



**Environmental and Engineering**

**Summary Report**

**Plan 43R-21080**

**Lot 28, Concession 9  
Township of Caledon, Ontario**

**Peel Region**

Prepared for:  
Tim Van Stralen

Prepared by:  
Azimuth Environmental  
Consulting, Inc.

July 2017  
Updated March 2020

AEC 06-057



Environmental Assessments & Approvals

March 10, 2020

AEC 06-057

Tim Van Stralen  
c/o Robert Russell Planning Consultants Inc.  
1857 Concession Road 2  
Township of Adjala  
Palgrave ON L0N 1V5

Attention: Tim Van Stralen

Re: Updated **Environmental and Engineering Summary Report  
Plan 43R-21080  
Lot 28, Concession 9, Town of Caledon, Region of Peel**

Dear Sir:

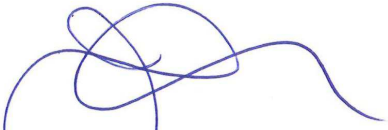
Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide an updated Environmental and Engineering Summary Report for the above noted property. The proposed land use concept plan consists of 21 new estate residential lots, a public roadway and other designated blocks for stormwater infiltration areas.

Review agencies had the opportunity to review the submission materials submitted in support of the abovementioned proposed development (Submitted July 25, 2017). Review comments related to the submission package were provided within a summary letter prepared by the Town of Caledon (April 23, 2018) which included comments from the Town in addition to other agencies (*i.e.* Peel Region, Nottawasaga Valley Conservation Authority etc.). Based on these comments, the various supporting reports/documents have been updated. Therefore, the Environmental and Engineering Summary report has been updated accordingly to reflect these changes.



We trust this report is sufficient for the purpose intended. If you have any questions or comments, please do not hesitate to contact the undersigned.

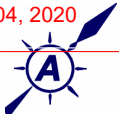
Yours truly,  
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Jacqueline Coughlin, B.A. Sc., P.Eng.,  
Partner/Senior Environmental Engineer



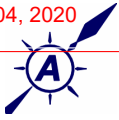
Lisa Moran, B.Sc.Env.  
Terrestrial Ecologist



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## 1.0 INTRODUCTION

Azimuth Environmental Consulting Inc. (Azimuth) was retained to complete a detailed Environmental and Engineering Summary Report for a proposed estate residential development ("the Site") to be located in the Town of Caledon and the Region of Peel. This report is intended to support the draft plan of subdivision.

The development is located within the Palgrave Estates Residential Community and within the regulated Oak Ridges Moraine Conservation Plan (ORMCP). The lands are designated a countryside development within the Town of Caledon Official Plan (TCOP).

Review agencies had the opportunity to review the original submission materials, including this report, submitted in support of the abovementioned proposed development (Submitted July 25, 2017). Review comments related to the submission package were provided within a summary letter prepared by the Town of Caledon (April 23, 2018) which included comments from the Town in addition to other agencies (*i.e.* Peel Region, Nottawasaga Valley Conservation Authority etc.). Based on these comments, the various supporting reports/documents have been updated. Therefore, the Environmental and Engineering Summary report has been updated accordingly to reflect these changes.

The purpose of this updated report is to summarize the environmental and engineering aspects of the development including any environmental site investigations and relevant mapping, findings and results for the preliminary engineering and servicing concepts (water supply, stormwater management, traffic and wastewater disposal), a description of the Sites environmental characteristics (*i.e.*, physical setting and natural heritage features), a summary of any residual environmental impact assessments, followed by recommendations and conclusions.

## 2.0 BACKGROUND

The 30.17 ha parcel of land is located in Lot 28, Concession 9 in the Town of Caledon and the Region of Peel (Figure 1, Map 1). The development is bounded by Highway 9 to the north, Mount Pleasant Road to the west, existing agricultural lands to the south and an existing residence to the east.

The western two-thirds of the property are occupied by active agricultural land use (wheat and soy). The eastern portion of the property is occupied by an existing residential lot and several cultural and disturbed vegetated communities located in proximity to the residence (Figure 2, Map 2).

Adjacent lands to the north, south, and east are also occupied by agricultural land use containing the occasional rural residences and farmsteads. The property to the west is occupied by a residential subdivision development within a former coniferous plantation.

The proposed land use concept plan consists of 21 new estate residential lots, a public roadway and other designated blocks for stormwater infiltration areas (Figure 3).

The 21 new lots will be accessed off one roadway exiting off of Mt. Pleasant Road. Potable water is to be provided by municipal services, whereas septic wastewater is to be handled through the use of private septic systems. The proposed draft plan utilizes building footprint sizes of 464 m<sup>2</sup> and septic bed sizes of 230 m<sup>2</sup>.

### **3.0 APPROACH**

#### **3.1 Site Reports**

The following reports have been prepared in support of the proposed development as it pertains to the functional servicing (stormwater, water supply, site servicing traffic), geotechnical, hydrogeology, and natural heritage aspects of the project:

- Traffic Impact Study Report (Serna Transtech, August, 2007);
- Geotechnical Investigation Report (Shaheen and Peaker Limited, May 2007);
- Preliminary Hydrogeological Assessment Report (Azimuth, August, 2006);
- Updated Hydrogeology Assessment Report (Azimuth, October 2007);
- Hydraulic Modelling Analysis Report (AECOM, 2012);
- Infiltration Testing Technical memorandum (SPL Consultants, June 2013);
- Response Letter to NVCA comments - Hydrogeology Assessment (Azimuth, February, 2014);
- Hydrogeological Investigation Report (V.A Wood Associates Limited, July 2016);
- Functional Servicing & Stormwater Management Report (GHD, March, 2017 updated October 2019); and,
- Environmental Impact Study Report (Azimuth, April 2017, updated January 2020);
- Hydrogeological and Nitrate Loading Assessment (DS Consultants Ltd., January 2020);
- Response Letter to NVCA comments – Stormwater Management (GHD, November 2018).

- Response Letter to NVCA comments – Stormwater Management and Geotechnical Considerations (GHD, March 2019);

### **3.2 Environmental Site Investigations**

A combination of field investigations were completed by various consultants in support of the proposed development concepts:

- Natural Heritage survey's completed by Azimuth in 2006, 2007 and 2019. The scope of work for the field investigations included classification of vegetation communities utilizing the general methods of the Ecological Land Classification System (ELC) for Southern Ontario, vegetation surveys and a dawn breeding bird survey.
- A site reconnaissance completed by Azimuth in 2006 as part of the Preliminary Hydrogeology Assessment to confirm the physical conditions of the study area and surrounding lands.
- Water quality sampling completed in 2006 as part of the Preliminary Hydrogeology Assessment by Azimuth to establish baseline water quality and for the purposes of assessing nitrate and chloride impacts to the ground water.
- Geotechnical Investigation completed in 2006 by Shaheen & Peaker consulting Engineers (Shaheen & Peaker). The scope of work included the installation of fourteen boreholes for the purposes of assessing the geotechnical aspects of the proposed development (i.e., foundations, soil and ground water conditions).
- Traffic Study completed by Serna Transtech in 2016 to determine the traffic volumes, counts and trip distributions during critical peak hours at select intersections within the study area.
- Hydrant Flow Test and was completed by Corix Water Services in 2012 at the McGuire Trail and Mount Pleasant intersection to assess water flows and pressure measurements.
- Hydraulic modelling completed by AECOM in 2012 to determine if the proposed development could be supported by the flow and pressures measurements in the Regions existing water distribution system.
- Infiltration testing completed by SPL Consultants in 2013 to support the design of the stormwater management pond.
- Hydrogeological Investigation completed by V.A Wood Associates Limited (V.A Wood) in 2016 to evaluate the hydrogeological conditions of the site. The scope of work included the installation of five monitoring wells, standard penetration tests, water level measurements and grain size testing.

- Hydrogeological and Nitrate Loading Assessment completed DS Consultants Ltd. (DSC, 2020) in 2019 to address the Towns's Peer Review comments (Golder). Scope of work included three additional boreholes completed as monitoring wells to enable ground water monitoring and ground water quality sampling to assess nitrate loading as a result of the development.

### **3.3 Environmental Mapping**

As per Section 7.1.18.2 of the Town's Official Plan, a series of Environmental Maps have been prepared that summarize the conditions of the site and the proposed development plans. Maps included within this summary report include the following:

- Map 1: Legal Boundary Survey
- Map 2: Air Photo
- Map 3: Topographic
- Map 4: Slope
- Map 5: Soil and Drainage Classification
- Map 6: Surface Hydrology
- Map 7: Vegetation and Wildlife Ecology
- Map 8: Environmental Summary
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## **4.0 ENVIRONMENTAL CHARACTERISTICS**

### **4.1 Physical setting**

The physical setting is described in detail in the Preliminary Hydrogeology assessment (and updated) completed by Azimuth in 2007 (Azimuth, 2007), the Hydrogeology Investigation completed by V.A Wood in 2016 (V.A Wood, 2016) and the most recent Hydrogeology Investigation completed in June 2018 by DSC (DSC, 2020). A brief summary is provided below:

#### **4.1.1 Physiography and Soils**

The property lies within the bounds of the Oak Ridges Moraine (Chapman and Putnam, 1984). Glaciofluvial ice contact deposits of gravel and sand, minor till, including eskers

and kames characterize the Quaternary geology of the region (Barnett *et al.*, 1991). Near the subject property, the Oak Ridges Moraine (ORM) has a general altitude of about 295 m, rising approximately 50 m above the valley lowlands. The moraine forms the height of land dividing the streams of the Lake Ontario basin from those flowing northward into Georgian Bay. The surface is hilly with a knob-and-basin relief typical of an end moraine.

In general, this upland is the source area for many streams, which drain the tills plains on either side of it. However there is a lack of streams within the moraine itself. The water infiltrates vertically through the sand and gravel deposits of the moraine, moving laterally only when it reaches less pervious beds and reappearing as springs along the slope of the moraine.

Based on the borehole records (Shaheen & Peaker, 2006), the overburden stratum within the uppermost 6 m is comprised of a mixture of sand, silty sand, fine sand, and sand and gravel. Below this unit there is sand to silty sand with discontinuous silt, fine sand and sand and gravel units, which were noted in some of the boreholes towards the southern and eastern portions of the subject property (Map 5).

The borehole logs (Shaheen & Peaker, 2006) indicate an absence of a shallow ground water condition within the upper 6.5 m of overburden at the time of drilling. The local MECP well logs indicate that ground water is typically found at a depth of between about 20 to 25 m below ground surface (bgs). The hydrogeological investigation completed by V.A Wood in 2016 indicates that all five monitoring were dry on completion of the field work. Water level measurements taken on four occasions and the report indicates that the well were dry.

As part of the DSC investigation (DSC, 2020), three monitoring wells were installed to identify the primary aquifer at the site to enable ground water monitoring and ground water sampling to address nitrate loadings at the Site. Wells were screened in the saturated sandy silt/ silty sand unit extending to depths between 21-28 m bgs. DSC indicates that the ground water levels at the site range from 19-25m bgs and the primary aquifer was identified at an approximate elevation of 281masl. Using a rising head test method, the hydraulic conductivity (k) of the soils varied between  $6.8 \times 10^{-5}$  m/s for the silty sand layer and  $6.8 \times 10^{-7}$  m/s for the sandy silt deposits.

#### 4.1.2 Topography and drainage

The topography of the site is gently undulating with a general fall about of about 4 m from about the central portion to the east and about 2 meters to the west (V.A Wood,

2016) (Map 4). The DSC investigation (DSC, 2020) indicates the local ground water flow direction within the site was inferred to be north -northeast.

#### 4.1.3 Bedrock Geology

The underlying bedrock is of Upper Ordovician in age, and is included as part of the Simcoe Group. Rocks types of this Group primarily consist of shale, limestone, dolostone and/or siltstone. As indicated in area well logs, the depth of the bedrock exceeds 75 m. Locally, the bedrock was encountered at only single well site, suggesting that a sufficient ground water supply is locally present within the overburden.

#### 4.1.4 Hydrogeology

The depositional environment has created a complex geological profile that includes interbedding of both coarser (e.g., sand, gravel) and finer-grained (e.g., silt, clay) units. Based on a review of local MECP water well records, it is observed that the bulk of wells constructed upon neighbouring properties are screened within coarser-grained units (i.e., sand and/or gravel), the upper contact of which lies at depths of between 30 to 75 m bgs.

A total of six (6) well records were identified for the same lot and concession as the subject property. The stratigraphic logs contained on these records indicate that all wells obtain their source(s) from a deep confined overburden aquifer unit with screened depths of approximately 33 to 52 m bgs. The sand unit located at these depths is shown to be capable of producing water at rates between 9 and 360 L/min (2 to 80 Igpm).

#### 4.1.5 Water Quality

To provide a baseline indication of local ground water quality, a sample of raw (untreated) ground water was obtained at a neighbouring residential property located at 17390 Mount Pleasant Road (~500 m south of the subject property). The analytical result for this sample indicates a good water geochemical quality, with only hardness and iron being found to exceed their respective criteria of the Ontario Drinking Water-Quality Standards (MECP, 2006). No health-related exceedances were noted in the sample.

It should be noted that this sample was collected from a well that draws from the deep aquifer and the water quality may differ from that found within the shallow ground water. In any regard, this sample is being used primarily for the purpose of nitrate and chloride impact calculations, since it represents the quality of the water source that is most commonly utilized by the surrounding residents. Additionally, we note that there was no accessible shallow ground water source available for sampling at the time of the site visit.



## 4.2 Natural Heritage

The natural heritage setting is described in detail in the Environmental impact Study completed by Azimuth (Azimuth, 2017 and 2020 update). A brief summary is provided below.

## 4.3 Significant Wetland

There are no wetlands identified on the property (Figure 2, Map 7). There are no Provincially Significant Wetlands (PSW) located on or adjacent (*i.e.* within 120m) of the property.

