April 2016

# REPORT ON

# Environmental Impact Statement and Tree Conservation Report in Support of the Development of 4789 Bank Street City of Ottawa, Ontario

**Submitted to:**
Claridge Homes
2001 - 210 Gladstone Avenue
Ottawa, Ontario K2P 0Y6

REPORT

**Report Number:** 13-1121-0186/4000

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# 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Claridge Homes (Claridge) to prepare an Environmental Impact Statement (EIS) for the proposed development of 4789 Bank Street (the Site: Figure 1). This Site forms part of the Leitrim Development Area (LDA), and was brought into the LDA in 2012 as part of Official Plan Amendment Number 76 (OPA 76). The Site is currently owned by Claridge Homes.

Appendix E to this report is a Tree Conservation Report (TCR), which has been prepared for the Site in accordance with the City's Tree Conservation Report Guidelines (Ottawa, 2014), and should be read in conjunction with this report.

## 1.1 Purpose

This report has been prepared in accordance with the EIS guidelines in the City of Ottawa Official Plan (Ottawa, 2015; 2013), and in consideration of the recommendations made in the Environmental Management Plan (EMP) prepared for the LDA east of Bank Street (Golder, 2016). The EMP included the recommendations of the "Leitrim Community Design Plan" (The Planning Partnership, Cumming Cockburn Limited, Delcan Corporation and StoneStable Consultants, May 2005) (CDP 2005). As this EIS is based on a number of the observations, conclusions and recommendations made in the EMP, that document should be read in conjunction with this report.

The proposed development includes a mix of single and town homes, a mixed-use area along Bank Street, school and park blocks, and all associated roadways and servicing. The development will be serviced by the Findlay Creek Village Stormwater Management (SWM) Facility, located off-Site.

# 2.0 ENVIRONMENTAL POLICY CONTEXT

## 2.1 Provincial Policy Statement

The updated Provincial Policy Statement (PPS) was issued under Section 3 of the *Planning Act* and came into effect April 30, 2014 (MMAH, 2014). It replaces the PPS issued March 1, 2005.

The natural heritage policies of the PPS indicate that:

- 2.1.4 *Development* and *site alteration* will not be permitted in:
  - a) significant wetlands in Ecoregions 5E, 6E and 7E; and,
  - b) significant coastal wetlands.
- 2.1.5 Unless it has been demonstrated that there will be no *negative impacts* on the natural features or their *ecological functions*, *development* and *site alteration* will not be permitted in:
  - a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;
  - b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
  - c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
  - d) significant wildlife habitat;
  - e) significant areas of natural and scientific interest; and,
  - f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).
- 2.1.6 *Development* and *site alteration* will not be permitted in *fish habitat* except in accordance with *provincial and federal requirements;*
- 2.1.7 *Development* and *site alteration* will not be permitted in *habitat of endangered species and threatened species*, except in accordance with *provincial and federal requirements*;
- 2.1.8 *Development* and *site alteration* will not be permitted on *adjacent lands* to the *natural heritage features and areas* identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*; and,
- 2.1.9 Nothing in policy 2.1 is intended to limit the ability of *agricultural uses* to continue.

## 2.2 Species at Risk

### 2.2.1 *Species at Risk Act* (SARA)

At the federal level, Species at Risk (SAR) designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal List of Wildlife Species at Risk (Canada, 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA) (Canada, 2002). On private or provincially-owned lands, only aquatic species and migratory birds listed as endangered, threatened or extirpated are protected under SARA, unless ordered by the Governor in Council.

### 2.2.2 *Endangered Species Act* (ESA)

Species at risk designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of Natural Resources and Forestry, species are added to the provincial *Endangered Species Act* (ESA) which came into effect June 30, 2008 (Ontario, 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA provides general habitat protection to all species listed as threatened or endangered. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. There are exemptions under the Act for certain activities, species and their habitats.

## 2.3 Fisheries Act

The purpose of the *Fisheries Act* (Canada, 1985) is to maintain healthy, sustainable and productive Canadian fisheries through the prevention of pollution, and the protection of fish and their habitat. In 2012, changes were made to the *Fisheries Act* to enhance Fisheries and Oceans Canada's (DFO) ability to manage threats to Canada's commercial, recreational and Aboriginal (CRA) fisheries. Revised project screening, reporting and mitigation tools were implemented in 2013 to make regulatory requirements clear and consistent and improve compliance (DFO, 2013a).

Projects affecting waterbodies supporting Canada's CRA fisheries must comply with the provisions of the *Fisheries Act*. The proponent is responsible for determining if the project is likely to cause impacts to CRA fish and if these impacts can be avoided or mitigated. The proponent must gather information on the type and scale of impact on the fishery and determine if the impacts will result in serious harm to fish. Proponents have a duty to maintain records of self-assessments completed for projects they undertake, and need to provide this information to DFO upon request. Serious harm to fish is defined as: the death of fish; and/or any permanent alteration to, or destruction of, fish habitat. If it is determined that the impacts cannot be avoided or mitigated and will result in serious harm to fish, an application for authorization must be submitted to DFO. Projects that have the potential to obstruct fish passage or affect flows needed by fish also require an authorization; even if these occur outside of CRA fishery areas (DFO, 2013a).

DFO has produced standard guidance tools, an online self-assessment process and documents to assist the proponent in determining the potential impacts on fish or fish habitat. These include the Fisheries Protection Policy Statement (DFO, 2013a) and the Pathway of Effects for routine activities, among others. Proponents of projects requiring a *Fisheries Act* Authorization are required to submit a Habitat Offsetting Plan, which provides

details of how the serious harm to fish will be offset, as well as outlining associated costs and monitoring commitments (DFO, 2013b). Proponents also have a duty to notify DFO of any unforeseen activities that cause serious harm to fish and outline the steps taken to address them.

## 2.4 South Nation Conservation

The South Nation Conservation Authority (SNC) is the governing body which regulates flood potential and natural heritage features in the South Nation River watershed. Development within regulated areas is governed by Regulation 170/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Legislative Assembly, 2006). Regulation 170/06 was derived under the authority of Ontario Regulation 97/04 and is specific to the SNC.

Under Ontario Regulation 97/04 a regulation may:

a) Restrict and regulate the use of water in or from rivers, streams, inland lakes, ponds, wetlands and natural or artificially constructed depressions in rivers or streams;

b) Prohibit, regulate or require the permission of the authority to straighten, change, divert, or interfere in any way with the existing channel of a river, creek, stream or watercourse, or change or interfere in any way with a wetland; and,

c) Prohibit, regulate or require the permission of the authority for development if, in the opinion of the authority, the control of flooding, erosion, dynamic beaches, or pollution, or the conservation of land may be affected by the development.

Development is not necessarily restricted within the SNC regulated area; however, it designates an area that triggers the need for a permit and, in most cases, an accompanying EIS.

Development of portions of the Site are located within the SNC regulated area and will require a permit from the SNC under the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

## 2.5 City of Ottawa

Proponents are required, under the City of Ottawa's OP, to prepare an EIS that documents the occurrence of significant natural heritage features in the proposed development area (Ottawa, 2013). The policies in the OP address both natural features as well as natural functions. The EIS must conform to the City of Ottawa EIS Guidelines (Ottawa, 2015).

The Site is currently designated in the OP as General Urban Area / Expansion Area, and lands immediately east of the Site are designated as Rural Natural Feature (RNF) (portion of the Findlay Creek Wetland RNF). No development is permitted within 120 m of an RNF unless it can be demonstrated through the EIS that there will be no negative impacts to the feature or its associated functions.

### 2.5.1 Environmental Management Plan

An Environmental Management Plan (EMP) was prepared by Golder (2016) for the portion of the LDA east of Bank Street, which includes the Site. The main objectives of the EMP were to identify and assess the natural features present on-Site, and develop options for future development that are consistent with provincial and municipal goals, objectives, and policies. Further, the EMP defined a recommended stormwater management plan for the planned urbanization of the Site, including conceptual servicing issues and constraints.

As it relates to the natural environment on and adjacent to the Site, the EMP made the following recommendations:

- Maintain surface water flows from the Site to the Findlay Creek Village SWM Facility, and eventually to Findlay Creek;
- Explore opportunities for maintaining suitable habitat on-Site for Monarch Butterfly, Rattlesnake Manna Grass and Eastern Milksnake; and,
- No intrusion into the Rural Natural Feature other than for implementation of the stormwater management expansion for the LDA.

The EMP also identified the following items that should be included in an EIS for the Site:

- An assessment of the potential impacts of the loss of natural cover within the development boundary, and associated mitigation recommendations;
- Determine the presence / absence of SAR and SWH not identified in this EMP and determine any impacts to those features associated with the proposed development;
- Explore opportunities for inclusion of natural or naturalized habitat in the site plan;
- Identification of any on-Site environmental features recommended for protection, considering grading and other servicing constraints for the Site; and,
- Detailed mitigation measures for avoiding impacts to the natural environment, including incorporation of the recommendations of Appendix 10 to the City of Ottawa EIS Guidelines document.

Further, it was recommended that a TCR be undertaken in accordance with the requirements of the City of Ottawa (2014) for the Site. The TCR is included in Appendix D.

# 3.0 METHODS

The methods used to gather and assess natural environment data on the Site including background research, on-Site field investigations and analysis using published guidelines and criteria, were presented in detail in the EMP (Golder, 2016). The data collected as part of the EMP were used as a baseline to assess the proposed development against the City EIS requirements.

## 3.1 Field Surveys

For clarity, field survey dates are presented in Table 1, as consolidated from the EMP (Golder 2016). Locations of all survey stations on-Site are provided in Figure 2.

**Table 1: Summary of Natural Environment Field Surveys in the Study area**

| Date | Type of Survey |
|---|---|
| September 12, 2013 | Reconnaissance (Muncaster) |
| September 17, 2013 | Reconnaissance (Muncaster) |
| April 25, 2014 | Amphibian Call-count Survey |
| May 23, 2014 | Amphibian Call-count Survey |
| June 7, 2014 | Breeding Bird Survey;<br>Ecological Land Classification (ELC);<br>Botanical Survey; Visual Encounter Survey |
| July 2, 2014 | Breeding Bird Survey;<br>Ecological Land Classification (ELC);<br>Botanical Survey; Visual Encounter Survey |
| April 23, 2015 | Amphibian Call-count Survey |
| May 28, 2015 | Amphibian Call-count Survey |
| August 12, 2015 | Ecological Land Classification (ELC); Tree Survey;<br>Visual Encounter Survey |
| September 18, 2015 | Ecological Land Classification (ELC); Tree Survey;<br>Visual Encounter Survey |

# 4.0 EXISTING CONDITIONS

The existing conditions on the Site, including natural environment, hydrology, hydrogeology, and surficial and bedrock geology are discussed in detail in the EMP (Golder, 2016). The EMP should be read in conjunction with this EIS.

The majority of the Site consists of abandoned agricultural fields in various stages of natural succession. The Site contains a single surface water conveyance ditch. East of the Site is a deciduous forest and swamp that is designated as an RNF in the City of Ottawa Official Plan. Surrounding land uses include agriculture and urban residential.

The Site lies within the South Nation Conservation (SNC) watershed, specifically the Shields Creek / North Castor River subwatershed. The main watercourse associated with the local landscape surrounding the Site is Findlay Creek, which drains an area of approximately 1383 ha, and eventually outlets to the North Castor River (City of Ottawa, 2004). Findlay Creek is located south of the Site (Figure 3).

# 5.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

The current concept plan was prepared by Annis, O'Sullivan and Vollebek Ltd. (AOV) (October 2015) and is provided on Figure 4. The proposed development consists of 222 single units and 203 townhome units, within a total of 12.77 ha. A mixed-use block is proposed along the Site's Bank Street frontage, for a total of 1.97 ha. Also proposed are a 2.00 ha park block, 0.69 ha of a school block to be shared with the property to the south, and a 0.08 ha walkway. The balance of the Site will consist of streets (7.46 ha) and a future access block (0.05 ha). The development will be serviced with municipal water and sewer lines. The development will be serviced by the existing off-Site Findlay Creek Village SWM Facility, which is discussed further in Section 5.1.

## 5.1 Stormwater Management Plan

The stormwater management concept for the LDA was developed in the Leitrim Development Area Stormwater Management Environmental Study Report and Pre-Design (CCL, May 1995), and was consolidated in the Addendum to Leitrim Development Area Stormwater Management Environmental Study Report and Pre-Design (CCL and IBI Group, July 2005) and the Final Serviceability Report Leitrim Development Area City of Ottawa (IBI Group, March 2007). From a planning perspective, and in the context of the stormwater management system and overall servicing, the existing system consists of a dual drainage system; trunk storm sewers; two end-of-pipe SWM facilities; the wetland berm and outlet control structure; the Del Zotto flow splitter; the Findlay Creek extension, and the North-South Swale.

Following analysis completed by IBI, it was recommended that the runoff from the LDA be conveyed to a stormwater management facility for water quantity control and quality treatment. To accommodate this, the existing Findlay Creek Village SWM Facility may require expansion.

The stormwater management recommendations are as follows:

- The servicing of the Site will be a dual drainage system with minor flow conveyed to the Findlay Creek Village SWM Facility via an independent trunk storm sewer. During infrequent storm events, major flow will cascade to the SWM Facility;
- To accommodate the Site, the Findlay Creek Village SWM Facility may require expansion to achieve water quantity and quality targets;
- The outlet structure for existing Findlay Creek Village SWM Facility is not to be modified; that is, outflow rates from the facility are to be maintained; and,
- Site level, or source control, best management practices (BMPs) are proposed across the Site. As with other similar developments within the LDA, mitigating controls are proposed for the final development, as well as during construction. On the individual lots, the mitigation measures include flat lot grading; split lot drainage; and pre-installation of roof leader splash pads. Across the development, this includes vegetative planting and the installation of low permeability clay barriers in the servicing trenches to assist in maintaining the existing groundwater levels. In addition to source control BMPs, conveyance control BMPs are proposed, including flat vegetated swales, pervious rearyard drainage, and catchbasin sumps.

## 5.2 Buffer Recommendations and Linkages

The need to protect and enhance the natural heritage features within and adjacent to the Site was addressed in the development of the proposed design plan. Golder has reviewed the natural features in the local landscape in relation to the proposed development, through both desktop and field surveys, and has not identified the need for any buffer or linkage features at the Site.

# 6.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES

The significant natural features associated with the Site, as defined in the PPS and the Natural Heritage Reference Manual (NHRM) (MNRF, 2010), were identified and characterized in the EMP (Golder, 2016). Although each of the identified features is discussed below for context, the EMP includes more detailed discussion. The following is an assessment of the effects of the proposed development on the Site on natural heritage features. Significant natural features identified at the Site are shown on Figure 3.

## 6.1 Fish Habitat

The surface water features located at the Site are intermittent, and disconnected from Findlay Creek by a grated drop structure. Therefore, these features are not considered fish habitat for the purposes of this report. They do, however, contribute flows via the Findlay Creek Village SWM facility to Findlay Creek east of Bank Street, which is a well-documented cool and coldwater habitat for fish.

In view of the subsurface conditions, it is expected that the quantity of deeper groundwater recharge from precipitation that falls on the Site is very small (Golder, 2016). Similarly, in view of the presence of the Findlay Creek Village SWM Facility and the limited areal influence of Findlay Creek to locally induce groundwater discharge, the change in surface runoff to Findlay Creek or local shallow groundwater discharge to Findlay Creek due to the proposed development is expected to be negligible in terms of flow in the Creek (Golder, 2016). In addition, storm drainage from the developed lands will be directed to Findlay Creek via the SWM facility.

As such, in term of the water budget for these lands, it is expected that the proposed development will not alter in a meaningful way the present contribution of infiltrating precipitation to flow in Findlay Creek (Golder, 2016). The effect of development is also expected to result in more effective conveyance of storm runoff to Findlay Creek via the SWM Facility, from which discharge of treated stormwater is provided at a controlled rate.

## 6.2 Significant Wildlife Habitat

Significant wildlife habitat (SWH) on the Site has been identified using provincial guidelines including the Natural Heritage Reference Manual (MNRF, 2010), the Significant Wildlife Habitat Technical Guide (SWHTG; MNRF, 2000a), the Significant Wildlife Habitat Decision Support System (MNRF 2000b), and the Significant Wildlife Habitat Ecoregion Criteria Schedules (MNRF, 2015). The types of SWH identified on the Site are described below. The Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF, 2014) was used to determine appropriate mitigation for disturbance or removal of SWH.

### 6.2.1 Species of Conservation Concern

Suitable habitat for two species of conservation concern was identified on the Site: monarch butterfly and eastern milksnake. Monarch butterfly may utilize the open areas of the Site where flowering plants and milkweed are present. Eastern milksnake may utilize all habitats on the Site. Golder does not consider the habitats for these species on the Site significant within the planning district, given that suitable habitats for these species are widespread in the rural areas of the City of Ottawa, and the Site does not represent unique or particularly large habitats for any of these species. However, opportunities for maintenance of these species on-Site could include naturalized plantings (including milkweed and other flowering plants) within the park block at the eastern edge of the Site (Figure 4).

In addition, a regionally rare plant species (Rattlesnake Manna Grass) was observed in the small wetland community on-Site. This species and its habitats are not afforded specific protection; however, this species could be transplanted to a nearby suitable habitat that will be unaffected by the proposed development prior to Site clearing.

