AGRICULTURAL IMPACT ASSESSMENT FOR PROPOSED UPPERS QUARRY
PART LOTS 119, 120, 136, & 137
FORMER TOWNSHIP OF STAMFORD, CITY OF NIAGARA FALLS

Prepared for:

Prepared by:

Colville Consulting Inc.
432 Niagara Street,
St. Catharines, Ontario L2M 4W3

Project Number: C16075
Date: September 2021

EXECUTIVE SUMMARY

Colville Consulting Inc. was retained by Walker Aggregates Inc. to prepare an Agricultural Impact Assessment (AIA) for the proposed Uppers Quarry in Niagara Falls, Ontario. The Subject Lands are located in the Greater Golden Horseshoe and are located in a prime agricultural area. The Places to Grow: Growth Plan for the Greater Golden Horseshoe (2019) requires that an AIA be prepared for new development proposed in prime agricultural areas. An AIA is "a study that evaluates the potential impacts of non-agricultural development on agricultural operations and the Agricultural System and recommends ways to avoid or, if avoidance is not possible, minimize and mitigate adverse impacts." (Growth Plan).

The Ontario Ministry of Agriculture, Food and Rural Affairs have developed the draft Agricultural Impact Assessment Guidance Document (2018) which provides direction on the preparation of an AIA for aggregate extraction applications. Colville Consulting Inc. prepared this AIA using OMAFRA's guidance document to identify potential impacts resulting from the proposed quarry operation and developed, where possible, provide mitigation measures to avoid, minimize and mitigate impacts on agricultural operations and the local Agricultural System.

The proposed Uppers Quarry application will be for a Category 2, Class "A" Quarry Below Water license application. Agricultural rehabilitation will not be feasible. The lands are equivalent in productivity to CLI Class 3 lands. The eventual loss of these lower priority prime agricultural lands is unavoidable and has been identified as the most significant impact on agriculture. However, the proposed quarry will not retire any farm infrastructure, investment in land improvements such as tile drainage, and, with the implementation of the proposed mitigation measures, it is not expected to have any negative impacts on farming operations in the Study Area or on the local Agricultural System.

The AIA evaluated potential alternative locations and determined that the choice of location is reasonable and meets provincial policy requirements for locating a non-agricultural use in a prime agricultural area. The AIA concluded that with the implementation of the recommended mitigation measures, the proposed Uppers Quarry the impact will be limited mainly to the permanent loss of approximately 106.3 ha of lower priority agricultural lands. The proposed quarry operation will be compatible with the surrounding agricultural land uses and will comply with Provincial and Municipal agricultural policies.

TABLE OF CONTENTS

LIST OF TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

Walker Aggregates Inc. (Walker) is proposing to establish a new quarry to extract limestone/dolostone in Niagara Falls, Ontario. Extraction of aggregate material will extend below the water table and therefore Walker will be applying for a Category 2, Class "A" licence.

The proposed quarry is separated by two municipal road allowances, Upper's Lane and an unopened road allowance. These roads divide the proposed quarry into three extraction areas; the north extraction area (north of Upper's Lane), the mid extraction area (the lands between Upper's Lane and the unopened road allowance), and the south extraction area (located south of the unopened road allowance). The entirety of the proposed quarry is located within a prime agricultural area and is designated "Good General Agricultural" within the Regional Niagara Official Plan and designated "Good General Agriculture" within the City of Niagara Falls Official Plan Schedule A – Official Plan Future Land Use.

The Provincial Policy Statement (PPS) permits aggregate extraction on prime agricultural lands in prime agricultural areas; however, the PPS requires that alternative sites be investigated and impacts on surrounding agricultural operations and lands be assessed and mitigated to the extent feasible.

Colville Consulting Inc. was retained by Walker in November of 2016 to conduct an Agricultural Impact Assessment (AIA) for the proposed new quarry which is referred to herein as the proposed Uppers Quarry. An AIA is a tool used to identify, evaluate and minimize the potential impacts on agricultural operations and surrounding agricultural systems whenever new, non-agricultural land uses are proposed in agricultural areas. This AIA has been prepared in accordance with the *Agricultural Impact Assessment (AIA) Guidance Document (2018)* prepared by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). As such it addresses the applicable provincial and municipal policies for locating new aggregate operations in agricultural areas; an overview of which is provided in Section 1.5.

1.1 Purpose of the Study

The purpose of the AIA is to identify and evaluate potential impacts of the proposed new quarry on the local *Agricultural System* and to recommend mitigation measures that avoid, minimize and/or eliminate identified potential adverse impacts to the extent feasible. The AIA is required to satisfy provincial and municipal requirements for new, non-agricultural land uses proposed in agricultural areas.

The AIA assesses both the Subject Lands and a broader Study Area the size of which was determined based on the size and scale of the proposed land use and in accordance with recommendations provided in the Agricultural Impact Assessment (AIA) Guidance Document. The AIA characterizes the agricultural operations and agricultural resources within the Primary Study Area (i.e. Subject Lands and immediate adjacent area) and broader Secondary Study Area through review of available background information, field studies and discussions with the proponent.

The AIA includes an alternate site evaluation to determine whether other alternate locations exist which could avoid potential adverse impacts on agricultural operations and resources. Upon settling on the

proposed location, potential adverse impacts were identified and evaluated. Mitigation measures were then developed to avoid and/or reduce any adverse impacts are provided. The evaluation of net impacts assumes all recommended mitigation measures are implemented. The AIA also includes a general plan for monitoring of the project following the implantation of mitigation measures in order to ensure that measures are effective.

One means typically employed to reduce impacts related to loss of agricultural lands is to progressively rehabilitate the site and restore the agricultural capability of the affected lands. In this case, rehabilitation to an agricultural use is not feasible because extraction will take place below the water table. In addition, the Minimum Distance Separation (MDS) requirements do not apply to aggregate operations and have not been addressed within this report.

1.2 Description of Development

The proposed quarry operation will have a maximum annual tonnage limit of approximately 1.8 million tonnes, with fluctuation based on current market conditions. The lifespan of the operation is expected to be between 40 and 50 years dependant on market conditions and actual annual production rates.

The proposed after use following the completion of all extraction activities will be to create a recreational lake. The area is not suitable for rehabilitation to agricultural use due to significant extraction below the water table.

1.2.1 Alternate Extraction Scenario

In the event that Walker obtains permission from the City of Niagara Falls, extraction will include Uppers Lane and the unopened road allowance within the licence/extraction area. These roadways are not in agricultural production and do not appear provide a main transit or transportation corridor. The inclusion of the alternate extraction scenario for the proposed Uppers Quarry will not impact the results of the Agricultural Impact Assessment.

1.3 Study Scope

The study characterizes the lands within the Study Area, assesses the potential for alternative sites on lower capability agricultural lands and lower priority agricultural lands. The AIA provides an assessment of the proposed quarry conformity to all applicable agricultural policies, the agricultural resources, land uses and cropping patterns in the Study Area, an investigation of agricultural investments and infrastructure, and an assessment of any potential conflicts with surrounding agricultural operations within the Study Area.

1.3.1 Review of Background Information

One of the first tasks undertaken was to collect and review all relevant information required to meet the Study objectives. The background review included:

- a review of the soils information from the provincial digital soil resource database for the Subject Lands and published reports (*Soils of the Regional Municipality of Niagara*, Report No. 60; Sheet 5); the Greater Golden Horseshoe Growth Plan, the Implementation Procedures for the Agricultural System in Ontario's Greater Golden Horseshoe (2020) and the draft Agricultural Impact Assessment Guidance Document (2018);
- a review of Niagara Regional Official Plan (2014) and City of Niagara Falls Official Plan (2019) policies and land use designations;
- a review of the parcel fabric in the Study Area to assess the level of fragmentation of agricultural lands;
- a review OMAFRA's Agricultural Information Atlas, the Greater Golden Horseshoe Agricultural Systems Portal mapping to obtain agricultural resources information; and
- a review aerial photographic imagery to review the type and extent of agricultural operations on Site and in the surrounding area and to identify potential sources of conflict.

1.3.2 Field Work

A reconnaissance level, land use survey to:

- Identify the mix of land uses in the Study Area and where possible verify aerial photographic interpretation of land uses observed;
- Identify the agricultural crops grown in the Study Area;
- Identify the agricultural investments in infrastructure and land improvements;
- Identify the type and status (active vs. non-active) of farm operations potentially impacted by proposed aggregate extraction operations;
- Identify farm buildings (including empty livestock and/or retired farm infrastructure) and other key permanent facilities and other components of the agri-food network;
- Neighbouring farm communities and transportation network upon which the farm community relies on; and
- Other aggregate operations.

1.3.3 Analysis of Impact

To be consistent with the AIA Guidance Document (draft), potential negative effects of the proposed aggregate extraction operation on agriculture was evaluated through an assessment of:

- The quality and quantity of agricultural land impacted;
- Fragmentation of agricultural lands and operations;
- The type of agricultural, agriculture-related or on-farm diversified uses being impacted and their significance for supporting other agricultural production in the surrounding area;
- The loss of existing and future farming opportunities;

- The loss of infrastructure, services or assets important to the surrounding agricultural community and agri-food sector;
- The loss of agricultural investments in structures and land improvements (e.g. artificial drainage);
- The disruption or loss of function to artificial drainage and irrigation installations;
- Changes to the soil drainage regime;
- Changes to surface drainage features which could have an effect on adjacent lands;
- Changes to landforms, elevations and slope that could alter microclimatic conditions (e.g. modification to slopes that may reduce or improve cold air drainage opportunities and changes to elevation may have an impact on diurnal temperatures);
- Changes to hydrogeological conditions that could affect neighboring municipal or private wells, sources of irrigation water and sources of water for livestock;
- Disruption to surrounding farm operations, activities and management (e.g. temporary loss of productive agricultural lands, cultivation, seeding, spraying, harvesting, field access, use of road network);
- The potential effects of noise, vibration, dust, and traffic on agricultural operations and activities
- Potential compatibility concerns such as normal farm practices facing challenges with e.g. nuisance complaints, vandalism and trespassing that may occur with the new development being established; and
- The inability or challenges to move farm vehicles and equipment along roads due to increased traffic caused by haul routes, changes in road design.

1.3.4 Mitigation Measures and Net Impacts

As directed by the AIA Guidance Document and Growth Plan policies, whenever possible, development should avoid impacts on the agricultural system. When impacts cannot be avoided, mitigation measures will be prepared to minimize or mitigate potential impacts of the proposed aggregate operation. The net impacts will then assessed based on the assumption that the proposed mitigation measures will be put in place.

