throughout the construction process and will only be decommissioned once permanent vegetation has been established and soil is stabilized.
- Prior to the decommissioning of all erosion and sediment control measures, all accumulated sediments shall be removed from site and disposed of appropriately.
- All construction debris must be disposed of off-site in an appropriate manner.
- A spill control and response plan must be developed prior to starting construction. The spill plan must consider all potential pollutants and spill risk based on their intended use.
- Pollutants are stored at least fifteen (15) meters away from the designated Hazard Lands within a designated storage area with a drip pan to ensure to minimize the risk of leaching.
- All disturbed soils shall be stabilized using sod, or native seed mix where it is deemed appropriate.
- ESC monitoring should occur weekly at a minimum to note any deficiencies with measures. All deficiencies should be addressed within 24 hours of notification.

The installation of all ESC measures should be in accordance with the OPSS and the best management practices outlined within STEP's *Erosion and Sediment Control Guide for Urban Construction*. In order to ensure the continued functioning of erosion and sediment control measures, weekly monitoring of all ESC measures should be completed.

Please note that erosion and sediment control plans are dynamic documents and should be reviewed throughout the construction process in order to ensure they continue to be effective. Additional measures may be required during the construction process as additional information arises.

5.3 Construction Access, Equipment, and Material Storage

In order to ensure construction debris and waste materials do not contaminate the adjacent watercourse and surrounding environment, the following measures must be put into place:

- Construction vehicles shall access the property from the existing roadway at 23rd Street "A" E.

- The operation of construction vehicles should be limited to outside the periphery of the tree drip line to avoid damage to root systems on adjacent properties.
- All stockpiled materials must be placed 15 meters away from the Hazard Lands.
- All stored equipment, materials, stockpiles, and construction vehicles will be stored away from existing trees, outside of the vegetated buffer strip limits.
- Any required dewatering shall be conducted in a sustainable manner, following best management practices to minimize erosion and sedimentation to receiving waterbodies.
- All refuelling of equipment should be greater than 30 metres way from open water and be carried out in a controlled manner.
- Drip pans should be placed under non-mobile equipment.

6.0 SETBACKS AND BUFFERS

6.1 Vegetative Buffers

The Hazard Lands designation as per Schedule 'A' of the Owen Sound OP creates an established vegetative buffer between the property and the Kenny Drain. Therefore, a vegetative buffer is already established along the eastern boundary of the study area to protect the Kenny Drain and its adjacent slopes from erosion and sedimentation during construction as well as to mitigate inputs post-construction and allow for access to the stormwater infrastructure. It is recommended that a hedge row be planted along the eastern perimeter of the development to further minimize the risks of erosion associated with overland flow.

6.2 Setbacks

Due to the sparsity of riparian vegetation within the Hazard Lands, and the proposed removal of all vegetation from the study area for the development of a 30-lot residential subdivision, EcoTec recommends following the minimum 6 metre setback from the adjacent Riverine Erosion Zone. This setback is as per the *Grey Sauble Conservation Authority Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation Ontario Regulation 151/06* in order to ensure there are no deleterious impacts on the adjacent watercourse.

7.0 CONCLUSIONS AND RECCOMENDATIONS

The following is a summary of recommendations for development of a 30-lot residential development within the study area. These recommendations have been created to reduce potential environmental impacts as a result of site development:

- All vegetation removals should occur outside of the breeding bird window (April 1st – August 31st), active period for amphibian and reptile species (March – November), as well as the active period for bats (March – December).
- If any native vegetation is damaged or removed, native species should be planted in their place as an offsetting measure. All plantings must be monitored until successful establishment.
- It is recommended that native vegetation be planted within the proposed stormwater block in the northeastern extent of the study area, and if possible, a native vegetation buffer strip be planted along the eastern edge in order to replace habitat lost to the proposed clearing of approximately 0.23 hectares of woodlot present within the study area.
- In order to improve stormwater quality, EcoTec recommends consulting the Credit Valley Conservation and Toronto and Region Conservation's *Low Impact Development Stormwater Management Planning and Design Guide* for the implementation of best management practices related to stormwater management.
- Pre-development water balance and water recharge rates should be maintained post-development.
- Any exposed soils must be covered with sod or seed following the conclusion of construction activities. All plantings must be monitored until successful establishment.
- Where native seed mix use is possible, EcoTec recommends incorporating common milkweed into planting plans.
- The set back of adjacent Hazard Lands shall be adhered to in order to protect vulnerable slopes associated with the Kenny Drain, with the addition of the 6-metre setback from the Riverine Erosion Zone.
- All dewatering activities must be conducted in accordance with the industry-standard best management practices
- It is recommended that the installation of sediment and erosion control measures be carried out prior to any site grading or building construction.