## 4.4 Habitat for Threatened and Endangered Species

Potential habitat for THR and END species was identified on and adjacent to the property through a SAR assessment. Our assessment considered field survey data and an evaluation of the potential functions of natural and cultural vegetation communities found on the property. Potential habitat for the following species was identified:

### 4.4.1 END Bat Species

Little Brown Myotis, Northern Myotis and Tri-colored Bat use a wide variety of habitats for summer roosting including rock crevices, buildings, bridges, caves, mines, and large snags (>25cm diameter at breast height) in the early stages of decay within coniferous, deciduous and mixed forest/swamp communities (MNR 2014, COSEWIC 2013). Forest communities located at the southeast section of the property (Figure 2) may provide suitable roosting habitat for these END bat species.

### 4.4.2 Barn Swallow

The property provides some potential habitat function for this species. A potentially suitable nesting structure (existing dwelling) is present on the property, and the adjacent cultural meadows/agricultural lands provide potential foraging opportunities. Azimuth's field studies yielded no observations or indication that Barn Swallow is utilizing the property.

### 4.4.3 Butternut

The hedgerows and woodland communities provide potentially suitable habitat for Butternut. There were no Butternut documented during Azimuth's field investigations.

## 4.5 Fish Habitat

There are no watercourses or fish habitat on the property (Figure 2, Map 7).

#### **4.6 Areas of Natural and Scientific Interest**

There are no ANSI's on or adjacent (*i.e.* within 120m) of the property.

#### **4.7 Significant Valleylands**

There are no valleylands on the property.

#### **4.8 Significant Woodlands**

The woodland on the property in conjunction with contiguous off-site woodland is not greater than 4ha in size (Figure 2, Map 7). The ORMCP Technical Paper No. 7 states that any woodland that is 4 ha or larger within a Countryside or Settlement Area is considered to be significant. There are no Key Natural Heritage Features (KNHF) or Hydrologically Sensitive Features (HSF) or their associated Minimum Vegetation Protection Zone that intercept the woodland. Therefore; the woodland on the property would not be considered to be significant according to the ORMCP.

#### **4.9 Candidate Significant Wildlife Habitat**

Potential Significant Wildlife Habitat (SWH) was identified on and adjacent to the property through a SWH assessment. Our assessment considered field survey data, NHIC data for tracked species, and an evaluation of the potential functions of natural and cultural vegetation communities found on the property. The following candidate SWH was identified:

##### **4.9.1 Bat Maternity Colonies**

Forest communities and an existing dwelling, features both located at the east section of the property (Figure 2), may provide suitable habitat for bat maternity colonies.

##### **4.9.2 Special Concern and Rare Wildlife Species**

###### Grasshopper Sparrow

A singing male Grasshopper Sparrow was documented during Azimuth's breeding bird surveys within the agricultural fields on the property.

#### **4.10 Sand Barrens, savannahs and tallgrass prairies**

There are no sand barrens, savannahs or tallgrass prairies on the property (Figure 2).

#### **4.11 Key Natural Heritage Features Summary**

These Natural Heritage Features and Candidate Features were included within the Impact Assessment:

- Candidate SWH (Bat Maternity Colony, Special Concern & Rare Wildlife Species);
- Potential habitat for END or THR Species [END bat species, Barn Swallow (THR) and Butternut (END)].

Based on Azimuth's assessment of these features, there will be no impacts to the above identified candidate and confirmed features.

#### **4.12 Reforestation Areas**

The proposed development plan incorporates the reforestation of approximately 12.2 ha of the property (Figure 3, Map 11 and 12). The areas to be reforested include a portion of the rear of each of the residential lots and the majority of the eastern half of property (Figure 3). The gentle slopes and arability of most of the property indicate that reforestation is ideally suited. Where steep slopes are present in Block 22, strategic selection of species and management protocol will be required to ensure successful reforestation.

#### **4.13 Town of Caledon Environmental Zoning**

Both EZ1 and EZ2 is currently identified on the property according to Schedule I of the Town's OP, parts of which are contained within the proposed building envelope (Figure 2).

The EZ1 designated areas within the westernmost portion of the property are contained within the agricultural fields of the west, including within the proposed building envelope. This EZ1 designated areas are under cover of row-planted cash crops, and thus, from a natural heritage perspective are providing no significant ecological function. Based on our understanding of the EZ1 criteria, all areas of active agriculture on the property should have EZ1 designations removed. NVCA is in agreement that the EZ1 feature currently mapped on the west portion of the property is indistinct on the landscape and does not need either the EZ1 or EZ2 status (NVCA, 2018).

The central EZ1 feature (to the east), in actuality is confirmed as an EZ2 feature as it is a dry lowland swale that performs natural run-off, detention and groundwater recharge functions (as confirmed by the sandy soils present on the site). NVCA has indicated that the two south arms should also be included within the EZ2 mapping (NVCA, 2018). Any functions of the area designated as EZ2 on the property will remain post-development, as this section of the property is not contained with the building envelope (Figure 3).

Within the east portion of the property, EZ1 designated areas exist that are associated with the woodland habitat. The EZ1 features include areas of native upland and lowland woodlands. Although the CUP3-1 is not considered to be native, we are proposing to include these areas within the EZ1 designation to maintain the existing forest cover on the property. Since the woodland is not a KNHF, only the feature itself would be considered EZ1. There is no related Minimum Vegetation Protection Zone associated with this feature. All forested areas would also be maintained post-development.

Figure 3 and Map 8 depicts the recommended EZ1 and EZ2 designations based on the current conditions of the property and as confirmed by NVCA.

#### **4.14 Natural Heritage Conclusions**

The proposed development plan will result in the development of 21 estate residential lots, the maintenance of the existing residence (lot 22), and the reforestation of 12.2 ha of active agricultural land and manicured grass. The proposed development plan will not result in the removal or negative impact of the existing forest and old field vegetation communities on the property. The proposed development does not affect PSW, ANSI, Significant Woodlands, Valley Lands or Wildlife Habitat on or adjacent (*i.e.* within 120m) of the property as defined by the Provincial Policy Statement (MMAH, 2014) (Figure 3, Map 8). There are no watercourses or water bodies and therefore, there is no fish habitat on the property. No habitat of federally or provincially THR or END species will be affected by the proposed development plan.

No KNHF or HSF were found as described in the ORMCP (2017). The recommended Environmental Zone 1 included forest habitat on site (Figure 3). The areas of the property recommended as Environmental Zones 2, are topographic lows that convey occasional seasonal over land flow. These features are located east of the proposed development footprint and will be maintained and is included as part of the area being proposed for reforestation (Figure 3). The reforestation of the feature will not impact its function to accommodate occasional seasonal over land flow, provided that reforestation/re-vegetation planning incorporates site specific species recommendations. The property is within an area mapped as the Palgrave Estate Residential Community area in which estate residential subdivision development may be permitted if the environmental features are not adversely impacted (Town of Caledon, 2018). Our assessment did not identify any adverse environmental impacts within the proposed development and, as such, is in compliance with the policies of the Town.

## **5.0 PRELIMINARY ENGINEERING**

GHD completed the Functional Servicing and Stormwater Management Report for the proposed estate residential development which includes a summary of the updated nitrate

assessment completed by DSC (2020). The servicing and stormwater management concepts are summarized below:

## 5.1 Septic Systems

The proposed development will utilize private onsite treatment and disposal facilities for each of the 22 lots as permitted by Section 7.1.8.1 of the official plan. Based on the soil testing results from the geotechnical report (Shaheen & Peaker, 2006) and the results from the infiltration testing completed by SPL Consultants (SPL, 2013), conventional in-ground septic tile bed systems have been recommended for the site (GHD, 2017). The design and construction of the sewage disposal system will be in accordance with the Ontario Building Code. For more detailed information on the septic servicing, refer to the Functional Servicing and Stormwater Management Report (GHD, 2019).

As part of the hydrogeological studies completed by Azimuth (2006 and updates) and V.A Woods (2016), an environment impact assessment was completed for ground water resources. Ground water impacts were considered based on the MECP Guideline B7-7 (Reasonable Use Policy) with respect to nitrate (as nitrogen). The ground water impact assessment has since been updated as part of the DSC's Hydrogeological investigation to assess the ability of the land to treatment sewage effluent to meet acceptable limits.

During the DSC investigation, three ground water samples were collected from the onsite wells and analyzed for nitrate and nitrite. Additionally two off site wells were sampled and analyzed for nitrate and nitrite. The analytical results indicated that the nitrate concentrations were above the Ontario Drinking Water Standards (ODWS) from the onsite wells but met the ODWS at the two off site wells. The data suggested that the elevated nitrate levels on the site are likely the result of current farming practices and the application of nitrate in the form of fertilizer to enhance crop growth (DSC, 2020).

Given the change in property use from agricultural to residential, the nitrate-nitrogen loading in ground water is expected to decrease. As such, DSC have recommended additional sampling of the upgradient nitrate nitrogen concentrations in groundwater to provide seasonal comparison and further validate that the onsite nitrate -nitrogen concentrations in ground water are the result of historical agricultural practices. Even though the downgradient wells are not expected to be affected, DSC have recommended the use of tertiary aeration treatment systems to minimize nitrate loading at the Site and to reduce or limit the off site nitrate concentration in the future. The use of tertiary aeration treatment systems will reduce nitrate loadings by ~50% resulting in a nitrate concentration of 2.2mg/L which is well below the applicable criteria.

For more detailed information on the nitrate evaluation and mitigation and monitoring plan, refer to the Hydrogeological and Nitrate Loading Assessment Report (DSC, 2020).

## **5.2 Water Supply**

The proposed development will be serviced by the Palgrave combined Drinking Water Supply and Distribution System, which is serviced by a well based supply system (water pressure zone District 8).

The existing water distribution system consists of a 200 mm diameter PVC watermain located approximately 200m south of Highway 9, on the west side of Mount Pleasant Road just north of McGuire Trail. This 200mm diameter watermain is eventually increased to a 300mm diameter watermain on McGuire Trail and Rowley Drive intersection within the existing subdivision (GHD, 2019).

A detailed hydraulic modelling analysis was completed by AECOM (2012) to determine the serviceability of the existing and future Peel water system to provide sufficient flow to meet the projected demands and fire flow requirements for the proposed development. Modelling results were confirmed using data from a hydrant flow test undertaken by Coris Water Services in 2012.

Based on recommendations provided by AECOM (2012), A 200mm diameter watermain can adequately provide water service to the development by connecting to the existing 200mm watermain at the Mount Pleasant Road and McGuire Trail intersection, and the future connection to the development to the south.

For more detailed information on the hydraulic modelling analysis refer to the Functional Servicing and Stormwater Management Report (GHD, 2019).

## **5.3 Stormwater Management Plan**

The SWM Plan established for the development has been designed in accordance with pertinent Town of Caledon and Conservation Authority (LSRCA) guidelines along with site specific constraints and criteria.

The proposed SWM Plan provides Level 1 quality and quantity control using an integrated SWM approach including lot level control, conveyance control, and end of pipe infiltration systems (infiltration basin and swale).

At the lot level, roof runoff and foundation drains will be directed to the pervious grassed areas for infiltration. Drainage from within the structure envelope, including driveways and other impervious areas, will be directed to adjacent pervious areas or rear and side

yard swales where required. For Lots 13 and 21, which are proposed to flow uncontrolled, soak away pits are proposed at the rear property line as shown.

Given the small size of the subject site, there will be only two primary stormwater discharge locations. The main discharge location, which will drain over 80% of the developed area to a SWM infiltration basin located at the southwest corner of the site. The second location (adjacent to Mount Pleasant Road along the west side of Lot 21) where stormwater will be first treated by an Oil Grit Separator will then discharge to an infiltration swale.

The SWM infiltration basins will serve to infiltrate all flows up to and including the 100 year storm event, and will infiltrate Regional storm runoff such that predevelopment runoff volumes are not exceeded. To ensure adequate storage, the larger SWM infiltration basin is to be designed with enough storage to contain 2 times the 100 year storm runoff volume. With respect to stormwater quality treatment, an Oil Grit Separator is proposed upstream of the smaller SWM infiltration basin, and a sediment forebay upstream of the main cell in the larger SWM infiltration basin.

The proposed minor/ major drain systems are designed to municipal standards and safe access/ egress will be provided to the site during routine storm events. Furthermore, a water balance calculation has confirmed that best efforts are being made to maintain existing water balance conditions.

For more detailed information on the pre- and post drainage conditions, stormwater criteria, stormwater management controls, and the water balance assessment, refer to the Functional Servicing and Stormwater Management Report (GHD, 2019).

#### **5.4 Traffic**

A Traffic Impact Study was completed by Sernas Transtech development in August 2006 (Sernas, 2007) to determine the traffic volumes anticipated to be generated by the proposed development during peak hours.

The study determined that no improvements are required at the intersection of Highway 9 at Mount Pleasant Road and Mount Pleasant Road at McGuire Trail I Street A to accommodate the additional growth in traffic generated by the proposed residential development. The volumes projected at these intersections will remain low and will continue to operate with acceptable volume-to-capacity ratio and level of service during both a.m. and p.m. peak periods.



For more detailed information on the Traffic Impact Study refer to the Functional Servicing and Stormwater Management Report (GHD, 2017).

## **6.0 RESIDUAL ENVIRONMENTAL IMPACTS**

No residual environment impacts related to stormwater, water supply, sewage servicing or traffic were identified in the Functional Servicing and Stormwater Management Report for the proposed residential development.

No residual environment impacts were identified in the hydrogeological studies completed by Azimuth (2006 and updates) and/ or V.A Woods (2016) as it relates to ground water impacts from septic systems.

No residual environment impacts were identified in the Environmental Impact Study Report completed by Azimuth (2017) as it relates to natural heritage features.

## **7.0 DESIGN AND CONSTRUCTION PRACTICES**

An erosion and sedimentation control plan will be implemented during the construction Phases of the development. At the time of development, install silt control fencing adjacent to areas where development contractors deem erosion to be a concern. Install silt controls based on best management practices in place at the time of future development; monitor and maintain the fencing throughout the development and during construction activities to ensure a protective barrier to sedimentation. Where sediment and erosion controls are employed, the contractor should avoid the use of wire mesh fencing and erosion control blankets which have the potential to trap wildlife.

