Oak Ridges Moraine Natural Heritage Evaluation – Proposed Hall's Lake Estates Subdivision, Town of Caledon

Prepared for:

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TABLE OF CONTENTS

APPENDICES

List of Tables

1 INTRODUCTION

Savanta Inc. (Savanta) was retained by Riteland Development Corporation to conduct a Natural Heritage Evaluation (NHE) in accordance with Section 23.1 of the Oak Ridges Moraine Conservation Plan (ORMCP) for the proposed Hall's Lake Estates subdivision, herein referred to as the Subject Lands. The Subject Lands are located mainly within the Town of Caledon with 396 metres of frontage on the east side of Mount Wolfe Road, south of Hall's Lake Sideroad. The Subject Lands are legally described as Part of Lot 20, Concession X, Regional Municipality of Peel, and Part of Lot 27, Concession XII, Township of King, Regional Municipality of York. **Figure 1 (Appendix A)** depicts the Subject Lands. This NHE was recently requested by the Town of Caledon in support of a revised Draft Plan of Subdivision application by the proponent.

The proposed development would occupy approximately 56 hectares and be comprised of 28 low density estate residential lots. These lands have been the subject of previous site investigation in support of the original 1998 Draft Plan of Subdivision application and subsequent revisions to the proposed Draft Plan. The last revision and circulation of the Draft Plan was in 2010. At that time, the Draft Plan was prepared by a previous consulting team, and since then, Calder Engineering Ltd has been retained to update the Draft Plan to address, review agency concerns and provide additional supporting documentation. As part of this process, Savanta was retained in 2011 to provide ecological support.

Both the Town of Caledon (the Town) and Toronto and Region Conservation Authority (the TRCA) provided technical comments to the 2010 circulation as detailed within letters dated April 18th, 2011 and May 13th, 2011 respectively, and Calder Engineering Ltd. was subsequently retained to manage the file. Savanta was then retained to provide ecological input to the project and completed a site reconnaissance in July 2012 to gain an overall sense of field conditions, but with a specific focus on the extent and quality of a wetland swale on the southwesterly portion of the Subject Lands as is described in greater detail below. With regard to natural heritage features on these Subject Lands, a NHE was completed by SAAR Environmental Ltd. (SAAR) in 2010 and Savanta has utilized that report and vegetation mapping as part of the foundation for assessing potential impacts related to the current draft plan application.

In response to the Town and TRCA comments, Mr. Rob Whyte of Calder Engineering Ltd. has been party to several meetings with Town and TRCA staff to address technical issues and advance a draft plan that can address the key items of identified concern. A revised Draft Plan has been prepared which reflects the need for the 30 metre Minimum Vegetation Protection Zone (MVPZ) around Key Natural Heritage Features (KNHF). The earlier NHE prepared by SAAR had identified and staked three wetland units – identifying two of the wetland units as part of the provincially significant Hall's Lake-Kennifick Wetland Complex as confirmed by the Ministry of Natural Resources in 2009. The third wetland unit, a dry swale (MAM 2-2) on the southwestern portion of the Subject Lands was not discussed or recognized as a part of the Hall's Lake-Kennifick Wetland Complex, or as a potential constraint to development. However, the MNR has confirmed that this broad swale is, in fact the upper portions of Wetland 51 and is also part of the designated PSW. Further, the TRCA had noted in their comments that this feature required further consideration, as it likely would be a Key Natural Heritage Feature as per the ORMCP.

1.1 Purpose of report

This Natural Heritage Evaluation was formally requested by the Town of Caledon following initial review of the revised Draft Plan and supporting documentation. While the Town acknowledged the apparent benefits of the new plan, staff had requested the completion of an NHE specifically to address potential impacts to the three wetland communities and associated buffers (i.e., Vegetated Protection Zones) related to the proposed alignment of Street "A", and the rear yards of some of the residential lots.

As described in Section 23.(1)(a) of the ORMCP, the Natural Heritage Evaluation will:

> *"demonstrate that the development or site alteration applied for will have no adverse effects on the key natural heritage feature or on the related ecological functions".*

2 NATURAL HERITAGE PLANNING CONSIDERATIONS

An assessment of the natural heritage features and functions of the Subject Lands and adjacent area that could be affected by the proposed development was undertaken to comply with the requirements of the following regulatory agencies, local and regional municipalities, and/or legislation:

- The Oak Ridges Moraine Conservation Plan (ORMCP);
- Toronto and Region Conservation Authority (TRCA);
- The Town of Caledon Official Plan, 2008; and,
- The Regional Municipality of Peel Official Plan, 2008.

• The Oak Ridges Moraine Conservation Plan

The Subject Lands are designated a Natural Linkage area as per the ORMCP and thereby require a Natural Heritage Evaluation in accordance with Section 23.1. Section 12.1 of the ORMCP states that the purpose of a Natural Linkage area "is to maintain, and where possible improve or restore, the ecological integrity of the Plan Area, and to maintain and where possible improve or restore, regional-scale open space linkages between Natural Core Areas and along river valleys and stream corridors…".

• Toronto and Region Conservation Authority

The Regulation Limit delineates hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances. Pursuant to the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 166/06), any development in or on areas defined in the Regulation (e.g. river or stream valleys, hazardous land, wetlands) requires permission from TRCA. TRCA may grant permission for development in or on these areas if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The Regulation also states that it is prohibited 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 without permission from the TRCA.

• Palgrave Secondary Plan, Town of Caledon Official Plan 2008

The Subject Lands are subject to the policies and designations within the Caledon Official Plan 2008 section 7.1 within the Palgrave Estate Residential Community Secondary Plan, which provides "for orderly development of estate residential community within a comprehensive environmental planning framework." The Palgrave Estate Residential Community is completely within the Oak Ridges Moraine Conservation Plan Area (ORMPCA); therefore, development on the Subject Lands is not only subject to Section 7.1 of the Town of Caledon Official Plan, but to the policies outlined in the ORMCP.

- **The Regional Municipality of Peel Official Plan 2008**

As per section 2.2 of the Region of Peel's OP, the ORMCP is an overarching legislation guiding the Region's policies pertaining to the larger environmental systems. Schedule D1 of the Region's OP depicts the boundary of the Palgrave Estate Residential Community, which is identified as "additional component of the Countryside Area and residential development is permitted, subject to the Town of Caledon Official Plan,...and specified provisions of the ORMCP."

