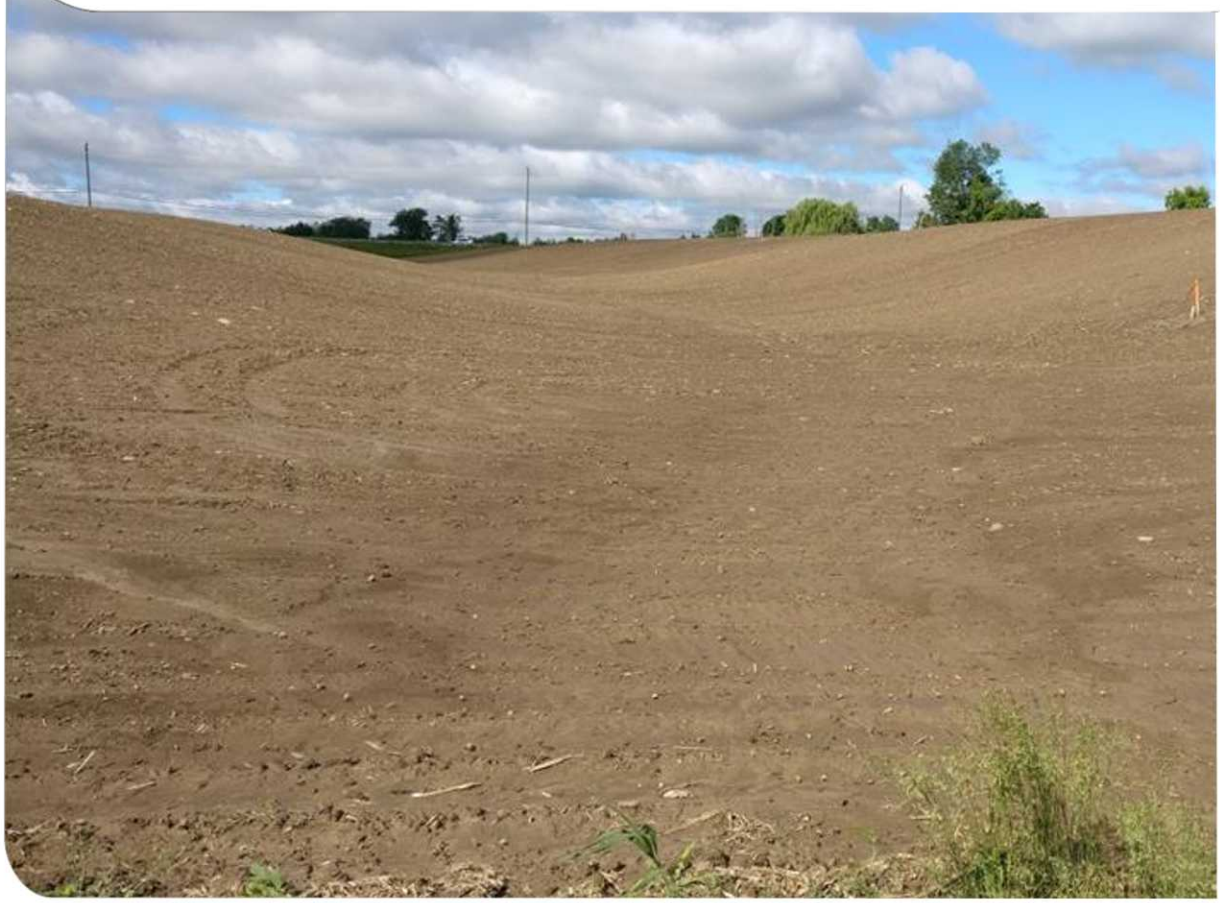
DILLON CONSULTING

TRIPLE CROWN LINE DEVELOPMENTS INC.