- It is recommended that only clean fill materials are used to achieve desired grades, if required, in order to prevent the introduction of invasive species.
- It is recommended that prior to starting construction, a spill control and response plan must be developed.
- It is recommended that during construction, pollutants and construction debris must be stored at least fifteen (15) meters away from the designated Hazard Lands within a designated storage area.
- It is recommended that during construction, all stored equipment, materials, stockpiles, and construction vehicles will be stored away from existing trees, outside of the vegetated buffer strip limits.
- It is recommended that during construction, all earth material stockpiles be surrounded with double-row silt fence barrier until such time that they are removed from site or blended into the existing site grading. Straw bales are recommended to be placed between the silt fence rows to provide additional protection and stabilization.
- If dewatering measures are required during construction, it is recommended that the pump outlet be placed in a geotextile filter bag throughout the duration of pumping activities and shall be placed on a flat surface at least thirty (30) meters away from the receiving waterbody.

The proposed development lot lacks a presence of suitable SAR habitat or significant wildlife habitat, has low potential for providing any important linkages to surrounding natural features, and is located within approved residential lot development zoning. Though habitat for Bat Maternity Colonies may be present, the quality of foraging habitat is low, and habitat with higher suitability occurs in the adjacent lands, therefore impacts to bats can be mitigated by ensuring that vegetation removals are undertaken outside of the active bat period (March – December).

As such, provided the listed recommendations and mitigation measures outlined in this EIS are followed throughout all phases of construction, the disturbances caused by this development are deemed low risk to the surrounding natural features so long as the proposed development plans maintain and even enhance the quality of stormwater discharging to the Kenny Drain during precipitation events.

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APPENDIX A: PHOTOGRAPHIC RECORD



Photo 1. Cultural meadow in the foreground, looking through the forest stand, into the field that was cleared by the landowner. Photo taken facing west (May 5, 2021).



Photo 2. Representation of the FOD community. Photo taken facing north (May 5, 2021).



Photo 3. The subject area had been cleared by the landowner prior to EcoTec's arrival on site to complete a vegetation inventory. Photo taken facing northwest (May 5, 2021).



Photo 4. The subject area had been cleared by the landowner prior to EcoTec's arrival on site to complete a vegetation inventory. Photo taken facing west (May 5, 2021).



Photo 5. The subject area had been cleared by the landowner prior to EcoTec's arrival on site to complete a vegetation inventory. Standing water was observed through the site. Photo taken facing north (May 5, 2021).



Photo 6. The Kenny Drain along the western edge of the study area. Photo taken facing south (May 5, 2021).



Photo 7. The Kenny Drain along the western edge of the study area. Photo taken facing south (June 25, 2021).



Photo 8. Fish collected during the Rapid Stream Assessment. (June 25, 2021).



Photo 9. Vegetation re-establishing within the cleared area. Photo facing north (September 30, 2021).



Photo 10. Vegetation re-establishing within the cleared area. Photo facing north (September 30, 2021).



Photo 11. Vegetation re-establishing within the cleared area. Photo facing south (September 30, 2021).



Photo 12. Vegetation re-establishing within the cleared area. Photo facing southeast (September 30, 2021).