3 DATA COLLECTION AND ANALYSIS

3.1 Field Studies

Savanta staff conducted a field visit in the summer of 2012 to assess the environmental conditions on the Subject Lands. Of particular focus was the extent and quality of the dry swale on the southwest portion of the Subject Lands, and as noted above, SAAR had completed a detailed NHE in 2010. This dry swale is the westernmost wetland community on the Subject Lands and is the uppermost extension of Wetland 51 that occurs predominantly off-property, on lands to the south, and is also part of the Hall's Lake-Kennifick Wetland Complex. Savanta's site observations confirmed the general wetland boundaries of this feature and further noted the lack of any defined drainage pathway through this feature, although it is evident that this broad swale is seasonally wet, especially following the freshet period.

3.2 Supporting Documents and Resources

Savanta has relied on supporting background information and site surveys/investigations to provide additional insight into the overall character of the Subject Site. Examples of these are included below.

3.2.1 Natural Heritage Information Centre

SAAR Environmental Ltd prepared a December 2010 Natural Heritage Evaluation of the Subject Lands in accordance with the ORMCP. This report assessed the extent and quality of the Natural Heritage Features (NHF) on the Subject Lands and identifies potential impacts of the proposed development and mitigation efforts required.

3.2.2 Functional Servicing and Stormwater Management Report

Calder Engineering Ltd. prepared an updated Functional Servicing and Stormwater Management Report dated November 2013 that identifies proposed methods for site sanitary and water servicing, and the plan for drainage and stormwater management within the Subject Lands.

3.2.3 Planning Rationale Report

A Planning Rationale was completed by Paul A. King dated November 6, 2013. The document reviews the revised Draft Plan in the context of the Palgrave Estate Residential Community Secondary Plan. The report notes that the revised Draft Plan of subdivision conforms to the Provincial, Regional and Municipal goals, objectives and policies for development in the Palgrave Estates Residential Community.

4 SITE DESCRIPTION

4.1 Physical Environment

4.1.1 Physiography

As reported by SAAR (2010) and Calder Engineering (2013), the Subject Lands is part of the Palgrave Moraine, an ice-contact stratified area of sands, gravel, and silts that originated as kame outwash deposits. The Palgrave Moraine is a strip of hummocky topography 5 to 7 kilometres in width extending from Caledon East to the Palgrave and Mount Wolfe area, and then east to King City (White, 1975).

4.1.2 Geology

SAAR (2010) identifies the underlying bedrock geology as the Georgian Bay Formation of Ordovician Age. This contains olive-green and gray siltstones, silty limestones and limestones with thin interbed of green shale. The bedrock generally slopes southeast.

4.1.3 Soils

Calder Engineering (2013) reports that the geotechnical investigation performed by Soil Engineers Ltd. (2006) revealed that the Subject Lands are generally composed of approximately 250 to 400 millimetre layer of topsoil, which overlays silty clay or silty sand till. The silty clay layers identified on the Subject Lands are generally impervious, while the silty sand till has a relatively low permeability. Silty sand till is predominant along the southern boundary of the Subject Lands. Ground water was detected at 2 of the 10 borehole locations, although the Soil Engineers report notes that soil colour within all 10 of the boreholes remained brown to the maximum depth investigated, approximately 5m, suggesting oxidization, which indicates that the ground water regime lies below this level.

4.1.4 Drainage Basin Location

As reported by SAAR's Environmental Ltd. (2010), the Subject Lands fall within the Mount Wolfe Agricultural Area, which represents a high point in the overall drainage basin. An elongated ridge running through the Subject Lands acts as a subwatershed divide. Water flowing north off of this point flows towards the Hall's Creek lowlands. The southern flowing water flows to low-lying wet areas.

4.2 Biological Environment

4.2.1 Vegetation Communities and Flora

A detailed Ecological Land Classification (ELC) analysis is located in SAAR's Environmental Limited (2010) NHE Hall's Lake Report.

In a letter dated May 13, 2011 from the TRCA to the Town, concerns were expressed regarding the MAM 2-2 wetland community located in the southwest portion of the Subject Lands. This

feature has been identified as a Key Natural Heritage Feature (KNHF) associated with Wetland No. 51 and therefore, a potential constraint to development. This community was identified in SAAR's Natural Heritage Evaluation Hall's Lake 2010 mapping; however, it was not discussed in the body of the report. Savanta's site visit confirmed SAAR's classification of the feature. In addition to this wetland community, there are two other KNHF wetland communities on the Subject Lands that this NHE will focus on. The vegetation units recorded by SAAR (2010) and Savanta within the three KNHF's are provided in Table 1 below and depicted on **Figure 2 (Appendix A)**.

Table 4.2 Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
Marsh	
Meadow Marsh	
MAM 2-2 Reed-canary Grass Mineral Meadow Marsh Type	This unit is nearly entirely dominated by Reed-canary Grass almost to the exclusion of other species. There is a minor presence of Tall White Aster and Jewel Weed. .
Meadow Marsh	
MAM 3-2 Reed-canary Grass Organic Meadow Marsh Type	These meadows are dominated by Reed-canary Grass, with the submergent components including Coontail and Milfoil. At the edges of the marsh bulrushes and cattails persist.
Shallow Marsh	
MAS 3-1 Cattail Organic Shallow Meadow Marsh Type	This tall herb graminois community is dominated by cattail, with tall white aster and jewelweed growing in the lower forb layer.
Shallow Marsh	
MAS 3-2 Bulrush Organic Shallow Marsh Type	This marsh type is dominated by soft-stem bulrush, with an admixture of sedges and cattail.
Swamp	
Thicket Swamp	
SWT 2-2 Dogwood and Willow Mineral Thicket Swamp Type	This is a complex of willow and red-osier dogwood-dominated thickets. Many other species are also present, including jewelweed, field horsetail, rough goldenrod and spotted Joe-pye weed.
Thicket Swamp	
SWT 3/2-4 Willow Organic Thicket Swamp Type with Reed-canary Grass/ Buttonbush Organic Thicket Swamp Type	These are complexes of willow and buttonbush-dominated tall shrub thickets, occurring either separately or in various mixes. There are also occasional admixtures of meadowsweet. The herb layer is diverse and consists of rice cut grass, sundew, water horehound, royal fern, willow herb, common wetland herbs and rushes.
Deciduous Swamp	
SWD 4-A Willow Elm Balsam Poplar Swamp Type	These are diverse communities associated with floodplains, composed of varying amounts of willow, white elm and balsam poplar. The shrub and herb understoreys are very well developed.
Shallow Water	
Mixed Shallow Aquatic	
SAM 1-4 Pondweed Mixed	Beneath the sparse emergents, such as bulrush and cattail, various species of pondweeds grow in the water volume

