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ENVIRONMENTAL IMPACT STUDY (EIS) TERMS OF REFERENCE & SUBMISSION STANDARDS

This document supports ORCA's role in the municipal plan review process under the Planning Act, R.S.O. 1990, as well as the review of permit applications under the Conservation Authorities Act Ontario Regulation 167/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

Approved by Board of Directors Resolution 107/15, December 4, 2015

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1.0 INTRODUCTION

The Otonabee Region Conservation Authority's (ORCA) 'Watershed Planning & Regulation Manual' provides guidance to staff for the review of development applications made under both the Planning Act and Ontario Regulation 167/06, ORCA's 'Development, Interference with Wetlands and Alterations to Shorelines and Watercourses' regulation issued under Section 28 of the Conservation Authorities Act.

This Environmental Impact Study (EIS) Terms of Reference and Submission Standards document has been prepared to outline the process for undertaking an EIS when required as part of a Planning Act and/or permit application process. The intent of these guidelines is to:

1. Provide standardized study guidelines;
2. Improve the quality of submitted reports; and,
3. Expedite the review process.

1.1 ENVIRONMENTAL IMPACT STUDY (EIS) – WHAT IS IT? WHEN IS IT REQUIRED?

An EIS is a mechanism for describing potential direct and indirect impacts of a proposed development within or adjacent to a natural heritage feature or system.

The EIS must assess impacts anticipated from the proposed development application on natural heritage features, functions and linkages that may include but is not limited to:

- Significant¹ wetlands
- Significant¹ woodlands
- Significant valleylands
- Significant wildlife habitat
- Significant Areas of Natural and Scientific Interest (ANSI)
- Habitat of threatened and endangered species
- Fish habitat
- Natural heritage systems and linkages
- Natural areas of concern designated in municipal official plans
- Ground water and surface water features (e.g., watercourses, seepage areas, recharge/discharge areas, springs, non-significant wetlands and associated riparian areas)

¹ Significant, as defined by the 2014 Provincial Policy Statement means:

- a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time;
- b) in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources; and
- c) in regard to other features and areas in policy 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.

In fulfilling its plan review and permitting activities outlined in the 'Watershed Planning & Regulations Manual', ORCA may:

- Recommend to municipal partners that an EIS be submitted in support of a Planning Act application (e.g., Zoning By-law Amendment, Consent, Minor Variance) to be consistent with provincial interests articulated in the Provincial Policy Statement (PPS) and other relevant provincial plans (i.e., Oak Ridges Moraine Conservation Plan); and/or
- Request that an EIS be submitted in support of an Ontario Regulation 167/06 permit application.

Under the Planning Act, and in accordance with the 2014 PPS and municipal official plans, an EIS is generally required or triggered when development or site alteration is proposed within or adjacent to a natural heritage feature or area identified by either the province, the municipality, or ORCA. Section 2.1 of the PPS prohibits development and site alteration in or adjacent to specified natural heritage features unless the ecological function has been evaluated. The EIS must demonstrate that there will be no negative ecological and hydrological impacts on the natural heritage system, connectivity and linkages associated with the site and surrounding area.

While ORCA also has a delegated responsibility to represent the 'provincial interest' as it relates to natural hazards (Section 3.1 of the PPS), this

Major Development

In some cases large scale development applications may require a comprehensive EIS to be conducted on a watershed or subwatershed scale to identify natural heritage features for protection, potential development areas, and development setbacks that are ecologically sustainable. The natural heritage or environmental management strategies developed through watershed, subwatershed or secondary plans may fulfill these requirements. Should a Comprehensive EIS be required, ORCA will work with the municipality and/or proponent to develop a specific Terms of Reference

information is typically beyond the scope of an EIS and is addressed via appropriate technical reports to identify the flooding and erosion hazard limits (e.g., stream bank erosion analysis, geotechnical investigation, geomorphologic assessment or floodplain mapping).

Under Ontario Regulation 167/06, ORCA's 'Development, Interference with Wetlands and Alterations to Shorelines and Watercourses' regulation, ORCA may request an EIS to aid decision-making on permit applications for development within areas that could interfere with the hydrologic and hydrogeologic function of wetlands, watercourses and ground water and surface water features (e.g., recharge/discharge zones, water quality and quantity, fluvial geomorphology, etc.).

1.2 PRE-CONSULTATION – BEFORE SUBMITTING AN APPLICATION

Pre-consultation is an opportunity for the proponent, ORCA staff and staff from the local municipality to discuss the development proposal; review available information; identify the natural heritage and hazard features on the subject property; and identify the relevant planning and permitting policies to be addressed by the EIS.

The initial consultation and EIS scoping exercise will establish whether the *principle of development* is acceptable or unacceptable based on the probability of negative impacts on natural heritage features and conformity to relevant policies. ORCA will make recommendations on the level of effort required to address the potential for impacts and the Terms of Reference (TOR) or scope of the study that will be required.

Pre-consultation should occur prior to circulation of the development application to ensure a complete application is submitted under the Planning Act, or under Ontario Regulation 167/06, ORCA's 'Development, Interference with Wetlands and Alterations to Shorelines and Watercourses' regulation.