1.4 Location

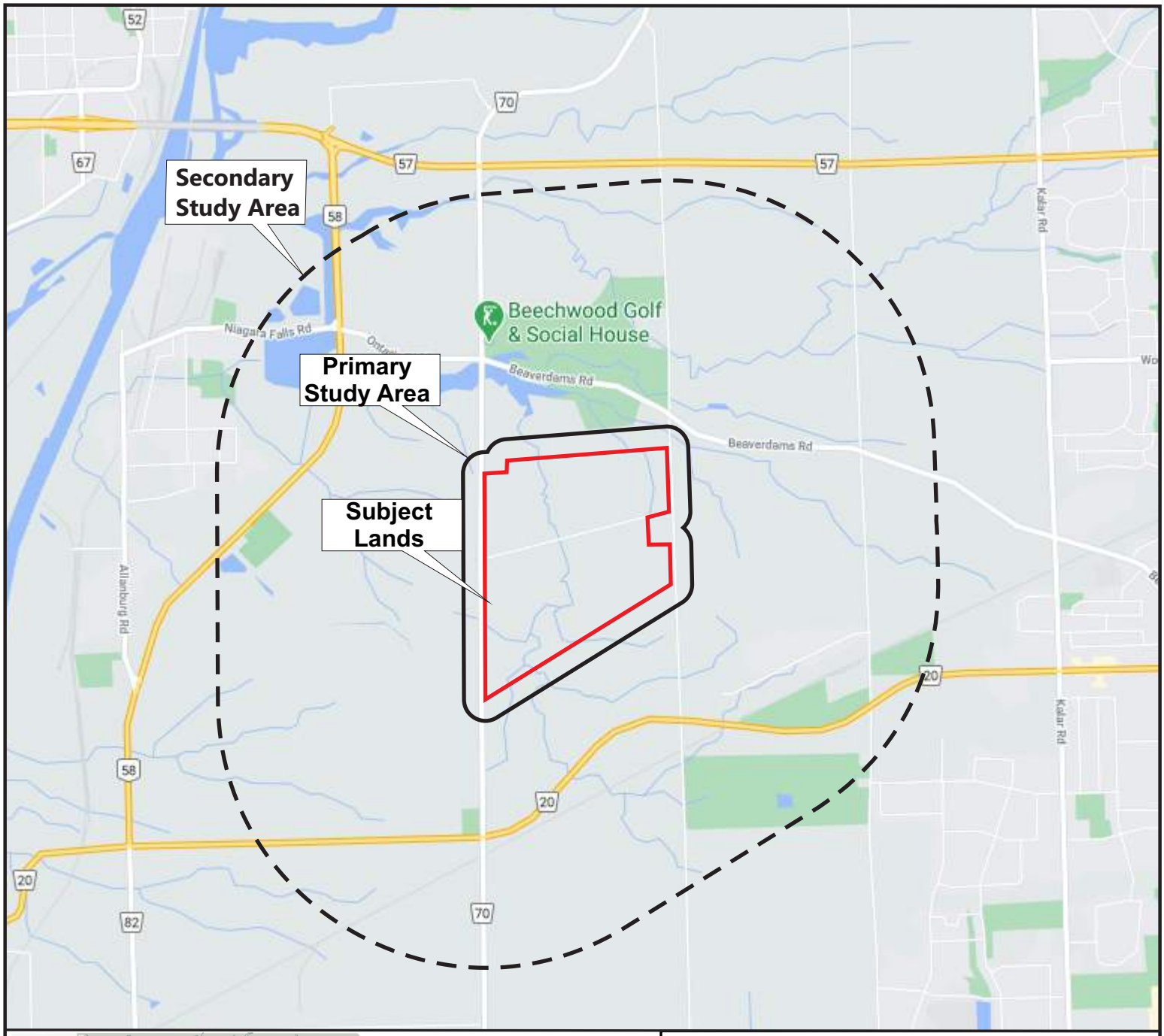
The proposed Uppers Quarry is located within the former Township of Stamford in the City of Niagara Falls, Ontario on Part Lots 119, 120, 136 and 137. Through review of the site plans the proposed Upper's Quarry site is approximately 106.3 ha in size and is generally situated south of Beaverdams Road, east of Thorold Townline Road (Regional Road 70), north of Lundy's Lane (Highway 20), and West of Beechwood Road. Uppers Lane (and the road allowance between Lots 120 and 136 bisect the area, dividing the Subject Lands into three extraction areas:

i) North Extraction Area: extraction area north of Upper's Lane;

ii) Mid Extraction Area: extraction area south of Upper's Lane and north of the unopened road allowance between Township Lots 120 & 136 in the former Township of Stamford, now in the City of Niagara Falls ("unopened road allowance"); and

iii) South Extraction Area: extraction area south of the unopened road allowance.

The portion of the Subject Lands that are in agricultural production are cleared and cultivated annually. An existing watercourse flows through the Subject Lands from south to north and discharges into Beaverdams Creek. A small woodlot is located along Thorold Townline Road south of Uppers Lane.



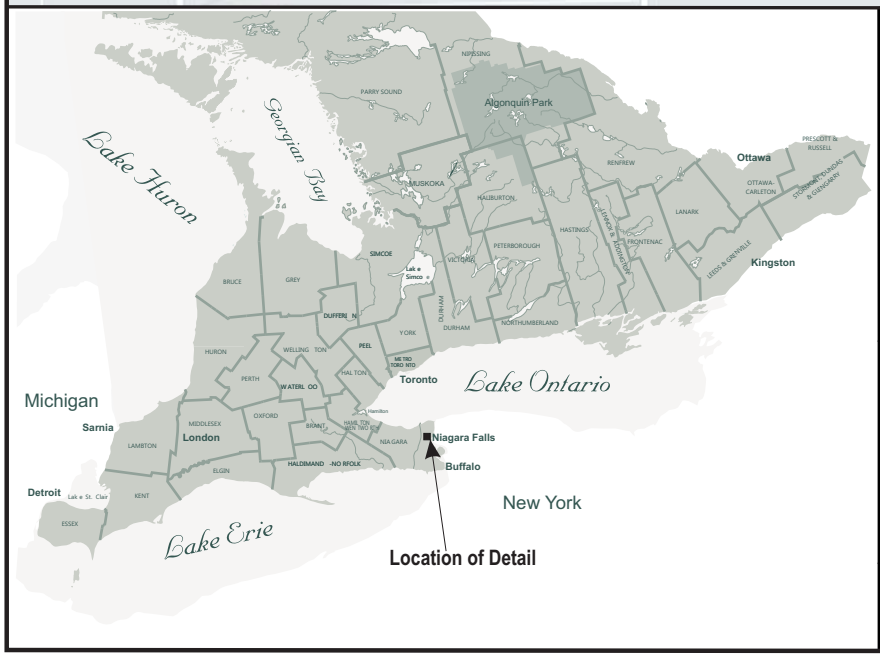


FIGURE 1

Location

Uppers Quarry

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC.

DATE: December 2020

FILE: C16075

1.5 Agricultural Policy Requirements

1.5.1 Provincial Policy Statement

Land Use Policy and development in the province of Ontario is directed by the Provincial Policy Statement (PPS), which was issued under the authority of Section 3 of the Planning Act. Section 3 of the Planning Act states that decisions affecting planning matters "shall be consistent with" policy statements issued under the Act.

The latest version of the PPS came into effect on May 1, 2020. Section 2.3 of the PPS addresses proposed development in prime agricultural area. Section 2.3.1 states that "Prime agricultural areas shall be protected for long-term use for agriculture". The PPS defines prime agricultural areas as areas where prime agricultural lands predominate. Prime agricultural lands include specialty crop areas and Canada Land Inventory (CLI) Classes 1, 2 and 3 soils, in this order of priority for protection.

Section 2.3.6 states that:

"Planning authorities may only permit non-agricultural uses in prime agricultural areas for:

a) extraction of minerals, petroleum resources and mineral aggregate resources, in accordance with policies 2.4 and 2.5; or

b) limited non-residential uses, provided that all of the following are demonstrated:

1. the land does not comprise a specialty crop area;
2. the proposed use complies with the minimum distance separation formulae;
3. there is an identified need within the planning horizon provided for in policy 1.1.2 for additional land to be designated to accommodate the proposed use; and
4. alternative locations have been evaluated, and

i. there are no reasonable alternative locations which avoid prime agricultural areas; and

ii. there are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

Impacts from any new or expanding non-agricultural uses on surrounding agricultural operations and lands are to be mitigated to the extent feasible."

The Subject Lands, as is most of the Study Area, are located in an area that consists of predominantly prime agricultural land. However, as per Section 2.3.6 a) of the PPS, mineral aggregate extraction is a permitted use in prime agricultural areas, in accordance with policies 2.4 and 2.5.

Section 2.5.4 deals specifically with mineral aggregate extraction in prime agricultural areas. Section 2.5.4.1 states: "In prime agricultural areas, on prime agricultural land, extraction of mineral aggregate resources is permitted as an interim use provided that the site will be rehabilitated back to an agricultural condition.

Complete rehabilitation to an agricultural condition is not required if:

a) outside of a specialty crop area, there is a substantial quantity of mineral aggregate resources below the water table warranting extraction, or the depth of planned extraction in a quarry makes restoration of pre-extraction agricultural capability unfeasible;

b) in a specialty crop area, there is a substantial quantity of high quality mineral aggregate resources below the water table warranting extraction, and the depth of planned extraction makes restoration of pre-extraction agricultural capability unfeasible;

c) other alternatives have been considered by the applicant and found unsuitable. The consideration of other alternatives shall include resources in areas of Canada Land Inventory Class 4 through 7 lands, resources on lands identified as designated growth areas, and resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands shall be protected in this order of priority: specialty crop areas, Canada Land Inventory Class 1, 2 and 3 lands; and

d) agricultural rehabilitation in remaining areas is maximized."

The lands are not considered specialty crop area and, therefore, only (a) and (c) apply. A substantial amount of high quality mineral aggregate resource is present as low as ±39 m below the ground surface and ±35 below the potentiometric surface (i.e. groundwater table) and, accordingly, complete agricultural rehabilitation will not be feasible. Other alternatives have been considered and discussed as part of this AIA.

1.5.2 Aggregate Resources Act

The Aggregate Resources Act (ARA) lays out the rules governing aggregate resource management and is carried out by the Ministry of Natural Resources and Forestry (MNRF) in the province of Ontario. The Act includes rules regarding issuing of licenses and permits, changes to approvals, inspections, complaint response, compliance and rehabilitation monitoring. The overall purpose of the act is to manage, control and regulate aggregate resources in Ontario, to minimize adverse effects to the environment and surrounding communities and to ensure adequate rehabilitation of lands following excavation. The ARA was most recently updated on December 10, 2019.

1.5.3 Growth Plan for the Greater Golden Horseshoe

The Subject Lands are located within the Greater Golden Horseshoe Growth Plan Area. The Growth Plan for the Greater Golden Horseshoe was prepared and approved under the Places to Grow Act, 2005 and took effect on August 28, 2020. The Growth Plan provides a framework for implementing Ontario's vision "for building stronger, prosperous communities by better managing growth in this region". The sections relevant to the proposed quarry opportunity are listed below.