Agricultural Opinion Report

15505 Airport Road, Town of Caledon, Ontario



July 27, 2017 – 17-4928

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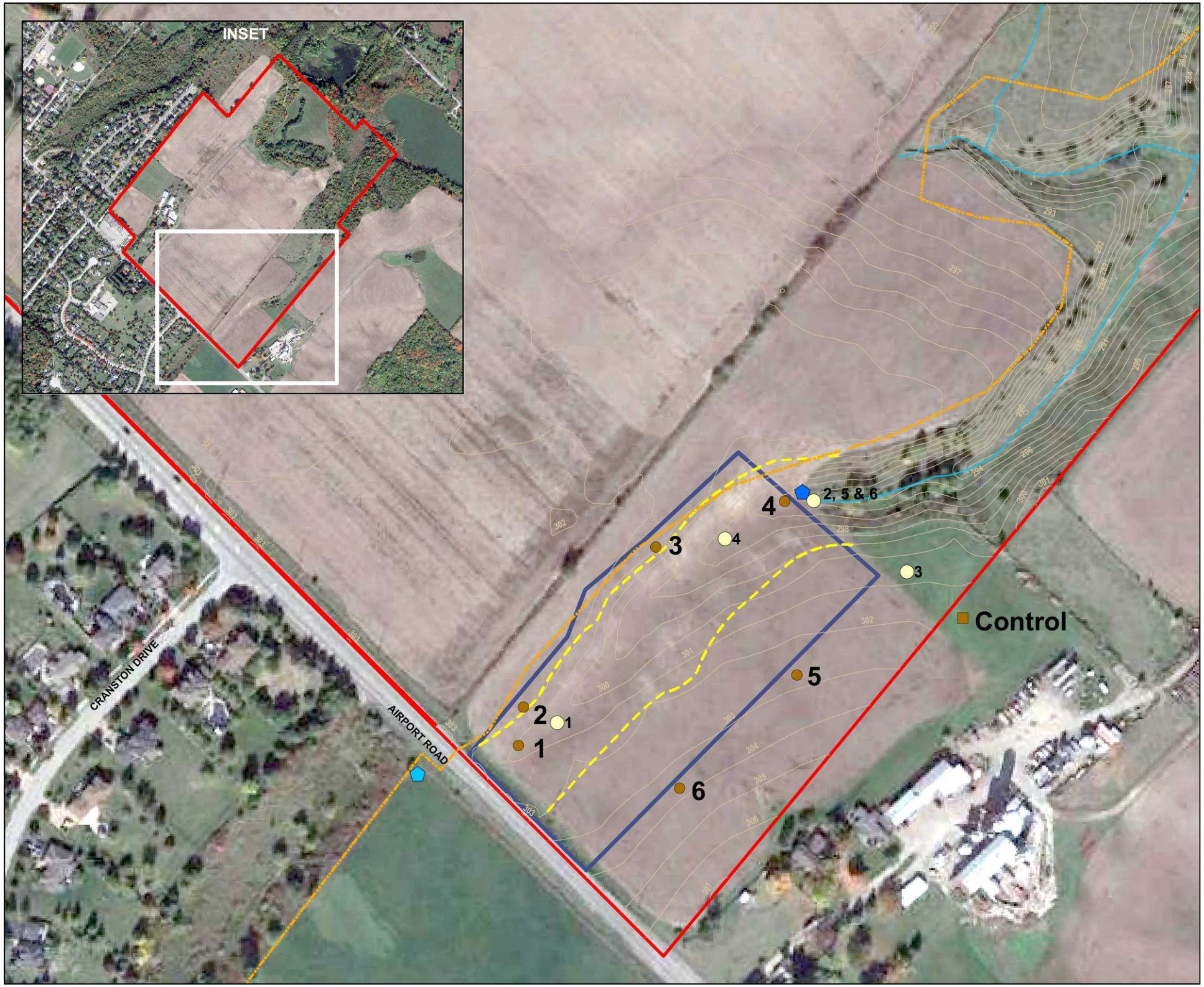
References

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by Triple Line Developments Inc. to conduct an agricultural assessment on a field located on the Innis Farm, 15505 Airport Road, Town of Caledon, Ontario (the "Property"). The Property is approximately 63.2 ha in size and is legally described as Part of Lot 18, Concession 1, Albion, in the Municipality of Caledon.

A residential development is proposed directly north of the Property (at 15717 Airport Road) and a 2.16 ha stormwater management pond associated with this development is proposed to be constructed within an agricultural field, approximately 3.9 ha in size, within the northwest portion of the Property (the "Field"; **Figure 1**). The Field is not within the Town of Caledon's Settlement Boundary and is currently designated Prime Agricultural Area.

This Agricultural Opinion Report is required to assess the overall agricultural capability of the Field and to apply for an Official Plan Amendment and Zoning By-Law amendment.

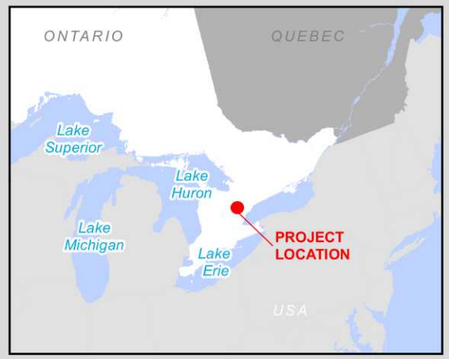


TRIPLE CROWN LINE DEVELOPMENTS
15505 Airport Road, Caledon

FIGURE 1
SOIL TEST PIT LOCATIONS AND FEATURES

LEGEND

- Photo Locations
- Culvert Inlet
- Culvert Outlet
- Soil Pit
- Soil Pit - Control
- 2021 Settlement Boundary
- Estimated Top of Slope
- Watercourse
- Study Area
- 1 m Contour
- Proposed Stormwater Management Facility



0 10 20 30 METRES
SCALE 1:2,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, TRCA

MAP CREATED BY: LK/SFG
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 17-4928
STATUS: DRAFT
DATE: 7/18/2017

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2.0 Methodology

The information contained in this Agricultural Opinion Report is based on a site visit that was conducted on June 21, 2017, an interview with the current landowner, as well as a combination of existing published data and data made available through various public agencies, web-based mapping programs and other environmental reports related to the Property.

2.1 Land Owner Interview and Field Reconnaissance

An informal interview occurred with Mr. Wayne Innis who is one of the owners of the Innis Farm to obtain a history of their farming operation, and to document the cropping history of the northwest field and its agricultural limitations.

2.2 Soil Classification and Compaction

Six soil test pits were excavated in the Field (**Figure 1**) to a depth of approximately 70 cm using a shovel. One control test pit was located in an uncultivated area to the southwest of the Field. The topsoil and subsoil within each pit were characterized according to the *Field Manual for Describing Soils in Ontario* (Denholm and Schut, 2003). Information was also recorded on factors that might affect successful cropping operations (i.e., excessive moisture, stoniness, etc.). The purpose of these pits were to compare soil conditions to see how they differ in terms of soil type, drainage potential, and to see if other physical limitations are present that may be not be described in the more general county wide soil survey. Soil compaction within the Field was determined using a Turf-Tec Soil Compaction Tester/Dial Penetrometer. Field findings were compared to soil descriptions found in the *Soil Survey of Peel County* (Hoffman and Richards, 1953 - reprinted February 1990.) and soil colours were described using a Munsell Soil Colour Chart.