ELC Type	Community Description
Shallow Aquatic Type	
Mixed Shallow Aquatic	
SAM 1-2 Duckweed Mixed Shallow Aquatic Type	Duckweed covers the surface of the water in this simple community.
Open Water	
Open Aquatic	
OAO Open Water Aquatic	With no macrophyte vegetation, not tree or shrub cover, this is a general designation for open water habitats without duckweed of pondweeds present

5 OAK RIDGES MORAINE CONSERVATION PLAN KEY NATURAL HERITAGE FEATURE ASSESSMENT

As described in Section 23.(1)(a) of the ORMCP, the Natural Heritage Evaluation will:

> *"demonstrate that the development or site alteration applied for will have no adverse effects on the key natural heritage feature or on the related ecological functions"*

Specifically, the ORMCP defines eleven KNHF and Key Hydrologic Features that need to be considered as follows:

- Wetlands;
- Significant portions of the habitat of endangered, rare, and threatened species;
- Fish habitat;
- Areas of Natural and Scientific Interest (ANSIs);
- Significant valleylands;
- Significant woodlands;
- Significant wildlife habitat;
- Sand barrens, savannahs, and tallgrass prairies;
- Kettle lakes;
- Permanent and intermittent streams; and,
- Seepage areas and springs.

5.1 Wetlands

According to sections 22 and 26 of the ORMCP wetlands are identified as both KNHF's and hydrologically sensitive features. The ORMCP defines "wetland" as:

> "…lands such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that,
>
> (a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface;
>
> (b) has hydric soils and vegetation dominated by hydrophytic or water- tolerant plants; and
>
> (c) has been further identified by, the Ministry of Natural Resources or by any other person, according to the evaluation procedures established by the Ministry of Natural Resources, amended from time to time."

In accordance with the ORMCP definition of 'wetland' the Subject Lands contain four isolated kettle ponds, tree and shrub swamp and the Hall's Lake shoreline, which marks the northeastern limits of the Subject Lands and is beyond the area proposed for the estate lots.

The Ministry of Natural Resources has identified two kettle wetland areas designated as Wetland No. 35 and Wetland No. 36. These features are associated with the provincially significant Hall's Lake-Kennifick Wetland Complex. In addition, a broad swale area in the southwestern portion of the Subject Lands is comprised of a mineral marsh community and is considered to be the uppermost portion of Wetland 51, which is most predominant to the south of the Subject Lands.

These KNHF wetlands require the establishment of Minimum Vegetative Protective Zones (MVPZs). The revised Draft Plan application has included a 30 metre VPZ surrounding all KNHF's, with minor encroachments associated with "Street A". All proposed lots and stormwater drainage features have been located outside of the KNHF's and MVPZs.

5.2 Fish Habitat

The ORMCP defines "fish habitat" as:

"…the spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out the life processes, as further identified by the Department of Fisheries and Oceans (Canada)".

The locations of fish habitat can be determined by MNR or by the Federal Department of Fisheries and Oceans (DFO). If no detailed fish habitat mapping is available, all permanent or intermittent streams, kettle lakes, and all ponds other than off stream constructed ponds are considered to be fish habitat unless adequately demonstrated otherwise. Fish habitat may also be identified through hydrological evaluations of hydrologically sensitive features.

It is worthy to note that DFO has recently changed their policy as of November 2013 with regards to development projects and fish habitat. In accordance with the new policies, Savanta has conducted a "self-assessment" of the development proposed in the revised Draft Plan.

Based on the above, only two of the three wetland features associated with the Subject Lands potentially provide Fish Habitat as defined by the ORMCP (i.e., Wetlands 35 and 36). These features are comprised of a combination of open water areas, shallow aquatic habitat, swamp/marsh communities, and drainage swales. SAAR (2010) notes that Wetland No. 35 and No 36 have submergent and emergent wetland vegetation communities. Wetland No.51, which is only partially on the Subject Lands, is seasonally wet, and dominated by narrow leaved and robust vegetation. The wetlands and vegetation communities support turtles, breeding amphibians, and waterfowl staging/breeding. Savanta's reconnaissance confirmed these observations.

The dry mineral marsh draw in the southwestern portion of the site would not be considered to represent either direct or indirect habitat based on the ephemeral drainage to this feature and lack of defined flow channel. All these wetland features are isolated and there does not appear to be any potential direct connection to downstream

watercourses. Further, the revised plan will not include any direct impacts or alterations to these wetland features. The alignment of "Street A" does cross the intermittent swale that drains from Wetland 35, however, Calder Engineering notes that this crossing would be in the form of an open-bottom culvert and would continue to convey flow to down-gradient features.

5.3 Areas of Natural and Scientific Interest (ANSIs)

ANSI's are areas that have been identified as having life science values related to protection, scientific study or education; and, have been identified by the Ministry of Natural Resources.

Consultation with the Ministry of Natural Resources revealed no ANSI's on the Subject Lands.

5.4 Significant Valleylands

Significant valley lands should be defined and designated by the planning authority.

No Significant Valleylands occur on, or within 120 metres of, the Subject Lands.

5.5 Significant Woodlands

Woodland are defined by the ORMCP as:

> "a treed area, woodlot or forested area, other that a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees."

Significance is determined through the evaluation process carried out by the Ministry of Natural Resources. As per the ORMCP, the planning authority or proponent of the NHE, such as the Conservation Authority, may identify additional significant woodlands.

Two significant woodlands have been identified on the Subject Lands.

The Upland Hardwood community FOD 5-8,which contains remnant native hardwood bush including White and Red Ash, Sugar Maple, American Beech and Basswood, for conservation and as such will be conserved with the recommend buffer zone setbacks.

The Mixed Woodland, FOM 3-2,) on the northwestern portion of the Subject Lands will be included within the area of Lot 26 where a previous dwelling had existed. Lot 26 was designed in the revised Draft Plan to include the woodlot adjacent to the Subject Lands in order to maintain private ownership of the feature and restrict public access. For further discussion of this matter the reader is referred to the Planning Rationale (Paul King, 2013). This woodland and associated MVPZ will remain untouched and be protected through the Town of Caledon zoning By-Law for the project, which will limit development in Lot 26 to the structural envelope.

With the exception of Lot 26, Savanta notes that none of the areas proposed for estate development as part of the revised Draft Plan (i.e., in the southern portions of the Subject

Lands), contain any of the above-mentioned wooded parcels, hence there are no anticipated direct or indirect impacts to any of these features.

