February 2017

REPORT ON

Environmental Impact Statement and Tree Conservation Report for the Development of 4840 Bank Street (Idone Lands) City of Ottawa, Ontario

Submitted to:
4840 Bank Street Inc.
c/o The Regional Group
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Ottawa, ON
K2C 0P9

REPORT

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by 4840 Bank Street Inc. to complete an Environmental Impact Statement (EIS) for the property at 4840 Bank Street, Ottawa, Ontario (known as the Idone lands), which are part of the Leitrim Development Area (LDA). The Idone lands are located on Part Lot 22, Concession 4, City of Ottawa (Gloucester), Ontario (the Site; Figure 1). Appendix A 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, 2017), and should be read in conjunction with this report. The Site is currently owned by 4840 Bank Street Inc.

1.1 Purpose

This report has been prepared in accordance with the City of Ottawa (the City) EIS guidelines (Ottawa, 2015a), the policies of the City Official Plan (OP) (Ottawa, 2016), and in consideration of the recommendations made in the Environmental Management Plan (EMP) prepared by Golder (2016a) for the Site, which is part of the LDA west of Bank Street. A Terms of Reference for the EMP was prepared and submitted to the City, and was accepted on January 8, 2014 (Ottawa, 2014). The field surveys typically undertaken for an EIS were performed as part of the work plan approved for the EMP and those details are included in that document. As such, this EIS should be read in conjunction with the EMP. This EIS includes an assessment of potential impacts of the proposed development on natural heritage features on the Site and on the adjacent lands, to the limit of the area that may be potentially affected (the Study Area).

This EIS was prepared based on the assumption that the lands to the north (the Remer lands) are developed, as the Remer lands are subject to a 1994 Ontario Municipal Board (OMB) decision (No. 900220) that defined the limit of development and has Draft Plan of Subdivision approval from the City of Ottawa (File No. D07-16-11-0007). As such, this EIS assumes that vegetation on the lands to the north, with the exception of the protected areas, as defined in the EMP, has been largely removed and the lands have been developed.

This report builds on the recommendations of the EMP prepared for the Site, and provides appropriate recommendations for design of the proposed development on the Site to meet the requirements of the City OP.

1.2 Site Description

The Site is currently characterized by abandoned agricultural lands in various stages of natural succession. There are also two surface water features on the Site.

2.0 ENVIRONMENTAL POLICY CONTEXT

The proposed Site is located in the City of Ottawa. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the proposed Site consisted of the following:

- Provincial Policy Statement (MMAH, 2014)
- City of Ottawa Official Plan (Ottawa, 2016)
- *Endangered Species Act* (Ontario, 2007
- *Species at Risk Act* (Canada, 2002)
- *Fisheries Act* (Canada, 1985)
- South Nation Conservation Reg.170/06 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario, 2006).

An overview of the above noted legislation and policy documents is discussed in Sections 2.1 to 2.5.

2.1 Provincial Policy Statement

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

The natural heritage policies of the PPS indicate that:

- 2.1.4 *Development* and *site alteration* shall not be permitted in:
  - a) significant wetlands in Ecoregions 5E, 6E and 7E
  - 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* shall 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
  - 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* shall not be permitted in *fish habitat* except in accordance with *provincial and federal requirements.*
- 2.1.7 *Development* and *site alteration* shall 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* shall 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*.
- 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 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 the treatment of certain species and their habitats for some activities.

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 fisheries 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 the 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 Site is located in the South Nation River watershed, specifically the Shields Creek/North Castor River Subwatershed. South Nation Conservation (SNC) administers Ontario Regulation 170/06, which creates regulated areas where development may be subject to flooding, erosion and/or where interference with wetlands and alterations to shorelines and watercourses may have adverse effect on environmental features. Development within regulated areas is governed by Regulation 170/06 Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario, 2006). Regulation 170/06 was derived under the authority of Ontario Regulation 97/04 and is specific to 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.

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.

Although development is not necessarily restricted within the SNC regulated area, it designates an area which triggers the need for a permit and, in most cases, an accompanying EIS. SNC may grant permission for development in these areas if, in its opinion, the control of flooding, erosion, pollution or the conservation of land will not be affected by the development.

The western edge of the Site is located within the regulation limit and a permit from SNC under the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* regulation will be required in order to develop within this area.

2.5 City of Ottawa

Proponents are required, under the City OP (Ottawa, 2016), to prepare an EIS, following the City guidelines (Ottawa, 2015a), which documents the occurrence of significant natural heritage features in, and adjacent to, the proposed development area. The policies in the OP address both natural features and natural functions.

The Site is currently designated in the OP as Developing Community (Expansion Area) within the Urban Policy Plan Area.

Although the Site is not adjacent to any Urban or Rural Natural Features, it is located adjacent to the Casino Wetland, which is a provincially significant wetland (PSW). As such, the Site requires an EIS under Section 3.2.1 of the City OP.

2.5.1 Environmental Management Plan (EMP)

An EMP was prepared by Golder for a portion of the LDA west of Bank Street, which includes the Site (Golder, 2016a). 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. As discussed at the August 29, 2013 pre-consultation meeting with City staff, an EIS was to be prepared following acceptance of the EMP to address specific issues and provide additional details where warranted.

As it relates to the natural environment features on the Site and in the Study Area, the following recommendations were included in the EMP:

- Obtain a permit from the Ministry of Natural Resources and Forestry (MNRF) under the *Endangered Species Act* to remove Category 2 and 3 butternut trees where they will be impacted by development (permit negotiations in progress).
- Maintain the function of the surface water features on-Site, including supporting the fishery in Findlay Creek and surface water conveyance, post-development to comply with the *Fisheries Act* through the implementation of a constructed conveyance channel (conceptual design included in the EMP and detailed design in progress). The channel will comply with SNC requirements by maintaining and improving the surface water conveyance function of surface drainage from rural lands off-Site to the south by providing more permanent flow, and providing habitat for wildlife, including amphibians, which will be at least comparable to existing conditions.
- Provide a 15 m setback between rear lot lines and the east end portion of the constructed conveyance channel where the proposed channel alignment crosses the southwest corner of the Site.
- Capture and divert flows that are currently conveyed via intermittent watercourse INT-2 northward, by constructing an earth berm along the south limit of the Site.
- Explore opportunities for tree retention as part of a Tree Conservation Report.

The following recommendations from the EMP are also included in this EIS:

- Assessment of the potential impacts of the loss of natural cover on-Site and associated mitigation recommendations.
- Identification of any on-Site environmental features recommended for protection, considering grading and other servicing constraints for the Site.
- Determination of negative effects, if any, of removal of amphibian breeding habitat (full or partial) on this habitat type in the planning area.
- 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.
- General mitigation measures to minimize the potential impacts of the development on the natural environment.

3.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

The proposed development will be residential consisting of low rise single and multiple units (Figure 2), a park block, and commercial and mixed uses along Bank Street (Stantec, 2017). Stormwater quantity and quality on the Site will be controlled by means of expansion of the existing Findlay Creek Village stormwater management facility east of Bank Street.

A constructed conveyance channel has been incorporated in a small portion of the southwest corner of the Site, including a 15 m setback to rear yards. This feature will convey upstream rural runoff and maintain this contribution of base flows to the Leitrim Core Wetland Buffer and Findlay Creek.

3.1 Stormwater Management Plan

The proposed stormwater management plan for the Site is detailed in the EMP, with key points provided below for context. The EMP should be read in conjunction with this EIS.

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).

Under pre-development conditions, runoff from the Site is conveyed by overland flow north/northwest towards the Leitrim Core Wetland and Wetland Buffer, and northeast towards Bank Street. As identified in the July 2005 Addendum, minor flow from the Site will be conveyed to the Findlay Creek Village SWM Facility via the western trunk storm sewer. It was also confirmed that major system (overland) flow from the majority of the Site would cascade via street segments to the Leitrim Core Wetland Buffer. The existing outlet structure of the Findlay Creek Village SWM Facility will not be modified; that is, outflow rates from the facility will be maintained.

Runoff from lands to the south of the Site, currently conveyed on-Site by intermittent watercourse INT-2, will be diverted by a small earth berm along the southern edge of the Site to permanently direct and convey the runoff westward towards the conveyance channel proposed to be constructed mainly off-Site to the west.

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 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 rear yard drainage; and catchbasin sumps.

3.1.1 Constructed Conveyance Channel

In order to maintain external flows from south of the Site to the Leitrim Core Wetland Buffer under post-development conditions, a constructed channel feature is proposed, a section of which is located through a small portion of the southwest portion of the Site. This constructed channel (Figure 2) will serve a dual purpose, providing both hydraulic conveyance and naturalized habitat for wildlife. It will be designed hydraulically for flood flow conveyance, and not for any specific low flow or “channel forming” condition.

The downstream end of the constructed conveyance channel is off-Site at the east edge of the Leitrim Core Wetland Buffer and is topographically lower than the Leitrim Core Wetland to the west. Discharge from the end of the channel, which will occur during the majority of storm events, will continue to flow downslope to the northwest in the Leitrim Core Wetland Buffer and not enter the Leitrim Core Wetland directly. In the rare large storm events or spring thaw, the water that overtops the western channel embankment will similarly flow downslope to the northwest.

Information with respect to channel design, and general recommendations for structural, habitat and vegetation design, are provided in the EMP.

4.0 METHODS

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

5.0 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, 2016a). The EMP should be read in conjunction with this EIS.

The Site is located to the east of the Leitrim Core Wetland and northeast of the Casino Wetland, both of which are provincially significant. The majority of the Site is characterized by mixed meadow, and deciduous open woodland-deciduous thicket vegetation communities. There is a small pocket of a thicket swamp community in the southwest corner of the Site.

There are two surface water channels on the Site (INT-2 and INT-3; Figure 3) that eventually flow into Findlay Creek, which is located approximately 760 m to the north of 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, 2016a). 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.