2.3 Soil Capability Mapping

Canadian Land Inventory – Soil Capability for Agriculture mapping (Agriculture and Agri-Food Canada, 2017) was reviewed and compared to field studies (i.e., soil pit investigations), the descriptions within the Soil Survey Report, and information collected from the landowner interview.

2.4 Aerial Photography and Roadside Survey

The extent of agricultural and non-agricultural land use surrounding the Property was determine through a review of aerial photography (ca. 2015) and through roadside observations of the field condition on adjacent properties within a 0.5 km area of the Property.

3.0 Results and Interpretation

3.1 Landowner Interview

The Property is owned by Mr. Wayne Innis and he indicated that his family have farmed the Property since 1900. Mr. Innis currently operates the farm with his brother and they originally raised dairy cattle and produced milk. However, in 2003 they found that the operation was too small to making a living, and sold their herd as well as the milk quota.

At present, there are three barns on the Property, but only one has the capability to house livestock (the southern barn; **Figure 1**). The other two barns are storage and equipment barns and one houses a workshop used as a facility to repair automobiles, trucks and farm machinery. Mr. Innis indicated that this was his main source of revenue. There are three silos and two small grain bins on the Property. The silos are no longer in use but the grain bins are still operational.

The livestock barn houses beef cattle (backgrounders) less than 12.5 months old. These cattle are housed only in the winter and spend the summer months in pasture. Mr. Innis stated that the maximum number of cattle that could occupy the barn is 25, although he only has 15 head of cattle at present. The barn also houses two medium-sized horses (that are raised for a hobby) and this is the maximum capacity the barn can hold. Manure generated by the livestock barn is solid (> 30% moisture content) and is temperately stored for less than 14 days in a solid outside facility with no cover. Other livestock include a flock of chickens that are used as a source of farm fresh eggs.

Mr. Innis indicated that cash crops (i.e., corn and soybean) and high quality hay are grown on fields that are relatively level. Other areas of the Property have rolling and relatively steep terrain, and are only suitable for pasture.

With respect to the Field where the proposed stormwater management pond is to be located, Mr. Innis indicated that soybean is planted with corn every third year. The field has limitations in the northern third due to a large valley system that has relatively steep slopes and a swale that drains to the east. Mr. Innis indicated that gully erosion has been a factor, and constant improvements have occurred over the years to maintain the soil as well as the drain in this area.

3.2 Description of Soils

3.2.1 Soil Survey of Peel County

A review of the Soil Survey of Peel County indicates the dominant soil type on the Field is an Oneida Clay Loam that is the well-drained member of the Oneida catena, and typically occurs on smooth moderately sloping topography (Hoffman and Richards, 1953). The Oneida soil series, and other members of the Oneida catena, are fine textured soils that have developed from shale and limestone parent material. These soils can be moderately stony and the surface horizon generally consists of a clay loam texture. The parent material texture ranges from a clay loam to clay. On the more gentle slopes, the parent

material can be found at depths ranging from 60 to 80 cm. On steeper slopes, erosion of the topsoil may reduce the thickness of the plow layer, and the depth to the underlying calcareous parent material may be 40 cm or less.

Oneida soils are moderately to slowly permeable; however, surface run-off is rapid which results in a moderately well drained soil. Oneida soils have a high water-holding capacity, but, because of the soil's impervious nature and rapid surface runoff drought conditions can occur within these soils. For example, during the site visit the soils were relatively dry despite the record rainfalls that have occurred in the Greater Toronto Area in the early part of June 2017.

A typical description of this soil that has developed under woodlot vegetation shows depths of approximately of 38 cm of a clay loam, over clay till. No stones are present in either the first (A horizon) or second (B horizon) layers, but stones may be found in the parent material, and occasional reach the surface if deep soil disturbance has occurred. The Oneida Clay Loam is mainly used for dairying and general farming, but is also well adapted for other crops including cereal grains, hay and pasture. Hoffman and Richards (1953) have provided some guidelines that give a rating from poor to good for various classes of crops depending if tile drain has been installed. In general, crops such as wheat, barley, alfalfa, red clover, corn and beans get a rating of fair to good if only natural drainage is present; however, the presence of tile drainage does increase the rating to good with most crops.

3.2.2 Field Topography and Features

A distinctive depression approximately 4 m to 5 m in depth and 40 m wide is located in the northern third of the Field and represents approximately 1 ha (**Figure 1 and Photo 1**). To the east of this feature is a narrow grassy valley (**Photo 2**) that eventually drains east into Innis Lake. In contrast, the southern portion of the Field is comparatively flat with a gentle slope towards the depression (**Photo 3**).

A headwater drainage feature assessment was conducted in the northern portion of the Field in March 2017 and the results are presented in the *Preliminary Environmental Impact Study* (Dillon, 2017). The topographical depression does not exhibit characteristics and functions associated with headwater drainage features and there is no connection between the topographical depression and the tributary that is located within the adjacent valley.

A culvert/storm infrastructure pipe that originates on the west side of Airport Road passes through the northern portion of the Field and discharges in the grassy valley area. Mr. Innis indicated the culvert/storm infrastructure pipe has been present for many decades but received an upgrade during the installation of Airport Road in 1959.