The intent of pre-consultation is to:

- Discuss the proposed development and review the planning context including PPS policies, municipal land use designations, zoning and permitted uses, and relevant ORCA planning and permitting requirements;
- Determine the scope of the EIS that is required based on the type of development application required, scale of the proposals, the significance, sensitivity and extent of the natural heritage system and hazards associated with the site and adjacent lands, availability of required data and anticipated impacts;

- Discuss existing information and data including subwatershed studies, hydrogeological or geotechnical data that may be relevant to the subject lands and the development proposal; and,
- Identify site visit dates to be conducted by the proponent/consultants and agencies to field review and/or stake the natural features, boundaries (e.g., top of bank, wetlands, woodland drip line), potential locations for watercourse crossings, geotechnical hazards, etc.

Note that field work may identify additional features beyond those initially scoped. In such situations, on-going communication between ORCA staff and consultants/proponents is encouraged prior to the submission of a Planning Act and/or permit application.

During pre-consultation, both the proponent and ORCA staff should be prepared to provide the following information:

Role of Proponent	Role of ORCA
Background information – development history, existing uses, feature information based on local knowledge	Legislative policy and permitting requirements including other relevant planning and regulatory agencies that may be implicated in the proposed development, e.g., MNRF, TSW, DFO, PCCHU, MTO, Planning Authorities, etc.
Development proposal	Planning/regulatory context
Preliminary site plan overlaid on aerial imagery	Existing information/data/studies
Copy of MNRF correspondence re. Species at Risk or natural feature screening	Natural heritage and hazard features mapping

In some cases, pre-consultation may result in the modification of a development proposal, ultimately eliminating the need for an EIS (i.e., moving the proposed building envelope outside the feature and its area of interference).

1.3 QUALIFICATIONS

The EIS and field surveys must be completed by qualified professionals with appropriate training in biology, ecology, botany or related fields and in accordance with accepted engineering or scientific principles, provincial standards, criteria and guidelines (e.g., Ecological Land Classification system training and applicability of the evaluation criteria within the Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Reference Manual 2nd Edition), and/or to the satisfaction of ORCA. Contributing authors and field technician staff should be listed in the report.

For wetland delineation and evaluation, individuals must be Ontario Wetlands Evaluation System (OWES) certified.

1.4 EIS TERMS OF REFERENCE (TOR)

The applicant will be given direction and guidance as to the anticipated scoping, form and content of the EIS based on preliminary identification of issues and concerns discussed in the pre-consultation meeting. It is at this stage that all parties will agree on whether the EIS will be scoped to exclude some or all expected terrestrial and aquatic inventories, depending on the scale of the proposed development, anticipated impacts, and availability of existing data. Otherwise, a full EIS will be required.

The EIS TOR shall be scoped for each application following the pre-consultation meeting and will be provided to the consultant either during or after pre-consultation.

Generally, the TOR will address the following:

1. Description of proposed development (type and scale);
2. Study area boundaries;
3. Key ecological features, functions, linkages and other natural processes that may be affected, directly or indirectly, by the development;
4. Information needs and availability of information;
5. Potential impacts (direct and indirect) associated with the proposed development; description of existing conditions versus post development;
6. Means of avoiding or mitigating anticipated impacts; and,
7. The nature and extent of additional information or studies that may be required to satisfy policy and permitting requirements.

The scope of the EIS is generally determined based on existing conditions, the size of the proposed development and the distance between the proposed development and the natural

heritage features on site. Therefore, all aspects of the proposed development should be taken into account when determining the scope of the EIS. ORCA maintains the right to include additional scoping measures into the EIS if elevated levels of impact are identified during pre-consultation and/or scoping phases. Additionally, if it is recognized that added or elevated levels of impact are occurring during development, such impacts and associated mitigation measures will need to be amended into the EIS.

An EIS scoping checklist has been prepared (Appendix A) to assist with this EIS TOR customization process. The purpose of the checklist is to identify EIS parameters that must be addressed in order to support a proposed planning or permit application. The checklist should be completed jointly by a qualified professional, the relevant municipality and/or ORCA staff during pre-consultation. The completed checklist will be provided to the consultant either during or after pre-consultation. Once the scoping checklist has been completed and approved, the consultant may be asked to develop a detailed site specific TOR to demonstrate how all the checklist items will be addressed in the EIS report. Depending on the complexity of the development, additional meetings may be held to develop and agree upon the TOR for the EIS.

The checklist should be submitted with the EIS.

2.0 EIS REPORT REQUIREMENTS

This section outlines ORCA’s requirements for an EIS report to support municipal planning applications and permit applications. Table 1 summarizes the preferred EIS report Table of Contents. The content requirements of each section are elaborated in the following pages. The EIS report formatting submission standards are listed in Appendix B. The list below outlines the elements to be included in a complete EIS application.

Table 1. Environmental Impact Study (EIS) report preferred Table of Contents

EIS Report Section	Contents
Executive Summary	Description of proposed development Table format of key impacts, mitigation strategies and conformity assessment to relevant policy Key recommendations
Introduction: Background & Purpose	Identity of proponent and location of subject property Location map Land use history and regional context Site plan of existing conditions General description of the proposed development