Restore areas of disturbed/exposed soil as soon as possible, stabilizing the areas with native trees, shrubs, grasses or other suitable native vegetation.

During the rough grading and road construction activities, a temporary sediment and erosion pond will be utilized. The facility will have sufficient volume to comply with Ministry of Natural Resources Technical Guidelines for Erosion and Sediment Control.

## **8.0 CONCLUSIONS**

- The lots can be serviced by private sewage disposal system for treatment of domestic wastes as permitted by Section 7.1.8.1 of the Official Plan.
- A 200mm diameter watermain can adequately provide water service to the development by connecting to the existing 200mm watermain at the Mount Pleasant Road and McGuire Trail intersection, and the future connection to the development to the south.



- There were no identified KNHF or HSF on the property. The existing wooded area within the eastern portion of the property will be maintained post-development.
- Stormwater control within the subject site can be provided through a combination of lot-level, conveyance, and end-of-pipe infiltration systems.
- The proposed method of stormwater management meets the requirements of the Town of Caledon and the ORCMP by infiltrating all runoff on site for storms up to the 100-year return period event and by limiting post development regional storm runoff to equal or less than pre development levels.
- Storm sewers located west of the Street 'A' high point will be sized for the Town's 2-year design storm, where the storm sewers located east of the Street 'A' high point will be sized for the 100-year design storm.
- Major system flows from the development will be directed to infiltration areas, where the primary SWM infiltration basin will provide enough storage for the runoff 2 times the 100 year storm event.
- Appropriate design and construction practices will be implemented during the construction phases of the development.
- The existing road network, including the unsignalized intersection, can adequately and safely accommodate the incremental traffic general the proposed residential subdivisions.

## 9.0 REFERENCES

AECOM, 2012. Hydraulic Modelling Analysis Report, 2012

Azimuth Environmental Consulting Inc. October 2007 Updated July 2017 and January 2020. Environmental Impact Study Graham Property. Lot 28, Concession 9 (geographic Township of Albion and Part 2 of Plan 43R-21080) In the Town of Caledon and the Region of Peel

Azimuth Environmental Consulting Inc., 2006, Preliminary Hydrogeological Assessment Report, August, 2006

Azimuth Environmental Consulting Inc., 2007. Updated Hydrogeology Assessment Report, October 2007

Azimuth Environmental Consulting Inc., 2014. Response Letter to NVCA comments - Hydrogeology Assessment. February, 2014;

COSEWIC. 2013. COSEWIC assessment and update status report on the Little Brown Myotis *Myotis lucifugus*, Northern Myotis *Myotis septentrionalis* and Tri-colored Bat

Perimyotis subfalvus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

GHD, 2019. Functional Servicing & Stormwater Management Report, Graham Lands, Town of Caledon, October, 2019

GHD, 2017. Functional Servicing & Stormwater Management Report, Graham Lands, Town of Caledon, March, 2017

DSC, 2020. Hydrogeological and Nitrate Loading Assessment, January 17, 2020

Ministry of Natural Resources and Forestry (MNRF). 2014. Eastern Small-footed Bat. Queen's Printer for Ontario. <https://www.ontario.ca/environment-and-energy/eastern-small-footed-bat>

Nottawasaga Valley Conservation Authority (NVCA) April 17, 2018 Review comments related to Updated July 2017 EIS.

Oak Ridges Moraine Conservation Plan. 2017. Including associated Technical Papers. Response Letter to NVCA comments - Hydrogeology Assessment (Azimuth, February, 2014);

Serna Transtech, 2007. Traffic Impact Study Report August, 2007

Shaheen and Peaker Limited, 2006. Geotechnical Investigation Report, May 2007  
SPL Consultants, 2013 Infiltration Testing Technical memorandum June 2013

Town of Caledon. Official Plan. 2018.

SPL Consultants, 2013 Infiltration Testing Technical memorandum, June 2013

V.A Wood Associates Limited, 2016. Hydrogeological Investigation Report July 2016

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**APPENDICES**

- Appendix A: Figures**  
**Appendix B: Maps**
- 
-

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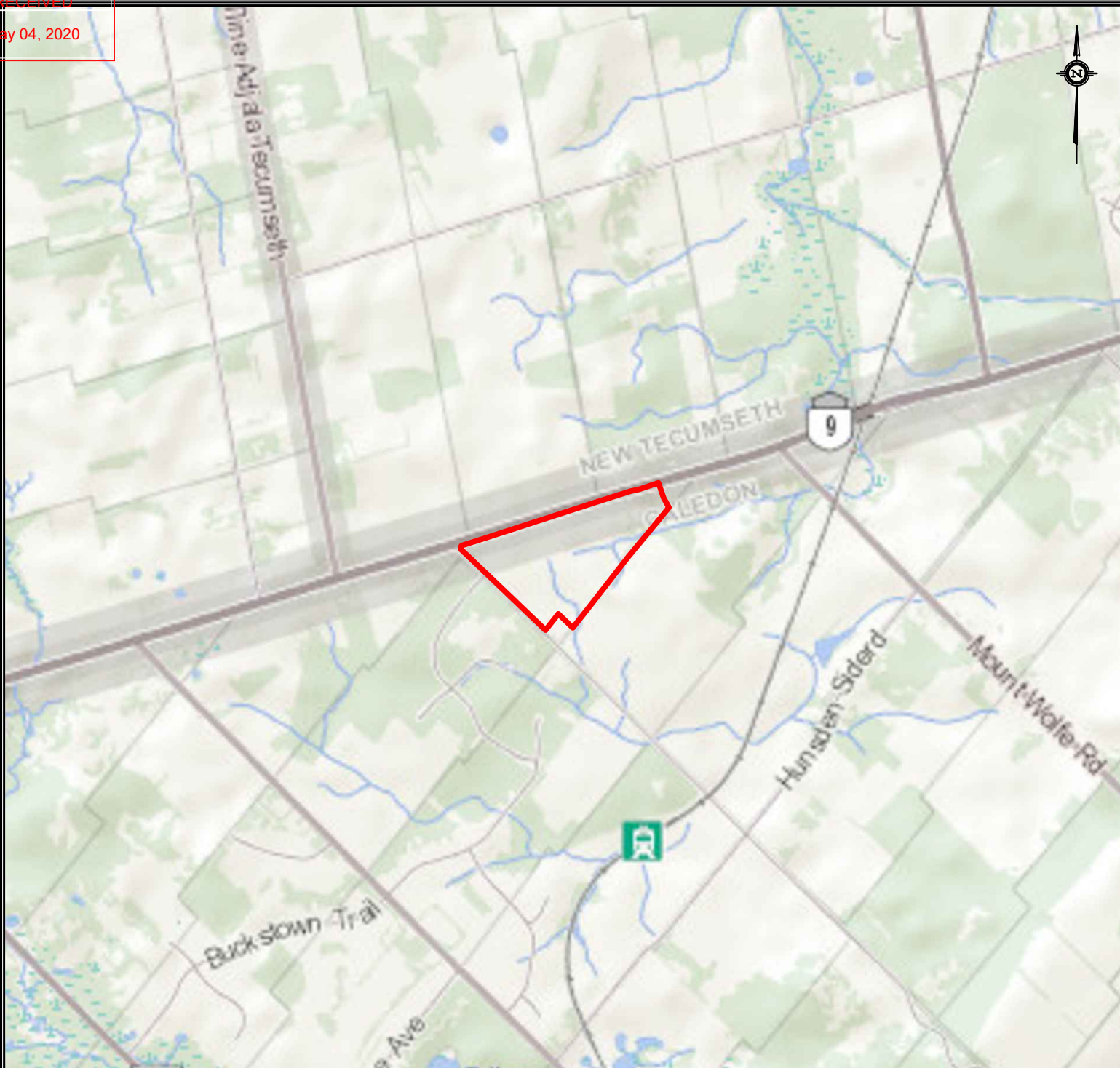
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**APPENDIX A**

**Figure**

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**LEGEND:**  
 — Approx. Property Boundary

REG MAP

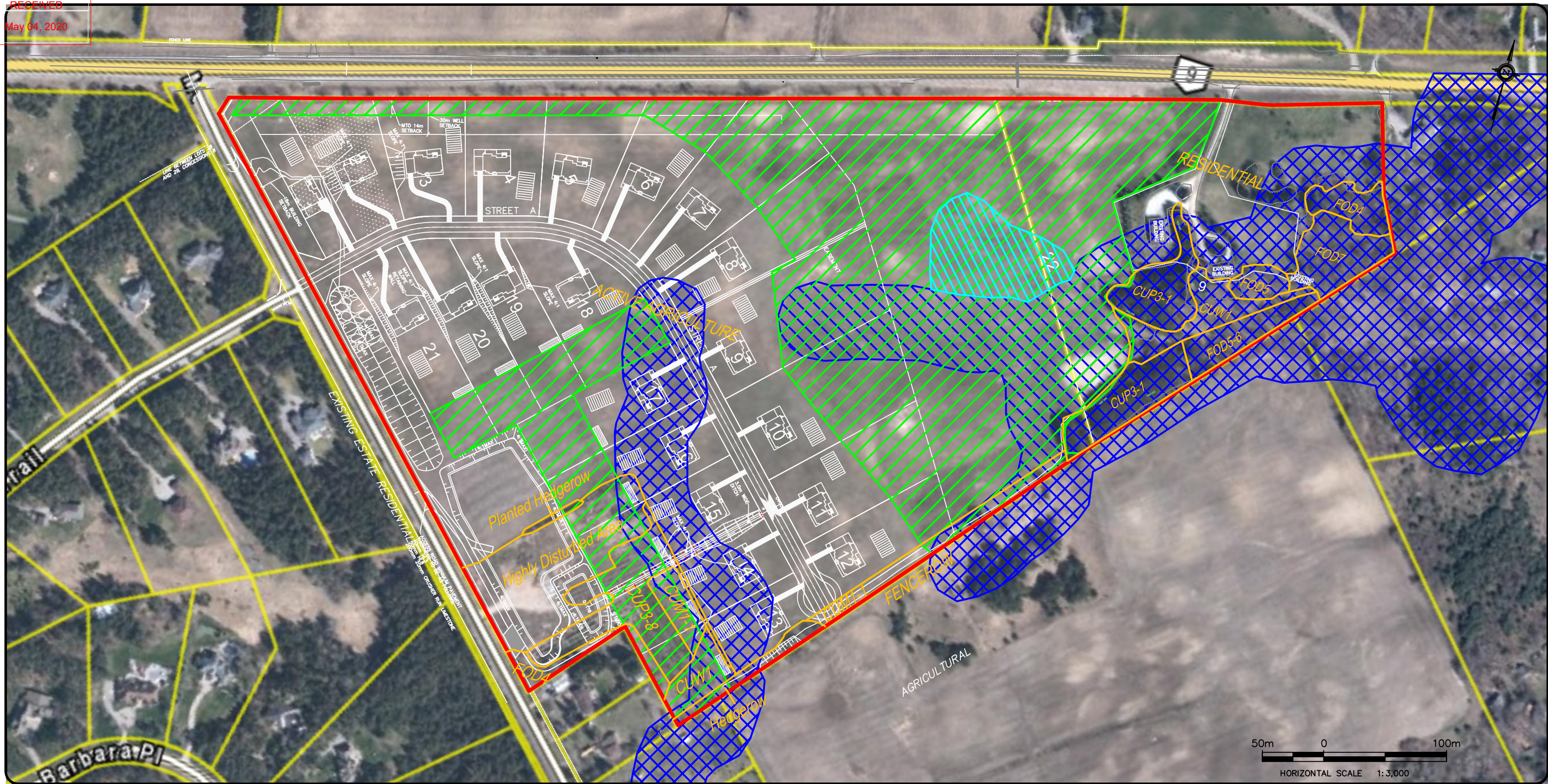
HORIZONTAL SCALE 1: 25,000

Study Area Location

Lot 28 Concession 9,  
 Town of Caledon, ON

DATE ISSUED: October 2019	Figure No.
CREATED BY: JLM	1
PROJECT NO.: 06-057	
REFERENCE: MNR	





<b>Legend:</b>	Property Boundary	Current Environmental Zone 1 (Schedule I, TCOP, 2016)
Reforestation Area (12.2ha)	Current Environmental Zone 2 (Schedule I, TCOP, 2016)	
Vegetation Communities		
CUM1-1 Dry-Moist Old Field Meadow Type	<b>Oak Ridges Moraine Rare Plant Species Locations</b>	
CUW1 Mineral Cultural Woodland Ecosite	9 Black Walnut ( <i>Juglans nigra</i> )	
CUP3-1 Red Pine Coniferous Plantation Type		
CUP3-8 White Spruce-European Larch Coniferous Plantation Type		
FOD4 Dry-Fresh Deciduous Forest Ecosite		
FOD5 Dry-Fresh Sugar Maple Deciduous Forest Ecosite		
FOD5-6 Dry-Fresh Sugar Maple-Basswood Deciduous Forest Type		
FOD7 Fresh-Moist Lowland Deciduous Forest Ecosite		



## ENVIRONMENTAL MANAGEMENT AND REFORESTATION PLAN

Date Issued: October 2019  
 Created By: JLM  
 Project No. 06-057  
 File Name: Figure 2

VanStralen EIS Lot  
28, Concession 9  
Town of Caledon

Figure No.  
**2**





Legend:	
	Property Boundary
	Recommended Environmental Zone 1
	Recommended Environmental Zone 2
	Reforestation Area (12.2ha)

**PROPOSED DEVELOPMENT**

Date Issued: October 2019	VanStralen EIS Lot 28, Concession 9 Town of Caledon	Figure No.
Created By: PHD		3
Project No. 06-057		
File Name: Figure 3		