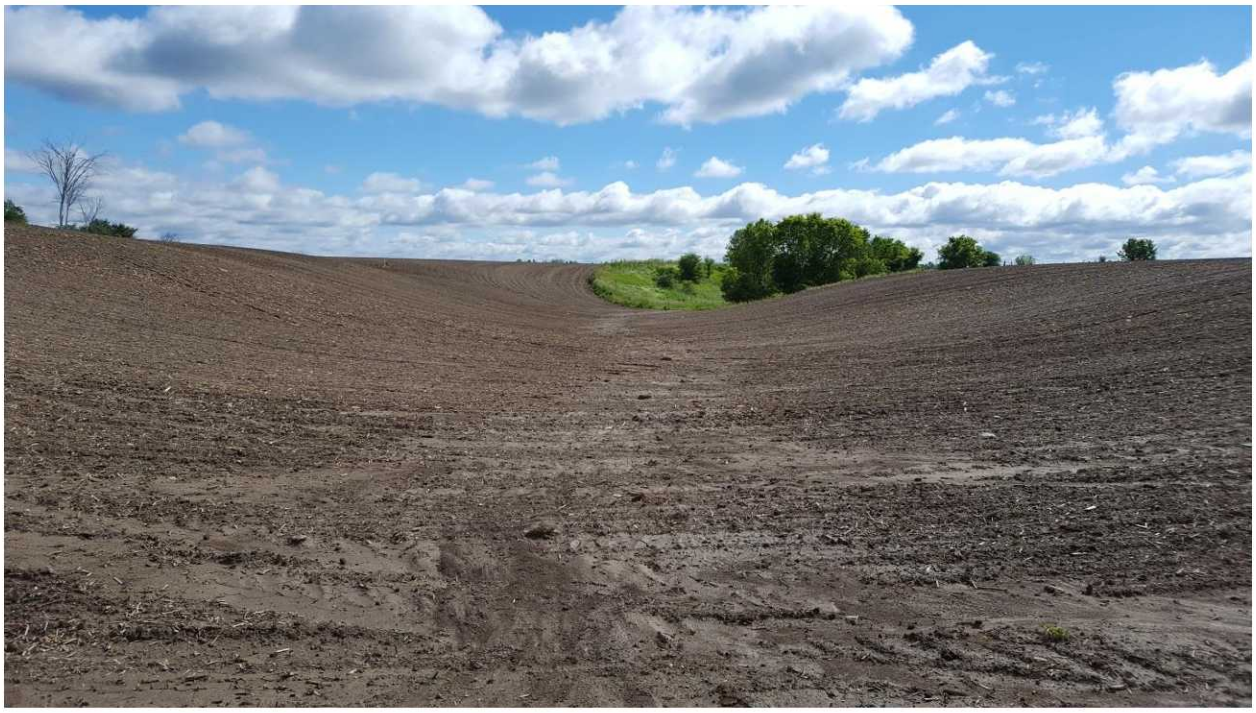

Photo 1 – View of valley system within northwest field looking east.