	<p>Overview of pre-consultation recommendations and site specific terms of reference</p> <p>Relevant planning and permitting policies</p> <p>Literary review of background studies and reports</p>
Site Description	<p>Field work dates, weather conditions, detailed methodology</p> <p>Field observations of the biophysical components on site (e.g., soils, topography, drainage, natural heritage features and areas, hazards, surface and ground water features, hydrological functions, landscape linkages)</p> <p>Identify the natural heritage system planning components</p> <p>ELC mapping, including soil sampling sites</p> <p>Development Constraint Map (limits or boundary of natural heritage and hazard features and areas)</p> <p>Wetland boundaries will be flagged in the field</p>
Development Proposal	<p>Existing conditions (main roads, lot lines, buildings)</p> <p>Current planning context</p> <p>Description of proposed development</p> <p>Detailed site plan of proposed building/development envelope (including all servicing and access requirements and accessory uses)</p> <p>Proposed site alterations (e.g., changes to grade and drainage patterns)</p> <p>All proposed activities (e.g., vegetation removal, grading, filling, draining and other construction activities)</p>
Impact Assessment	<p>Map of development constraints and site plan</p> <p>Description of municipal zoning by-law requirements (e.g., required setbacks)</p> <p>Impacts to significant features and areas</p> <p>Impacts to the ecological and hydrological functions of wetlands and watercourses</p> <p>Impacts to connectivity/linkages (buffers and adjacent lands)</p> <p>Possibility of cumulative impacts</p> <p>Summarize effects in table format for executive summary</p>
Mitigation Measures	<p>Analysis of mitigation measures to eliminate or reduce impacts (e.g., size of buffers and setbacks)</p> <p>Compensation plan (e.g., offsetting)</p> <p>Map depicting location and extent of proposed mitigations</p> <p>Summarize mitigation strategy in table format for executive summary</p>

Monitoring	Study design to evaluate mitigation and compensation measures (e.g., compliance or effectiveness monitoring), where appropriate (i.e., subdivisions and other major developments)
Conclusions and Recommendations	Summary of potential impacts Summary of mitigation measures and/or compensation options Preferred development alternative Conformity to the policy and legislative framework Development conditions Summarize key points in table format for executive summary
References	List of reference materials cited
Appendices	Maps Species lists Copies of field collection sheets (ELC, OWES, MMP, etc.) Photographs Personal communications Terms of Reference checklist List of qualified professionals

2.1.1 EXECUTIVE SUMMARY

Include a summary at the front of the report that outlines the description of the proposed development, effects on the environment and all recommendations. This should be done in table format with a column outlining each of the following: Predicted Impacts, Mitigation and Residual Effects.

If an amended EIS is being submitted, include the modifications to the proposed development plan that have been incorporated to ensure that potential impacts have been eliminated, mitigated or offset and describe how these revisions satisfy planning and regulatory requirements.

2.1.2 INTRODUCTION: BACKGROUND & PURPOSE

This section should provide details about the identity of the proponent and a general description of the existing conditions on the subject property and the proposed development. A brief description of the historical and present land uses and the relevant municipal land use policies and provisions (e.g., zoning and permitted uses) on and adjacent to the subject property, as well as regulatory requirements should be outlined. In addition, an overview of the pre-consultation meeting and the agreed upon EIS TOR should also be addressed.

A general location map and site plan of existing conditions is required (use of aerial photos and GIS spatial data can be provided upon request).

This initial step will help gain an understanding of the site, identify preliminary issues, and outline information gaps and the need for additional surveys and data collections.

2.1.3 SITE DESCRIPTION

This section of the EIS should provide a description of the existing terrestrial and aquatic environment. It should summarize existing relevant background studies (e.g. sub/watershed, hydrological, geotechnical, etc.) and report the results of field work conducted in support of the current study. The study area, field survey dates and weather conditions, and field methodology should be discussed in detail. The report should provide a clear description of all vegetation communities using the Ecological Land Classification System (ELC) for Southern Ontario protocol and the significance of the site specific natural heritage features should be assessed using the Natural Heritage Reference Manual 2nd Edition or a similar provincially recognized protocol. Timing considerations for field work must be made to accommodate the seasonality of certain plant species, wildlife movements and fish migration and spawning.

Vegetation units, significant features, hazards and other relevant biophysical features and areas are to be superimposed onto aerial photos. The required GIS format of maps and coordinates provided to ORCA are UTM Zone 18 NAD 83 in ESRI shape file format. The use of historical aerial photographs for the subject property and surrounding lands is encouraged. Current and historical aerial photos dating back to 1982 (and earlier for limited portions of the watershed) are available at ORCA upon request. Fees may be associated with the provision of photos.

Wetland boundaries should be flagged in the field by an Ontario Wetland Evaluation System (OWES) qualified evaluator. This boundary delineation shall be surveyed by a registered Ontario Land Surveyor (OLS) and illustrated on a Reference Plan or Site Plan. Where wetland boundaries differ from approved MNRF Provincially Significant Wetland boundaries, the proponent must obtain acceptance of the revised boundary from the MNRF.

When available, ORCA will provide information pertaining to wetland mapping, natural heritage features, floodplain mapping, etc. Detailed information on rare species, ANSI's and other biophysical features of the site may be obtained directly from the MNRF district office in Peterborough.

The importance of the site should be considered at all scales, including the landscape, vegetation community and species. Site description of the area and the site plan (constraint mapping) should include all primary source information collected in support of the EIS. A discussion of the broader natural heritage system such as references to ORCA's watershed report card, provincial plans and other relevant inventories within which the site is located should also be included, where appropriate.