APPENDIX B: VEGETATION INVENTORY

Vegetation			
Common Name	Scientific Name	S-rank	Wetness Coefficient
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	S5	3
American Elm	<i>Ulmus americana</i>	S5	3
Amur Honeysuckle	<i>Lonicera maackii</i>	SNA	5
Apple sp.	<i>Malus sp.</i>	SNA	NA
Apple/Hawthorn hybrid	<i>Malus/Crataegus sp.</i>	SNA	NA
Birdsfoot Trefoil	<i>Lotus corniculatus</i>	SNA	3
Black Cherry	<i>Prunus serotina</i>	S5	3
Black Locust	<i>Robinia pseudoacacia</i>	SNA	3
Black Willow	<i>Salix nigra</i>	S4	-5
Canada Anemone	<i>Anemone canadensis</i>	S5	-3
Canada Goldenrod	<i>Solidago canadensis</i>	S5	3
Carolina Poplar	<i>Populus canadensis</i>	SNA	NA
Chickory	<i>Cichorium intybus</i>	SNA	5
Colts Foot	<i>Tussilago farfara</i>	SNA	3
Common Dandelion	<i>Taraxacum officinale</i>	SNA	3
Common Horsetail	<i>Equisetum arvense</i>	S5	0
Common Mullein	<i>Verbascum thapsus</i>	SNA	5
Common Reed	<i>Phragmites australis</i>	SU	-3
Common Yarrow	<i>Achillea millefolium</i>	SNA	3
Daisy Fleabane	<i>Erigeron annuus</i>	S5	3
European Buckthorn	<i>Rhamnus cathartica</i>	SNA	0
Forget-Me-Not	<i>Myosotis scorpioides</i>	SNA	-5
Garlic Mustard	<i>Alliaria petiolata</i>	SNA	0
Geranium sp.	<i>Geraniaceae sp.</i>	SNA	NA
Glossy Bukthorn	<i>Rhamnus frangula</i>	SNA	0
Hawthorn sp.	<i>Crataegus sp.</i>	SNA	NA
Heal All	<i>Prunella vulgaris</i>	S5	0
Ironwood	<i>Ostrya virginiana</i>	S5	3
Large-toothed Aspen	<i>Populus grandidentata</i>	S5	5
Late Goldenrod	<i>Solidago altissima</i>	S1	3
Manitoba Maple	<i>Acer negundo</i>	SU	0
Meadow Willow	<i>Salix petiolaris</i>	S5	-3
Narrow-leaved Cattail	<i>Typha angustifolia</i>	SNA	-5
Narrow-leaved Plantain	<i>Plantago lanceolata</i> L.,	SNA	3

New England Aster	<i>Symphotrichum novae-angliae</i>	S5	-3
Oxeye Daisy	<i>Leucanthemum vulgare</i>	SNA	5
Pussy Willow	<i>Salix discolor</i>	S5	-3
Queen Anne's Lace	<i>Daucus carota</i>	SNA	5
Red Clover	<i>Trifolium pratense</i>	SNA	3
Red Raspberry	<i>Rubus idaeus</i>	S5	3
Red-osier Dogwood	<i>Cornus sericea</i>	S5	-3
Reed Canary Grass	<i>Phalaris arundinacea</i>	S5	-3
Riverbank Grape	<i>Vitis riparia</i>	S5	0
Rose sp.	<i>Rosa sp.</i>	SNA	NA
Spotted Knapweed	<i>Centaurea stoebe</i>	SNA	5
Staghorn Sumac	<i>Rhus typhina</i>	S5	3
Strawberry	<i>Fragaria vesca</i>	S5	3
Sugar Maple	<i>Acer saccharum</i>	S5	3
Tall Buttercup	<i>Ranunculus acris</i>	SNA	0
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	SNA	3
Thistle sp.	<i>Carduus sp.</i>	SNA	NA
Timothy	<i>Phleum pratense</i>	SNA	3
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	S4	3
Virgin's Bower	<i>Clematis virginiana</i>	S5	0
White Ash	<i>Fraxinus Americana</i>	S4	3