5.6 Significant Wildlife Habitat

The Ministry of Natural Resources is responsible for identifying Significant Wildlife Habitat through an evaluation process established by the Ministry.

While the Subject Lands do provide habitat for snakes, fogs, foraging raptors and insects, SAAR's fieldwork revealed no Significant Wildlife Habitat on the Subject Lands. As noted previously, Savanta has submitted a Screening Request to the Aurora MNR and will be following up with them.

5.7 Areas of Natural and Scientific Interest

An Area of Natural and Scientific Interest (ANSI) is an area identified by the MNR as having provincially or regionally significant representative geological or ecological features.

No ANSIs have been identified on, or within 50 m* of the Subject Site.

5.8 Significant Wildlife Habitat

Significant wildlife habitat is one of the more complicated natural heritage features to identify and evaluate. The NHRM includes criteria and guidelines for designating significant wildlife habitat. There are two other documents, the Significant Wildlife Habitat Technical Guide and the Significant Wildlife Habitat Decision Support System, that can be used to help decide what areas and features should be considered significant wildlife habitat. There are four general types of significant wildlife: seasonal concentration areas, migration corridors, rare or specialized habitat, and species of conservation concern. All types of significant wildlife habitat in relation to the Subject Site are discussed in more detail below.

5.9 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The following is a partial list of numerous potential examples: winter deer yards, amphibian breeding ponds, snake and bat hibernacula, waterfowl staging and moulting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as significant wildlife habitat. Areas that support a species at risk, or if a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

The Subject Lands do not contain Seasonal Concentration Areas.

* The Natural Heritage Reference Manual (MNR, 2010) recommends 50 m as the distance adjacent to an ANSI which should be addressed in the assessment of a proposed development's impacts.

5.10 Migration Corridors

Migration corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements. Some examples are trails used by deer to move to wintering areas, and areas used by amphibians between breeding and summering habitat.

The Subject Lands support four types of migration corridors: stream corridors, woodland corridors, avian corridors for flight and a number of steep slopes associated with the hilly landform of Mount Wolfe as noted by SAAR (2010).

The important ecological functions provided by the stream corridor located within the northeastern forest patch are:

- ***a headwater linkage to wetlands downstream of the Hall's Lake Wetland;***
- ***large winter hibernaculae for herptiles in pond;***
- ***forested linkage for wildlife;***
- ***insect and herptile forage base for birds; and,***
- ***limited potential for coldwater fishery spawning habitat enhancement.***

The forest patch in the northeastern area of the Subject Lands provides a path for larger mammals to move from the Hall's Lake lowlands upslope into open agricultural space. According to SAAR's field data collected during winter tracking exercises, Ruffed Grouse, White-tailed deer and Meadow vole utilize the terrestrial pathways. Hedgerows provide limited connectivity and cover for terrestrial movement or movement between wetlands and forest patches. SAAR's data did not indicate the use by herptofauna of the northeastern forest patch although the potential exists.

It is worthy to note that none of the above areas are anticipated to be affected either directly or indirectly by the proposed Draft Plan application.

5.11 Rare or Specialized Habitat

Rare or specialized habitat, are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the 'state', or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC, could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

Specialized habitats are microhabitats that are critical to some wildlife species. Potential examples include moose aquatic feeding areas, salt licks for ungulates, and groundwater seeps for Wild Turkeys.

Based upon the information contained within SAAR's 2010 NHE, no rare or specialized habitat was noted on these lands.

5.12 Species of Conservation Concern

Species of conservation concern represents the habitat type with the highest potential of occurring. This group includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, nationally rare (with designations by the COSEWIC), provincially rare, regionally rare; and locally rare (at the municipal level). This is also the order of priority that should be attached to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to forest fragmentation and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

No Species of Conservation Concern were identified on, or adjacent to the Subject Lands.

5.13 Sand Barrens, Savannahs, or Tallgrass Prairies

These conditions do not exist on, or adjacent to, the Subject Lands.

5.14 Kettle Lakes

Kettle Lakes do not occur on the Subject Lands.

5.15 Permanent and Intermittent Streams

Permanent and Intermittent Streams are considered hydrologically sensitive features in accordance with Section 26 of the ORMCP. In order to maintain the quality and function of hydrological feature

> "all development and site alteration with respect to land within a hydrologically sensitive feature or the related minimum vegetation protection zone is prohibited" (ORMCP).

Exceptions can be made for transportation, infrastructure and utilities as described in section 41, but only if the need for the project has been demonstrated and there is no reasonable alternative. Section 41 of the ORMCP outlines situations in which transportation and infrastructure uses may be permitted to cross a KNHF or a hydrologically sensitive feature. Instances where this may be acceptable are in cases when the need for the project has been

demonstrated and there is no reasonable alternative and if the applicant can adopt planning, design and construction policies that will minimize adverse effects on the ecological integrity of the Plan Area.

The Subject Lands contain a number of low-lying drainage swales and a headwater coldwater creek located within the northeastern forest patch. The creek runs from west to east into Hall's Lake, and this is well away from the proposed estate residential development that occurs to the south. As noted by SAAR's 2010 NHE, the stream has two distinct reaches: the lower reach extends from meadow edge through the upland hardwoods and mixed woodlot into Hall's Lake, and the upper reach runs from a vernal wetlands discharging in the spring. The surrounding woodlots have been identified a KNHFs and as such have been conserved and constrained from the lot fabric. The recommended MVPZs have been applied to all KNHF in the revised Draft Plan (with minor exceptions associated with Street A).

5.16 Springs or Seepages

It is possible that there may be some local seasonal seepage associated with the open-water portions of the wetland blocks on the Subject Lands, but there will be no direct impacts to the areas around these features and Calder Engineering has embarked on the monitoring necessary to determine the feature-based water balance around these areas.

6 DESCRIPTION OF PROPOSED DEVELOPMENT

The 56.12 hectare parcel is proposed for the creation of 28 estate residential lots using a combined rural and urban road cross-section, individual private septic systems for sewage disposal, and municipal water. The Functional Servicing and Stormwater Management Report prepared by Calder Engineering identifies that, where practical, storm drainage blocks have been designated outside of the KNHFs and associated MVPZs to provide opportunity to incorporate filter strips and other LID concepts.

Further details regarding the Site Plan are provided on **Figure 3 (Appendix A)**.

