DUFFERIN AGGREGATES, A DIVISION OF CRH CANADA
MILTON QUARRY EAST EXTENSION
AGRICULTURAL IMPACT ASSESSMENT
TOWN OF HALTON HILLS
REGION OF HALTON

DBH Soil Services Inc.

November 4, 2021

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TOWN OF HALTON HILLS
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Prepared for:

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November 4, 2021

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DBH Soil Services Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICIES

1 BACKGROUND

DBH Soil Services Inc. was retained to complete an Agricultural Impact Assessment (AIA) for the Dufferin Aggregates proposed Milton Quarry East Extension (MQEE). The Dufferin Aggregates proposed MQEE is contiguous with the existing Milton Quarry East Cell to the north, the existing North Quarry to the west, and the existing Main Quarry at a distance to the south/southwest.

The proposed MQEE is located within Part Lot 12, Concession 1, Town of Halton Hills (formerly Town of Esquesing), in the Regional Municipality of Halton. The Study Area was defined according to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) *Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018),* where it is stated:

> *For mineral aggregate resource extraction the primary study area (i.e. subject land) is the proposed licensed area.*

Therefore, the Study Area was the area defined as the proposed license area. Henceforth, the proposed license area will be referred to as the Study Area. The Study Area is approximately 15.9 ha in size and is predominantly open field areas. The Study Area is proposed as a below groundwater extraction, consistent with the existing quarry operation.

The Study Area abuts an unopened road allowance for the Nassagaweya Esquesing Townline on the southwest side. The Study Area is located approximately 3.5 km northwest of Milton, 3.8 km northwest of Highway 401, 6.0 km northeast of the hamlet of Campbellville, and 9.25 km southwest from Georgetown.

The proposed MQEE required the completion of an Agricultural Impact Assessment as per the request by the Niagara Escarpment Commission and the Region of Halton at the Pre-Consultation/Development Review Committee Meeting (November 12, 2020), despite the Study Area not being located in a prime agricultural area or currently being used for agriculture. Further, this AIA will be completed as per the requirements identified in the *DBH Soil Services Inc. Agricultural Impact Assessment (AIA) Terms of Reference (March 5, 2021).*

The purpose of this AIA is to document the existing agricultural character, identify potential existing (or future) agricultural impacts, and to provide avoidance or mitigative measures as necessary to offset any impacts.

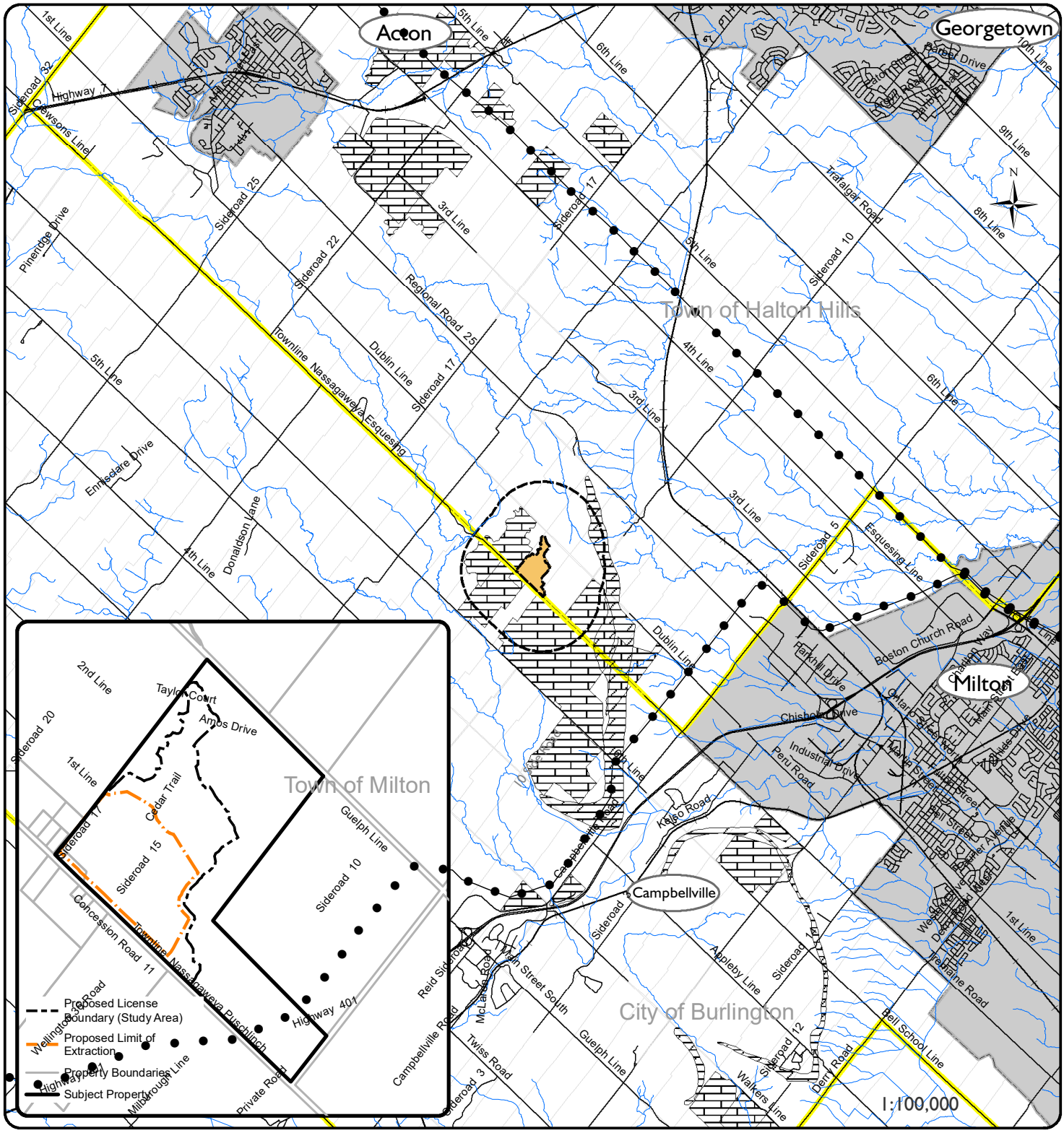
For the purpose of an AIA report, agricultural operations and activities are evaluated in a larger area, the Secondary Study Area, described as a potential zone of impact extending a minimum of 1000 m (1.0 km) beyond the boundary of the Study Area.

This minimum 1000 m (1.0 km) area of potential impact outside the Study Area is used to allow for characterization of the agricultural community and the assessment of impacts adjacent both on and in the immediate vicinity of the Study Area.

The Study Area comprises woodland areas and open field areas. The Secondary Study Areas comprise a mix of land uses including rural uses, woodlands, existing quarry lands/quarry ponds, escarpment lands, golf course and small areas of agricultural lands.

Figure 1 illustrates the relative location and shape of the Study Area and the Secondary Study Area with respect to the above-mentioned community features. Figure 1 includes an inset map to illustrate the shape and size of the parcel and to illustrate the proposed Extraction Limit and License Boundary.

This report documents the methodology, findings, conclusions, and mapping completed for this study.



Legend

- Watercourse (MNRF)
- Hydro Line (MNRF)
- Rail line (MNRF)
- Roads (MNRF)
- Aggregate Authorized Site Active (MNRF)
- Built Up Areas (Halton Region)
- Escarpment (OMAFRA Soils Data)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1 km)
- Study Area (Proposed License Boundary)

Figure 1

Location

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2 METHODOLOGY

In an effort to define the methodology for an Agricultural Impact Assessment (AIA) study, a review of the *Halton Region Official Plan* (Office Consolidation June 19, 2018) was completed to determine the designated Land Use of the Study Area. The review of Map 1 – Regional Structure (June 19, 2018) illustrates that portions of the Study Area are considered as Agricultural Area, while Map 1E – Agricultural System and Settlement Areas illustrates that portions of the Study Area are considered as Agricultural System outside Prime Agricultural Areas. As such, the Study Area is not considered as a Prime Agricultural Area.

A further review of the *Halton Region Official Plan (*Consolidated June 19, 2018) was completed to determine if there were specific local guidelines and/or requirements for the completion of an Agricultural Impact Assessment study. It was noted that the *Halton Region Official Plan* required that an Agricultural Impact Assessment study be completed (for lands within the Prime Agricultural Area) to determine the *potential impact of urban development on existing agricultural operations, including the requirement for compliance with the Minimum Distance Separation formulae where an agricultural operation is outside the Urban area.* It was determined above that the Study Area is not located in a Prime Agricultural Area, and as such, an Agricultural Impact Assessment (AIA) is not specifically required for the proposed MQEE. A request from the Niagara Escarpment Commission and the Region of Halton at the Pre-Consultation/Development Review Committee Meeting (November 12, 2020), to complete an AIA necessitated this study.

The review also determined that the Region of Halton has created a document titled "*Agricultural Impact Assessment Guidelines, October 1985"*, and had updated those guidelines with a newer version from June 2014. The Region of Halton has specific standards and guidelines for completing Agricultural Impact Assessments (AIA) within the boundaries of the Region of Halton. The Halton Region guidelines are comprehensive and require considerable detail to complete.

A further review was completed to determine the existence and use of Agricultural Impact Assessment Guidelines in Ontario.

The review on the existence and use of Agricultural Impact Assessment Guidelines revealed that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) had released draft Agricultural Impact Assessment guidelines in a document titled *"Draft Agricultural Impact Assessment Guidance Document*." (2018, March). This document is considered as "Draft for Discussion Purposes" and does not have status. Recent discussions with staff from OMAFRA have indicated that the release of the final version of their Agricultural Impact Assessment Guidelines document is imminent.

As a result of the review on the existence and use of Agricultural Impact Assessment guidelines in Ontario, this Agricultural Impact Assessment report has been completed with regard to the *Agricultural Impact Assessment (AIA) Guidelines Regional Official Plan Guideline* (Halton Region, 2014), a review/reference to the *Draft Agricultural Impact Assessment Guidance Document*

(OMAFRA, March 2018) and through discussion with staff from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

The Region of Halton Agricultural Impact Assessment Guidelines states that an AIA should include the following:

- Description of the proposal
- Purpose
- Applicable Planning Policies
- Onsite and Surrounding Area Physical Resource Inventory (including: soils; climate; slope; topography; drainage)
- Minimum Distance Separation (MDS) calculations
- On-site features (including: past farming practices; type and intensity of existing agricultural production; nonagricultural land use; parcel size, shape and accessibility; existing farm management; capital investment related to agriculture)
- Offsite Land Use Features (including: surrounding land use types; existing and potential constraints to onsite agriculture; regional land use, lot and tenure patterns)
- Agricultural Viability
- Assessment of Impact on Agriculture
- Mitigative Measures/Avoidance/Minimizing impact
- Conclusions

It should be noted that the use of Land Tenure is specific to the Halton Region AIA guidelines and is not a characteristic that is defined within the policies of the *Provincial Policy Statement* (PPS 2020) or the *Growth Plan for the Greater Golden Horseshoe* (2020, August 28). Further, the term land tenure is not described or discussed in the OMAFRA draft AIA guidelines. As such, the use of Land Tenure has no policy direction and was not included as part of this study.

Many of these general tasks, listed above, are also identified and presented in the OMAFRA "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*". As a result, this AIA will follow the above referenced task list.

It should also be noted that this AIA will assess the impacts both within and from the Study Area boundary.

2.1 DATA COLLECTION

2.1.1 POLICY

Relevant policy, by-laws and guidelines related to agriculture and infrastructure development were reviewed for this study.

The review included an examination of Provincial and Municipal policy as is presented in the *Provincial Policy Statement (PPS 2020), the Greenbelt Plan (2017), the Growth Plan for the Greater*

Golden Horseshoe (Office Consolidation 2020), the Oak Ridges Moraine Conservation Plan (2017), the *Niagara Escarpment Plan* (2017), *the Halton Region Official Plan (Office Consolidation 2018), the Town of Halton Hills Official Plan (Consolidated May 1, 2019), and the Town of Milton Official Plan (August 2008).*

Further, the review included an assessment of *The Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks. Publication 853. (OMAFRA, 2016).* The MDS document was reviewed to determine the applicability of the document's use for this study.

An assessment of online data resources including the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Ministry of Natural Resources and Forestry (MNRF) Land Information Warehouse (Land Information Ontario Geowarehouse (LIO)), the Region of Halton website, the Town of Halton Hills website, the Town of Milton website, combined with telephone, email and in person communication was used to derive a list of relevant policy, by-law and guidelines. Each relevant policy, by-law and guideline was collected in digital or paper format for examination for this study.

2.1.2 PHYSIOGRAPHY

A review of *The Physiography of Southern Ontario. Ontario Geological Survey Special* (3rd ed., Vol. 2.1984). Ministry of Natural Resources was completed to document the type(s) and depth of bedrock and soil parent materials, and how these materials, in conjunction with glacial landforming processes, have led to the development of the existing soil resources.

2.1.3 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed from the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping and windshield surveys.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops – Publication 811* (June 2017). The map illustrated in Publication 811 is the map shown in the Draft OMAFRA AIA guidance document and is used as the standard approach for determining potential limitations to agriculture as based on climate.

2.1.4 AGRICULTURAL LAND USE

Agricultural land use data was collected through observations made during roadside reconnaissance (windshield) surveys and field surveys conducted in March 2021. Data collected included the identification of land use (both agricultural and non-agricultural), the documentation of the location and type of agricultural facilities, the location of non-farm residential units and the location of non-farm buildings (businesses, storage facilities, industrial, commercial and institutional usage).

Agricultural land use designations were correlated to the *Agricultural Resource Inventory* (ARI)

(Ontario Ministry of Agriculture and Food report and maps) and the information provided in the Agricultural System Portal (OMAFRA) for the purpose of updating the Ontario Ministry of Agriculture and Food Land Use Systems mapping for both the Study Area and Secondary Study Area.

2.1.5 MINIMUM DISTANCE SEPARATION

Minimum Distance Separation (MDS) formulae were developed by OMAFRA to reduce and minimize nuisance complaints due to odour from livestock facilities and to reduce land use incompatibility.

Guideline #1 states

> *In accordance with the Provincial Policy Statement, 2014, this MDS Document shall apply in prime agricultural areas and on rural lands. Consequently, the appropriate parts of this MDS Document shall be referenced in municipal official plans, and detailed provisions included in municipal comprehensive zoning by-laws such that, at the very least, MDS setbacks are required in all designations and zones where livestock facilities and anaerobic digesters are permitted*.

Further, Guideline #3 states

> *Certain proposed uses are not reasonably expected to be impacted by existing livestock facilities or anaerobic digesters and as a result, do not require an MDS I setback. Such uses may include, but are not limited to:*
>
> - *extraction of minerals, petroleum resources and mineral aggregate resources*

Therefore, as this AIA study is to address the potential extension of a quarry (a mineral aggregate resource), Minimum Distance Separation (MDS 1) does **NOT** apply, and MDS 1 calculations were not required nor completed for this study.

2.1.6 LAND FRAGMENTATION

Land fragmentation data was collected through a review of online interactive mapping on the Agricultural Information Atlas (OMAFRA, 2020) website, the Agricultural System Portal (OMAFRA, 2021), the Town of Halton Hills Website and assessment data and the Region of Halton website and assessment data. This data was used to determine the extent, location, relative shape of each parcel/property within both the Study Area and the Secondary Study Area.

Land fragmentation can be defined as the increase in the number of smaller parcels, which are generally non-agricultural uses, within a predominantly agricultural area. Over time the increase in smaller non-agricultural land uses creates a patchwork-like distribution of rural land uses, resulting in lands lost to agricultural production. Generally, good productive areas of farmland are comprised of larger parcels with few (if any) smaller parcels interspersed.

The assessment of fragmentation looked at the size, shape and number of parcels within a given area, and provide comment on the potential effect on agriculture.

It should be noted that although the Halton Region AIA guidelines require a Land Tenure study, there are no Provincial or Municipal policies that discuss or provide authority over land

ownership trends. Further, the standard that has been used to determine land ownership has been by conducting a review of recent assessment data. In the past, this was a reasonable approach in that most farm operations were family run, therefore, the information on the assessment data would illustrate a person's name and address. In a similar fashion, speculative owners (developers), would be determined by a property owned by a numbered company. However, farm operations are now often identified as a business (for tax purposes), and as such, the assessment data will show those farms as a numbered business as well. The result is that the standard approach to assess and document the land ownership will no longer provide the distinct separation between farm operation and speculative landowner.

2.1.7 VIABILITY

It should also be noted that the Halton Region AIA Guidelines require an assessment of 'viability' for both onsite and on neighbouring operations. The term 'viability' has not been defined, nor has the term 'viability assessment', with the exception of indicating in Section 11 – Background Information to Accompany the AIA "*d) a description of the methodologies and survey techniques employed in the study, including a description of soil sampling techniques and method of viability assessment*".

As a result of the lack of detail in the requirements of a viability study, this AIA will comment on the potential use of the lands (Study Area) for agricultural uses.

2.1.8 SOIL SURVEY

Soil survey data and *Canada Land Inventory (CLI)* data was provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) in digital format through the *Land Use Systems Mapping Dataset (Land Information Ontario)* website warehouse. The soils/CLI data is considered the most recent iteration of the soil information from OMAFRA.

The digital soil survey data was also correlated to the printed soil survey report and map *The Soil Survey of Halton* (Report No. 43 of the Ontario Soil Survey. *Gillespie, J. E., R. E. Wicklund and M. H. Miller*, 1971) to determine if the digital soils data has been modified from the original soil survey data.

An onsite reconnaissance survey of soils and topography was completed on March 25, 2021.

2.1.9 AGRICULTURAL SYSTEM

The Ontario Ministry of Agriculture, Food and Rural Affairs online Agricultural Systems mapping were reviewed to determine the extent of agriculture on the Study Area, in the Secondary Study Area, both within the Town of Halton Hills, the Region of Halton and the Town of Milton. The Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network.

The Agricultural Land Base illustrates the Prime Agricultural Areas (including Specialty Crop Areas), while the Agri-Food Network illustrates regional infrastructure/transportation networks, buildings, services, markets, distributors, primary processing, and agriculture communities.

A review of online mapping and the OMAFRA Document *Implementation Procedures for the Agricultural System in Ontario's Greater Golden Horseshoe – Supplementary Direction to a Place to Grow: Growth Plan for the Greater Golden Horseshoe, Publication 856*, were reviewed as part of this study.

2.1.10 AGRICULTURAL STATISTICS

Agricultural statistics were provided by and downloaded from the OMAFRA website. The statistics were provided in Excel format for the Province of Ontario, Region of Halton and the Town of Halton Hills. The data sets provide information from the 2006 Census up to (and including) the 2016 Census. Three data sets were reviewed as part of this AIA (2006, 2011 and 2016).

3 POLICY REVIEW

Clearly defined and organized environmental practices are necessary for the conservation of land and resources. The long-term protection of quality agricultural lands is a priority of the Province of Ontario and has been addressed in the *Provincial Policy Statement (2020)*. Further, in an effort to protect agricultural lands, the Province of Ontario has adopted policy and guidelines to provide a framework for managing growth. The framework is provided in four provincial land use plans. These four provincial land use plans: *Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for The Greater Golden Horseshoe*. (Office Consolidation 2020) support the long-term protection of farmland. The four provincial land use plans have policy plans that require the completion of Agricultural Impact Assessment (AIA) studies for changes in agricultural land use within Prime Agricultural areas.

Municipal Governments have similar regard for the protection and preservation of agricultural lands and address their specific concerns within their respective Official Plans on County/Regional level and Township level.

With this in mind, the: *Provincial Policy Statement (2020); Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2019)* were reviewed for this study.

With respect to this AIA and the four provincial land use plans, a review of the boundaries of the Greenbelt Plan Area, the Oak Ridges Moraine Area, the Niagara Escarpment Plan Area, and the Growth Plan for the Greater Golden Horseshoe Area was completed. It was determined that the Study Area (and Secondary Study Area) were located within the Growth Plan for the Greater Golden Horseshoe Area and the Niagara Escarpment Plan area.

A review of the agricultural policies in the *Halton Region Official Plan* (Office Consolidation June 19, 2018) the *Town of Halton Hills Official Plan* (May 1, 2019, Consolidation), and the *Town of Milton Official Plan (Consolidated August 2008)* was also completed.

It was determined through these reviews, that neither the Study Area nor the Secondary Study Area are located in a Provincially or Municipally designated Specialty Crop Area.

The relevant policies from the above-mentioned documents are presented as follows.

3.1 PROVINCIAL AGRICULTURAL POLICY

The *Provincial Policy Statement (PPS) (2020)* was enacted to document the Ontario Provincial Governments development and land use planning strategies. The *Provincial Policy Statement (2020)* provides the policy foundation for regulating the development and use of land. With respect to the potential future development of the Study Area, the following policies may apply,

as the lands are designated as Agricultural Area and Agricultural System outside a Prime Agricultural Area. The PPS (2020) defines Rural lands as lands which are located outside settlement areas and which are outside prime agricultural areas. By that definition, the Study Area would be considered as rural lands. The PPS (2020) addresses rural lands in section 1.1.5. As this study is for the proposed extension of a mineral aggregate operation, the policies within Section 2.5 – Mineral Aggregate Resources also apply. Select policy from Sections 1.1.5 and 2.5 are provided as follows.

1.1.5.2 On rural lands located in municipalities, permitted uses are:

a) the management or use of resources;
b) resource-based recreational uses (including recreational dwellings);
c) residential development, including lot creation, that is locally appropriate;
d) agricultural uses, agriculture-related uses, on-farm diversified uses and normal farm practices, in accordance with provincial standards;
e) home occupations and home industries;
f) cemeteries; and
g) other rural land uses.

As is stated in 1.1.5.2 a), the management or use of resources is permitted. The term resources includes mineral aggregates, therefore the extraction of mineral aggregates in rural areas is permitted and an allowed use for the Study Area.

Section 2.5 states:

2.5.2.1 As much of the mineral aggregate resources as is realistically possible shall be made available as close to markets as possible.

2.5.2.2 Extraction shall be undertaken in a manner which minimizes social, economic and environmental impacts.

2.5.3.1 Progressive and final rehabilitation shall be required to accommodate subsequent land uses, to promote land use compatibility, to recognize the interim nature of extraction, and to mitigate negative impacts to the extent possible. Final rehabilitation shall take surrounding land use and approved land use designations into consideration.