The information provided in this section should be as detailed as possible and should include the following requirements:

1. Geology

- Landforms
- Soils (auger sites should be identified on the map with UTMS provided)
- Topography
- Erosion-prone locations

2. Hydrogeology

- Recharge/discharge zones, including seeps
- Groundwater quality and quantity
- Groundwater elevations and flow direction
- Seasonal groundwater elevation variations
- Connection between groundwater and surface water at site, and the adjacent natural feature(s)

3. Hydrology

- Surface water quality and quantity
- Surface drainage features (Note: the EIS should use the definition of watercourse within the Conservation Authorities Act to identify watercourse features)
- Flow characteristics of surface watercourses
- Wetlands and riparian habitat (i.e., shorelines)
- Floodplain and regulation limits
- Water balance (major development proposals)

4. Vegetation (refer to Appendix C for recommended data collection standards)

- Onsite vegetation:
 - i. Determine and map all vegetation communities, including dominant species in accordance with the Ecological Land Classification System (ELC), Southern Ontario manual protocol as appropriate. In tabular format, list all species observed by ecosite or vegetation type unit. Map the ELC communities, including ELC codes, as an overlay on an aerial photo of subject property and provide copies of completed ELC field sheets in an appendix.

- ii. Examine and report on soil samples for communities that may be wetlands (map sampling locations).
- iii. Describe the location and distribution of all rare or uncommon species based on field surveys and those obtained from the local MNRF district office. Map the location of rare vascular plant species onto the ELC map.
- iv. Evaluate and map all wetlands using the latest Ontario Wetland Evaluation System (OWES) Manual. Provide copies of completed OWES field sheets in an appendix, where applicable. Stake the limits of this feature in the field to be delineated on a survey by an OLS.
- Offsite vegetation, adjacent to the subject property:
 - v. Describe the location and distribution of any rare, uncommon or species of conservation concern based on relevant field work and records obtained from the local MNRF district office.

5. Wildlife (refer to Appendix C for recommended data collection standards)

- Inventory all wildlife species for each ELC ecosite or vegetation type observed during field site visits in background reviews. Conduct species specific inventories using acceptable methodologies when required.
- Report on observed habitat units as per the ELC protocol (e.g., snags, den trees, hibernacula, nests, etc.).
- Conduct a breeding bird survey (include minimum of two dedicated field site visits) for each habitat type using the Point Count method and provide breeding evidence for each species observed as described in “Ontario Breeding Bird Atlas Guide for Participants” (2001). Complete field surveys in accordance with the appropriate timing and habitat survey requirements. Please contact the MNRF district office to determine what species specific field surveys are required for Species At Risk (e.g., bobolink, eastern meadowlark, whip-poor-will) for the property. Include owl call play back surveys where appropriate.
- Complete a spring frog and marsh bird survey in accordance with the Marsh Monitoring Program methodology (Bird Studies Canada), as appropriate.
- Identify, map and confirm the extent all candidate significant wildlife habitat both onsite and on adjacent lands using the “Significant Wildlife Habitat Technical Guide, 2000” (MNRF) and Eco-region Criterion Manuals.
- Identify and assess wildlife functions such as waterfowl staging areas, fish spawning and nursery sites, wintering grounds, areas that provide critical life cycle habitat (i.e., vernal pools) and wildlife corridors.
- Describe the location and distribution of any rare, uncommon species as well as Species At Risk. Please contact the local MNRF district office to obtain additional

records. Please refer to the Ontario Endangered Species Act and the federal Species At Risk Act to ensure compliance.

- Identify, map and confirm all candidate Significant Habitat of Endangered and Threatened Species both onsite and on adjacent lands, if not already done so by the MNRF. Contact the MNRF district office for information and guidance. Precise configuration of the significant habitat area should be done by an individual with expert knowledge of species requirements.

6. Aquatic Habitat (refer to Appendix C for recommended data collection standards)

- Determine and map the location and distribution of fish habitat and species, particularly spawning and other critical habitats (e.g., refuge pools and nursery habitat).
- Define watercourse flow characteristics with particular emphasis on seasonal fish habitat.
- Determine site specific water temperatures.
- If there is no fish habitat onsite, identify contributing functions (e.g., flow and sediment regime, water quality, vegetation as food source).

7. Corridors and Linkages

- Provide discussion around existing linkages within the site and connections with other natural heritage areas. The EIS should assess the following linkage functions of the site:
 - Hydrological function: riparian areas, floodplains, valleylands, drainage areas, surface and ground water connections, recharge and discharge areas.
 - Degree of connection with natural areas (proximity, distance, intervening land use) and opportunities for increasing the integrity and number of connections through restoration.
 - Movement patterns of wildlife groups.
- All linkages and corridors should contain an evaluation of the following:
 - The natural areas and habitats linked and the type of linkages within the site and connections with other natural heritage areas (e.g., Kawarthas Naturally Connected modelled scenario, hydrological and hydrogeological linkages, biological and biophysical linkages)

If new features are identified (e.g., flooding or erosion hazards) further consultation will be required to provide the appropriate info to the applicant.

2.1.4 DEVELOPMENT PROPOSAL

This section of the report should focus on the existing conditions and proposed development on the subject property in order to fully assess potential impacts associated with various development alternatives and methods. The level of detail required will be determined during the pre-consultation meeting.