Section 4.2.8 states that:

> "3. In prime agricultural areas, applications for new mineral aggregate operations will be supported by an agricultural impact assessment and, where possible, will seek to maintain or improve connectivity of the Agricultural System.
>
> 4. For rehabilitation of new mineral aggregate operation sites, the following apply:
>
> a) the disturbed area of a site will be rehabilitated to a state of equal or greater ecological value and, for the entire site, long-term ecological integrity will be maintained or enhanced;
>
> b) if there are key natural heritage features or key hydrologic features on the site, or if such features existed on the site at the time of the application:
>
> i. the health, diversity, and size of these key natural heritage features and key hydrologic features will be maintained or enhanced; and
>
> ii. any permitted extraction of mineral aggregate resources that occurs in a feature will be completed, and the area will be rehabilitated, as early as possible in the life of the operation; c) aquatic areas remaining after extraction are to be rehabilitated to aquatic enhancement, which will be representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation will meet the intent of policy 4.2.8.4 b); and
>
> c) outside the Natural Heritage System, and except as provided in policies 4.2.8.4 a), b) and c), final rehabilitation will appropriately reflect the long-term land use of the general area, taking into account applicable policies of this Plan and, to the extent permitted under this Plan, existing municipal and provincial policies. In prime agricultural areas, the site will be rehabilitated in accordance with policy 2.5.4 of the PPS, 2014.
>
> 6. Except as provided by the policies of this subsection, decisions on planning matters must be consistent with the policies in the PPS that pertain to the management of mineral aggregate resources.
>
> 7. Where an application under the Aggregate Resources Act has been received and deemed complete by the Province as of July 1, 2017, any applications under the Planning Act to permit the making, establishment or operation of the pit or quarry to which the Aggregate Resources Act application relates, if approved, will not be subject to the policies of this Plan."

As the proposed Uppers Quarry will extract bedrock resources below the water table, final rehabilitation of the Subject Lands will not be returned to an agricultural after-use, but rather to a lake condition. Once extraction is concluded and dewatering ceases, the groundwater will rebound, filling the former extraction areas which will result in the formation of a series of lakes.

Section 4.2.6 of the GGH Growth Plan states that:

> "7. Municipalities are encouraged to implement regional agri-food strategies and other approaches to sustain and enhance the Agricultural System and the long-term economic prosperity and viability of the agri-food sector, including the maintenance and improvement of the agri-food network by:
>
> a) providing opportunities to support access to healthy, local, and affordable food, urban and near-urban agriculture, food system planning and promoting the sustainability of agricultural, agri-food, and agri-product businesses while protecting agricultural resources and minimizing land use conflicts;
>
> b) protecting, enhancing, or supporting opportunities for infrastructure, services, and assets. Where negative impacts on the agri-food network are unavoidable, they will be assessed, minimized, and mitigated to the extent feasible; and
>
> c) establishing or consulting with agricultural advisory committees or liaison officers.
>
> 8. The prime agricultural areas identified in official plans that are approved and in effect as of July 1, 2017 will continue to be protected in accordance with the official plan until provincial mapping of the Agricultural System has been issued.
>
> 9. In implementing the Agricultural System, upper- and single-tier municipalities may, through a municipal comprehensive review, refine or augment provincial mapping in a manner that is consistent with this Plan and any implementation procedures issued by the Province."

1.5.4 Greenbelt Plan

The proposed new quarry is not affected by the Greenbelt Plan as the Subject Lands are located outside the Greenbelt area.

1.5.5 Niagara Escarpment Plan

The Subject Lands do not fall within the Niagara Escarpment Plan area therefore the NEP does no apply to the proposed new quarry.

1.5.6 Regional Official Plan for Niagara

Section 5 of the in-effect Consolidated Regional Official Plan (2014) contains the Region's Agricultural and Rural Areas policies. These policies apply to lands designated Unique Agricultural Areas and Good General Agricultural Areas. The Unique Agricultural Areas includes both good tender fruit and good grape lands. The Good General Agricultural Areas includes organic soils, areas of Classes 1 and 2 lands, areas of 60 to 70 percent Class 1 and 2 lands, and the majority of Class 3 lands. The Subject Lands and Study Area are located within the Good General Agricultural Area.

Section 5.B.7 states that:

"Non-agricultural uses should not be located in Agricultural Areas. The introduction of new non-agricultural development of all types into the Agricultural Areas has an adverse impact on the agricultural and natural resources and shall be strictly limited. However, applications for individual non-agricultural uses may be considered. These applications will be reviewed through a Regional Official Plan Amendment subject to the following conditions:

a) Non-agricultural uses are not permitted in Unique Agricultural Areas—Good Tender Fruit and Good Grape Areas.

b) Non-farm residential lots and uses are not permitted in Good General Agricultural Areas or in Rural Areas in close proximity to agricultural activity.

c) A demonstrated need for additional land to be designated within the municipality and the desirability of the proposed use to the community.

d) There are no reasonable alternatives in Rural Areas or in Urban Areas.

e) There are no reasonable alternative locations in other Good General Agricultural Areas with lower priority agricultural land.

f) The degree of conflict with surrounding agricultural uses. Any conflict should be mitigated to the extent feasible. This would depend on the size and nature of the proposed use, the existing agricultural uses, and on any buffering factors between them. For example, creeks, roadways and other prominent features would be helpful in defining and screening a non-agricultural use from surrounding farms;

g) Compliance with policies contained in Chapters 6 and 7, Environmental Policies including the Natural Heritage and Aggregate Resource Policies.

h) Applications must be supported by adequate technical assessment to ensure that private water supply and private sewage services can be provided.

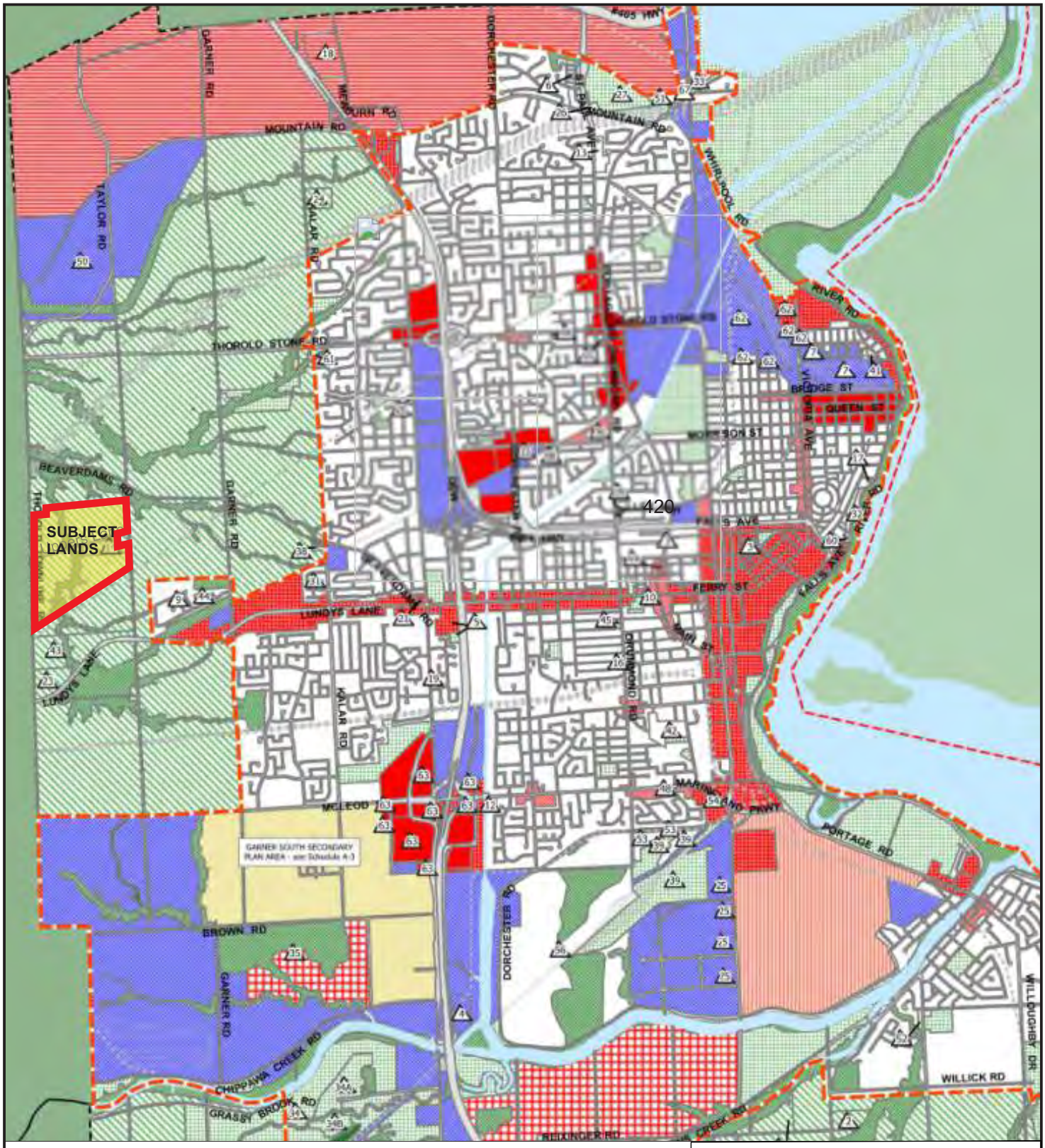
i) Compliance with other policies contained in the Regional Official Plan."

The agricultural related conditions have been addressed herein.

1.5.5 City of Niagara Falls Official Plan - Office Consolidation Amended to April 2019

According to the City of Niagara Falls Official Plan Schedule A – Official Plan Future Land Use, the majority of the Subject Lands are designated Good General Agriculture land as shown in Figure 2.

Land designated as Good General Agricultural includes both agricultural areas and natural areas. The City of Niagara Falls Official Plan states that the predominant uses in this designation will be for agriculture of all types. Other non-agricultural uses not related to agriculture are generally not permitted.



Legend

- * ENVIRONMENTAL PROTECTION AREA
- EXTRACTIVE INDUSTRIAL
- GOOD GENERAL AGRICULTURE
- INDUSTRIAL
- MAJOR COMMERCIAL
- MINOR COMMERCIAL
- GARNER SOUTH SECONDARY PLAN
- NIAGARA ESCARPMENT PLAN AREA
- OPEN SPACE
- PARKWAY RESIDENTIAL
- RESIDENTIAL
- RESORT COMMERCIAL
- RURAL / AGRICULTURAL
- THEME PARK MARINELAND
- TOURIST COMMERCIAL
- SPECIAL POLICY AREA
- NIAGARA ESCARPMENT BOUNDARY
- URBAN AREA BOUNDARY
- **SUBJECT LANDS**

FIGURE 2
City of Niagara Falls
Uppers Quarry AIA
Schedule A: Future Land Use 2014

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC.

DATE: December 2020 FILE: C16075

However, as per Section 7.4 of the Plan, Council may consider site specific amendments to the Plan to permit non-agricultural development within the Good General Agriculture designation.

Appendix IV of the Official Plan shows those areas within the City of Niagara Falls that have been identified as Potential Aggregate Resource areas. These areas are to be protected for future extractive industrial purposes. The Subject Lands are included within the Bedrock Resource Area.