It has been established in this AIA that the Study Area is not in a Prime Agricultural Area, therefore Section 2.5.4 of the PPS (2020) (extraction in prime agricultural areas) does not apply to this study. As a result, there is no requirement for rehabilitation to an agricultural condition.

3.2 THE GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

A review of the boundaries of the *Growth Plan for The Greater Golden Horseshoe*. (Office Consolidation 2020) area (Schedule 1 – Greater Golden Horseshoe Growth Plan Area) was completed. It was determined that the Study Area lands are located within the Growth Plan for the Greater Golden Horseshoe mapped area. Specifically, the Study Area is located within the Greenbelt Area.

There are no Specialty Crop Lands within either the Study Area lands or the Secondary Study Area.

Section 1.2.3 of the GPGGH provided guidance with respect to the other provincial plans. First, that the GPGGH *must also be read in conjunction with the other provincial plans*, and where there is a conflict between the plans regarding the natural environment or human health, the direction that provides more protection will prevail. In this instance, the Niagara Escarpment Plan provides the policies relate to agriculture and mineral extraction.

Figure 2 illustrates the relative location of the Study Area and the Secondary Study Area with respect to the boundaries of the Growth Plan for the Greater Golden Horseshoe and the Agricultural System. This figure illustrates the Provincial Agricultural Land Base Mapping. As noted in Figure 2, the Study Area and the Secondary Study Area are not located within Prime Agricultural Areas or Candidate Areas.

Therefore, neither the Study Area or the Secondary Study area lands are considered as Prime Agricultural areas or are considered Candidate Areas for possible inclusion in the Prime Agricultural areas.

3.3 GREENBELT AREA

A review of the Greenbelt Plan (2017), map division and enlargement Map 91 revealed that the Study Area and the Secondary Study Area are located within the Niagara Escarpment Plan Area. The Greenbelt Plan establishes the Protected Countryside and Urban River Valley designations.

Figure 3 illustrates the location of the Study Area and the Secondary Study Area with respect to the Greenbelt Area. The Greenbelt Area area does not apply to the Study Area. A small portion of the Secondary Study Area is located within the Protected Countryside of the Greenbelt Area.

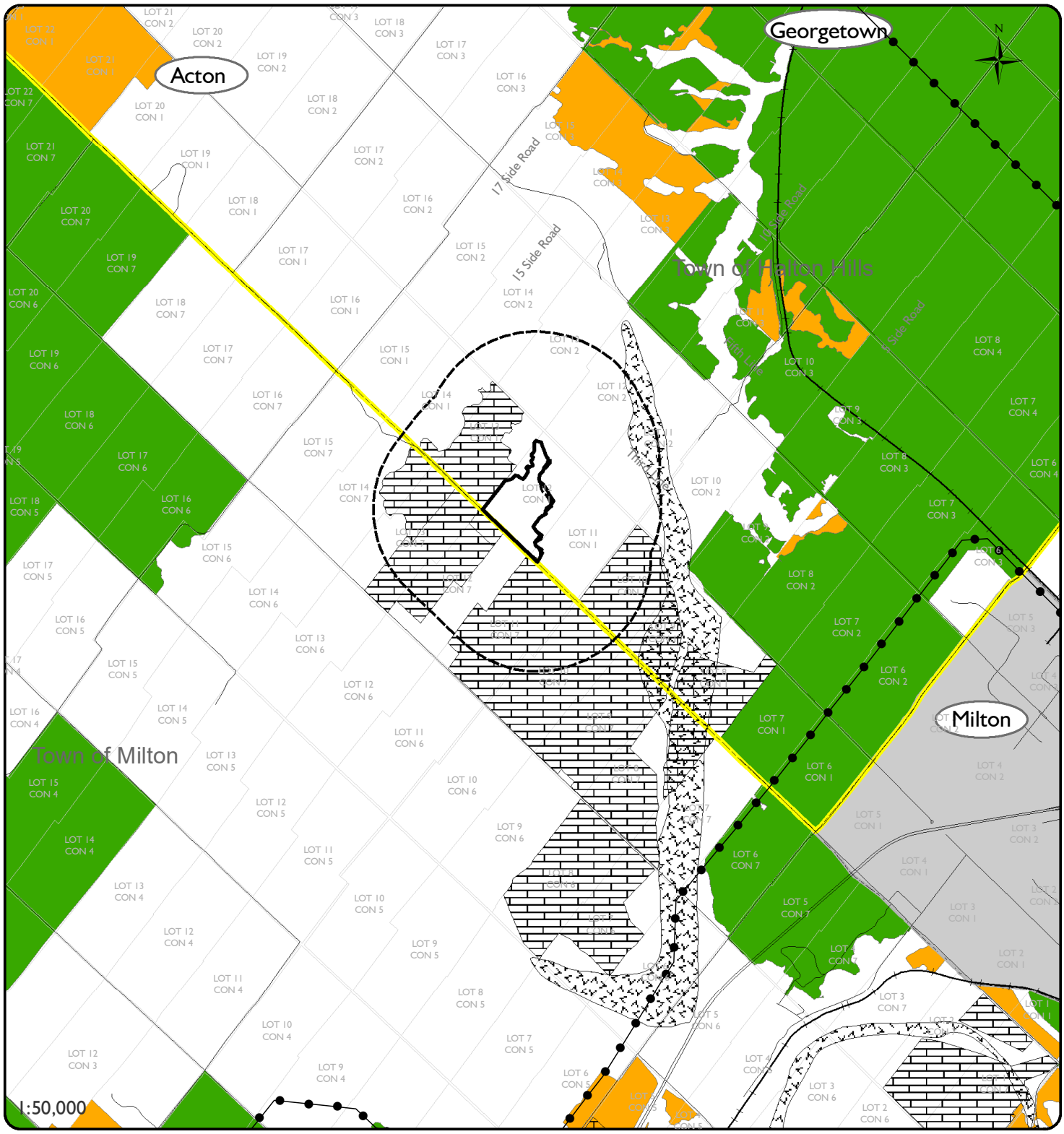
3.4 NIAGARA ESCARPMENT PLAN

A review of the boundaries of the *Niagara Escarpment Plan (2017)* area (*Niagara Escarpment Plan Map 3 – Regional Municipality of Halton, 2018*) was completed. It was determined that the Study Area was comprised of Escarpment Rural Area lands. The Study Area is not considered a Prime Agricultural area.

The Secondary Study Area is comprised of portions of Escarpment Rural, Escarpment Natural Area, Escarpment Protection Area, and Mineral Resource Extraction Area (Licensed Pit or Quarry (<=20,000 tonnes)).

There are no Specialty Crop Lands within either the Study Area lands or the Secondary Study Area.

Figure 4 illustrates the Niagara Escarpment Plan mapping from a digital file downloaded from the Ontario Geowarehouse (Land Information Ontario).



Legend

- Hydro Line (MNRF)
- Rail line (MNRF)
- Roads (MNRF)
- Aggregate Authorized Site Active (MNRF)
- Built Up Areas (Halton Region)
- Escarpment (OMAFRA Soils Data)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1 km)
- Study Area

Identification

- Candidate Area
- Prime Agricultural Area

Figure 2

Provincial Land Base

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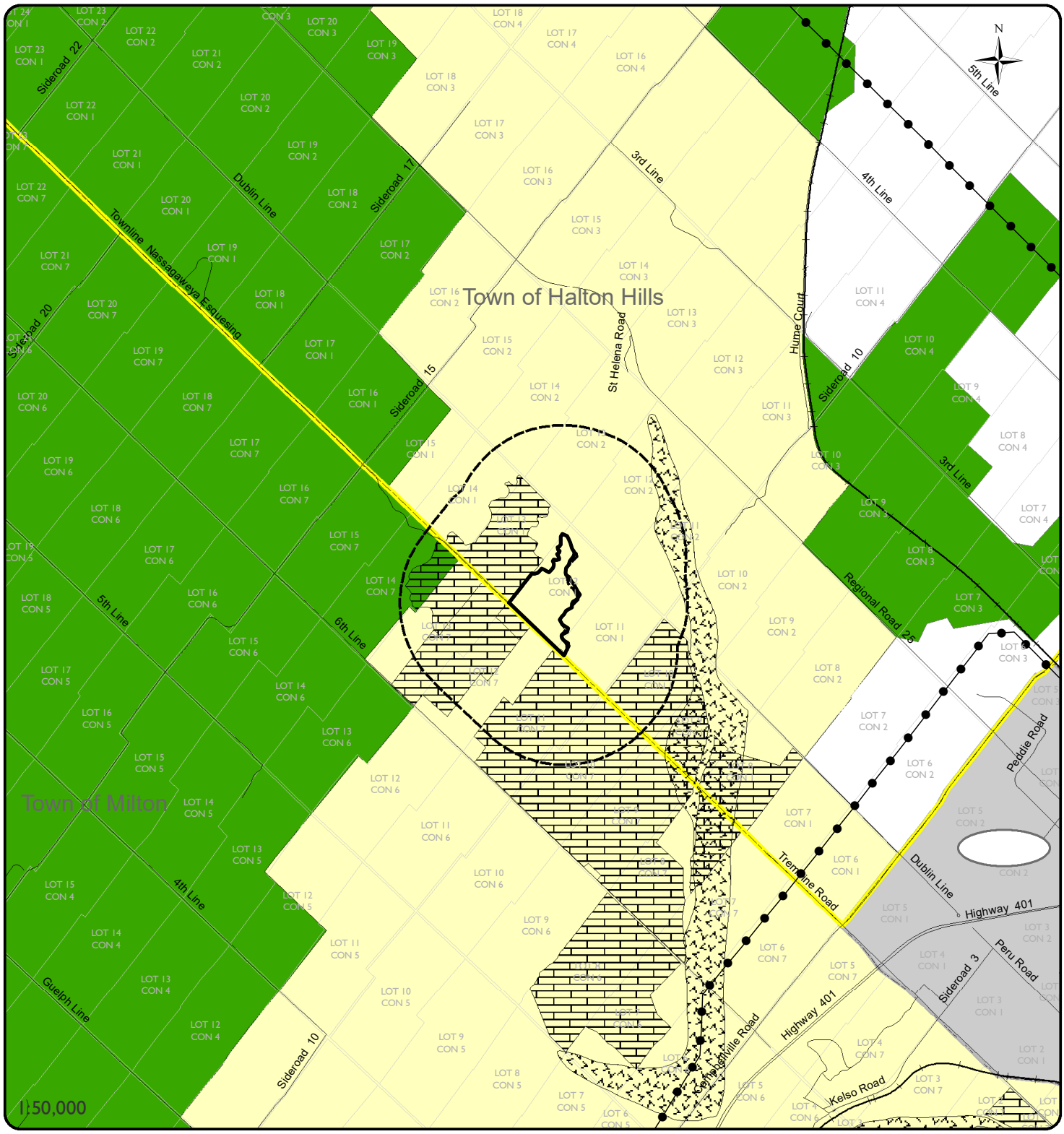

Legend

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- Escarpment (OMAFRA Soils Data)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1 km)
- Study Area

Greenbelt Designation (MNRF)

- Niagara Escarpment Plan
- Greenbelt Protected Countryside

Figure 3

Greenbelt Map

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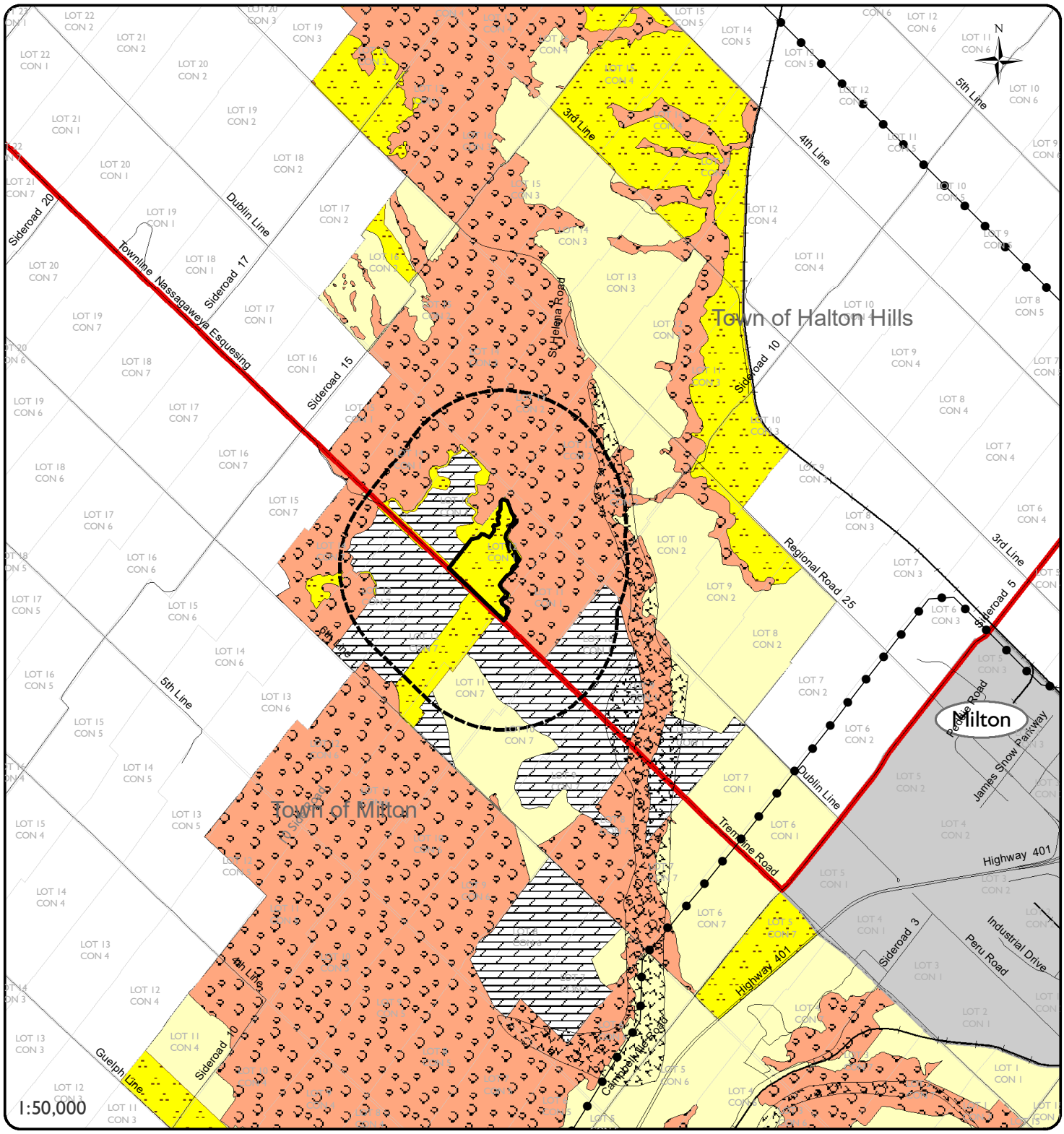

Legend

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- Rail line (MNRF)
- Roads (MNRF)
- Built Up Areas (Halton Region)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1km)
- Study Area

Niagara Escarpment Plan Designation

- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Recreation Area
- Escarpment Rural Area
- Mineral Resource Extraction Area

Figure 4

Niagara Escarpment Plan

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Escarpment Natural Area policies, Escarpment Protection policies, and Escarpment Rural Area policies are provided in Sections 1.3, 1.4, and 1.5 respectively. Mineral Resource Extraction Area policies are provided in Section 1.9 of the NEP. Additional Development Criteria policy is provided in Section 2, with Mineral Aggregate Resource policies identified in Section 2.9.

Select policies are provided below.

1.3.3 Permitted Uses
Subject to Part 2, Development Criteria, the following uses may be permitted:

1. *Existing uses (for greater certainty, includes existing agricultural uses, existing agriculture-related uses and existing on-farm diversified uses).*

1.4.3 Permitted Uses
Subject to Part 2, Development Criteria, the following uses may be permitted:

2. *Agricultural uses.*
3. *Agriculture-related uses and on-farm diversified uses, in prime agricultural areas.*
4. *Existing uses.*

1.5.3 Permitted Uses
Subject to Part 2, Development Criteria, the following uses may be permitted:

1. *Agricultural uses.*
2. *Agriculture-related uses and on-farm diversified uses.*
3. *Existing uses.*
17. *New licensed mineral aggregate operations producing up to 20,000 tonnes annually.*
18. *Wayside pits and quarries.*

1.9.3 Permitted Uses
Subject to conformity with Part 2, Development Criteria, official plans and where applicable, zoning by-laws that are not in conflict with the Niagara Escarpment Plan, the following uses may be permitted:

1. *Agricultural uses.*
2. *Agriculture-related uses and on-farm diversified uses.*
3. *Existing uses.*
4. *Mineral aggregate operations licensed pursuant to the Aggregate Resources Act but not including associated facilities unless they are permitted as an accessory use.*

Therefore, subject to Section 1.5.3 17 and 18, a newly licensed mineral aggregate operation producing up to 20,000 tonnes annually, and wayside pits and quarries are permitted on the Study Area, subject to Part 2, Development Criteria of the NEP.

1.9.5 After Uses

Following the surrender of the licence issued pursuant to the Aggregate Resources Act, an amendment to the Niagara Escarpment Plan is required. The amendment will change the land use designation of the lot from Mineral Resource Extraction Area to a land use designation that has designation criteria consistent with the rehabilitation completed on the property and will be processed in accordance with Part 1.2.1.

2.9 Mineral Aggregate Resources

1. *Notwithstanding Part 2.7.2 and subject to compliance with all other relevant policies of this Plan, mineral aggregate operations, wayside pits and quarries, and any accessory use and*

accessory facility thereto, may be permitted in key natural heritage features and any vegetation protection zone associated therewith, except for:

a). wetlands;

b). significant woodlands, that are not young plantation or early successional habitat (as defined by the Ministry of Natural Resources and Forestry).

2. Mineral aggregate operations and wayside pits and quarries, and accessory uses may be permitted in a key natural heritage feature or the vegetation protection zone associated therewith, which is solely the habitat of endangered species and threatened species and not any other key natural heritage feature, provided it is in compliance with the Endangered Species Act, 2007.

In addition to all other relevant policies of this Plan, proposals for mineral aggregate operations including wayside pits and quarries, accessory uses, accessory facilities and haul routes shall:

g). minimize negative impacts of mineral aggregate operations and their accessory uses on surrounding land uses;

h). complete progressive and final rehabilitation of the licensed site to provide equal or greater ecological values, including utilizing native species, in order to accommodate subsequent land use designations compatible with the surrounding land uses;

i). within the licensed area but outside of the area of extraction, protect the Escarpment environment during periods of extraction and rehabilitation;

7. Progressive rehabilitation may include the use of off-site material, whereon-site material is not available. Off-site material shall only be used where required to stabilize and revegetate disturbed areas. The use ofoff-site material shall be minimal and shall not be used for any major regrading toward a planned after-use with the deposition of off-site material.

8. The use of off-site material for progressive rehabilitation shall meet the applicable provisions of Part 2.13 (Scenic Resources and Landform Conservation) of this Plan and such material shall also meet the relevant standards of the Ministry of the Environment and Climate Change, the Ministry of Natural Resources and Forestry and the municipality where it has approved such standards.

9. The use of off-site material shall not be permitted unless it is determined through appropriate environmental, technical and planning studies that doing so will achieve greater long-term ecological and land use compatibility (e.g., the importation of topsoil to improve site capability for agriculture, forestry or habitat diversity) and the implementing authority is satisfied that the use of off-site material does not constitute a commercial fill or landfill operation.

3.5 OFFICIAL PLAN AND ZONING BY-LAW POLICY

Official Plan policies are prepared under the Planning Act, as amended, by the Province of Ontario. Official Plans generally provide policy comment for land use planning while taking into consideration the economic, social and environmental impacts of land use and development concerns. For the purpose of this AIA study, a review of the agricultural policies in the *Halton Region Official Plan* (Office Consolidation June19, 2018), the *Town of Halton Hills Official Plan* (Consolidated 2019), and the *Town of Milton Official Plan (*Consolidated August 2008*)* was completed.

3.5.1 HALTON REGION OFFICIAL PLAN (OFFICE CONSOLIDATION)

A review of the *Halton Region Official Plan* (Office Consolidation June 19, 2018) Map 1 – Regional Structure revealed that portions of the Study Area are identified as part of the Agricultural Area.

Map 1E – Agricultural System and Settlement Areas illustrates that portions of the Study Area are part of the Agricultural System outside the Prime Agricultural Areas.

Figure 5 illustrates a select portion of the Regional Structure Map (*Halton Region Official Plan*, (Office Consolidation June 19, 2018). The approximate location of the Study Area is illustrated as a solid line, while the approximate location of the Secondary Study Area is illustrated as a dashed line. Figure 5 illustrates that portions of the Study Area are comprised of Agricultural Area and the Regional Natural Heritage System.

A review of Figure 5 also illustrates that the Secondary Study Area comprises Agricultural Areas, Regional Natural Heritage System, and Mineral Resource Extraction Area. A review of the Secondary Study Area in Figure 5 illustrates that it is comprised predominately of Mineral Resource Extraction Area and Regional Natural Heritage System. There is a small portion of Agricultural Area in the Secondary Study Area (northwest). The overall extent of the Agricultural Area and the Regional Natural Heritage System areas is similar in size.

There are no Specialty Crop lands identified in either the Study Area or the Secondary Study Area.

Section 139.9 of the *Halton Region Official Plan* (Office Consolidation June 19, 2018) provides policy on the Prime Agricultural Areas in the Region of Halton. Select policies are presented as follows.

139.9 The purpose of the Prime Agricultural Areas, as shown on Map 1E, is to assist in interpreting policies of this Plan and to assist the City of Burlington and the Towns of Milton and Halton Hills in developing detailed implementation policies for their respective Official Plans.

139.9.1 The Prime Agricultural Areas shown on Map 1E include lands in the Agricultural Area and Regional Natural Heritage System designations. Together these lands support and advance the goal to maintain a permanently secure, economically viable agricultural industry and to preserve the open space character and landscape of Halton's non-urbanized area.

139.9.2 It is the policy of the Region to:

(1) Require Local Municipalities to designate Prime Agricultural Areas in accordance with Map 1E, within their Official Plans and include detailed supporting policies which implement the related goals, objectives and policies of this Plan.