APPENDIX C: WILDLIFE OBSERVATIONS

Bird Species		Visit		
Common Name	Scientific Name	May 5, 2021 (Visit #1)	June 25, 2021 (Visit #2)	July 6, 2021 (Visit #3)
Mourning Dove	<i>Zenaida macroura</i>	X	X	
Common Grackle	<i>Quiscalus quiscula</i>	X		X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	X	X	X
Mallard	<i>Anas platyrhynchos</i>	X		
Northern Cardinal	<i>Cardinalis cardinalis</i>	X		X
European Starling	<i>Sturnus vulgaris</i>	X	X	X
Common Raven	<i>Corvus corax</i>	X		
American Goldfinch	<i>Spinus tristis</i>	X	X	X
Field Sparrow	<i>Spizella pusilla</i>	X		
Ring-billed Gull	<i>Larus delawarensis</i>	X	x	X
Song Sparrow	<i>Melospiza melodia</i>	X		
Turkey Vulture	<i>Cathartes aura</i>	X		
White-throated Sparrow	<i>Zonotrichia albicollis</i>	X		
Black-capped Chickadee	<i>Poecile atricapillus</i>	X		
American Robin	<i>Turdus migratorius</i>	X	X	X
Common Yellowthroat	<i>Geothlypis trichas</i>		X	
Chipping Sparrow	<i>Spizella passerina</i>		X	
Yellow Warbler	<i>Setophaga petechia</i>		X	
American Crow	<i>Corvus brachyrhynchos</i>		X	
Blue Jay	<i>Cyanocitta cristata</i>			X
Belted Kingfisher	<i>Megaceryle alcyon</i>			X
Gray Catbird	<i>Dumetella carolinensis</i>			X

APENDIX D: ONTARIO BREEDING BIRD ATLAS SPECIES LIST

Common Name	Scientific name	Breeding Evidence
Alder Flycatcher	<i>Empidonax alnorum</i>	Probable (T)
American Black Duck	<i>Anas rubripes</i>	Possible (H)
American Crow	<i>Corvus brachyrhynchos</i>	Confirmed (FY)
American Goldfinch	<i>Spinus tristis</i>	Probable (P)
American Kestrel	<i>Falco sparverius</i>	Confirmed (CF)
American Redstart	<i>Setophaga ruticilla</i>	Probable (T)
American Robin	<i>Turdus migratorius</i>	Confirmed (NY)
American Woodcock	<i>Scolopax minor</i>	Probable (T)
Baltimore Oriole	<i>Icterus galbula</i>	Confirmed (CF)
Barn Swallow	<i>Riparia riparia</i>	Confirmed (CF)
Belted Kingfisher	<i>Megaceryle alcyon</i>	Confirmed (CF)
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Possible (H)
Blackburnian Warbler	<i>Setophaga fusca</i>	Possible (S)
Black-capped Chickadee	<i>Poecile atricapillus</i>	Confirmed (FY)
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>	Possible (S)
Black-throated Green Warbler	<i>Setophaga virens</i>	Possible (S)
Black-white Warbler	<i>Mniotilta varia</i>	Probable (P)
Blue Jay	<i>Cyanocitta cristata</i>	Probable (P)
Blue-winged Teal	<i>Anas discors</i>	Possible (H)
Bobolink	<i>Dolichonyx oryzivorus.</i>	Probable (D)
Broad-winged Hawk	<i>Buteo platypterus</i>	Possible (H)
Brown Creeper	<i>Certhia americana</i>	Possible (S)
Brown Thrasher	<i>Toxostoma rufum</i>	Confirmed (FY)
Brown-head Cowbird	<i>Molothrus ater</i>	Probable (P)
Canada Goose	<i>Branta canadensis</i>	Confirmed (FY)
Canada Warbler	<i>Cardellina canadensis</i>	Possible (S)
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Confirmed (NY)
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	Possible (S)
Chimney Swift	<i>Chaetura pelagica</i>	Probable (T)
Chipping Sparrow	<i>Spizella passerina</i>	Confirmed (FY)
Cliff Swallow §	<i>Petrochelidon pyrrhonota</i>	Confirmed (NY)
Common Grackle	<i>Quiscalus quiscula</i>	Confirmed (NY)
Common Loon	<i>Gavia immer</i>	Probable (H)
Common Merganser	<i>Mergus merganser</i>	Probable (H)
Common Nighthawk	<i>Chordeiles minor</i>	Probable (T)
Common Raven	<i>Corvus corax</i>	Possible (H)
Common Snipe	<i>Gallinago gallinago</i>	Probable (P)
Common Yellowthroat	<i>Geothlypis trichas</i>	Confirmed (FY)
Cooper's Hawk	<i>Accipiter cooperii</i>	Probable (H)
Downy Woodpecker	<i>Picoides pubescens</i>	Probable (P)
Eastern Bluebird	<i>Sialia sialis</i>	Confirmed (NY)
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Confirmed (NY)
Eastern Meadowlark	<i>Sturnella magna</i>	Confirmed (CF)