The City's policies do not prohibit new or expanding aggregate extraction operation from locating within the Good General Agriculture designation. In fact, all of the Potential Aggregate Resource areas of the OP; as identified in Figure 2 are located within the Good General Agriculture designation.

Policy 9.3.5 states that "Where applicable, no extraction will be permitted on Good General Agriculture lands unless the Ministry of Agriculture and Food is satisfied that the site can be substantially rehabilitated for agriculture to allow production of the same area and at the same level of productivity." Due to the extensive below water table excavation, it is not feasible to rehabilitate the same area and level of productivity of the existing agricultural lands. Therefore, this policy is not consistent with overarching Provincial Policy Statement (2020) Section 2.5.4.1 and is not applicable to this application.

2.0 PROCESS

2.1 Qualifications

CCI was retained to complete the AIA by Walker Industries who commissioned the report in order to support the application for a proposed new quarry (Uppers Quarry) in the area of Uppers Lane in Niagara Falls. The report has been authored by Sean Colville (P.Ag.) along with support from CCI staff. Sean Colville is the lead qualified professional on the project and has extensive expertise and experience in the field of agricultural planning and the completion of AIAs for proposed new and expanding aggregate operations. Sean also has experience developing agricultural rehabilitation plans for aggregate operations. Curriculum Vitae for Sean and supporting staff are included in Appendix A of this report.

2.2 Consultations

Pre-consultation with stakeholders is an important part of the completion of an AIA process. A pre-consultation plan was developed by the Study Team and Walker Industries for the Proposed Uppers Quarry application. A pre-consultation meeting was held on October 17, 2019 with planning staff at the Niagara Region, City of Niagara Falls and the Niagara Peninsula Conservation Authority. The purpose of the meeting was to introduce the proposed undertaking and identify the studies and issues that need to be addressed.

The bulk of the public consultation process will take place following the formal submission of the application. Walker's website for the Uppers Quarry states that: "The company will be consulting extensively with stakeholders including the local community, First Nations, local politicians, regulators, commenting agencies and nearby businesses throughout the applications process and beyond."

3.0 STUDY AREAS

The Study Area for the AIA includes a Primary Study Area, a Secondary Study Area and a broader study area for the Alternative Site Assessment.

3.1 Primary Study Area

The Primary Study Area (identified on Figure 1) includes all lands/properties which are potentially directly impacted by the proposed aggregate extraction operation. This includes the Subject Lands (e.g. the proposed licenced area) and any lands immediately adjacent (e.g. 120 m) to the licenced area which are potentially directly impacted by the operation (e.g. changes to surface drainage patterns).

3.2 Secondary Study Area

The Secondary Study Area (identified on Figure 1) includes the lands that could potentially be affected by indirect impacts of the proposed aggregate operation. For this study, the Secondary Study Area includes all lands within a minimum of 1.5 km of the Subject Lands. In some cases, it extends beyond 2.0 km.

The Secondary Study Area also includes the new haul routes to assess whether changes to the proposed use of or upgrades to a local road may have an impact on agricultural operations.

3.3 Alternative Site Assessment Study Area

The AIA includes an alternative site assessment to be consistent with the PPS and OMAFRA's AIA Guidelines (draft). The Study Area for the Alternative Site Study is generally defined as the market area for the aggregate products to be produced from the site. The market area generally includes the lands south of the Greenbelt Plan areas (south of St. Catharines) to approximately Welland and east of the Welland Canal to the Niagara River. The Alternative Site Assessment Study Area is located in Appendix B of the AIA.

4.0 STUDY METHODOLOGY

The study methodology involves a review of background information and site-specific information collected through field inventories. The background information includes information obtained through a review of planning documents and information provided by Study Team members; a review of existing published documents to obtain soil and climate resource and drainage information; a review of agricultural systems mapping; and a review of the lot fabric within the Study Area.

The field inventories included a reconnaissance level soil confirmation survey and a land use survey of the Study Area.

4.1 Background Data Collection

The information collected and reviewed for this study included information published by or available on the websites of the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA), Ontario Ministry of Municipal Affairs and Housing (MMAH), Ontario Ministry of the Environment (OMOE), Regional Municipality of Niagara, and City of Niagara Falls. Published information such as soil survey reports, agricultural capability ratings, regional land use mapping, artificial tile drainage mapping, and various regional agricultural studies was reviewed.

The following sources of information were reviewed for this study:

- The Provincial Policy Statement (2020);
- Growth Plan for the Greater Golden Horseshoe (2019);
- Implementation Procedures for the Agricultural System in Ontario's Greater Golden Horseshoe (2018);
- Greenbelt Plan (2017);
- Niagara Escarpment Plan (2017);
- The Consolidated Regional Official Plan (Revised 2014);
- The City of Niagara Falls Official Plan (2019);
- The Provincial Soil Resource Database;
- The Soils of the Regional Municipality of Niagara including The Soils of Niagara Falls, Regional Municipality of Niagara Ontario Map Sheet 5 (1989);
- The Physiography of Southern Ontario (Chapman & Putnum 1984);
- OMAFRA's Artificial Drainage Systems mapping (ADS27D, Niagara Falls, Revised September 1997); and
- Agricultural System and agricultural land base mapping (OMAFRA, 2017).

A more complete list of materials reviewed is provided in the references section of this report.

4.2 Field Inventories

The field inventory completed for this study included a reconnaissance level land use survey of the surrounding area to identify agricultural operations, relative levels of agricultural investment, cropping patterns and mix of land uses.

4.2.1 Land Use Survey

Prior to the conduction of the land use survey, the municipal official plan designation (see Figure 2) and zoning for the Subject Lands as well as the Study Area were reviewed. In addition, OMAFRA's agricultural systems mapping was reviewed to identify components of the Agri-Food Sector. Possible farmstead locations were identified and agri-food businesses were noted on mapping prior to survey.

Information gathered during the land use surveys included the type of land uses observed (both agricultural and non-agricultural), the cropping pattern observed (i.e., the type of field crops and non-agricultural land cover), the location of farm operations (including both livestock and other agricultural operations) relative to the Subject Lands. Recent investments in agricultural lands or facilities were also noted. Findings from the land use survey are provided in Section 5.5.

4.3 Alternate Site Study Methods

To address PPS Policy 2.5.4.1. c), alternative sites were considered. The following sections summarize the methodology used to evaluate alternative locations.

4.3.1 Identification of Study Area

The Study Area for the Alternative Site Study was identified by Walker's as their main market area for their aggregate products. A high-level screening removed urban areas, NEC lands, Greenbelt areas and specialty crop areas from the Alternate Site Study "Study Area". There was one area located within the Rural designation that remained however that site (Alternate Site #1) was eliminated in the Alternative Site Analysis completed by MHBC due to the presence of natural heritage features and high levels of fragmentation which would make procuring an adequate land supply for a quarry infeasible. Following the elimination of these areas the only viable aggregate areas remaining were located in the Good General Agriculture designation.

4.3.2 Assessment of Agricultural Priority

The next step was to determine if any of the areas were of lower agricultural priority (CLI Class 4-7), provincial soil database data was used to calculate the Hoffman Productivity Indices values for the Study Area. Areas with lower capability soils were invariably correlated with drainage features and would not be suitable for quarry extraction. There were no Class 7 lands located within the Study Area. Next agricultural priority was determined, among prime agricultural lands CLI Class 3 lands have the lowest priority, following specialty crop lands and CLI Class 1 and 2 lands. The Subject Lands are made up of mainly CLI Class 3 lands and avoid the CLI Class 2 lands found in some other portions of the Study Area. Finally, geological formations and drift thickness within the Study Area were assessed to determine if

there were other viable areas for extraction. In this case the Subject Lands appear to be the most suitable for extraction, both in terms of agricultural priority and geology.

5.0 DESCRIPTION OF SOILS AND LANDS

5.1 Physiography

5.1.1 Geology

The Subject Lands are located within the Middle Silurian Lockport Formation. The Lockport Formation is subdivided into three members, the Gasport, Goat Island and Eramosa members. The Gasport member is a blue-grey, thin to very thick bedded, fine to medium-crystalline, crinoidal dolomitic limestone. The Goat Island member is a grey, thinner and irregularly bedded, fine crystalline dolostone, locally cherty or shaly formation. The Eramosa member is a brown, thin-bedded, fine-crystalline, bituminous dolostone, with minor shale partings.

5.1.2 Surficial Geology

The surficial geology of the Niagara Peninsula has been greatly influenced by the effects of the last period of glaciations which ended approximately 10,000 years ago. During the late Wisconsinan period, the Ontario ice lobe covered much of the Niagara Peninsula. The debris deposited subglacially as a lodgement till by the Ontario ice sheet is referred to as the Halton till. This till is typically comprised of a dense, clay loam material. A series of moraines were formed parallel to the retreating ice margins, the more prominent of which include the Vinemount Moraine and Niagara Falls Moraine. As glacial melt continued, most of the area south of the Niagara Escarpment was inundated by proglacial Lake Warren. Extensive areas of fine textured, reddish hued, glacio-lacustrine sediments of various thicknesses were deposited over the Halton till. This clay plain is referred to as the Haldimand clay plain physiographic region (Chapman and Putnam, 1984).

5.1.3 Surface Drainage Features

The Subject Lands are located in the eastern portion of the Haldimand clay plain and in the Niagara River Sub-watershed. The Niagara River and Welland River are the most significant surficial drainage features in the sub-watershed. The headwaters of the Welland River are located near Mount Hope and from here it meanders easterly through the central portion of the Niagara Peninsula and discharges into the Niagara River. There are several other much shorter watercourses all originating east of the Welland Canal such as Ushers Creek, Lyons Creek, Tea Creek, Black Creek and Boyers Creek. Each of these watercourses also flow easterly and discharge directly into the Niagara River or into the Welland River.

5.1.4 Soils

Despite these surficial drainage features, the soil in this area is typically poorly to imperfectly drained due to relatively flat topography which characterizes the clay plain and the heavy soil textures (i.e., silts and clays). Agricultural development in some portions of the Haldimand clay plain has been significantly hindered by these inherent soil and drainage characteristics.

5.2 Soil Resources

5.2.1 Regional Soil Survey

The soil mapping in *The Soils of the Regional Municipality of Niagara* (Kingston and Presant. 1989) provides mapping at a scale of 1:25,000 and covers the Study Area. The Niagara Falls (Map sheet 5) shows the soil series mapped in the area. According to the mapping the Study Area consists of mostly reddish-hued lacustrine heavy clay as well as lacustrine silty clay material. In some cases, this material is relatively thick (i.e., greater than one metre) whereas in other areas the depth of the lacustrine sediments overlying the Halton till is less than one metre.

The main soil series mapped in this area are the Beverly, Niagara, Haldimand, and Toledo soils. The drainage of these soils ranges from imperfect to poor, with a small area of Alluvial soils which is variably drained.