6.1 Significant Valleylands

Recommended criteria for designating significant valleylands under the PPS include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential, and historical and cultural values. There are no significant valleylands in the Study Area; therefore, no further analysis is warranted.

6.2 Significant Areas of Natural and Scientific Interest (ANSI)

ANSIs are designated by the province according to standardized evaluation procedures. No ANSIs have been identified in the Study Area; therefore, no further analysis is warranted.

6.3 Significant Woodlands

Significant woodlands, significant valleylands, and significant wildlife habitat should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM for Policy 2.3 of the PPS (MNRF, 2010). There are no significant woodlands on the Site and no further analysis is warranted.

6.4 Significant Wetlands

Mapping received from the MNRF showed that the Leitrim Core Wetland is located more than 120 m from the western limit of the Site, with contiguous wetland communities extending closer to the Site from the west. As discussed in the EMP, these contiguous wetland communities are not considered part of the PSW. The adjacent Casino Wetland (to the southwest) was evaluated by Golder through a desktop exercise supported by field surveys, and has been found to be contiguous with the Leitrim Core Wetland. The Casino Wetland is therefore considered part of the PSW (Beacon, 2007; current MNRF mapping). For clarity, both the Leitrim Core and the Casino portions of this wetland are herein referred to collectively as the Leitrim PSW.

Potential direct effects of development of the Site to be considered are in relation to the hydrology and hydrogeology of the adjacent Leitrim PSW, as well as contributing to indirect effects such as introduction of exotic species, degradation of water quality, and the quality of wildlife habitat available in the PSW.

As part of the studies undertaken for the EMP and the Permit to Take Water (PTTW) Application (Golder, 2014), it was determined that the development of the Site will have no impact on the hydrology or hydrogeology of the Leitrim Core Wetland or the Casino Wetland, as both features are recharged from areas off-Site, and surface water inputs to the wetlands will be protected through implementation of the proposed surface water conveyance channel and the proposed stormwater management plan. It was determined that although anticipated grade raises may cause minor changes in groundwater levels within the developed area, the groundwater flow direction in the overburden at the Site is not anticipated to change to an extent that would adversely affect the wetland water levels. As such, no long-term impact to the hydrology, hydrogeology or water quality in the wetlands is anticipated to result from the proposed development. Protection of the existing water regime will ensure no long-term changes to the existing vegetation communities and associated wildlife habitats, beyond what may occur as part of natural processes (e.g., succession).

Construction activities have the potential to temporarily or permanently affect groundwater levels and water quality in the wetland. Based on the findings of the PTTW Application, these potential effects can be appropriately mitigated through standard practices including: directing all excess pumped water to the Findlay Creek Village SWM Facility east of Bank Street to protect water quality; and, installing clay dykes through the permeable service trench bedding and backfill materials to prevent them from acting as wetland “drains”. These measures have been undertaken successfully for other developments adjacent to the Leitrim Core Wetland, and monitoring has not shown adverse effects to the wetland. Additional mitigation measures to be employed during construction are discussed in Section 8.1.

As reported in the EMP (Golder, 2016a), the Leitrim Core Wetland and the Casino Wetland are already highly impacted by exotic species, particularly glossy buckthorn (*Rhamnus frangula*), and it is anticipated that the setbacks and buffers of the proposed development from the wetlands will effectively buffer the wetlands from the introduction of additional exotic species, and other impacts such as light, noise, human intrusion (the wetlands are exceptionally thick in terms of vegetation), and impacts to wildlife from loose pets (see Section 7.2). No further analysis for significant wetlands is warranted.

6.5 Endangered or Threatened Species

One provincially endangered species, butternut (*Juglans cinerea*), was identified through field surveys on the Site. The locations of the individual trees are shown on Figure 3. Although this species and its associated habitats are provided protection under the ESA, some exemptions are detailed in Section 23.7 of Ontario Regulation 242/08 (Ontario, 2015). Under the regulation, up to a defined number of certain individual trees of this species may be removed from an area provided the conditions of Section 23.7 of the regulation have been satisfied. Removal of trees not covered under the regulation can only be performed under the authority of an ESA permit. Permitting, removal of the trees and compensation, if required, will be negotiated with the MNRF. These negotiations are currently in progress.

No other endangered or threatened species were identified on the Site and therefore no further analysis is warranted.

6.6 Fish Habitat

There are two intermittent surface water features on the Site (INT-2 and INT-3), which meet the *Fisheries Act* definition of fish habitat due to their contributions to the recreational fishery present downstream of the Site in Findlay Creek (Figure 2.2 in the EMP).

Based on DFO review (letter response provided as an appendix to the EMP), the proposed alterations to the surface water features do not require a *Fisheries Act* authorization, as serious harm to fish will be avoided through the implementation of standard mitigation measures detailed in Section 8.1.1 of this report.

In addition to the implementation of mitigation measures during construction, the proposed design plan has incorporated recommendations from the Fish Habitat Protection Guidelines for Developing Areas (MNRF, 1994) to minimize harm to fish and fish habitat, including the following:

- Maintaining a vegetation setback strip along the proposed surface water conveyance channel.
- Refraining from adding suspended matter to surface water features.
- Allowing for one full month of growing period following any disturbance where banks are stabilized with vegetation to enable vegetation to become firmly established.

Through the in-design mitigation measures described above, and implementation of the proposed stormwater management system and protection measures for the Leitrim Core Wetland and Casino Wetland detailed in Section 8.1.1, no impacts to fish and fish habitat are anticipated on-Site, in the wetlands, or downstream in Findlay Creek.

The intermittent watercourses on the Site (INT-2 and INT-3) were assessed per the Evaluation and Classification of Headwater Drainage Features Guidelines (the Guidelines) (CVC/TRCA, 2014). Through the assessment, the results indicate that INT-2 and INT-3 warrant conservation. The Guidelines state under Conservation that one should “maintain, relocate, and/or enhance drainage feature and its riparian zone corridor”. The conveyance channel that will be constructed within the southwest corner of the Site will serve to maintain the sheet surface flow contribution towards Findlay Creek in a more effective manner (i.e., the intermittent features on the Site will be removed and there will be a more consistent flow through the conveyance channel). In addition, wildlife habitat for many species including amphibians, fish and invertebrates will be created in conjunction with the

channel, and the resulting habitat will be at least comparable to the existing conditions, and water quality will not be altered by the proposed development.

No further analysis is warranted.

6.7 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). Those 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.

6.7.1 Rare or Specialized Habitat

6.7.1.1 Specialized Habitats

Portions of the Site support SWH for breeding amphibians (woodland) (Figure 2.2 in the EMP and Figure 3 in this report). According to the City's OP and the PPS, development within and adjacent to significant wildlife habitat may be undertaken provided it is demonstrated that there will be no negative impacts on the natural feature or its ecological functions.

Based on a desktop assessment, the amphibian breeding habitat on-Site is approximately 1.0 ha in size, while the potential available habitat of this type within the Leitrim Core Wetland as a whole (including the Casino Wetland) is approximately 235 ha. Removal of the on-Site portions of this habitat type represents an approximate 0.4% reduction in the total potentially available habitat within the PSW (Leitrim Core and Casino Wetlands).

Based on Golder's study of the Leitrim PSW, there is much higher quality amphibian breeding habitat and higher levels of activity in the adjacent portions of the PSW than there is on-Site. There are no unique features that support amphibian breeding on the Site that are not better-represented elsewhere in the PSW.

The amphibian breeding habitats were assessed under Index #14 (Amphibian Breeding Habitat – Woodland) and Index #40 (Amphibian Movement Corridor) of the Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF, 2014b). Index #14 of the SWHMiST outlines the key ways in which residential development can negatively affect amphibian breeding habitat, including:

- Direct removal of breeding habitat, which can affect local populations of amphibians
- Adjacent development can alter ground or surface water quality or quantity
- Adjacent development can disconnect breeding from upland over-wintering and foraging habitat
- Tree removal can alter moisture regimes and remove summer / winter habitat
- Human-related impacts such as noise pollution, predation by pets, road mortality, light pollution, spread of exotic species

The Index states that "when complete avoidance of identified amphibian breeding habitat cannot be accommodated and the habitat is large (as it is at the Site and extending west and southwest into the Leitrim PSW), minimizing the amount of habitat affected may be a satisfactory mitigation option". It further clarifies that the development should be sited at the edge of the habitat, and ensure that it does not affect the water quality or quantity in the adjacent remaining habitat.

As stated, direct removal of the amphibian breeding habitat on the Site is proposed. Any removal of this type of habitat on-Site will be conducted in a manner that will not have an adverse effect on the amphibian breeding habitat to the west/southwest (the feature) or its ecological function, as habitats on Site represent only a small portion of the eastern edge of this habitat. This ensures that no 'islands' of either breeding or upland summer/winter habitat will be created, and no disconnect will be created between breeding and upland habitat.

The removal of any suitable amphibian habitat on-Site and the subsequent proposed development will not result in changes to the groundwater or surface water quality or quantity in the remaining habitat to the west/southwest. In addition, groundwater recharge and discharge functions will not be altered in a manner that will affect the breeding areas to the west/southwest. Best management practices (i.e., erosion control and removal of the least amount of vegetation possible) will also be implemented to avoid adverse effects on the existing habitat to the west/southwest. In addition, based on recommendations in the SWHMiST, where possible, mitigation measures will be implemented to protect the forest cover to the west of the proposed development and amphibian habitat will be created as part of the constructed conveyance channel design.

The SWHMiST states that where "proposed development would possibly have a negative effect on part of a pond or the adjacent habitat…there may be opportunity to create alternate breeding ponds…" The small section of the constructed conveyance channel to be located in the southwest corner of the Site, as well as the 15 m setback to rear yards, will provide natural habitat for amphibians moving through the landscape. Breeding habitat for amphibians has been incorporated just off-Site to the west within the constructed conveyance channel. Overall, there will be sufficient habitat remaining for the amphibian species observed during field surveys in the areas to the west of the Site, such that the proposed development is not expected to have an adverse effect on the regional population of any amphibian species.