Eastern Phoebe	<i>Sayornis phoebe</i>	Confirmed (AE)
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	Probable (T)
Eastern Wood-Pewee	<i>Contopus virens</i>	Confirmed (NB)
European Starling	<i>Sturnus vulgaris</i>	Confirmed (CF)
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Confirmed (NY)
Field Sparrow	<i>Spizella pusilla</i>	Possible (S)
Golden-crown Kinglet	<i>Regulus satrapa</i>	Confirmed (FY)
Gr Crested Flycatcher	<i>Myiarchus crinitus</i>	Probable (P)
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Probable (T)
Gray Catbird	<i>Dumetella carolinensis</i>	Possible (H)
Great Blue Heron §	<i>Ardea herodias</i>	Possible (H)
Great Horned Owl	<i>Bubo virginianus</i>	Confirmed (NY)
Green Heron §	<i>Butorides virescens</i>	Possible (H)
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	Confirmed (CF)
Herring Gull §	<i>Larus argentatus</i>	Confirmed (NY)
Horned Lark	<i>Eremophila alpestris</i>	Possible (S)
House Finch	<i>Haemorhous mexicanus</i>	Possible (S)
House Sparrow	<i>Passer domesticus</i>	Confirmed (CF)
House Wren	<i>Troglodytes aedon</i>	Confirmed (AE)
Indigo Bunting	<i>Passerina cyanea</i>	Probable (T)
Killdeer	<i>Charadrius vociferus</i>	Confirmed (NE)
Least Flycatcher	<i>Empidonax minimus</i>	Confirmed (CF)
Loggerhead Shrike †	<i>Lanius ludovicianus</i>	Possible (H)
Magnolia Warbler	<i>Setophaga magnolia</i>	Possible (S)
Mallard	<i>Anas platyrhynchos</i>	Confirmed (AE)
Marsh Wren	<i>Cistothorus palustris</i>	Probable (T)
Mourning Dove	<i>Zenaida macroura</i>	Probable (P)
Mourning Warbler	<i>Geothlypis philadelphia</i>	Possible (S)
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	Possible (S)
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Possible (H)
North Waterthrush	<i>Parkesia noveboracensis</i>	Probable (T)
Northern Cardinal	<i>Cardinalis cardinalis</i>	Confirmed (NY)
Northern Flicker	<i>Colaptes auratus</i>	Confirmed (FY)
Northern Goshawk	<i>Accipiter gentilis</i>	Possible (H)
Northern Harrier	<i>Circus cyaneus</i>	Possible (H)
Northern Mockingbird	<i>Mimus polyglottos</i>	Probable (P)
Orchard Oriole ‡	<i>Icterus spurius</i>	Possible (S)
Ovenbird	<i>Seiurus aurocapilla</i>	Confirmed (NB)
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Possible (S)
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Confirmed (NY)
Pine Siskin	<i>Spinus pinus</i>	Possible (S)
Pine Warbler	<i>Setophaga pinus</i>	Possible (S)
Purple Finch	<i>Haemorhous purpureus</i>	Possible (S)
Purple Martin	<i>Progne subis</i>	Confirmed (AE)
Red-breast Nuthatch	<i>Sitta canadensis</i>	Confirmed (CF)
Red-eyed Vireo	<i>Vireo olivaceus</i>	Probable (N)
Red-shouldered	<i>Buteo lineatus</i>	Probable (A)
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Confirmed (NY)