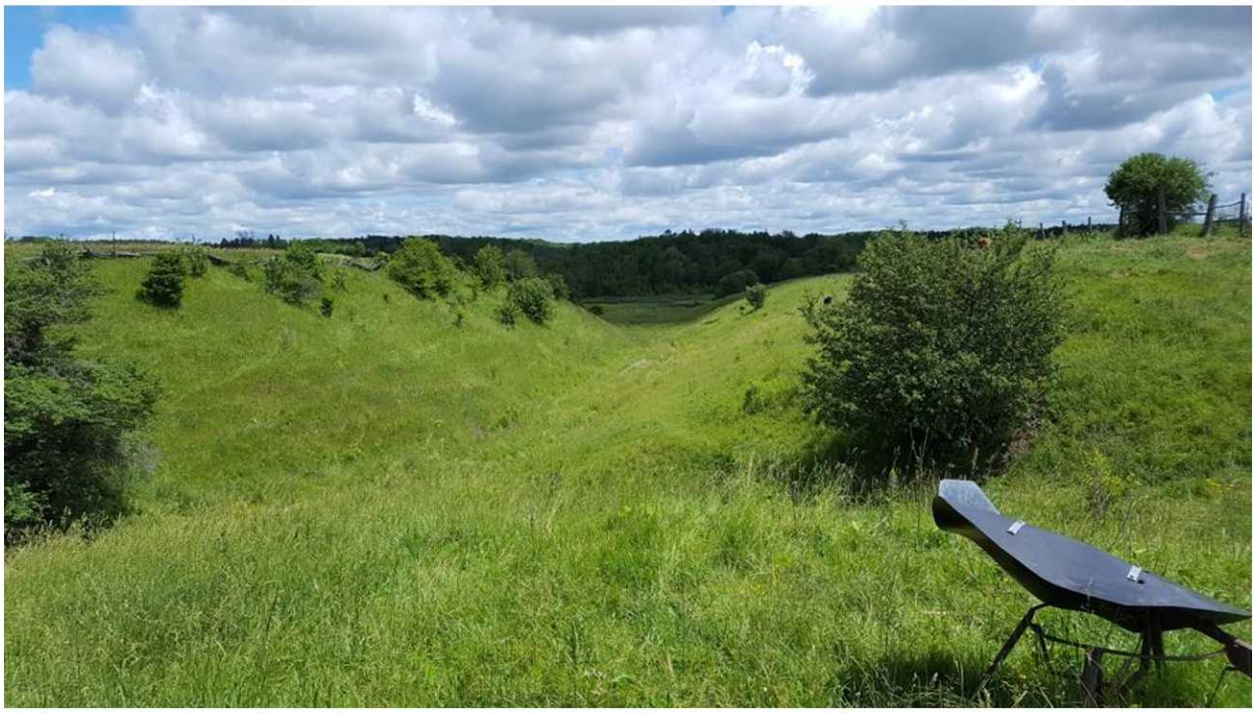

Photo 2 – View of steep grassy slopes that drain eastward towards Innis Lake

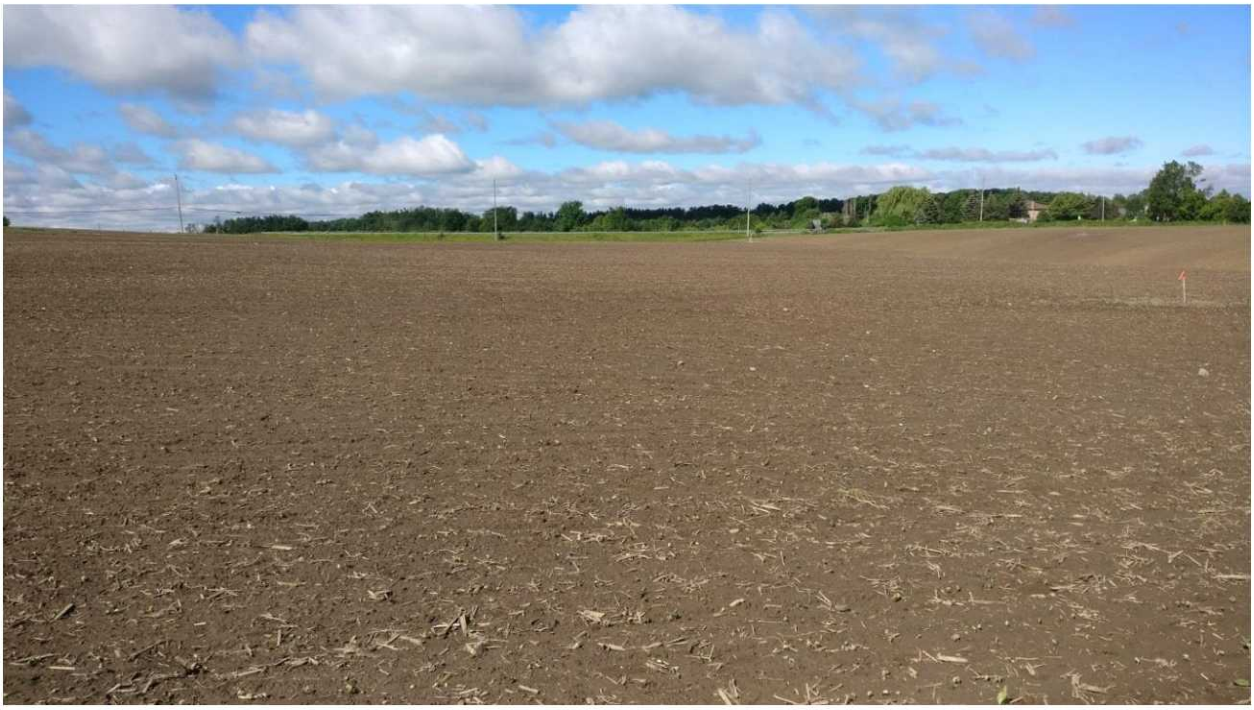

Photo 3 – Southern portion of the field planted with soy bean, looking west; Note the relatively flat topography and the depression in the background.

3.2.3 Field Observations

Soil test pits were located in the high and low topographic areas of the field in order to capture the greatest and least productive portions, as well as to determine if there were differences in topsoil depth. The estimated top of slope and the location of the soil pits are shown in **Figure 1**. Descriptions for each of the six soil pits and one control are shown in **Table 1**. Generally, the topsoil description (i.e., Horizon A) was similar to that described in Hoffman and Richards (1953). However, the depth of topsoil varied among the test pit locations. The control test pit has a similar topsoil depth to the topsoil in the southern portion of the field (locations 5 and 6). In contrast, topsoil was approximately 10 cm thinner in the most northern locations in the field (location 2 and 3). Within the depression topsoil depths were approximately 25 cm thicker than the control.

These findings indicate that topsoil is eroding from the slopes into the depression in the northern portion of the Field. In contrast, the southern portion of the field outside the proposed development does not appear to be impacted by erosion.

A review of **Figure 1** shows that there are numerous areas along the north and south valley wall where erosion of the slope has been sufficient to move the topsoil into the valley bottom causing limited topsoil cover to remain. It is likely that this trend will continue, and subsoil will become exposed if common field crops continue to be grown in this valley feature. Inspection of the side slopes also found signs of sheet, rill and gully erosion where soybean had been planted along with migration of topsoil (**Photo 4**).