Beverly Soil Series (19.8% of Subject Lands)

Beverly soils have developed from silty clay lacustrine deposits greater than one metre in depth. The surface texture of Beverly soils is commonly silty clay loam, however, loamy and coarse phases of Beverly soils have also been mapped. The surface horizon (Ap) is generally between 15 and 20 cm thick, pH values are usually neutral, and the mean organic matter contents is 3.6 percent. The underlying B horizon is also often comprised of silty clay textures and is susceptible to compaction by machinery during periods of saturation. The calcareous Ck horizon is most frequently mapped as a silty clay and is generally encountered at approximately 45 cm from the surface.

Beverly soils are imperfectly drained and moderately to slowly permeable. The surface runoff is medium to high and depends on the surface textures and degree of slope. The water table is often located in the surface and subsurface horizons for long periods of the growing season, particularly where heavy farm machinery has caused the subsoil to become compacted. The water holding capacity of these soils ranges from medium to high. Excess water in the subsoil results in the formation of distinct to prominent, yellowish-brown to yellowish-red mottles. The poorly drained Toledo soils are often found in association with Beverly soils.

Beverly soils are generally good agricultural soils and are rated as CLI Class 2D and CLI Class 3T on slopes that exceed 5%. The Beverly Loamy phase is mapped within the Subject Lands and is rated CLI Class 2DT. Where Beverly-Toledo complex soil units are mapped, the soils are rated CLI Class 2DE-3W.

The main agricultural limitation for these soils is related to their high clay content which can result in soil structural problems if not carefully managed. Artificial drainage of these soils is necessary to achieve highest yields. On steeper slopes, these soils are susceptible to erosion and steps must be taken to ensure it does not become a problem which will result in decreased yields.

Toledo Soil Series (6.1% of Subject Lands)

Toledo soils have also developed from the same silty clay lacustrine deposit as the Beverly soil series, however, these soils are poorly drained. The calcareous C horizon is encountered at depths ranging between 40 and 60 cm. The overlying B horizon is gleyed and prominent mottles are found throughout

this and the C horizons. The soil texture is silty clay and as with the Beverly soil, it is susceptible to compaction when saturated. Surface textures are commonly silty clay loam.

Toledo soils have a high water holding capacity, are slowly permeable and water saturation in the soil remains high throughout much of the year. The surface runoff is medium to high and depends on the surface textures and degree of slope. To produce common field crops artificial drainage is required. Toledo soils that are artificially drained, or where it can be feasibly installed, are rated as CLI Class 3W. These soils have moderately severe limitations that restrict the range of crops because of excess water this may result from inadequate soil drainage, a high water table, seepage or from runoff from surrounding areas. The Soils found on the Subject Lands are shown in Figure 3.

Niagara Soil Series (26.8% of Subject Lands)

The Niagara soils are imperfectly drained, moderately to slowly impermeable and have a high water-holding capacity. These soils generally occur on very gentle to gentle slopes and as a result surface drainage is often better than the poorly drained Welland soils. Niagara soils have developed from clayey lacustrine sediments. The surface layer often consists of a silty clay approximately 20 cm in depth; the weathered horizon below the plough layer is a heavy clay and approximately 40 cm thick. The calcareous, heavy clay textured parent material is typically encountered at a depth of approximately 60 cm.

Niagara soils on nearly level slopes and simple, very gentle slopes are rated as CLI Class 3D, whereas on complex, very gentle and gentle slopes these soils are rated as CLI Class 3DT. The Niagara-Welland soil complex is rated CLI Class 3D-3WD. They are limited by their poor soil structure that results from the high clay content. They may also require artificial drainage to improve yields for many crops to reduce the potential for compaction when working the soils with farm machinery. When these soils are wet they are very susceptible to compaction, additionally erosion is also a concern when these crops are under continuous row crop production.

Haldimand Soil Series (31.9% of Subject Lands) Haldimand soil series is also common within the Subject Lands and in the Study Area. The Haldimand soils have developed from a lacustrine heavy clay and are imperfectly drained and slowly permeable. Due to their relatively impermeable nature, surface runoff is rapid, particularly on C class slopes. The high clay content and dense nature of these soils limit their productivity. However, with the installation of artificial tile drainage and the use of compaction minimization techniques, fair crop yields are achievable.

Haldimand Loamy phase as well as Haldimand Loamy phase-Lincoln soils complex are mapped within the Subject Lands. The Haldimand Loamy phase soils are rated 3D. The Haldimand Loamy phase-Lincoln soil complex unit, on very gentle and gentle slopes these soils are rated as CLI Class 3DT. The Haldimand Loamy phase- Lincoln soil complex are rated CLI Class 3D-3WD. These soils are also limited by their poor soil structure. They may require artificial drainage to improve yields for many crops and to reduce the potential for compaction when working the soils with farm machinery. When these soils are

Legend

- Subject Lands
- Urban Boundary
- Soil Boundary

SLOPE CLASSES(%)

A a Level slopes (0.0 - 0.5%)
B b Nearly level slopes (0.5 - 2.0%)
C c Very Gentle slopes (2.0 - 5.0%)
D d Gentle slopes (5 - 9%)
E e Moderate slopes (9 - 15%)
F f Strong slopes (15 - 30%)
Gg Steep slopes (30 - 45%)

Simple Slopes (uniform, lengths > 50 metres) denoted in upper case
Complex Slopes (short, irregular slopes) denoted in lower case

Soil Series

HIM Haldimand soils consisting of mainly lacustrine heavy clay parent material. Imperfect drainage.

LIC Lincoln soils poorly drained and have a high water-holding capacity. Parent materials consists of mainly lacustrine heavy clay.

NGR Niagara soils consist of mainly reddish-hued lacustrine heavy clay parent material with imperfect drainage.

BVY Beverly soils consists of mainly lacustrine silty clay parent material with imperfect drainage.

BVY.L Beverly soils loamy phase consists of 15-40 cm of loamy textures over lacustrine silty clay. these soils have imperfect drainage.

TLD Toledo soils consisting of mainly lacustrine silty clay parent material with poor drainage.

ALU Alluvial soils are variable floodplain deposits with variable drainage.

Source: The Soils of the Regional Municipality of Niagara (Kingston and Presant. 1989)

Figure 3

Provincial Soil Series Mapping

N

0 50 M

1:8,030

Soil Name — **Soil Symbol** NGR^{70}- WLL^{30} — Percent

c > B — Slope

Prepared for:

walker

Prepared by:

COLVILLE CONSULTING INC.

Revised: December 2020 FILE: C16075

wet they are also very susceptible to compaction. Erosion resulting from topography is also a concern when these areas are under continuous row crop production.

Alluvial Soils (13.4% of Subject Lands)

Alluvial soils have a variety of soil textures and drainage conditions. Typically, they consist of finer textured sediments and are imperfectly to poorly drained. These soils are confined to floodplains where sediments are deposited as a result of recent flooding. Surface horizons are usually relatively thick accumulations of mineral and organic material. The underlying sediments can be highly variable in texture and buried horizons and organic materials are common.

Most of the soils mapped as Alluvial are found along the existing creek that flows through the Subject Lands and are rated as CLI Class 5I due to the potential for frequent of long-lasting inundation. The areas mapped as Alluvium often also include the side slopes along the existing creek's floodplain. Small areas in the north east corner of the Subject Lands are mapped as an Alluvium-Niagara soils complex which is classified as CLI Class 5I-3DT.

Table 1. Soil Series Mapped on Subject Lands

Soil Series	Area (Ha)	Percentage of Subject Lands
Niagara	28.62	26.92%
Toledo	6.45	6.07%
Beverly	16.61	15.62%
Beverly—Loamy Phase	4.45	4.19%
Alluvium	14.26	13.41%
Haldimand	29.87	28.09%
Haldimand—Loamy Phase	4.13	3.88%
Welland	1.38	1.30%
Lincoln	0.56	0.53%
Total	106.3	100.00

5.3 Canada Land Inventory Agricultural Capability

The Canada Land Inventory (CLI) is an interpretative system for assessing the effects of climate and soil characteristics on the limitations of land for growing common field crops. The CLI system has seven soil classes that descend in quality from Class 1, which has few limitations, to Class 7 soils which have no agricultural capability for common field crops. Class 2 through 7 soils have one or more significant limitations, and each of these are denoted by a capability subclass. There are thirteen subclasses described in CLI Report No. 2 (1969). Eleven of these subclasses have been adapted to Ontario soils. More information regarding the CLI Classification system is provided in Appendix C.

5.3.1 CLI Agricultural Capability

The Soils of the Regional Municipality of Niagara (Kingston and Presant. 1989) provides the CLI capability ratings for common field crops in the Regional Municipality of Niagara. These ratings were used to show the CLI capability rating for the Subject Lands (Figure 4). Table 2 shows the distribution of CLI Classes for the Subject Lands and Appendix C provides a detailed CLI capability description for individual soil series.

Within the Subject Lands, the most common limitations (subclasses) are erosion (E), wetness (W), undesirable soil structure and low permeability (D), topography (T) and inundation (I). The Haldimand soils have moderately severe limitations relating to low permeability (D) and topography (T) and are the most common soils found on the Subject Lands.

Table 2. CLI Soil Capability for Agriculture – Subject Lands

CLI Class	Hectares	% of Subject Lands
2D	0.88	0.82
2DE	4.57	4.29
2DT	9.74	9.16
Total Class 2	15.19	14.28
3D	24.39	22.94
3T	5.73	5.39
3DT	38.30	36.02
3W	6.45	6.07
3WD	2.01	1.89
Total Class 3	76.89	72.31
Total 5I	14.26	13.41
Total	106.3	100.00

Soil Boundary | Subject Lands | Urban Boundary

Soil Classification

CLI Class 2 - Soils in this class have moderate limitations that restrict the range of crops.

CLI Class 3 - Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices.

CLI Class 5 - Soils in this class gave very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible.

Soil Classification Subclass

E	Erosion - soils where damage from erosion is a limitation to agricultural use.
W	Excess Water - limitations for agriculture due to poor drainage; improvements not feasible.
D	Undesirable soil structure and/or low permeability - limitations resulting from poor soil structure due to high clay content. These soils require moderate conservation practices.
T	Topography- Topography is a limitation.
I	Inundation by streams or lakes - soils subjected to inundation causing crop damage or restricting agricultural use.

Refer to Figure 4 for Soil Symbol Information

Source: The Soils of the Regional Municipality of Niagara (Kingston and Presant. 1989)

Figure 4

CLI Capability Mapping

N

0 50 M

1:8,030

Prepared for:

walker

Prepared by:

COLVILLE CONSULTING INC.

Revised:December 2020 FILE: C16075

5.3.2 Agricultural Productivity

Another way to assess the agricultural productivity of a land parcel is to apply the Hoffman Productivity Indices (HPI). The HPI are used to relate the productivity of land to the CLI Capability (based on expected yields). Assuming the same level of management is applied to different CLI classes, the productivity for each class will differ. Hoffman (1971) determined the average yields produced for common field crops on CLI classes 1 through 4 lands. It was determined that a CLI Class 2 soil produced yields approximately 20% less than a CLI Class 1 soil and therefore has a value of 0.80 relative to a CLI Class 1 soil. The value for a CLI Class 3 soil is 0.64 and for a CLI Class 4 soil the value is 0.49. These figures were extrapolated to get values for CLI Classes 5, 6, & 7.