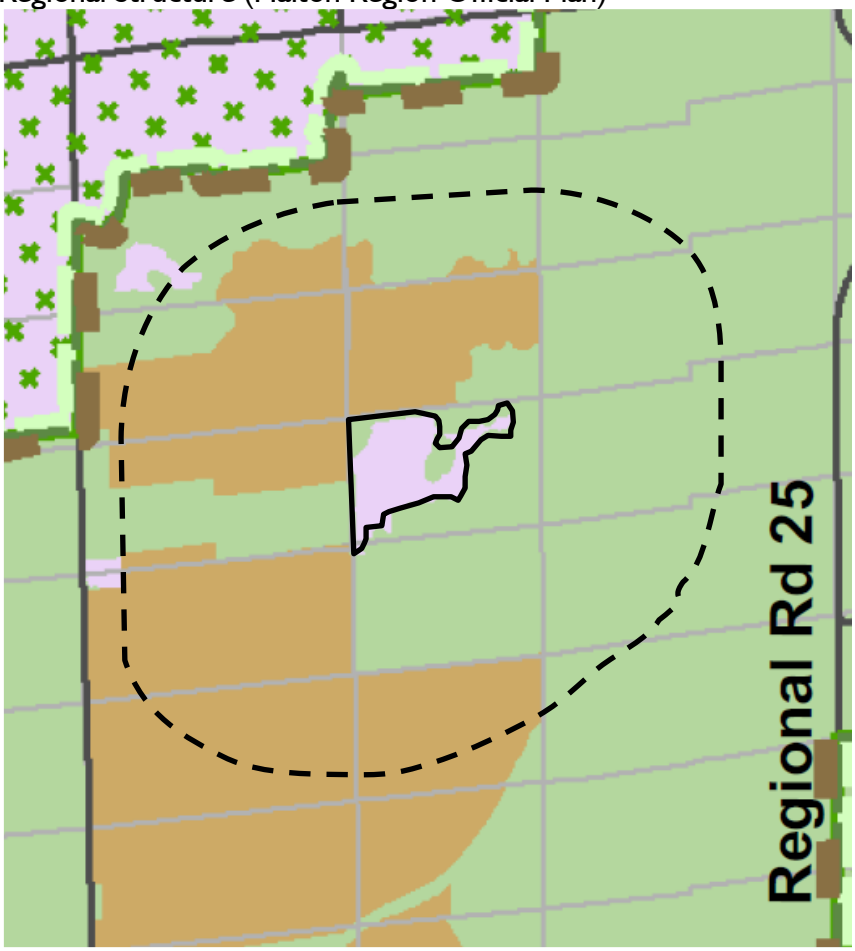
(2) Within the Greenbelt Plan Area, prohibit the redesignation of land within Prime Agricultural Areas to permit non-agricultural uses, except where permitted by the Greenbelt Plan.

(3) Outside the Greenbelt Plan Area, permit the removal of land from Prime Agricultural Areas only where the following have been demonstrated through appropriate studies to the satisfaction of the Region:

- *a) necessity for such uses within the planning horizon for additional land to be designated to accommodate the proposed uses;*
- *b) amount of land area needed for such uses;*
- *c) reasons for the choice of location;*
- *d) justification that there are no reasonable alternate locations of lower capability agricultural lands;*
- *e) no negative impact to adjacent agricultural operations and the natural environment;*
- *f) there are no reasonable alternatives that avoid Prime Agricultural Areas as shown on Map 1E, and*
- *g) the land does not comprise a specialty crop area.*

Extraction of mineral aggregate resources is permitted in Prime Agricultural Areas in accordance with Section 110(6.1).

Figure 5 Regional Structure (Halton Region Official Plan)



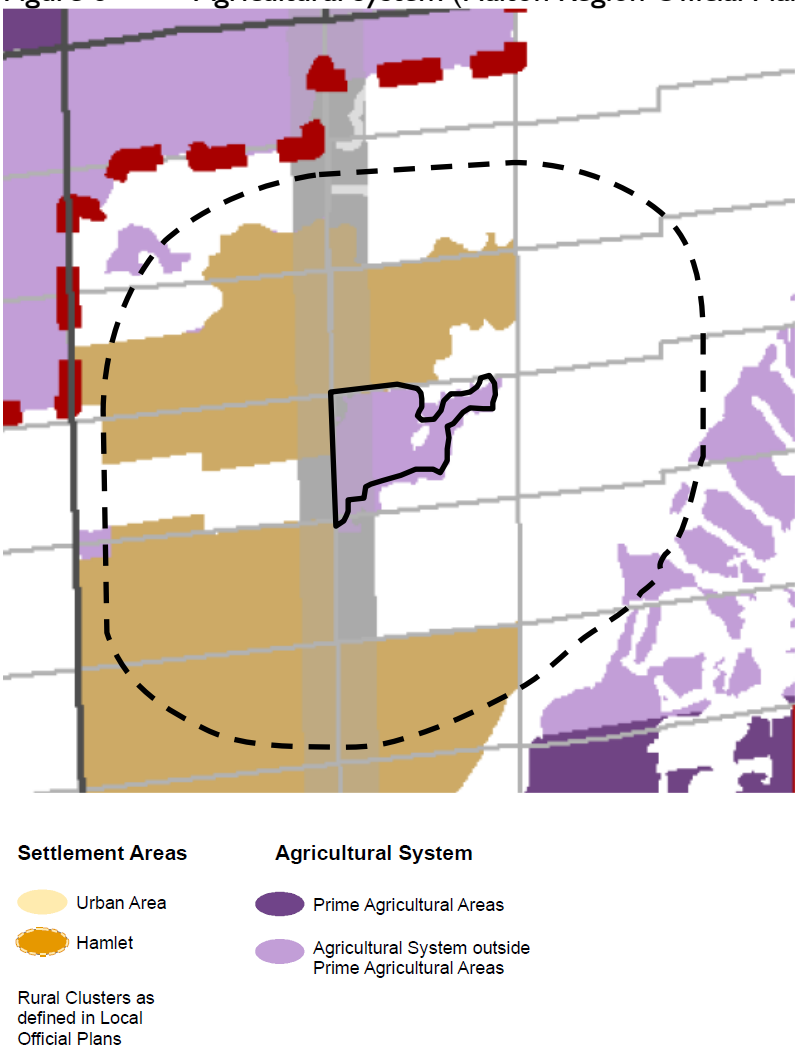
Source: Map 1 Regional Structure – Halton Region Official Plan (Office Consolidation June 19, 2018)

A review of the *Halton Region Official Plan* (Office Consolidation June 19, 2018) Map 1E illustrates the Agricultural System and Settlement Areas. Figure 6 illustrates select portions of the Map 1E. As illustrated in Figure 6, portions of the Study Area are identified as Agricultural System outside Prime Agricultural Areas. Therefore, the Study Area lands are not designated as Prime Agricultural lands or existing within a Prime Agricultural Area.

Portions of the Secondary Study Area include Mineral Resource Extraction Area and Agricultural System outside the Prime Agricultural Areas. There are no specialty crop areas defined within the Region of Halton. The Study Area and Secondary Study Areas do not comprise any lands

designated as specialty crop lands/areas. In Figure 6 (below), the Study Area is illustrated as a solid black line, while the Secondary Study Area is illustrated as a dashed line.

Figure 6 Agricultural System (Halton Region Official Plan)



Source: Map 1E Agricultural System and Settlement Areas – Halton Region Official Plan (Office Consolidation June 19, 2018)

3.5.2 TOWN OF HALTON HILLS OFFICIAL PLAN

The *Town of Halton Hills Official Plan (Consolidated 2019)* was reviewed to determine the designated land uses within the Study Area and Secondary Study Area. Schedule A1 – Land Use Plan illustrated that both the Study Area and portions of the Secondary Study Area (area within the Town of Halton Hills) are located within the Niagara Escarpment Plan Area. Further, the text within Schedule A1 indicates that the Niagara Escarpment Plan Area is mapped on Schedule A2.

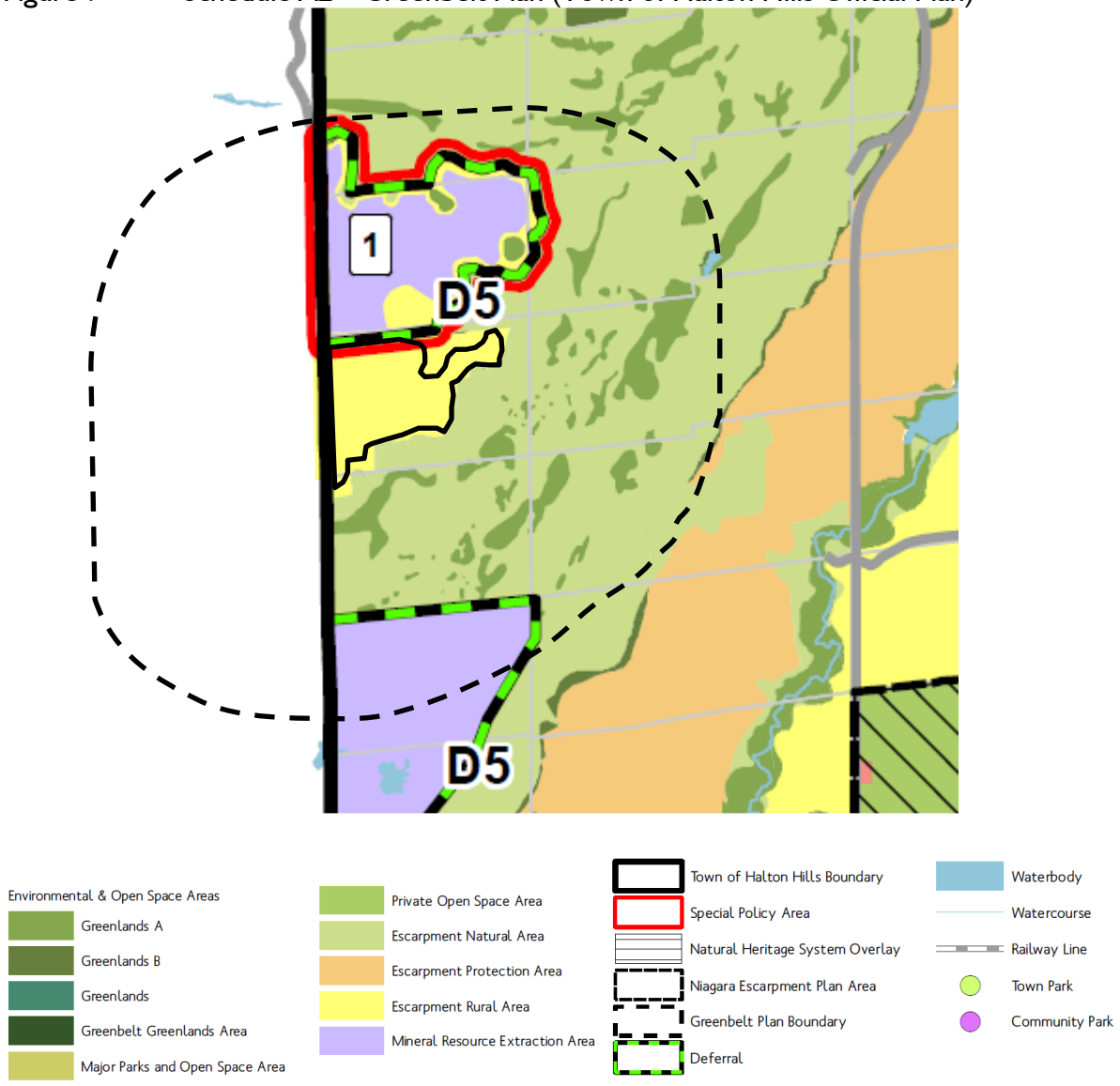
A review of Schedule A2 – Greenbelt Plan indicates that the Study Area is comprised of Escarpment Rural.

The portions of the Secondary Study Area that are located within the Town of Halton Hills are designated as Escarpment Natural Area, possibly Greenlands A, Mineral Resource Extraction Area, and Escarpment Protection Area.

Figure 7 provides a select portion of the *Town of Halton Hills Official Plan (May 1, 2019 Consolidation) Schedule A2 – Greenbelt Plan*.

There are no specialty crop areas defined in the *Town of Halton Hills Official Plan (May 1, 2019 Consolidation) Schedule A1 – Land Use Plan or Schedule A2 – Greenbelt Plan*. No portions of the Study Area or Secondary Study Area are located within a Municipality designated Specialty Crop Area.

Figure 7 Schedule A2 – Greenbelt Plan (Town of Halton Hills Official Plan)



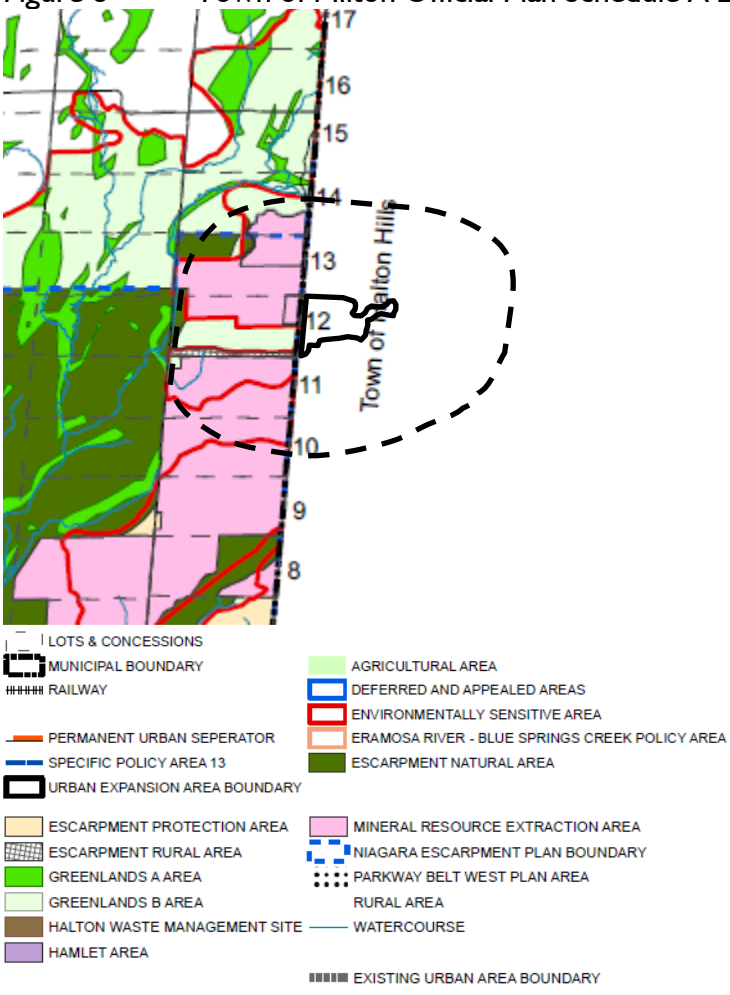
Source: Schedule A2 – Greenbelt Plan - Town of Halton Hills Official Plan

Portions of the policies for Escarpment Rural Area and Escarpment Natural Area have been provided previously in this AIA in the Niagara Escarpment Plan Section. In Figure 7 the Study Area is illustrated as a solid black line, while the Secondary Study Area is illustrated as a dashed line.

3.5.3 TOWN OF MILTON OFFICIAL PLAN

The *Town of Milton Official Plan (2008)* was reviewed to determine the designated land uses within the Secondary Study Area. Schedule A – Land Use Plan illustrates portions of the Secondary Study Area. The Study Area is located wholly within the Town of Halton Hills and as such is not illustrated on the Town of Milton Official Plan documents. Figure 8 illustrates select portions of the Town of Milton Official Plan Schedule A Land Use Plan (below) and shows the relative location of the Study Area (solid black line) and the Secondary Study Area (dashed black line).

Figure 8 Town of Milton Official Plan Schedule A Land Use Plan



Source: Town of Milton Official Plan Schedule A – Land Use Plan

As illustrated in Figure 8, the portions of the Secondary Study Area that are in the Town of Milton comprise portions of Mineral Resource Extraction Area and Escarpment Natural Area. Select policies for the Niagara Escarpment Plan Area have been provided previously in this AIA.

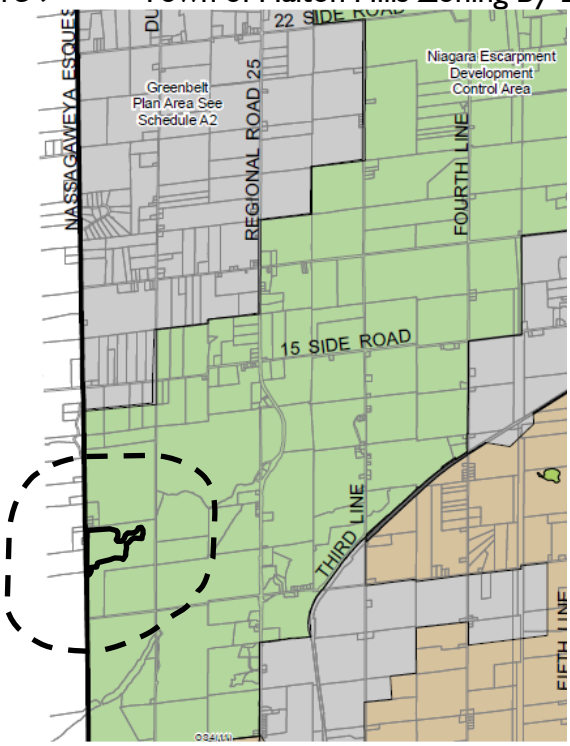
No portion of the Secondary Study Area is defined as Prime Agricultural land or was defined as a Specialty Crop Area within the *Town of Milton Official Plan (August 2008 Consolidation)*.

3.5.4 TOWN OF HALTON HILLS ZONING BY-LAW 2010-0050

The *Town of Halton Hills Zoning By-Law 2010-0050 (Consolidated December 2019)* was reviewed to determine the designated zoning on the lands within the Study Area and portions of the Secondary Study Area.

Figure 9 illustrates a select portion of the *Town of Halton Hills Zoning By-Law (Zoning By-Law 2010-0500)* Schedule A1 – Rural Lands (December 32, 2020 Consolidation). As illustrated on this figure, the Study Area and portions of the Secondary Study Area are located within the Niagara Escarpment Development Control Area. The Study Area is illustrated as a solid black line, while the Secondary Study Area is defined with a dashed line.

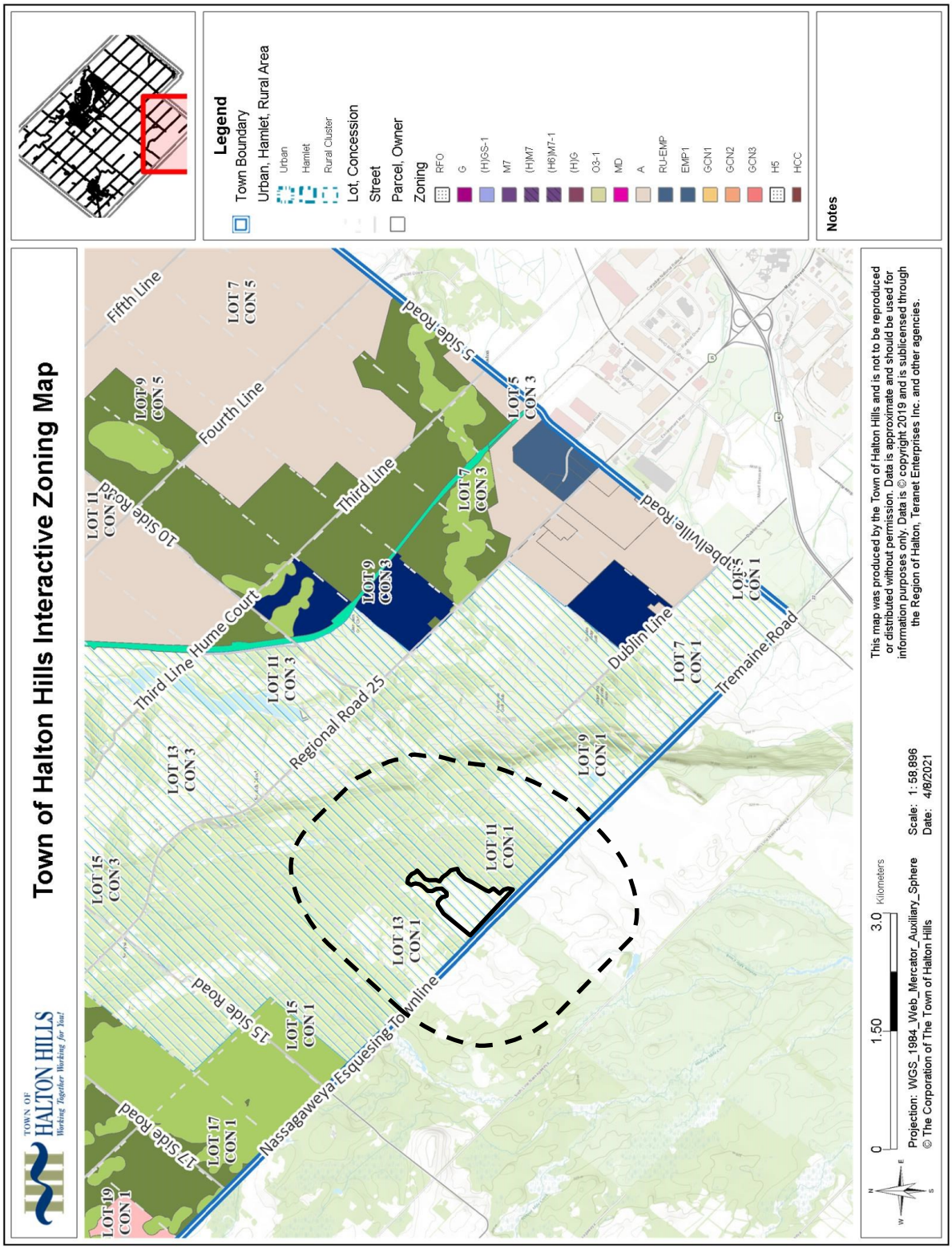
Figure 9 Town of Halton Hills Zoning By-Law Schedule A1 – Rural Lands



Source: Town of Halton Hills Zoning By-Law 2010-0500 (Schedule A1- Rural lands)

Figure 10 illustrates a portion of the online interactive zoning designations for the Study Area and portions of the Secondary Study Area. As illustrated on Figure 10, portions of the Study Area and the Secondary Study Area comprise NEC (Niagara Escarpment Control Area) lands. It should be noted that the print of the online map did not provide a complete legend, however,

Figure 10 Town of Halton Hills Zoning By-Law 2010-0050



the Study Area and portions of the Secondary Study Area (portions within the Town of Halton Hills mapping) were defined as Niagara Escarpment Plan Area. The Study Area is illustrated as a solid black line, while the Secondary Study Area is illustrated as a dashed line.