The concept plan for the development should reflect the current planning context including official plan land use designations and Zoning By-law zones and applicable provisions for permitted uses for the subject property and adjacent lands. The development design should be respectful of the natural heritage system that has been identified and the EIS should describe conditions that must be met for development approvals. For larger developments, details such as storm water management, erosion and sediment control, and/or landscaping plans may be submitted as part of the detailed site design prior to grading. A detailed site plan will be required to illustrate any existing uses and natural features on site and may include, but is not limited to, the following:

- Main roads, maintenance routes, public trails, etc.
- The location of any existing building(s) or structure(s), driveways or parking lots
- Existing or new lot lines
- Septic system and well locations
- Existing infrastructure
- Stormwater management areas and surface drainage features (e.g., swales, culverts, tile beds)
- Erosion and sedimentation control measures
- Grading limits and post grading contours
- Extent of proposed vegetation removal/retention
- Required development setbacks (e.g., zoning by-law provisions)
- Development or land use alternatives (e.g., buffers)
- Timing of construction, including phasing of development
- All proposed activities associated with the development that may have environmental impacts (e.g., fill placement, draining and other construction activities)
- Other features as requested through the EIS pre-consultation process

Many of these elements can be discussed or described in a general or conceptual manner within the EIS, with the understanding that further detail will be provided when detailed grading information and building envelope information is available. Impacts can be clearly stated in the EIS with final impacts clarified during detailed design stages.

In addition, the proposed development may be subject to a number of federal, provincial, regional or local policy and legislative requirements relevant to the EIS. The proponent should be aware of the applicable policies and legislation that may affect their property and development proposal; and the EIS should detail how the concept plan will satisfy planning and regulatory requirements of the following, where applicable:

Federal:

- Fisheries Act
- Migratory Birds Convention Act
- Species at Risk Act
- Navigable Waters Act
- Historic Canals Regulation

Provincial:

- Planning Act
- Conservation Authorities Act
- Endangered Species Act
- Public Lands Act
- Lakes and Rivers Improvement Act
- Provincial Policy Statement
- Oak Ridges Moraine Conservation Plan

Municipal:

- Upper Tier Official Plan
- Lower Tier Official Plans
- Zoning By-laws, tree cutting By-laws, etc.

Please note that the most restrictive policy provisions will apply when determining a development proposals policy conformance.

2.1.5 IMPACT ASSESSMENT

This section of the report must address impacts that might reasonably be expected to occur as a result of development. Impacts may be direct or indirect and not immediately apparent at the time of initial development. The EIS should describe negative or positive impacts on-site and relative to the adjacent lands, including the nature, extent and duration of all potential impacts, impacts of servicing options, and impacts from alternative development. The assessment should predict cumulative impacts of the proposal including existing and future developments within the surrounding area. It is important to note that even small-scale development can contribute to cumulative impacts on the landscape.

The methodology used to determine effects on the environment, including scientific literature consulted, should be cited in the body of the report to support the impact analysis.

Features and functions of concern may include, but are not limited to:

- Impacts to physical features
 - i. Topography – alteration to grade and drainage patterns (e.g., fill placement and retaining walls)
 - ii. Pre-development flood plain encroachments/alterations
 - iii. Watercourse or surface drainage feature alterations/changes as a result of stormwater or urban runoff
 - iv. Sediment and erosion sensitive areas (e.g., grading on steep slopes, adjacent to drainage features, etc.
 - v. Impacts due to development servicing
 - vi. Effects on groundwater, e.g., reduced surface water recharge and post development water balance
- Impacts to ecosystems
 - vii. Vegetation – loss of, encroachment, modification, etc.
 - viii. Wildlife and habitat – loss of, fragmentation, lighting, noise, predation by pets, etc.
 - ix. Fish habitat – any alteration to physical fish habitat including refuge pools, thermal classification, upwellings, or benthic organisms; and any impacts causing serious harm to fish that are part of or that support a commercial, recreational or Aboriginal fishery
 - x. Corridors and linkages – loss, encroachment, modification, etc.
- Loss of other natural features including swales, hedgerows, thickets, meadows, etc. Impacts (extent and degree) to adjacent lands, e.g., transportation of sedimentation and effects on connectivity/fragmentation
- Further demand on resources
 - xi. Activities that occur within or adjacent to the natural features, (walking, swimming, boating, fishing, trapping, hunting, harvesting, use of all-terrain vehicles, etc.)
 - xii. Recreational amenities – both existing and future trails, access points, etc.

Section 13 of the “Natural Heritage Reference Manual” (MNRF, 2010) provides a comprehensive list of potential impacts on significant (as defined by the PPS) natural features and natural heritage systems. A condensed list of potential development impacts can also be found in Appendix D.

2.1.6 MITIGATION MEASURES

All development has the potential for negative impacts on ecosystems. This section of the EIS report must describe potential mitigation measures and possible compensation, and their effectiveness to eliminate or reduce potential impacts of the proposed development on natural features and areas and their functions.

ORCA recommends a proactive approach to mitigation, namely that proponents attempt to eliminate negative impacts at the early stages of project development through design and location modifications to avoid effects on key features or functions and/or methods to restore features or functions that might be impacted. Of these, avoidance is preferred. Where avoidance is not possible, a rationale should be provided along with alternative options including measures to minimize impacts.

It is expected that the EIS report will identify measures that **will be taken** to mitigate the effects of the proposal on environmental features (e.g., analysis of buffers and development setbacks). The proponent will be responsible for assessing the feasibility of the proposed mitigation measures and ensuring they can be incorporated into the development proposal.

This section should include a summary table with columns for: Predicted Impacts, Mitigation and Residual Effects, which will be translated to the Executive Summary section of the report.

Mitigation

Mitigation, as defined by the “Natural Heritage Reference Manual” (MNRF 2010), involves the prevention, modification or alleviation of impacts on the natural environment and the prevention of any negative impacts. Mitigation can also include any action intended to enhance beneficial effects.