The HPI was calculated for the Subject Lands to assess the relative productivity of the lands for common field crop production. As determined above, the majority of the soils are comprised of CLI Class 3 soils. An HPI rating above 0.9 is considered to be equivalent in productivity to a CLI Class 1 soil. An HPI of between 0.73-0.89 is equivalent in productivity to a CLI Class 2 soil and an HPI in the range of 0.58-0.72 is equivalent in productivity to a CLI Class 3 soil. As shown in the Table 3, the Subject Lands have an HPI equal to 0.62 which is equivalent to a CLI Class 3 soil.

Table 3. Agricultural Productivity for Subject Lands

CLI Class	A Area (Ha) of CLI Class	B Percentage of Subject Lands	C Common Field Crop Yield Index	D HPI	E Total Productivity Index Range
1	0.00	0.00	1.0	0.000	0.90 – 1.00
2	15.19	14.28	0.8	0.11	0.73 – 0.89
3	76.89	72.31	0.64	0.46	**0.58 – 0.72**
4	0.00	0.00	0.49	0.000	0.43 – 0.57
5	14.26	13.41	0.33	0.04	0.28 – 0.42
6	0.00	0.00	0.17	0.00	0.10 – 0.27
7, O, & NM	0.00	0.00	0.02	0.00	0.00 – 0.09
HPI for Subject Lands	106.34	100.00%		**0.62**	**Class 3**

To determine the HPI multiply the percentages of each CLI Class (Column B) by the Common Field Crop Yield Index (Column C) and sum the values in Column D. Column E provides the Productivity Ranges to determine the CLI Class equivalents.

Note: Column sums may not total due to rounding.

We can also apply the HPI to the entire Study Area to determine the area's overall productivity. Table 5 shows the productivity of the soils assuming that drainage improvements are feasible.

Table 4. Agricultural Productivity for Study Area

CLI Class	A Area (Ha) of CLI Class	B Percentage of Subject Lands	C Common Field Crop Yield Index	D HPI	E Total Productivity Index Range
1	3.24	0.03	1.0	0.00	0.90 – 1.00
2	1505.53	13.34	0.8	0.11	0.73 – 0.89
3	8040.43	71.24	0.64	0.46	**0.58 – 0.72**
4	68.66	0.61	0.49	0.00	0.43 – 0.57
5	653.35	5.79	0.33	0.02	0.28 – 0.42
6	0.00	0.00	0.17	0.000	0.10 – 0.27
7, O, & NM	1015.25	9.00	0.02	0.002	0.00 – 0.09
HPI for Study Area	11286.46	100.00%		**0.59**	**Class 3**

To determine the HPI multiply the percentages of each CLI Class (Column B) by the Common Field Crop Yield Index (Column C) and sum the values in Column D. Column E provides the Productivity Ranges to determine the CLI Class equivalents. Note: Column sums may not total due to rounding.

The results show that the productivity of the Study Area is 0.59 which is also equivalent in productivity to CLI Class 3 soils.

5.4 Climate

5.4.1 Regional Climatic Conditions

The temperatures experienced in the Niagara Peninsula are highly influenced of both Lake Ontario and Lake Erie. The lakes moderate the temperatures and protect the area from extreme cold winter and early spring temperatures (i.e. frost). In the summer months the deep, cooler waters of Lake Ontario act to moderate the warm tropical air, which regularly approaches the area from the south.

The Niagara Fruit Belt is one of the provincially recognized specialty crop areas. It is generally located between the Niagara Escarpment, the Vinemount Moraine, Fonthill Kame and Lake Ontario to the north. It is one of Canada's largest producers of tender fruit crops such as grapes, peaches, cherries, plums, pears, apples, and berries. The production of these crops relies on a unique combination of good, fertile soils, a moderate climate, adequate rainfall and a long frost-free growing season.

Common field crops (soybeans, corn, and cereal grains), which do not rely on the milder climatic conditions experienced in the Niagara Fruit Belt, are commonly grown throughout the Region.

5.4.2 Climate Information for Niagara Falls Area

The Subject Lands are located in Niagara Falls. Climate data for the Niagara Falls is available through Environment Canada's National Climate Data and Information Archive's online database. The area generally receives uniform levels of precipitation year-round supplemented by the addition of moisture from the Great Lakes during the fall and winter months. Niagara Falls receives an average of 970.2 mm of precipitation annually (Environment Canada website); 808.6 mm of rainfall and 161.6 cm of snowfall. The daily average temperature ranges from a high of 21.4°C in the month of August to a low -4.5°C in January. According to the OMAFRA Factsheet Freeze Risk During Spring and Autumn in Ontario (Brown, D.M., & A. Bootsma, 1991) the average length of the frost-free period is estimated to be between 160 and 170 days. The frost-free period ranges from about April 25th to October 20th.

Niagara Falls receives annually an average of between 3100 and 3200 accumulated crop heat units (CHU). The crop heat unit ratings are based on the total accumulated CHU for the frost-free growing season (Brown, D. M., and A. Bootsma. 1993). All common field crops can be grown in areas receiving 3100-3200 CHU.

5.4.3 Site Conditions

Winter temperatures are generally cooler and there is a greater occurrence of spring frosts that occur later in the spring. The low areas along Beaverdams Creek also have an increased potential for frost damage to cold sensitive crops. As a result, many specialty crops common in other areas (e.g., north of the Niagara Escarpment) are not suitable for the Study Area due to because of the less favourable climatic conditions.

The Niagara Falls area is not known as a specialty crop growing area, however some vegetable and hardy fruits crops can be grown. Some specialty crop production does take place in the northern portion of the City of Niagara Falls in the general vicinity of Mountain Road. Some farmers are able to take advantage of several key physiographic advantages (e.g., increase of slope, slopes aspect, proximity to Lake Ontario, improved surface drainage). These physiographic advantages allow for some limited specialty crop production.

The Study Area does not receive the full climatic benefits experienced by those lands in the Niagara Fruit Belt, which are located primarily to the north of the Niagara Escarpment. The Study Area is not part of this provincially recognized specialty crop area.

5.5 Land Use Characteristics

5.5.1 Greater Golden Horseshoe Agricultural System

The AIA included a review of the Greater Golden Horseshoe Agricultural System Portal and its mapping layers. The purpose of the Agricultural System Portal is to provide agricultural related information which can assist with planning, economic development and to enhance efforts to protect agricultural lands, agricultural uses and services upon which agriculture and the agri-food sector depend. The online mapping tool shows the agricultural land base and includes approximately 60 map layers showing the

locations of transportation infrastructure, processing and storage facilities, and other agricultural support businesses and infrastructure. It also shows the spatial density of various types of farms and crops.

The review of the Agricultural System Portal shows that the Subject Lands are located within the agricultural land base. However, as shown in Appendix D, there are only a few agri-food related uses within either the Primary or Secondary Study Areas. There are some businesses in the area that provide services to the agricultural community, however, they are located outside of the study areas and are primarily in the existing urban areas and will not be impacted by the proposed quarry extraction operation.

There is a low level of agricultural investment and other than a small number of greenhouses south of Lundy's Lane, there are no agriculture-related land uses within the study areas. The Agricultural System Portal shows the spatial density for beef, dairy, hog, sheep, and goat production as low, and moderate to low for poultry. The spatial density for vegetable and fruit production is low. Again, other than the greenhouse operations south of Lundy's Lane, there is no specialty crop production identified.

5.5.2 Land Use Survey Methods

A reconnaissance level land use survey was originally completed on January 12th, 2017. Updates to land use were made throughout the period of study and as recently as September 30, 2020. The land use surveys involved an inventory of farm operations, field crops, and observations of non-farm land uses. The purpose of the survey was to identify agricultural and non-agricultural uses in the Study Area and identify agricultural operations that may be sensitive to the introduction of new land uses. Field boundaries and land uses were interpreted from the observations recorded during the land use surveys and from a review of aerial photography. In addition, Google Earth™ was used to identify land uses in cases where it was difficult to observe from the roadside. OMAFRA's Guidelines on Permitted Uses in Ontario's Prime Agricultural Area (publication 851, 2016) was used to classify agricultural land uses into three categories: Agricultural Uses, Agriculture-related Uses and On-farm Diversified Uses.

Farm types were noted and identified as either active or inactive (e.g., retired), livestock, cash crop or hobby farms. Livestock operations include poultry, dairy, beef, cow-calf and equestrian operations. Those inactive or retired farm operations were evaluated to determine whether they should be considered as either an empty livestock operation or as a remnant farm. Remnant farms have no infrastructure that is suitable for housing livestock whereas the infrastructure for an empty livestock facility is still in a condition that could permit the keeping of livestock with minimal investment.

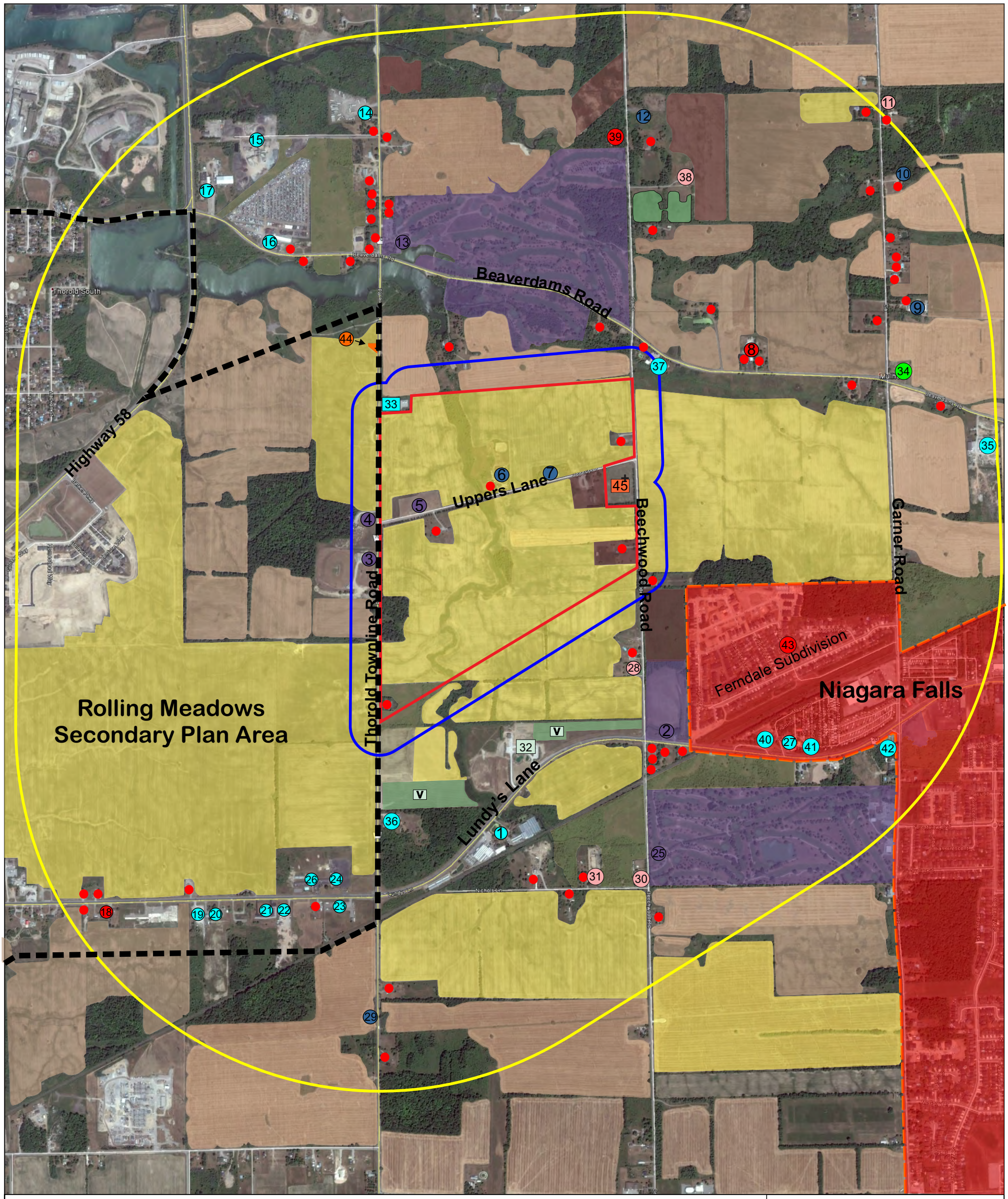
Non-farm, land uses include non-farm residences, residential subdivisions, recreational, institutional, commercial, and aggregate operations.