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**APPENDIX B**

**Maps**

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TOWN OF CALEDON  
PLANNING  
RECEIVED  
May 04, 2020

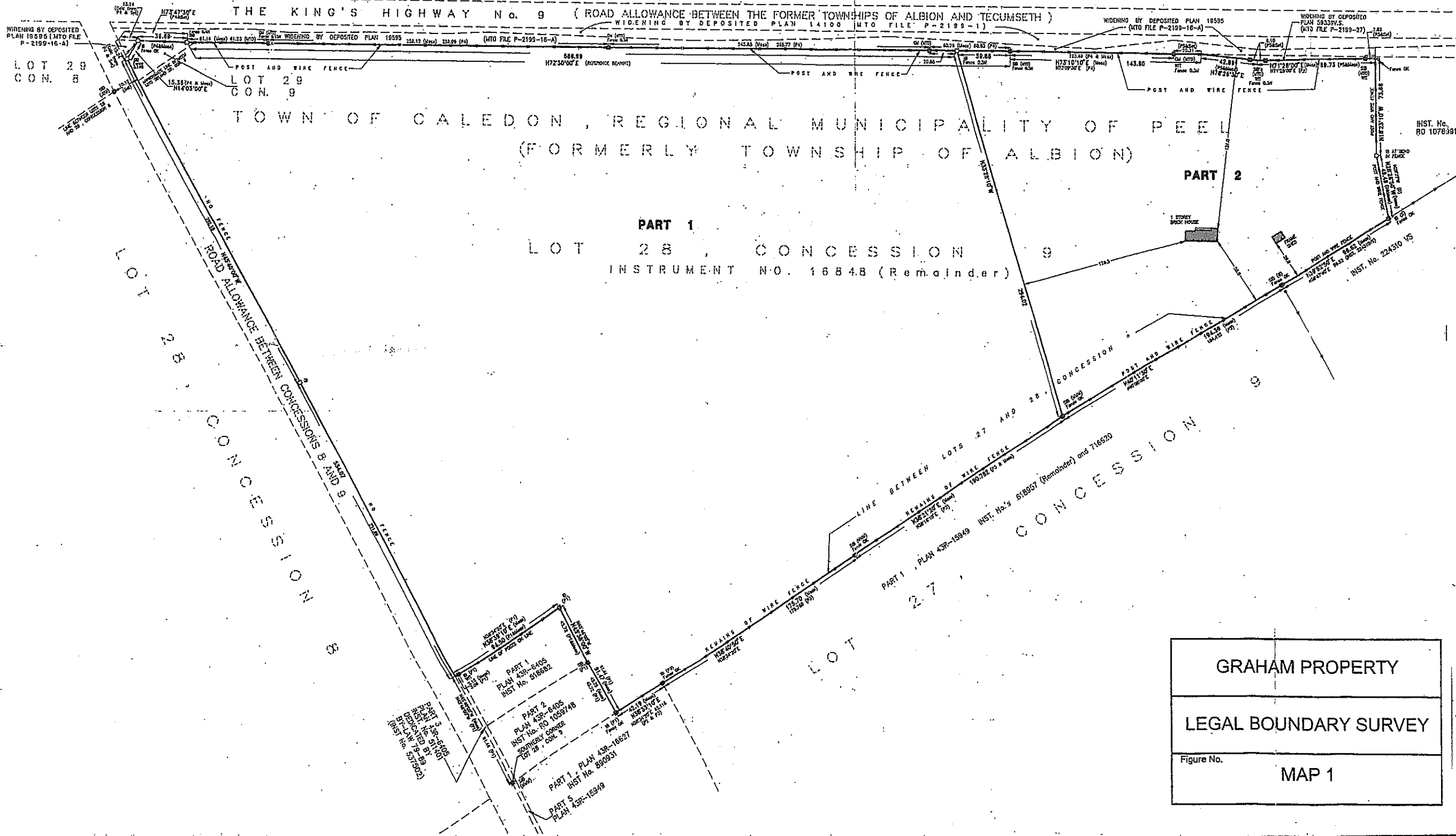
TOWN OF NEW TECUMSETH, COUNTY OF SIMCOE  
CONCESSION 1 (FORMERLY TOWNSHIP OF TECUMSETH)

THE KING'S HIGHWAY No. 9 (ROAD ALLOWANCE BETWEEN THE FORMER TOWNSHIPS OF ALBION AND TECUMSETH)

TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL  
(FORMERLY TOWNSHIP OF ALBION)

PART 1  
LOT 28, CONCESSION 9  
INSTRUMENT NO. 16848 (Remainder)

PART 2



I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE REGISTRY ACT.  
DATE: June 19, 1995  
J. STEL  
Ontario Land Surveyor

PLAN. 43R-21080  
RECEIVED AND DEPOSITED:  
DATE: June 29, 1995  
J. Madison  
Assistant Registrar for the Registry Division of Peel (No. 43)

METRIC  
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

CAUTION THIS PLAN IS NOT A PLAN OF SUBMISSION WITHIN THE HEARING OF THE PLANNING ACT.

SCHEDULE				
PART	LOT	CONCESSION	INSTRUMENT No.	AREA
1	PART OF LOTS 28 AND 29	9	16848 (Remainder)	24.174 ha
2	PART OF 28			6.000 ha

PLAN OF SURVEY OF  
PART OF LOTS 28 AND 29  
CONCESSION 9  
TOWN OF CALEDON  
(GEOGRAPHIC TOWNSHIP OF ALBION)  
REGIONAL MUNICIPALITY OF PEEL  
SCALE 1:1500  
50 40 30 20 10 0 50 100 Metres  
J. STEL, OLS, 1995

- NOTES
- BEARINGS ARE ASTROPHONIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF THE KING'S HIGHWAY No. 9 AS SHOWN ON DEPOSITED PLAN 15555 HAVING A BEARING OF H7230'00"E.
  - DENOTES SURVEY MONUMENT FOUND
  - DENOTES SURVEY MONUMENT PLANTED
  - SB DENOTES STANDARD ROCK BARR
  - IB DENOTES IRON BAR
  - CB DENOTES CONCRETE MONUMENT
  - MTO DENOTES MINISTRY OF TRANSPORTATION, ONTARIO
  - S DENOTES A.R. SHAW'S OLS
  - B DENOTES E. BASSON OLS
  - WT DENOTES WITNESS
  - P1 DENOTES PLAN 43R-6405
  - P2 DENOTES PLAN 43R-18827
  - P3 DENOTES PLAN 43R-15849
  - P4 DENOTES DEPOSITED PLAN 15595
  - P5 DENOTES DEPOSITED PLAN 58339 VS
  - O DENOTES INSTRUMENT, No. RD 1078391

GRAHAM PROPERTY

LEGAL BOUNDARY SURVEY

Figure No. MAP 1

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEY ACT AND THE REGISTRY ACT AND THE REGULATIONS MADE THEREUNDER;
- THE SURVEY WAS COMPLETED ON THE 12TH DAY OF JUNE, 1995.

DATE: JUNE 19, 1995  
J. STEL  
Ontario Land Surveyor

J. STEL, OLS  
R.R. No. 1, BOX N. 9  
445 STEVENSON AVENUE  
KLENGUISH, ONTARIO, L0J 1G0  
(905) 893-1241





LEGEND  
Property Boundary



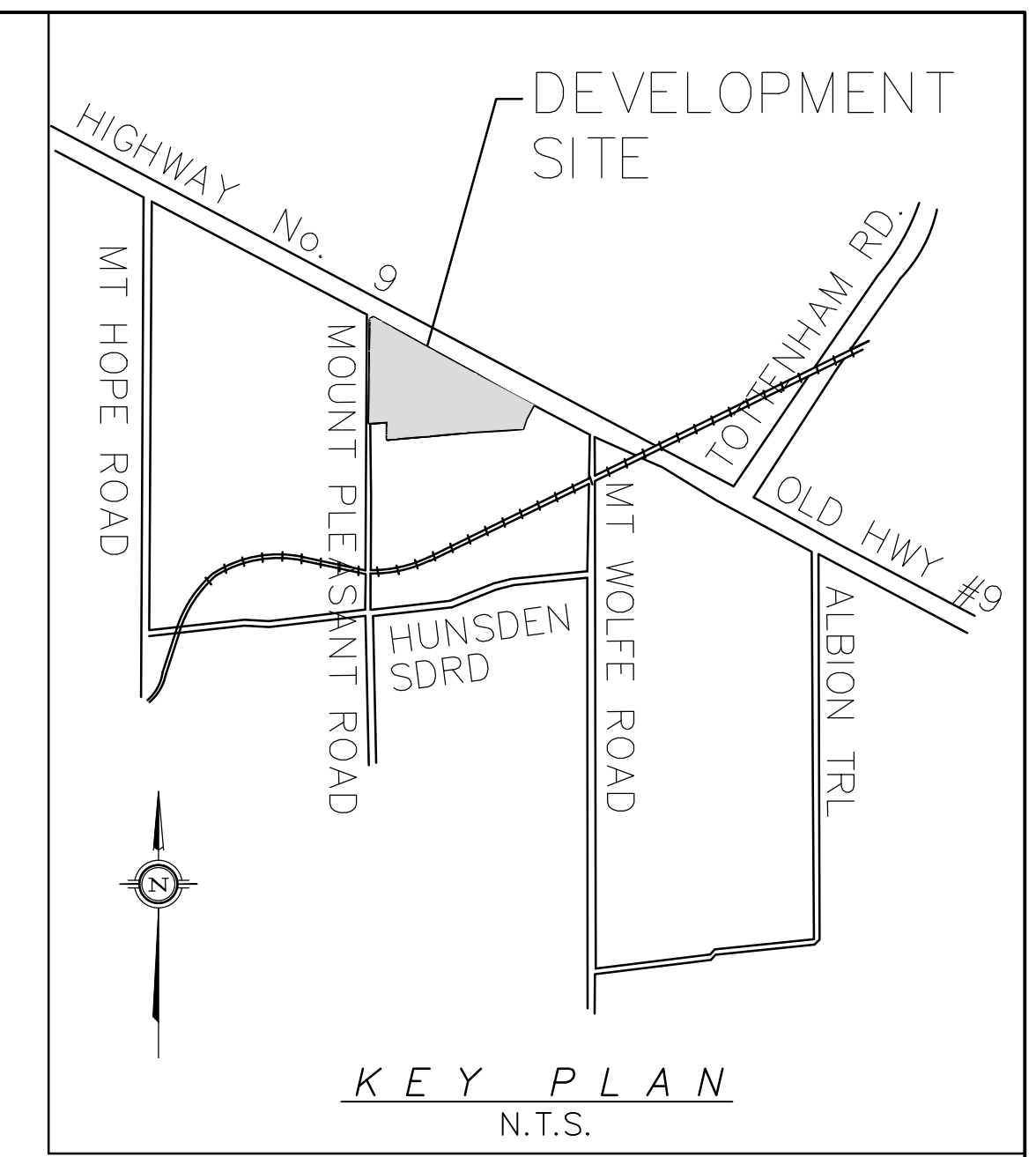
Air Photo (2014)

Lot 28, Concession 9  
Town of Caledon, ON

Date Issued:	January 2020	Map No. <b>2</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	

Plotted by: JMCCARTNEY on March 12, 2020 at 12:59pm  
File: C:\Users\jmccartney\AppData\Local\Temp\AcPublish\_4456\06-057\_2019.dwg Layout: Map 2 Plotscale: 40





- Legend**
- LEGAL BOUNDARY
  - DENOTES SURVEY MONUMENT FOUND
  - GENERAL REGULATION LIMIT – NVCA
  - FLOOD HAZARD LIMIT – NVCA

**BENCHMARK:**  
MTC PRECISE BM 758064 – 297.373m

LOCATED ON PALGRAVE PUBLIC SCHOOL – WEST SIDE OF HWY 50, 10.6 KM NORTH OF JCT. OF HWY. 50 AND KING STREET IN THE TOWN OF CALEDON (BOLTON), 3.4 KM SOUTH OF JCT. OF HWYS. 9 AND 50 AND 37m WEST OF CENTRE LINE OF HWY. 50. TABLET IS SET HORIZONTALLY IN EAST FACE OF CONCRETE FOUNDATION, 3m NORTH OF EAST ENTRANCE, 5m SOUTH OF NORTHEAST CORNER AND 98cm BELOW BRICKWORK.