Types of mitigation include, but are not limited to:

- Modifying the proposal – avoidance
- Development setbacks and buffers (link to conditions of approval)
- Salvaging plant material
- Identifying appropriately wide vegetated buffers and setbacks
- Retaining riparian and shoreline vegetation
- Additional plantings
- Removal of non-native and/or invasive species
- Control of invasive species (gardening or landscaping with native species)
- Timing restrictions that address disturbances to wildlife due to site preparation activities
- Creating wildlife passages to reduce road kill and the barrier effect of roads

- Wildlife appropriate lighting
- Infiltration measures such as Low Impact Development technologies
- Stormwater management
- Sediment control
- Fencing to control human and pet access to natural areas
- Dedication of land, and Public and landowner education (e.g., adverse effects of pets, dumping of lawn clippings and yard waste in natural areas, gardening with native instead of non- native and potentially invasive plants)

Mitigation measures contained in the EIS must be enforceable and attainable in a timely fashion.

Compensation

Compensation for loss of natural vegetation cover and wildlife habitat can include restoring, enhancing or creating habitat. Generally, compensation is not considered an acceptable approach. However, for some very small, low diversity natural features, compensation may be considered, at the sole discretion of ORCA, and when all other mitigation options have been determined to be not feasible. It is a last resort and in many cases will not be considered an acceptable solution.

If compensation is being contemplated, potential opportunities on the property at a suitable location should be identified through the EIS. If compensation for loss of habitat is not possible on the subject property, it may be directed off site to suitable restoration and rehabilitation sites within the Otonabee Region watershed.

Compensation must be designed and undertaken by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of ORCA.

Compensation can be varied and may involve, but is not limited to restoring wetlands, planting of trees, restoring vegetation communities, creating riparian buffers, creating nesting sites, creating hibernacula, etc. It should be noted that generally, through consultation with ORCA, compensation should favour “like for like.”

2.1.7 MONITORING

As determined during pre-consultation, monitoring may be required in the pre-construction, construction/operation and post-construction periods depending on the scale of development. Details of the monitoring program will be specific to the proposal and will be determined through the completion of the EIS and supporting studies submitted for the site plan and

detailed design. Monitoring must be able to detect environmental change that can be attributed to work, or an activity related to the development, and for which some anticipated level of mitigation may be employed.

The purpose of the monitoring plan will be to measure effects over time. However, remedial steps may be necessary where actual impacts are greater than those predicted. The “Natural Heritage Reference Manual” (MNRF, 2010) states that monitoring may be required where:

- There is uncertainty as to the effectiveness of established mitigation measures to avoid negative impact;
- New and untested mitigation measures are used; and,
- There are some long-term operations associated with a development that could facilitate some future or on-going refinement to the mitigation strategy.

For large scale projects and projects near significant areas, a multi-season/year inventory may be required, and may be established as a condition of approval. Where a monitoring plan is required, further consultation with ORCA staff to discuss the parameters of the plan will be required.

2.1.8 CONCLUSIONS AND RECOMMENDATIONS

In this section the EIS will demonstrate how the development proposal complies with the PPS, Official Plan and Zoning By-law provisions, ORCA’s planning and regulatory policies, and other relevant legislation. Recommendations should outline how the proposal can maintain or enhance ecological and/or hydrological functions of the feature.

This section of the EIS report will:

- Identify and provide the rationale for the preferred development alternative
- Summarize any potential impacts to the natural heritage feature(s) on and off the site
- Summarize any mitigation and compensation measures that will be implemented
- Conclude whether the proposal can proceed as outlined in the EIS and whether it meets relevant planning and regulatory policies
- Indicate if additional studies are expected to address policies pursuant to the protection of natural hazards after the EIS is submitted
- Indicate the need for a new, amended or consolidated EIS if significant modifications to the original application are proposed

Questions to be considered in formulating recommendations:

- Should the proposal proceed as planned?
- Should the proposal be revised?
- What mitigation measures are required to ensure policy compliance?
- What conditions can be imposed to support development approval?

It is expected that the EIS report will identify measures that will be taken to mitigate the effects of the development on the natural heritage system. The proponent will be responsible for assessing the feasibility of the proposed mitigation measures and ensuring that these recommendations can be incorporated into the development proposal.

2.1.9 REFERENCES

A list of cited materials comprising the literature review is to be provided in this section of the report.

2.1.10 APPENDICES

The appendices should include all information gathered while conducting site visits, including species lists of flora and fauna and site photographs. Additional information that must be provided if applicable may include:

- Copies of completed field survey sheets (e.g., Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES), Marsh Monitoring Program (MMP), etc.)
- Natural heritage feature boundaries and appropriate buffers and/or development setbacks
- Preliminary stormwater management plans
- Preliminary erosion and sediment control plans, and
- Preliminary vegetation planting and management plans for proposed restoration or buffer areas, including species lists

REFERENCES

Lee, H, T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification System for Southern Ontario: First Approximation and its application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement under the Planning Act.

Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch Wildlife Section. Science Development and Transfer Branch.

Ministry of Natural Resources. March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. 2005. Second edition. Toronto: Queen's Printer for Ontario.

Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System for Southern Ontario 3rd edition.

Stanfield, L. (editor). 2013. Ontario Stream Assessment Protocol. Version 9.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 505 pages.