### 6.2.2 Rural Natural Feature

The significant natural features associated with the RNF were detailed in the EMP (Golder, 2016), which should be read in conjunction with this report. As a brief summary, the following features were identified:

- Habitat for Endangered and Threatened Species;
- Specialized Habitats [Interior Forest and Amphibian Breeding (Woodland)]; and,
- Habitat for Species of Conservation Concern.

No physical intrusion into the RNF is proposed as part of this development, therefore no direct impacts to the RNF or associated significant functions and features are anticipated to result from the proposed development.

The proposed development has the potential to indirectly impact the RNF through changes to hydrology and hydrogeology, which could affect conditions in the RNF. As described in the EMP, development activities that have the potential to affect the hydrogeological regimes are:

- Temporary trench dewatering during installation of services, in particular trenching into the upper portion of the dolomitic bedrock; and,
- Alterations to Site drainage.

A hydrogeological assessment will be completed for the purpose of preparing a Permit to Take Water application for Site servicing. As described in the EMP, based on previous experience in the LDA, in very similar subsurface conditions, it is not expected that temporary dewatering for sewer installation will have an impact on the hydrology and hydrogeology of the RNF. As discussed in Section 6.1, changes to Site drainage are unlikely to impact shallow or deep groundwater levels in the landscape.

Based on this, no impacts to the significant features associated with the RNF are anticipated to result from the proposed development.

# 7.0 POTENTIAL DIRECT IMPACTS

## 7.1 Construction Impacts

Construction impacts have the potential to negatively affect the RNF adjacent to the Site, as well as non-significant natural features on the Site, including loss of overall biodiversity on the Site through removal of vegetation and wildlife habitat.

Activities related to Site preparation and development such as grading, filling, and presence of heavy machinery can cause soil erosion and compaction, while machinery can destroy over-hanging vegetation. Encroachment into the RNF can also occur by machinery, foot traffic, and discarding or storage of construction materials outside the construction envelope. These impacts will be avoided through implementation of standard construction practices, as outlined in Section 8.2.1.

Generally, noise generated by construction activities represents a short-term disturbance to wildlife using the adjacent natural areas. It is expected that with the completion of construction, wildlife will quickly return to their normal use patterns within the natural areas adjacent to the development. Loss of biodiversity on the Site due to construction (i.e., site clearing) will be mitigated through naturalized plantings wherever possible in the development, including parks and streetscapes.

## 7.2 Human Impacts

Many of the chronic impacts that can occur in urban natural areas are not a result of degradation of the edge of the natural features, but a dramatic increase in human use through the entire system. The residential development may result in a marginal increase in potential disturbance to the adjacent natural features through the following potential impacts:

- Light pollution;
- Increased noise;
- Introduction of exotic species;
- Increased human influence (ad-hoc trails, dumping, edge encroachment); and,
- Mortality of wildlife from loose pets.

The key measure employed in the proposed design plan to mitigate for these potential effects is the placement of a large park block adjacent to the RNF, with the remaining interface composed of rear yards. This will reduce light and noise pollution associated with road traffic, and the park feature will encourage nature enjoyment at the periphery of the RNF. Additional mitigation measures are outlined in Section 8.2.2.

# 8.0 MITIGATION AND MONITORING

## 8.1 Monitoring

Monitoring programs are developed to assess the effectiveness of mitigation measures implemented at a project location. For the proposed project, the key mitigation measure is avoidance of natural features and thereby avoidance of direct impacts to those features, through the proposed development design. Given that no negative effects to the natural environment are anticipated to result from the proposed project, nor are any enhancement opportunities planned, no monitoring is recommended.

Stormwater from the Site, once developed, will flow into the existing Findlay Creek Village SWM Facility. Because this facility is already operational and has been found to function as expected, no monitoring of the facility, as part of this proposed project, is proposed. Proposed monitoring proposed related to performance of, and potential effects from, the Findlay Creek Village SWM Facility itself are discussed in Section 6.6.2 of the EMP.

## 8.2 Mitigation

### 8.2.1 Construction Best Management Practices

Standard BMPs to be implemented or followed during construction to mitigate potential impacts to the adjacent natural features include the following:

- The development envelope shown in the design plan (AOV, 2015) be clearly demarcated and maintained;
- No removal of vegetation during the active season for breeding birds (April 15 – August 15), unless construction disturbance is preceded by a nesting survey conducted by a qualified biologist;
- Clearing of vegetation should begin at Bank Street and move eastward to allow wildlife the opportunity to leave the construction area safely (ensure gaps in construction boundary fencing are maintained until vegetation clearing is complete);
- Adherence to recommendations of the TCR with respect to clearing along the edge of the RNF;
- Installation of clay barriers through the permeable service trench bedding and backfill materials as they are constructed; and,
- Implementation of other standard BMPs, including sediment and erosion controls, spill prevention, etc. during the construction phase of the project.

### 8.2.2 Light, Dust and Noise

Potential human impacts to the adjacent RNF can be further mitigated through the following:

- Avoid direct glare beyond the property boundaries that abut natural features by installing low intensity and downward pointing lights;
- Turn off outdoor lighting when not in use, except where used for security and safety;
- Consider the use of motion sensors on all safety and security lighting;
- Develop and distribute an Owner Awareness Package to all residents; and,
- Implement standard BMPs to mitigate noise and dust on the Site during the construction phase of the project.

# 9.0 CUMULATIVE EFFECTS

Cumulative effects assessment considers the potential for additive impacts to the local landscape due to existing and future development. With the exception of the Rural Natural Feature present east of the Site, the local landscape consists of urban development west of Bank Street, existing and planned urban development north of the Site, and cleared lands and agriculture to the south. Therefore the Site is located in an urbanized and urbanizing area, with significant infrastructure, commercial and urban residential development. No intrusion into the adjacent RNF is proposed as part of this development, therefore no impacts to the RNF are anticipated provided appropriate mitigation measures are employed. The proposed development is not anticipated to negatively affect any significant natural features, therefore cumulative effects to the natural environment are not anticipated to result from the proposed development.

The City of Ottawa EIS guidelines include consideration of cumulative impacts. Cumulative impacts are compounded environmental effects that may result due to multiple or successive development or site alteration activities. Cumulative impacts may affect natural features or their ecological functions, water quality or quantity, sensitive surface or groundwater features, and their related hydrologic functions.

Potential cumulative impacts were estimated by considering project effects within an expanded geographic area as well as a longer timeframe. For this analysis, cumulative impacts were considered for projects and developments potentially affecting the adjacent RNF in the past and future (approximately 10 years).

The impact analysis in this report concludes that there are no negative effects anticipated on natural features from this proposed development. For an assessment of cumulative effects, only residual effects as a result of a project are carried forward. Although the proposed development will not contribute to cumulative effects in the planning area, a discussion of the anticipated projects has been included below.

The City has provided some details on a number of other projects in the area that should be considered in conjunction with the proposed development on the Site.

There are a number of road network and transportation master plan proposals that will be implemented in the next 10 - 30 years, including the Bank Street widening, the light rail transit (LRT) to Leitrim, and the Leitrim Road realignment. There is also a proposal for an extension of Earl Armstrong Road from Albion Road to Hawthorne Road; this project has been removed from the latest version of the Transportation Master Plan because of disagreement over the conceptual realignment.

In general, the local landscape consists of urban development west of Bank Street, existing and planned urban development north of the Site, and planned urban development and agriculture to the south. Therefore the Site is located in an urbanized and urbanizing area, with significant infrastructure, commercial and urban residential development.

All of the projects noted above would require (or have completed) either an EIS or an Environmental Assessment (EA), including an analysis of potential impacts to the local landscape and environmental heritage features, to be completed prior to approval and development. Overall, the road works are all located outside of the RNF and would not have an adverse effect on its form or function. Similarly, anticipated residential development of the lands to the north and south would not have a direct negative effect on the RNF.

No other cumulative impacts from other projects were evident at the time this report was prepared.

# 10.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed development at 4789 Bank Street has been assessed for potential ecological impacts under the Provincial Policy Statement, and other policies and regulations, including Section 2.4.2 of the City of Ottawa Official Plan, as well as the *Endangered Species Act*.

The proposed development meets the recommendations of the Environmental Management Plan (Golder 2016) prepared for the Urban Expansion Land Areas 9a and 9b.

Based on these analyses, it is expected that there will be no negative impacts to the significant natural features and functions on the Site or in the adjacent RNF. These conclusions are based on the following recommendations:

- Maintain the development envelope shown in the design plan (AOV, 2015);
- Adhere to the principles and general approach included in the Update to the Serviceability Report (IBI, 2007);
- Refrain from removing vegetation during the active season for breeding birds (April 15 – August 15), unless construction disturbance is preceded by a nesting survey conducted by a qualified biologist;
- Schedule clearing of vegetation to begin at Bank Street and move eastward to allow wildlife the opportunity to leave the construction area safely (ensure gaps in construction boundary fencing are maintained until vegetation clearing is complete);
- Adhere to the recommendations of the TCR when clearing adjacent to the RNF;
- Install the clay barriers through the permeable service trench bedding and backfill materials as they are constructed;
- Prepare and distribute an Owner Awareness Package for all residents of the proposed development to increase awareness of the sensitivity of the adjacent RNF;
- Undertake any monitoring required by the PTTW; and,
- Implement mitigation as outlined in Section 8.2 during the construction and operational phases of the project.

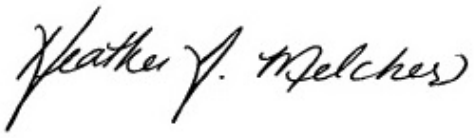
Maintain and enhance natural habitat wherever possible as per Section 6.2.1.

## 11.0 CLOSURE

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

**GOLDER ASSOCIATES LTD.**

Gwendolyn Weeks, B.Sc.(Env)
Ecologist



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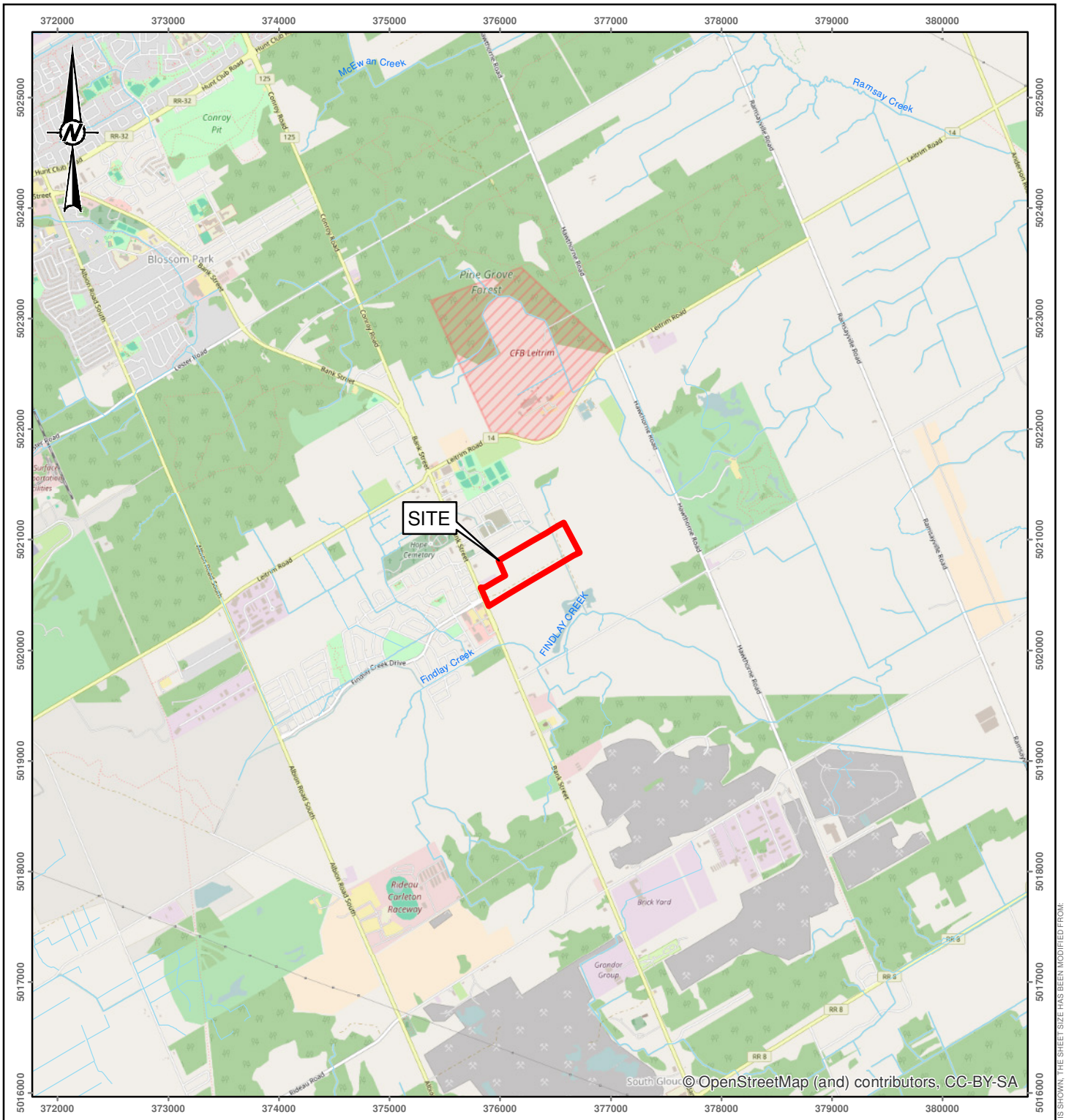


0 500 1,000 2,000

SCALE 1:50,000 METRES

CLIENT
CLARIDGE HOMES

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
4789 BANK STREET

TITLE
**KEY PLAN**

CONSULTANT
Golder Associates

| | |
|---|---|
| YYYY-MM-DD | 2016-10-06 |
| PREPARED | JEM/BR |
| DESIGN | GW |
| REVIEW | HM |
| APPROVED | HM |

| PROJECT | PHASE | Rev. | FIGURE |
|---|---|---|---|
| 1311210186 | 4000 | A | 1 |

**NOTES**

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1311210186/4000.

**REFERENCE**

PROJECTION: MODIFIED TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
0

Path: N:\Active\2013\1121 - Geotechnical\13-1121-0186 Claridge Kellam Lands Bank St\Spatial\MXD\Reporting\Phase4000_EIS\EnvironmentalImpactStatement_EIS\1311210186-4000-01.mxd


LEGEND

- AMPHIBIAN CALL-COUNT STATION
- BREEDING BIRD STATION
- ROADWAY
- STUDY AREA

KEY

CUM: MIXED MEADOW
CUT 1A/CUT 1B/CUT 1C: DECIDUOUS THICKET
CUM/CUT: MIXED MEADOW-DECIDUOUS THICKET COMPLEX
FOC 2-2: DRY-FRESH WHITE CEDAR CONIFEROUS FOREST
MAS 2-1: CATTAIL MINERAL SHALLOW MARSH
SWT 2-2: WILLOW MINERAL THICKET SWAMP

NOTES

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REFERENCE

LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2011
PROJECTION: MODIFIED TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

0 30 60 120
SCALE 1:3,000 METRES

CLIENT
CLARIDGE HOMES

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
4789 BANK STREET

TITLE
**ECOLOGICAL LAND CLASSIFICATION AND SURVEY LOCATIONS**

CONSULTANT
Golder Associates

| | |
|---|---|
| YYYY-MM-DD | 2016-10-06 |
| PREPARED | JEM/BR |
| DESIGN | GW |
| REVIEW | HM |
| APPROVED | HM |

| PROJECT No. | PHASE | Rev. | FIGURE |
|---|---|---|---|
| 1311210186 | 4000 | A | 2 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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LEGEND

- WATERCOURSE
- RURAL NATURAL FEATURE
- HABITAT FOR REGIONALLY RARE RATTLESNAKE MANNA GRASS
- STUDY AREA

NOTES

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1311210186/4000.