7 POTENTIAL ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION

The purpose of this Natural Heritage Evaluation is to present and discuss the natural heritage features and environmental functions that are currently occurring on, and adjacent to, the Subject Lands, specifically focusing on the three KNHF wetlands identified in the revised Draft Plan. This NHE assesses how the proposal for 28 estate residential lots within the revised Draft Plan will satisfy the relevant policies of the Oak Ridges Moraine Conservation Plan. This NHE also seeks to address the specific concerns from the TRCA and the Town of Caledon regarding the dry-swale feature in the southwestern portion of the Subject Lands. The NHE is then intended to assess the potential effects on these natural heritage functions that could occur over the short-term and long-term following implementation of the site plan and:

> *"identify planning, design and construction practices that will maintain and, where possible, improve or restore the health, diversity and size of the key natural heritage feature and its connectivity with other key natural heritage features"*

This assessment has been separated into a discussion of ***potential direct*** impacts and ***potential indirect*** impacts. In Savanta's experience, the range of possible impacts from a proposed land development application can usually be divided into these two categories: ***direct*** impacts are normally associated with the physical removal or alteration of natural features that could occur based upon a land use application, and ***indirect*** impacts may be changes or impacts (these could be minor or major) to less visible functions or avenues that could cause negative impacts to natural heritage features over time.

7.1 Potential Direct Effects

7.1.1 Loss of Significant or Sensitive Wildlife Habitat or Vegetation

The development proposal will involve the construction of an internal roadway, residential lots and associated septic beds. These activities will result in the conversion of portions of active agricultural and cultural meadow lands but will not involve the loss or significant or sensitive wildlife habitat or vegetation, based upon Savanta's site observations and the surveys and inventories previously completed by SAAR. Wooded areas in the northern portions of the Subject Lands will not be affected by the application. The majority of road construction and estate lots will all take place outside of the wooded areas with the exception of Lot 26, which is discussed in further detail in Section 5.5.

7.1.2 Minimum Vegetative Protection Zone (MVPZ) Encroachment

In accordance with the Town of Caledon Official Plan (2010) appropriate buffers are required to minimize the potentially negative effects of development with regards to natural features. In the case of KNHF's, the ORMCP requires a MVPZ of 30m be applied. However, the Town does provide some limited degree of flexibility in the incorporation of the minimum VPZ. Within Section 7.1.9.29 of the Palgrave Secondary Plan 2010, a minimum buffer width of 30m is

"*required over at least 90% of the shore frontage around every pond and stream and their inlet watercourses*". Street "A" of the revised Draft Plan will follow along the MVPZ of the southwestern wetland (i.e., Wetland 51) and will permanently encroach on the MVPZ surrounding the middle wetland block (i.e., Wetland 35), resulting in a 2.4% net loss of the buffer zone. Hence, this is well within the 10% flexibility afforded within Section 7.1.9.29 of the Palgrave Secondary Plan and the proposed encroachment is in general compliance with planning policies associated with the Subject Lands. In addition, there are certain properties (such as Lots 10, 11, and 12) where reforestation is proposed along the rear of the lots and this will serve to add additional area to the vegetation protection zone in these areas (i.e., adjacent Wetland 35). As well, Lots 1, 2, and 4 are also proposed for some reforestation and this will add to the VPZ adjacent to Wetland 51. Further details on this item can be found in Section 8 of the Functional Servicing and Stormwater Management Report that form part of the overall Draft Plan submission.

7.1.3 Other Direct Effects - Construction Impacts

The direct physical impacts that can occur to adjacent vegetation from the use of heavy equipment must also be considered. Typically, the area of construction impact is normally larger than the actual building envelope, as the creation of access roads and staging areas, and the use of heavy equipment can cause disturbance to adjacent areas.

In this case, the construction of Street A will involve some limited encroachment within the Vegetation Protection Zone related to the Wetland 35, although no direct alterations will occur to wetland community. Calder Engineering Ltd. has prepared a preliminary Erosion and Sediment Control Plan that demonstrates how the construction activities will occur without impact to the adjacent KNHFs. The plan will ensure a temporary sediment control fencing is installed prior to grading, and that mud mats are utilized at locations where construction vehicles exit the site. Topsoil and material stockpiles will be enclosed with a Terrafix Terrafence (or approved equivalent) siltation fence. All temporary erosion and sediment control measures will be routinely inspected and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.

7.2 Potential Indirect Effects

A discussion of potential indirect impacts from "development" applications typically includes a wider range of issues than that for potential direct impacts. In most situations where land development is proposed, concerns for both ground and surface water quality and quantity within the Subject Site as well as off-site, need to be considered. In addition, impacts to vegetation communities and wildlife habitat can potentially occur indirectly as a result of adjacent development, and proposed changes to existing land use can sometimes result in impacts to wildlife movement patterns and disruption of landscape-scale linkages and corridors. Many of these potential indirect effects do not apply in this proposal, but the following discussion addresses these matters.

7.2.1 Changes to Surface Water Quantity and Quality

The FSR and Stormwater Management report prepared by Calder Engineering Ltd. notes that a combined urban and rural cross-section is proposed and no storm sewers are anticipated, although short sections may ultimately be required to facilitate grading. Grassed swales and infiltration trenches are proposed to dampen hydrologic response and provide water quality benefit. Calder Engineering Ltd. provides a typical cross-section within their FSR.

Further to the issue of surface water quantity, Calder Engineering Ltd. met with TRCA and Town staff in May 2013 to discuss the requirement for a "feature-based water balance" and the agreement was that this will be undertaken in two stages. The first stage will involve monitoring and baseline data collection to establish the current hydrologic and ecological conditions and the second stage will involve detailed technical analyses and assessment, and will be completed at the detailed design stage following Draft Plan approval. As noted elsewhere in this report (and discussed within the previous SAAR NHE), there are no permanent watercourse features on these subject lands and hence, the potential for surface water quality impacts to downstream aquatic habitats is minimal. As discussed within the Calder Engineering Ltd. FSR, the lots will be on private services and they are sized to accommodate the expected septic loads – the potential for treated septic or domestic gray-water discharge to have an impact on the adjacent wetland features is negligible.

Based on the foregoing, the proposed conversion of these lands from agricultural use to estate residential lots are not anticipated to have an adverse influence on either downgradient surface water quality, nor on the quality of water within the wetland blocks.

7.2.2 Changes to Ground Water Quantity and Quality

As per above, these will be large estate residential lots and the proposed septic systems will be finalized at the detailed design stage, however, they treated discharge will meet appropriate guidelines and will not be expected to have any negligible impact on local ground water resources.