Crop identification was carried out as follows: corn, soybeans, and silage corn were considered row crops; forages such as grass mixes, alfalfa, and clovers were classified as forage. Forage crops include hay, haylage and pasture lands. Cereal crops such as barley, winter wheat, spring wheat, oats, and rye were given the general classification of 'grains.' Areas that were obviously under cultivation but were ploughed at the time of the land use survey were identified as 'cultivated'. Specialty crops, such as

vegetable crops, were also mapped but comprise a very small proportion of the crops being grown in the Study Area. Areas not in agricultural production include idle lands, scrub lands and natural areas (i.e. forested). Land uses were categorized as follows:

- *Row Crops:* These are areas that are cultivated or planted with common field crops such as corn, beans, or grain. Most of this cash crop land is in soybeans and winter wheat.
- *Forage:* Lands that are used to produce forage crops such as hay or hay silage.
- *Pasture:* Fenced lands that are used to pasture livestock.
- *Cash crop operation:* Building complex and machinery typical of farm operation that concentrates predominantly on the production of common field crops.
- *Hobby Farm:* A residential dwelling, with or without accessory buildings, and includes some crop production for personal consumption or limited sale; and/or small numbers of livestock raised for personal consumption, pleasure or limited sale. A hobby farm normally will generate little or no income.
- *Retired:* A residence with a barn and associated ancillary buildings that are no longer used for agricultural purposes. The farm buildings may be abandoned or used for storage and other non-farm related uses.
- *Idle:* Idle lands are non-forested areas that have not been utilized for agricultural crops and now contain old meadow vegetation communities containing very little woody vegetation.
- *Scrubland:* Scrubland is land that has been left idle long enough for woody shrubs and/or young trees to become established.
- *Woodlot:* Woodlot includes forested areas (including plantations and re-forested areas).
- *Residential:* Non-farm residential development includes single dwellings on small lots, estate residential lots and dwellings, subdivisions and urban residential areas.
- *Industrial*: Includes both small and large scale industrial developments and lands designated for industrial uses.
- *Institutional:* Institutional uses commonly include churches & cemeteries, educational facilities and publicly owned facilities.
- *Commercial:* Land uses that include non-agricultural commercial operations such as gas stations, automotive repair, etc.)
- *Recreational:* Land uses such as golf courses, soccer and baseball fields.

The mix of land uses and cropping patterns observed in the Study Area are shown in Figure 5. Descriptions of these land uses are provided in Appendix E.


Beaverdams Road
Thorold South
Highway 58
Uppers Lane
Thorold Townline Road
Beechwood Road
Garner Road
Lundy's Lane
Rolling Meadows
Secondary Plan Area
Ferndale Subdivision
Niagara Falls
Mulh
Legend
Subject Lands
Primary Study Area
Secondary Study Area
Urban Area
Recreational
Non-farm Residence
Institutional/Church
Utility/Infrastructure
Industrial/Commercial
Rolling Meadows Secondary Plan
Urban Boundary- Niagara Falls
Cemetery
Row Crops
Specialty Crops
V Vineyard
Pasture/Forage
Cultivated
Idle
Scrub
Thicket/Forested
Agricultural Use
Retired and Remnant Farm Operation
Hobby Farm
FIGURE 5
Land Use Map
N
W
E
S
100 0 500
Metres
Approximate Scale 1:15,500
Prepared for:
walker
Prepared by:
COLVILLE CONSULTING INC.
Date: December 2020
File: C16075

5.5.3 Land Use Observations in the Study Area

The land uses and cropping pattern observed in both the Primary and Secondary Study Areas are shown in Figure 5.

Primary Study Area

The Primary Study Area consists of lands within 120 m of the Subject Lands; these lands may be directly impacted by the proposed development of Uppers Quarry. The land uses in the Primary Study Area consist mainly of row crop production, cultivated fields, a utility facility and recreational land uses (i.e., golf facility). The Niagara Cricket Center and the DMZ Paintball Facility are also located within the Primary Study Area. The land uses identified in the Primary Study Area are summarized in Table 5.

Table 5: Primary Study Area Land Use Summary

	Total Number	**Active**	**Retired or Remnant**
Agricultural	0	0	0
Agriculture-related	0	0	0
On-farm Diversified	0	0	0
	Total Number	Commercial	Other
Non-Agricultural	8	1-Commercial operation 1 - Utility Station	3 – Recreational Uses 1 - Former community garden 1 – Bible Baptist Church 1 - Remnant farm operation (demolished)

Secondary Study Area

The land uses in the Secondary Study Area consist primarily of non-farm related uses. These land uses include numerous non-farm residences and several commercial, recreational, institutional, and public facilities/utilities scattered throughout. In addition, a significant portion of the secondary study area is now part of the urban boundary of the City of Thorold (the Rolling Meadows secondary plan area) and the urban boundary of the City of Niagara Falls also makes up a portion of the eastern Secondary Study Area. There are also extensive areas of idle, scrub and forested lands throughout the Secondary Study Area. The idle and scrublands have developed on farmlands which are no longer in active production and have begun to naturalize. Where lands are being cultivated they are primarily used for common field crop production. Corn, soybeans and pasture/forage crops were all observed. Substantial areas of specialty crop production are non-existent.

Site #9 is a retired dairy farm. There are several implement sheds and a barn in fair condition. It is assumed that the barn is structurally sound and still capable of housing livestock.

The active farm operations observed in the Secondary Study Area are small hobby farms many of which are located on small lots in an existing residential area. They are not viable farm operations capable of supporting a farm family. Hobby farms usually include a residential dwelling with some farm related buildings (e.g., small barns, pens, and sheds). A hobby farm may include some crop production (e.g., gardens, small hay fields. etc.) for personal consumption, feed for a small number of animals or for

limited sale. It may also include a small number of animals (e.g., chickens raised for meat and eggs, beef, or horses) which are likely been raised for personal consumption. A hobby farm normally will generate little or no family income.

Not including the many residences and building lots within existing and approved subdivisions, there are multiple non-farm residences within one and a half kilometers of the Subject Lands. Residential development is also very common along Garner Road and Lundy's Lane. Additionally, there are at least eleven other non-farm uses including; an auto recycling depot and automotive shop, an Asphalt Plant, multiple golf courses and recreational facilities, a garden centre and greenhouse located in the southern portion; along with multiple motels and commercial operations along Lundy's Lane that are within the urban area and in proximity to the Subject Lands.

Finally, it is important to note the proximity of the Subject Lands to the urban boundary of both the City of Thorold and Niagara Falls. The Rolling Meadows secondary plan area is located immediately west of the Subject Lands, while the Fernwood subdivision is located along the eastern portion of the Secondary Study Area in the City of Niagara Falls. These two subdivisions result in increased fragmentation in the area and decrease the agricultural priority of the lands for agriculture. The land uses identified in the Secondary Study Area are summarized in Table 6.

Table 6: Secondary Study Area Land Use Summary

	Total Number	**Active**	**Retired or Remnant**
Agricultural	9	5 – Hobby Farm 1 – Winery	3 - Retired Livestock Operation
Agriculture-related	2	1 - Country Basket Garden Center and Greenhouse 1 – Niagara Honey	0
On-farm Diversified	0	0	0
	Total Number	**Commercial**	**Other**
Non-Agricultural	26	8 - Commercial	1 –Residential Subdivision 1 – Non-farm residence 1 – Recreational - Lundy's Lane Driving Range 2 – Beechwood Golf and Social Club & Niagara Falls Golf Club 1 – Pet Groomer 5 – Motel/Inn 1 – Night Club 1 - Campark Resorts Camping and RV Resort 1 – Italo-Canadian Club 1 – RV Lot 2 – Recreational 1 - Cemetery

5.6 Land Improvements

Investment in agricultural land improvements is common in high priority prime agricultural areas. These land improvements often include investment in artificial tile drainage installations and major investments such as the construction of municipal drains which benefit the broader agricultural community. In areas with imperfectly and poorly drained soil such as those in the study area, the installation of artificial drainage can significantly improve the productivity of the soil.

As shown in Figure 6, there is no recorded tile drainage installations in the study area. According to OMAFRA's AgMaps and the Agricultural System Portal mapping, there is one small area of random tile drainage to the north of the study area and two small areas of systematic tile drainage to southwest and just outside of the study area. This is despite the prevalence of imperfectly and poorly drained soils in the study area. No municipal drains are mapped in the study area. The lack of investment in tile drainage reduces the agricultural priority of the lands within the Subject Lands and broader study area.