Human-related impacts as described in the SWHMiST will be mitigated through the implementation of the 15 m setback to rear yards to reduce potential light and noise impacts on the adjacent remaining habitats, and the use of standard tools, such as Owner Awareness Packages and signage, to reduce human impact on the surrounding environment.

Based on Index #40 of the SWHMiST, which deals with amphibian movement corridors, wooded areas must be wide enough to provide an interior area of moist woods. The forest canopy should be closed (> 60 % crown closure) and composed of deciduous trees (species composition may vary). There may be gaps in the canopy but they should not bisect the corridor. The forest understory should have an abundant supply of downed woody debris, shrubs, and other structures providing cover and moist microclimates. Some amphibians will also cross open areas such as old fields, pastures, hayfields, and golf course fairways (MNRF, 2014b). The habitat on the Site is contiguous with the wetland habitats to the west/southwest; they form the edge habitats and are part of a larger wetland polygon. There is no habitat to the east, so there is no movement from the west to the east. The habitats on the Site do not meet the criteria as outlined above (closed canopy deciduous forest with interior areas) and, most importantly, they do not connect one natural feature to another, so they do not function as a movement corridor for amphibians. Based on this, no mitigation for this habitat type is required or recommended.

Removal of the on-Site portions of the SWH will not have a negative impact on the SWH feature as a whole within the Leitrim Core or Casino Wetlands, as there will be no degradation that threatens the health and integrity of the remaining habitat or its ecological function as a result of the proposed development. As noted, removal represents a small (approximately 0.4%) reduction in the overall available habitat, with the best habitats being maintained within the Leitrim Core and Casino Wetlands. All potential effects will be appropriately mitigated as discussed above and through the implementation of mitigation measures discussed in Section 8.1; no further analysis is warranted.

6.7.2 Habitat for Species of Conservation Concern

There is suitable habitat for one species of conservation concern on the Site, namely monarch butterfly (*Danaus plexippus*). This species was not observed on the Site, and Golder does not consider the suitable habitats on the Site significant within the planning area as there is abundant, better-quality habitat off-Site [Appendix Q (Table Q-3) of the SWHTG (MNRF, 2000a)]. The habitats are therefore not provided protection under the PPS and no further analysis is warranted.

Notwithstanding the foregoing, there are opportunities to maintain habitat for this species on-Site within the park block, and in the constructed conveyance channel corridor (Figure 2). These areas may be naturalized, where feasible and permissible, to provide some areas of naturalized habitat (e.g., wildflower plantings), and the lands immediately to the west will be preserved and naturalized as part of the proposed conveyance channel construction. Overall, natural habitats in these areas should be maintained to the extent possible, and other naturalized habitats should be included wherever appropriate and permissible. No further analysis is warranted.

6.8 Other Natural Heritage Designations

Portions of the Site are identified as Urban Natural Area (UNA 184 – Remer Property in the City of Ottawa Urban Natural Areas (UNA) Environmental Evaluation Study (Muncaster and Brunton, 2005). However, the assessment of the feature, as documented in the EMP, did not recommend protection for the feature per Policy 3.2.3 of the City's OP. Further, considering the small portion of the UNA on the northwest corner area of the Site in isolation of the large portion of the UNA that extends onto the Remer lands, the portion on the Site would rank "Low" using Muncaster and Brunton's criteria, and would not be identified for evaluation based on its small size (<5 ha). No further analysis is warranted.

7.0 POTENTIAL INDIRECT IMPACTS

7.1 Construction Impacts

Construction impacts have the potential to negatively affect the natural features in the Study Area, 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 natural areas can also occur by machinery, foot traffic, and discarding or storage of construction materials outside the construction envelope. The separation of the Site from the Casino Wetland by approximately 100 m (and from the Leitrim Core Wetland by more than 120 m; actually separated from the Leitrim Core Wetland by approximately 450 m at the closest point) will provide ample buffering from potential construction impacts; however, standard construction practices will still be employed to mitigate damage to the adjacent natural features, as outlined in Section 8.1.

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. Temporary and short term loss of biodiversity at the Site due to construction (i.e., site clearing) should be mitigated through naturalized plantings wherever possible in the development, primarily in the park block and constructed conveyance channel.

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, but an increase in human use through the entire system. Residential developments 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)
- Mortality of wildlife from loose pets

The Site is located approximately 100 m from the edge of the Casino Wetland and approximately 450 m from the Leitrim Core Wetland, and the potential human impacts described above related to the development of the Site are unlikely to have a measurable impact on these features. The implementation of other mitigation measures, such as signage and distribution of an Owner's Awareness package, will mitigate for these potential impacts on the constructed conveyance channel and associated naturalized setback. Cumulative effects are dealt with in Section 9.

8.0 MITIGATION AND MONITORING

8.1 Mitigation

8.1.1 Fish and Fish Habitat

The following mitigation measures will be implemented during construction to minimize harm to fish and fish habitat:

- **Timing**: Since the fish community within the drainage network is classified as warm to cool water, no in-water work will occur between the restriction periods in the MNRF Kemptville District of April 1 to July 15. However, if during this timing window the intermittent watercourses are dry, they will be isolated from the rest of the existing drainage network with earth cofferdams and will be in-filled. If infilling must occur during these timing windows and fish are present, a permit to relocate fish will be sought prior to any in-water works.
- **Contamination and Spill Management**: A response plan will be developed that will be implemented immediately in the event of a sediment release or spill of a deleterious substance and an emergency spill kit will be kept on-Site.
- **Erosion and Sediment Control**: As part of the subdivision draft plan, an erosion and sediment control plan will be developed to minimize the risk of sedimentation within the Leitrim Core Wetland and Casino Wetland during all phases of the project. These include installation of sediment barriers on all catch basin and maintenance holes and a silt fence barrier along all areas that sheet drain off-Site, reseeding and

mulching of disturbed areas, and installation of straw bale check dams in outlet ditches, etc. Exposed soils will be stabilized if above the high water mark and any in-water work will be isolated via turbidity curtains, etc. All sedimentation and erosion control measures will be regularly inspected and adapted to meets needs.

- **Shoreline Revegetation**: The shoreline of the newly constructed conveyance channel will be stabilized through revegetation with native species prior to the channel being operational.
- **Fish Protection**: If in-filling is to commence during periods where water remains in the intermittent watercourses, an assessment of the presence of fish within the channels will be conducted by a qualified biologist. If fish are identified, a fish collection permit from the MNRF will be sought and fish will be relocated downstream. If flow diversion via pumping is to be conducted in the channels prior to fish relocation, appropriate measures will be taken to minimize the likelihood of impingement or entrainment.
- **Operation of Machinery**: Machinery will be operated on land above the high water mark where possible. All water crossings will occur over existing crossing structures or temporary crossing structures will be constructed as necessary, with all necessary permits obtained from South Nation Conservation. All refueling, washing, and servicing of machinery will be completed beyond 30 m of the watercourses.
- **Permitting**: A permit from South Nation Conservation will be required prior to undertaking any works within 120 m of the Casino Wetland or within any watercourse.

Recommendations from the Land Development Guidelines for the Protection of Aquatic Habitat (DFO, 1993) will be implemented, including: stabilization of soils as soon as possible; avoiding unnecessary removal of vegetation and delay removal as long as possible to limit erosion of soils; and diverting runoff away from denuded areas.

8.1.2 Construction Best Management Practices

Standard Best Management Practices to be followed during construction to mitigate damage to the adjacent natural features include the following:

- The development envelope shown in the design plan (Stantec, 2017) 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.
- Wildlife should be allowed the opportunity to leave the construction area safely by ensuring gaps in construction boundary fencing are maintained until vegetation clearing is complete.
- Follow the recommendations provided in the City's Protocol for Wildlife Protection during Construction (Ottawa, 2015b).
- The surface water conveyance channel will be constructed as part of the first phase of development to ensure surface water flow is diverted prior to its interaction with on-Site construction activities, and to allow as much time as possible for the establishment of vegetative growth. At the same time, as part of this work, the flow that is currently conveyed via INT-2 will be diverted westward via an earth berm to be constructed along the south limit of the Site.
- The installation of clay dykes through the permeable service trench bedding and backfill materials as they are constructed.
- Implementation of standard best management practices, including sediment and erosion controls, spill prevention, etc., during the construction phase of the project.

8.1.3 Light, Dust and Noise

Potential human impacts to the adjacent natural areas (constructed conveyance channel and setback) 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.

8.2 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 implemented is avoidance of impacts to the adjacent significant natural features and the functions they perform.

One area where monitoring may be required is in relation to the Leitrim Core Wetland. Prior to commencing servicing of the Idone Lands, an application will be made for a Permit to Take Water (PTTW) issued by the Ministry of Environment and Climate Change in relation to temporary groundwater control during construction. Depending on the predicted temporary effects of this groundwater control, monitoring of groundwater levels and a vegetation monitoring program may be requirements. Details of the monitoring plan will be set out in the PTTW. Additional monitoring of vegetation in the conveyance channel will be undertaken according to Section 6.7.3 of the EMP, through a photomonitoring program. Additional details on the vegetation monitoring program for the conveyance channel will be developed as part of the final design of the conveyance channel, and will be a component of the approval required from SNC under Reg. 170/06 for its construction.

Stormwater from the Site, once developed, will flow into the existing Findlay Creek Village SWM Facility, which is to be expanded in part to provide sufficient capacity for the Idone Lands. Because this facility is already operational and has been found to function as expected, no monitoring of the facility in relation to the Site, is proposed. Monitoring proposed in relation to performance of and potential effects from the Findlay Creek Village SWM Facility itself are discussed in Sections 6.7.2 and 6.7.4 of the EMP.