7.2.3 Lighting

In some situations, the development of lands near sensitive natural areas can be problematic if lighting concerns are not considered. Typically, these concerns are more important in suburban areas where the placement of rear lots or public parks close to natural areas can introduce unwanted lighting. In particular, the use of large light standards for recreational areas can be problematic by allowing light penetration into forested blocks, which could inhibit or affect wildlife use.

Within the Hall's Lake estates subject lands, this issue is not anticipated to be a major item. There will be ambient light from the light standards, but it will project only modest ambient lighting into the adjacent wetland blocks. The 30m MVPZ will assist in mitigating this effect as it will provide additional setback from the roadway. In those locations where there is limited

encroachment into the MVPZ, this will reduce the buffer width, however, it is not anticipated to be a major concern to local wildlife usage within these wetland blocks. In terms of lighting from the residential lots, this would primarily be associated with the rear lots would be of greatest concern in those rear lots that will abut the wooded top-of-bank associated with the valley. Should lighting be deemed a concern, there may be a need to consider special lighting treatments which tend to focus lighting downwards, or which incorporate lighting shields. Over the past number of years, the variety in lighting has increased greatly such that there are many options available.

8 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this ORMCP NHE has been to present and discuss the key natural heritage and key hydrologic features currently found on these Subject Lands in the vicinity of the proposed 28 estate lots and the associated internal road system based on the current Draft Plan of subdivision and to assess the potential direct and indirect impacts of the development on these features. Attention has also been paid to those locations where limited encroachments have been proposed within the MVPZ and whether these encroachments could affect the overall function of the features. In addition, this NHE makes recommendations as to how the proposal ought to proceed in light of site investigations and review of background information.

Based on site observations and analysis presented in the foregoing sections of this report the following conclusions have been reached:

- The revised Draft Plan has resulted in a realignment of the internal road network such that it now avoids direct crossing of any of the wetland blocks and predominantly respects the minimum 30m MVPZ surrounding these features, which are designated as KNHFs under the policies of the ORMCP. The revised Draft Plan has reduced the number of proposed estate lots from 31 to 28 relative to the 2010 circulated Draft Plan

- There are three wetland communities present within the estate subdivision – part of the provincially significant Hall's Lake - Kennifick Wetland Complex. Previous site investigations by SAAR did not identify any habitat for rare or threatened species and Savanta did not observe any SAR during the site reconnaissance in July 2012. Fish habitat may be present within the open-water portions of Wetlands 35 and 36, however, these features will not be impacted by the estate development. These ponded areas are isolated and there is no ability for fish to migrate out of these ponds to downstream watercourses (should fish be present). The third wetland is a broad mineral marsh swale that is predominantly dry and forms the upper portions of Wetland 51. This site contains no ANSI's, significant valleylands, sand barrens, savannahs, and tallgrass prairies, or permanent streams as defined in the ORMCP. The areas around the open-water portions of Wetlands 35 and 36 may include some areas of seepage (at least seasonally), however, the feature-based water balance investigations by Calder Engineering Ltd. will guide the use of LIDs and infiltration trenches will ensure that the existing hydrologic regime can be replicated.

- Savanta has submitted a Screening Request to the Aurora District MNR to determine the potential for species at risk to occur on these Subject Lands and will continue to pursue a response from the MNR.

- A minimum 30m MVPZ has been provided adjacent to each of the three wetland blocks, which are identified as KNHF's. The realigned "Street A" and estate lots respects the MVPZ in all locations except one area where slight encroachments into the buffer will be required to accommodate the roadway, although as noted below, this minor

encroachment would meet the policies within the Palgrave Secondary Plan. Following are conclusions regarding these temporary and permanent encroachments:

- The construction of the roadway will necessitate some limited encroachments into portions of the MVPZ, however, these impacts will be of a temporary nature. Upon final completion of the road, any disturbed areas will be fully restored as buffer area. Prior to any earth moving activities, and during the full extent of the construction phases, approved erosion and sediment control measures will be installed and monitored to ensure sediment migration does not occur towards the wetland features;

- Calder Engineering Ltd. has identified that the proposed road alignment will require a permanent loss of 2.4% of the MVPZ area adjacent to the middle wetland block (i.e., Wetland 35). This will reduce the width of the MVPZ in a localized area. Savanta has discussed the anticipated approach to the road construction with Calder Engineering Ltd. and reviewed the potential effects of placing the roadway adjacent to this wetland. Based upon these discussions, Savanta is of the opinion that the localized modest reduction in buffer widths will have negligible effect on the wetland functions presently occurring in these features. In terms of Wetland 35 closest to where the road will occur, the encroachment within the buffer around this wetland will be further limited by the grading in this area – the grades will direct water westerly towards the MAM-2 swale, which will have a full buffer width. The roadway will only serve the internal estate lots, hence, vehicle traffic will be limited. The slight reduction in buffer width in this area lies within the acceptable range of encroachment as per the Town of Caledon's Official Plan, 2010 (the Palgrave Secondary Plan). Further, it is noted in the Calder Engineering Ltd. report that the there will be other locations, where there will be additional lands that will be designated as Open Space and included in the MVPZ's associated with the wetland features which will add to the buffer widths in these locations and will result in an overall increase in buffer beyond the 30m MVPZ. More specifically, this will result in an increase in the MVPZ for the MAM-2 swale from 19,731 to 24,029 m^2 (21.8%) and an increase in the MVPZ for Wetland 35 from 34,156 to 34,304 m^2 (0.4%). These areas are depicted on Map 9 within the Calder Engineering Report as part of this submission.

- Based on the foregoing, Savanta is of the opinion that the minor encroachments within the MVPZ adjacent to the wetland blocks will not have a measurable impact on wetland functions and over the majority of the redesigned Draft Plan, they have been mitigated by provision of additional contiguous buffer lands, and the ORMCP policies relating to protection of KNHFs and provision of a VPZ have been met.

- In Savanta's opinion, the potential impacts of the proposed project on environmental features on, and adjacent to, the property can also be mitigated through standard design and best management practices.

- As noted within the Planning Rationale Report, the revised Draft Plan of Subdivision conforms to the Provincial, Regional and Municipal goals, objectives and policies for development in the Palgrave Estates Residential Community.