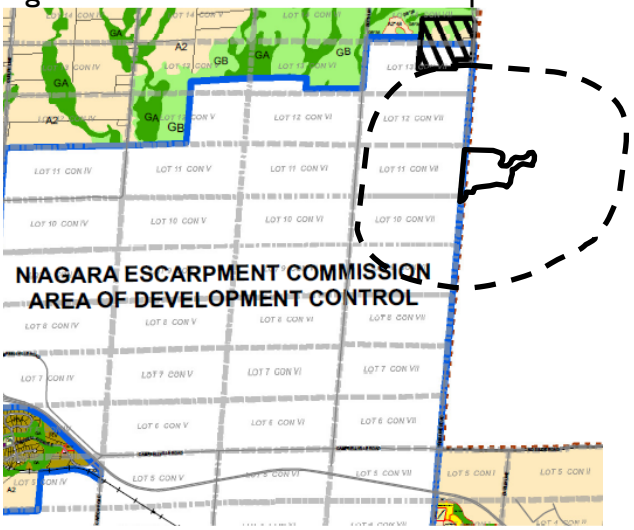
3.5.5 TOWN OF MILTON COMPREHENSIVE ZONING BY-LAW 144-2003

The *Town of Milton Comprehensive Zoning By-Law 144-2003 Rural Area* (Consolidated December 2020) was reviewed to determine the designated zoning on the lands within portions of the Secondary Study Area. The Study Area is located wholly within the Town of Halton Hills and as such, only portions of the Secondary Study Area are located within the Town of Milton.

Figure 11 illustrates a select portion of the *Town of Milton Comprehensive Zoning By-Law 144-2003 Rural Area* (Consolidated December 2020). As illustrated on this figure, portions of the Secondary Study Area are located within the Niagara Escarpment Commission Area of Development Control. The Study Area is illustrated as a solid black line, while the Secondary Study Area is defined with a dashed line.

Policies related to the Niagara Escarpment Commission Area of Development Control have been provided previously in this AIA.

Figure 11 Town of Milton Comprehensive Zoning By-Law 144-2003



Source: Town of Milton Comprehensive Zoning By-Law 144-2003 (Consolidated December 2020)

4 AGRICULTURAL RESOURCE POTENTIAL

4.1 PHYSICAL CHARACTERISTICS

The physiographic resources within the Study Area and the Secondary Study Area are described in this section. The physiographic resources identify the overall large area physical characteristics documented as background to the soils and landform features. These characteristics are used to support the description of the soils and agricultural potential of an area.

4.1.1 PHYSIOGRAPHY

On review of the Land Information Ontario (LIO) digital physiographic region data, and *The Physiography of Southern Ontario 3rd Edition*, (Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984), it was determined that the Study Area is located in the Flamborough Plain Physiographic unit and the Secondary Study Area is comprised of the Flamborough Plain and Niagara Escarpment Physiographic units.

The Flamborough Plain Physiographic unit is described as an isolated tract of shallow drift above the brow of the Niagara Escarpment. A few drumlins are found scattered over this plain. The plain is drained by small streams, and good soil is not abundant in this physiographic unit.

The Niagara Escarpment Physiographic unit is described as an area that extends from the Niagara River to the northern tip of the Bruce Peninsula (Tobermory). The Niagara Escarpment Physiographic unit comprises a variety of landforms that are not found anywhere else in Ontario. The unit comprises vertical cliffs along the brow that outline the edge of the limestone formations, while the area extending back from the brow has areas that have been stripped of soils, resulting in rock-hewn landscapes.

4.1.2 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the *1:10000 scale Ontario Base Map Index*, Land Information Ontario digital contour mapping, aerial photo interpretation and windshield surveys.

The topography of the open field portions of the Study Area is comprised of gentle to moderate sloping lands with mounds of stone piles noted in the landscape. Steep sloping lands were noted in areas adjacent to escarpment areas.

The Secondary Study Area topography is influenced by the contours of the existing quarry lands with steeply sloping areas, ponded areas, escarpment areas and undulating topography.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops – Publication 811* (June 2017).

The Study Area and Secondary Study Area are located near the 3100 Crop Heat Units (CHU-M1) available for corn production in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

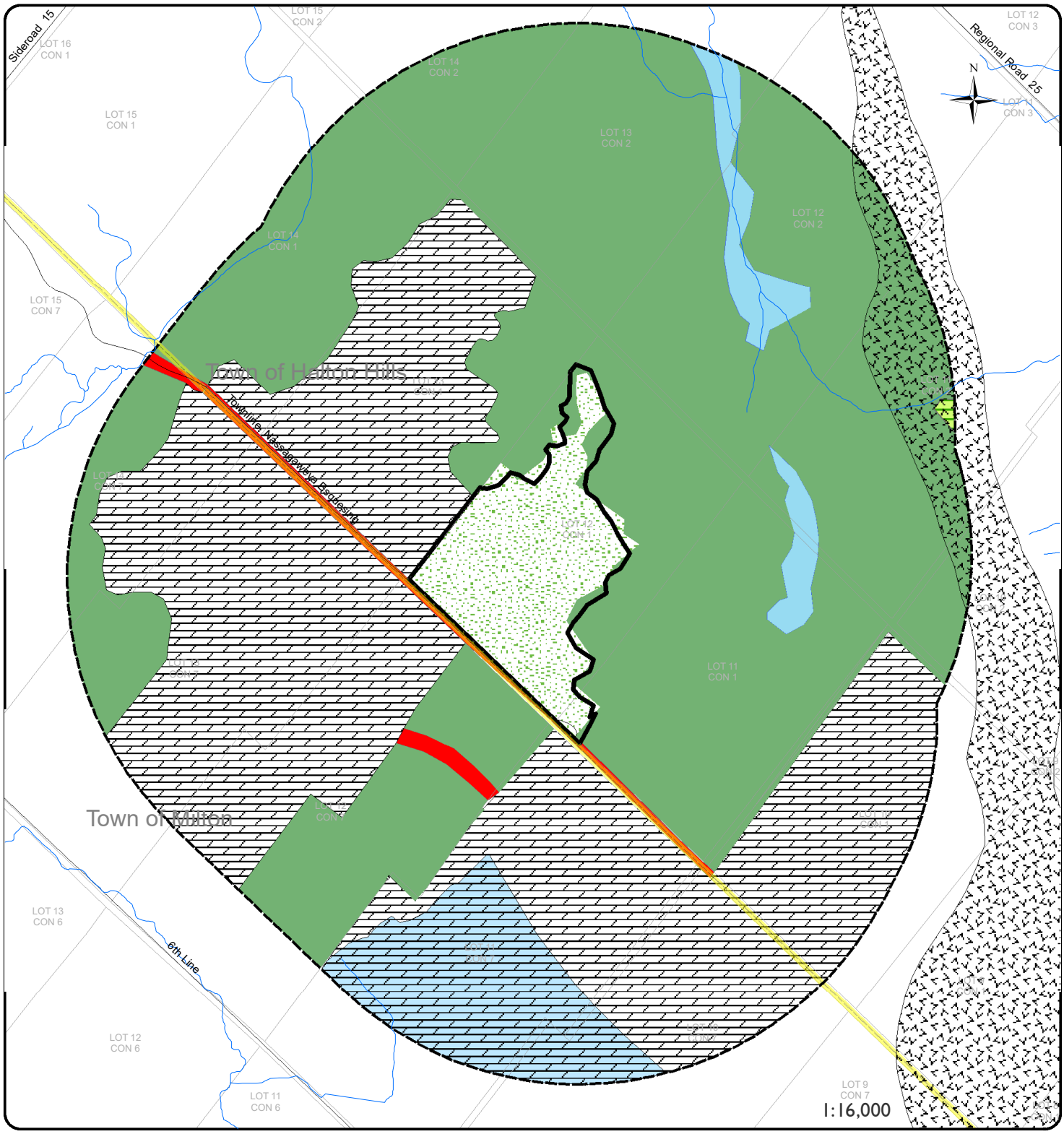
Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2017)) map is illustrated on Figure 12. The approximate location of the Study Area and Secondary Study Area is marked with a blue star.

Figure 12 Crop Heat Units Map

Source: Figure 1-1 Crop Heat Units – Agronomy Guide for Field Crops (Publication 811, 2017)

4.2 LAND USE

The land use for both the Study Area and the Secondary Study Area was completed through windshield surveys (completed in January 2021 and March 2021), an onsite visit, a review of recent aerial photography, Google Earth Imagery, Bing Imagery, Birdseye Imagery, the Region of Halton online Imagery, the Town of Halton Hills online imagery, and correlation to the OMAFRA Land Use Systems mapping. Agricultural and non-agricultural land uses are illustrated on Figure 13.



Legend

- Roads (MNRF)
- Watercourse (MNRF)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1 km)
- Study Area

Existing Land Use

- disturbed
- golf course
- open field
- pond
- quarry
- quarry pond
- road allowance
- woodland

Figure 13

Land Use

DBH Soil Services Inc.

October 2021

The terms used in the Agricultural Land Use assessment were derived from the OMAFRA Agricultural Resource Inventory (ARI) 1983 Coverage. It should be noted that not all terms were relevant or used in this AIA. Only the terms that were appropriate for this area were utilized. For the purposes of this AIA additional terms or more relevant terms such as 'common field crop' were used. As example, 'common field crop' indicates crop production that includes corn and soybean. The ARI 1983 Coverage land use terms include:

- Built up
- Cherries
- Corn System
- Extraction Pits and Quarries
- Grazing System
- Hay System
- Idle Agricultural Land (5 - 10 years)
- Idle Agricultural Land (> 10 years)
- Market Gardens/Truck Farms
- Mixed System
- Nursery
- Orchard
- Pasture System
- Recreation
- Reforestation
- Sod Farm
- Swamp/Marsh/Bog
- Unknown
- Vineyard
- Vineyard-Orchard
- Water
- Woodlands

The windshield survey identified the types of land uses including farm and non-farm uses (eg: built up areas, commercial, and roads). Farms were identified as livestock, cash crop, retired, or remnant. Livestock operations were further differentiated to the type of livestock based on the livestock seen at the time of the survey, through a review of on farm infrastructure (type of buildings, manure system, feed (bins, bales), and types of equipment) or through any signage associated with the respective agricultural operation. This type of assessment may indicate that a farm or barn has the capability of a certain type of livestock but does not actually have livestock at that location.

It should be noted that the roadside survey is based on a line-of-sight assessment process. Therefore, dense brush, woodlands, tall crops, and topography can prevent an accurate assessment of some fields and/or buildings. In those instances, measures are taken to try to identify the crop and/or buildings through conversations with landowners (if applicable, or possible in this Covid-19 environment) and/or review of aerial photography and online imagery.

In some instances, no information is available. In those instances, the field polygon will be identified as 'unknown crop' or 'unknown building use or type'.

On collection of the roadside reconnaissance data, agricultural cropping patterns were identified and mapped. Corn and soybean crops were mapped as common field crops. Small grains are typically characterized as including winter wheat, barley, spring wheat, oats and rye. Forage crops may include mixed grasses, clovers and alfalfa. Other areas used for pasture, haylage or hay were mapped as forage/pasture. It should also be noted that the roadside reconnaissance survey was completed in March. As a result, the identification of agricultural crops and cropping patterns was based on last years (2020 growing season) crop stubble that remained in the fields.

Non-farm (built up or disturbed areas) uses may include non-farm residential units, commercial, recreational, estate lots, services (utilities), industrial development, quarry lands, and any areas that have been man-modified and are unsuitable for agricultural land uses (cropping).

Land Use information was digitized in Geographic Information System (GIS - Arcmap) to illustrate the character and extent of Land Use in both the Study Area and the Secondary Study Area. Area calculations for each land use polygon (area) were calculated within the GIS software and exported as tabular data. The data is presented as follows. Land use designations and land use definitions are provided in Table 1.

Table 1 Typical Land Use Designations

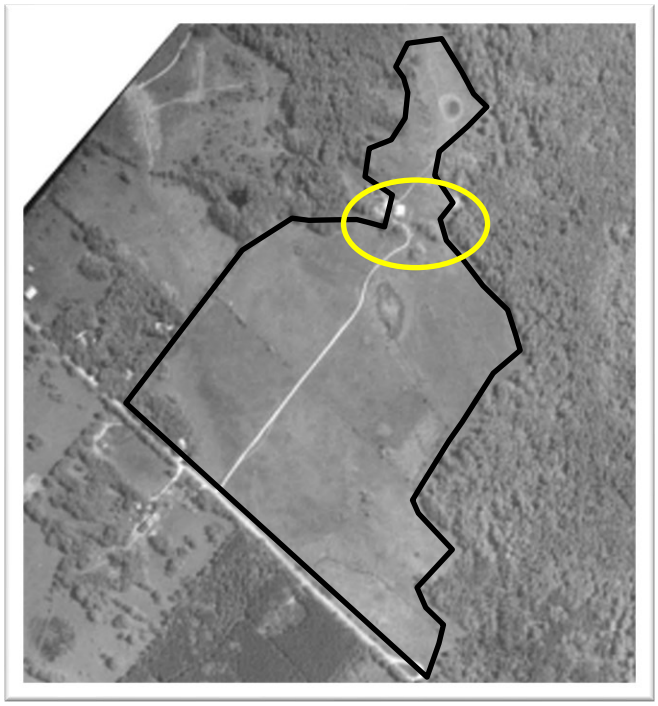
Land Use Designation	Land Use Definitions
Built Up/Disturbed Areas	Residential, commercial, industrial, man modified, existing road system
Common Field Crop	Corn, Soybean, Cultivated
Forage/Pasture	Forage/Pasture
Ponds	Ponds
Scrublands	Unused field (>5 years)
Small Grains	Wheat, Oats, Barley
Woodlands	Forested Areas

4.2.1 LAND USE – STUDY AREA

The historical use of the open field areas of Study Area lands until around the year 2000 was agricultural. The woodland areas (Escarpment Protection Area) appear to have been and remain as a treed/forested area.

Historical aerial photography from 1990 (below) illustrated that there were farm buildings on the property and that the buildings were located farther back in the open field area, roughly ¾ of the way back. These buildings have been removed at some point in the past. The open field

areas appeared to be fallow on the aerial photography. The historical aerial photograph (below) from 1990 illustrates the location of the agricultural buildings with a yellow oval. The approximate location of the Study Area has been illustrated with a solid black line.



The road allowance for the Nassagaweya Esquesing Townline also appears to be open up to the Study Area on the historical aerial photograph (1990). The road allowance appears to have been closed off at some point between 2009 and 2010. The continued review of Google Earth Pro imagery through 2005, 2009, 2010, 2012-2018 also suggests that the Study Area lands have not been used for agricultural purposes back to at least 2004.

A further review of the Town of Halton Hills Website (Interactive Mapping) historical ortho photos was completed. These ortho photos included images that extended back to 1999 and illustrate similar findings in that the open field areas of the Study Area lands appear to have not been used for active cropping since approximately 1999 (as based on the date of the ortho photos).

The onsite survey has revealed that the Study Area comprises approximately 93.2 % as open field, and approximately 6.8 % as woodland areas. It should be noted that the calculated areas are based on a digitized air photo base map within the ARCMap GIS program. The digitizing is not based on field mapped forest edge boundaries.

There are no active agricultural operations on the Study Area. There are no buildings of any kind located on the Study Area lands.

4.2.2 LAND USE – SECONDARY STUDY AREA

The Secondary Study Area consists of a variety of land uses including, but not limited to built-up/disturbed areas (Quarry land), quarry pond, open field, pond, golf course, and woodlands areas.

The Secondary Study Area comprises approximately 38.5 percent as disturbed lands (including built up, disturbed soils and existing quarry land), approximately 5.5 percent as quarry pond, 0.3 percent as open field, 2.0 percent as ponded areas, 0.1 percent as recreational uses (golf course), and the remaining 53.6 percent as woodland areas.

On review of the Land Use data, it was observed that the predominant land uses in the Secondary Study Area include disturbed areas (predominantly existing quarry lands) and woodlands. There was no land in the Secondary Study Area that comprised active agricultural uses.

Table 2 illustrates the percent occurrence of the land uses for both the Study Area and Secondary Study Area.

Table 2 Land Use – Study Area and Secondary Study Area

Land Use Designation	Study Area Percent Occurrence	Secondary Study Area Percent Occurrence
Built Up/Disturbed Areas (including existing quarry)	-	38.5
Quarry Pond	-	5.5
Open Field	93.2	0.3
Pond		2.0
Recreation (Golf Course)		0.1
Woodlands	6.8	53.6
Totals	100.0	100.0

4.3 AGRICULTURAL INVESTMENT

Agricultural investment is directly associated with the increase in capital investment to agricultural lands and facilities. In short, the investment in agriculture is directly related to the money used for the improvement of land through tile drainage or irrigation equipment, and through the improvements to the agricultural facilities (barns, silos, manure storage, sheds).

As a result, the lands and facilities that have increased capital investment are often considered as having greater tendency for preservation than similar capability lands and facilities that are undergoing degradation and decline (no or limited upkeep). The investment in agriculture is

often readily identifiable through observations of the condition and type of the facilities, field observations and a review of OMAFRA artificial tile drainage mapping.

Agricultural investment also looks at the investment in facilities and services that the local farming community might require (grain elevators, abattoirs, cold storage facilities) as part of their normal operations.

4.3.1 AGRICULTURAL FACILITIES

Agricultural facilities (facilities that may be capable of housing livestock) and barns were identified through a combination of aerial photographic interpretation, a review of online digital imagery (Municipal online imagery, Google Earth Pro, Bing Mapping, and Birds Eye Imagery), a review of Ontario Base Mapping and roadside evaluations. The agricultural facilities or potential livestock facilities that were identified on mapping and imagery prior to conducting field investigations included buildings used for the active housing of livestock, barns that were empty and not used to house livestock, barns in poor structural condition, barns used for storage and any other large building that had the potential to house livestock.

Agricultural activities such as livestock rearing usually involve an investment in agricultural facilities. Dairy operations require extensive facilities for the production of milk. Poultry and hog operations require facilities specific for those operations. Beef production, hobby horse and sheep operations usually require less investment capital (when compared to dairy operations or other high valve operations).

Some cash crop operations are considered as having a large investment in agriculture if they have facilities that include grain handling equipment such as storage, grain driers and mixing equipment that is used to support ongoing agricultural activities. Figure 14 illustrates the location of agricultural buildings for both the Study Area and the Secondary Study Area.

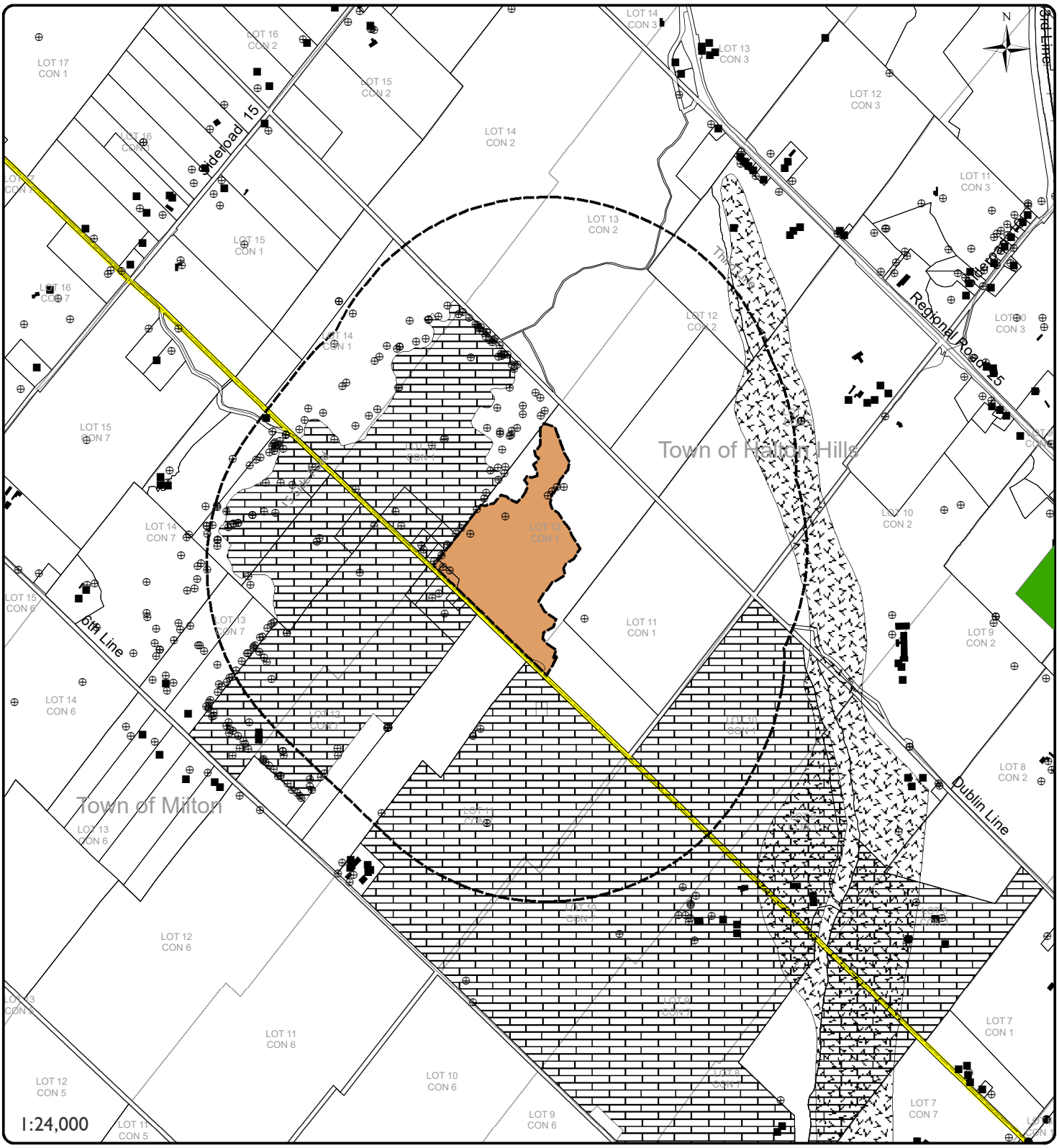
4.3.1.1 Study Area

There were no agricultural buildings located in the Study Area. There is no capital investment related to buildings (agricultural or other) in the Study Area.