REFERENCE

LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2011
PROJECTION: MODIFIED TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

0 75 150 300
SCALE 1:7,500 METRES

CLIENT
CLARIDGE HOMES

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
4789 BANK STREET

TITLE
**SIGNIFICANT NATURAL FEATURES**

CONSULTANT
Golder Associates

| | |
|---|---|
| YYYY-MM-DD | 2016-10-06 |
| PREPARED | JEM/BR |
| DESIGN | GW |
| REVIEW | HM |
| APPROVED | HM |

| PROJECT No. | PHASE | Rev. | FIGURE |
|---|---|---|---|
| 1311210186 | 4000 | A | 3 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 25mm

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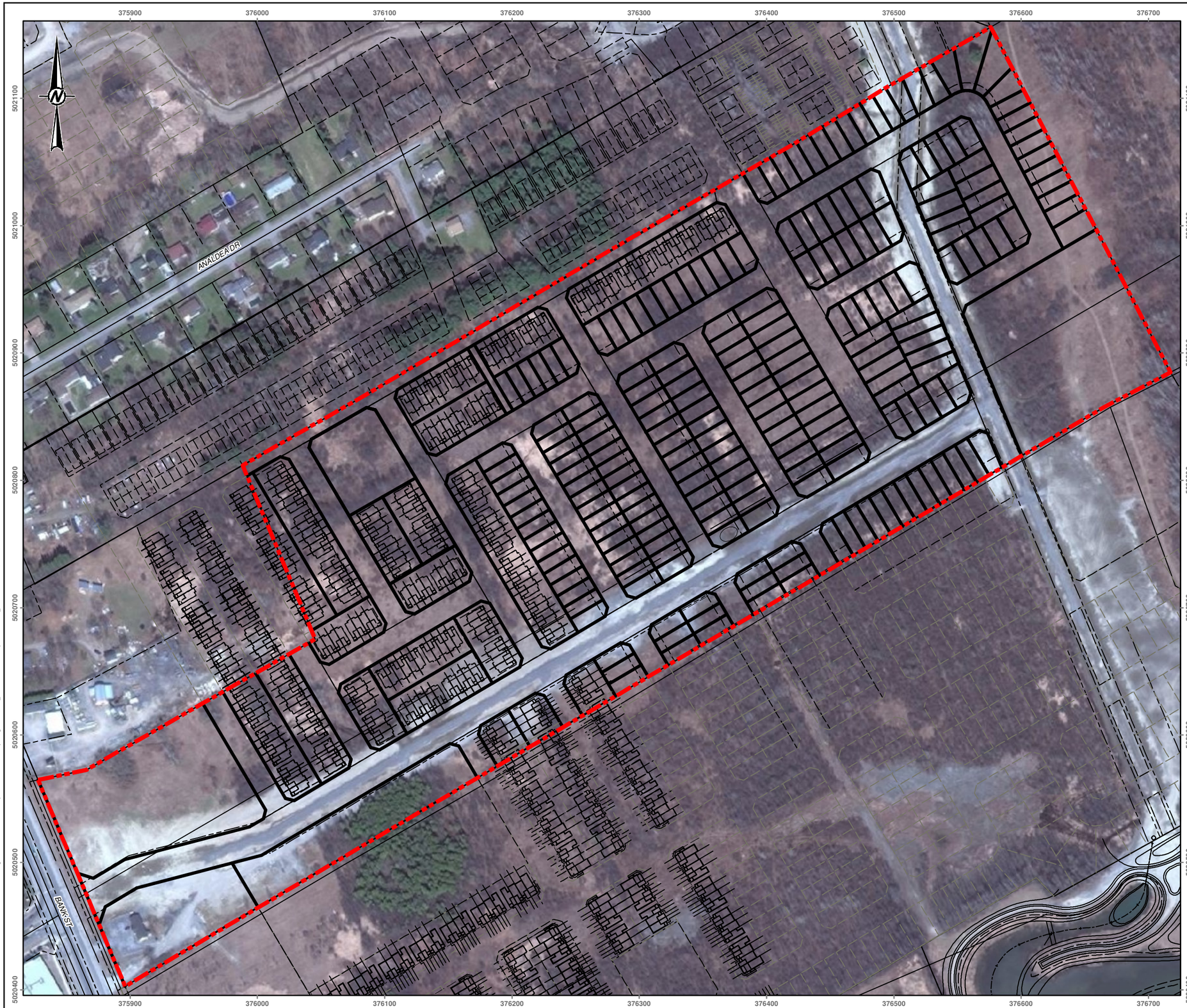



LEGEND

ROADWAY

STUDY AREA

NOTES

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1311210186/4000.

REFERENCE

BASEPLAN PROVIDED IN AUTOCAD FORMAT BY CLARIDGE HOMES, 2016-03-21.
LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2011
PROJECTION: MODIFIED TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

0 30 60 120
SCALE 1:3,000 METRES

CLIENT
CLARIDGE HOMES

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
4789 BANK STREET

TITLE
**PROPOSED SITE PLAN**

CONSULTANT
Golder Associates

| | |
|---|---|
| YYYY-MM-DD | 2016-10-06 |
| PREPARED | JEM/BR |
| DESIGN | GW |
| REVIEW | HM |
| APPROVED | HM |

| PROJECT No. | PHASE | Rev. | FIGURE |
|---|---|---|---|
| 1311210186 | 4000 | A | 4 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm
0

Path: N:\Active\2013\1121 - Geotechnical\13-1121-0186 Claridge Kellam Lands Bank St\Spatial\MXD\Reporting\Phase 4000_EIS\Environmental\ImpactStatement_EIS\1311210186-4000-04.mxd

# APPENDIX A

## Vascular Plants Observed in the Study Area

**April 2016**
**Report No.** 13-1121-0186/4000

Golder Associates

| Scientific Name | Common Name | Origin[a] | Global Rarity Status[b] | Ontario Rarity Status[b] | SARA[c] | ESA[d] | Location[e] |
|---|---|---|---|---|---|---|---|
| *Acer negundo* | Manitoba maple | (N) | G5 | S5 | Not Listed | Not Listed | 1,4 |
| *Acer rubrum* | Red maple | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Achillea millefolium* | Common yarrow | I | G5T5? | SNA | Not Listed | Not Listed | 1 |
| *Agrostis gigantea* | Red top | I | G4G5 | SNA | Not Listed | Not Listed | 1,2 |
| *Alisma triviale* | Small-flowered water plantain | N | G5 | S5 | Not Listed | Not Listed | 2 |
| *Ambrosia artemisiifolia* | Ragweed | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Apocynum androsaemifolium* | Spreading dogbane | N | G5 | S5 | Not Listed | Not Listed | 1,2,4 |
| *Apocynum cannabinum* | Indian hemp | N | GNR | S5 | Not Listed | Not Listed | 1 |
| *Artemisia vulgaris* | Common wormwood | I | GU | SNA | Not Listed | Not Listed | 1 |
| *Asclepias syriaca* | Common milkweed | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Betula papyrifera* | White birch | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Betula pendula* | European white birch | I | GNR | SNA | Not Listed | Not Listed | 1,2 |
| *Bidens cernua* | Nodding beggar-ticks | N | G5 | S5 | Not Listed | Not Listed | 2 |
| *Bidens frondosa* | Beggar-ticks | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Bromus inermis* | Smooth brome | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Carex crinita* | Fringed sedge | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Carex projecta* | Necklace sedge | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Carex* spp. | Sedge species | N | ? | ? | Not Listed | Not Listed | 1,2,3 |
| *Carex stipata* | Awl-fruited sedge | N | G5 | S5 | Not Listed | Not Listed | 2 |
| *Carex vulpinoidea* | Fox sedge | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Cerastium fontanum* | Mouse-ear chickweed | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Chenopodium album* | Lamb's-quarters | I | G5T5 | SNA | Not Listed | Not Listed | 1 |
| *Cichorium intybus* | Chicory | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Cicuta bulbifera* | Bulb-bearing water-hemlock | N | G5 | S5 | Not Listed | Not Listed | 2 |
| *Circaea lutetiana* | Enchanter's nightshade | N | G5 | S5 | Not Listed | Not Listed | 1,4 |
| *Cirsium arvense* | Canada thistle | I | GNR | SNA | Not Listed | Not Listed | 1,2 |
| *Cirsium vulgare* | Bull thistle | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Clematis virginiana* | Virgin's-bower | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Clinopodium vulgare* | Wild basil | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Conyza canadensis* | Horseweed | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Cornus stolonifera* | Red osier dogwood | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Dactylis glomerata* | Orchard grass | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Daucus carota* | Wild carrot | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Dianthus armeria* | Deptford pink | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Dichanthelium acuminatum* | Small panic grass | N | G5T5 | S4S5 | Not Listed | Not Listed | 1 |
| *Doellingeria umbellata* | Flat-topped aster | N | G5T5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Echinochloa crusgalli* | Barnyard grass | I | GNR | SNA | Not Listed | Not Listed | 1,2,3 |
| *Echium vulgare* | Viper's bugloss | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Eleocharis* sp. | Spike rush species | N | ? | ? | Not Listed | Not Listed | 2,3 |
| *Elodea canadensis* | Canada waterweed | N | G5 | S5 | Not Listed | Not Listed | 2 |
| *Elymus repens* | Quack grass | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Equisetum arvense* | Field horsetail | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Erigeron annuus* | Daisy fleabane | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Erigeron philadelphicus* | Philadelphia fleabane | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Eupatorium perfoliatum* | Boneset | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Euthamia graminifolia* | Grass-leaved goldenrod | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Eutrochium maculatum* | Joe-pye weed | N | G5TNR | S5 | Not Listed | Not Listed | 1,2,3 |
| *Fragaria virginiana* | Common strawberry | N | G5 | S5 | Not Listed | Not Listed | 1,4 |
| *Fraxinus pennsylvanica* | Green ash | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Galium mollugo* | White bedstraw | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Galium palustre* | Marsh bedstraw | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Geum aleppicum* | Yellow avens | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Glyceria canadensis* | Rattlesnake manna grass | N | G5 | S4S5 | Not Listed | Not Listed | 1,2 |
| *Glyceria grandis* | Tall manna grass | N | G5 | S4S5 | Not Listed | Not Listed | 2 |
| *Glyceria striata* | Fowl manna grass | N | G5T5 | S4S5 | Not Listed | Not Listed | 1,2,3 |
| *Heliopsis helianthoides* | Ox-eye | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Hieracium aurantiacum* | Orange hawkweed | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Hieracium piloselloides* | King devil | I | GNR | SNA | Not Listed | Not Listed | 1,2 |
| *Hypericum perforatum* | Common St. John's-wort | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Impatiens capensis* | Spotted Jewelweed | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Juncus effusus* | Soft rush | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Juncus* spp. | Rushes | N | ? | ? | Not Listed | Not Listed | 1,2,3 |
| *Lactuca serriola* | Prickly lettuce | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Leersia oryzoides* | Rice cut-grass | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Lemna minor* | Duckweed | N | G5 | S5 | Not Listed | Not Listed | 1 |

| Scientific Name | Common Name | Origin[a] | Global Rarity Status[b] | Ontario Rarity Status[b] | SARA[c] | ESA[d] | Location[e] |
|---|---|---|---|---|---|---|---|
| *Leonurus cardiaca* | Common motherwort | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Leucanthemum vulgare* | Ox-eye daisy | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Linaria vulgaris* | Butter-and-eggs | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Lonicera tatarica* | Tartarian honeysuckle | I | GNR | SNA | Not Listed | Not Listed | 1,3,4 |
| *Lotus corniculatus* | Bird's-foot trefoil | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Lycopus americanus* | American water-horehound | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Lycopus uniflorus* | Northern water-horehound | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Lythrum salicaria* | Purple loosestrife | I | G5 | SNA | Not Listed | Not Listed | 1,2,3 |
| *Malus pumila* | Apple | I | G5 | SNA | Not Listed | Not Listed | 1 |
| *Malva moschata* | Musk mallow | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Medicago sativa* | Alfalfa | I | GNR | S5 | Not Listed | Not Listed | 1 |
| *Melilotus alba* | White sweet clover | I | G5 | SNA | Not Listed | Not Listed | 1 |
| *Mentha arvensis* | Field mint | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Oenothera biennis* | Common evening-primrose | N | G5 | S5 | Not Listed | Not Listed | 1,4 |
| *Onoclea sensibilis* | Sensitive fern | N | G5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Oxalis stricta* | Common yellow wood-sorrel | N | G5 | S5 | Not Listed | Not Listed | 1,4 |
| *Panicum capillare* | Witch grass | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Parthenocissus inserta* | Virginia creeper | N | G5 | S5 | Not Listed | Not Listed | 1,2,3,4 |
| *Pastinaca sativa* | Parsnip | I | GNR | SNA | Not Listed | Not Listed | 1,4 |
| *Persicaria maculosa* | Lady's-thumb | I | G3G5 | SNA | Not Listed | Not Listed | 1 |
| *Phalaris arundinacea* | Reed canary grass | N | G5 | S5 | Not Listed | Not Listed | 1,2, |
| *Phleum pratense* | Timothy | I | GNR | SNA | Not Listed | Not Listed | 1,3 |
| *Pinus resinosa* | Red pine | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Plantago major* | Common plantain | I | G5 | SNA | Not Listed | Not Listed | 1 |
| *Plantago rugelii* | Rugel's plantain | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Poa palustris* | Fowl bluegrass | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Poa pratensis* | Kentucky bluegrass | I | G5T5? | SNA | Not Listed | Not Listed | 1,4 |
| *Populus alba* | White poplar | I | G5 | SNA | Not Listed | Not Listed | 1,4 |
| *Populus balsamifera* | Balsam poplar | N | G5 | S5 | Not Listed | Not Listed | 1,3,4 |
| *Populus deltoides* | Eastern cottonwood | N | G5T5 | S5 | Not Listed | Not Listed | 1,3 |
| *Populus tremuloides* | Trembling aspen | N | G5 | S5 | Not Listed | Not Listed | 1,3,4 |
| *Potentilla argentea* | Silvery cinquefoil | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Potentilla norvegica* | Rough cinquefoil | I | G5 | S5 | Not Listed | Not Listed | 1 |
| *Potentilla recta* | Rough-fruited cinquefoil | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Prunella vulgaris* | Heal-all | N | G5T5 | S5 | Not Listed | Not Listed | 1,2,3,4 |
| *Prunus virginiana* | Choke cherry | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Ranunculus acris* | Common buttercup | I | G5 | SNA | Not Listed | Not Listed | 1 |
| *Rhamnus cathartica* | Common buckthorn | I | GNR | SNA | Not Listed | Not Listed | 1,4 |
| *Rhamnus frangula* | Glossy buckthorn | I | GNR | SNA | Not Listed | Not Listed | 1,2,3 |
| *Rhus typhina* | Staghorn sumac | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Rubus idaeus* | Red raspberry | N | G5T5 | S5 | Not Listed | Not Listed | 1,3 |
| *Rumex crispus* | Curled dock | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Salix bebbiana* | Beaked willow | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Salix discolor* | Pussy willow | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Salix petiolaris* | Slender willow | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Sambucus canadensis* | Common elderberry | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Saponaria officinalis* | Bouncing-bet | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Scirpus cyperinus* | Wool-grass | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Scirpus hattorianus* | Black bulrush | N | G5 | S4 | Not Listed | Not Listed | 1,2,3 |
| *Silene vulgaris* | Bladder campion | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Sisyrinchium montanum* | American blue-eyed grass | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Solanum dulcamara* | Climbing nightshade | I | GNR | SNA | Not Listed | Not Listed | |
| *Solidago canadensis* | Canada goldenrod | N | G5T5 | S5 | Not Listed | Not Listed | 1,2,3,4 |
| *Solidago rugosa* | Rough goldenrod | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Sonchus arvensis* | Common sow-thistle | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Spiraea alba* | Meadowsweet | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Symphyotrichum cordifolium* | Heart-leaved aster | N | G5 | S5 | Not Listed | Not Listed | 1 |
| *Symphyotrichum lanceolatum* | Panicled aster | N | G5T5 | S5 | Not Listed | Not Listed | 1,2,3 |
| *Symphyotrichum lateriflorum* | Calico aster | N | G5T? | S5 | Not Listed | Not Listed | 1,4 |
| *Taraxacum officinale* | Common dandelion | I | G5 | SNA | Not Listed | Not Listed | 1 |
| *Trifolium aureum* | Yellow hop-clover | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Trifolium hybridum* | Alsike clover | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Trifolium pratense* | Red clover | I | GNR | SNA | Not Listed | Not Listed | 1,4 |
| *Trifolium repens* | White clover | I | GNR | SNA | Not Listed | Not Listed | 1,3 |
| *Turritis glabra* | Tower mustard | N | G5 | S5 | Not Listed | Not Listed | 1 |

| Scientific Name | Common Name | Origin[a] | Global Rarity Status[b] | Ontario Rarity Status[b] | SARA[c] | ESA[d] | Location[e] |
|---|---|---|---|---|---|---|---|
| *Tussilago farfara* | Colt's-foot | I | GNR | SNA | Not Listed | Not Listed | 1,3 |
| *Typha latifolia* | Common cattail | N | G5 | S5 | Not Listed | Not Listed | 2,3 |
| *Ulmus americana* | White elm | N | G5? | S5 | Not Listed | Not Listed | 1,2,3 |
| *Urtica dioica* | Stinging nettle | N | G5T? | S5 | Not Listed | Not Listed | 1,2,3 |
| *Verbena hastata* | Blue vervain | N | G5 | S5 | Not Listed | Not Listed | 1,2 |
| *Viburnum lentago* | Nannyberry | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Vicia cracca* | Cow-vetch | I | GNR | SNA | Not Listed | Not Listed | 1 |
| *Vitis riparia* | Riverbank grape | N | G5 | S5 | Not Listed | Not Listed | 1,3 |
| *Xanthium strumarium* | Cocklebur | N | G5 | S5 | Not Listed | Not Listed | 1 |

**Notes:**

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

[b] Ranks based upon determinations made by the Ontario Natural Heritage Information Centre (2014).

G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.

SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

[c] Canada Species at Risk Act (Schedule 1; checked August September)

[d] Ontario Endangered Species Act (O. Reg. 4/12 amending O.Reg.230/08; checked September 2014)

[e] Location - 1. CUM/CUT - Cultural Meadows/Cultural Thickets, 2. MAS 2-1 Cattail Mineral Shallow Marsh, 3. SWT2-2 Willow Mineral Thicket Swamp, 4. FOC 2-2 Dry-Fresh White Cedar Coniferous Forest

# APPENDIX B

## Wildlife Observed in the Study Area

**April 2016**
**Report No.** 13-1121-0186/4000

| Common Name | Scientific Name | Origin[a] | Global Rarity Status[b] | Ontario Rarity Status[b] | SARA[c] | ESA[d] |
|---|---|---|---|---|---|---|
| **(Mammals)** | | | | | | |
| Coyote | *Canis latrans* | N | S5 | G5 | | |
| Deer mouse | *Peromyscus sp.* | N | S5 | G5 | | |
| Eastern cottontail | *Sylvilagus floridanus* | N | S5 | G5 | | |
| Racoon | *Procyon lotor* | N | S5 | G5 | | |
| White-tailed deer | *Odocoileus virginianus* | N | S5 | G5 | | |
| Woodchuck | *Monax monax* | N | S5 | G5 | | |
| **(Birds)** | | | | | | |
| Alder flycatcher | *Empidonax alnorum* | N | S5B | G5 | | |
| American crow | *Corvus brachyrhynchos* | N | S5B | G5 | | |
| American goldfinch | *Carduelis tristis* | N | S5B | G5 | | |
| American redstart | *Setophaga ruticilla* | N | S5B | G5 | | |
| American robin | *Turdus migratorius* | N | S5B | G5 | | |
| Baltimore oriole | *Icterus galbula* | N | S4B | G5 | | |
| Black-capped chickadee | *Poecile atricapilla* | N | S5 | G5 | | |
| Blue Jay | *Cyanocitta cristata* | N | S5 | G5 | | |
| Chipping sparrow | *Spizella passerina* | N | S5B | G5 | | |
| Common grackle | *Quiscalus quiscula* | N | S5B | G5 | | |
| Eastern kingbird | *Tyrannus tyrannus* | N | S4B | G5 | | |
| European starling | *Sturnus vulgaris* | I | SNA | G5 | | |
| Gray catbird | *Dumetella carolinensis* | N | S4B | G5 | | |
| Killdeer | *Charadrius vociferus* | N | S5B, S5N | G5 | | |
| Mourning dove | *Zenaida macroura* | N | S5 | G5 | | |
| Northern flicker | *Colaptes auratus* | N | S4B | G5 | | |
| Red-eyed vireo | *Vireo olivaceus* | N | S5B | G5 | | |
| Red-winged blackbird | *Agelaius phoeniceus* | N | S4 | G5 | | |
| Song sparrow | *Melospiza melodia* | N | S5B | G5 | | |
| Spotted sandpiper | *Actitis macularia* | N | S5 | G5 | | |
| Swamp Sparrow | *Melospiza georgiana* | N | S5B | G5 | | |
| Veery | *Catharus fuscescens* | N | S4B | G5 | | |
| White-throated sparrow | *Zonotrichia albicollis* | N | S5B | G5 | | |
| Yellow warbler | *Setophaga petechia* | N | S5B | G5 | | |
| **(Herpetiles)** | | | | | | |
| American toad | *Bufo americanus* | N | S5 | G5 | | |
| Northern Leopard Frog | *Rana pipiens* | N | S5 | G5 | | |
| Spring Peeper | *Pseudacris crucifer* | N | S5 | G5 | | |
| Gray Treefrog | *Hyla versicolor* | N | S5 | G5 | | |
| **(Dragonflies and Butterflies)** | | | | | | |
| Black swallowtail | *Papilio polyxenes* | N | S5 | G5 | | |
| Cabbage White | *Pieris rapae* | I | SNA | G5 | | |
| Dot-tailed whiteface | *Leucorrhinia intacta* | N | S5 | G5 | | |
| Eastern Tailed Blue | *Everes comyntas* | N | S5 | G5 | | |
| Viceroy | *Limenitis archippus* | N | S5 | G5 | | |
| Widow Skimmer | *Libellula luctuosa* | N | S5 | G5 | | |

**Notes:**

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

[b] Ranks based upon determinations made by the Ontario Natural Heritage Information Centre (2014).
G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

[c] Canada *Species at Risk Act* (Schedule 1; checked July 2014)

[d] Ontario *Endangered Species Act* (O. Reg. 4/12 amending O.Reg.230/08; checked July 2014)

# APPENDIX C

## Species at Risk Screening

**April 2016**
**Report No.** 13-1121-0186/4000

Golder Associates

| Common Name | Scientific Name | Species at Risk Act, Schedule 1 List of Wildlife SAR Status[1] | Endangered Species Act, Reg. 230/08 SARO List Status[2] | Provincial Rarity Rank[5] | Ontario Habitat Descriptions | Probability of Occurrence Ranking (Field Verification) |
|---|---|---|---|---|---|---|
| Western chorus frog - Great Lakes St. Lawrence/Canadian Shield Population | *Pseudacris triseriata* | THR | | S3 | In Ontario, this amphibian species habitat typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel [pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding. | Low |
| Mottled duskywing - Great Lakes Plains population | *Erynnis martialis* | END | THR | S2 | In Ontario, the mottled duskywing is found in the same habitat as its food plant Ceanothus spp.: open or partially open dry sandy areas, or limestone alvars. These habitats are relatively uncommon and include dry open pine and pine oak woodland, other open dry woodlands, alvars, savannah and other dry open sandy habitats. Usually seen nectaring on wildflowers, or on wet sandy roads in the company of other duskywing species. | Low |
| Monarch | *Danaus plexippus* | SC | SC | S2N, S4B | In Ontario, monarch is found throughout the northern and southern regions. This butterfly is found wherever there are milkweed (*Asclepius spp.*) plants for its caterpillars and wildflowers that supply a nectar source for adults; often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes. | High |
| West Virginia white | *Pieris virginiensis* | | SC | S3 | In Ontario, west virginia white is found primarily in the southern region of the province. This butterfly lives in moist, mature, deciduous woodlands, and the caterpillars feed only on the leaves of toothwort (*Cardamine* spp), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated. | Low |
| Barn swallow | *Hirundo rustica* | | THR | S4B | In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands. Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused. | Low |
| Black tern | *Chlidonias niger* | | SC | S3B | In Ontario, the black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching. | Low |
| Bobolink | *Dolichonyx orizivorus* | | THR | S4B | In Ontario, the bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation. Bobolinks prefer grassland habitat with a broad-leaf component and a substantial litter layer. They have low tolerance for presence of woody vegetation and are sensitive to extensive mowing. They are found in greater numbers in old fields where mowing and re-sowing are infrequent. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more broad-leaved forbs. | Low |
| Canada warbler | *Cardellina canadensis* | THR | SC | S4B | In Ontario, breeding habitat for the Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets. It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks. | Low |
| Chimney swift | *Chaetura pelagica* | THR | THR | S4B, S4N | In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used. | Low |
| Common nighthawk | *Chordeiles minor* | THR | SC | S4B | These aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bog ferns, prairies, gravel pits and gravel rooftops in cities. | Low |
| Eastern meadowlark | *Sturnella magna* | | THR | S4B | In Ontario, the eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlarks prefer moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component. They prefer well drained sites or slopes, and sites with different cover layers. | Low |
| Least bittern | *Ixobrychus exilis* | THR | THR | S4B | In Ontario, the least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation. Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency. | Low |
| Peregrine falcon (anatum subspecies) | *Falco peregrinus anatum* | SC | SC | S3B | In Ontario, the peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate. | Low |

| Common Name | Scientific Name | Species at Risk Act, Schedule 1 List of Wildlife SAR Status[1] | Endangered Species Act, Reg. 230/08 SARO List Status[2] | Provincial Rarity Rank[5] | Ontario Habitat Descriptions | Probability of Occurrence Ranking (Field Verification) |
|---|---|---|---|---|---|---|
| Red-headed woodpecker | *Melanerpes erythrocephalus* | THR | SC | S4B | In Ontario, the red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs. They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees. | Low |
| Short-eared owl | *Asio flammeus* | SC | SC | S2N,S4B | In Ontario, the short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clearcuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources. Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment. | Low |
| Eastern Whip-poor-will | *Antrostomus vociferus* | THR | THR | S4B | In Ontario, the whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha. No nest is constructed and eggs are laid directly on the leaf litter. | Low |
| Wood Thrush | *Hylocichla mustelina* | | SC | S4B | During the breeding season, the wood thrush is found in moist, deciduous hardwood or mixed stands, often previously disturbed, with a dense deciduous undergrowth. Wood Thrushes choose habitats based on the structure of the forest. Specifically, this species selects nesting sites with the following characteristics: lower elevations with trees >16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor. | Low |
| Eastern Wood-Pewee | *Contopus virens* | | SC | S4B | In Ontario, the eastern wood-pewee breeds in a wide variety of wooded habitats, including deciduous, coniferous, or mixed forests, and open woodland. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. IT tends to inhabit edges of younger forests having a relatively dense midstory. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, one to two meters above the ground, in a wide variety of deciduous and coniferous trees. | Low |
| American eel | *Anguilla rostrata* | | END | S1? | In Ontario, the American eel is native to Lake Ontario, St. Lawrence River and Ottawa River watersheds. Their current distribution includes lakes Huron, Erie, and Superior and their tributaries. The Ottawa River population is considered extirpated. The preferred habitat of the American Eel is cool water of lakes and streams with muddy or silty substrates in water temperatures between 16 and 19°C. The American eel is a catadromous fish that lives in fresh water until sexual maturity then migrates to the Sargasso Sea to spawn. | Low |
| Lake sturgeon - Great Lakes / upper St.Lawrence Population | *Acipenser fulvescens* | | THR | S2 | In Ontario, the lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers, and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 metres in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands. | Low |
| River redhorse | *Moxostoma carinatum* | SC | SC | S2 | In Ontario, the river redhorse is known to occur in the Mississippi River, Ottawa River, Madawaska River, Grand River, Trent River, and Thames River systems. They inhabit moderate to large rivers. The majority of their time is spent in pool habitats with slow-moving water and abundant vegetation. Spawning occurs in areas of shallow, moderate to fast-flowing waters in riffle-run habitats with coarse substrates of gravel and cobble. | Low |
| Flooded jellyskin | *Leptogium rivulare* | THR | THR | S1 | In Ontario, flooded jellyskin is found in the eastern region. This lobed, leaf-like lichen grows on the lower trunks of trees in hardwood swamps where flooding occurs in the spring. The most common tree host is black ash, but it has also been recorded on silver maple, trembling aspen, bur oak and white cedar. Trees must be live to support the lichen. These seasonal pond habitats typically occur over top of calcareous bedrock, such as limestone. There is unlikely to be a minimum size requirement for the area of flooded forest habitat available to the lichen, as long as adequate flooding is present. | Low |
| Eastern cougar | *Puma concolor couguar* | | END | SU | This species historically inhabited extensive forested areas in Ontario. | Low |
| Grey fox | *Urocyon cinereoargenteus* | THR | THR | S1 | While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes, and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist. | Low |
| Small-footed bat | *Myotis leibii* | | END | S2S3 | This species most commonly uses ground level rock roosts in talus slopes, rock fields and vertical cliff faces for their summer and maternity roosts. Females who have young require roost sites that receive a lot of sunlight in order to keep the pups warm while the mother is away from the nesting site. Unlike most other bat species they prefer to hibernate in caves and mines that are very short in length (150m) and are most often found hibernating near the entrance of their hibernacula where temperatures sometimes dip below zero, and the humidity is very low. | Low |

| Common Name | Scientific Name | Species at Risk Act, Schedule 1 List of Wildlife SAR Status[1] | Endangered Species Act, Reg. 230/08 SARO List Status[2] | Provincial Rarity Rank[5] | Ontario Habitat Descriptions | Probability of Occurrence Ranking (Field Verification) |
|---|---|---|---|---|---|---|
| Little Brown Myotis | *Myotis lucifugus* | | END | S4 | This species forages over water where their diet consists of aquatic insects, mainly midges, mosquitoes, mayflies, and caddisflies. They also feed over forest trails, cliff faces, meadows, and farmland where they consume a wide variety of insects, from moths and beetles to crane flies. This species is especially associated with humans, often forming nursery colonies containing hundreds, sometimes thousands of individuals in buildings, attics, and other man-made structures. | Low |
| Northern Myotis | *Myotis septentrionalis* | | END | S3 | This species is found in dense forest stands and chooses maternity roosts beneath exfoliating bark and in tree cavities. They rely upon caves and underground mines for hibernation sites. During the summer, this species appears especially reliant upon forested habitats and is found in greater densities in the northern areas of its range than in the south. Little is known about its food habits, although it has been observed foraging along forest edges, over forest clearings, at tree-top level, and occasionally over ponds. | Low |
| Blanding's turtle - Great Lakes/St.Lawrence population | *Emydoidea blandingii* | THR | THR | S3 | Blanding's turtle will utilize a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers, but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in to order reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies. | Low |
| Eastern ribbonsnake - Great Lakes population | *Thamnophis sauritius* | SC | SC | S3 | Eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds. | Low |
| Milksnake | *Lampropeltis triangulum* | SC | SC | S3 | Milksnake utilizes a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations. | Moderate |
| Northern map turtle | *Graptemys geographica* | SC | SC | S3 | Northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Hibernation takes place in soft substrates under deep water. | Low |
| Snapping turtle | *Chelydra serpentina* | SC | SC | S3 | Snapping turtle utilizes a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways. | Low |
| Spotted turtle | *Clemmys guttata* | END | END | S3 | Spotted turtle habitat consists of shallow, slow-moving and unpolluted water such as ponds, bogs, marshes, ditches, vernal pools and sedge meadows. It is also occasionally found in woodland streams or sheltered shallow bays. These habitats are characterized by soft substrates and abundant aquatic vegetation. Females lay eggs in soil and leaf litter in wooded areas close to wetlands. Hibernation takes place in substrates under water, often under moss hummocks or muskrat dens. | Low |
| Stinkpot or Eastern musk turtle | *Sternotherus odoratus* | SC | SC | S3 | Eastern musk turtle is very rarely out of water and prefers permanent bodies of water that are shallow and clear, with little or no current and soft substrates with abundant organic materials. Hibernation occurs in soft substrates under water. Eggs are sometimes laid on open ground, or in shallow nests in decaying vegetation, shallow gravel or rock crevices. | Low |
| American ginseng | *Panax quinquefolius* | END | END | S2 | American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in neutral, loamy soils. | Low |
| Butternut | *Juglans cinerea* | END | END | S3? | Butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory. Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant. | Low |
| Eastern prairie fringed-orchid | *Platanthera leucophaea* | END | END | S2 | Eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates , and occassionaly grows along roadsides or lake margins. | Low |

**Notes:**

[1] *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 6 July 2012); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[2] *Endangered Species Act* (ESA), 2007 (O.Reg 242/08 last amended 1 July 2012 as O.Reg 122/12). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 24 Jan 2013 as O.Reg 25/13, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

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

[4] Global Ranks (GRANK) are Rarity Ranks assigned to a species based on their range-wide status. GRANKS are assigned by a group of consensus of Conservation Data Centres (CDCs), scientific experts and the Nature Conservancy. These ranks are not legal designations. G1 (Extremely Rare), G2 (Very Rare), G3 (Rare to uncommon), G4 (Common), G5 (Very Common), GH (Historic, no record in last 20yrs), GU (Status uncertain), GX (Globally extinct), ? (Inexact number rank), G? (Unranked), Q (Questionable), T (rank applies to subspecies or variety). Last assessed August 2011.

[5] Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated). Last assessed August 2011.

[6] General Habitat Protection is applied when a species is newly listed as endangered or threatened on the SARO list under the ESA, 2007. The definition of general habitat applies to areas that a species currently depends on. These areas may include dens and nests, wetlands, forests and other areas essential for breeding, rearing, feeding, hibernation and migration. General habitat protection will also apply to all listed endangered or threatened species without a species-specific habitat regulation as of June 30, 2013 (ESA 2007, c.6, s.10 (2)). Regulated Habitat is species-specific habitat used as the legal description of that species habitat. Once a species-specific habitat regulation is created, it replaces general habitat protection. Refer to O.Reg 242/08 for full details regarding regulated habitat.

[7] Refer to the individual species' federal recovery strategy for a full description of the critical habitat (http://www.sararegistry.gc.ca/sar/recovery/recovery_e.cfm)

[+]Species Codes derived from the following sources: Birds – 53rd AOU Supplement (2012); Amphibians – Marsh Monitoring Program (Bird Studies Canada 2003); Fish – Golder; Reptiles – Golder.

[*]NHIC (Natural Heritage Information Centre); ROM (Royal Ontario Museum); OBBA (Ontario Breeding Bird Atlas); Herp Atlas (Herptofaunal Atlas of Ontario); Odonata Atlas (of Ontario); Mammal Atlas (of Ontario); BCI (Bat Conservation International); Butterfly Atlas (Ontario Butterfly Atlas)

# APPENDIX D

## Tree Conservation Report

**April 2016**
**Report No.** 13-1121-0186/4000

Golder Associates

April 13, 2016 Document No. 13-1121-0186/4000

Mr. Mark Richardson, Forester - Planning
City of Ottawa
Ottawa City Hall
110 Laurier Avenue West
Ottawa, Ontario, K1P 1J1

**TREE CONSERVATION REPORT – 4789 BANK STREET (CLARIDGE LANDS), OTTAWA, ONTARIO**

Dear Mr. Richardson:

Golder Associates Ltd. (Golder) has been retained by Claridge Homes (Claridge) to prepare a Tree Conservation Report (TCR) in support of the proposed development of 4789 Bank Street, Ottawa (the Site) (Attachment A: Figure 1). This letter satisfies the requirements of a TCR per the City of Ottawa guidelines (2014), and should be read in conjunction with the Environmental Impact Study (EIS) and Environmental Management Plan (EMP) prepared by Golder for the Site (2016a; 2016b).