The above conclusions are based on the following recommendations being implemented:

- On Draft Plan approval a detailed erosion and sediment control plan be prepared as part of the detailed design process (as identified in this NHE, Calder Engineering Ltd. has prepared a preliminary erosion and sediment control plan that provides general guidance on management actions and procedures that will be implemented throughout all stages of construction);

- Site grading and construction of the proposed services and dwellings should not proceed until suitable erosion and sediment control measurements are in place;

- Only clean fill materials should be used during the construction process;

- Standard mitigation measures are applied regarding the use of fuels and chemicals during the construction process to reduce the risk of groundwater or surface water contamination from accidental spills.

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Appendix A

Figure 1: Site Location
Figure 2: Ecological Land Classification
Figure 3: Site Plan

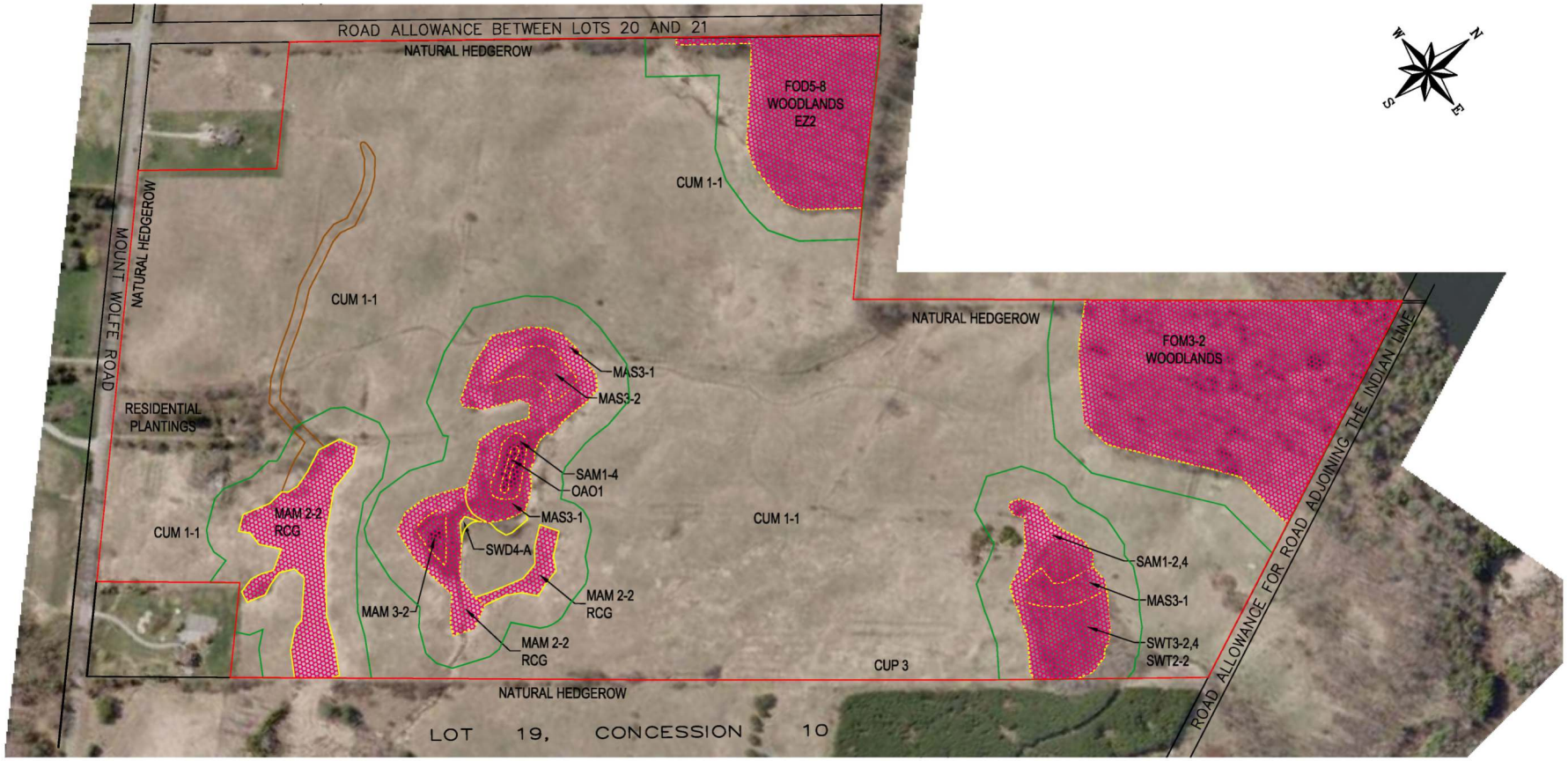
Figure 1 Site Location

Reference: Aerial Image from Google Earth

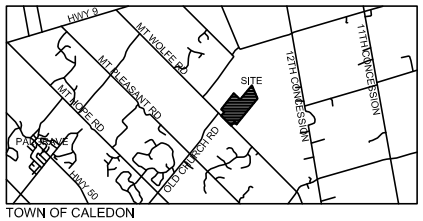
From Calder Engineering Ltd. Figure 1.1 Hall's Lake Estates Study Area Location
File: S:\8700 - SAV 7244 Halls Lake\corel\Figure 1 Site Location.cdr Date revised: January 9, 2014.

Calder Engineering Ltd.

SAVANTA



KEY PLAN



TOWN OF CALEDON

NTS

LEGEND

- PROPERTY LINE
- ECOLOGICAL LAND CLASSIFICATION - VEGETATION
- ORMCP KEY NATURAL HERITAGE FEATURE (KNHF)
- ORMCP MINIMUM VEGETATION PROTECTION ZONE (MVPZ)
- DRY SWALE

NOTES

1. IMAGE SOURCE: FIRST BASE SOLUTIONS INC.
2. ECOLOGICAL LAND CLASSIFICATIONS ADAPTED FROM NATURAL HERITAGE EVALUATION PREPARED BY SAAR ENVIRONMENTAL LIMITED AND DATED DECEMBER, 2010

ECOLOGICAL LAND CLASSIFICATIONS

CULTURAL MEADOW
- CUM1-1 DRY-MOIST OLD FIELD/MEADOW TYPE

MARSH
- MAS3-1 CATTAIL ORAGANIC SHALLOW MARSH TYPE
- MAS3-2 BULLRUSH ORGANIC SHALLOW MARSH TYPE
- MAM2-2 REED-CANARY GRASS MINERAL MEADOW MARSH TYPE
- MAM2-1 REED-CANARY GRASS ORGANIC MEADOW MARSH TYPE