9.0 CUMULATIVE EFFECTS

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 Leitrim Core Wetland and SAR habitat both 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.

For the purposes of this assessment, it is assumed that the lands to the north of the Site (the Remer Lands) have been fully developed. Through the EMP and EIS for the Remer Lands (Golder, 2016a; 2016b), it was determined that there was no measurable negative impact to the Leitrim PSW or any other natural heritage features in the planning area.

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.

The lands to the south, although not currently developed, are zoned Rural, and designated General Rural Area, in the City OP (Ottawa, 2013). The lands to the east of the Casino Wetland, although not developed at this time, have been approved for a severance. They are currently zoned Rural, but they, and lands south to Rideau Road, may be added to the urban boundary in the future.

All of the projects noted above would require 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 Leitrim Core and Casino Wetlands and would not have an adverse effect on the form or function of the larger feature. Similarly, anticipated development of the lands to the east of the Casino Wetland and south of the Site would not have a direct negative effect on nearby natural heritage features, as they are located outside of the wetlands.

In general, 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. In addition, as noted in this report, 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.

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 4840 Bank Street (Idone Lands) 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*.

Based on Golder's review of UNA 184, in consideration of the Remer lands development to the north, no portion of the UNA that extends onto the Site should be considered significant or worthy of protection under Policy 3.12 – 3 b) of the OP. The proposed development also meets the recommendations of the Environmental Management Plan (Golder, 2016a) prepared for the Remer and Idone lands.

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 lands. These conclusions are based on the following recommendations:

- Maintain the development envelope shown in the design plan (Stantec, 2017).
- Construct the surface water conveyance channel as per the recommendations of the EMP, and as part of the first phase of the Remer development.
- Capture and divert flows that are currently conveyed via INT-2 westward via an earth berm to be constructed at the time of development of the Remer lands (north of the Site) along the south limit of the Site.
- Undertake the detailed design of the conveyance channel and plans for naturalized plantings within the allowance for the channel.
- 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.
- Allow wildlife the opportunity to leave the construction area safely (ensure gaps in construction boundary fencing are maintained until vegetation clearing is complete).
- Follow the recommendations provided in the City's Protocol for Wildlife Protection during Construction (Ottawa, 2015b).
- Install the clay dykes 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 natural features.
- Undertake monitoring according to Section 6.7 of the EMP.
- Implement mitigation as outlined in Section 8.1 during the construction and operation phases of the project.
- Maintain and enhance natural habitat wherever possible as per Section 6.7.2.

11.0 CLOSURE

We trust that the information presented in this report meets your requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

Gwendolyn Weeks, H.B.Sc.(env)
Ecologist

Heather Melcher, M.Sc.
Associate, Senior Ecologist

GAW/PAS/HM/sg
\\golder.gds\gal\ottawa\active\2013\1121 - geotechnical\13-1121-0083 remer and idone lands\phase 1030 and 2030 natural environment\eis and tcr\idone eis\1311210083-001-r-rev 0_idone lands final eis_16feb2017.docx

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12.0 REFERENCES

Beacon Environmental (Beacon). 2007. Assessment of the "Casino" and "Raceway" Wetlands, Former Township of Gloucester, City of Ottawa. Letter report prepared for the City of Ottawa.

Canada, Government of (Canada). 1985. *The Fisheries Act*. R.S.C., 1985, c. F-14. Last amended on 2013-11-25.

Canada, Government of (Canada). 2002. *Species at Risk Act*. S.C. 2002, c. 29.

Fisheries and Oceans Canada (DFO). 1993. Land Development Guidelines for the Protection of Fish Habitat (online). URL: http://www.dfo-mpo.gc.ca/Library/165353.pdf

Fisheries and Oceans Canada (DFO). 2013a. Fisheries Protection Policy Statement. Ecosystem Programs Policy, Fisheries and Oceans Canada. Ottawa, Ontario

Fisheries and Oceans Canada (DFO). 2013b. Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting. Fisheries and Oceans Canada. Ottawa, Ontario.

Golder Associates Ltd. 2016a. Environmental Management Plan for the Remer and Idone Lands, Ottawa, Ontario.

Golder Associates Ltd. 2016b. Environmental Impact Study for the Remer Lands, Ottawa, Ontario.

IBI Group Inc. March 2007. Final Serviceability Report Leitrim Development Area City of Ottawa.

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

Ontario Legislative Assembly. 2006. Ontario Regulation 170/06 made under the *Conservation Authorities Act*. South Nation Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

Ontario Legislative Assembly. 2007. *Endangered Species Act* (ESA). URL: http://www.MNRF.gov.on.ca/en/Business/Species/2ColumnSubPage/STEL01_131232.html.

Ontario, Government of (Ontario). 2015. Ontario Regulation 242/08 made under the *Endangered Species Act*. General.

Ontario Ministry of Municipal Affairs and Housing (MMAH). 2014. Provincial Policy Statement. URL: http://www.mah.gov.on.ca/Page1485.aspx.

Ontario Ministry of Natural Resources and Forestry (MNRF). 1994. Fish Habitat Protection Guidelines for Developing Areas. March 1994.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2000a. Significant Wildlife Habitat Technical Guide (SWHTG). 151 pp.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2000b. Significant Wildlife Habitat Decision Support System.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2009. Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide. Working Draft.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2010. Natural Heritage Reference Manual for Natural Heritage Polices of the Provincial Policy Statement, 2005 Second Edition.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2012. Significant Wildlife Habitat Ecoregion Criterion Schedule: Ecoregion 6E. Draft, February 2012.

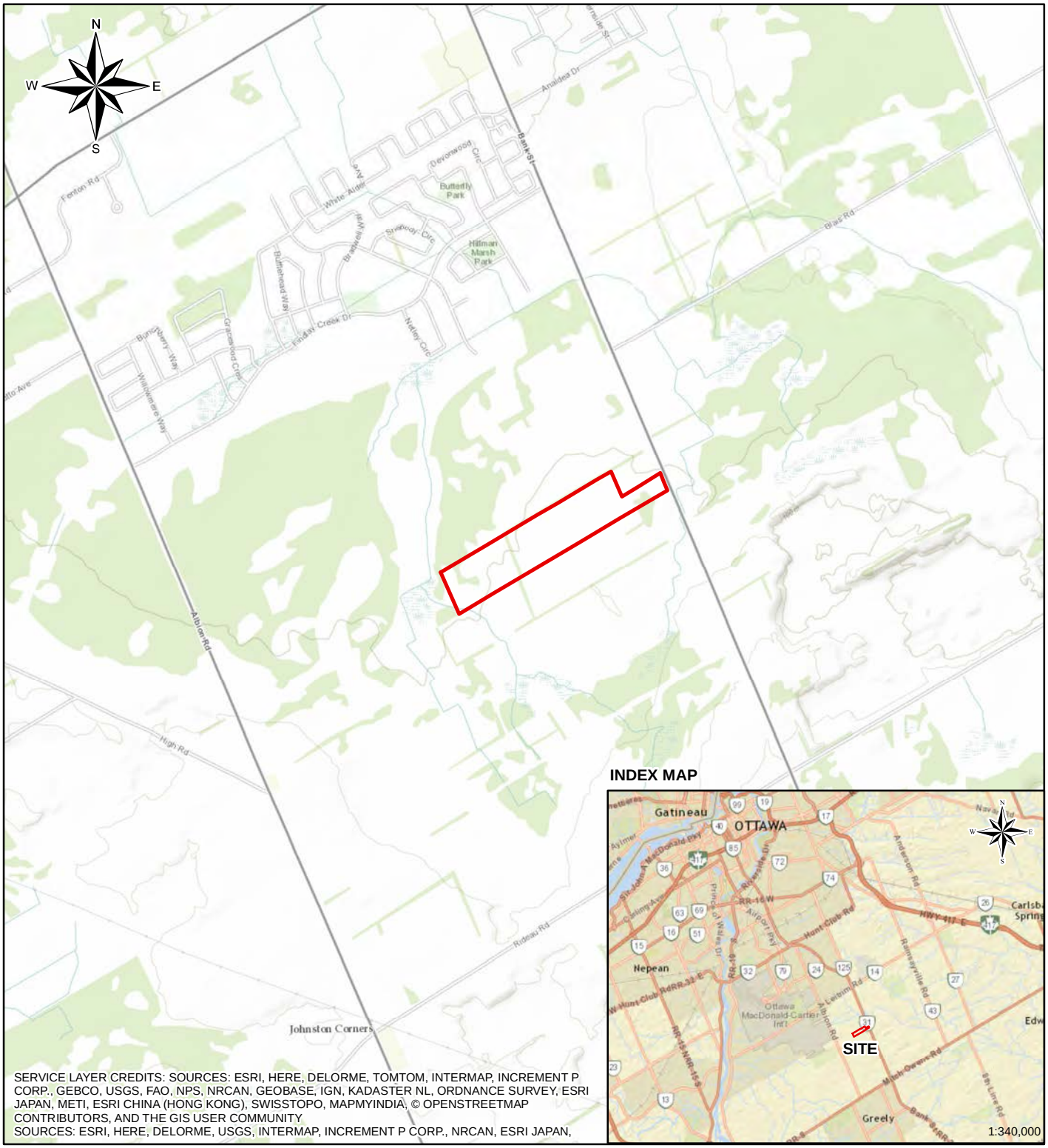
Ottawa, City of. 2014. Personal Correspondence. Email dated January 8, 2014. Confirmation of acceptance of the Terms of Reference for the EMP.

Ottawa, City of. 2015a. Environmental Impact Statement Guidelines. URL: http://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/environmental-impact-statement-guidelines. Accessed: 2016.

Ottawa, City of. 2015b. City of Ottawa Protocol for Wildlife Protection during Construction.