## 1.0 GENERAL INFORMATION

**Owner / Applicant:**
Claridge Homes
2001 - 210 Gladstone Avenue
Ottawa, Ontario K2P 0Y6
(613) 233-6030

**Consultants Hired to Prepare this Report:**
*Gwendolyn Weeks, H.B.Sc. (Env), Ecologist*
Golder Associates Ltd.
1931 Robertson Road
Ottawa, ON
K2H 5B7
613-592-9600

**Contractor Implementing the Plan:**
To be subcontracted by Claridge Homes

## 2.0 CURRENT DESIGNATIONS AND STATUS OF PLANNING APPLICATION

The Site was brought into the Leitrim Development Area (LDA) in 2012 as part of Official Plan Amendment Number 76 (OPA 76). The Site is currently designated in the Official Plan as General Urban Area / Expansion Area. The Site forms part of the Leitrim Community Design Plan (CDP), which serves to provide a coordinated vision for development in the area subject to the CDP.

The majority of the Site consists of abandoned agricultural fields in various stages of natural succession. There is a single surface water conveyance ditch on the Site. There is a deciduous forest and swamp east of the Site that is designated as a Rural Natural Feature (RNF) in the City of Ottawa Official Plan (Ottawa, 2003). Surrounding land uses include agriculture and urban residential.

## 3.0 PROPOSED WORKS AND SCHEDULE

The current concept plan was prepared by Annis, O'Sullivan and Vollebek Ltd. (AOV) (October 2015) and is provided on Map 2 (Attachment C) of this letter. The proposed development consists of 222 single units and 203 townhome units, within 12.77 ha. A mixed-use block is proposed along the Site's Bank Street frontage, within 1.97 ha. Also proposed are a 2.00 ha park block, 0.69 ha of a school block to be shared with the property to the south, and a 0.08 ha walkway. The balance of the Site will consist of streets (7.46 ha) and a future access block (0.05 ha). The development will be serviced with municipal water and sewer lines. The Urban Boundary dictates the extent of the developable area.

From a storm servicing perspective, stormwater quantity and quality control will be controlled by the existing Findlay Creek Village SWM Facility southeast of the Site.

Site level, or source control, best management practices (BMPs) are proposed across the Site. Mitigating controls are proposed for the final development, as well as during construction. On the individual lots, the mitigation measures include flat lot grading; split lot drainage; and pre-installation of roof leader splash pads. Across the proposed development, this includes vegetative planting and the installation of low permeability clay barriers in the servicing trenches to assist in maintaining the existing groundwater levels.

It is anticipated that the Site will be developed as a single phase, and that clearing of the Site for installation of Site servicing will begin in 2016.

## 4.0 EXISTING TREE COVER ON-SITE

Golder characterized the tree cover on the Site using species composition, and general size, age and condition notes by species. The areas where tree retention may be feasible, as discussed in Section 6.0, were assessed in more detail. Individual specimen trees (large, old, novel species in the local landscape, or otherwise unique) were searched for and their locations marked.

The existing tree cover on-Site, including specimen trees and Species at Risk (SAR), is illustrated on Map 1 (Attachment C), with descriptions of each identified tree grouping and specimen tree provided in Tables 1 and 2 (Attachment B).

## 5.0 NATURAL ENVIRONMENT FEATURES ON-SITE

As part of the EMP and EIS prepared for the Site (Golder 2016a; 2016b), Golder reviewed available background data, and completed detailed field surveys, to identify any known or potential significant natural features associated with the treed portions of the Site. Each of the features discussed below is shown on Figure 3 of the EIS.

The surface water features on the Site are intermittent, and disconnected from Findlay Creek by a grated drop structure. Although these features are not considered direct fish habitat, they contribute flows via the Findlay Creek Village SWM facility to Findlay Creek, which is a well-documented cool and coldwater habitat for fish. There are no steep slopes, valleys or escarpment features on the Site.

The City's Greenspace Master Plan (Ottawa, 2006) identifies the majority of the Site as Contributing to the Primary linkages to the east and southeast of the Site. The City of Ottawa Urban Natural Areas (UNA) Environmental Evaluation Study (Muncaster and Brunton, 2005) does not identify any UNAs on or adjacent to the Site.

The plant communities on the Site were delineated in the field by Golder according to the Ecological Land Classification system for Southern Ontario (Lee et al., 1998; Lee, 2008) as detailed in the EMP (Golder 2016b). None of the plant communities on the Site are rare (S1-S3) within the province, nor are any of the plant species observed are rare within the province. A single regionally rare plant species (Rattlesnake Manna Grass – *Glyceria canadensis*) was observed in the small wetland community on-Site (Figure 3 of the EIS).

## 5.1 Species at Risk and Significant Wildlife Habitat

The individual trees and treed habitats on the Site were assessed for their potential to support SAR (including those listed as threatened, endangered or special concern under the *Endangered Species Act* and the *Species at Risk Act*), as well as for the habitat function they may provide.

No endangered or threatened species or their potential habitats were identified on the Site.

The treed portions of the Site provide suitable habitat for two species of conservation concern, including: eastern milksnake (*Lampropeltis triangulum*) and monarch (*Danaus plexippus*), which may use the treed areas for foraging, roosting or basking.

No other significant wildlife habitat was identified on the Site.

# 6.0 PROPOSED ALTERATIONS TO TREE COVER

Due to the need for mass grading to meet servicing requirements and the density of development required to meet Official Plan and CDP requirements, there is little opportunity to retain trees on the Site. Areas where tree retention may be feasible are in the two park blocks shown on Map 2 (Attachment C); however, retention in these areas will also be contingent upon grading requirements. Trees in these areas will be retained until later stages of the planning and engineering for the Site can determine whether or not they can be retained. Tree clearing and grading will exclude these areas until a final determination can be made.

## 6.1 Natural Heritage Features

The key natural heritage features associated with trees and treed portions of the Site have been discussed in Section 5.0 and 5.1. The potential impacts of tree removal and subsequent development in these areas are discussed in detail in the EIS and EMP (2016a; 2016b).

# 7.0 RECOMMENDATIONS AND MITIGATION MEASURES

The following protection measures must be implemented for retained trees on-Site and for the edge of the RNF in particular, prior to any tree removal or Site works. Protection measures are to be maintained for the duration of construction:

- Under the guidance of a landscape architect, erect a fence at the critical root zone (CRZ) of trees;
- When trees to be removed overlap with the CRZ of trees to be preserved: cut roots at the edge of the CRZ and grind down stumps after tree removals, do not pull out stumps. Ensure there is not root pulling or disturbance of the ground within the CRZ;
- If roots must be cut, roots 20 mm or larger should be cut at right angles with clean, sharp horticultural tools without tearing, crushing, or pulling. Refer to City of Ottawa Specification S.P. F-8011 Tree Protection, Excavation of Root Zone;
- Hand work is preferred within the CRZ, and use of machinery in this zone should be supervised by an arborist;

- Do not place any material or equipment within the CRZ of any tree;
- Do not attach any signs, notices or posters to any tree;
- Do not disturb, raise or lower the existing grade within the CRZ without approval;
- Only tunnel or bore when digging within the CRZ of a tree;
- Do not damage the root system, trunk, or branches of any tree; and,
- Direct exhaust fumes from all equipment away from any tree canopy.

In order to protect wildlife and potential habitat of SAR, the recommendations as presented in the EIS should be adhered to, including:

- No removal of vegetation during the active season for breeding birds (April 15 – August 15); and,
- No intrusion into the adjacent RNF.

## 8.0 PROPOSED PLANTING

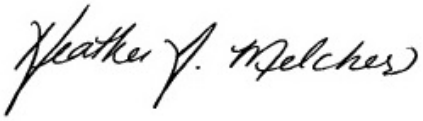
It is anticipated that a detailed landscaping plan for the Site will be prepared at later planning stages of the project. As input to that plan, Golder recommends the following:

- Wherever possible, plant native tree species that reflect the current mix of species on-Site;
- Avoid planting invasive species; and,
- Design landscaping in accordance with all relevant City of Ottawa plans and guidelines, including the Leitrim Community Design Plan.

We trust that this report meets with the City's requirements. If any further information or clarification is required, please do not hesitate to contact the undersigned.

Sincerely,

**GOLDER ASSOCIATES LTD.**



Gwendolyn Weeks, B.Sc.(Env)
Ecologist

Heather Melcher, M.Sc.
Associate, Senior Ecologist

GAW/HM/PAS/sg
\\golder.gds\gal\ottawa\active\2013\1121 - geotechnical\13-1121-0186 claridge kellam lands bank st\eis 2015-2016\reporting 2016\appendix d_tcr\claridge lands_tcr_final.docx

Attachments: Attachment A – Figure 1 – Key Plan
Attachment B – Tables 1 and 2
Attachment C – Maps 1 and 2

## References

Golder Associates Ltd. 2016a. Environmental Impact Statement in Support of the Development of 4789 Bank Street, City of Ottawa, Ontario.

Golder Associates Ltd. 2016b. Environmental Management Plan for the Urban Expansion Land Areas 9a and 9b, Ottawa, Ontario.

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

Lee, H.T. 2008. Draft Southern Ontario Ecological Land Classification. Ministry of Natural Resources and Forestry: London, Ontario.

Muncaster Environmental Planning Inc. (Muncaster) and Brunton Consulting Services. 2005. City of Ottawa Urban Natural Areas Environmental Evaluation Study – Final Report.

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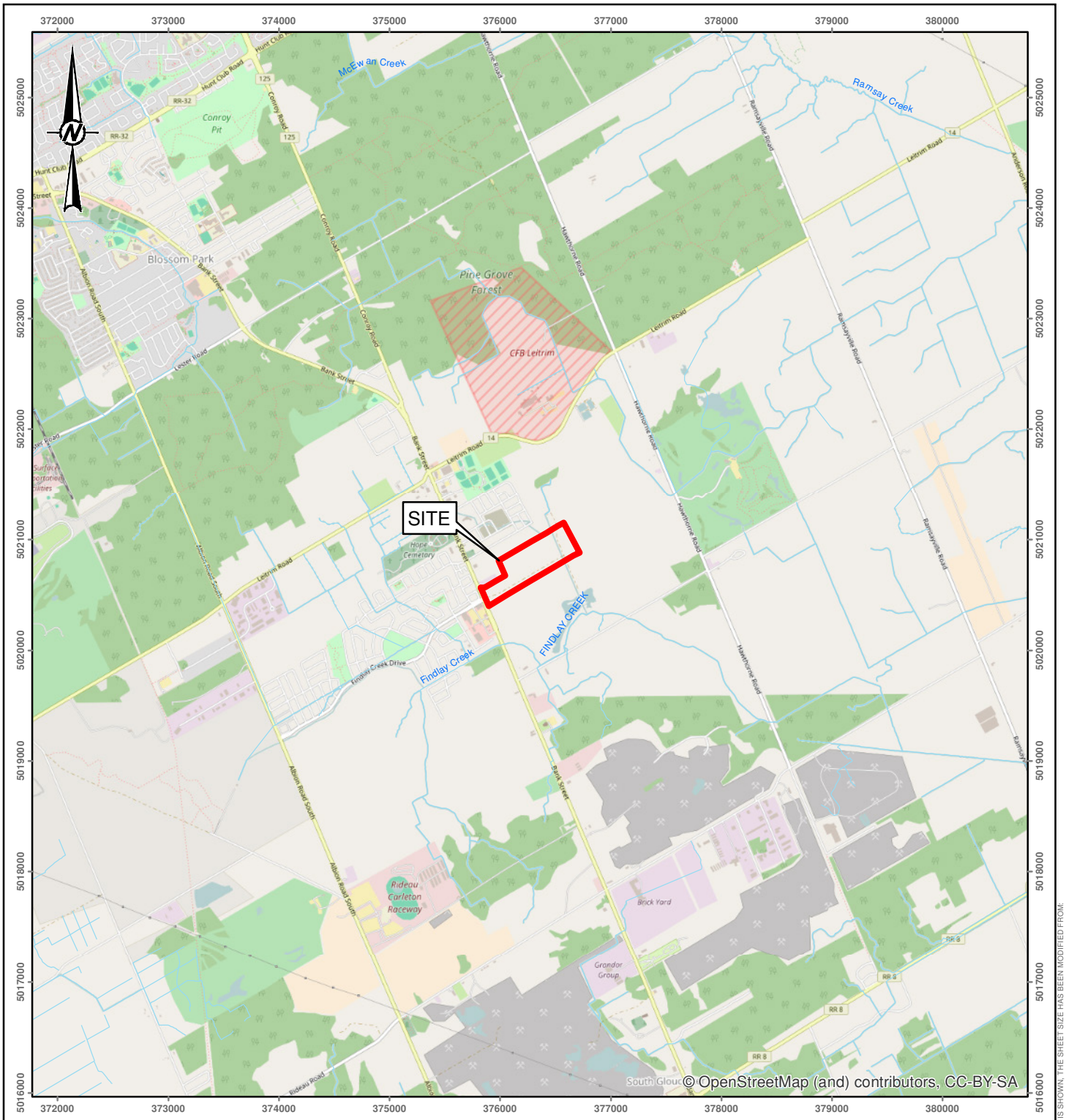
Ottawa, City of. 2006. Greenspace Master Plan – Strategies for Ottawa's Urban Greenspaces. Publication 4-01.

Ottawa, City of. 2013. Annotated Version of the OP Showing Proposed Changes as per Amendment No. 150. Available: http://documents.ottawa.ca/en/node/5720. Accessed: 2014.

Ottawa, City of. 2014. Tree Conservation Report Guidelines (online). Available: http://ottawa.ca/en/residents/water-and-environment/trees-and-community-forests/tree-conservation-report-guidelines.

# ATTACHMENT A

## Figure 1 – Key Plan




0 500 1,000 2,000

SCALE 1:50,000 METRES

CLIENT
CLARIDGE HOMES

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
4789 BANK STREET

TITLE
**KEY PLAN**

CONSULTANT
Golder Associates

| | |
|---|---|
| YYYY-MM-DD | 2016-10-06 |
| PREPARED | JEM/BR |
| DESIGN | GW |
| REVIEW | HM |
| APPROVED | HM |

| PROJECT | PHASE | Rev. | FIGURE |
|---|---|---|---|
| 1311210186 | 4000 | A | 1 |

**NOTES**

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1311210186/4000.

**REFERENCE**

PROJECTION: MODIFIED TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
0

Path: N:\Active\2013\1121 - Geotechnical\13-1121-0186 Claridge Kellam Lands Bank St\Spatial\MXD\Reporting\Phase4000_EIS\EnvironmentalImpactStatement_EIS\1311210186-4000-01.mxd

# ATTACHMENT B

## Tables 1 and 2

# Table 1 - Tree Groupings



| Tree Grouping # | Stand Description* | Average range of dbh (cm) | Notes |
|---|---|---|---|
| 1 | White elm 50%<br>Common buckthorn 10%<br>Willow species 10%<br>Green ash 10%<br>White birch, pin cherry, bur oak, trembling aspen, etc. 20% | 5 to 10 | Deciduous thicket with a mix of immature early successional trees and tall shrubs. The white elms are in poor condition or dead. The rest of the trees are primarily in good condition. |
| 2 | White elm 45%<br>Common buckthorn 25%<br>Speckled alder 15%<br>Trembling aspen 5%<br>Willows, green ash etc. 10% | 6 to 18 | Deciduous thicket where overall shorter shrubs are dominant over trees and tree sized shrubs. Trees are immature to sapling, and in good health with the exception of many of the white elms which are in poor condition or dead. Occasional tree up to 26 cm dbh. |
| 3 | White elm 40%<br>Common buckthorn 30%<br>Speckled alder 10%<br>Trembling aspen 5%<br>Willows, green ash, Manitoba maple, bur oak etc. 15% | 6 to 18 | Similar to Tree Grouping # 2, but sparser trees with a higher proportion of shrubs and non-woody plants. |
| 4 | White elm 30%<br>Bur oak 20%<br>Common buckthorn 20%<br>Green ash 10%<br>Trembling aspen 10%<br>Red maple, white birch, manitoba maple, willows etc. 10% | 7 to 22 | Deciduous thicket with a mix of sapling and immature trees and tall shrubs. Many of the elms and green ash area in poor condition. The rest of the trees are primarily in good condition. Shrub cover is dense and healthy. Occasional bur oak up to 33 cm dbh. |
| 5 | White elm 30% Green ash 30%<br>Bur oak 10%<br>Red maple 10%<br>Willows 5%<br>Trembling aspen, buckthorn species, white birch, nannyberry, Manitoba maple 5 % | 10 to 24 | Similar to Tree Grouping # 4 but sparser trees with a higher proportion of shrubs and non-woody plants. Small low-lying wet locations occur where water tolerant vegetation persists. Many of the elms and green ash are in poor condition. The rest of the trees are primarily in good condition. |
| 6 | Green ash 40%<br>White elm 30%<br>Red maple 15%<br>Willows 5%<br>Buckthorns, trembling aspen, Manitoba maple etc. 10% | 10 to 20 | Primarily thicket swamp with scattered trees. Many of the elms and green ash are in poor condition. Occasional green ash and white elm up to 30cm dbh. |
| 7 | Manitoba maple 45%<br>White elm 25%<br>Bur oak 10%<br>Trembling aspen 10%<br>Green ash, black cherry etc. 10% | 12 to 30 | Deciduous thickets and overgrown hedgerow with a mix of sapling and immature trees and tall shrubs. Occasional multi-stemmed Manitoba maple up to 40cm. Many of the elms and green ash are in poor condition. Manitoba maples are in good condition, but multi-stemmed and gnarly. The rest of the trees are primarily in good condition. |
| 8 | Manitoba maple 70%<br>White elm 10%<br>Trembling aspen 10%<br>Bitternut hickory, green ash, white pine etc. 10% | 15 to 30 | A patch of multi-stemmed Manitoba maple interspersed with other sapling and immature trees, and dense shrubs. Occasional multi-stemmed Manitoba maple up to 35cm. The elms are in poor condition. Manitoba maples are in good condition but multistemmed and gnarly. The rest of the trees are primarily in good condition. |