APPENDIX A: EIS SCOPING CHECKLIST

Date:		Completed by:	
Proponent:			
Location:			
Type of Application:			

Check first box if sufficient information is available; check second box if to be addressed by current EIS

<input type="checkbox"/> <input type="checkbox"/> Natural Heritage Designation and Zoning: <input type="checkbox"/> <input type="checkbox"/> Provincially Significant Wetland <input type="checkbox"/> <input type="checkbox"/> Non-Provincially Significant Wetland <input type="checkbox"/> <input type="checkbox"/> Unevaluated Wetland <input type="checkbox"/> <input type="checkbox"/> Threatened or Endangered Species Habitat <input type="checkbox"/> <input type="checkbox"/> Significant Woodland <input type="checkbox"/> <input type="checkbox"/> Significant Valleyland <input type="checkbox"/> <input type="checkbox"/> Significant Wildlife Habitat <input type="checkbox"/> <input type="checkbox"/> Area of Natural and Scientific Interest <input type="checkbox"/> <input type="checkbox"/> Fish Habitat <input type="checkbox"/> <input type="checkbox"/> Other Designations (e.g., SNA, ESA, ORM, Greenlands, etc.)

<input type="checkbox"/> <input type="checkbox"/> Geology, Hydrogeology, Hydrology: <input type="checkbox"/> <input type="checkbox"/> Subwatershed or Wetland Catchment boundary <input type="checkbox"/> <input type="checkbox"/> Surface Drainage Patterns (incl. all permanent and intermittent watercourses) <input type="checkbox"/> <input type="checkbox"/> Geomorphologic and Topographic features <input type="checkbox"/> <input type="checkbox"/> Soils (surface and subsurface) <input type="checkbox"/> <input type="checkbox"/> Groundwater Recharge/Discharge Areas <input type="checkbox"/> <input type="checkbox"/> Hyrdogeologic Conditions Specify timing of any field studies to be done: <input type="checkbox"/> winter <input type="checkbox"/> spring <input type="checkbox"/> summer <input type="checkbox"/> fall
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<input type="checkbox"/> <input type="checkbox"/> Natural Hazard Lands: <input type="checkbox"/> <input type="checkbox"/> Survey Flood Plain <input type="checkbox"/> <input type="checkbox"/> Valleylands <input type="checkbox"/> <input type="checkbox"/> Erosion Hazards <input type="checkbox"/> <input type="checkbox"/> Poorly Drained Soils
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<input type="checkbox"/> <input type="checkbox"/> Biological Inventory: <input type="checkbox"/> <input type="checkbox"/> Wetland Evaluation <input type="checkbox"/> <input type="checkbox"/> Wetland Boundary Delineation <input type="checkbox"/> <input type="checkbox"/> Ecological Land Classification <input type="checkbox"/> <input type="checkbox"/> Wildlife Inventory <input type="checkbox"/> Amphibians <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Reptiles <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Birds <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Mammals <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Fish <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Insects <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Plants <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> SAR <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Other:
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- Significant Wildlife Habitat
 - Seasonal Concentration Areas of Animals
 - Waterfowl Stopover and Staging Areas -Terrestrial and Aquatic
 - Shorebird Migratory Stopover Area
 - Raptor Wintering Area
 - Bat Hibernacula
 - Bat Maternity Colonies
 - Bat Migratory Stopover Area
 - Turtle Wintering Area
 - Snake Hibernacula
 - Colonially Nesting Bird Breeding Habitat (Bank and Cliff/Tree/Shrub, Ground)
 - Migratory Butterfly Stopover Area
 - Landbird Migratory Stopover Areas
 - Deer Yarding Areas
 - Deer Winter Congregation Area
 - Rare Vegetation Communities or Specialized Habitat for Wildlife
 - Cliff and talus slopes
 - Sand Barren
 - Alvar
 - Old Growth Forest
 - Savannah
 - Tallgrass Prairie
 - Other
 - Specialized Habitat for Wildlife
 - Waterfowl Nesting Area
 - Bald Eagle and Osprey Nesting, Foraging, Perching Habitat
 - Woodland Raptor Nesting habitat
 - Turtle Nesting Areas
 - Seeps and Springs
 - Amphibian Breeding Habitat - Woodland and Wetland
 - Habitat for Species of Conservation Concern (not including End or Thr Species)
 - Marsh/Woodland Area-Sensitive/Open Country/Shrub/Early Successional Bird Breeding Habitat
 - Terrestrial Crayfish
 - Special Concern and Rare Wildlife Species
 - Animal Movement Corridors
 - Amphibian Movement Corridors
 - Deer Movement Corridors
 - Other
 - Mast producing Areas
 - Lek

APPENDIX B: EIS REPORTING STANDARDS

Please ensure that the following standards are met:

- 2 paper copies of the report and a digital copy, signed by the principal author(s), are submitted to ORCA;
- 8 ½" X 11" paper, doubled sided;
- a title page listing the name of the proponent, address of the subject property, name of consulting firm and consultant, and the date the report was completed;
- maps 11"X17" shall be bound into the report – larger maps shall be inserted in a pocket inside the back cover of the report;
- minimum map size is 8"X11", maximum 36"X60" (folded to 8.5"x11" to fit inside report)
- all maps to include a metric scale, north arrow, full legend corresponding to all mapped features
- surveyed site plan and maps showing vegetation community boundaries identified using the Ecological Land Classification System for Southern Ontario (Lee et al, 1998), surveyed wetland boundary and verified by ORCA staff, floodplain lines and regulation limits, existing and proposed land use and property boundaries
- appendices to include:
 - annotated species checklists with current S ranks and Endangered Species Act and Species At Risk Act designations
 - list of contributors/staff to the EIS and their position titles
 - a copy of the approved Terms of Reference

Submitted documents shall remain the property of ORCA.