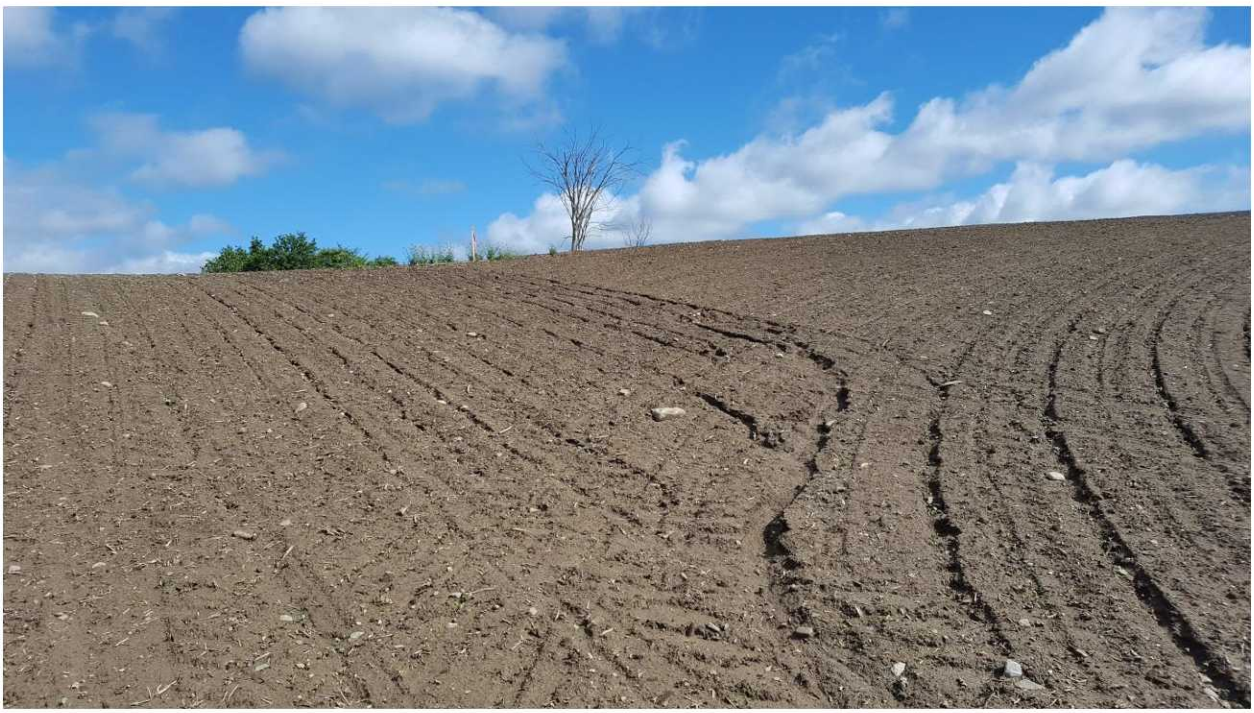

Photo 4 – View of north slopes with northwest field. Soybean has been planted, but rill erosion is occurring along the planted rows that flow downslope into the valley.

Table 1: Description of Soil Pits

Soil Pit ID	Horizon	Depth (cm)	Matrix Colour	Mottle Description	Texture	Structure	Calcareous Reaction	Comments
1	Ap	0-63	10 YR 4/3 (brown)	None	Clay Loam	Granular and friable	None	• Sample taken at bottom of slope in swale. • One large boulder at 50 cm.
	B_1	63-100	10 YR 3/6 (dark yellowish brown)	None	Silty Clay	Blocky	None	• No moisture in pit •
2	Ap	0-18	10 YR 4/3 (Brown)	None	Clay Loam	Granular and friable	None	• Sample taken at crest of slope. • Small stones present
	B_1	20-60	10 YR 3/6 (dark yellowish brown)		Silty Clay	. Blocky structure	None	• Few stones
3	Ap	0-18	10 YR 4/3 brown	None	Clay loam	Friable	None	• Sample taken at crest of slope Many earthworms • Few stones up to 3 cm
	B_1	18-70	10 YR 3/4	None	Silty clay l	Blocky	Weak	• Few stones and gravels.
4	Ap	0-56	10 YR 4/3 Brown	None	Clay loam	Friable	None	• Some stones up to 20 cm due to erosion from upslope. • Smaller stores also found throughout this horizon
	B_1	56-70	10 YR 3/6 Dark yellowish brown	None	Silty clay	Blocky	Weak	• Some stones in this horizon
5	Ap	0-28	10 YR 4/3 Brown	None	Clay loam	Granular and friable	Weak	• Sample taken on smooth slope

Soil Pit ID	Horizon	Depth (cm)	Matrix Colour	Mottle Description	Texture	Structure	Calcareous Reaction	Comments
	B_1	28-70	10 YR 3/6 Dark yellowish brown	None	Silty clay	Blocky	None	• Few large stones in this layer.
6	Ap	0-27	10 YR 4/2 Dark Grey Brown	None	Clay loam	Granular and friable	None	• Sample taken on smooth slope. • Few stones
	B_1	27-72	10YR4/4 Dark Yellowish Brown	None	Silty Clay	Blocky	Weak	• Few stones
Control	Ap	0-29	10 YR 3/2 Very dark grey brown	None	Silty Clay	Granular and very friable	None	• Lots of organic matter due to hay crop. • Many earth-worms
	B_1	29 to 80	10YR4/4	None	Silty Clay	Blocky	None	• Pit is moist due to cover crop.
								•

Evidence of Soil Compaction

Oneida soils have a relatively high bulk density that is consistent throughout the soil profile; however, it can become compacted under dry conditions. Soil compaction throughout the field (i.e., measured above 300 psi) was recorded at a depth of approximately 40 cm, which is the typical depth of the plow pan. Compaction of the soil can occur under wet soil conditions during cultivation of the fields in the spring or during the fall harvest. Compaction impedes root penetration and reduces the air and water volumes in the soil, and has an impact of crop growth. In the lower areas of the northwest field, some new planted soybeans had not penetrated the soil, and roots were exposed. Due to the soil's high bulk density and potential for compaction, these soils need to be carefully managed to ensure that the soil structure is not damaged when under cultivation.

3.2.4 Soil Land Capability Mapping (CLI)

When reviewing CLI system mapping, four assumptions should be made.

i) the soils will be well managed under a largely mechanized system of agriculture;
ii) soils requiring improvements, can be done economically by the farmer himself are evaluated on the assumption that such improvements can only be achieved through cooperative action among farmers or between farmers and governments;
iii) distance to market, road systems, location, cultural patterns, characteristics of land ownership, size of farms and skill or resources of individual operators are not criteria for evaluating agricultural capability; and
iv) the capability of classification of soils (i.e., CLI rating) in an area may be changed as new information on the properties, behaviours and responses of soils become available.