**TOPO SURVEY :**  
B.M.C. Construction Layout Services LTD.  
18 Ivybridge Drive  
Brampton, Ontario  
L6V-2X2  
905-457-5061 (Office)  
416-580-7216 (Cell)

**SURROUNDING SURVEY INFORMATION:**  
CONTOUR INFORMATION (FIRST BASE SOLUTIONS – CIRCA 2002 DIGITAL ELEVATION MODEL)

**GRAHAM PROPERTY  
ESTATE DEVELOPMENT**

CONSULTANT

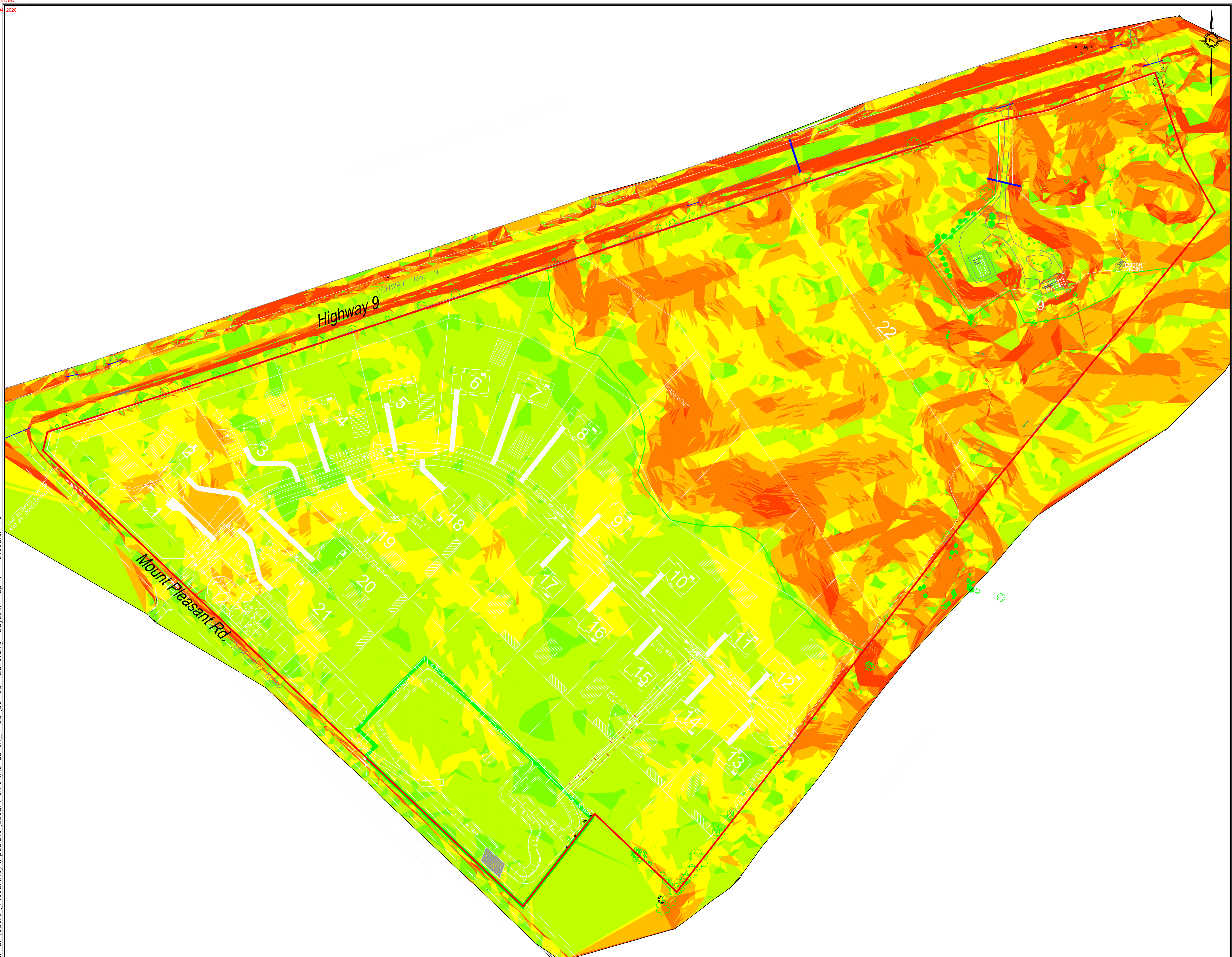


6705 Millcreek Drive, Unit 1  
Mississauga Ontario L5N 5M4  
T 1 416 213 7121 F 1 416 890 8499  
E ytomail@ghd.com W www.ghd.com

TOPOGRAPHIC MAP

DESIGN	T.D.	DRAWN	M.P.	CHECKED	S.P.
SCALE	1:2000	PROJECT No.			
DATE	NOV, 2016	06131 MAP 3			

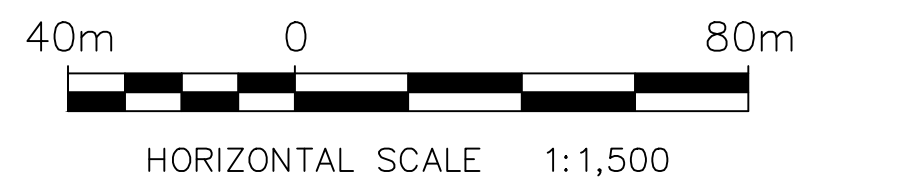




**LEGEND**

Property Boundary

Color	Layer	Slopes		Percent	Area
		Range Beg.	Range End		
Light Green	SRF-RNG1	0.00	1.00	7.4	31324.27
Yellow-Green	SRF-RNG2	1.00	5.00	34.8	147340.64
Yellow	SRF-RNG3	5.00	10.00	25.5	107997.13
Orange	SRF-RNG4	10.00	15.00	14.7	62393.73
Red-Orange	SRF-RNG5	15.00	25.00	12.4	52320.43
Red	SRF-RNG6	25.00	100.00	5.2	22008.28



**Slope Map**

**Lot 28, Concession 9  
Town of Caledon, ON**

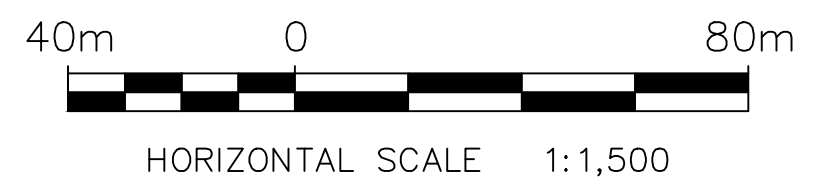
Date Issued:	January 2020	Map No. <b>4</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	

Plotted by: JMCCARTNEY on March 12, 2020 at 1:00pm  
File: C:\Users\jmccartney\AppData\Local\Temp\AcPublish\_4456\06-057\_2019.dwg Layout: Map 4 Plotscale: 40





- LEGEND**
- Property Boundary
  - # Approx. Borehole Locations  
(Geotechnical Investigation  
Shaneen & Peaker Ltd., 2006)
  - PSI - Poorly Sorted Outwash  
Sandy Loam  
Ref: Soil Map of Peel County  
Soil Survey Report No. 18
  - Drainage Direction



**Soil Drainage and Classification**

**Lot 28, Concession 9  
Town of Caledon, ON**

Date Issued:	January 2020	<b>Map No.</b>  <b>5</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	

Plotted by: JMCCARTNEY on March 12, 2020 at 1:00pm  
 File: C:\Users\jmccartney\AppData\Local\Temp\AcPublish\_4456\06-057\_2019.dwg Layout: Map 5 Plotscale: 40  
 DAYSTAMP: L:\06-Projects\06-057 Graham Property Maps\Drafting\dwg\06-057 2014.dwg





- LEGEND**
- Property Boundary
  - # Approx. Borehole Locations (Geotechnical Investigation Shaneen & Peaker Ltd., 2006)
  - Inferred Shallow Groundwater Flow Direction (Based on Topography)
  - Drainage Direction & Divides No Seasonal Water Table (at <5m Depth)



**Surface and Groundwater Flow Map**

**Lot 28, Concession 9  
 Town of Caledon, ON**

Date Issued:	January 2020	<b>Map No. 6</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	

Plotted by: JMCCARTNEY on March 12, 2020 at 1:00pm  
 File: C:\Users\jmccartney\AppData\Local\Temp\AcPublish\_4456\06-057\_2019.dwg Layout: Map 6 Plotscale: 40  
 DAYSTAMP: L:\06-Projects\06-057 Graham Property Maps\Drafting\dwg\06-057 2014.dwg





- LEGEND**
- Property Boundary
  - Vegetation Communities
  - CUM1-1 Dry-Moist Old Field Meadow Type
  - CUW1 Mineral Cultural Woodland Ecosite
  - CUP3-1 Red Pine Coniferous Plantation Type
  - CUP3-8 White Spruce-European Larch Coniferous Plantation Type
  - FOD4 Dry-Fresh Deciduous Forest Ecosite
  - FOD5 Dry-Fresh Sugar Maple Deciduous Forest Ecosite
  - FOD5-6 Dry-Fresh Sugar Maple-Basswood Deciduous Forest Type
  - FOD7 Fresh-Moist Lowland Deciduous Forest Ecosite

**Oak Ridges Moraine Rare Plant Species Locations**  
 9 Black Walnut (*Juglans nigra*)



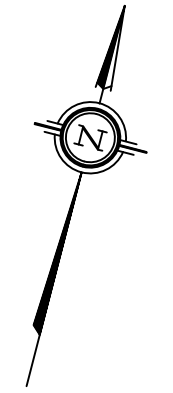
**Vegetation and Wildlife Ecology**

**Lot 28, Concession 9  
 Town of Caledon, ON**

Date Issued:	January 2020	<b>Map No.</b> <b>7</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	

Plotted by: JMCARTNEY on March 12, 2020 at 1:00pm  
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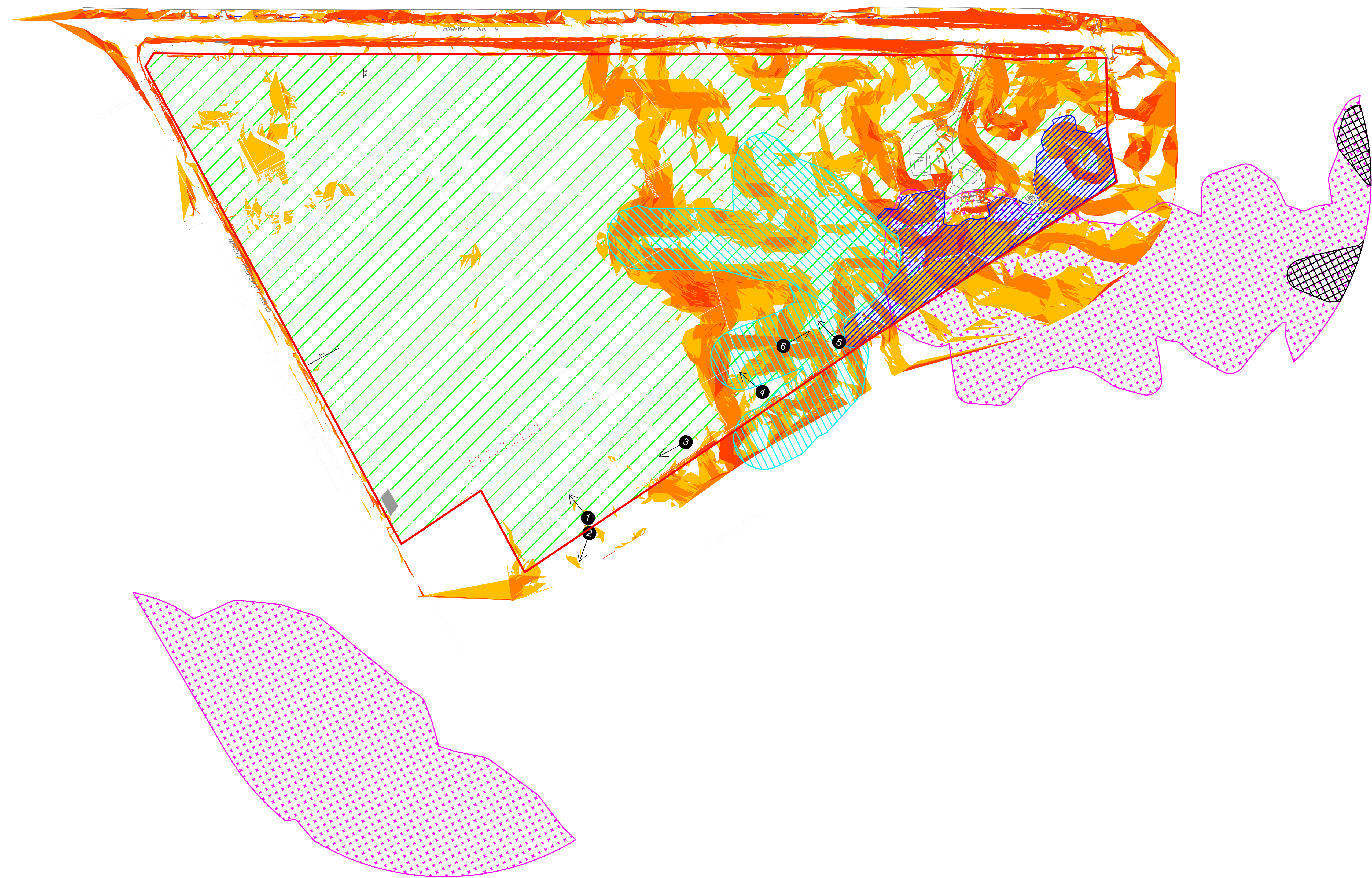
**LEGEND**

- Property Boundary
- ▨ Policy Area 3 (Town of Caledon, Schedule G)  
Soils do not have rapid/restricted percolation rates (see Map 5)

Color	Layer	Range Beg.	Range End	Percent	Area
Yellow	SRF-RNG4	10.00	15.00	14.7	62393.73
Orange	SRF-RNG5	15.00	25.00	12.4	52320.43
Red	SRF-RNG6	25.00	100.00	5.2	22008.28

- ▨ Recommended Environmental Zone 1
- ▨ Recommended Environmental Zone 2
- ▨ NVCA Regulation Limit
- ▨ NVCA Flood Limit

*Note:*  
No seasonal water table 0-0.5m below ground surface.  
No seasonal water table 0.5-1.5m below ground surface.