SWAMP
- SWD4-A WILLOW ELM BALSAM POPLAR SWAMP TYPE
- SWT2-2 WILLOW MINERAL THICKET SWAMP TYPE
- SWT3-2-4 WILLOW ORGANIC THICKET SWAMP TYPE WITH REED-CANARY SALIX

MIXED SHALLOW AQUATIC WATER
- SAM1-2 DUCKWOOD MIXED SHALLOW AQUATIC TYPE
- SAM1-4 PONDWOOD MIXED SHALLOW AQUATIC TYPE

OPEN WATER
- OAO1 OPEN WATER I - INTERMITTENT WITH ANNUAL FLUCTUATIONS

WOODLANDS
- FOD5-8 DRY-FRESH SUGAR MAPLE-WHITE ASH DECIDUOUS FOREST TYPE
- FOM3-2 DRY-FRESH SUGAR MAPLE-HEMLOCK MIXED FOREST TYPE

PLANTATION
- CUP3 CONIFEROUS PLANTATION MIXTURE

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THE CORPORATION OF THE TOWN OF CALEDON

RITELAND DEVELOPMENT CORPORATION

HALL'S LAKE ESTATES (21T-98001C)

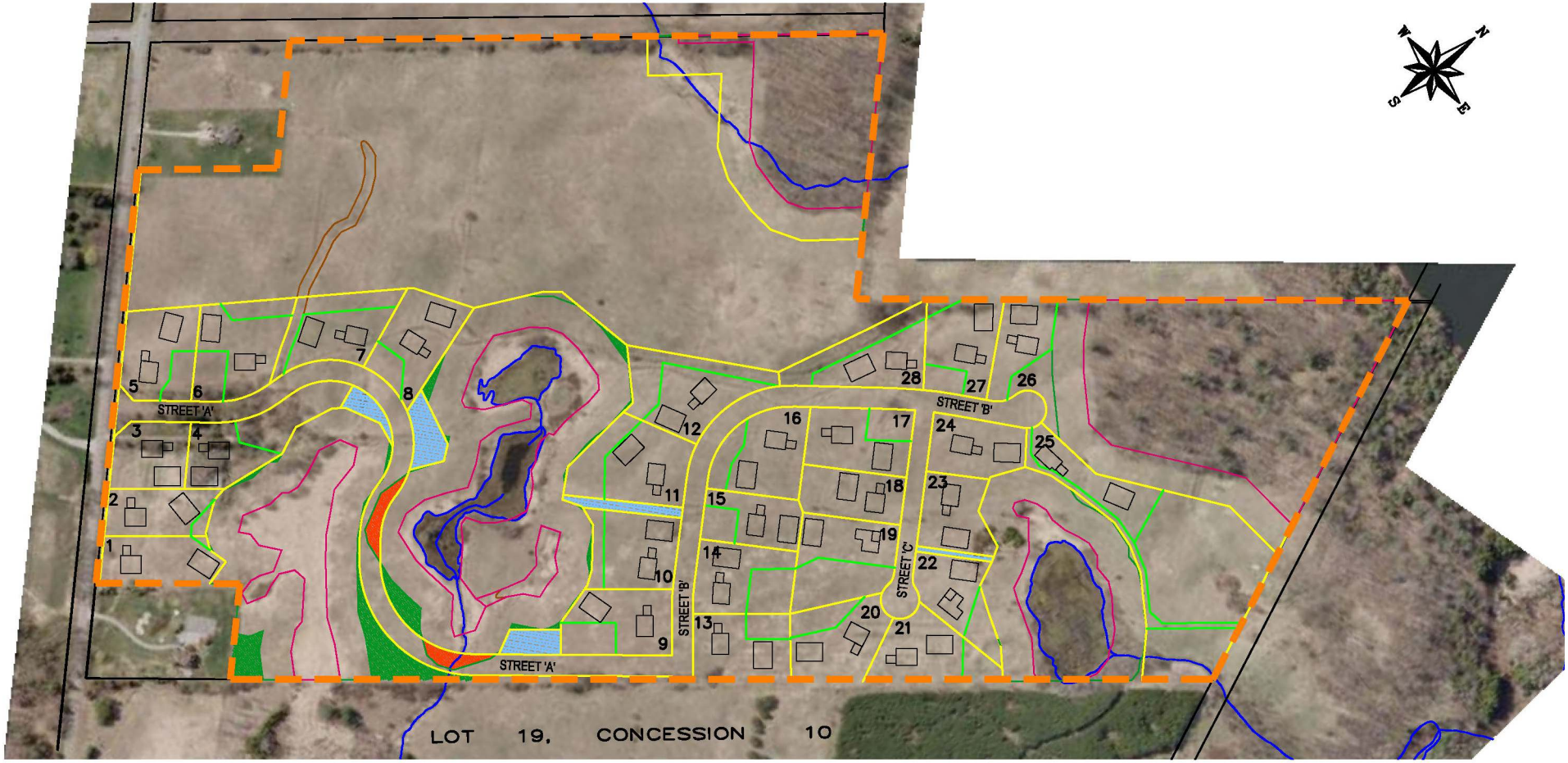
MAP 7

VEGETATION, ORMCP, KNHF AND MVPZ FEATURES

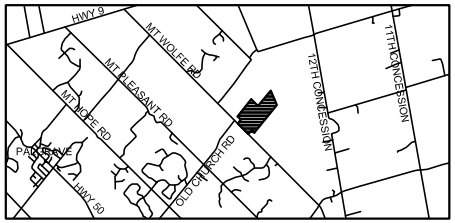
Figure 2 Ecological Land Classification

File: S:\8700 - SAV 7244 Halls Lake\corel\Figure 2 Ecological Land Classification.cdr Date revised: January 22, 2014.

Calder Engineering Ltd. SAVANTA



KEY PLAN



NTS

LEGEND

- PROPERTY LINE
- LOT LINES
- STRUCTURAL ENVELOPE
- ORMCP KEY NATURAL HERITAGE FEATURE (KNHF)
- ORMCP MINIMUM VEGETATION PROTECTION ZONE (MVPZ)
- EX. DRY SWALE
- POTENTIAL DRAINAGE BLOCK
- ADDITIONAL VPZ BEYOND 30m MVPZ
- 30m MVPZ ENCROACHMENT AREA

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HALL'S LAKE ESTATES

Figure 3 Site Plan

From Calder Engineering Ltd. Figure 2.1 Site Plan File: S:\8700 - SAV 7244 Halls Lake\corel\Figure 3 Site Plan.cdr Date revised: January 22, 2014.