Ottawa, City of. 2016. Annotated Version of the OP Showing Proposed Changes as per Amendment No. 150. URL: http://documents.ottawa.ca/en/node/5720. Accessed: 2016.

Stantec Geomatics Ltd. 2017. Draft Plan of Subdivision of Part of Lot 22, Concession 4 (Rideau Front), Geographic Township of Gloucester, City of Ottawa.



INDEX MAP

LEGEND

SITE

500 250 0 500

SCALE 1:25,000 METRES

NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 13-1121-0083/2030.

REFERENCE

DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9

PROJECT

ENVIRONMENTAL IMPACT STATEMENT
IDONE LANDS

TITLE

KEY PLAN

Golder Associates

PROJECT No. 13-1121-0083			SCALE AS SHOWN	REV. 0.0
DESIGN	GW	2014-12-08	FIGURE 1	
GIS	BR	2015-05-19		
CHECK	PAS	2015-05-19		
REVIEW	PAS	2015-05-19		

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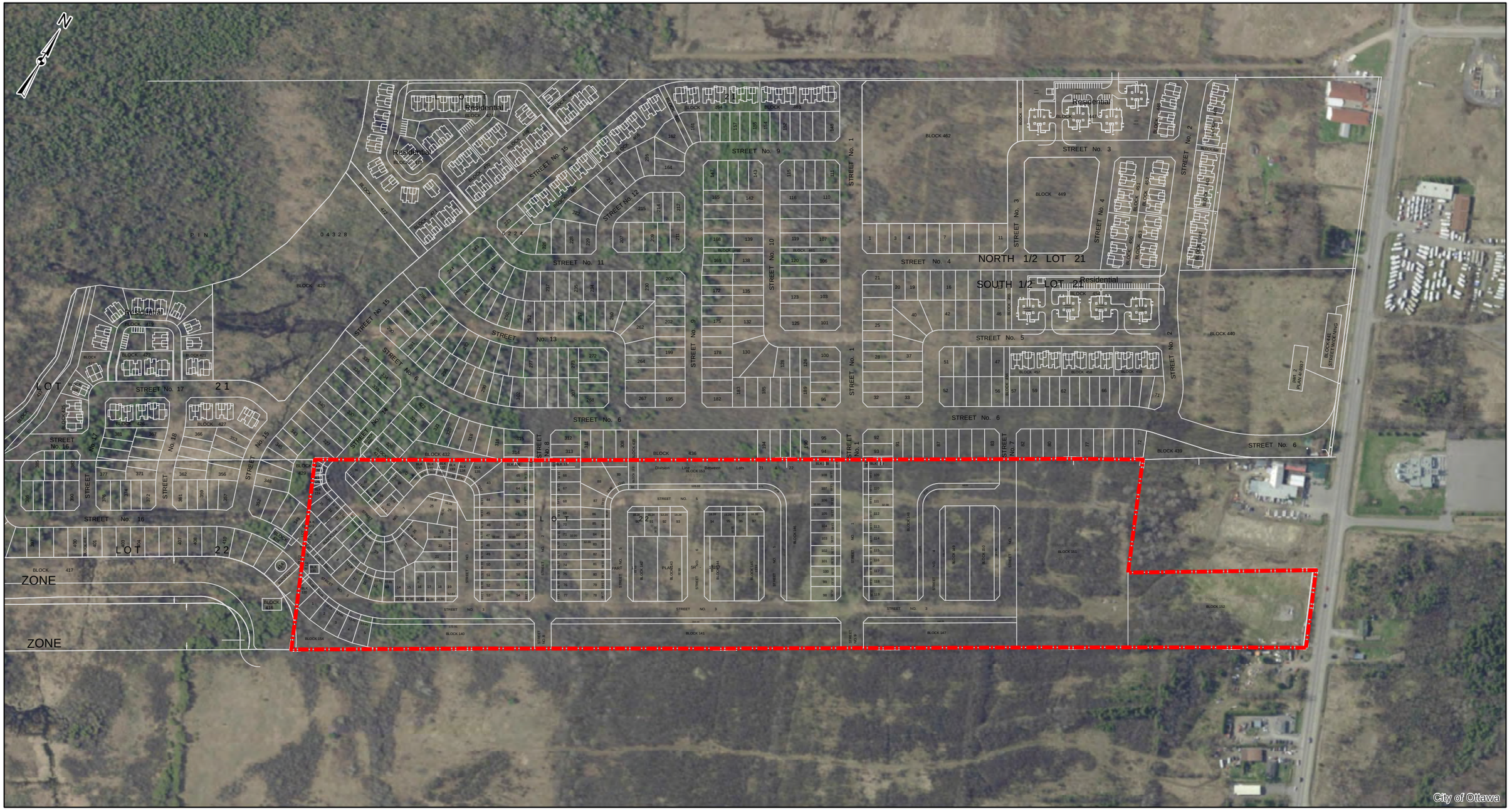


LEGEND

SITE

80 40 0 80

SCALE 1:4,000 METRES

NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 13-1121-0083/2030

REFERENCE

IDONE LANDS DEVELOPMENT PLAN PROVIDED IN ELECTRONIC FORMAT BY STANTEC, 2017-01-05.
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

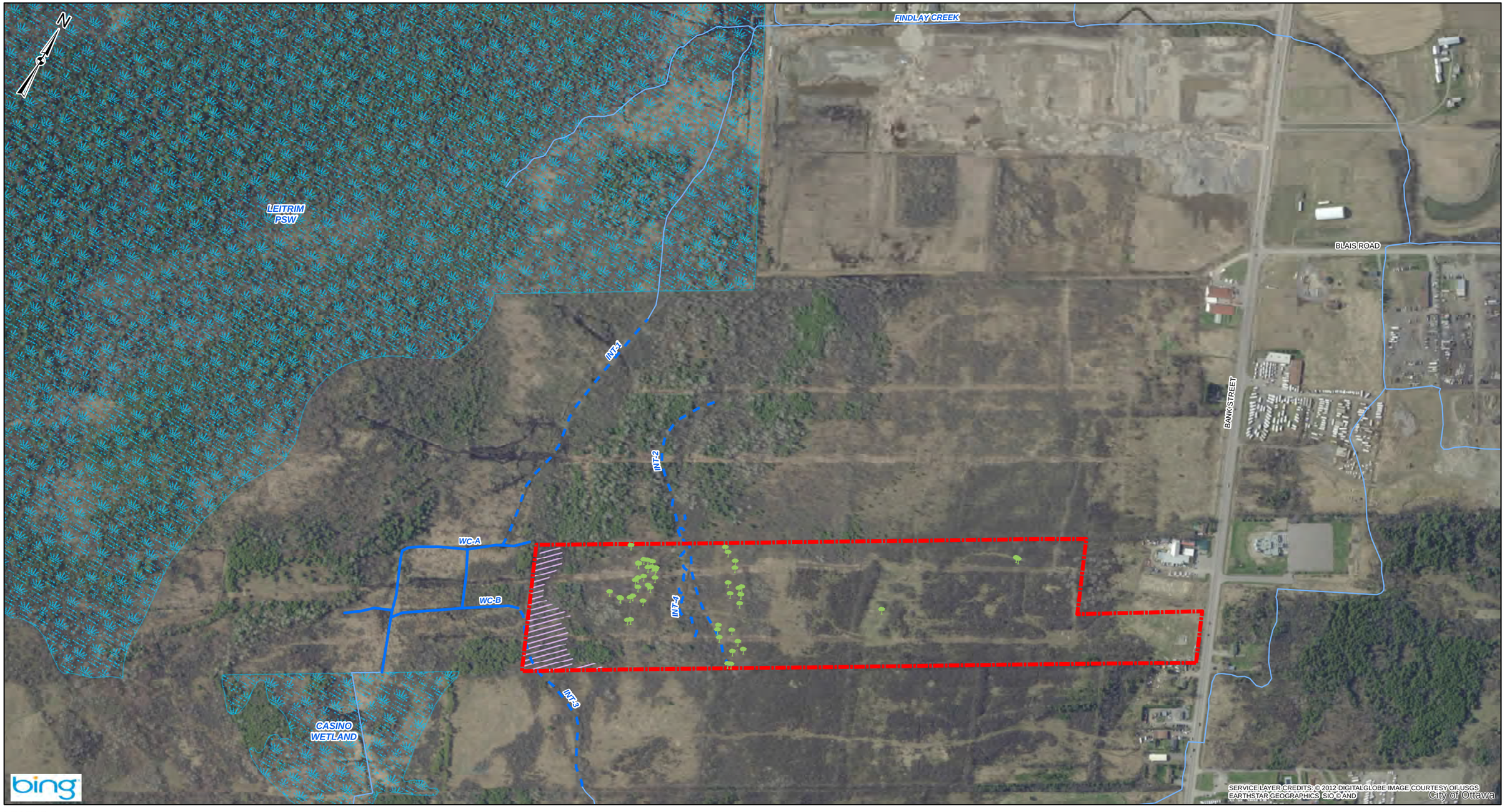
PROJECT
ENVIRONMENTAL IMPACT STATEMENT
IDONE LANDS

TITLE
PROPOSED DESIGN PLAN

Golder Associates

PROJECT No. 13-1121-0083			SCALE AS SHOWN	REV. 0
DESIGN	FN	2017-01-13		
GIS	BR	2017-01-13		
CHECK	PAS	2017-01-13		
REVIEW	PAS	2017-01-13		

FIGURE 2



LEGEND

- BUTTERNUT TREE LOCATION
- WATERCOURSE
- WETLAND CHANNEL
- INTERMITTENT STREAM
- SITE
- PROVINCIALLY SIGNIFICANT WETLAND
- SIGNIFICANT WILDLIFE HABITAT - AMPHIBIAN BREEDING; REFER TO EMP SECTION 6.1.5 FOR DISCUSSION
- *WC* - WETLAND CHANNEL
- *INT* - INTERMITTENT STREAM