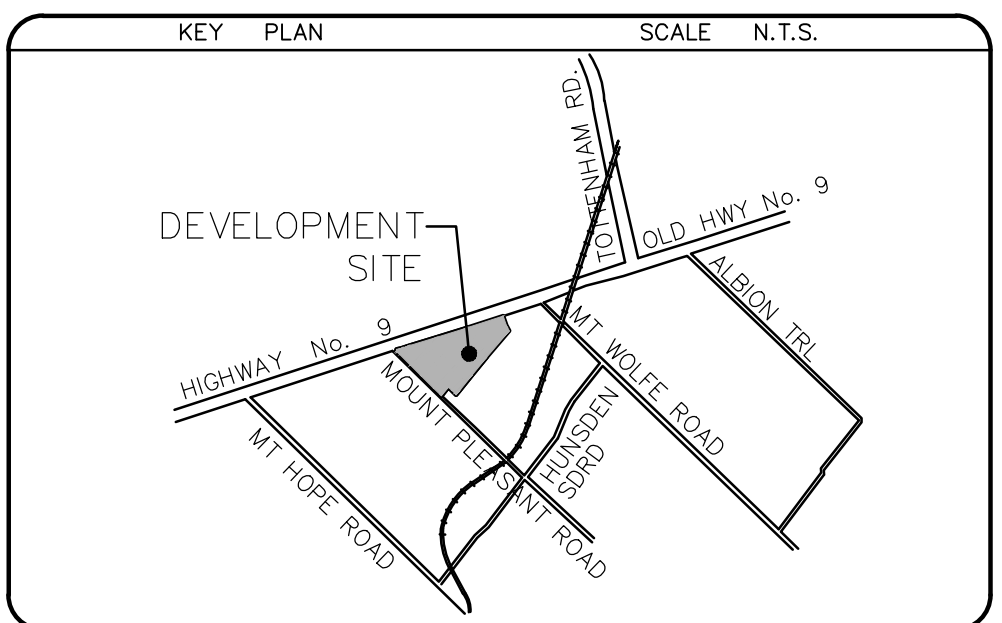
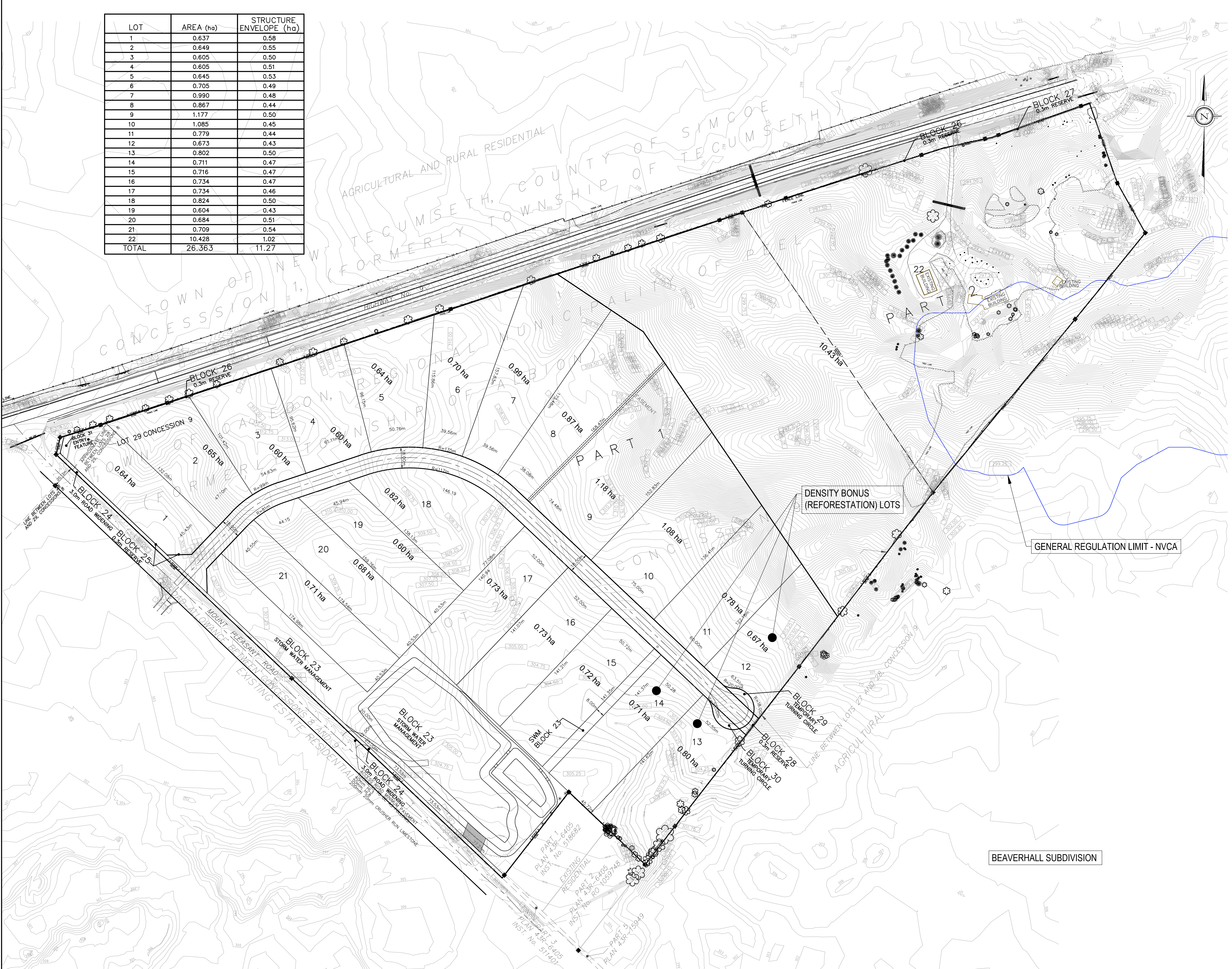
**Environmental Summary**

**Lot 28, Concession 9  
Town of Caledon, ON**

Date Issued:	January 2020	<b>Map No.</b> <b>8</b>
Created By:	JLM	
Project No.:	06-057	
Reference:	First Base Solutions	



LOT	AREA (ha)	STRUCTURE ENVELOPE (ha)
1	0.637	0.58
2	0.649	0.55
3	0.605	0.50
4	0.605	0.51
5	0.645	0.53
6	0.705	0.49
7	0.990	0.48
8	0.867	0.44
9	1.177	0.50
10	1.085	0.45
11	0.779	0.44
12	0.673	0.43
13	0.802	0.50
14	0.711	0.47
15	0.716	0.47
16	0.734	0.47
17	0.734	0.46
18	0.824	0.50
19	0.604	0.43
20	0.684	0.51
21	0.709	0.54
22	10.428	1.02
TOTAL	26.363	11.27



**DRAFT PLAN**  
OF SUBDIVISION OF  
PART OF LOTS 28 AND 29,  
CONCESSION 9 (ALBION), DESIGNATED  
as PART 2 on PLAN 43R-21080  
**TOWN OF CALEDON**  
REGIONAL MUNICIPALITY OF PEEL

**SCHEDULE OF LAND USE**

RESIDENTIAL-ESTATE	- (LOTS 1-22)	= 26.363 ha
STORM WATER MANAGEMENT	- (BLOCKS 23)	= 2.430 ha
ROAD WIDENING	- (BLOCK 24)	= 0.165 ha
0.3m RESERVES	- (BLOCKS 25,26,27,28)	= 0.041 ha
TEMPORARY TURNING CIRCLE	- (BLOCKS 29 & 30)	= 0.041 ha
ENTRY FEATURE ROAD	- (BLOCK 31)	= 0.012 ha
	- STREET A	= 1.122 ha
<b>TOTAL AREA OF SUBDIVISION</b>		<b>30.174 ha</b>

DATE	COMMENTS/REVISIONS	BY
AUG., 2007	ORIGINAL SUBMISSION	P.K.
OCT., 2016	TOWN COMMENTS	P.K.
FEB., 2020	TOWN COMMENTS	K.K.

**SECTION 51(17) OF THE PLANNING ACT**  
 UNDER SECTION 51(17) OF THE PLANNING ACT: H) PIPED MUNICIPAL WATER SUPPLY  
 INFORMATION REQUIRED BY CLAUSES A,B,C,D,E I) SANDY SILT AND SILTY SAND  
 F,G, & J SHOWN ON DRAFT AND KEY PLANS. K) PRIVATE SEWAGE DISPOSAL SYSTEMS  
 AND STORM SEWERS TO BE INSTALLED  
 L) NONE

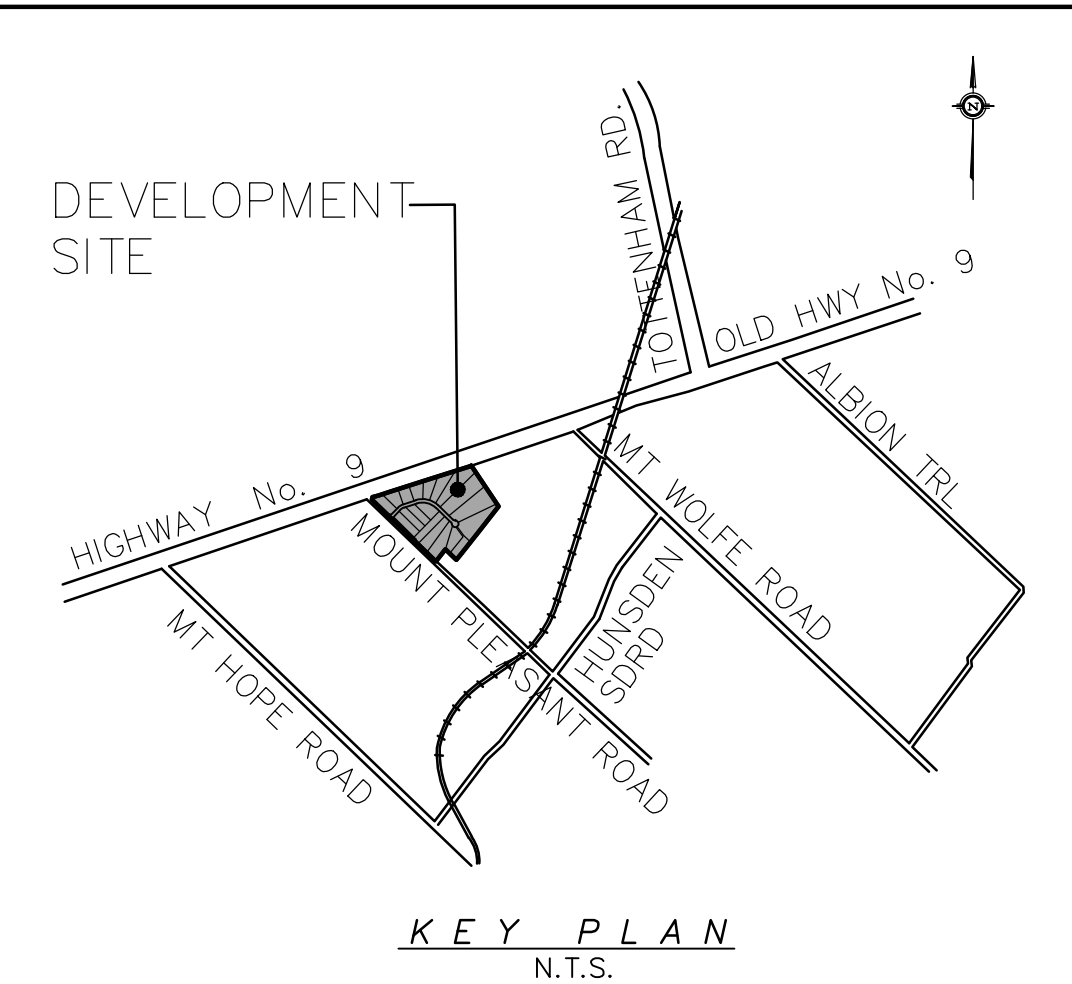
OWNER'S CERTIFICATE	SURVEYOR'S CERTIFICATE
WE, THE REGISTERED OWNERS OF THE SUBJECT LANDS, HEREBY AUTHORIZE ROB RUSSELL TO PREPARE AND SUBMIT A DRAFT PLAN OF SUBDIVISION FOR APPROVAL.  PAUL VAN STRALEN OWNER PART 1, PART OF LOTS 28 & 29 1685078 ONTARIO INC.  SIGNED _____ DATE _____  ADRIAN KLEYWEGT OWNER PART 2, PART OF LOT 28  SIGNED _____ DATE _____	I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN ON THIS PLAN.  TED VAN LANKVELD ONTARIO LAND SURVEYOR  SIGNED _____ DATE _____

**NOTES**  
 BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF THE KING'S HIGHWAY No. 9 AS SHOWN ON DEPOSITED PLAN 19595, HAVING A BEARING OF N72°30'00"E.  
 ■ DENOTES SURVEY MONUMENT FOUND  
 IB DENOTES IRON BAR  
 SIB DENOTES STANDARD IRON BAR  
 CM DENOTES CONCRETE MONUMENT  
 JDB DENOTES J.D. BARNES LTD.  
 MMM DENOTES MARSHALL MACKLIN MACKLIN LTD.  
 MTO DENOTES MINISTRY OF TRANSPORTATION ONTARIO  
 P1 DENOTES PLAN 43R-6405  
 P3 DENOTES PLAN 43R-15949

**PLANNING & DEVELOPMENT CONSULTANT**  
**ROB RUSSELL**  
 Planning Consultant  
 32 Albert Street  
 Georgetown, Ontario  
 L7G 2B3  
 Phone: 647-460-5511  
 Email: rob.russell@russellplanning.com

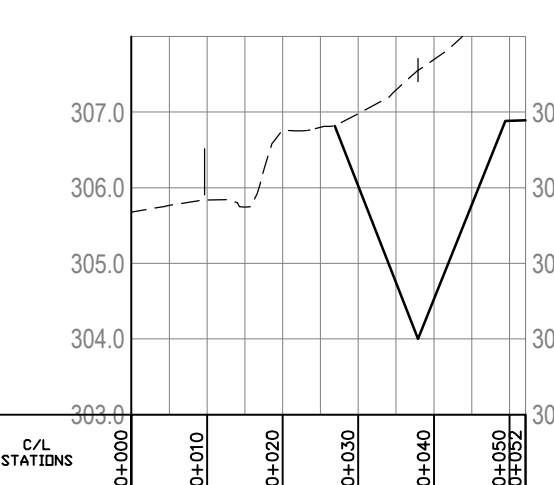
SCALE: 1:1500  
DRAWING No. MAP 9





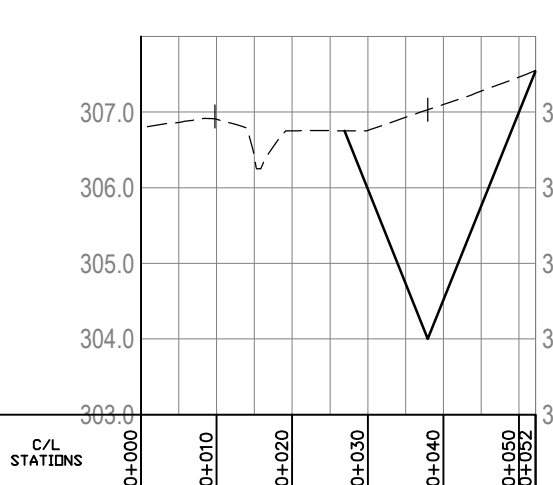
- Legend**
- EXISTING CONTOUR
  - 307.30 PRELIMINARY ELEVATION
  - 30m @ 0.75% PRELIMINARY ROAD GRADE
  - PROPOSED STORM SEWER
  - PROPOSED WATERMAIN
  - OVERLAND FLOW
  - DRAINAGE AREA IDENTIFIER (EXISTING CONDITION)
  - DRAINAGE AREA IN HECTARES (EXISTING CONDITION)
  - DRAINAGE BOUNDARY (EXISTING CONDITION)
  - PROPOSED SEPTIC BED
  - PROPOSED FRONT OF HOUSE ELEVATION LOT NUMBER
  - PROPOSED REAR OF HOUSE ELEVATION
  - PROPOSED DRIVEWAY GRADE
  - STRUCTURE ENVELOPE
  - CUT
  - FILL
  - HYDRANT
  - INFILTRATION TRENCH