CLI mapping for the Caledon and Brampton area was produced during the mid-1940s, and the rating for the subject lands was 70% Class 1, and 30% Class 3 with a limitation of topography being a factor to consider. The CLI rating of Class 1 suggests that there are no limitations to agriculture, and cultivation can occur immediately once the land is cleared.

Through field investigations, it was found that the southern portion of the Field did appear to be Class 1 lands, and no tile drains had been installed according to Mr. Innis. In contrast, the depressional area in the northern portion of the field suggests this area should be classified as Class 3 with a limitation of topography and requires management to prevent further erosion of the slopes.

Upon further field review, it was discovered that disruption of soils in the northern portion of the northwest field had occurred due to the installation of a 66 cm diameter concrete culvert to drain flows from the west of Airport Road towards Innis Lake located to the east (**Photo 5**). In this regard, chunks of concrete, bedrock and brick had been found within the headlands of the northwest field, along with thinner soils compared to those compared to the south. In addition, deposition of soils and crop debris

from flooding events within the valley this spring had been found near the outlet of the culvert (**Photo 6**).

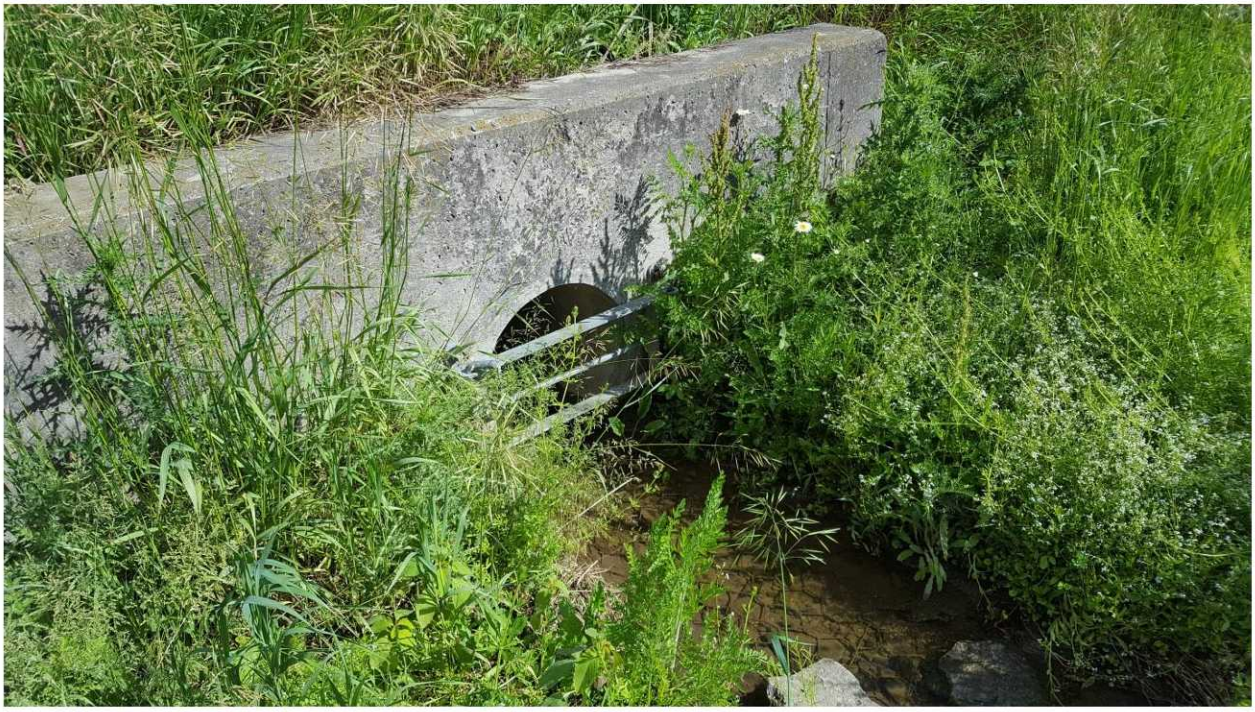

Photo 5 – Outlet of 66 cm diameter culvert near east end of northwest field.