120 60 0 120

SCALE 1:6,000 METRES

NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 13-1121-0083/2030

REFERENCE

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
ENVIRONMENTAL IMPACT STATEMENT
IDONE LANDS

TITLE
SIGNIFICANT NATURAL HERITAGE FEATURES AND SPECIES AT RISK

Golder Associates

PROJECT No. 13-1121-0083			SCALE AS SHOWN	REV. 0
DESIGN	GW	2014-12-08	FIGURE 3	
GIS	BR	2015-05-19		
CHECK	PAS	2015-05-19		
REVIEW	PAS	2015-05-19		

APPENDIX A

Tree Conservation Report

February 16, 2017 Project No. 13-1121-0083

Ms. Martha Copestake, Forester - Planning
City of Ottawa
Ottawa City Hall
110 Laurier Avenue West
Ottawa, ON, K1P 1J1

TREE CONSERVATION REPORT – 4840 BANK STREET (IDONE LANDS)
OTTAWA, ONTARIO

Dear Ms. Copestake:

Golder Associates Ltd. (Golder), together with Novatech Engineering Consultants (Novatech), have been retained by Leitrim South Holdings Inc. to prepare a Tree Conservation Report (TCR) in support of the proposed development of 4840 Bank Street, Ottawa, also known as the Idone Lands (the Site) (Map 1). This letter has been prepared in consideration of direction received from the City of Ottawa, and is meant to satisfy the requirements of a TCR per the City of Ottawa guidelines (2017). This letter should be read in conjunction with the Environmental Impact Study (EIS) and Environmental Management Plan (EMP) prepared by Golder for the Site (2017a; 2016).

The overall phasing plan for development will be determined by a number of factors including extension of municipal servicing from the Remer Lands to the north, and division of the lands based on the desired mix of types of units available to suit market conditions. This report has been prepared on the details available at this time.

1.0 GENERAL INFORMATION

Owner / Applicant:
4840 Bank Street Inc.
c/o The Regional Group
1737 Woodward Drive, 2nd Floor
Ottawa, ON, K2C 0P9
(613) 230-2100

Consultants Hired to Prepare this Report:
Fergus Nicoll Dip. T. Terrestrial Specialist
Golder Associates Ltd.
1931 Robertson Road
Ottawa, ON, K2H 5B7
613-592-9600

Jessica Palacios, BLA, OALA, CSLA, Landscape Architect
Novatech Engineering Consultants
240 Michael Cowpland Drive, Suite 200
Ottawa, ON, K2M 1P6
613-254-9643

Contractor Implementing the Plan:
To be subcontracted by 4840 Bank Street Inc.

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2.0 CURRENT DESIGNATIONS AND STATUS OF PLANNING APPLICATION

The Idone lands are located on Part Lot 22, Concession 4, City of Ottawa (Gloucester), Ontario. The Site is currently characterized by abandoned agricultural lands in various stages of natural succession. There are also a few small wetland areas and surface water features on the Site.

The Site is currently designated in the OP as Developing Community (Expansion Area) within the Urban Policy Plan Area.

No Urban or Rural Natural Features (UNF) are present on, or in the immediate vicinity of, the Site. The Site is adjacent to the Casino Wetland and east of the Leitrim Core Wetland, both of which are provincially significant wetlands (PSW).

3.0 PROPOSED WORKS AND SCHEDULE

The proposed development will be residential consisting of low rise single and multiple units (Figure 2), a park block, and commercial and mixed uses along Bank Street (Stantec, 2017). Stormwater quantity and quality on the Site will be controlled by means of expansion of the existing Findlay Creek Village Stormwater Management Facility east of Bank Street.

A constructed conveyance channel has been incorporated in the southwest corner of the Site, including a 15 m setback to rear yards. This feature will convey upstream rural runoff and maintain this contribution of base flows to the Leitrim Core Wetland Buffer and Findlay Creek.

It is anticipated that clearing of the Site will begin in 2017.

4.0 EXISTING TREE COVER ON-SITE

Based on input from the City of Ottawa, Golder characterized the tree cover on the Site by species composition, and general size, age and condition notes by species. The areas where tree retention may be more feasible were reviewed more closely, with attention paid to identifying individual specimen trees targeted for possible retention. No individual specimen trees were identified on this Site in these areas.

The existing tree cover on the Site, including Species at Risk (SAR), has been illustrated on Map 1 (Attachment A), with descriptions of each identified tree grouping provided in Table 1 (Attachment B).

5.0 NATURAL ENVIRONMENT FEATURES ON-SITE

For detailed information on the Natural Environment Features on the Site, refer to the Environmental Impact Study (EIS) and Environmental Management Plan (EMP) prepared by Golder for the Site (2017a; 2016).

6.0 PROPOSED ALTERATIONS TO TREE COVER

There is little opportunity to save existing trees on the Site due to the need for mass grading to meet servicing requirements, and the density of development required to meet Official Plan and CDP requirements. The trees shown on Map 2 will be retained until the feasibility of their long term retention is determined at a later stage of planning and engineering. These trees will be protected by fencing with an offset of 6 m to prevent damage to the critical root zones during the initial tree clearing and grading, and until a decision on their long-term retention is reached. Ultimately, the ability to retain trees will be dependent on individual block design requirements such as site plan layout, servicing, and detailed grading.

6.1 Natural Heritage Features

The key natural heritage features and potential impacts of the proposed development on the Site, including the potential impacts of tree removal are discussed in detail in the EIS and EMP (Golder 2017a; 2016) for the Site.

7.0 RECOMMENDATIONS AND MITIGATION MEASURES

The following protection measures must be implemented for retained trees, both on-Site and on lands directly adjacent, 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 where the CRZ is established as being 10 centimetres from the trunk of a tree for every centimetre of trunk diameter at breast height (Attachment C). The CRZ is calculated as DBH x 10cm.
- 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 20mm 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.
- Ensure that exhaust fumes from all equipment are directed 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) unless a qualified biologist has determined that no nesting is occurring within 5 days prior to the clearing. A pre-clearing survey for active stick nests and cavity nests must also be conducted between April 1 and April 15, in order to identify and protect early-nesting owls and raptors.
- All buffer areas as shown on the design plan are established and protected with a fence that has an offset of 6 metres.

8.0 PROPOSED PLANTING

Recognizing both the loss of natural tree canopy and City efforts to maintain a treed canopy on a long term basis, a study will be undertaken to explore alternate tree planting schemes to meet municipal goals. In the study, the following planting methods and strategies will be considered:

- Ensure tree species respond to soil conditions identified in the geotechnical report (Golder, 2017b). No planting restrictions due to sensitive soil conditions are required for this Site.
- Plant non-invasive species and large native species, where opportunities exist.
- Ensure the proposed plantings will improve the aesthetic and biodiversity of the Site and fit within the biological matrix of the Leitrim Core Wetland while responding to the suburban environment.
- Direct drainage to trees through grading.
- Minimize impact of roadway salt spray and snow clearing. This could be mitigated by locating trees further from the roadway where possible.
- Provide adequate soil volume for each tree. Where possible, provide trees with enlarged root zones or linked tree pits to increase the soil volume available to each tree.
- Minimize over-compaction of soils.

Additionally, specifications and cross sections for services and utilities will be reviewed and appropriate adjustments will be made to achieve consistent street tree patterns. Simple changes such as placing utilities under or next to driveways for house connections will be studied and incorporated into the Composite Utility Plans. In this way it is expected that tree health and longevity will be improved and meet City objectives to create and maintain a viable urban canopy. Tree species contemplated for the Site are provided in Tables 2 and 3 below.

Table 2: Streetscape Trees

Common Name	Scientific Name
*Red Maple	*Acer rubrum*
Black Maple	*Acer saccharum* subsp. *Nigrum*
Freeman's Maple	*Acer x freemanii*
Serviceberry	*Amelanchier* sp.
Hackberry	*Celtis occidentalis*
Turkish Hazel	*Corylus colurna*
Ginkgo	*Ginkgo biloba*
Honey locust	*Gleditsia triacanthos* var. *inermis*
Kentucky Coffee Tree	*Gymnocladus dioicus*
Crabapple	*Malus* sp.
*Burr Oak	*Quercus macrocarpa*
Red Oak	*Quercus rubra*
*Basswood	*Tilia americana*
*White Elm	*Ulmus americana*

Notes:
*Species currently found on-Site.
All *Ginkgo biloba* will be male cultivars only. All *Ulmus americana* to be Dutch Elm resistant cultivars.

Table 3: Parks and Open Space Trees (may include streetscape trees, as appropriate)

Common Name	Scientific Name
Balsam Fir	*Abies balsamea*
*Silver Maple	*Acer saccharinum*
*Sugar Maple	*Acer saccharum*
*Yellow Birch	*Betula alleghaniensis*
American Beech	*Fagus grandifolia*
Black Walnut	*Juglans nigra*
Tamarack	*Larix laricina*
Hop Hornbeam	*Ostrya virginiana*
*White Spruce	*Picea glauca*
Colorado Spruce	*Picea pungens*
*Eastern White Pine	*Pinus strobus*
Swamp White Oak	*Quercus bicolor*
White Oak	*Quercus alba*
Mountain Ash	*Sorbus* spp.

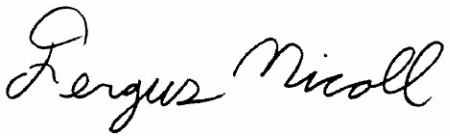
Notes:
* Species currently found on-Site.
All Ginkgo biloba will be male cultivars only. All Ulmus americana to be Dutch Elm resistant cultivars.

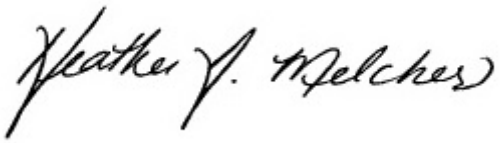
9.0 CLOSURE

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 under-signed.