SCALE: H 1:1000 1:100



SECTION A-A

SCALE: H 1:1000 1:100



SECTION B-B

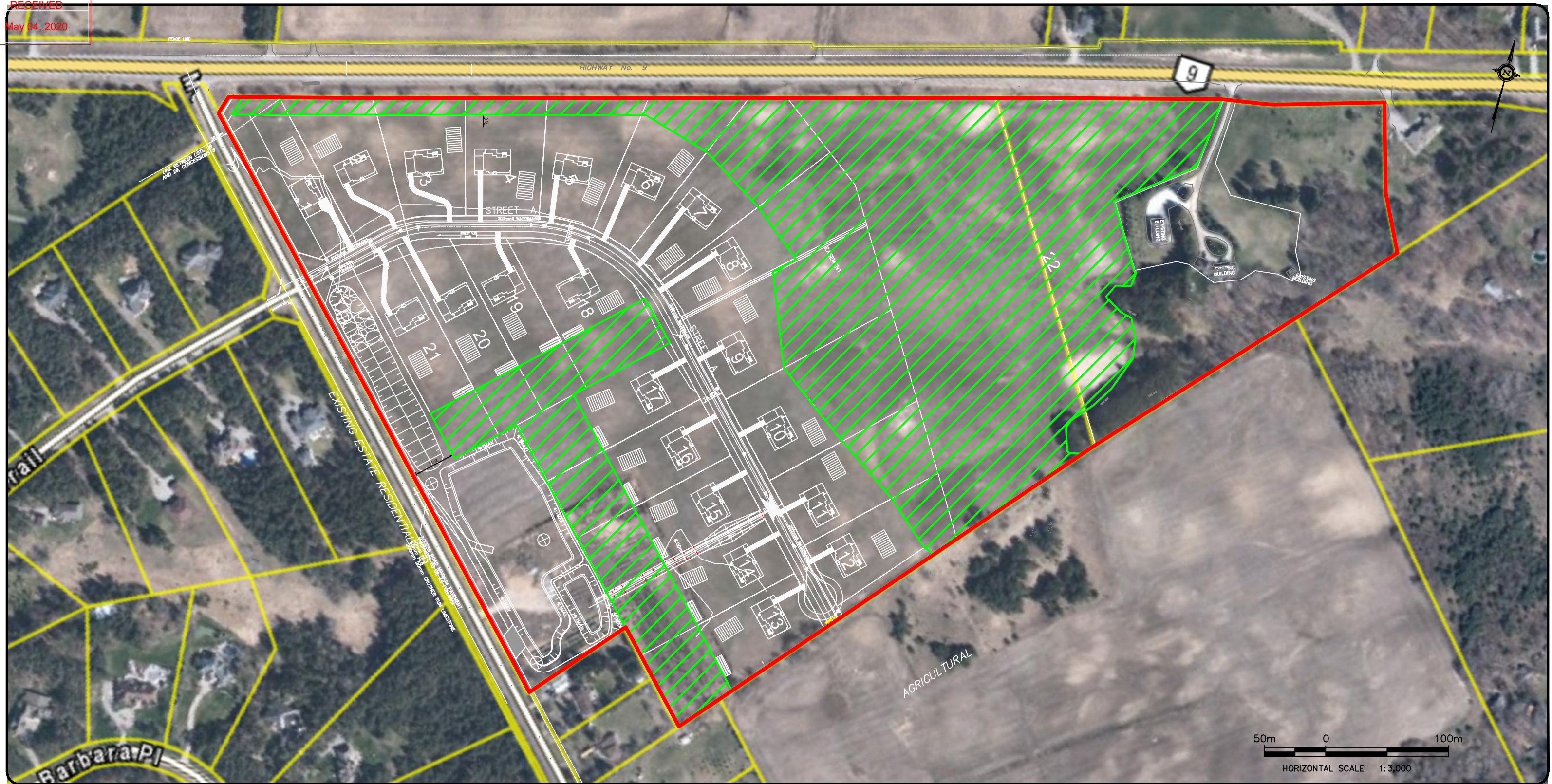
**GRAHAM PROPERTY ESTATE DEVELOPMENT**

CONSULTANT 6705 Millcreek Drive, Unit 1  
Mississauga Ontario L5N 5M4  
T 1 416 213 7121 F 1 416 890 8499  
E ytomail@ghd.com W www.ghd.com

**FUNCTIONAL GRADING, SITE SERVICING, AND STORMWATER MANAGEMENT PLAN**

DESIGN	T.D.	DRAWN	D.L.	CHECKED	P.S.
SCALE	1:1000	PROJECT No.	06131 MAP 10		
DATE	Rev FEB, 2020				





- Legend:
- Property Boundary
  - ▨ Reforestation Area (12.2ha)



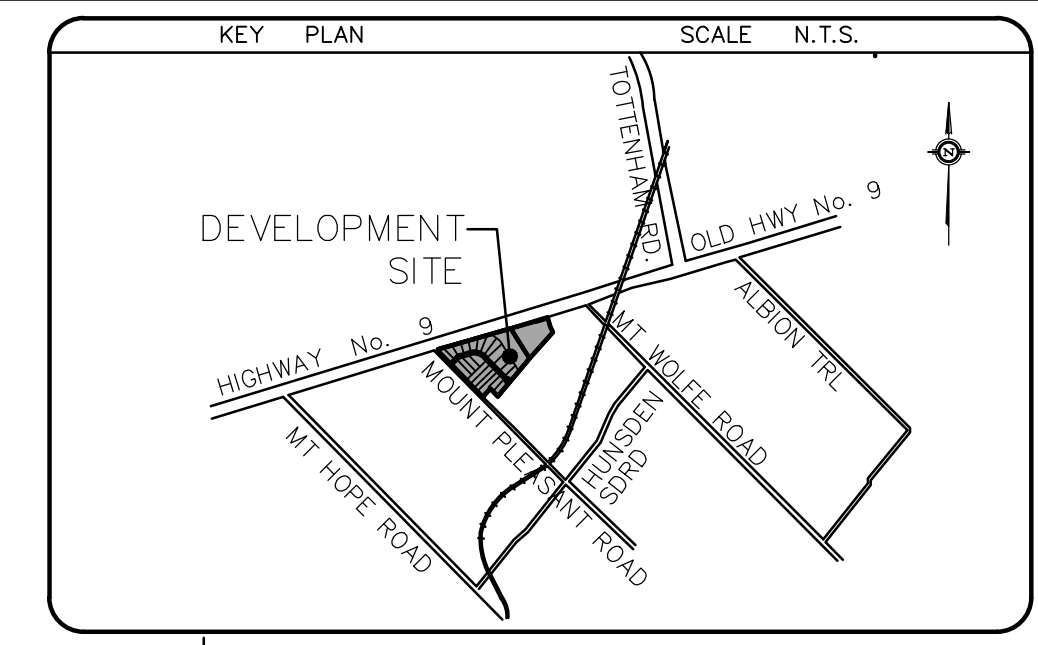
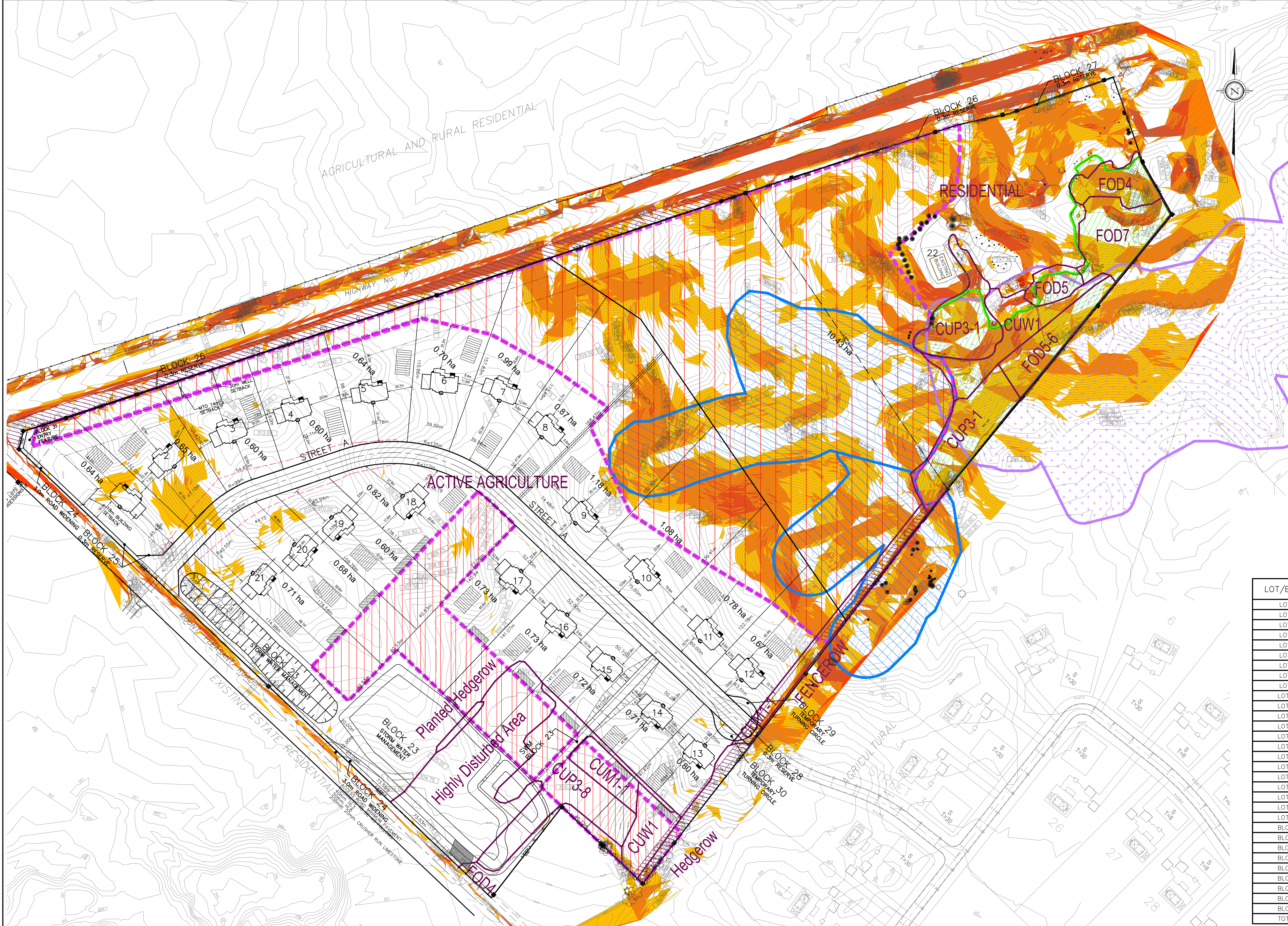
## ENVIRONMENTAL MANAGEMENT AND REFORESTATION PLAN

Date Issued: January 2020  
 Created By: JLM  
 Project No. 06-057  
 File Name: Map 11

VanStralen EIS  
 Lot 28, Concession 9  
 Town of Caledon

Map No.  
11





- Legend**
- EXISTING CONTOUR
  - REFORESTATION LINE
  - REFORESTATION AREA
  - SLOPES BETWEEN 10% TO 15%
  - SLOPES BETWEEN 15% TO 25%
  - SLOPES EXCEEDING 25%
  - RECOMENDED ENVIRONMENTAL ZONE 1
  - RECOMENDED ENVIRONMENTAL ZONE 2
  - NVCA REGULATION LIMIT
  - PROPOSED DRIVEWAY
  - PROPOSED HOUSE
  - PROPOSED SEPTIC TILE BED
  - INFILTRATION TRENCH
  - TREES
  - VEGETATION LINE
  - VEGETATION COMMUNITIES
  - FOD4** DRY-FRESH DECIDUOUS FOREST ECOSITE
  - FOD5** DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST ECOSITE
  - FOD5-6** DRY-FRESH SUGAR MAPLE-BASSWOOD DECIDUOUS FOREST TYPE
  - FOD7** FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE
  - CUW1** MINERAL CULTURAL WOODLAND ECOSITE
  - CUM1-1** DRY-MOIST OLD FIELD MEADOW TYPE
  - CUP3-1** RED PINE CONIFEROUS PLANTATION TYPE
  - CUP3-8** WHITE SPRUCE-EUROPEAN LARCH CONIFEROUS PLANTATION TYPE