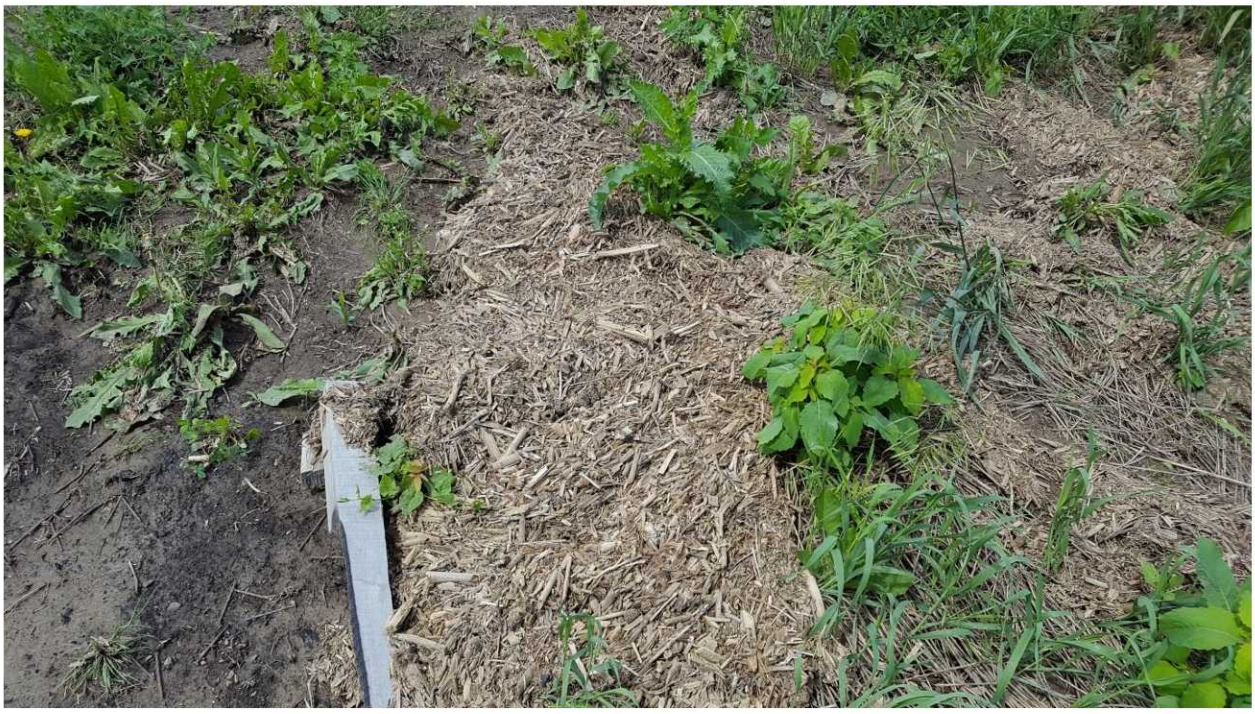

Photo 6 – View of sediment and corn stalk residue that has washed off the northwest field into adjacent valley lands. This accumulation of soil was at least 15 cm deep in some areas.

Limitations of Agriculture

The limitation of topography is an issue within at least the northern portion of the field as the presence of steep slopes, as well as visible signs of erosion, has been encountered. Cultivation of these slopes by farm equipment on these slopes does occur, but extreme caution is required to avoid tractor roll-over. However, continued erosion will occur on an annual basis unless a permanent cover crop or grassed water ways are installed throughout this area.

The slopes within the northern portion of the Field are steep and are contiguous with steeper slopes downstream that remain vegetated. To reduce the soil erosion in this area, it is recommended that agricultural operations cease and the area should be permanently vegetated. Alternatively, this area could be modified to accommodate a storm management pond for the planned development to the north. The construction of a berm and outlet for overflows could be directed to the east for long term treatment.

3.2.5 Surrounding Land Use

The Property is located near the southern limits of the community of Caledon East and development appears to be underway to the west along Cranston Drive. The properties located to the north are currently agricultural field but are within the Town of Caledon's Settlement Boundary and development has been proposed. Agricultural activity still occurs to the south and east, and will continue for the foreseeable future.

3.2.6 Nuisance Impacts

Nuisance impacts are usually associated with landfill operations, livestock operations and cropping operations. However, urban development can negatively impact agricultural operations in the following ways:

- Increased in litter (i.e., plastics, Styrofoam and lunch bags, etc.);
- Illegal dumping of building materials in farm laneways,
- Trespassing and harassment of livestock;
- Tampering and removal of livestock gates and fences;
- Increased noise; and
- Impacts of increased traffic flow.

3.2.6.1 Minimum Distance Separation

The Provincial Policy Statement, 2014 (Section 2.3.3.3) requires a minimum distance separation (MDS) calculation in prime agricultural areas and on rural lands. The MDS calculation is required prior to the approval of proposed lot creation and rezonings or re-designations, in accordance with the implementation guidelines in *The Minimum Distance Separation (MDS) Document* (Ontario Ministry of Agriculture, Food and Rural Affairs, 2017).

MDS applies when livestock barns and manure facilities are located on the lot to be severed or re-zoned for residential usage that could result in an odour conflict. Although a livestock facility is present on the

Property that is to be separated and rezoned as New Settlement Area boundary a MDS setback is not required because this severance is for infrastructure (which includes storm water management (SWM) ponds, Implementation Guideline 2). However, if the land use is later proposed to be rehabilitated or re-developed to a use that is not agricultural, the MDS setback shall be met prior to the approval of any required planning or building permit application.

Nevertheless, Dillon conducted a MDS calculation titled *Minimum Distance Separation calculation for the property located at 15505 Airport Road* (June 5, 2017) and found that the proposed dwellings have the appropriate setback from the livestock barn. Dwellings cannot be located within the addition lot severance (i.e., the proposed location of the stormwater management pond) as this area is within the MDS setback.

4.0 Conclusion: Long-Term Agricultural Potential

The Field is currently designated as Prime Agricultural Area and has recently been planted with soybean and corn every third year. However, the northern portion of the field has limitations for agriculture due to the presence of a large depressional area. Agricultural equipment cannot easily traverse this depression and soil erosion has been documented through the reduced topsoil layer and the observation of rills. The presence of this depression is consistent the CLI mapping that designates 30% of lands in the area as Class 3 with a limitation of topography. In contrast, the southern portion of the field maintains its Class 1 status as it has relatively even topography and a topsoil depth consistent with the control soil pit and the County soil maps.

The surrounding region is undergoing a large land-use change with the expansion of urban boundaries. A Settlement Boundary is located directly to the north of the Field. This development creates the potential for nuisance impacts on agricultural operations. Furthermore, the urban expansion has limited the long-term viability of agriculture in the area due to the reduce availability of high quality flat lands for hay and common field. This factor combined with limited skilled farm labour, potential odour complaints from manure handling as well as moving farm equipment along a busy commuter route (i.e., Airport Road) has made farming in the area a more difficult.

Overall, development of the stormwater management pond in the northern portion of the Field will have a minimal impact on the long-term agricultural production in the area.

References

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