# Table 1 - Tree Groupings



| Tree Grouping # | Stand Description* | Average range of dbh (cm) | Notes |
|---|---|---|---|
| 9 | White elm 60%<br>Green ash 10%<br>Manitoba maple 10%<br>Red maple 5%<br>Common buckthorn 5%<br>Willows, trembling aspen, apple, nannyberry etc. 10% | 3 to 15 | Deciduous thicket, with meadow-like openings, interspersed with scattered and clumps of sampling to immature trees. Occasional elm and Manitoba maple up to 30cm. The elms and green ash are in poor condition. The rest of the trees are primarily in good condition. |
| 10 | White elm 40%<br>Manitoba maple 20%<br>Common buckthorn 15%<br>Bur oak 10%<br>Trembling aspen 5%<br>Willows, apple, white birch green ash etc. 10% | 5 to 14 | Deciduous thicket with a mix of immature early successional trees and tall shrubs. Overall healthy, with the exception of many of the white elms and green ash which are in poor condition or dead. The rest of the trees are primarily in good condition. |
| 11, 12, 13 | Manitoba maple 95%<br>White elm 5% | 10 to 30 | Individual multi-stemmed Manitoba maples with occasional sapling/seedling tree and shrubs. Manitoba maples are in good condition, but multi-stemmed and gnarly. |
| 14 | White elm 100% | 8 to 20 | Patch of 10 scattered sapling and immature white elms. Trees are in fair to good condition. |
| 15 | Eastern white cedar 95%<br>White elm, sugar maple, green ash, Manitoba maple etc. 5% | 15 to 22 | An almost pure stand of immature eastern white cedar, with scattered other trees, and sparse shrubs and seedling ash in the understory. Occasional cedar up to 30cm. Overall trees are in good condition. |
| 16 | White elm 70%<br>Trembling aspen 10%<br>Green ash 10%<br>Willows, bur oak, eastern white cedar etc. 10% | 8 to 20 | Patches of deciduous thicket, with scattered immature trees. The white elms and some of the green ash are in fair to poor condition or dead. The rest of the trees are primarily in good condition. |
| 17 | White elm 30%<br>Bur oak 20%<br>Common buckthorn 20%<br>Green ash 10%<br>Trembling aspen 10%<br>Red maple, white birch, Manitoba maple, willows etc. 10% | 4 to 12 | Patches of deciduous thicket, with scattered immature trees. The white elms and some of the green ash are in fair to poor condition or dead. The rest of the trees are primarily in good condition. |

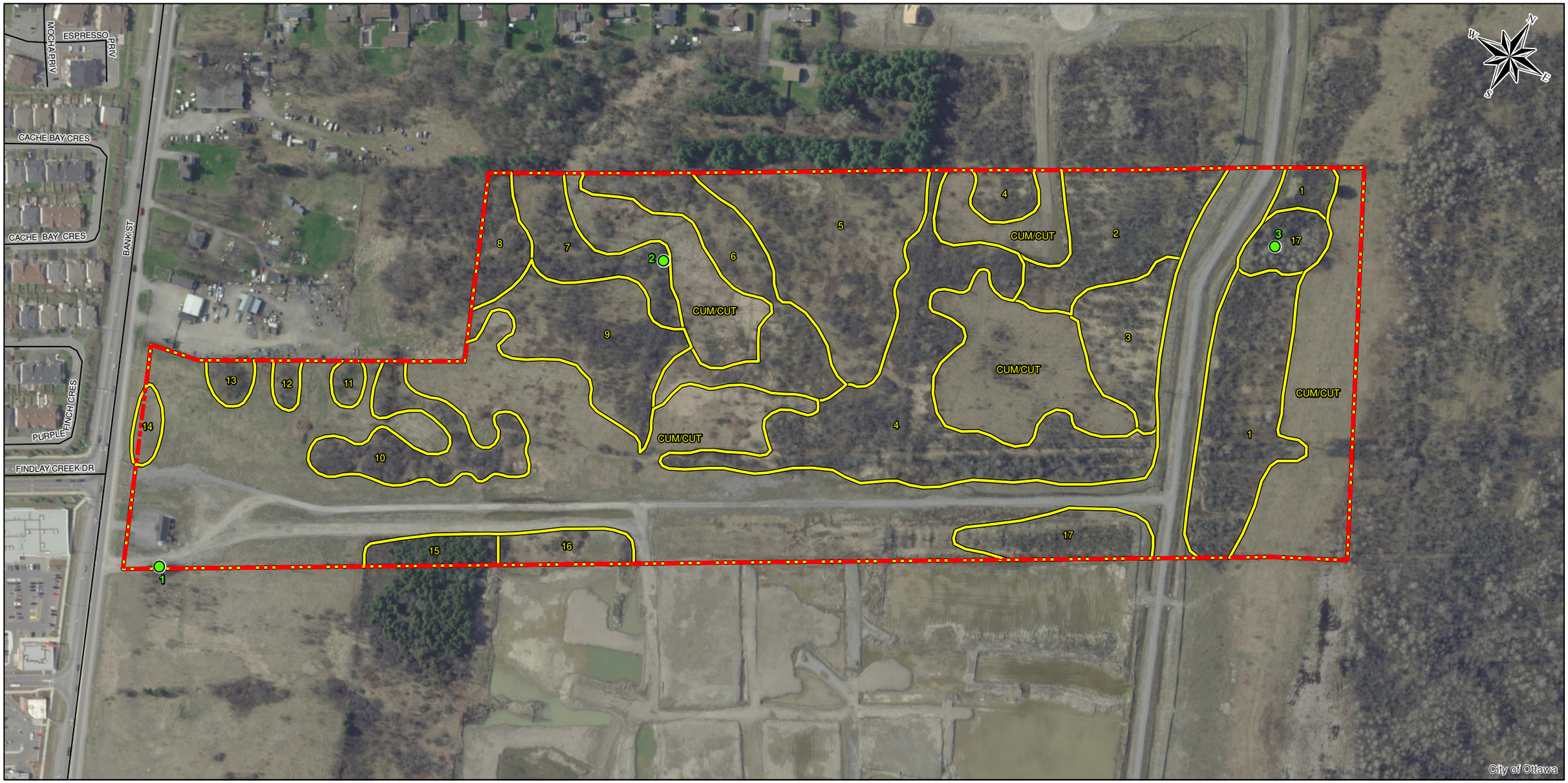
**Note:** *Dominant species and percent absolute cover, only trees and tree-sized shrubs are included.

# Table 2 - Individual Trees

| Tree # | Species | dbh (cm) | Notes |
|---|---|---|---|
| 1 | White elm (*Ulmus americana*) | 26 | Good condition. Single tree on edge of property. |
| 2 | Bur oak (*Quercus macrocarpa*) | 37 | Good condition, taller than surrounding canopy. |
| 3 | Trembling aspen (*Populus tremuloides*) | 40 | Good condition, larger tree in small pure stand of aspen. Possibly the parent tree. |

# ATTACHMENT C

## Maps 1 and 2




**LEGEND**

- INDIVIDUAL TREE (REFER TO TABLE 2, ATTACHMENT B)
- ROAD
- STUDY AREA
- TREE GROUPING (REFER TO TABLE 1, ATTACHMENT B)

60 30 0 60

SCALE 1:3,000 METRES

**NOTE**

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 13-1121-0186/4000.

**REFERENCE**

BING MAPS AERIAL IMAGERY, MARCH 2012, (C) 2010 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2011.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

PROJECT

TREE CONSERVATION REPORT IN SUPPORT OF THE DEVELOPMENT OF 4789 BANK STREET, CITY OF OTTAWA, ONTARIO

TITLE

# EXISTING VEGETATION

Golder Associates
Ottawa, Ontario

| | | | | |
|---|---|---|---|---|
| PROJECT No. 13-1121-0186 | | | SCALE AS SHOWN | REV. 0.0 |
| DESIGN | FIN | 2016-03-15 | MAP 1 | |
| GIS | BR/JM | 2016-03-15 | | |
| CHECK | HM | 2016-10-06 | | |
| REVIEW | HM | 2016-10-06 | | |

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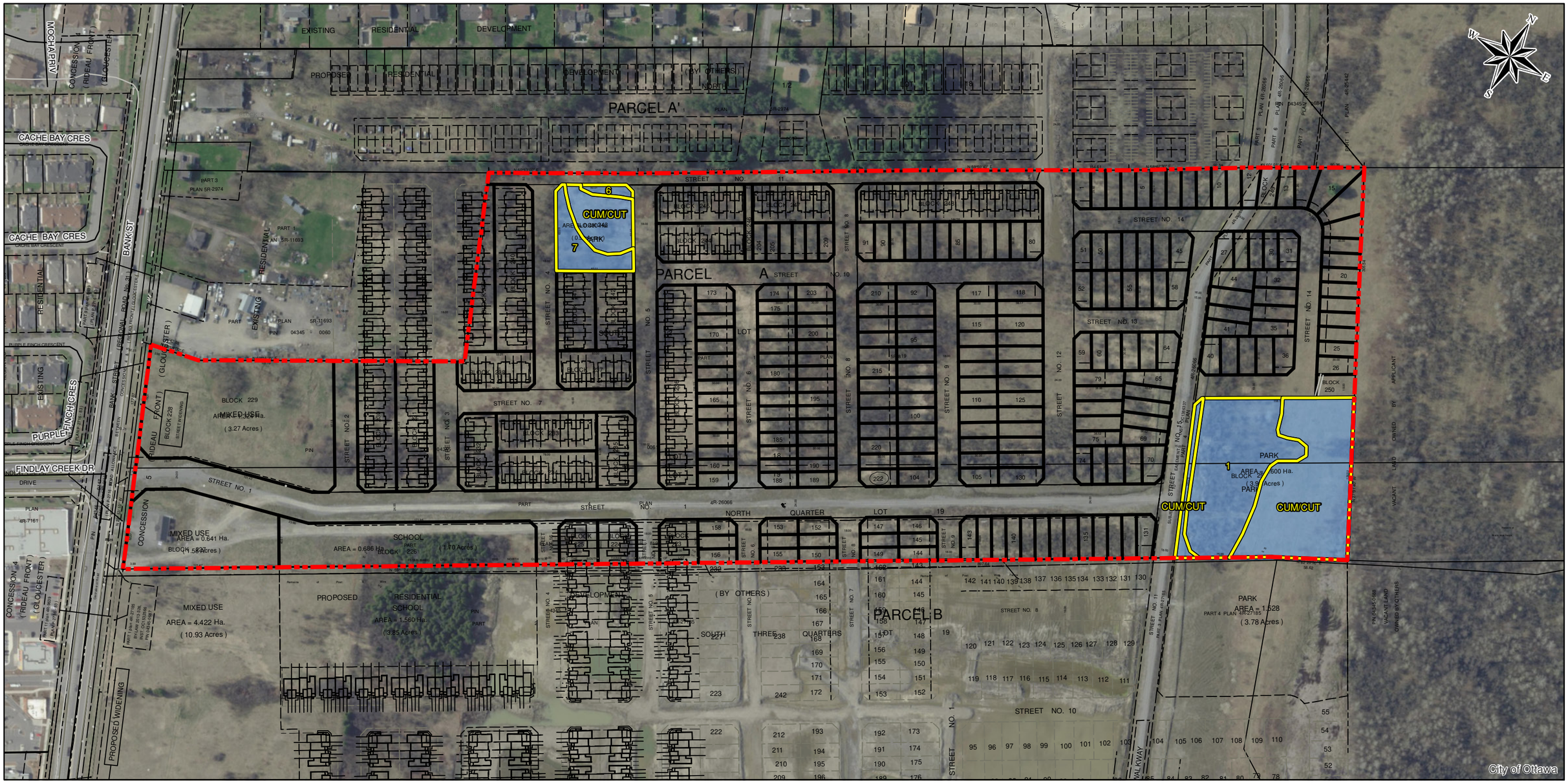


## LEGEND

- ROAD
- TREE GROUPING (REFER TO TABLE 1, ATTACHMENT B)
- STUDY AREA
- POTENTIAL TREE RETENTION AREA

60 30 0 60

SCALE 1:3,000 METRES

## NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 13-1121-0186/4000.

## REFERENCE

BING MAPS AERIAL IMAGERY, MARCH 2012, (C) 2010 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2011.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

PROJECT
TREE CONSERVATION REPORT IN SUPPORT OF THE DEVELOPMENT OF 4789 BANK STREET, CITY OF OTTAWA, ONTARIO

TITLE
# PROPOSED DEVELOPMENT AND CONSERVED VEGETATION

Golder Associates
Ottawa, Ontario

| PROJECT No. 13-1121-0186 | | | SCALE AS SHOWN | REV. 0.0 |
|---|---|---|---|---|
| DESIGN | FIN | 2016-03-15 | MAP 2 | |
| GIS | BR/JM | 2016-03-15 | | |
| CHECK | HM | 2016-10-06 | | |
| REVIEW | HM | 2016-10-06 | | |

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# APPENDIX E

## Qualifications and Experience of Report Authors

**April 2016**
**Report No.** 13-1121-0186/4000

### Education

*H.B.Sc. (Env) Honours Environmental Science, University of Guelph, Guelph, ON, 2004*

### Certifications

*MNRF Ecological Land Classification - Training Certificate, 2004*

*MNRF Ontario Wetland Evaluation System - Training Certificate, 2005*

*MNRF Butternut Health Assessor , 2011*

*Canadian Environmental Assessment Act Orientation - Training Certificate, 2011*

### Languages

*English – Fluent*

## Golder Associates Ltd. – Ottawa

***Terrestrial Ecologist***

Gwendolyn has been providing ecological consulting services since 2004, with particular knowledge in the field of terrestrial ecology. Gwendolyn is certified in both the Ontario Ministry of Natural Resources and Forestry (MNRF) Ecological Land Classification (ELC) and Wetland Evaluation systems, as well as being an MNRF certified Butternut Health Assessor.

Gwendolyn has strong field skills in plant and wildlife identification, terrestrial monitoring, applying ELC and wetland evaluation principles, and she possesses a strong understanding of planning regulations and policies in a natural heritage context. She is experienced in a broad range of environmental services, including terrestrial monitoring and assessment, wildlife inventory, floral inventory, habitat assessment, agency liaison and client relations.

Gwendolyn has authored numerous environmental impact statements, environmental assessments, natural heritage reviews, environmental constraints analyses, and letters of compliance for a variety of sectors, including residential developments, recreational developments, aggregates and energy projects (including renewable energy). She has also provided terrestrial ecology expertise on a wide range of projects, including work for government agencies and peer review services.

## Employment History

***Stantec Consulting Ltd. – Guelph, ON***
*Ecologist and Project Manager (2004 to 2011)*

Provided a range of terrestrial ecology services, including managing projects and natural heritage components of Environmental Assessments for numerous sectors, including residential, transportation, renewable energy and aggregate industries, as well as government agencies.

***Hamilton Region Conservation Authority – Hamilton, ON***
*Ecological Land Classification Technician (2004 to 2004)*

***Conservation Halton – Milton, ON***
*Student Ecologist (2003 to 2003)*

## PROJECT EXPERIENCE – TRANSPORTATION

**Highway 11/17 Route Planning - MTO**
Kakabeka Falls, Ontario, Canada

Route Planning Study for the future four-laning of Highway 11/17 between Kakabeka Falls and Shabaqua Corners. The purpose of the study was to review and evaluate various route alternatives for a new four-lane divided Highway 11/17. At completion of the study, a preferred route will be selected and designated. Terrestrial investigations characterized vegetation communities in the vicinity of each bridge according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Sensitive vegetation communities within a provincial park were reviewed. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

**Highway 11 Access Review - MTO**
Muskoka, Ontario, Canada

Planning, preliminary design and environmental assessment study to upgrade Highway 11 to a fully controlled access freeway, from Muskoka Road 117 to north of Alpine Ranch Road, in the Town of Bracebridge and the District Municipality of Muskoka. The study included identifying a plan to eliminate all at grade intersections and entrances and providing access to the highway at interchange locations only. Terrestrial investigations characterized vegetation communities in the vicinity of each bridge according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

**Highway 69 Site Selection of Highway Maintenance Patrol Yards – MTO**
Parry Sound to Sudbury, Ontario, Canada

This study was undertaken in order to assess a number of alternative locations for patrol yards within the study area, and to identify preferred alternatives at three locations. Performed Ecological Land Classification within each identified patrol yard alternative. Identification of flora and fauna, and habitat descriptions. The study area contained significant features including Provincially Significant Wetlands and required surveys and habitat assessments for Massassauga Rattlesnake, which was present in the study areas. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Highway 11 at the South Entrance of Powassan – MTO**
Powassan, Ontario, Canada

This study was carried out to update a Preliminary Design Report that recommended interchange locations for this stretch of Highway 11. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained significant features, a variety of habitats, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Veuve River Bridge and Amable du Fond River Bridges in Sudbury and North Bay - MTO**
Multiple Sites, Ontario, Canada

This study was carried out as part of the preliminary design for improvements to these two bridges located on Highways 535 and 630, respectively. Terrestrial investigations characterized vegetation communities in the vicinity of each bridge according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Fieldwork and reporting were undertaken according to MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

**Highway 6 (Hanlon Expressway) Improvements from South of Maltby Road to the Speed River – MTO**
Sudbury, Ontario, Canada

The purpose of this study was to identify the location and configuration for new interchanges to provide access to the Hanlon Expressway. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a wide range of upland forest habitats, wetlands and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Highway 17 at the West Junction of Municipal Road 55 - MTO**
Sudbury, Ontario, Canada

The purpose of this study was to identify the location and configuration for a new interchange to provide access to the west junction of Sudbury Municipal Road 55 from Highway 17. This work also included the planning for the future four-lane alignment of Highway 17, and the preliminary design of an interim two-lane Highway 17. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a wide range of upland forest habitats, wetlands, an agricultural reserve, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Highway 17 Southwest By-Pass - MTO**
Sudbury, Ontario, Canada

The purpose of this study was to identify a four-lane highway plan for this section of Highway 17, through the Sudbury area, with access restricted to interchange locations only. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a variety of upland and wetland habitats, including Areas of Natural and Scientific Interest. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Future Highway 11/17 – MTO**
North Bay, Ontario, Canada

This study was carried out to update previous studies that have been undertaken since the early 1960s to investigate ways to increase safety and efficiency on Highway 11/17 through the North Bay area. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained significant features including Provincially Significant Wetlands, a variety of upland habitats, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Highway 23 Widening - MTO**
Palmerston to Harriston, Ontario, Canada

The purpose of this project was to identify any improvements necessary to ensure that Highway 23, between Palmerston and the West limits of Harriston, met expected operational needs and standards. Performed Ecological Land Classification along the study corridor, identification of flora and fauna, and habitat description. The study area consisted mainly of agricultural land with remnant upland deciduous forest. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Highway 26 Widening - MTO**
Thornbury to Meaford, Ontario, Canada

Retained by the Ministry to assess possible design alternatives and develop the preliminary design for recommended improvements to Highway 26 in the study area. The project included the review and assessment of pavement condition, drainage, intersections, entrances, illumination, and highway alignment. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained Areas of Natural and Scientific Interest, prominent valleys, cliff features, and high quality fruit-crop lands. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

**Aquatic and Terrestrial Biology Retainer Services - MTO**
Southern Ontario, Canada

Provided terrestrial biology support for Natural Sciences work associated with ten proposed culvert repair projects, located throughout the Southwestern Region. The purpose of the assignment was to document the existing aquatic ecological features and to provide an assessment of migratory bird use in the vicinity of each culvert. Agency and field data were then considered in terms of the proposed culvert repairs, and recommendations for appropriate environmental protection measures were provided.