LOT/BLOCK	AREA (ha)	STRUCTURE ENVELOPE (ha)	REFORESTATION AREA (ha)
LOT 1	0.64	0.58	0.06
LOT 2	0.65	0.55	0.10
LOT 3	0.60	0.50	0.10
LOT 4	0.60	0.51	0.09
LOT 5	0.64	0.53	0.11
LOT 6	0.70	0.49	0.21
LOT 7	0.99	0.48	0.51
LOT 8	0.87	0.44	0.43
LOT 9	1.18	0.50	0.68
LOT 10	1.09	0.45	0.64
LOT 11	0.78	0.44	0.34
LOT 12	0.68	0.43	0.19
LOT 13	0.80	0.50	0.30
LOT 14	0.71	0.47	0.26
LOT 15	0.72	0.47	0.26
LOT 16	0.73	0.47	0.26
LOT 17	0.73	0.46	0.27
LOT 18	0.82	0.50	0.32
LOT 19	0.60	0.43	0.17
LOT 20	0.68	0.51	0.17
LOT 21	0.71	0.54	0.17
LOT 22	10.43	1.02	6.54
BLOCK 23	2.43	-	-
BLOCK 24	0.17	-	-
BLOCK 25	0.00	-	-
BLOCK 26	0.04	-	-
BLOCK 27	0.00	-	-
BLOCK 28	0.00	-	-
BLOCK 29	0.02	-	-
BLOCK 30	0.02	-	-
BLOCK 31	0.01	-	-
<b>TOTAL</b>			<b>12.18</b>

CONSULTANT

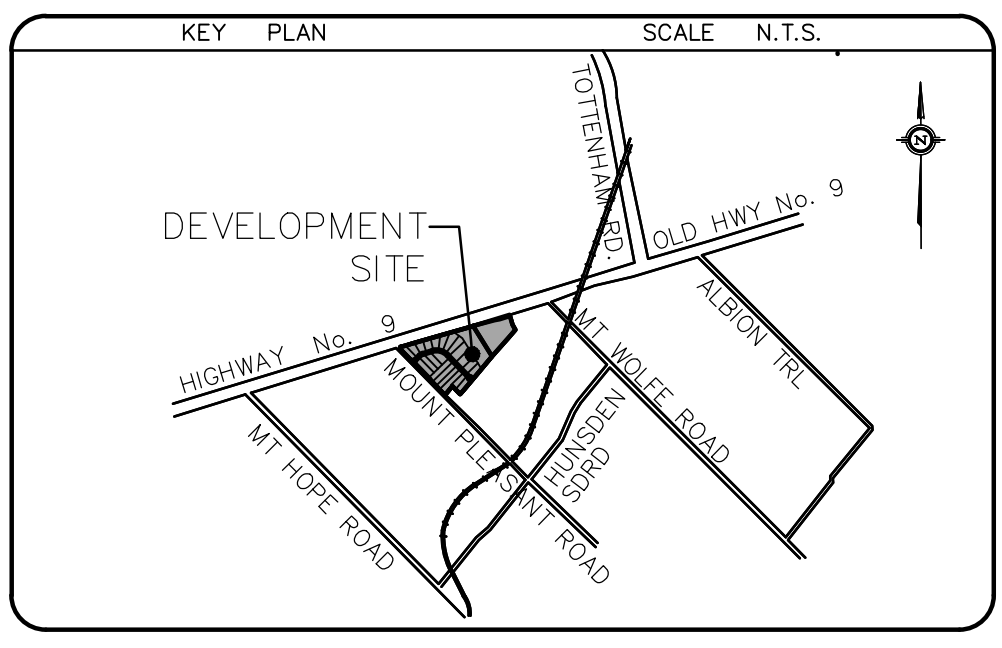
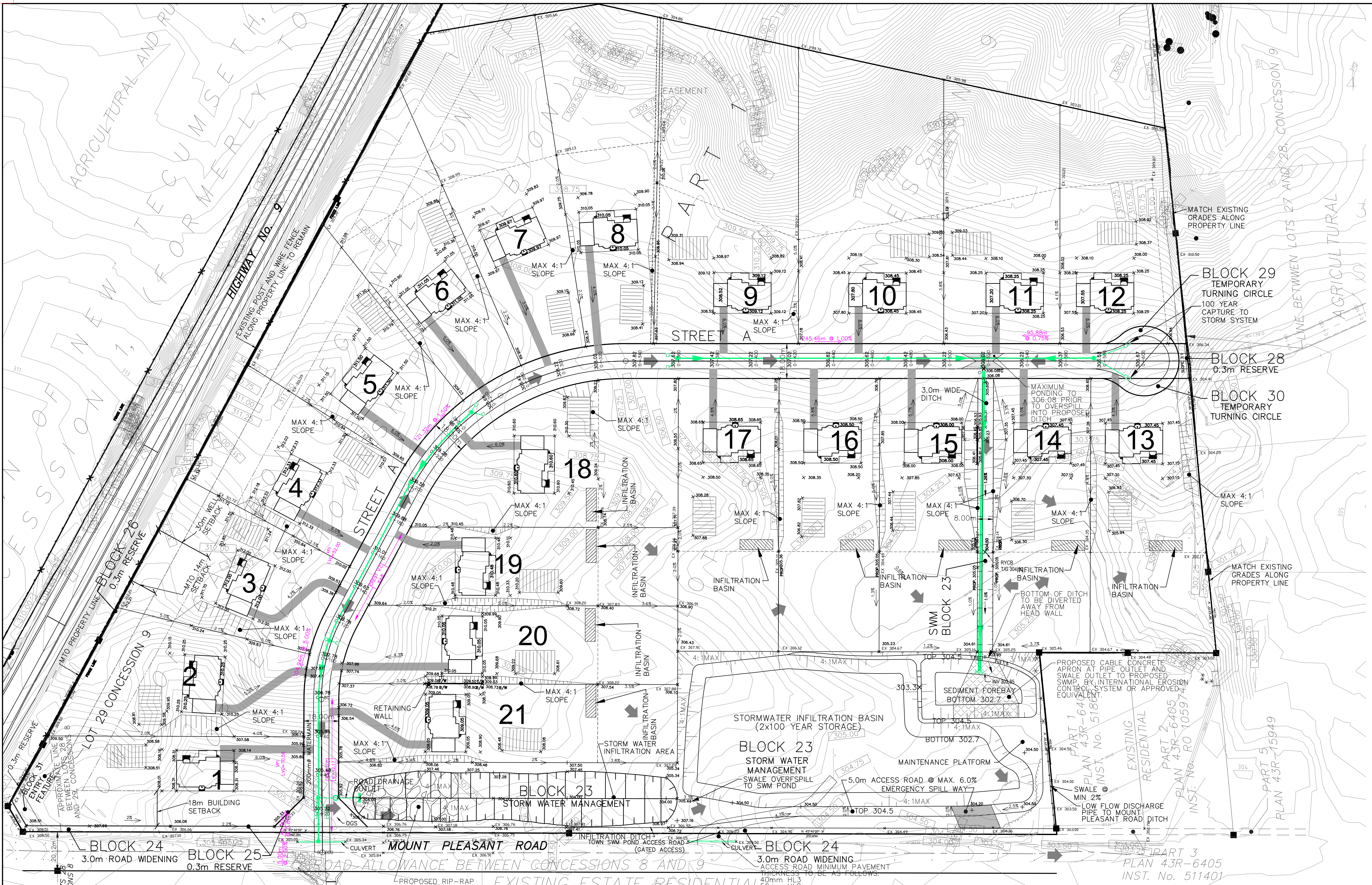
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GRAHAM PROPERTY  
ESTATE DEVELOPMENT

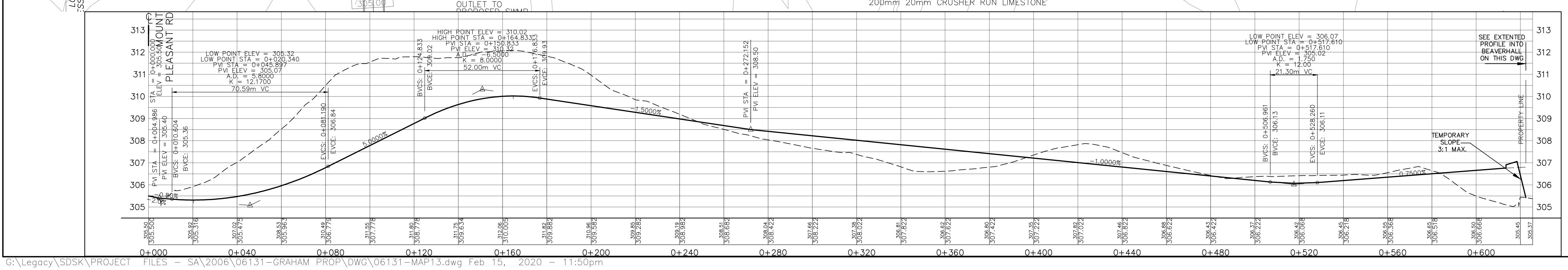
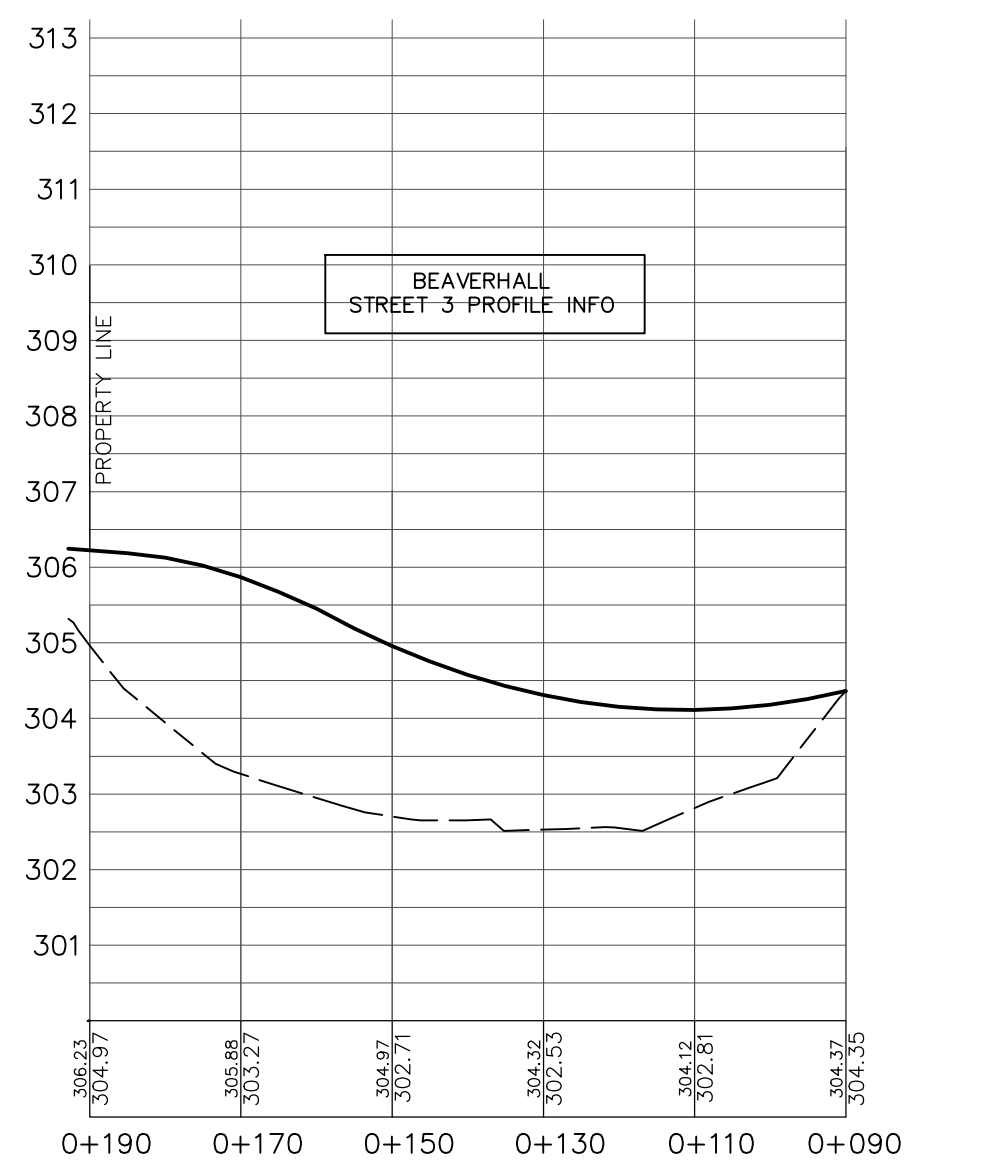
DRAFT PLAN, ENVIRONMENTAL  
SUMMARY, AND REVEGETATION PLAN

DESIGN		DRAWN	I.T.	CHECKED	E.L.	CONTRACT No. 06131
SCALE:	1:1500			DRAWING NUMBER		MAP 12
DATE:	Rev FEB. 2020					





- Legend**
- 302.00 — EXISTING CONTOUR
  - 307.30 — PRELIMINARY ELEVATION
  - 20.0m @ 0.75% — PRELIMINARY ROAD GRADE
  - ➔ OVERLAND FLOW
  - PROPOSED FRONT OF HOUSE ELEVATION
  - LOT NUMBER
  - PROPOSED REAR OF HOUSE ELEVATION
  - 2% — PROPOSED DRIVEWAY GRADE
  - ▨ PROPOSED SEPTIC BED
  - STRUCTURE ENVELOPE
  - ➔ PROPOSED STORM SEWER AND FLOW DIRECTION
  - ▨ INFILTRATION TRENCH



**GRAHAM PROPERTY ESTATE DEVELOPMENT**

CONSULTANT  
**GHD**  
6705 Millcreek Drive, Unit 1  
Mississauga Ontario L5N 5M4  
T 1 416 213 7121 F 1 416 890 8499  
E ytomail@ghd.com W www.ghd.com

**PRELIMINARY ROAD PLAN AND PROFILE**

DESIGN	T.D.	DRAWN	M.P.	CHECKED	S.P.
SCALE	1:1000	PROJECT No.	06131MAP-13		
DATE	Rev FEB, 2020				