Sincerely,

GOLDER ASSOCIATES LTD.





Fergus Nicoll, Dip. T.
Terrestrial and Wetlands Technical Specialist

Heather Melcher, M.Sc.
Associate, Senior Ecologist

FN/GAW/HM/sg

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Attachments: Attachment A – Maps 1 and 2
Attachment B – Table 1
Attachment C – Tree Protection Detail

10.0 REFERENCES

Golder Associates Ltd. 2016. Environmental Management Plan for the Remer and Idone Lands, Ottawa, Ontario.

Golder Associates Ltd. 2017a. Environmental Impact Statement for the Development of 4800 Bank Street (Remer Lands), City of Ottawa, Ontario.

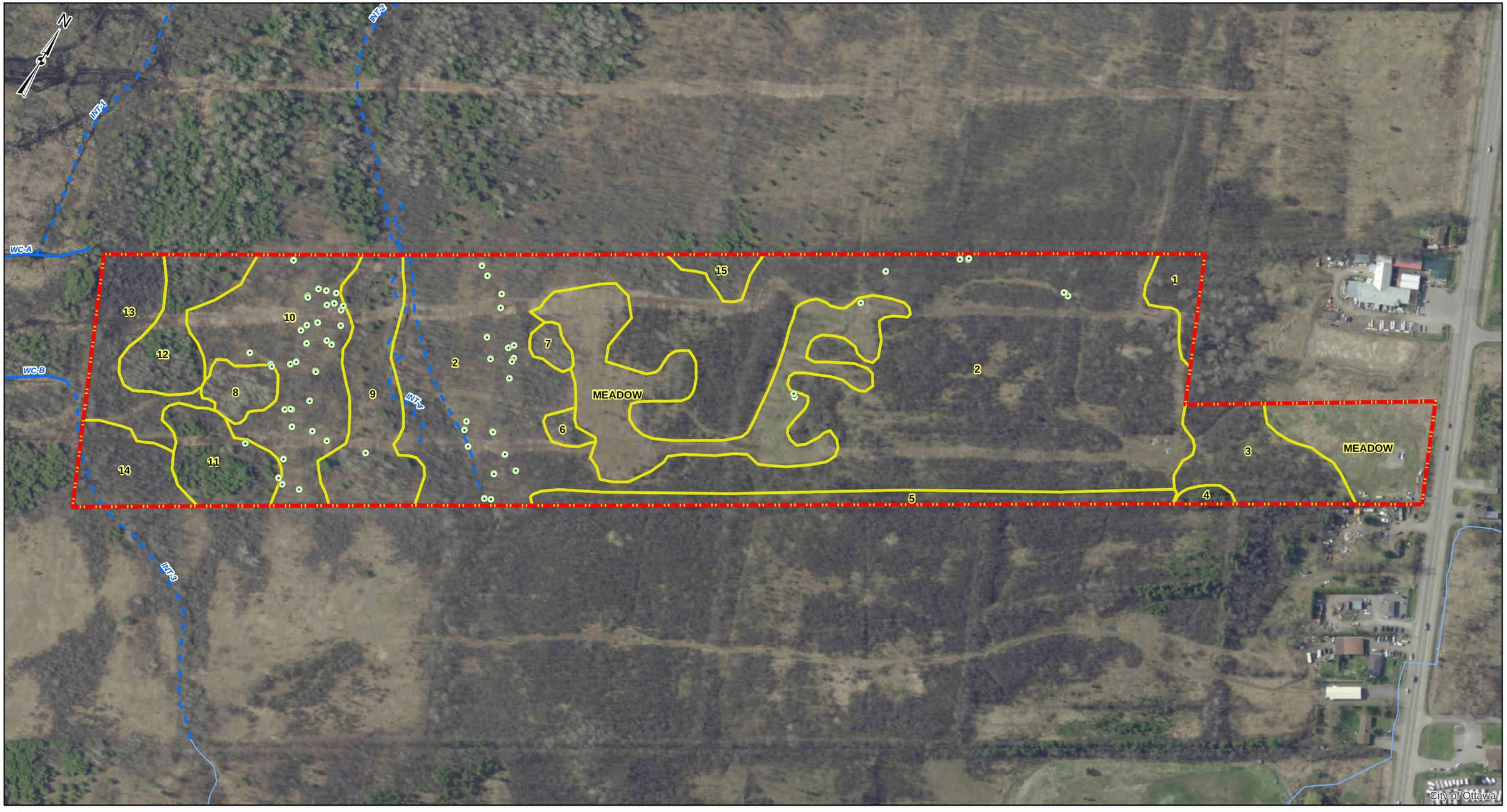
Golder Associates Ltd. 2017b. Geotechnical Investigation - Proposed Residential Development: Remer and Idone Lands, Ottawa, Ontario

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. 2017. Tree Conservation Report Guidelines (online). Available: http://ottawa.ca/en/residents/water-and-environment/trees-and-community-forests/tree-conservation-report-guidelines.

ATTACHMENT A

Maps 1 and 2



LEGEND

- BUTTERNUT TREE LOCATION
- TREE GROUPINGS
- IDONE LANDS
- WATERCOURSE
- INTERMITTENT STREAM
- WETLAND CHANNEL

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. 13-1121-0083

REFERENCE

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 – IDONE LANDS

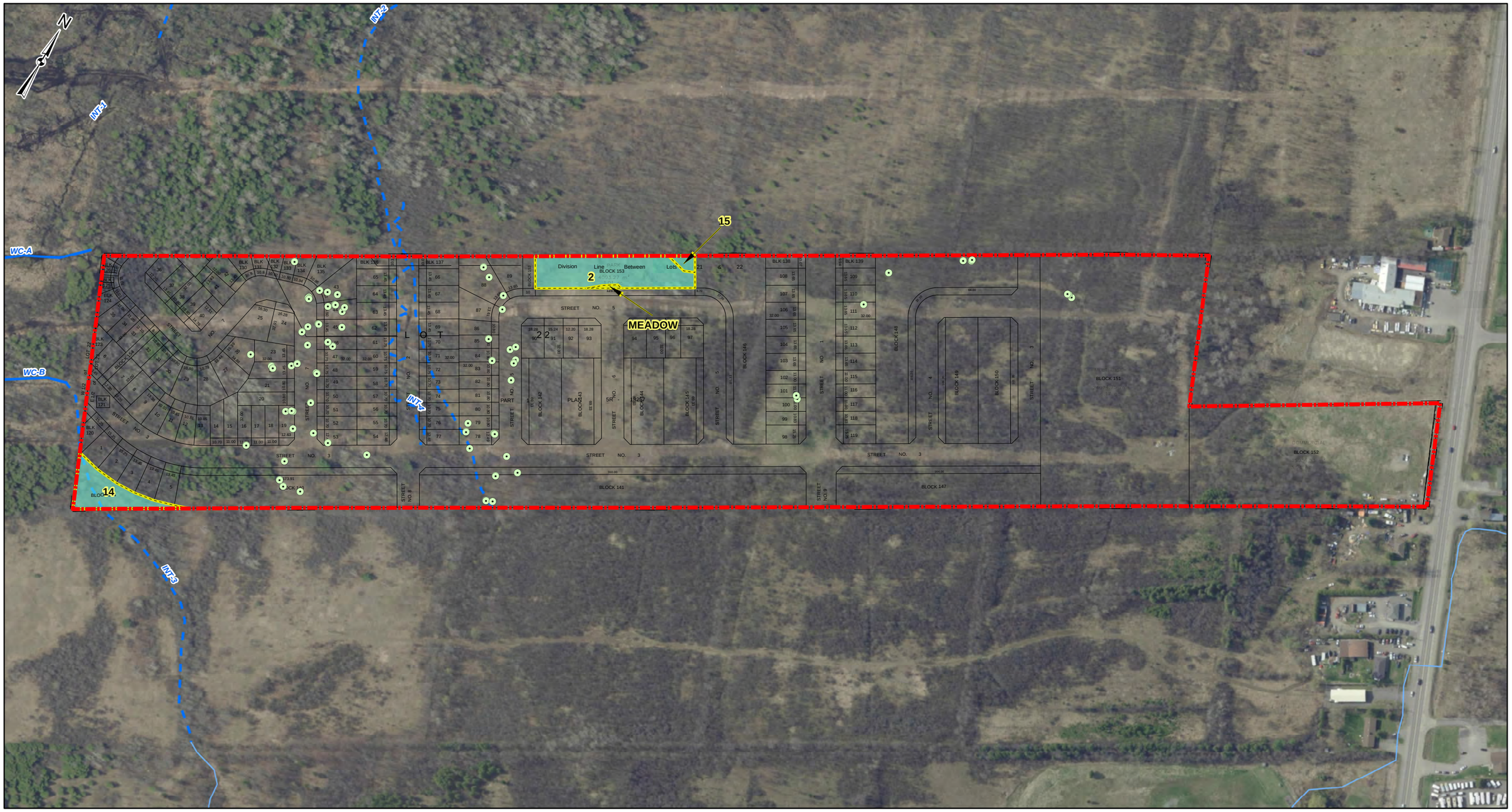
TITLE

CURRENT VEGETATION

Golder Associates

PROJECT No. 13-1121-0083			SCALE AS SHOWN	REV. 0
DESIGN	FN	2017-01-18		
GIS	BR	2017-01-23		
CHECK	FN	2017-01-30		
REVIEW	HM	2017-01-30		

MAP 1



LEGEND

- BUTTERNUT TREE LOCATION
- TREE GROUPINGS
- AREAS OF POTENTIALLY RETAINED VEGETATION
- IDONE LANDS
- WATERCOURSE
- INTERMITTENT STREAM
- WETLAND CHANNEL

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. 13-1121-0083

REFERENCE

BASE DATA PLAN PROVIDED IN ELECTRONIC FORMAT BY STANTEC, 2017-01-05. 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 – IDONE LANDS