## PROJECT EXPERIENCE – ECOLOGY

**Species at Risk Studies - Various Projects**
Various Location, Ontario, Canada

Gwendolyn has been involved in the design and undertaking of numerous studies for various Species At Risk in Ontario, and assessments of their habitats. Surveys followed accepted, standardized protocols and habitats were assessed against established criteria, where available. Species for which these types of studies have been undertaken include, but are not limited to: Fowler's Toad, Western Chorus Frog, Jefferson Salamander, Black Rat Snake, Eastern Hog-nosed Snake, Massassauga Rattlesnake, Short-eared Owl, Barn Swallow, Bobolink, Eastern Meadowlark, Peregrine Falcon, Least Bittern, West Virginia White, American Badger, Little Brown Bat and Northern Myotis, Eastern Foxsnake, Spiny Softshell, Blanding's Turtle, Butternut, American Hart's Tongue Fern, and American Ginseng, Gwendolyn has successfully navigated the over-all benefit permitting process under the Endangered Species Act for butternut and has performed work under the new O.Reg. 242/08 for American Ginseng. Gwendolyn's work with SAR has involved close liaison with the MNR, experts from academia, and involvement of public interest groups such as the Sierra Club of Canada and local Field Naturalist clubs.

**Greystone Village - Former Oblates Property**
Ottawa, Ontario, Canada

Golder worked with the Regional Group on this exciting redevelopment of the historic Oblates property in Ottawa, along the Rideau River. The site was assessed for natural heritage values, and an Environmental Impact Study and Tree Conservation Report were prepared.

**Remer Lands EIS and Environmental Management Plan**
Ottawa, Ontario, Canada

Golder provided natural heritage expertise in assisting the Regional Group to clear conditions for this draft-approved subdivision in Ottawa. This challenging project included a full inventory of the flora and fauna at the site in order to prepare an Environmental Management Plan, Environmental Impact Study and Tree Conservation Report for the site. Golder worked with the client, City of Ottawa, South Nation Conservation and the Ministry of Natural Resources and Forestry to navigate this challenging project and provide solutions that met the client's needs as well as natural heritage policy requirements at the municipal and provincial levels.

**Former CFB Rockcliffe**
Ottawa, Ontario, Canada

Golder is providing multi-disciplinary support to the redevelopment of the former CFB Rockcliffe site to a multi-use urban development. In support of the application to the City of Ottawa by Canada Lands Corporation, the Natural Environment team prepared the environmental impact statement and the tree conservation report, based on the proposed development plan. The evaluation of natural heritage features for this project site included the integration of provincial and federal regulations and associated best practices for mitigation of potential impacts.

**National Equestrian Park**
Ottawa, Ontario, Canada

The National Equestrian Park in Ottawa is undergoing some exciting changes under new management by Wesley Clover Parks. Golder has been supporting the natural environment studies to meet the needs of municipal, provincial and federal stakeholders, including development of the compensation plan for Bobolink. The recent developments have included an outdoor festival and concert venue and a FIFA 2-Star Soccer facility.

**McMachen Pit - SAR Works**
Rideau Lakes, Ontario, Canada

Designed and undertook a baseline study and transplantation plan for a sensitive plant Species at Risk on the client's proposed aggregate pit expansion lands in accordance with O.Reg. 242/08 under the Endangered Species Act. This project will involve annual follow-up monitoring of the transplanted individuals to assess their health and continued vigour. This project requires a detailed understanding of plant physiology and ecology, as well as a firm grasp of provincial legislation and regulations associated with Species at Risk.

**Dallan Lands - EIS**
Guelph, Ontario, Canada

Prepared an Environmental Impact Study for this proposed residential development. Multi-year field inventories related to flora and fauna were performed, including species at risk (Jefferson Salamander), and wetland boundaries were evaluated in co-operation with the Grand River Conservation Authority. Review of potential impacts was undertaken and presented in an Environmental Impact Statement. On-going consultation with public interest groups, University of Guelph experts, and City staff to develop a design plan in respect of complicated natural heritage features.

**Richmond Hill Subdivisions - Monitoring**
Richmond Hill, Ontario, Canada

Collected data and samples for an on-going monitoring program. Tasks included undertaking annual vegetation monitoring using a standardized methodology, analyzing collected data and comparing it with previous years results to identify changes.

**Activa Waterloo West Side Lands - Monitoring**
Waterloo, Ontario, Canada

Pre-construction monitoring on the subject lands was initiated in 1999 and continued during pre-construction years, with the intention of providing baseline environmental information prior to area grading and construction. This program addressed the City of Waterloo's development monitoring requirements, implemented for Laurel Creek and other watercourses within the City. The scope of work for the terrestrial monitoring included photographic and descriptive inventories of 22 stations on the subject lands. Terrestrial monitoring was conducted once per year with results analyzed, catalogued and compared with previous observations where applicable.

**Simpson Lands EIS and Terrestrial Monitoring**
Waterloo, Ontario, Canada

Designed an on-going terrestrial monitoring program for the subject lands based on City of Waterloo and GRCA guidelines. Monitoring of vegetation communities, changes in species compositions, and disturbance levels was undertaken, interpreted, and reported. Requirements for the EIS field program were designed and discussed with relevant agencies. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts related to the plan, and discussed mitigation measures for each potential impact.

**Buffalo Springs EIS Update and Homeowners' Manual**
Oro-Medonte, Ontario, Canada

Prepared an EIS as well as an Environmental Stewardship Guide for new homeowners, which aimed to acquaint residents with their natural surroundings and educate them as to how to protect those areas through their daily actions. Liaised with the Ministry of Natural Resources and local Conservation Authority throughout this project. Conducted surveys using standardized methodology for Butternut.

**Gordon Creek Developments - EIS**
Guelph, Ontario, Canada

Designed a fieldwork program in order to assess natural heritage features within the study area, and presented the Terms of Reference for the study to the City of Guelph Environmental Advisory Committee. Provided input to the project design based on findings of the field program, and authored an Environmental Impact Statement for the proposed development. The site contained a number of significant features, including Provincially Significant Wetland and wildlife corridors. Liaised with the City of Guelph and the Conservation Authority.

**Clerview Environmental Constraints Analysis and EIS**
Guelph, Ontario, Canada

Performed a preliminary environmental constraints analysis for the subject lands, using published resources and an initial field investigation to identify constraints to development. Wetland boundaries on site were delineated according the methodology outlined in the Ontario Wetland Evaluation System. Information was presented to the client in report format. The constraints analysis was used in the production of the draft plan of subdivision, for which an EIS was prepared. The field program and report format for the EIS was presented to and negotiated with the Guelph Environmental Advisory Committee (EAC). A full three-season field program was undertaken, and findings were reported in the EIS. The draft plan was reviewed to identify potential environmental impacts to the adjacent natural areas, and mitigation measures were recommended. The final EIS will be presented to the Guelph EAC.

**University of Waterloo Northwest Campus EIS**
Waterloo, Ontario , Canada

Undertook a review and assessment of the natural heritage components associated with the subject lands, including floral, faunal and community investigations. The information gathered was used to create an updated Greenspace System on the subject lands and to propose trail linkages between the site and adjacent lands. Reviewed the draft plan of development in relation to the subject lands in order to identify potential environmental effects and recommend mitigation measures.

**Activa Branchton - Dundas Lands EIS**
Cambridge, Ontario , Canada

Compiled three seasons worth of field data, including information on flora and fauna. Reviewed field data in conjunction with the preliminary design plan in order to recommend changes to elements of the plan to reflect consideration for the surrounding natural environment. Identified potential environmental effects related to the final design plan and recommended mitigation measures in the final Environmental Impact Statement.

**Victoria South Golf Course Environmental Constraints Analysis and EIS**
Guelph, Ontario, Canada

Completed a natural heritage review of the subject lands, and inventoried the site using Ecological Land Classification, as well as collecting data on flora and fauna. Completed an Environmental Constraints Analysis to present the findings of both the review and field inventories for consideration during preliminary site design for a recreational golf facility. Upon receipt of the preliminary design plan, a Terms of Reference was prepared and submitted to the City of Guelph Environmental Advisory Committee outlining the proposed approach for a complete Environmental Assessment for the proposed development. Review of potential impacts was undertaken and presented in an Environmental Impact Statement.

**City of Hamilton Nature Counts Program**
Ontario, Canada

Performed ELC within the City of Hamilton's boundary, from Ancaster to Puslinch. Designated Areas of Natural and Scientific Interest (ANSI) were inventoried for flora, fauna and disturbance level, and classified using ELC. Other tasks included air photo interpretation, field navigation and leadership.

## PROJECT EXPERIENCE – ENERGY

**Hydro One - Bruce to Milton Transmission Reinforcement Project**
Ontario, Canada

This project required a complete Environmental Assessment (EA) for the proposed installation of a new 180 km long double-circuit 500kV transmission line from the Bruce Power Complex to Hydro One's existing Milton Switching Station. Gwendolyn assisted in the preparation of the Natural Heritage component of the EA through planning and execution of various ecology field surveys, and through liaison with First Nations stakeholders. Work included Ecological Land Classification, wetland boundary delineation according to OWES, wildlife and plant inventory, and identification of significant wildlife habitat or habitat for species at risk within the proposed corridor and adjacent lands. Provided input as to suitable mitigation for sensitive environmental features along the proposed route.

**TransCanada - Eastern Mainline Project**
Ontario, Canada

TransCanada Pipelines Limited proposes to construct and operate new natural gas pipeline facilities along its existing Canadian Mainline between Markham, Ontario and the community of Iroquois, Ontario. The preliminary scope of the Project includes up to approximately 370 km of pipeline and related components, including valve sites and new and modified compression facilities at existing compressor stations along the proposed route. Work included designing and undertaking portions of the environmental field program, as well as contributing to reporting for the Environmental Assessment (EA) pursuant to the requirements of the *National Energy Board Act* and CEAA 2012.

## PROJECT EXPERIENCE – AGGREGATES

**Canaan Quarry**
Ontario, Canada

Prepared a Natural Environment Level I report for Cornwall Sand and Gravel according to the Aggregate Resources Act for a limestone quarry expansion. Work included a review of all published materials relating to the natural heritage features at the site, undertaking a scoped in-field review of the on-site features, and authoring the final report.

**Karson Kennedy Pit**
Ontario, Canada

Prepared a Natural Environment Level II report for Karson Aggregates according to the Aggregate Resources Act for a small sand pit project. Work included discussions with the MNRF, designing and undertaking the field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Worked with the Mississippi Valley Conservation Authority to develop an environmental monitoring program.

## PROJECT EXPERIENCE – ECOLOGY PEER REVIEW SERVICES

**County of Peterborough**
Peterborough, Ontario, Canada

Retained in 2010 by the County of Peterborough to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

**County of Frontenac**
Frontenac, Ontario, Canada

Retained in 2008/2009 by the County of Frontenac to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

## PROJECT EXPERIENCE – RENEWABLE ENERGY

**Clarington Wind Power Project**
Clarington, Ontario, Canada

Retained by Leader Resources Services Corp. to complete various studies in support of the REA application for an onshore Class 4 wind turbine generating project. These included a Natural Heritage Assessment, a Water Body Assessment, Endangered Species Act Permit Applications, Environmental Effects Monitoring Plan and a Noise Study Report. Golder successfully completed a thorough records review as well as field investigations. Wildlife and wildlife habitat investigations focused on bat maternity roosting habitat, grassland bird habitat, landbird migratory stopover areas, marsh bird breeding habitat, amphibian breeding habitat and snake hibernacula. Use of the property by avian wildlife was assessed over several years during various seasons including breeding and migration. Species at risk (SAR) habitat was identified and focused field surveys were completed as required. Completion of the Natural Heritage Assessment was approved by the MNR.

**Lindsay-Ops Landfill Site Renewable Energy Generation Facility**
Kawartha Lakes, Ontario, Canada

Retained by the City of Kawartha Lakes to conduct the site investigation component of a Natural Heritage Assessment (NHA) as per section 26 of Ontario Regulation (O. Reg.) 359/09 for a proposed biogas facility at the Lindsay-Ops Landfill site, City of Kawartha Lakes, Ontario. A Site Investigation Report was prepared based on these investigations, followed by an Evaluation of Significance (EOS) and Environmental Impact Statement (EIS) report as per sections 27 and 38 (2) of O. Reg. 359/09.

**South Branch Wind Farm**
South Dundas, Ontario, Canada

Environmental compliance monitoring during construction of this wind project for EDP Renewables - North America. Undertook a review of all environmental approvals and permits associated with the Project and prepared a comprehensive Compliance Manual based on the review. Golder also reviewed construction plans and procedures prepared by the Contractor for the Project in order to assess their compliance with agency guidelines and their related Acts, Codes and Regulations. Golder conducted monthly construction monitoring events to monitor compliance. Following the completion of Project construction, and all associated monitoring events, Golder will be preparing a Compliance Assessment Summary Report.

**Melancthon II - Natural Heritage Component**
Shelburne, Ontario, Canada

Completed a review of the natural heritage features within the study area for the Melancthon II Wind Project for Canadian Hydro Developers Inc. Work included contact and discussion with various agencies to obtain information on significant natural features. Also, field reconnaissance was undertaken within the study area to apply Ecological Land Classification for Southern Ontario. Prepared a Technical Appendix on the Natural Heritage features of the study area, to support the Environmental Screening Report for this project. This project was undertaken prior to implementation of the REA process.

**Kingsbridge II - Natural Heritage Component**
Goderich, Ontario, Canada

Undertook a review of natural heritage features within the study area for the Kingsbridge II Wind Project near Goderich, Ontario. Various agencies were contacted to obtain information on significant natural features within the study area. This information, along with data collected in the field, was presented in a Technical Appendix that formed part of the larger Environmental Screening Report for this project. This project was undertaken prior to implementation of the REA process.

**Multiple Renewable Energy Projects**
Multiple Location, Ontario, Canada

Assisted in design and implementation of field programs and subsequent reporting in support of REA applications for a number of wind farms in Ontario, including: Wolfe Island Wind Project (Wolfe Island, ON); Port Alma Wind Farm (Port Alma, ON); Grand Renewable Energy Park (Haldimand County, ON); St. Columban Wind Farm (Huron County, ON); Summerhaven Wind Energy Centre (Haldimand County, ON); Suncor Energy Adelaide Wind Power Project (Middlesex County, ON); and Armow Wind Project (Bruce County, ON). Many of these projects included surveys for species at risk utilizing standardized protocols.