APPENDIX C: DATA COLLECTION STANDARDS

The initial consultation between the proponent and ORCA will establish whether the principle for development is acceptable. ORCA will then make recommendations on the level of effort required to address the potential for impacts, and the specific elements of study that will be required for the EIS. These requirements will be chosen from a detailed list – not all elements will need to be studied for each EIS. For example, a multi-season inventory may be waived or reduced in scale when relatively current data is available for the site. In most cases, a minimum of three (3) site visits at the appropriate time of year will be required. When older (5 years and older) inventory data is available, it must be updated through the current study. The need to supplement existing data through a single or multi-season inventory will be evaluated on a case by case basis depending on the nature of the development and the sensitivity of the site features. The appropriate standard inventory protocols must be followed by a trained field biologist. The suggested biological inventory schedule is shown below.

Survey Timing	Target Organisms
Early Spring (Late March / early April)	<ul style="list-style-type: none"> • early frogs (wood, spring peeper and chorus frogs) • salamanders • ducks and geese • raptors • owls
Spring (May)	<ul style="list-style-type: none"> • frogs • migratory birds • reptiles including turtles and snakes • benthics • ephemeral flora
Early Summer (June)	<ul style="list-style-type: none"> • breeding birds • reptiles including turtles and snakes • benthics • fish and fish habitat • vegetation communities including wetlands
Summer	<ul style="list-style-type: none"> • breeding birds

(mid-July / early August)	<ul style="list-style-type: none"> • wildlife habitat • wetland species • vegetation communities including wetlands • summer flora • prairie species • insects including butterflies and dragonflies
Fall (September)	<ul style="list-style-type: none"> • migratory birds • late summer plant species • prairie species • butterflies

The following list provides standard surveying protocols for natural heritage identification and fieldwork in Ontario. Please provide copies of completed field sheets for each field methodology used.

1. OWES - Ontario Wetland Evaluation System for Southern Ontario (OMNRF, 2013, or most current version)
2. ELC - Ecological Land Classification System for Southern Ontario (Lee et al. 1998, or most current version)
3. Ontario Breeding Bird Atlas guide for participants (2001 or most current version). (http://www.birdsontario.org/download/atlas_feb03.pdf)
4. MMP - Great Lakes Marsh Monitoring Program (<http://www.bsc-eoc.org/mmpmain.html>)
5. Significant Wildlife Habitat Technical Guide (MNR 2000, or most current version)

APPENDIX D: POTENTIAL IMPACTS

Development activities likely to impact natural heritage features and areas, their functions, and natural heritage systems include: vegetation removal, grading, aggregate extraction, installation of services and utilities, building construction, water crossings, paving, groundwater taking, use of septic systems, human occupation, and recreation (walking, swimming, boating, fishing, hunting, use of all-terrain vehicles, etc.).

Vegetation removal and/or site grading can:

- reduce wildlife habitat;
- fragment natural areas stressing forest interior species;
- introduce non-native species;
- cause loss of linkages for animal movement resulting in isolation of populations and ultimately loss of biodiversity;
- disturb sensitive wildlife species;
- result in loss of rare plant species and communities;
- change the soil moisture regime and vegetation communities;
- reduce stability or cause physical alterations to sensitive landforms; and/or,
- affect groundwater recharge.

In riparian areas, vegetation removal and site grading can also:

- increase runoff and stream water temperature negatively affecting aquatic habitats;
- increase inputs of nutrients and contaminants to waterbodies;
- reduce quantity of food supply for aquatic life in the form of leaves, twigs and insects in waterbodies;
- reduce bank stability and increase erosion and sedimentation with resultant impacts on aquatic habitats;
- disrupt riparian corridors; and/or,
- disturb sensitive wildlife species.

In addition, wildlife may be negatively impacted by the following features associated with residential and commercial development:

- lights;
- noise;
- pets; and/or,
- lawns.

Construction of buildings and roads, and installation of services can:

- increase water contamination by oils, gasoline, grease and other materials from parking lots, driveways, and roads;
- increase imperviousness affecting groundwater recharge;
- result in direct loss of wildlife from collisions with buildings or vehicles;
- attract nesting turtles and other wildlife to roadsides increasing roadkills;
- increase nutrient inputs from septic systems;
- result in increased use of pesticides and fertilizers on lawns;
- increase predation of wildlife species by pets and invasion of non-native species;
- increase lighting and noise which may affect sensitive wildlife species; and/or,
- result in loss of linkages between habitats.

Interference with waterways (realignment, stream crossings) can:

- affect fish movement;
- affect water temperature and aquatic habitat; and
- affect channel geomorphology, wetland communities and fish habitat.

Recreational activities and seasonal development can:

- increase harvest of fish and reduce populations;
- improve access to sensitive sites which can result in vandalism and loss of ecosystem integrity;
- increase shoreline alteration which affects fish habitat;
- cause trampling of vegetation and soil compaction which affects vegetation communities and increases runoff to watercourses (impacting aquatic life);
- result in removal of vegetation causing loss of wildlife habitat and reduced biodiversity; and/or,
- disturb sensitive wildlife species.