4.3.1.2 Secondary Study Area

There were no agricultural buildings located in the Secondary Study Area. There is no capital investment related to buildings (agricultural or other) in the Secondary Study Area.

There will be no loss of any agricultural facilities as a result of the proposed MQEE.



Legend

- Building as Symbol (MNRF)
- Water Wells (MNRF)
- Roads (MNRF)
- Building to Scale (MNRF)
- Aggregate Authorized Site Active (MNRF)
- Escarpment (OMAFRA Soils Data)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Parcel Data
- Secondary Study Area (1 km)
- Study Area

Tile Drainage System Type (OMAFRA)

- Random
- Systematic

MNRF - Ministry of Natural Resources and Forestry
OMAFRA - Ontario Ministry of Agriculture, Food and Rural Affairs

Figure 14

Agricultural Investment

DBH Soil Services Inc.

April 2021

4.3.2 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage in the Study Area and within the Secondary Study Area was completed through a correlation of observations noted during the reconnaissance roadside survey, aerial photographic/aerial imagery interpretation and a review of *Artificial Drainage Mapping Dataset* (LIO, OMAFRA).

Visual evidence supporting the use of subsurface tile drains would have included observations of drain outlets to roadside ditches or surface waterways, and surface inlet structures (hickenbottom or French drain inlets).

Evidence in support of subsurface tile drainage on aerial photographs would be based on the visual pattern of tile drainage lines as identified by linear features in the agricultural lands and by the respective light and dark tones on the aerial photographs, often referred to as a 'herring bone' pattern. The light and dark tones relate to the moisture content in the surface soils at the time the aerial photograph was taken.

Artificial Drainage Mapping Datasets (LIO, OMAFRA) were downloaded in January 2021 and were reviewed to determine if an agricultural tile drainage system had been registered anywhere in the Study Area, or in the Secondary Study Area. The Artificial Drainage mapping data illustrates the location and type of tile drainage systems. The type of tile drainage system is defined as either 'random' or 'systematic'. A random tile drainage system is installed to drain only the low areas or areas of poor drainage within a field. A systematic tile drainage system refers to a method of installing drain tile at specific intervals across a field, in an effort to drain the entire field area. From a cost perspective, a systematic tile drainage system would have a greater cost, or investment in agriculture when compared to a random tile drainage system.

Figure 14 illustrates the Artificial Drainage mapping data (OMAFRA) for the Study Area and Secondary Study Area. As observed in Figure 14, there are no artificial tile drainage systems registered to the Study Area or Secondary Study Area. There is no capital investment in tile drainage in the Study Area or the Secondary Study Area.

There will be no loss of any tile drainage systems as a result of the proposed MQEE.

4.3.3 WATER WELLS

A review was completed of the Ministry of the Environment, Conservation and Parks (MECP) Water Well records (provided through Land Information Ontario) to determine the extent of water wells in the Study Area and the Secondary Study Area. The review of water well records involved a download of the latest version of the Water Well Records from the Land Information (LIO) data warehouse. The Water Well locations are identified on Figure 14. As illustrated on Figure 14, the MECP data indicates that there are numerous water wells located within both the Study Area and the Secondary Study Area.

The review of water well records was completed to determine the location and extent of water wells in the area, and to identify any potential concerns or impacts that may occur as a result of the construction and operation of the proposed MQEE. Generally, many livestock operations use ground water for their livestock, and any disruption to the water in terms of quality and/or quantity could have a significant impact to the operation. It should be noted that Dufferin Aggregates Milton Quarry is a proactive company that has maintained a strong relationship with the Region of Halton and with the quarry's neighbours. As such, Dufferin Aggregates Milton Quarry has an water monitoring plan in place. Dufferin Aggregates Milton Quarry has retained qualified team members to address any groundwater concerns.

The water monitoring program was developed as a result of various approvals and agreements and includes a Water Management System (WMS) that supports aggregate extraction activities, water storage/handling, mitigation of water related environmental features and long-term rehabilitation. The 2020 Annual Water Monitoring Report (GHD) was reviewed as part of this AIA (*2020 Annual Water Monitoring Report Dufferin Aggregates Milton Quarry, Region of Halton, Ontario)*.

The 2020 GHD report states in the conclusions that:

> 15. There is no indication that Dufferin's operations have had any adverse water quantity or quality effects on the residential wells in the vicinity of the quarry.

Further, discussions with staff at GHD indicated similar findings. GHD provided DBH Soil Services Inc. the following as it relates to their investigation related to the MQEE.

> *There are no known communal water supplies in the Milton Quarry area and there are no private or public water supply wells that could be potentially affected by the proposed MQEE. The closest water supply wells are 1.2 km or more away and hydraulically isolated from the proposed MQEE. Those to the north and west are on the far side of the existing quarry excavation while those to the east and south are below the Escarpment and hence beyond the Amabel Aquifer groundwater flow system.*

Therefore, the proposed MQEE will not impact any residential or agricultural water wells.

4.3.4 IRRIGATION

Observations noted during the reconnaissance survey indicated that there were no farms in the Secondary Study area, and as a result there were no irrigation systems.

There is no capital investment related to irrigation systems the Study Area or the Secondary Study Area.

4.3.5 LANDFORMING

Landforming is the physical movement of soil materials to create more uniformly sloped lands for the ease of mechanized operations. The costs associated with landforming can be exorbitant, depending on the volumes of soils moved.

No landforming for the purposes of enhancing an agricultural operation was noted within the Study Area or the Secondary Study Area.

There is no capital investment related to landforming the Study Area or the Secondary Study Area.

4.4 MINIMUM DISTANCE SEPARATION (MDS1)

Minimum Distance Separation (MDS) formulae were developed by OMAFRA to reduce and minimize nuisance complaints due to odour from livestock facilities and to reduce land use incompatibility.

A review of *The Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks - Publication 853*. (2016) OMAFRA revealed that MDS calculations are not required as per Guideline #3.

Guideline #3 states

> *Certain proposed uses are not reasonably expected to be impacted by existing livestock facilities or anaerobic digesters and as a result, do not require an MDS I setback. Such uses may include, but are not limited to:*
>
> - *extraction of minerals, petroleum resources and mineral aggregate resources*

Therefore, MDS 1 calculations were **NOT** required nor completed as part of this AIA.

4.5 FRAGMENTATION

Assessment data was evaluated to determine the characteristics and the degree of land fragmentation. In order to evaluate land fragmentation, the most recent Assessment Roll mapping and Assessment Roll information from the Town of Halton Hills, Town of Milton, and the Region of Halton were referenced on a property-by-property basis (for the Study Area and the Secondary Study Area) to determine the approximate location, shape and size of each parcel. The assessment of fragmentation looks at the numbers of and proximity of properties within the Study Area and Secondary Study Area.

It is noted that the Study Area has been defined as rural lands, however, the AIA guidelines require an assessment of fragmentation. For the purposes of the AIA requirement, an assessment of properties has been completed for the Study Area and Secondary Study Area.

Statistics Canada Census of Agriculture (2011) indicates that the average farm size in Ontario was 98.7 ha (244 acres). This average size is based on the number of Census farms divided by

the acreage of those Census farms (Total Farm Area). The Total Farm Area is land owned or operated by an agricultural operation and includes cropland, summer fallow, improved and unimproved pasture, woodlands and wetlands, and all other lands (including idle land, and land on which farm buildings are located) (Statistics Canada, 2017). It should be noted that the Census data average farm size is based on farmland holdings, which may include more than one parcel (property).

Census of Agriculture (2016) data indicates that the average farm size in Ontario (for Census farms) was 100.8 ha (249) acres. This value is an increase in farm size from the 2011 Census data. Again, the Census of Agriculture (2016) average farm size is based on farmland holdings, which may include more than one parcel (property). Further, the Census of Agriculture (2016) information indicates that the average farm size in Halton Region is 152 acres, and the average farm size for the Town of Milton is 112 acres.

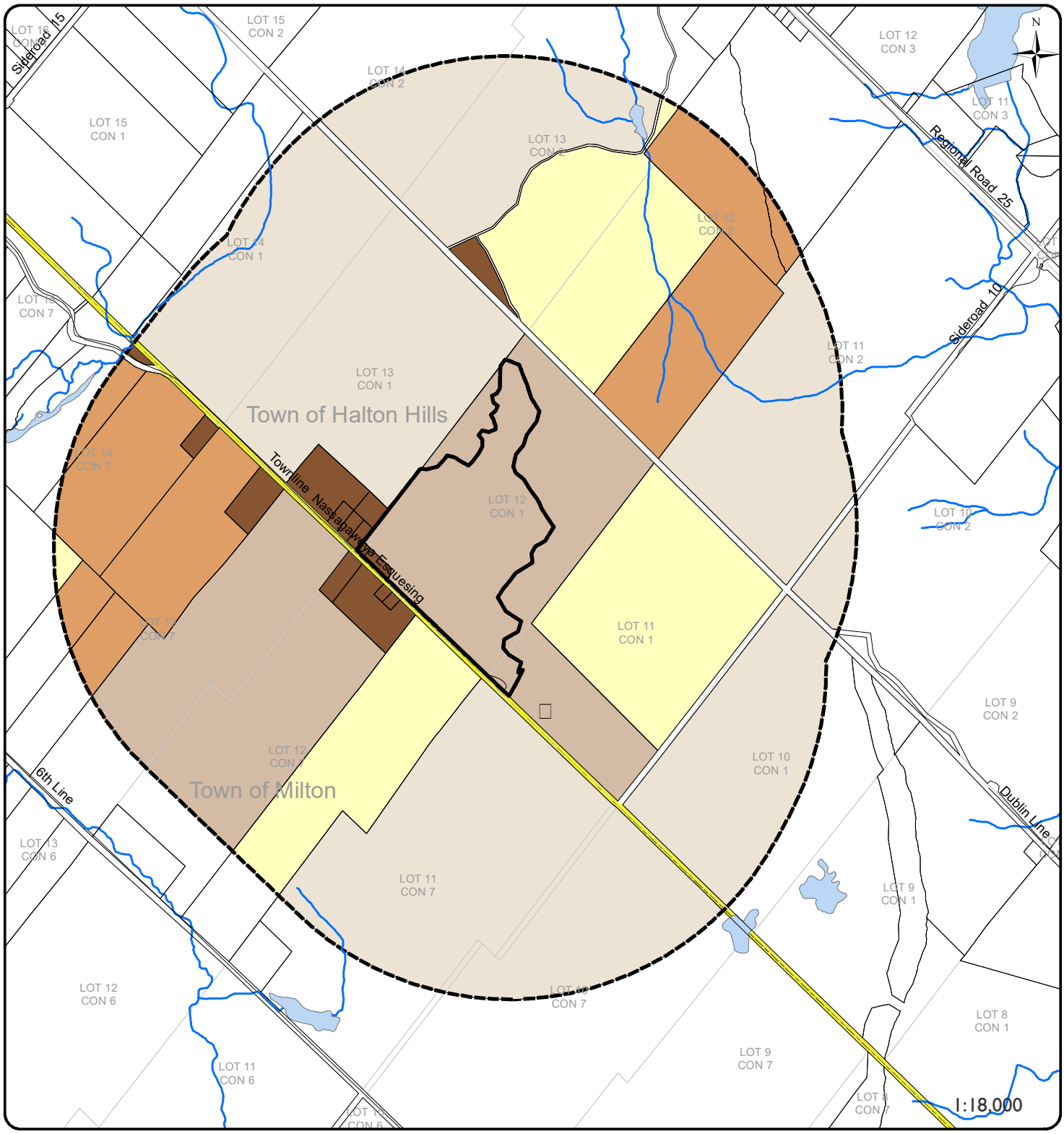
Figure 15 illustrates the complexity of the land fragmentation within the Study Area and the Secondary Study Area. GIS was utilized to calculate the area (in acres) of each parcel within the Study Area and the Secondary Study Area. Acre calculations were completed to allow an assessment or comparison of the parcels in the Study Area and the Secondary Study Area to the Census data. The Census data provides detailed information on Census farms (farms which provided census data), while the data within the Study Area and the Secondary Study Area refers to all parcel data (agricultural areas and non-agricultural areas). Census data is provided in the unit format of acres, with the splits in the data at 0.0 – 9.9, 10.0 – 69.9, 70.0 – 129.9, 130.0 – 179.9 and greater than 180.0 acres. For the purposes of this AIA, similar splits in acre data were used for the comparison.

As illustrated in Figure 15, the Study Area is comprised of 3 parcels. Two of the parcels are small areas (less than 9.9 acres) located adjacent to the unopened road allowance, while the third parcel comprised the majority of the Study Area. As illustrated in Figure 15, the majority of the Study Area is within the 130.0 – 179.9 acre range.

A review of the Figure 15 revealed that the much of the Secondary Study Area comprised the 130.0 – 179.9 acre range and the greater than 180 acre range. There are a few smaller parcels along the Nassagaweya Esquesing Townline to the northwest, and a few smaller parcels to the northeast. The larger parcels appear to be associated with the existing quarry operation, and the natural areas associated with the Escarpment to the south, and the woodland areas to the north/northwest.

Table 3 provides a comparison between the parcel count of the Secondary Study area and the Census farm data. The parcel count for the Town of Halton Hills reflects only the Census Farms in the 2016 census. The 2016 Census data for the Town of Halton Hills recognizes a total of 180 census farms.

As illustrated in Table 3, the parcel count for the Secondary Study Area indicates the presence of numerous small parcels. This type of fragmentation pattern is common in areas near urban boundaries and within the Greater Toronto Area (GTA).



Legend

- Roads (MNRF)
- Watercourse (MNRF)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Parcel Data
- Secondary Study Area (1 km)
- Study Area
- Water Body (MNRF)

Range in Acres

- 0.1 - 9.9
- 10.0 - 69.9
- 70.0 - 129.9
- 130.0 - 179.9
- >180

Figure 15

Fragmentation

DBH Soil Services Inc.

October 2021

There appear to be no residential units associated with any of the smaller parcels.

Table 3 Parcel Size

Parcel Size Range (Acre)	Parcel Count Secondary Study Area	Parcel Count Town of Halton Hills (2016 Census)
0.0 – 9.9	13	22
10.0 – 69.9	8	72
70.0 – 129.9	4	30
130.0 – 179.9	2	15
>180*	6	41

Note * = includes farm areas from 180 acres to over 3520 acres

Although a direct comparison of the parcel size count cannot be made, as the census data only refers to census farms, there are similarities in the proportion of the numbers. Generally, Table 3 illustrates a greater number of smaller parcels, with the number counts decreasing with the increase in parcel size, with the exception of the large areas associated with the quarry and Escarpment woodland areas.

4.6 SOILS AND CANADA LAND INVENTORY (CLI)

A review was completed of the soils and Canada Land Inventory (CLI) data base for both the Study Area and Secondary Study Area. The review was completed to determine the extent and location of the high capability soils.

The review included a download of the latest version of the soils data from the Land Information Ontario website and discussions with OMAFRA staff to determine if the downloaded data set is the latest iteration of the soils data. Further, the soils database was updated by DBH Soil Services to illustrate the areas associated with the existing quarry area. The areas associated with the existing quarry operations have been identified as 'disturbed'.

Due to the continual updates to the soil survey complex datasets, it is prudent to verify or at least confirm that the soil series data and Canada Land Inventory (CLI) information within the datasets is accurate across the Region of Halton. In an effort to confirm the correctness of the soils and the Canada Land Inventory data on a soil series basis, the dbase data file that is associated with the Region of Halton soil survey complex file was exported to Microsoft Excel to run a unique symbols list based on Soil Series, topography (slope), CLI class and CLI subclass.

The unique symbols list (based on the SYMBOL1 column) provided 211 unique symbols combined with the associated slope and CLI class and CLI subclass (CLI_1 and CLI_2). The unique symbols list is provided in Appendix C. A review of this list indicated that there were some issues with a few symbols of the soils and the respective CLI class and/or subclass. The

soils with issues are highlighted in yellow. A review of these soil polygon issues indicated that none of the affected soil polygons were located within the Study Area or Secondary Study Area.

As noted in the list in Appendix C, a few symbols for a particular soil series would have two or more CLI classes listed for a mineral soil. Similar conditions were associated with the CLI subclass, where two or more CLI and CLI subclass combinations were associated with the soil series symbol. In many cases the difference between the CLI classification was related only to the subclass. Therefore, in those instances, the Canada Land Inventory (CLI) rating or classification for a particular soil did not change, only the subclass did which relates to a different limitation in the soil, but not a change in CLI class.

In other instances, the CLI Class changed. In those instances, the change in some CLI Class were related to topography. The greater the slope results in the lower the capability of the land. In those instances, the CLI Class change was appropriate. In one instance a soil on an 'e' slope (slope length less than 50 metres and percent slope of 9.0 – 15.0) was rated as a CLI Class 1. Typically, slopes on 'e' slopes should be rated CLI Class 3T or 4T depending on soil texture.

For the purposes of this AIA, the soil and CLI data presented on Figure 16 is considered appropriate in soil code and CLI rating.

An onsite soil reconnaissance survey was completed to determine if the boundaries illustrated in the Provincial soils data set was appropriate for the Study Area. The reconnaissance level survey determined that the Provincial soils data and map sets were appropriate for the Study Area.

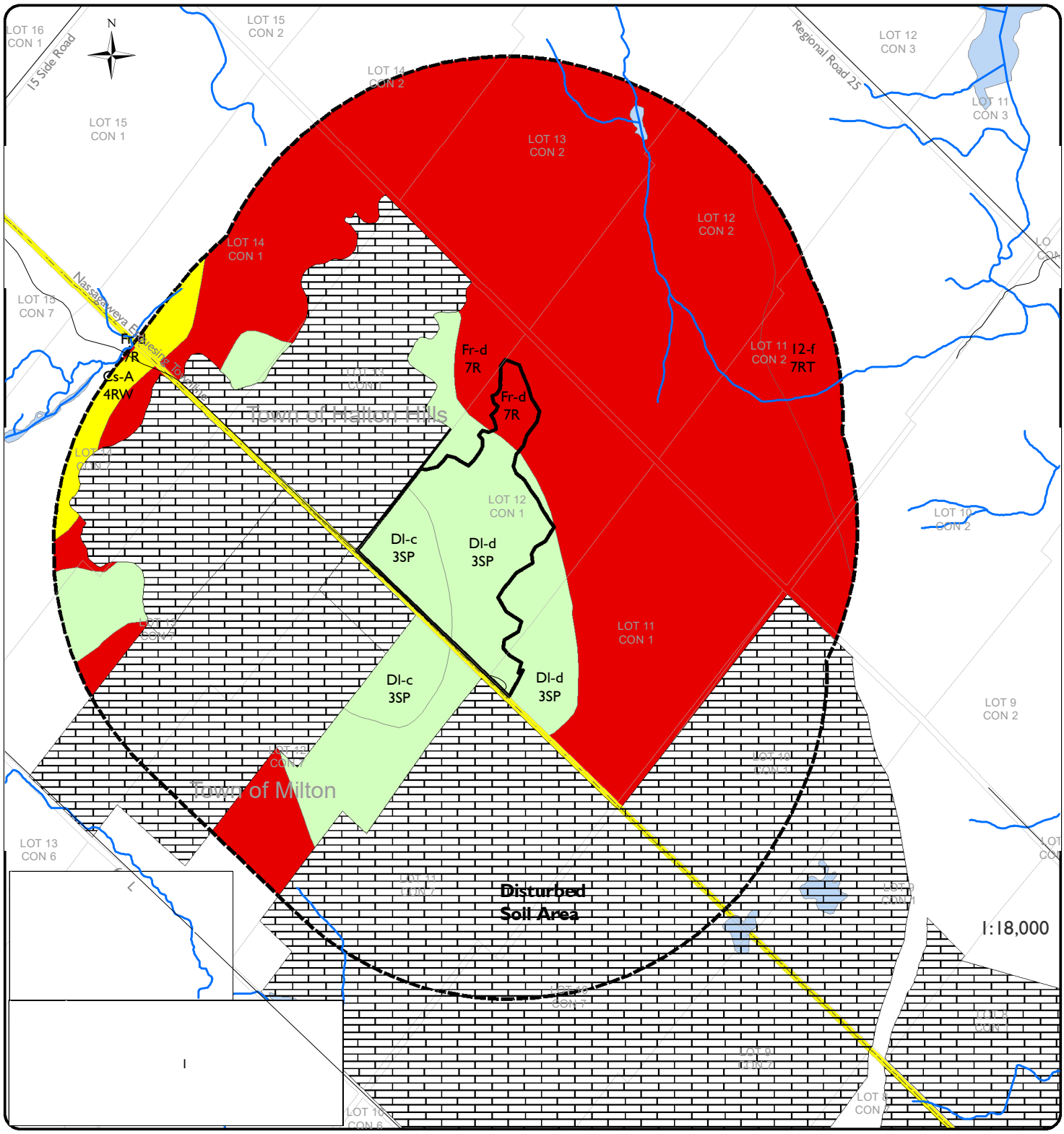
4.6.1 SOIL CAPABILITY FOR AGRICULTURE

Basic information about the soils of Ontario is made more useful by providing an interpretation of the agricultural capability of the soil for various crops. The Canada Land Inventory (CLI) system combines attributes of the soil to place the soils into a seven-class system of land use capabilities. The CLI soil capability classification system groups mineral soils according to their potentialities and limitations for agricultural use. The first three classes are considered capable of sustained production of common field crops, the fourth is marginal for sustained agriculture, the fifth is capable for use of permanent pasture and hay, the sixth for wild pasture and the seventh class is for soils or landforms incapable for use for arable culture or permanent pasture.

Organic or Muck soils are not classified under this system. Disturbed Soil Areas are not rated under this system.