Red-wing Blackbird	<i>Agelaius phoeniceus</i>	Confirmed (CF)
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Possible (S)
Rock Dove	<i>Columba livia</i>	Confirmed (AE)
Rose-breast Grosbeak	<i>Pheucticus ludovicianus</i>	Probable (P)
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	Probable (T)
Ruffed Grouse	<i>Bonasa umbellus</i>	Confirmed (FY)
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Probable (A)
Scarlet Tanager	<i>Piranga olivacea</i>	Probable (T)
Sedge Wren	<i>Cistothorus stellaris</i>	Possible (S)
Song Sparrow	<i>Melospiza melodia</i>	Confirmed (NY)
Sora	<i>Porzana carolina</i>	Probable (P)
Spotted Sandpiper	<i>Actitis macularius</i>	Confirmed (FY)
Swamp Sparrow	<i>Melospiza georgiana</i>	Probable (T)
Tree Swallow	<i>Tachycineta bicolor</i>	Confirmed (AE)
Turkey Vulture	<i>Cathartes aura</i>	Probable (T)
Upland Sandpiper	<i>Bartramia longicauda</i>	Confirmed (FY)
Veery	<i>Catharus fuscescens</i>	Confirmed (DD)
Vesper Sparrow	<i>Pooecetes gramineus</i>	Possible (S)
Virginia Rail	<i>Rallus limicola</i>	Possible (S)
Warbling Vireo	<i>Vireo gilvus</i>	Probable (T)
Whip-poor-will	<i>Antrostomus vociferus</i>	Probable (T)
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Confirmed (FY)
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Probable (T)
Wild Turkey	<i>Meleagris gallopavo</i>	Possible (H)
Winter Wren	<i>Troglodytes hiemalis</i>	Probable (T)
Wood Duck	<i>Aix sponsa</i>	Confirmed (FY)
Wood Thrush	<i>Hylocichla mustelina</i>	Possible (S)
Yellow Warbler	<i>Setophaga petechia</i>	Confirmed (CF)
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Possible (H)
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Possible (S)
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Probable (P)

*H = Suitable habitat present; S = Singing male in suitable habitat; P = Pair observed in suitable habitat; T = Territorial song; A = Agitated behaviour
V = Visiting probable nesting site; FY = Recently fledged young; AE = Adult leaving/entering nest; CF = Adult carrying food;
NY = Nest with young; DD = Distraction display

APENDIX E: ONTARIO REPTILE AND AMPHIBIAN ATLAS SPECIES LIST

Common Name	Scientific Name	Most Recent Record
Blanding's Turtle	<i>Emydoidea blandingii</i>	2019
Eastern Musk Turtle	<i>Sternotherus odoratus</i>	2018
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	2019
Northern Map Turtle	<i>Graptemys geographica</i>	2019
Snapping Turtle	<i>Chelydra serpentina</i>	2019
Dekay's Brownsnake	<i>Storeria dekayi</i>	2018
Eastern Gartersnake	<i>Thamnophis sirtalis sirtalis</i>	2017
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>	1979
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	2018
Massasauga Rattlesnake	<i>Sistrurus catenatus</i>	2016
Milksnake	<i>Lampropeltis triangulum</i>	2019
Northern Watersnake	<i>Nerodia sipedon</i>	2016
Red-bellied Snake	<i>Storeria occipitomaculata</i>	1992
Northern Ring-necked Snake	<i>Diadophis punctatus edwardsi</i>	1992
Smooth Greensnake	<i>Opheodrys vernalis</i>	1980
American Bullfrog	<i>Lithobates catesbeianus</i>	2018
Gray Treefrog	<i>Hyla versicolor</i>	2018
Green Frog	<i>Rana clamitans</i>	2018
Mink Frog	<i>Lithobates septentrionalis</i>	1979
Northern Leopard Frog	<i>Lithobates pipiens</i>	2019
Pickerel Frog	<i>Lithobates palustris</i>	1982
Spring Peeper	<i>Pseudacris crucifer</i>	2018
Wood Frog	<i>Lithobates sylvaticus</i>	2017
American Toad	<i>Anaxyrus americanus</i>	2018
Red-spotted Newt	<i>Notophthalmus viridescens</i>	1992
Eastern Red-backed Salamander	<i>Plethodon cinereus</i>	1989
Mudpuppy	<i>Necturus maculosus</i>	1990
Spotted Salamander	<i>Ambystoma maculatum</i>	1993
Five-lined Skink	<i>Plestiodon fasciatus</i>	1992