TITLE
PROPOSED DEVELOPMENT AND CONSERVED VEGETATION

Golder Associates

PROJECT No. 13-1121-0083			SCALE AS SHOWN	REV. 0
DESIGN	FN	2017-01-18	MAPS 2	
GIS	BR	2017-01-23		
CHECK	FN	2017-01-30		
REVIEW	HM	2017-01-30		

ATTACHMENT B

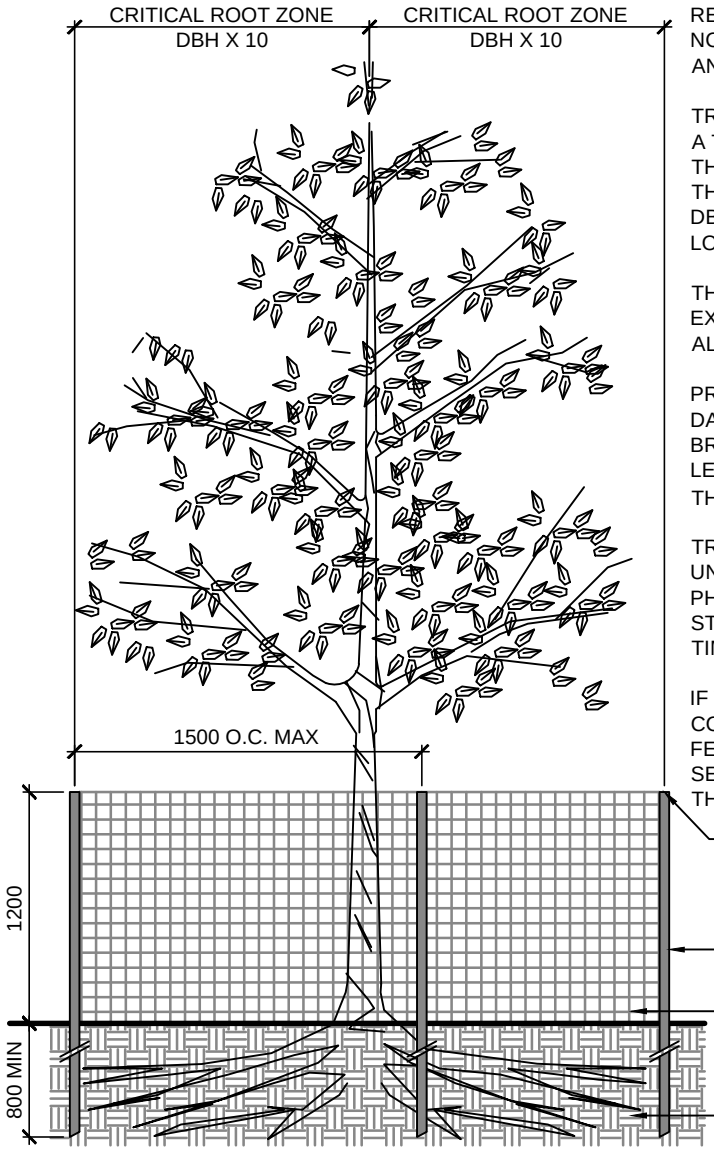
Table 1

Tree Grouping #	Stand Description*	Average range of dbh (cm)	Notes
1	Sugar maple 50% Basswood 25% Eastern cottonwood. trembling aspen, white ash, red maple etc. 25%	10 to 35	Small clump of immature trees, occasional larger sugar maple and cottonwood. Dense understory of shrubs such as glossy buckthorn. Overall in fair condition, with some trees showing dieback in crown. Ash trees showing signs of emerald ash borer and dieback.
2	White elm 40% White ash/green ash 35% Trembling aspen, basswood, red maple, common buckthorn, butternut, eastern white cedar etc. 25%	5 to 15	Open woodland, old overgrown field. Saplings and immature, with occasional semi-mature tree along old hedgerows etc. (e.g. butternuts and basswood) Some areas are dense thickets of buckthorn species, raspberry species, nannyberry, red osier dogwood etc.
3	White elm 45% White ash/green ash 30% Trembling aspen, basswood, red maple, common buckthorn, eastern white cedar etc. 25%	10 to 25	Open woodland, old overgrown field, similar to Tree Grouping #2 but more density.
4	Eastern white cedar 95% White elm, ash species 5%	10 to 15	Very small almost pure stand of immature eastern white cedar. Trees are very healthy with little dieback.
5	Basswood 70% White ash 15% White elm 10% Trembling aspen, sugar maple, red maple, eastern white cedar, white birch, butternut 5%	15 to 30	Immature hedgerow, along property boundary. Occasional older tree. Most trees in fair to good condition, except white elms and white ash showing dieback from disease and insect damage.
6, 7, 8	Trembling aspen 95% Balsam poplar, ash species, white elm 5%	10 to 25 cm	Three small almost pure stands of trembling aspen. Immature. Trees in fair condition, with some minimal woodpecker damage here and there.
9	Sugar maple 20% Basswood 20% White/green ash 20% Eastern white cedar 15% Eastern cottonwood. trembling aspen, white elm, red maple etc. 25%	15 to 25	Immature trees, occasional larger sugar maple and basswood. Dense understory of shrubs such as glossy buckthorn. Overall in fair condition, with some trees showing dieback in crown. Ash trees showing signs of emerald ash borer and dieback.
10	Eastern white cedar 95% White elm, ash species 5%	5 to 15	Very similar to Tree Grouping #2. Open woodland, old overgrown field. Saplings and immature, with occasional semi-mature tree along old hedgerows etc. (e.g. butternuts and basswood) Some areas are dense thickets of buckthorn species, raspberry species, nannyberry, red osier dogwood etc.
11	Eastern white cedar 85% White elm, ash species 15% Balsam poplar 5%	6 to 15	A primarily immature coniferous forest, dominated by eastern white cedar. Overall trees are in fair condition, with ash trees showing dieback, likely from emerald ash borer.
12	Trembling aspen/balsam poplar 35% White spruce/eastern white cedar 35% Green ash 20% Black ash, red maple, white elm, white birch, balsam poplar etc. 10%	15 to 30	An immature to forested swamp, with the occasional semi-mature component. Canopy partially open, understory moderate to dense. Overall fair condition except some ash trees showing signs of dieback, possibly from emerald ash borer, dead and dying white elms, and regular dieback on the occasional tree as expected in a natural forest. Snags do occur but are rare, and generally small.
13	Eastern white cedar 85% White elm, ash species 15% Balsam poplar 5%	6 to 15	A primarily immature coniferous forest, dominated by eastern white cedar. Overall trees are in fair condition, with ash trees showing dieback, likely from emerald ash borer.
19	Black ash 70% Eastern white Cedar 10% Silver maple, trembling aspen, white elm, willow species, glossy buckthorn etc. 20%	5 to 10	Mix of sapling and immature trees and shrubs in flooded area. Shrubs such as willows and buckthorns are equally dominant to trees. Trees are primarily sapling to immature and appear somewhat stunted, with a high proportion of dieback, and small snags, possibly related to saturated conditions. Appears to be flooded, at least in part, for most of the year.
15	Eastern white cedar 55 % White/green ash 25% Basswood, sugar maple, white pine, trembling aspen, nannyberry, common buckthorn etc. 20%	6 to 20	Small stand of sapling to immature eastern white cedar and other species. Moderate understory of shrubs. Overall healthy except some ash trees showing signs of dieback, possibly from emerald ash borer.

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

ATTACHMENT C

Tree Protection Detail



REFER TO THE TREE PROTECTION NOTES, FOUND ON THE PLANS AND/ OR REPORT.

TREES SHALL BE PROTECTED WITH A TEMPORARY FENCE ERECTED AT THE CRITICAL ROOT ZONE (CRZ). THE CRZ IS ESTABLISHED AS DBH x 10cm, SEE PLAN FOR LOCATION.

THE SURVEY SHALL SHOW EXISTING ELEVATION AT BASE OF ALL TREES TO BE PRESERVED.

PRUNE BRANCHES TO REMOVE DAMAGED OR OBJECTIONABLE BRANCHES. DO NOT PRUNE LEADERS. DO NOT PRUNE MORE THAN ¼ OF CROWN.

TREE PROTECTION TO REMAIN UNTIL THE SODDING/ SEEDING PHASE OF THE PROJECT IS STARTED, REMOVE FENCE AT THIS TIME.

IF TREES ARE BEING AFFECTED BY CONSTRUCTION, A WATER AND FERTILIZING PROGRAM SHOULD BE SET UP TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT.

TREE PROTECTION FENCE

D1

APPENDIX B

Curriculum Vitae

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

Senior Ecologist/Project Manager/GTA Bioscience Group Leader (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 – AGGREGATES

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.

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.

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.

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 – 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 LNG Facility
Trois Rivieres, Quebec, Canada

Designed and conducted inland fisheries field programs for a liquified 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 – MINING

EnCana Dyno
Bancroft, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of a 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 collection of benthic, fish, sediment and aquatic plant samples in affected and reference lakes and watercourses. As part of the terrestrial workplan, collection of plant 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, 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 collection of benthic, fish, sediment and aquatic plant samples in affected and reference lakes and watercourses. As part of the terrestrial work plan, collection of plant 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 – 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.

Education

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

Certifications

Ecological Land Classification - Training Certificate, 2004

Ontario Wetland Evaluation System - Training Certificate, 2005

Ontario Ministry of Natural Resources 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 Ecological Land Classification (ELC) and Wetland Evaluation systems, as well as being an OMNR 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, 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 the aggregate industry.

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 – 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 – 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-earted 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. Gwendoln'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.

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 Subdivisons - 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 – 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.

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.

TRAINING

St. John's Ambulance First Aid Training
2013

PROFESSIONAL AFFILIATIONS

Ontario Vernal Pool Association

Field Botanists of Ontario

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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