The Ontario Ministry of Agriculture, Food and Rural Affairs document *"Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario"* (2021, February 12), defines the Canada Land Inventory (CLI) classification as follows:

> "*Class 1 - Soils in this class have no significant limitations in use for crops. Soils in Class 1 are level to nearly level, deep, well to imperfectly drained and have good nutrient and water holding capacity. They can be*



Legend

- Roads (MNRF)
- Watercourse (MNRF)
- Aggregate Authorized Site Active (MNRF)
- Lot Lines (MNRF)
- Municipal Boundary (Halton Region)
- Secondary Study Area (1 km)
- Study Area
- Water Body (MNRF)

Canada Land Inventory (CLI)

- Class 3
- Class 4
- Class 5
- Class 7

Soil Code — Slope Code

Dl-c

CLI Class — 3SP — CLI Subclass

Figure 16

Soils
and
Canada Land Inventory (CLI)

DBH Soil Services Inc.

October 2021

managed and cropped without difficulty. Under good management they are moderately high to high in productivity for the full range of common field crops.

Class 2 - Soils in this class have moderate limitations that reduce the choice of crops, or require moderate conservation practices. These soils are deep and may not hold moisture and nutrients as well as Class 1 soils. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good management they are moderately high to high in productivity for a wide range of common field crops.

Class 3 - Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices. The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under good management these soils are fair to moderately high in productivity for a wide range of common field crops.

Class 4 - Soils in this class have severe limitations that restrict the choice of crops, or require special conservation practices and very careful management, or both. The severe limitations seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. These soils are low to medium in productivity for a narrow to wide range of common field crops, but may have higher productivity for a specially adapted crop.

Class 5 - Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible. The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants and may be improved through the use of farm machinery. Feasible improvement practices may include clearing of bush, cultivation, seeding, fertilizing or water control.

Class 6 - Soils in this class are unsuited for cultivation, but are capable of use for unimproved permanent pasture. These soils may provide some sustained grazing for farm animals, but the limitations are so severe that improvement through the use of farm machinery is impractical. The terrain may be unsuitable for the use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

Class 7 - Soils in this class have no capability for arable culture or permanent pasture. This class includes marsh, rockland and soil on very steep slopes."

With respect to the soils and Canada Land Inventory (CLI) identified in the Study Area and Secondary Study Area, The Ontario Ministry of Agriculture, Food and Rural Affairs document *"Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario"* (2021, February 12 defines the Canada Land Inventory (CLI) subclassification as follows:

Subclass P – Stoniness

Subclass P is determined by:

Class 2P: Surface stones cause some interference with tillage, planting and harvesting; stones are 15-60 cm in diameter, and occur in a range of 1-20 m apart, and occupy <3% of the surface area. Some stone removal is required to bring the land into production.

Class 3P: Surface stones are a serious handicap to tillage, planting, and harvesting; stones are 15-60 cm in diameter, occur 0.5-1m apart (20-75 stones/100 m), and occupy 3-15% of the surface area. The occasional boulder >60 cm in diameter may also occur. Considerable stone removal is required to bring the land into production. Some annual removal is also required.

Class 4P: Surface stones and many boulders occupy 3-15% of the surface. Considerable stone and boulder removal is needed to bring the land into tillable production. Considerable annual removal is also required for tillage and planting to take place.

Class 5P: Surface stones 15-60 cm in diameter and/or boulders >60 cm in diameter occupy 15-50% of the surface area (>75 stones and/or boulders/100 m).

Class 6P: Surface stones 15-60 cm in diameter and/or boulders >60 cm in diameter occupy >50% of the surface area.

Subclass R

Subclass R is determined by:
Class 3R: Consolidated bedrock occurs at a depth of 50-100 cm from the surface causing moderately severe restriction of moisture holding capacity and/or rooting depth.
Class 4R: Consolidated bedrock occurs at a depth of 20-50 cm from the surface causing severe restriction of moisture holding capacity and/or rooting depth.
Class 5R: Consolidated bedrock occurs at a depth of 10 to 20 cm from the surface causing very severe restrictions for tillage, rooting depth and moisture holding capacity. Improvements such as tree removal, shallow tillage, and the seeding down and fertilizing of perennial forages for hay and grazing may be feasible.
Class 6R: Consolidated bedrock occurs at a depth of 10-20 cm from the surface but improvements as in 5R are unfeasible. Open meadows may support grazing.
Class 7R: Consolidated bedrock occurs at < 10cm from the surface.

Subclass S – Adverse Soil Characteristics

Subclass S denotes soils having a combination of limitations of equal severity. In Ontario it has often been used to denote a combination of fertility (F) and moisture (M) when these are present with a third limitation such as topography (T) or stoniness (P).

Subclass T - Topography

The steepness of the surface slope and the pattern or frequency of slopes in different directions are considered topographic limitations if they: 1) increase the cost of farming the land over that of level or less sloping land; 2) decrease the uniformity of growth and maturity of crops; and 3) increase the potential of water and tillage erosion.

Subclass W – Excess Water

The presence of excess soil moisture (other than that from inundation) may result from inadequate soil drainage, a high water table, seepage, or runoff from surrounding areas. This limitation only applies to soils classified as poorly drained or very poorly drained.

Disturbed soil areas (built up/developed areas, quarry) are considered as Not Rated within the Canada Land Inventory (CLI) classification system. Muck (organic soils) are not rated in the Canada Land Inventory (CLI) classification system.

Figure 16 – Canada Land Inventory (CLI) illustrates the OMAFRA digital soils data for Study Area and the Secondary Study Area. The soils in the Study Area comprise Dumfries Loam and Farmington Loam – Rocky Phase soils. The Dumfries soils have been rated as CLI Class 3, while the Farmington Loam – Rocky Phase soils are rated as CLI Class 7. The extent of the Study Area lands in CLI Class 3 are primarily the open field areas and account for approximately 90.5 percent of the Study Area. The portion of the Study Area lands in the CLI Class 7 are generally associated with the woodland areas and account for approximately 9.5 percent of the Study Area.

The soils in the Secondary Study Area include Disturbed Soil Areas, Dumfries Loam, Farmington Loam – Rocky Phase, Colwood Loam – Shallow Phase, Oneida Silt Loam, and Escarpment areas. The majority of the Secondary Study Area is associated with the existing quarry lands and disturbed soils (transportation corridors) and accounted for approximately 44.3 percent. The remainder of the Secondary Study Area is associated with the shallow soils (Farmington) that are located adjacent to the Escarpment area, and the Class 3 lands located roughly central in the Secondary Study Area. Farmington soils and Escarpment lands account for approximately 45.6

percent of the Secondary Study Area, with CLI Class 3 soils occupying approximately 8.8 percent, and CLI Class 4 soils with approximately 1.3 percent.

The OMAFRA soils data base has not removed or discounted soils from transportation corridors or quarry areas. Therefore, those areas, with their associated disturbed soils, are included within the soil polygon that covers the area. This study attempts to remove the soils from roads and highway corridors in an effort to provide a more accurate data set. As a result, the areas that comprise transportation corridors and/or quarry lands were identified as "Disturbed Soil Area" on Figure 16 and are considered as "Not Rated" in the Canada Land Inventory (CLI) table below.

Table 4 illustrates the soils data as derived by percent occurrence within the respective polygons and summarizes the relative percent area occupied by each capability class for the Study Area and the Secondary Study Area.

Specialty crop ratings are not provided, as neither the Study Area nor the Secondary Study Area are located within a designated Specialty Crop Area.

Table 4 Canada Land Inventory

Canada Land Inventory Class (CLI)	Study Area Percent Occurrence	Secondary Study Area Percent Occurrence
Class 1	-	-
Class 2	-	-
Class 3	90.5	8.8
Class 4	-	1.3
Class 5	-	-
Class 6	-	-
Class 7	9.5	45.6
Not Rated	-	44.3
Totals	100.0	100.0

The Study Area comprises approximately 90.5 percent CLI Class 1 – 3 lands. Approximately 8.8 percent of the Secondary Study Area is Class 1 - 3 lands.

4.7 AGRICULTURAL SYSTEMS PORTAL

A review of the *Agricultural System Portal* (OMAFRA) online resource for agricultural services/agricultural network (markets, abattoirs, renderers, livestock auctions, investment, warehousing and storage, wineries and breweries) was completed.

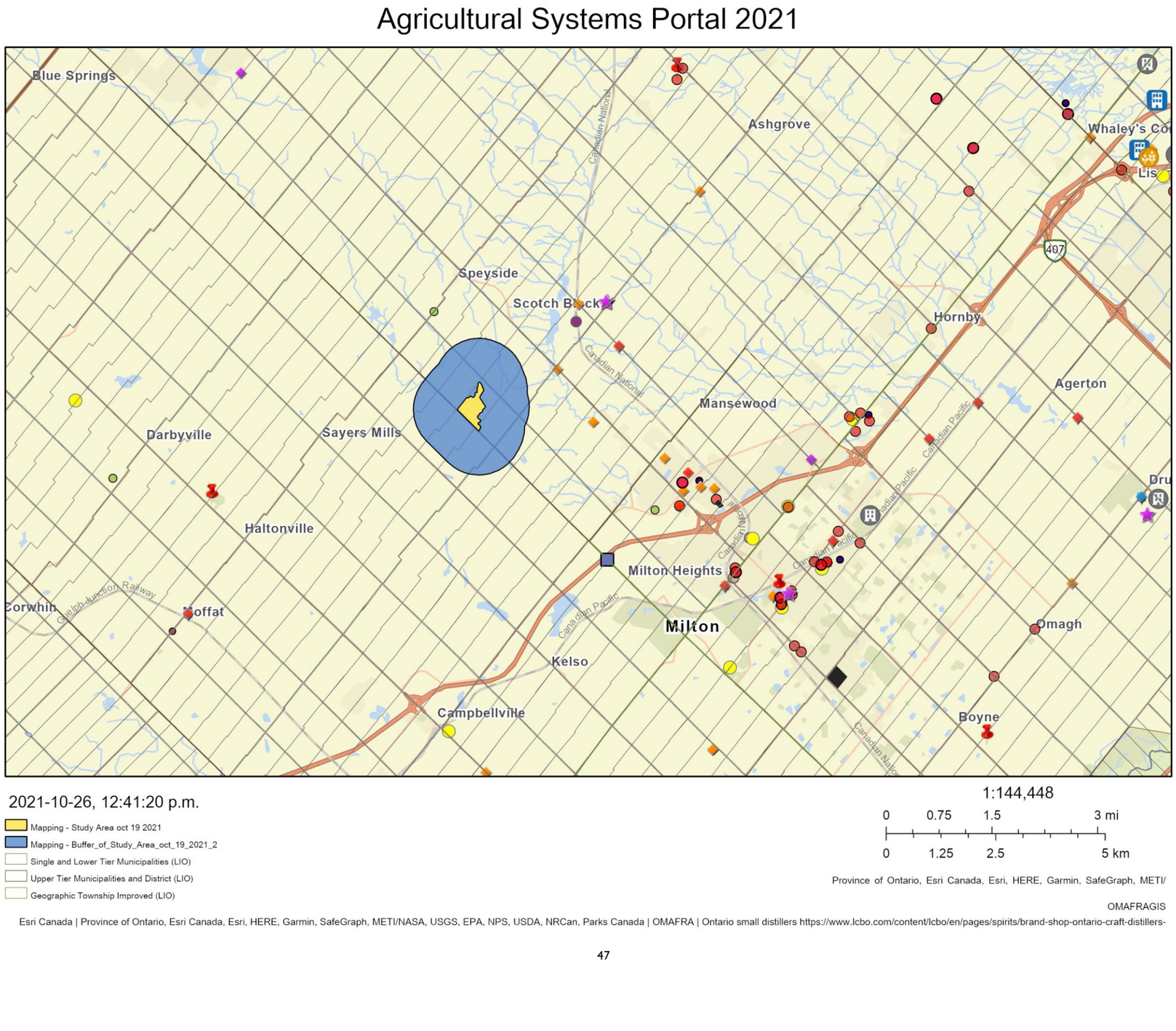
A review of the online *Agricultural System Portal* (OMAFRA) indicated that there were no farmers markets, pick your own operations, nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the Study Area or the Secondary Study Area.

A few farmers markets and wineries (Chudleigh's Entertainment Farm (www.Chudleighs.com), Wheelbarrow Orchards (www.frasersbeveragecompany.com), Andrews' Scenic Acres & Scotch Block Winery (www.andrewsfarm.ca)) were noted approximately 3 km northeast of the Study Area. Additional farm related services (small engine repair, Gordon Foods Ontario Distribution Centre, Versa Cold Logistics) were located within the urban areas of Milton.

A copy of the online image has been provided in Figure 17 – Agricultural Systems Mapping (OMAFRA). This figure includes a large area (Township scale coverage) around the Study Area and the Secondary Study Area, for the purposes of identifying agricultural services and networks in the local community.

The closest transportation network (major roadway) is the Highway 401 which is located just south of the Study Area and Secondary Study Area.

Figure 17 Agricultural Systems Mapping (OMAFRA)



4.8 AGRICULTURAL CENSUS DATA

A review of the Census of Agricultural data (Census 2016, including 2011 and 2006 data) was completed to determine the agricultural characteristics of the Region of Halton and the Town of Halton Hills, and to allow comparison to the agricultural characteristics in the Study Area and Secondary Study Area.

It was noted in the Census data that there were some differences in total numbers when comparing the 'Ag Profile Halton Regional Mun' sheet with the 'Ag Census over time' sheet in the Halton Census data downloaded from OMAFRA. The differences in numbers are not great, but they do exist. This would be considered as a limitation of the data set.

It should also be noted that the Census data refers to Halton Region as the Halton Regional Municipality, and the Town of Halton Hills as Halton Hills Township. The data in the following tables has been presented in the Census wording format.

4.8.1 HALTON REGIONAL MUNICIPALITY

Table 5 provides Census 2016 data for agricultural land use in the Regional Municipality of Halton and provides a comparison to the Provincial Census 2011 and 2006 agricultural data. As indicated in the census data, the Regional Municipality of Halton comprises approximately 0.58 percent of the total area of farms in Ontario (Census 2016).

Table 5 Halton Regional Municipality Census 2016 Data – Land Use

Item	Halton Regional Municipality	Province	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Land Use, 2016 Census (acres)					
Land in crops	52,602	9,021,298	0.58	0.69	0.75
Summerfallow land	243	15,885	1.53	3.06	1.78
Tame or seeded pasture	1,850	514,168	0.36	0.36	0.41
Natural land for pasture	3,414	783,566	0.44	0.39	0.40
Christmas trees, woodland & wetland	5,789	1,542,637	0.38	0.48	0.46
All other land	4,778	470,909	1.01	0.69	0.91
Total area of farms	68,676	12,348,463	0.56	0.63	0.67

Table 5 illustrates that there has been a slight decrease in most agricultural land uses (with the exception of Natural land for pasture and All other land) since 2006. There have been some fluctuations during 2011.

Table 6 provides a more detailed inventory of agricultural lands and it is evident from this data that the Region of Halton comprises a large land base for common field crops (corn and soybean), winter wheat and alfalfa crops (as based on Census farm data).

Table 6 Halton Regional Municipality Census 2016 Data - Crops

Item	Halton Regional Municipality	Province	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Major Field Crops, 2016 Census (acres)					
Winter wheat	7,643	1,080,378	0.71	0.83	0.86
Oats for grain	193	82,206	0.23	0.24	0.67
Barley for grain	229	103,717	0.22	0.41	0.73
Mixed grains	243	92,837	0.26	0.35	0.31
Corn for grain	12,272	2,162,004	0.57	0.64	0.87
Corn for silage	625	295,660	0.21	0.20	0.33
Alfalfa and Alfalfa Mixture	7,172	1,119,194	0.64	0.79	0.65
Soybeans	17,409	2,783,443	0.63	0.79	0.86
Potatoes	10	34,685	0.03	0.03	-
Major Fruit Crops, 2016 Census (acres)					
Total fruit crops	424	51,192	0.83	0.99	1.35
Apples	127	15,893	0.80	1.18	1.59
Sweet Cherries	x	435	-	0.52	.32
Peaches	13	5,232	0.25	-	-
Grapes	77	18,718	0.41	0.40	0.82
Strawberries	63	2,915	2.16	2.89	3.70
Raspberries	28	680	4.12	2.77	4.16
Major Vegetable Crops, 2016 Census (acres)					
Total vegetables	642	135,420	0.47	0.53	0.66
Sweet corn	83	22,910	0.36	0.38	0.32
Tomatoes	44	15,744	0.28	0.12	0.88
Green peas	x	16,268	-	-	0.11
Green or wax beans	x	9,732	-	-	-

Table 6 also illustrates the change in cropping in the Halton Regional Municipality as a percent of the Provincial totals from 2011 and 2006. The Census data indicates a reduction in the Halton Regional Municipality (as a percent of the Provincial totals) for grain production (oats and barley grain), and in alfalfa. There was a decrease in the Halton Regional Municipality (as a percent of the Provincial totals) in crop production for mixed grains and corn for silage since 2006.

With respect to fruit crops, there has been a decrease in the Halton Regional Municipality (as a percent of the Provincial totals) in apples, sweet cherries, and strawberries, while there was an increase in the acreage used for peaches, grapes and raspberry production. There has been a net decrease in the Halton Regional Municipality (as a percent of the Provincial totals) in major vegetable crop production since 2011 and 2006.

Table 7 illustrates the Census 2016 data for livestock. As shown in Table 7, the Halton Regional Municipality provides a small portion of the total cattle and calves and dairy cows (as a percent of the Provincial totals). When compared to the Census 2011 data, there have been decreases in most livestock inventories, with the exception of beef cows and total sheep and lambs where there have been increases.

It was also noted that the Halton Regional Municipality is a significant producer of total hens and chickens. There has been a slight increase in total hens and chicken production since 2011, as compared to the Provincial totals.

Table 7 Halton Regional Municipality Census Data (2016) – Livestock

Livestock Inventories, 2016 Census (number)					
Total cattle and calves	3,209	1,623,710	0.20	0.28	0.52
Steers	385	305,514	0.13	0.23	0.80
Beef Cows	826	236,253	0.35	0.42	0.44
Dairy Cows	379	311,960	0.12	0.18	0.17
Total Pigs	139	3,534,104	-	-	0.09
Total sheep and lambs	1,583	321,495	0.49	0.36	0.52
Poultry Inventories, 2016 Census (number)					
Total hens and chickens	162,456	50,759,994	0.32	0.30	0.50
Total turkeys	x	3,772,146	-	-	-

4.8.2 HALTON HILLS TOWNSHIP

A review of Census 2016 data for the Halton Hills Township reveals that the total area in farms is 37,154 acres (Census Farms). The majority of the farmed land is in crops with a total of 30,614 acres. The remaining lands are listed as tame or seeded pasture, natural land for pasture, and Christmas trees, woodlands and wetlands.

Table 8 provides Census 2016 data for agricultural land use in the Halton Hills Township and provides a percent comparison of the Halton Hills Township contribution from the Provincial Census 2011 and 2006 agricultural data. As indicated in the census data, Halton Hills Township comprises approximately 0.34 percent of the Land in Crops for Census farms in Ontario (Census 2016).

Table 8 Halton Hills Township Census Data (2016) – Land Use

Item	Halton Hills Township	Province	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Land Use, 2016 Census (acres)					
Land in crops	30,614	9,021,298	0.34	0.35	0.36
Summerfallow land	144	15,885	0.91	2.42	0.78
Tame or seeded pasture	731	514,168	0.14	0.16	0.21
Natural land for pasture	1,243	783,566	0.16	0.19	0.14
Christmas trees, woodland & wetland	2,495	1,542,637	0.16	0.17	0.19
All other land	1,927	470,909	0.41	0.22	0.30

Total area of farms	37,154	12,348,463	0.30	0.30	0.31

Table 9 provides a breakdown of the major field crops in the Halton Hills Township and provides a comparison of the contribution to the Provincial totals.

The Census 2016 data illustrates wheat, corn for grain and soybeans are the major field crops grown in Halton Hills Township. In comparison to the Census 2011 data there has been a decrease in the Halton Hills Township contribution in oats for grain and alfalfa production to the Provincial totals. There have been increases in Halton Hills Townships contribution to the production of barley and corn for grain, and potatoes for the Province. Similar comments can be made when reviewing the 2006 data, with the exceptions of wheat, where there has been a slight increase in Halton Hills Townships contribution to the Provincial total. Halton Hills Township contributes a limited amount to the Provincial totals for major field crops.

A review of the Halton Hills Township production of major fruit crops indicated that Halton Hills Township contributes a limited amount to the Provincial totals for production in major fruit crops. Halton Hills Townships major fruit crop is apples, with an overall net decrease in major fruit crop production contribution to the Provincial totals since 2011. When comparing the 2006 data, Halton Hills Townships contribution of major fruit crops to the Provincial total has remained consistent.

Table 9 Halton Hills Township Census 2016 - Crops

Item	Halton Hills Township	Province	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Major Field Crops, 2016 Census (acres)					
Winter wheat	x	1,080,378	-	-	-
Wheat	5,220	1,202,309	0.43	0.47	0.42
Oats for grain	x	82,206	-	0.15	0.30
Barley for grain	148	103,717	0.14	-	0.46
Mixed grains	x	92,837	-	0.26	0.25
Corn for grain	8,504	2,162,004	0.39	0.37	0.51
Corn for silage	381	295,660	0.13	0.09	0.15
Alfalfa and Alfalfa mixtures	3,337	1,119,194	0.30	0.35	0.32
Soybeans	9,438	2,783,443	0.34	0.37	0.37
Potatoes	4	34,685	0.01	-	0.00
Major Fruit Crops, 2016 Census (acres)					
Total fruit crops	121	51,192	0.24	0.35	0.24
Apples	70	15,893	0.44	0.61	0.44
Sweet Cherries	x	435	-	-	-
Peaches	x	5,232	-	-	-
Grapes	x	18,718	-	0.05	-
Strawberries	x	2,915	-	-	-
Raspberries	x	680	-	-	-
Major Vegetable Crops, 2016 Census (acres)					
Total vegetables	442	135,420	0.33	0.16	0.80
Sweet corn	x	22,910	-	0.24	0.56
Tomatoes	11	15,744	0.07	0.07	-
Green peas	1	16,268	0.01	-	-

Green or wax beans	5	9,732	0.05	-	0.03

Table 9 also provides census data for major vegetable crops. Halton Hills Township has seen a slight increase in its contribution to the Provincial total vegetable crops since 2011 and 2006, with the exception of tomatoes, where it has remained consistent, and with green peas and green or wax beans where there have been slight increases.