## TRAINING

***Wetland Creation Workshop***
*Toronto Zoo, 2010*

***MNRF Data Sensitivity Training***
*Ministry of Natural Resources and Forestry, 2014*

***Habitat Restoration Planning and Implementation***
*Northwest Environmental Training Centre, 2014*

***St. John's Ambulance First Aid Training***
*2013*

## PROFESSIONAL AFFILIATIONS

Ottawa Field Naturalists

Ontario Vernal Pool Association

Field Botanists of Ontario

## Education

*M.Sc. Applied Marine Science, University of Plymouth, Devon, UK, 1998*

*B.Sc. (Honours) Biology, Laurentian University, Sudbury, Ontario, 1996*

## Certifications

*PADI Master Scuba Diver Trainer, 2000*

*Small Craft Boat Operator, 2003*

*PADI Medic First Aid (CPR, First Aid, Automatic Emergency Defibrillator) Instructor, 2003, 2009*

*Small Non-pleasure Vessel Basic Safety - MED A3, 2011*

*Canadian Red Cross First Aid and CPR, 2012*

*WHMIS Training, 1990, 2001, 2004*

## Languages

*English – Fluent*

# Golder Associates Ltd. – Mississauga

***Associate, Senior Ecologist***

Heather Melcher is an Associate, Senior Ecologist and Project Manager/Director with Golder Associates. Heather has 15 years of experience working in a number of sectors including power, aggregates, mining and land development. Her experience lies in designing, managing and carrying out field programs for natural environment components of projects of various size and complexity, analysing and interpreting data, integrating natural environment data with surface water and hydrogeological data in the development of technical impact assessment reports and developing rehabilitation plans. Heather also has extensive experience in managing multi-disciplinary Environmental Assessments, and has worked as a project manager and ecologist within provincial, federal and international frameworks, as well as with other environmental and land use policies. Heather is experienced in dealing with Species at Risk (SAR) issues and works with municipal, provincial and federal legislation, negotiating with regulatory agencies and developing compensation plans.

# Employment History

***Golder Associates Ltd. – Mississauga, Ontario***

*Associate, Senior Ecologist/Project Manager (2004 to Present)*

Responsibilities include project management and preparation of environmental assessment reports, screening reports, and natural environment reports for private and public sectors, including land development, aggregate, and power. Development, implementation and coordination of terrestrial and aquatic field programs, coordination and management of activities and budgets of multi-disciplinary teams, and client and agency liaison. Management of the Bioscience GTA group, marketing and new client initiatives.

***ESG International – Guelph, Ontario***

*Ecologist/Environmental Planner (2002 to 2003)*

Specialized in resource management and land use planning. Worked with clients, residential and commercial land developers, land planners and regulatory agencies to obtain permits and approvals, specifically within the framework of Niagara Escarpment and Oak Ridges Moraine legislation. Compiled, assessed and reported on marine data collected for international projects.

***CBCL Ltd – Halifax, Nova Scotia***

*Ecologist/Environmental Planner (2001 to 2002)*

Intermediate project manager responsible for designing and implementing environmental effects monitoring, environmental impact assessment, and natural heritage projects. Developed and implemented marine and freshwater fisheries and benthic investigations, aquatic habitat assessments, and water quality and sediment assessments. Liaised with clients and regulatory agencies (federal and provincial), to obtain development permits and approvals.

***Southeast Environmental Association – Montague, Prince Edward Island***

*Bacterial Water Quality Project Coordinator (2000 to 2002)*

Responsible for collection of freshwater samples and laboratory analysis of faecal coliform bacteria to determine the effects of livestock farming runoff on the shellfish industry. Liaised with landowners and the agricultural engineer to establish effective remediation efforts, and developed education initiatives involving the general public, farmers and shell fishers. Reported to a multi-stakeholder board.

## PROJECT EXPERIENCE – CONSTRUCTION MATERIALS

**Lafarge Canada Ltd.**
Various Locations, Ontario, Canada

Project Manager and Natural Environment Component Lead for a number of ongoing license applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the Aggregate Resources Act (ARA). Responsibilities include coordinating aquatic and terrestrial field data collection and analysis, coordinating and interpreting and integrating with hydrogeological and surface water data, as well as producing Level I & II Natural Environment Technical reports and developing rehabilitation plans. Project responsibilities also included negotiating with municipalities and agencies on SAR issues, submitting ESA permit applications and developing compensation plans; attending open houses and public forums, responding to public and agency comments following submission. Project manager roles and responsibilities include coordinating and managing the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise, air quality and blasting specialists.

**Cavanagh Construction Ltd.**
Ottawa, Ontario, Canada

Natural Environment Component Lead for a below water Quarry license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing a rehabilitation plan, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNR regarding SAR issues and developing compensation plans.

**Tackaberry Sand and Gravel Ltd.**
Perth, Ontario, Canada

Natural Environment Component Lead for a below water Quarry license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing a rehabilitation plan, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNR regarding SAR issues and developing compensation plans.

**Greenfield Aggregates Sherk Pit**
Waterloo, Ontario, Canada

Natural Environment Component Lead for the below water Sherk Pit license application under the ARA. Responsibilities included terrestrial and aquatic data analysis, interpretation and integration with hydrogeological and surface water data, working with the planner to develop a rehabilitation plan as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Responsibilities also included responding to public and agency comments following submission.

**Lafarge Canada Inc., French Settlement Pit**
Ottawa, Ontario, Canada

Natural Environment Component Lead for the French Settlement Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Consulted with regulatory agencies, and attended public open houses.

**Lafarge Canada Inc., Sunningdale Pit**
London, Ontario, Canada

Natural Environment Component Lead for the Sunningdale Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Consulted with regulatory agencies, and attended public open houses. Developed mitigation and habitat compensation plans under the Ontario Endangered Species Act for barn swallow.

**Lafarge Canada Inc., Limebeer Pit**
Caledon, Ontario, Canada

Project Manager and Natural Environment Component Lead for the Limebeer Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Consulted with regulatory agencies, and attended public open houses. Project manager roles and responsibilities included coordinating and managing the activities and budgets of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise, and air quality specialists.

**Lafarge Canada Inc., Oster Pit**
Creemore, Ontario, Canada

Project Manager and Natural Environment Component Lead for the Oster Pit above water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner and the agricultural subconsultant to develop a progressive and final rehabilitation plan (agricultural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Project manager roles and responsibilities included coordinating and managing the activities and budgets of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise and air quality specialists.

**Colacem Cement Plant**
L'Orignal, Ontario, Canada

Natural Environment Component Lead for the Colacem Cement Plant assessment. Responsibilities included designing and coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with physical resource data, liaising with the planner and developing an Environmental Impact Statement (EIS) for the municipal approval process.

**Floyd Preston Ltd.**
Eastern Ontario, Canada

Natural Environment Component Lead for a proposed new quarry license application in eastern Ontario. Liaised with client, coordinated field data collection, mentored intermediate staff in data analysis and interpretation and preparing a Level I Natural Environment Technical Report under the Aggregate Resources Act (ARA), and reviewed reporting.

**Lafarge Canada Inc., McGill Pit**
Kemptville, Ontario, Canada

Natural Environment Component Lead for the McGill Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing progressive and final rehabilitation plans, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNR regarding Species at Risk issues and developing mitigation and habitat compensation plans for butternut.

**Amherst Quarries Inc.**
Windsor, Ontario, Canada

Aquatic Ecology Component Lead for a proposed quarry expansion license application in southern Ontario. Coordinated and/or conducted field data collection, interpreted and analysed data, and provided the aquatic environment and other background data components for the Level I/II Natural Environment Technical Report under the ARA.

## PROJECT EXPERIENCE – SPECIES AT RISK

**TransCanada - Various Sites in Ontario**
Ontario, Canada

Natural environment component lead for Species at Risk (SAR) monitoring at a number of sites across Ontario. Provided SAR advice and liaised with Ontario Ministry of Natural Resources (MNR) to develop construction monitoring protocols for SAR and migratory birds.

**Lafarge Canada Ltd.**
Various Locations, Ontario, Canada

Natural environment component lead for a number of SAR surveys at aggregate sites across Ontario in support of Endangered Species Act (ESA) exemption agreements. Species surveys included Blanding's turtle, loggerhead shrike, least bittern and gray ratsnake. Developed survey protocols with a number of MNR district offices, directed surveys and produced reports for submission.

**Leader Resources Services Ltd.**
Various Locations, Ontario, Canada

Project manager for a number of wind power projects under the Ontario Renewable Energy Approvals Act (REA). Worked with the client and the MNR to develop protocols and coordinate field surveys. Worked on ESA permitting applications and compensation plans.

**Lafarge Canada Ltd.**
Various Locations, Ontario, Canada

Project Manager and Natural Environment Component Lead for a number of license applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the *Aggregate Resources Act* (ARA). Responsibilities included working with the *Ontario Endangered Species Act* (ESA), developing survey protocols, negotiating with the MNR, completing Information Gathering Forms (IGF), submitting permit applications and developing compensation plans.

## PROJECT EXPERIENCE – WASTE

**Capital Region Resource Recovery Centre (CRRRC)**
Ottawa, Ontario, Canada

Natural Environment Component Lead for a provincial Environmental Assessment for a resource recovery centre on a 175 hectare site), including a landfill, contaminated soil management and recycling components. Responsibilities included designing the field program (terrestrial and aquatic), analyzing data, integrating the ecological data with other discipline data, completing the effects assessment, consulting with regulatory agencies, and participating in the public consultation process.

## PROJECT EXPERIENCE – POWER

**Trillium Power Wind Corporation**
Lake Ontario, Ontario, Canada

Project Manager for an offshore wind power project in Lake Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Responsibilities included coordinating and managing a multi-disciplinary team including noise specialists, biologists, archaeologists, public consultation specialists, aboriginal engagement specialists, visual impact assessment specialists and geophysicists. Liaised with client and agencies, attended regulatory agency meetings and participated in public open houses. Reporting satisfied both provincial and federal (CEAA) requirements.

**Leader Resources Services Corporation**
Various Locations, Ontario, Canada

Project Manager for a number of ongoing wind farm projects under O. Reg. 359/09 Renewable Energy Approvals (REA). Responsibilities include coordinating and managing a multi-disciplinary team including noise specialists, natural heritage specialists, archaeologists, cultural heritage specialists, public consultation specialists and aboriginal engagement specialists. Liaising with client and agencies, attended regulatory agency meetings and participated in public open houses.

**Mann Engineering/EffiSolar**
Various Locations, Ontario, Canada

Natural Heritage Project Manager for four 10 MW ground-mounted PV solar farms in southeastern Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Coordinated field programs, and carried out data analysis and report production. Liaised with client and agencies.

**SkyPower Corp.**
Various Locations, Ontario, Canada

Project Manager for eight wind power park projects in Renfrew County, Prince Edward County and Parry Island, Ontario. Coordinated field programs and managed a multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators, liaised with client and agencies, organized public open houses including assisting with preparation of panels, analysed data, and compiled results into an Environmental Screening Report/Environmental Impact Statement for submission to regulatory agencies.

**Algonquin Power**
Amherst Island, Ontario, Canada

Project Manager and field coordinator for one wind power project in Prince Edward County. Coordinated field programs and multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators, liaised with client and agencies, analysed data, and compiled results into documents to be submitted to regulatory agencies in support of the RES III RFP under the Ontario Power Authority Standing Offer Program.

**SkyPower Corp.**
Various Locations, Ontario, Canada

Project Manager for several solar power projects across Ontario, including Napanee and Norfolk. Coordinated or conducted field programs and data collection, coordinated and managed the activities of a multi-disciplinary team. Completed reports addressing the Ministry of the Environment Screening Criteria for Energy Projects to be submitted to regulatory agencies.

**OptiSolar Inc.**
Various Locations, Ontario, Canada

Project Manager for several solar power projects across Ontario, including Sarnia, Tilbury and Petrolia. Coordinated or conducted field programs and data collection, coordinated and managed the activities of a multi-disciplinary team including noise, archaeology, surface water, traffic and natural environment assessments. Completed reports to be submitted to regulatory agencies in support of planning/zoning applications.

**Port Granby Long-Term Waste Management Facility**
Port Granby, Ontario, Canada

Coordinated aquatic field technicians and participated in the collection and analysis of fish samples in support of the human health assessment component of the project. Worked with a team of biologists in the interpretation of data and reporting.

**Bruce Power Units 3&4 Restart**
Kincardine, Ontario, Canada

Worked with a team to establish Valued Ecosystem Components and appropriate study areas. Coordinated bioscience field technicians and interpreted data on fish impingement, entrainment, fishing pressure and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to determine the potential for warm water discharges to affect waterfowl use of nearby areas, and evaluated effects on the white-tailed deer population due to vehicle strikes. Prepared technical reports.

**Pickering Nuclear 'A' Return to Service Follow-up and Monitoring**
Pickering, Ontario, Canada

Coordinated aquatic field technicians and interpreted data on impingement, entrainment, fishing pressure, waterfowl surveys, and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to evaluate the effects of wildlife-vehicle interactions on nearby roadways on terrestrial biota populations. Prepared annual monitoring reports.

## PROJECT EXPERIENCE – MINING

**EnCana Dyno**
Bancroft, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of decommissioned uranium mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment workplan. Tasks in the aquatic workplan included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. As part of the terrestrial workplan, collection of small mammal and plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

**EnCana Coldstream**
Thunder Bay, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of a decommissioned copper mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, and risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment work plan. Tasks in the aquatic work plan included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. As part of the terrestrial work plan, collection of plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

## PROJECT EXPERIENCE – OIL & GAS

**TransCanada Greater Golden Horseshoe Facilities Modifications**
Ontario, Canada

Natural environment component lead for an environmental and socio-economic assessment for modifications to a number of facilities under the National Energy Board (NEB). Responsibilities included designing the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysing data, completing the baseline and effects assessment, liaising with agencies and permitting.

**TransCanada Eastern Mainline Project**
Ontario, Canada

Vegetation and wetland component lead for an environmental and socio-economic assessment for a 392 km pipeline in southern Ontario under the National Energy Board (NEB). Responsibilities included designing the field program, analysing data, completing the baseline and effects assessment.

**TransCanada Parkway West Connection**
Milton, Ontario, Canada

Natural environment component lead for an environmental and socio-economic assessment for a new pipeline connection under the National Energy Board (NEB). Responsibilities included designing the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysing data, completing the baseline and effects assessment, liaising with agencies and permitting.

**TransCanada Vaughan Mainline Extension**
Ontario, Canada

Senior technical reviewer and advisor for the vegetation, wetland and wildlife components for an environmental and socio-economic assessment for a pipeline in southern Ontario under the National Energy Board (NEB).

**TransCanada LNG Facility**
Trois Rivieres, Quebec, Canada

Designed and conducted inland fisheries field programs for a liquefied natural gas facility and associated distribution pipelines. The programs included aquatic habitat assessments of all watercourse pipeline crossings, and an assessment of habitat and water quality of inland lakes in the vicinity of the facility. Interpreted data and prepared technical reports.

## PROJECT EXPERIENCE – FISHERIES ENVIRONMENTAL ASSESSMENTS

**Bruce Power Ltd**
Kincardine, Ontario, Canada

Lead biologist for a Lake-wide whitefish distribution study. Tagged and collected meristic data on all whitefish captured using trap nets. Completed weekly summary reports in addition to a final fish effort report including recommendations.

**Bruce Power Ltd., Ontario Power Generation**
Kincardine, Ontario, Canada

Completed terrestrial and aquatic environment post-restart follow-up monitoring reports, including entrainment, impingement, fish habitat use, fishing pressure, bass spawning habitat, waterfowl surveys, roadkill surveys, and deer mortality surveys.

## PROJECT EXPERIENCE – ENVIRONMENTAL IMPACT STATEMENTS

**Biglieri Group**
Ontario, Canada

Project Manager for a residential subdivision development application in southern Ontario. Responsibilities included coordinating and managing a multi-disciplinary team including surface water engineers and biologists. Tasks included designing and coordinating the terrestrial and aquatic field program, and completing an environmental impact study report. Liaised with client and agencies.

**Brookfield Homes**
Brantford, Ontario, Canada

Project Manager for a residential subdivision development application in southern Ontario. Responsibilities included coordinating and managing a multi-disciplinary team including hydrogeologists, surface water engineers and geomorphologists. Tasks included designing and coordinating the terrestrial and aquatic field program, and completing a constraints analysis report and map, and environmental impact study report. Liaised with client and agencies, and attended regulatory agency meetings and participated in negotiations.

**Maldives Fishery Infrastructure - Feasibility Study**
Maldives, Asia

Responsibilities included writing a preliminary environmental screening assessment of eight proposed fishery infrastructure projects, including aquaculture, upgrading existing processing plants and marinas in the Maldives and completing a feasibility study of these projects. Tasks included completing a desktop background assessment of the natural environment, collecting in-situ water quality data, mapping marine fish habitat, corals and terrestrial habitats. In addition, collection of socio-economic data - both desktop and personal interviews was included in the study. Compilation and analysis of the data was completed, and recommendations and mitigation measures were provided in the report. Follow-up included designing the environmental impact assessment required for the chosen project.

**Oak Hills Golf Course - Permit to Take Water**
Stirling, Ontario, Canada

Project Manager for a golf course Permit to Take Water (PTTW) renewal application. Designed aquatic and hydrology field program and carried out fish habitat assessments. Analysed data and determined aquatic habitat critical low flows. Compiled supporting documentation for the permit application and prepared a client report including recommendations for continued monitoring.

## TRAINING

***Microsoft Project Level 1 Training***
*2008*

***Royal Ontario Museum (ROM) Fish ID Workshop***
*2005*

***Introduction and Intermediate MapInfo Professional Training***
*2000*

## PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI)

Member, Ontario Stone Sand and Gravel Association (OSSGA)

## PUBLICATIONS

**Conference Proceedings**

Melcher, Heather. 2015. *Bats and the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Toronto, Canada.

Melcher, Heather. 2014. *Changes to the Ontario Endangered Species Act and Implications to the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Ottawa, Canada.

**Other**

Melcher, Heather. 2001; 2002. Effects of Agricultural Inputs of Faecal Coliforms on the Shellfish Industry in Prince Edward Island. Annual Monitoring Report. Prince Edward Island.

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