Table 10 provides the Census 2016 data for livestock for the Halton Hills Township. As indicated below, Halton Hills Township contributions to the Provincial totals are limited with respect to livestock or poultry inventories. Overall, there have been decreases in Halton Hills Township's contributions to the Provincial totals since 2006.

Table 10 Halton Hills Township Census 2016 - Livestock

Item	Halton Hills Township	Province	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Livestock Inventories, 2016 Census (number)					
Total cattle and calves	1,505	1,623,710	0.09	0.15	0.18
Steers	211	305,514	0.07	0.15	0.18
Beef cows	417	236,253	0.18	0.23	0.26
Dairy cows	208	311,960	0.07	0.12	0.11
Total pigs	70	3,534,104	0.00	0.00	0.00
Total sheep and lambs	548	321,495	0.17	0.18	0.18
Poultry Inventories, 2016 Census (number)					
Total hens and chickens	1454	50,759,994	0.00	0.00	0.00
Total turkeys	14	3,772,146	0.00	0.00	0.00

Table 11 provides a side-by-side comparison of the Halton Hills Township and Halton Regional Municipality Census 2016 data for crops. Table 11 also provides a calculation of the percent occurrence of the Halton Hills Township agricultural census data (2016, 2011, 2006) as a comparison to the Halton Regional Municipality agricultural census data (2016, 2011, 2006).

As illustrated in Table 11, the Halton Hills Township provides a significant contribution to the major field crops in Halton Regional Municipality, as evidenced by values ranging from 40 to over 66 percent of Halton Regional Municipality totals. There have been net increases in the percent contribution from Halton Hills Township to the Halton Regional Municipality totals for wheat, barley for grain, corn for grain, corn for silage, soybeans and potatoes since 2006. There have been some decreases in Halton Hills Township contribution to Halton Regional Municipality totals for oats for grain and mixed grains.

With respect to major fruit crops, Halton Hills Township contributes 55.12 percent of the Halton Regional Municipality total for apples, and 28.54 percent of the total fruit crops (2016 data). Halton Hills Township has seen a general decline in the contributions of grapes since 2011 and strawberries since 2006.

With respect to major vegetable crops, Halton Hills Township contributes 68.85 percent of the Halton Regional Municipality total. Table 11 illustrates Halton Hills Township contributes 25 percent of the tomato crop and a review of census data indicates that the Halton Hills Township also contributes a small percentage of a variety of crop types including cabbage, pumpkins, beets and onions.

Table 11 Comparison of Township and Region Census Data 2016 - Crops

Item	Halton Hills Township	Halton Regional Municipality	Percent of Region of Halton 2016	Percent Region of Halton 2011	Percent of Region Halton 2006
Major Field Crops, 2016 Census (acres)					
Winter wheat	x	7,643	-	-	-
Wheat	5,220	7,835	66.62	61.02	54.58
Oats for grain	x	193	-	61.05	44.70
Barley for grain	148	229	64.63	-	63.43
Mixed grains	x	243	-	74.87	82.09
Corn for grain	8,504	12,272	69.30	58.56	58.46
Corn for silage	381	625	60.96	47.21	44.10
Alfalfa and Alfalfa Mixture	3,337	7,172	46.53	43.81	49.52
Soybeans	9,438	17,409	54.21	45.99	43.09
Potatoes	4	10	40.00	-	-
Major Fruit Crops, 2016 Census (acres)					
Total fruit crops	121	424	28.54	35.18	52.21
Apples	70	127	55.12	51.34	73.52
Sweet Cherries	x	x	-	-	-
Peaches	x	13	-	-	-
Grapes	x	77	-	13.51	-
Strawberries	x	63	-	-	43.31
Raspberries	x	28	-	-	-
Major Vegetable Crops, 2016 Census (acres)					
Total vegetables	442	642	68.85	30.48	30.33
Sweet corn	x	83	-	63.92	91.2
Tomatoes	11	44	25.0	55.00	-
Green peas	1	x	-	-	-
Green or wax beans	5	x	-	-	-

Table 12 provides a comparison of Halton Hills Township and Halton Regional Municipality Census (2016) data for livestock inventories. As illustrated in Table 12, Halton Hills Township is a significant contributor to Halton Regional Municipality's livestock inventories, with the exception of poultry.

Halton Hills Township contribution to Halton Regional Municipality totals for 2016 indicate that Halton Hills Township contributes 46.90 percent of the total cattle and calves, 54.81 percent of steers, 50.48 of the beef cows, 54.88 percent of the dairy cows, 50.36 percent of total pigs, and 34.62 percent of total sheep and lambs. The review of the data indicates that there have been increases in Halton Hills Township's contribution to Halton Regional Municipality livestock totals since 2006 for total cattle and calves, steers, and total pigs. There has been a decrease in Halton Hills Township contribution to Halton Regional Municipality since 2006 for dairy cows and beef cows. There has been a slight increase in the contribution to total hens and chickens since 2006.

Table 12 Comparison of Township and Region Census Data 2016 – Livestock

Item	Halton Hills Township	Halton Regional Municipality	Percent of Region of Halton 2016	Percent of Region of Halton 2011	Percent of Region of Halton 2006
Livestock Inventories, 2016 Census (number)					
Total cattle and calves	1,505	3,209	46.90	54.45	34.96
Steers	211	385	54.81	65.76	23.24
Beef cows	417	826	50.48	53.99	58.06
Dairy cows	208	379	54.88	66.31	64.62
Total pigs	70	139	50.36	0.00	0.00
Total sheep and lambs	548	1,583	34.62	49.33	34.05
Poultry Inventories, 2016 Census (number)	1,454	162,456		25.95	0.00
Total hens and chickens			0.90		
Total turkeys	14	x	-	-	-

In general terms, the Halton Regional Municipality is a large contributor to the Provincial agricultural production of fruit crops. Halton Hills Township is a small contributor to the Province of Ontario agricultural production but is a large contributor to Halton Regional Municipality apple crop production. Further, in general terms, Halton Hills Township is a significant contributor to Halton Regional Municipality livestock production.

5 RESOURCE ALLOCATION AND CONFLICT POTENTIAL

Land use planning decisions involve trade-offs among the competing demands for land. The fundamental base used for the evaluation of agricultural lands is land quality, i.e. CLI soil capability ratings. Within the rural/urban interface, there are a number of other factors which contribute to the long-term uncertainty of the economic viability of the industry and these, in turn, are reflected in the lack of investments in agricultural facilities, land and infrastructure and changes to agricultural land use patterns in these areas. Several of these factors include, but are not limited to, the presence of rural non-farm residents, land fragmentation, intrusions of non-agriculture land uses, non-resident ownership of lands and inflated land values. This section summarizes the impact of these factors on agriculture in the area.

5.1 IMPACTS, ASSESSMENT AND COMPATABILITY WITH SURROUNDING LAND USES

The identification and assessment of potential impacts is paramount to determining potential mitigation measures to either eliminate or offset the impact to the extent feasible. A review of the *Draft Agricultural Impact Assessment Guidance Document,* (OMAFRA 2018) identified numerous potential impacts to agriculture which may include:

- Interim or permanent loss of agricultural lands
- Fragmentation, severing or land locking of agricultural lands and operations
- The loss of existing and future farming opportunities
- The loss of infrastructure, services or assets
- The loss of investments in structures and land improvements
- Disruption or loss of functional drainage systems
- Disruption of loss of irrigation systems
- Changes to soil drainage
- Changes to surface drainage
- Changes to landforms
- Changes to hydrogeological conditions
- Disruption to surrounding farm operations
- Effects of noise, vibration, dust
- Potential compatibility concerns
- Traffic concerns
- Changes to adjacent cropping due to light pollution

It should be noted that this Agricultural Impact Assessment (AIA) report should be read in conjunction with all other discipline reports in an effort to provide an adequate evaluation of the above-mentioned potential impacts that are beyond the scope of agriculture.

Documented within this report is the agricultural character of both the Study Area and the Secondary Study Area. It has been determined that the Study Area is located within an area

that falls under the policy of the *Niagara Escarpment Plan,* (2017*)* and comprised Escarpment Rural Area lands. Similarly, the Secondary Study Area also falls under the policy of the Niagara Escarpment Plan and is comprised of Escarpment Natural Area, Escarpment Rural Area and Mineral Resource Extraction Area.

It has been documented that the Study Area is bordered on three sides by existing quarry operations, and on the fourth side by woodlands and the Niagara Escarpment. There is an unopened road allowance along the southwest side of the Study Area, between the existing quarry operations and the Study Area. As a result, there is no open road access to the Study Area without crossing access to the existing quarry operations.

It has also been shown that large portions of the Secondary Study Area land use comprise the existing quarry lands, woodlands, and escarpment areas.

The Study Area comprises three parcels (two small, one large). The Secondary Study Area comprises larger parcels (associated with the quarry operations, woodlands, and the escarpment area), with a few smaller parcels along Nassagaweya Esquesing Townline, to the northwest.

These types of fragmentation (and business/commercial intrusions) are a clear indication of an area impacted by non-agricultural uses.

With respect to the potential impacts as listed on the previous page of this report, and the proposed future MQEE, the following provides some context as to the extent of the potential impacts.

- Interim or permanent loss of agricultural lands – portions of the Study Area are considered as an Agricultural System outside the Prime Agricultural Area in the *Halton Region Official Plan* (Office Consolidation June 19, 2018) Map 1 – Regional Structure. The Provincial Policy Statement definitions indicate that these lands would be considered as rural lands. There will be a permanent loss of the use of these rural lands.
- Fragmentation, severing or land locking of agricultural lands and operations – there will be no fragmentation, severing or landlocking of agricultural lands as a result of the proposed MQEE.
- The loss of existing and future farming opportunities – there will be no loss of existing farming opportunities, as the lands are not, and have not been used for agriculture in at least 20 years. There may be a loss of the potential for future farming opportunities on the Study Area.
- The loss of infrastructure, services or assets – there is no loss of infrastructure, services or assets as a result of the proposed MQEE.
- The loss of investments in structures and land improvements – there is no net loss of investment in agriculture as a result of the proposed MQEE.
- Disruption or loss of functional drainage systems – there is no net loss of artificial tile drainage on the Study Area, and there is no net loss or disruption to artificial tile drainage systems in the Secondary Study Area.

- Disruption of loss of irrigation systems – there is no loss of investment in irrigation systems.
- Changes to soil drainage – there will be no net change in soil drainage for agriculture in the Secondary Study Area as a result of the proposed MQEE.
- Changes to surface drainage – there will be no net change in surface drainage for agriculture within the Secondary Study Area as a result of the proposed MQEE.
- Changes to landforms – there will be no changes to landforms (with respect to agriculture) in the Secondary Study Area as a result of proposed MQEE.
- Changes to hydrogeological conditions – are addressed under separate cover by the hydrogeological consultant. There are no changes to hydrogeological conditions that impact agricultural operations.
- Disruption to surrounding farm operations – there will be no disruption on surrounding/adjacent farms as the proposed future MQEE is in an area with no agricultural lands in close proximity.
- Effects of noise, vibration, dust – there should be limited potential for additional noise, vibration, and dust during the operations of the proposed MQEE due to the separation distance to surrounding agricultural operations.
- Potential compatibility concerns – there will be limited potential for compatibility concerns with the proposed MQEE as there are no adjacent agricultural lands in the Secondary Study Area.
- Traffic concerns – Traffic issues will be limited in scope as this is a proposed extension of an existing quarry that has an extensive internal road system with access to an existing and extensive road network.
- Changes to adjacent cropping due to light pollution – there will be no potential for changes in cropping or crop production due to light pollution, as the proposed MQEE will be of sufficient distance from any agricultural lands that if there was any light pollution, the light would not be a factor in causing crop issues.

5.2 TRAFFIC, TRESPASS AND VANDALISM

Specific to agriculture, increased vehicle traffic along roadways can lead to safety issues with respect to the movement of slow moving, long, wide farm machinery and, as well, interrupt or alter farm traffic flow patterns.

Trespassing and vandalism impacts are generally related to development within agricultural areas predominated by specialty crop operations or large livestock operations, and in areas of close proximity to urban environments.

Traffic patterns for the proposed MQEE will remain consistent with the existing traffic pattern. Vehicle traffic will make use of an internal road system with access to the existing and extensive municipal road network.

Trespassing and vandalism are more often a concern with specialty crop operations and livestock operations. The location of the proposed MQEE, in addition to the extensive woodland/natural areas, help to separate any potential interactions with neighbouring lands.

5.3 AGRICULTURAL INFRASTRUCTURE

The reconnaissance level land use survey did not identify any agricultural equipment dealers, seed dealers/cleaning/drying services or farm equipment maintenance service businesses within the Study Area or Secondary Study Area.

A review of the *Agricultural System Portal* (OMAFRA) was completed to identify the presence of any livestock assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries within the Study Area. None of these features was identified within the Study Area or the Secondary Study Area.

The lack of local agricultural business and infrastructure is also indicative of areas in limited or marginal agriculture activities, as these services rely on the business supplied by the local farm operators.

5.4 MITIGATION MEASURES

Mitigation measures are generally designed and integrated to offset any potential negative impact that may occur as the result of a development in or adjacent to a Prime Agricultural Area. It has been identified that neither the Study Area nor the Secondary Study Area is within a Prime Agricultural Area. The following provides general comment and context on mitigation measures.

5.4.1 AVOIDANCE

Any change in land use within or adjacent to an identified or designated prime agricultural area will result in the potential for impacts to the adjacent agricultural area. The severity of the potential impacts is related to the type and size of the change in land use, and the degree of agricultural activities and operations in the surrounding area.

The first method of addressing potential impacts is to avoid the potential impact. In this study, the proposed MQEE will be a permanent use within the Town of Halton Hills. There are no designated prime agricultural lands within a prime agricultural area lost due to a proposed MQEE, as a result, direct impact to the Prime Agricultural Area, has been avoided.

5.4.2 MINIMIZING IMPACTS

When avoidance is not possible, the next priority would be to minimize impacts to the extent feasible. As a result, mitigation measures should be developed to lessen any potential impacts. The minimization of impacts may be achieved during the design process and through proactive planning measures that provide for the separation of land uses.

In this instance (proposed MQEE), any potential impacts to agricultural lands, will be related to potential impacts on the adjacent, designated agricultural lands within the Secondary Study Area.

As has been identified in this AIA, there are no designated agricultural lands within a prime agricultural area located within the Secondary Study Area.

Therefore, the potential methods of minimizing impacts are not necessary or required.

There will be no direct traffic from the proposed MQEE to the agricultural lands.

The quarry will maintain appropriate procedures for mitigating noise, dust, traffic, and blasting activities in the proposed MQEE.

5.4.3 MITIGATING IMPACTS

When avoidance techniques and minimizing potential impacts to agriculture have not achieved the desired effect the next priority is to mitigate any further impact. Again, it is noted that the Study Area is not considered as prime agricultural land, or in a prime agricultural area. The following potential mitigation measures are generally considered for protection of agricultural lands from non-compatible land uses. In the case of the proposed MQEE, these mitigation measures are not required or recommended.

Potential mitigation measures may include:

- The creation of berms or vegetated feature between the different types and intensities of land uses to reduce the potential for trespassing and potential vandalism. These types of buffers reduce impacts by preventing trespassing and associated problems such as litter, vandalism and dogs running at large. Effective buffers between agriculture and urban uses may combine a separation of uses, vegetation/plantings and berms. Vegetated buffers should include the use of deciduous and coniferous plants, with foliage from base to crown. These types of plantings will be effective in the capture of dust and spray drift.
- The use of adequate fencing between the different types of land uses to reduce the potential for trespassing and potential vandalism.
- The use of signage between the different types and intensities of land uses to indicate No Trespassing, Private Property and Open Pit.
- The use of plantings/vegetation as screens and buffers to reduce visual impacts and sounds.

- The use of reduced speed limits in the agricultural areas.
- Implementation of surface and/or groundwater monitoring in areas where agricultural operations make use of surface or groundwater as part of their normal farm practices. It is understood that Dufferin Aggregates maintains and continues to monitor groundwater resources as part of their existing permit. This monitoring program will continue for the proposed MQEE.
- Limit the use of tall streetlights or use lighting that is directed down and away from agricultural lands. Limit the use of any type of lighting (high pressure sodium (HPS) lights, and LED lights are known to interfere with soybean production) that has a negative effect on agricultural lands, livestock or crops.
- The use of design elements to direct traffic away from farming areas. It is understood that the traffic related to the proposed MQEE will be maintained through an internal road system, with the access and egress from the proposed MQEE, to be continued through the existing gate and scale system, with traffic to the existing road system on Dublin Line.

This AIA has provided comment on the avoidance (if possible), minimizing potential impacts and mitigation measures in the instances where avoidance is not possible.

6 SUMMARY AND CONCLUSIONS

DBH Soil Services Inc. was retained to complete an Agricultural Impact Assessment (AIA) for the Dufferin Aggregates proposed Milton Quarry East Extension (MQEE). The Dufferin Aggregates proposed MQEE is contiguous with the existing Milton Quarry East Cell to the north, the existing North Quarry to the west, and the existing Main Quarry at a distance to the south/southwest.

The proposed extension area is located within Part Lot 12, Concession 1, Town of Halton Hills (formerly Town of Esquesing), in the Regional Municipality of Halton. The Study Area was defined according to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) *Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018) as the proposed licensed area.*

The proposed MQEE is located approximately 3.5 km northwest of Milton, 3.8 km northwest of Highway 401, 6.0 km northeast of the hamlet of Campbellville, and 9.25 km southwest from Georgetown.

The Study Area is comprised of large areas of open field, with the remaining are in woodlands. The Secondary Study Areas comprise a mix of land uses including rural uses, woodlands, existing quarry lands/quarry ponds, escarpment lands, golf course and small areas of agricultural lands.

A request by the Niagara Escarpment Commission and the Region of Halton at the Pre-Consultation/Development Review Committee Meeting (November 12, 2020) necessitated this study despite the site being located outside a prime agricultural area. Further, this AIA was completed as per the requirements identified in the *DBH Soil Services Inc. Agricultural Impact Assessment (AIA) Terms of Reference (March 5, 2021)*.

The results of this Agricultural Impact Assessment are presented below:

- **Geographical Limits**

  The Study Area is located in the Flamborough Plain Physiographic unit and the Secondary Study Area is comprised of the Flamborough Plain and Niagara Escarpment Physiographic units.

  The Flamborough Plain Physiographic unit is described as an isolated tract of shallow drift above the brow of the Niagara Escarpment. A few drumlins are found scattered over this plain. The plain is drained by small streams, and good soil is not abundant in this physiographic unit.

  The Niagara Escarpment Physiographic unit is described as an area that extends from the Niagara River to the northern tip of the Bruce Peninsula (Tobermory).

The Study Area comprises a relatively simple mix of gently undulating topography. The Secondary Study Area topography is influenced by the contours of the existing quarry lands with steeply sloping areas, ponded areas, escarpment areas and undulating topography.

The Study Area and Secondary Study Area are located near the 3100 Crop Heat Units (CHU-M1) available for corn production in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

A review of the OMAFRA soils and Canada Land Inventory (CLI) digital data indicated that the soils in the Study Area comprise Dumfries Loam and Farmington Loam – Rocky Phase soils. The Dumfries soils have been rated as CLI Class 3, while the Farmington Loam – Rocky Phase soils are rated as CLI Class 7. The extent of the Study Area lands in CLI Class 3 are primarily the open field areas and account for approximately 90.5 percent of the Study Area. The portion of the Study Area lands in the CLI Class 7 are generally associated with the woodland areas and account for approximately 9.5 percent of the Study Area.

The soils in the Secondary Study Area include Disturbed Soil Areas, Dumfries Loam, Farmington Loam – Rocky Phase, Colwood Loam – Shallow Phase, Oneida Silt Loam, and Escarpment areas. The majority of the Secondary Study Area is associated with the existing quarry lands and disturbed soils (transportation corridors) accounting for approximately 44.3 percent. The remainder of the Secondary Study Area is associated with the shallow soils (Farmington) that are located adjacent to the Escarpment area. Farmington soils and Escarpment lands account for approximately 45.6 percent of the Secondary Study Area, with CLI Class 3 soils occupying approximately 8.8 percent, and CLI Class 4 soils at approximately 1.3 percent.

- **Agricultural Policy**

It was determined that the Study Area was comprised of Escarpment Rural Area lands. The Secondary Study Area is comprised of portions of Escarpment Rural, Escarpment Natural Area, Escarpment Protection Area, and Mineral Resource Extraction Area (Licensed Pit or Quarry (<=20,000 tonnes)).

There are no municipal or Provincial Specialty Crop Lands within either the Study Area lands or the Secondary Study Area.

A review of the boundaries of the Greenbelt Plan area determined that both the Study Area and the Secondary Study Area are located within the Niagara Escarpment Plan area.

A review of the *Halton Region Official Plan* (Office Consolidation June 19, 2018) Map 1 – Regional Structure revealed that portions of the Study Area is identified as Agricultural

Area, with the remainder comprised of Regional Natural Heritage System. The Secondary Study Area was defined as a combination of Regional Natural Heritage System, Mineral Resource Extraction Area, and a small portion of Agricultural Area.

The Halton Region Agricultural System mapping (Map 1E of the Region of Halton Official Plan) illustrates that portions of the Study Area are defined as Agricultural System outside Prime Agricultural Areas.

The *Town of Halton Hills Official Plan* (May 1, 2019 Consolidation) was reviewed, and it was determined that both the Study Area and portions of the Secondary Study Area (area within the Town of Halton Hills) are located within the Niagara Escarpment Plan Area

A review of the *Town of Halton Hills Official Plan* (May 1, 2019 Consolidation*)* Schedule A2 – Greenbelt Plan indicates that the Study Area is comprised of Escarpment Rural lands. The portions of the Secondary Study Area that are located within the Town of Halton Hills are designated as Escarpment Natural Area, possibly Greenlands A, Mineral Resource Extraction Area, and Escarpment Protection Area.

A review of the *Town of Milton Official Plan (2008)* indicates that the portions of the Secondary Study Area that are in the Town of Milton comprise portions of Mineral Resource Extraction Area and Escarpment Natural Area.

A review of *Town of Halton Hills Zoning By-Law 2010-0050* (Consolidated December 2019) determined that the Study Area and portions of the Secondary Study Area are located within the Niagara Escarpment Development Control Area.

A review of the *Town of Milton Comprehensive Zoning By-Law 144-2003 Rural Area* (Consolidated December 2020) determined that portions of the Secondary Study Area are located within the Niagara Escarpment Commission Area of Development Control.

No lands within the Study Area or Secondary Study Area are located within any Provincially designated Specialty Crop areas or in any municipally zoned specialty crop area.

- **Agricultural Land Use**

The onsite survey has revealed that the Study Area comprises approximately 93.2 percent as open field, and approximately 6.8 percent as woodland areas. There are no active agricultural operations on the Study Area. There are no buildings of any kind located on the Study Area lands.

The Secondary Study Area comprises approximately 38.5 percent as disturbed lands (including built up, disturbed soils and existing quarry land), approximately 5.5 percent as quarry pond, 2.0 percent as ponded areas, 0.1 percent as recreational uses (golf course), and the remaining 53.6 percent as woodland areas.

On review of the Land Use data, it was observed that the predominant land uses in the Secondary Study Area include disturbed areas (predominantly existing quarry lands) and woodlands. There are no agricultural land uses in the Secondary Study Area.

- **Agricultural Investment**

  There were no agricultural buildings located in the Study Area. There is no capital investment related to buildings (agricultural or other) in the Study Area.

  There were no agricultural buildings located in the Secondary Study Area. There is no capital investment related to buildings (agricultural or other) in the Secondary Study Area.

  There will be no loss of any agricultural facilities as a result of the proposed MQEE.

  There is no investment in artificial tile drainage or irrigation on the Study Area or the Secondary Study Area.

  There is no investment in irrigation in either the Study Area or the Secondary Study Area.

  There is no investment in landforming for agricultural purposes in either the Study Area or the Secondary Study Area.

  A review of the online *Agricultural System Portal* (OMAFRA) indicated that there were no nurseries, specialty farms (crop or livestock), frozen food manufacturing in the Study Area or Secondary Study Area.

  There are no agricultural services within the Study Area or Secondary Study Area.

  The closest transportation network (major roadway) is Highway 401 which is located to the south of the Study Area.

- **Land Fragmentation**

  Land fragmentation represents a major impact to the long-term viability of agriculture in the Secondary Study Area and is typical of areas under pressure from non-agricultural land uses.

  The Study Area is comprised of 3 parcels. Two of the parcels are small areas (less than 9.9 acres) located adjacent to the unopened road allowance, while the third parcel comprised the majority of the Study Area.

  The majority of the Secondary Study Area comprised the 130.0 – 179.9 acre range and the greater than 180 acre range. There are a few smaller parcels along the Nassagaweya Esquesing Townline to the northwest, and a few smaller parcels to the northeast. The

larger parcels appear to be associated with the existing quarry operation, and the natural areas associated with the Escarpment to the south, and the woodland areas to the north/northwest.

There are no residential units or livestock operations within the Secondary Study Area.

The foregoing represents a comprehensive Agricultural Impact Assessment with the purpose of evaluating the Study Area and Secondary Study Area to document the existing agricultural character and to determine any potential impacts to agriculture as a result of the proposed future extension of the Dufferin Aggregates Milton Quarry on the Study Area.

Given the geographical location of these lands, it is the conclusion of this study that the proposed future development of the Dufferin Aggregates MQEE (Study Area lands) would have no additional impact on the surrounding agricultural activities within the Secondary Study Area. It is my opinion that these lands can reasonably be used for the proposed MQEE.

Sincerely
DBH Soil Services Inc.

Dave Hodgson, P. Ag
President

7 REFERENCES

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APPENDIX A

Unique Soil Symbols and Canada Land Inventory (CLI) List

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
10	N	0	5	I	
11	N	0	7	T	
12	f	0	7	R	T
13	N	0	7	R	
B.L.	N	0	5	I	
Ba	A	0	2	F	
Ba	B	0	2	F	
Ba	c	I	2	F	
Ba	C	0	2	F	
Be	B	0	2	F	
Be	c	0	2	F	
Bl	b	2	2	F	
Bl	C	0	2	F	
Bl	c	2	2	F	
Bl	c	I	2	F	
Br	d	3	5	R	
Bs	C	0	4	F	R
Bu	C	2	2	F	M
Bu	c	I	2	F	M
Bu	d	I	3	T	
Bu	d	2	3	T	
Bu	e	2	4	T	
Bu	e	3	4	T	
Cd	A	0	2	W	
Cd	B	0	2	W	
Ch	A	0	I		
Ch	a	I	I		
Ch	B	I	I		
Ch	b	0	I		
Ch	B	2	I		
Ch	C	0	I		
Ch	C	I	I		
Ch	C	2	I		
Ch	d	I	I		
Ch	f	I	I		
Ci	C	I	I		
Ck	C	I	2	F	
Cl	c	I	I		

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
Co	A	0	2	W	
Co	a	1	2	W	
Co	B	0	2	W	
Co	C	0	2	W	
Cs	A	0	4	R	W
Cs	B	0	4	R	W
Dk	a	1	4	F	M
Dk	B	2	4	F	M
Dk	C	2	4	F	M
Dk	d	3	4	S	T
Dk	d	2	4	S	T
Dk	e	3	4	S	T
Dk	e	4	4	S	T
Dk	f	3	6	T	S
Dk	g	1	6	T	S
Dl	a	3	3	S	P
Dl	c	3	3	S	P
Dl	c	4	3	S	P
Dl	d	4	3	M	F
Dl	d	3	3	S	P
Dl	d	2	3	S	P
Dl	e	3	4	S	T
Dl	e	2	4	S	T
Dl	e	0	4	S	T
Dl	e	4	5	P	
Dl	f	3	5	T	
Dl	f	4	5	T	
Dr	d	3	6	R	P
Dr	d	4	6	R	P
Ds	d	3	6	R	P
Du	e	3	4	S	T
Fl	A	2	6	R	
Fl	b	1	6	R	
Fl	c	4	6	R	
Fl	c	2	6	R	
Fl	c	1	6	R	
Fl	c	3	6	R	
Fl	c	0	6	R	
Fl	d	3	6	R	
Fl	d	2	6	R	

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
Fl	d	4	6	R	
Fl	d	1	6	R	
Fl	E	2	6	R	
Fl	e	1	6	R	
Fn	A	0	2	F	M
Fn	a	1	2	F	M
Fn	c	1	2	F	M
Fn	D	0	2	S	T
Fn	d	1	3	T	
Fn	d	0	3	T	
Fn	d	2	3	T	
Fn	d	3	3	T	
Fn	e	0	4	T	
Fo	b	0	2	F	M
Fo	b	1	2	F	M
Fo	c	2	2	F	M
Fo	d	2	3	S	T
Fo	d	1	3	S	T
Fo	d	3	3	S	T
Fo	e	3	4	S	T
Fo	e	2	4	S	T
Fo	f	2	5	T	
Fo	f	3	5	T	
Fo	g	0	6	T	
Fp	e	2	4	R	T
Fr	d	3	7	R	
Fr	d	4	7	R	
Fs	b	3	5	R	
Gf	B	2	4	W	
Gf	e	2	4	W	
Gi	B	0	2	F	M
Gi	C	0	2	F	M
Gi	c	1	2	F	M
Gi	c	2	2	F	M
Gi	D	1	2	S	T
Gi	d	2	3	T	
Gi	e	0	4	T	
Gi	e	1	4	T	
Gi	e	2	4	T	
Gi	f	2	5	T	

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
Gi	f	0	5	T	
Gl	c	2	1		
Gl	c	1	1		
Gl	c	0	1		
Gl	d	2	3	T	
Gl	D	1	3	T	
Gl	E	2	4	T	
Gl	E	1	4	T	
Gl	F	1	5	T	
Gl	f	2	5	T	
Gl	f	0	5	T	
Gp	c	2	5	R	
Gr	a	0	5	W	
Gr	B	0	5	W	
Gs	c	2	3	R	
Gs	d	2	3	R	T
Gu	c	1	1		
Gu	d	2	3	T	
Gu	D	1	3	T	
Gu	e	2	4	T	
Jc	B	1	3	D	W
Jc	B	0	3	D	W
Jc	B	2	3	D	W
Jc	C	1	3	D	W
Kl	b	2	4	P	W
Kl	c	2	4	P	W
Kl	c	3	4	P	W
Kl	d	3	4	P	W
Lc	a	1	2	D	
Lc	D	1	3	E	T
Lc	E	2	4	T	
Lc	f	1	5	T	
Lc	f	2	5	T	
Lc	f	0	5	T	
Lc	g	2	5	D	
Li	B	3	5	P	W
Li	c	3	5	P	W
Li	C	2	5	P	W
Li	C	1	5	P	W
Li	d	3	5	P	W

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
Ll	B	3	1		
Ll	b	2	1		
Ll	c	2	1		
Lo	C	2	1		
M	A	0	O		
Ma	A	0	7	1	
Ml	A	0	4	D	W
Ml	C	1	4	D	W
Ms	A	0	O		
Oi	D	2	3	T	
Oi	d	1	3	T	
Oi	d	3	3	T	
Oi	e	2	4	T	
Oi	F	2	5	T	
Ol	c	1	1		
Ol	D	1	3	T	
Ol	d	2	3	T	
Ol	e	1	4	T	
Ol	f	1	5	T	
On	A	0	1		
On	a	1	1		
On	A	2	1		
On	B	1	1		
On	B	0	1		
On	c	0	1		
On	C	1	1		
On	c	2	1		
On	D	2	3	T	
On	D	1	3	T	
On	D	0	3	T	
On	e	2	1		
On	e	1	1		
On	E	2	4	T	
On	E	0	4	T	
On	E	1	4	T	
On	F	2	5	T	
On	F	1	5	T	
On	G	1	6	T	
Or	A	0	5	P	
P	A	0	O		

SYMBOL1	CLASS1	STONINESS1	CLI1	CLI1_1	CLI1_2
Pl	A	1	2	W	
Pl	B	2	2	W	
Pl	c	2	2	W	
PT	N	N	0		
QY	N	N	0		
Sp	c	1	2	F	M
Sp	c	0	2	F	M
Sp	d	1	2	T	
Sp	e	1	3	T	
Tc	a	1	3	D	
Tc	c	1	3	D	
Tc	d	1	3	D	T
Tr	e	0	4	T	
Tr	f	0	5	T	
Tu	a	0	1		
Tu	B	0	1		
Tu	c	0	1		
UL	N	N	0		
Vi	c	0	2	F	
Vi	c	1	2	F	
Wi	b	0	2	F	
ZZ	N	N	W		

APPENDIX B

DAVE HODGSON CURRICULUM VITAE

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DAVID B. HODGSON, B.Sc., P. Ag.
PRESIDENT – Senior Pedologist/Agrologist

EDUCATION

- B.Sc. (Agriculture), 1983-1987; University of Guelph, Major in Soil Science
- Agricultural Engineering, 1982-1983; University of Guelph.
- Materials Science Technology, 1981-1982; Northern Alberta Institute of Technology (NAIT), Edmonton, Alberta.

AREAS OF PROFESSIONAL EXPERIENCE

2000 to Present — **Senior Pedologist/President. DBH Soil Services Inc., Kitchener, Ontario.**
Mr. Hodgson provides expertise in the investigation, assessment and resource evaluation of agricultural operations/facilities and soil materials. Dave is directly responsible for the field and office operations of DBH Soil Services and for providing advanced problem solving skills as required on an individual client/project basis. Dave is skilled at assessing soil and agricultural resources, determining potential impacts and is responsible for providing the analysis of and recommendations for the remediation of impacts to soil/agricultural/environmental systems in both rural and urban environments.

1992 to 2000 — **Pedologist/Project Scientist. Ecologistics Limited, Waterloo, Ontario.**
As pedologist (soil scientist), Mr. Hodgson provided expertise in the morphological, chemical and physical characterization of insitu soils. As such, Mr. Hodgson was involved in a variety of environmental assessment, waste management, agricultural research and site/route selection studies.
Dave was directly responsible for compiling, analysis and management of the environmental resource information. Dave is skilled at evaluating the resource information utilizing Geographic Information System (GIS) applications.

Dave was also involved the firms Environmental Audit and Remediation Division in the capacity of: asbestos identification; an inspector for the remediation of a pesticide contaminated site; and an investigator for Phase I and Phase II Audits.

SELECT PROJECT EXPERIENCE

Environmental Assessment Studies

- Agricultural Component of the Green for Life (GFL) Environmental, Moose Creek, Eastern Ontario Waste Handling Facility (EOWHF) Expansion, 2020 – 2021.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment, 2019 – ongoing.
- Peer Review of the Walker Environmental Group (WEG) Inc. Southwestern Landfill Proposal, Ingersoll, 2013 – ongoing.
- Agricultural Component for the High-Speed Rail Kitchener to London –Terms of Reference, 2018,
- Agricultural Component of the Mount Nemo Heritage District Conservation Study – City of Burlington, 2014 – 2015.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment – Phase 2, 2014 – 2016.
- Peer Review of the Agricultural Component of the Walker Group Landfill – Ingersoll, 2013 – 2015.
- Agricultural Component of the Highway 407 East Extension Design and Build Phase, 2012 – 2013.
- Agricultural Component of the Beechwood Road Environmental Centre (Landfill/Recycling) – Napanee, 2012 – 2013.

- Agricultural Component of the Clean Harbors Hazardous Waste Landfill Lambton County 2009 – 2015.
- Agricultural Component of the Highway 401 widening Cambridge to Halton Region 2009 – 2012.
- Agricultural Component of the Upper York Sanitary Sewer Study, York Region, 2009 – 2013.
- Agricultural Component of the Greater Toronto Area West Corridor Environmental Assessment Study 2007 – 2013 (Phase 1).
- Agricultural Component of the Niagara to GTA Planning and Environmental Assessment Study, 2007 – 2013.
- Agricultural Component of the Highway 401 widening, Chatham, 2006 - 2007.
- Agricultural Component of the Trafalgar Road study, Halton Region, 2005.
- Agricultural Component of the Highway 404 Extension North, 2004.
- Agricultural Component of the Highway 404 – 400 Bradford Bypass, 2004.
- Agricultural Component of the Highway 407 East Extension, 2002 – 2010.

Agricultural Impact Studies

- Milton, CRH Quarry Expansion, Agricultural Impact Assessment, 2020 – ongoing.
- Grimsby, Specialty Crop Area Redesignation, Agricultural Impact Assessment, 2020-ongoing.
- Halton Hills, Premier Gateway Phase 2 Employment Lands Secondary Plan, Agricultural Impact Assessment, 2020-ongoing.
- Milton Education Village Secondary Plan, Agricultural Impact Assessment, 2020-ongoing.
- Woodstock, Pattullo Avenue Realignment, Agricultural Impact Assessment, 2020-ongoing.
- Smithville, West Lincoln Master Community Plan, Agricultural Impact Assessment, AECOM, 2019 – On-going.
- Kirby Road Agricultural Impact Assessment, HDR, Vaughan, 2019 – On-going.
- Elfrida Lands, City of Hamilton, Agricultural Impact Assessment Update, WSP, 2019 – On-going.
- Dorsay Development – Durham Region High Level Agricultural Assessment, 2019.
- Stoney Creek Landfill AIA Update – GHD, 2019.
- Town of Wilmot, Agricultural Impact Assessment (AIA) Aggregate Pit Study (Hallman Pit), 2018, On-going.
- Courtice Area South East Secondary Plan (Clarington) Agricultural Impact Assessment (AIA), 2019,
- Town of Halton Hills, Minimum Distance Separation (MDS 1), August 2018,
- Cedar Creek Pit/Alps Pit (North Dumfries), Agricultural Impact Assessment (AIA), 2018 – On-going,
- Belle Aire Road (Simcoe County) Agricultural Impact Assessment (AIA) Study, 2019,
- Vinemount Quarry Extension (Niagara) Agricultural Impact Assessment (AIA) Study, December 2017.
- Grimsby – Agricultural Impact Assessment Opinion, November 2017.
- City of Hamilton, Urban Core Developments – Agricultural Capability Assessment, February 2017.
- Township of North Dumfries – Minimum Distance Separation (MDS 1), February 2017.
- Township of Erin, County of Wellington – Minimum Distance Separation 1(MDS1 Study), 2016.
- Halton Hills Employment Area Secondary Plan, Halton, 2015 - 2016.
- Peer Review of Agricultural Impact Assessment, Oro-Medonte Township, 2015.
- Greenwood Construction Aggregate Pit, Mono Township, 2014 - 2015.
- Innisfil Mapleview Developments, Town of Innisfil – Minimum Distance Separation (MDS 1), 2014.
- Loyalist Township – Minimum Distance Separation (MDS 1 & 2), 2014.
- Rivera Fine Homes, Caledon – Minimum Distance Separation (MDS 1), 2014.
- Town of Milton PanAm Velodrome – Minimum Distance Separation (MDS) 2012 – 2013.

Soil Surveys/Soil Evaluations

- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2020-2021.
- City of Kitchener, City Wide Soil Study, 2020-ongoing.
- Soil Survey, Fallowfield Drive, City of Kitchener Development Manual Study, 2020-ongoing.
- Soil Survey, Williamsburg Estates, City of Kitchener Development Manual Study, 2020-ongoing.
- Soil Survey, South Estates, City of Kitchener Development Manual Study, 2020-ongoing.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Maryhill Pit, 2019.

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- Soil Survey and Canada Land Inventory Evaluation, Glen Morris Pit, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Brantford Pit Extension, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Pinkney Pit Extension, Lafarge Canada, May 2018,
- Soil evaluation and opinion, King-Vaughan Road, March 2018,
- Soil Sampling, Upper Medway Watershed, Agriculture and Agri-Food Canada. December 2017 – June 2018.
- Soil Survey and Canada Land Inventory Evaluation, Hillsburgh Pit Extension, SBM St Marys, December 2017.
- Soil Survey and Canada Land Inventory Evaluation, Erin South Pit Extension, Halton Crushed Stone, December 2017.
- City of Kitchener, City Wide Urban Soil Assessments, 2016 – On-going.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT) Program Study, 2016.
    - Bruce County (15 sites)
    - Grey County (4 sites)
- Soil Survey and Canada Land Inventory Evaluation, Wasaga Beach area, County of Simcoe, 2016.
- Soil Survey and Canada Land Inventory Evaluation Study, MHBC Bradford, Simcoe County, 2016.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Carbon Foot Print Offsetters, Durham Region, 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Abundant Solar Energy (12 Sites – Peterborough, Madoc, Havelock, Belleville), 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), City of Hamilton, 2015.

Municipal Comprehensive Review Studies (MCR)

- Simcoe County, 2020-ongoing.
- Northhumberland County, 2020-ongoing.
- Halton Region, 2019-ongoing.

Land Evaluation and Area Review Studies (LEAR)

- Mapping Audit Halton Region. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2019 - ongoing.
- Land Evaluation and Area Review – Soils Component, in Association with AgPlan Ltd, Kanata/Munster. December 2017 – July 2018.
- Land Evaluation and Area Review – Soils Component, Prince Edward County, 2016 – 2017.
- Land Evaluation and Area Review – Soils Component, Peel Region, 2013 - 2014.
- Land Evaluation and Area Review, Minto Communities, Ottawa, 2012 – 2013.
- GIS and LE component of Land Evaluation and Area Review, York Region 2008 – 2009.
- Land Evaluation and Area Review, Mattamy Homes, City of Ottawa – Orleans, 2008 – 2009.
- GIS for Manitoba Environmental Goods and Services (EG&S) Study. 2007 – 2008.
- GIS and LE component of Land Evaluation and Area Review, Halton Region 2007 - 2008.
- GIS and LE component of Land Evaluation and Area Review, City of Hamilton, 2003 – 2005.

Expert Witness

- Local Planning Appeal Tribunal (LPAT) Hearing, Greenwood Aggregates Limited, Violet Hill Pit Application, 2020.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds 2018-2019.
- Town of Mono Council Meeting, Greenwood Aggregates Violet Hill Pit, January 2018.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds, Simcoe County, 2015 – 2016.
- Ontario Municipal Board (OMB) Hearing, Town of Woolwich, Gravel Pit, 2012 – 2013.
- Ontario Municipal Board (OMB) Hearing, Mattamy Homes – City of Ottawa, 2011 – 2012.
- Ontario Municipal Board (OMB) Hearing, Town of Colgan, Simcoe County, 2010.
- Presentation to Planning Staff on behalf of Mr. MacLaren, City of Ottawa, 2005.
- Ontario Municipal Board (OMB) Hearing, Flamborough Severance, 2002.

- Preparation for an Ontario Municipal Board Hearing, Flamborough Golf Course, 2001.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Wetland Delineation Assessment, 2000.
- Ontario Municipal Board (OMB) Hearing, Watcha Farms, Grey County, Agricultural Impact Assessment – Land Use Zoning Change, 1999-2000.
- Ontario Municipal Board (OMB) Hearing, Town of St. Vincent Agricultural Impact Assessment – Land Use Zoning Change, 1999 – 2000.
- Halton Agricultural Advisory Committee (HAAC), Halton Joint Venture Golf Course Proposal - Agricultural Impact Assessment for Zoning Change, 1999-2000
- Halton Agricultural Advisory Committee (HAAC), Sixteen Mile Creek Golf Course Proposal – Agricultural Impact Assessment for Zoning Change, 1999.
- Ontario Municipal Board (OMB) Hearing, Town of Flamborough, Environs Agricultural Impact Assessment for Zoning Change – Golf Course Proposal, 1999.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Agricultural Impact Assessment, 1998.

Monitoring Studies

- Union Gas/Enbridge Gas – Gas Pipeline Construction Monitoring – Mainline Construction (20 “) – Kingsville – 2019 - 2020.
- Union Gas/Enbridge Gas – Gas Pipeline Construction Monitoring for Tree Clearing. Kingsville Project. February/March 2019.
- CAEPLA – Union Gas 36” Gas Pipeline Construction Monitoring and Post Construction Clean Up – Agricultural Monitoring Panhandle Project. 2017 – 2018.
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