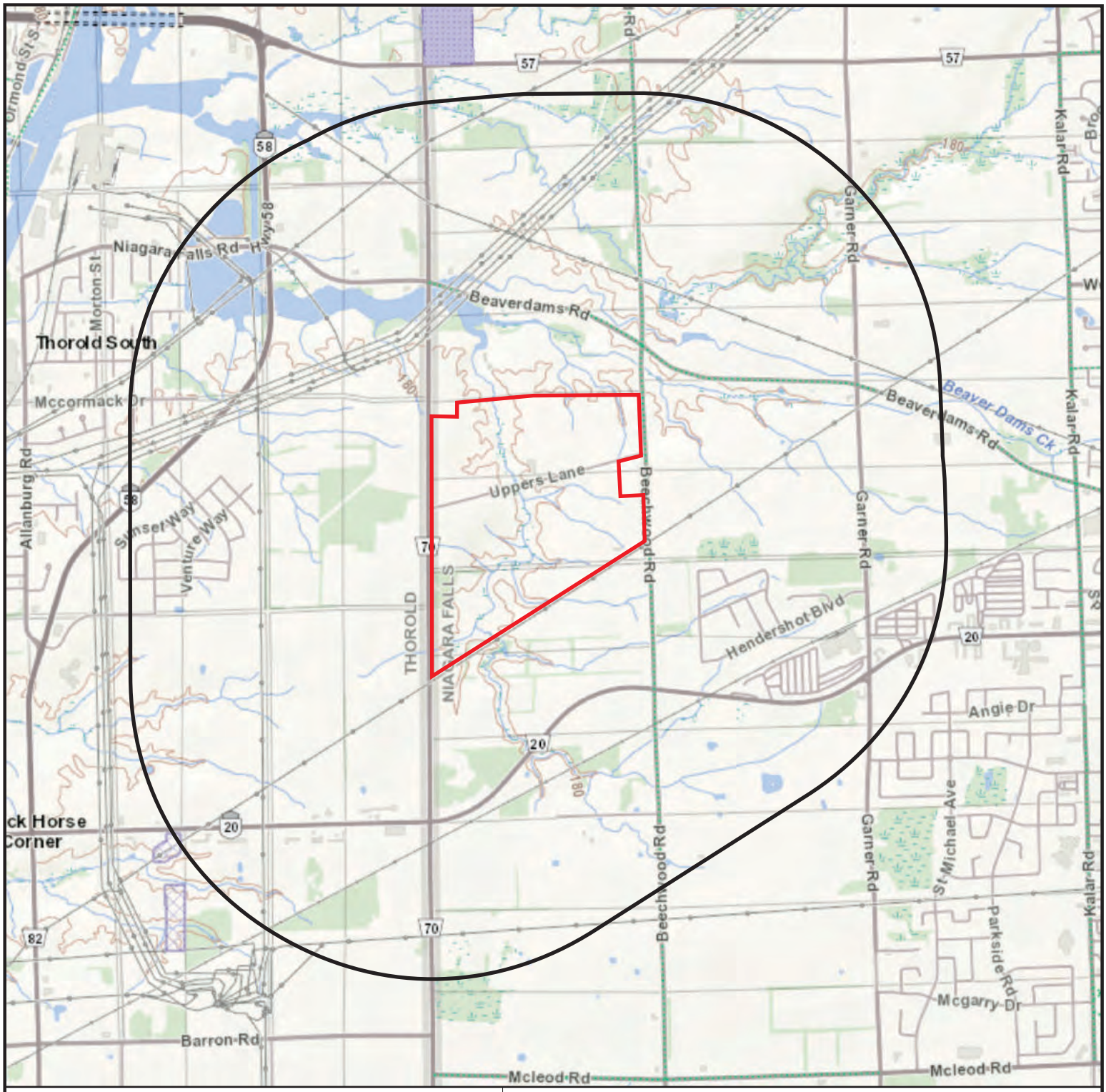
5.7 Fragmentation of Agricultural Lands

Fragmentation of agricultural lands can have a negative impact on the viability of agricultural lands and its long-term preservation for agricultural purposes. Fragmentation of farmlands generally reduces the economic viability of the area by reducing the efficiency of which lands can be farmed and increasing the operating costs for farms comprised of several small and separated parcels. Small farm parcels are often uneconomical and cannot support a farm family and an outside (off farm) source of income may be required to maintain the agricultural operation. Agricultural areas which have been fragmented also often have a higher occurrence of non-farm land uses which in turn means that there is a greater potential for conflict arising between farm and non-farm land uses.

Areas with relatively low levels of fragmentation are considered to be more viable economically, with fewer sources of non-farm land use conflicts. In most cases, these areas have a higher priority for protection. The more fragmentation experienced in an agricultural area the lower the areas agricultural priority.

Figure 7 shows that the Study Area has experienced lot severance to various degrees. There are still some large, contiguous agricultural blocks along with several small non-agricultural lots. Many of which are located in Thorold and are within the Rolling Meadows Secondary Plan area which is scheduled for future urban development.

The proposed quarry extraction will have a small impact on the agricultural land base on adjoining parcels. The extraction limits will bisect two agricultural parcels. However, the resulting lot sizes will both exceed 15 ha and will remain viable for common field crop production.



Agricultural Tile Drainage — Random

Wooded Area

Rivers

Power Lines

Subject Lands

Secondary Study Area

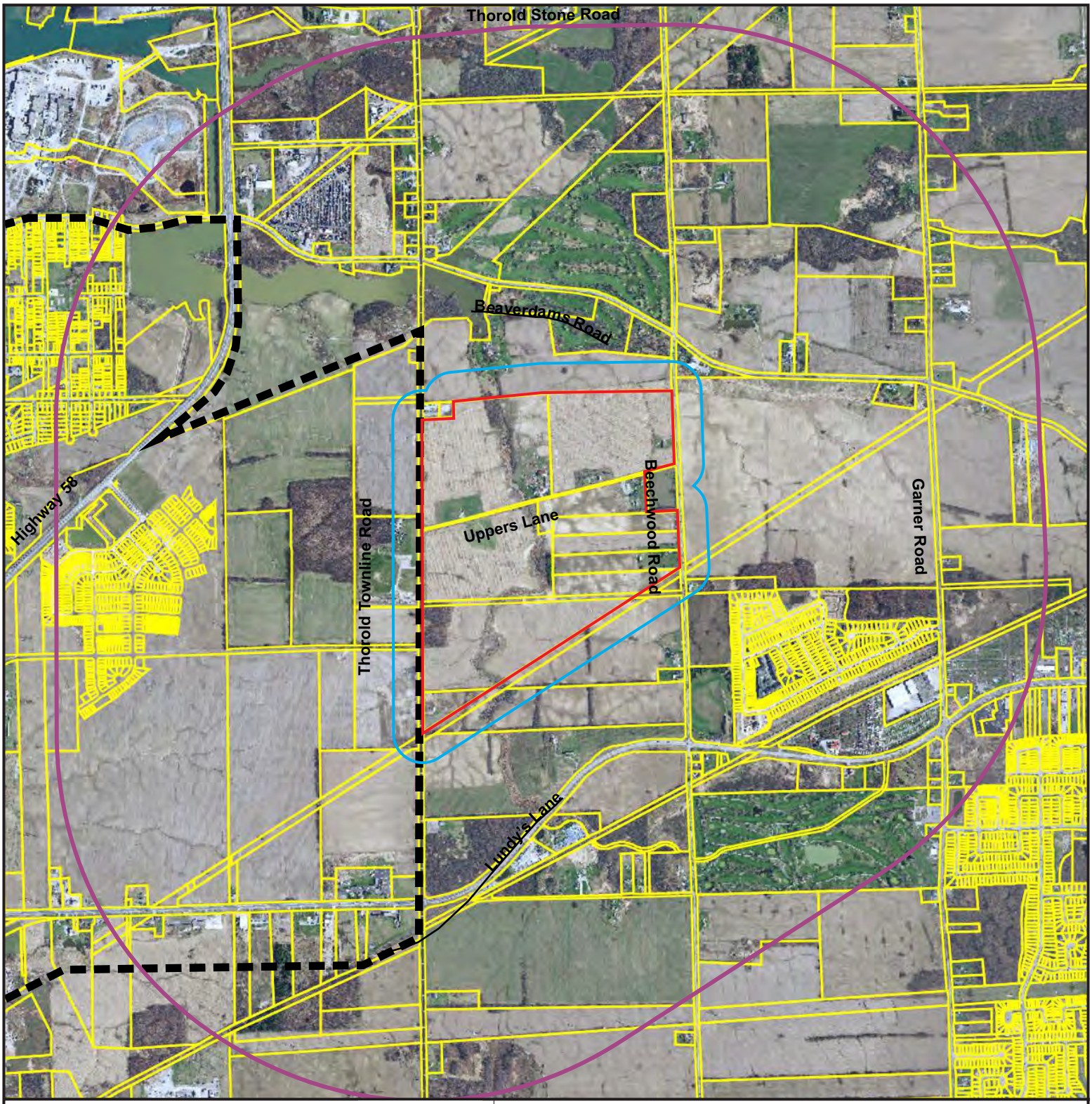
Figure 6
Land Improvements

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC.

Revised: December 2020

FILE: C16075



Wooded Area

Rivers

Subject Lands

Lot Line

Urban Boundary

(Rolling Meadows Secondary Plan)

Primary Study Area

Secondary Study Area

100 0 500 Metres

Scale 1:21,750

Figure 7
Lot Fabric and Fragmentation

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC.

Revised: December 2020

FILE: C16075

5.8 Assessment of Economic and Community Benefits

The Subject Lands and surrounding area are not located within the Niagara Fruit Belt and do not receive the micro-climatic benefits characteristic of the tender fruit lands to the north. The area has experienced a decline in the number of active farm operations, a loss of investments in agricultural infrastructure and there a lack of investments in land improvements such as tile drainage. These are not characteristics of a vibrant agricultural system. According to the census Canada, census for agriculture, approximately 250,000 acres of land were actively cultivated for common field crops in 2016 in the Haldimand/Niagara Region, with 30-61% of that land being leased lands. Lands that are leased by farmers do not often receive the same level of investment as lands that are owned directly by a farmer. Many farmers leasing lands are unwilling to invest in lands that are not their own unless a long-term leasing arrangement can be negotiated.

The Subject Lands are being leased to a local, custom farm operator who also farms several other properties in the study areas and elsewhere in the Niagara Region. The harvest and sale of the commodities produced on these lands support his farm operation, which in turn supports the broader agri-food network in the Niagara Region. It is understood that Walker will continue to lease the Subject Lands until they are required for extraction. This will minimize the impact of the eventual long-term loss of the agricultural lands for common field crop production and the impact on the local agricultural system.

The Agricultural System Portal mapping (Appendix D) shows a relatively low level of agricultural investment and few components of the agri-food network within the study areas. As a result, the proposed Uppers Quarry will have a low impact on agriculture and agri-food industry.

5.9 Statistics Canada Census of Agriculture Review

The information available on the Statistics Canada Census for Agriculture was reviewed to obtain a more complete picture of the agricultural landscape in Niagara Falls. The majority of farms in the Niagara Falls area are between 4 – 28 ha (10-69 acres) in size. There was approximately 3,654 acres of land in agricultural production in 2016. This is a significant reduction from 2011 when 6,888 acres were in production. There has been a corresponding decline in the number of farm operations and land under active production between 2011 and 2016. In 2011 there were 88 farms reported in the Niagara Falls area, a number that declined to 58 in 2016. The types of farms most heavily represented in those numbers included greenhouse and nursery operations (nine) poultry and egg production (eight), oil seed and grain production (8), and horse operations (seven). Soybean production and hay production were also represented (six operations each).

Overall, the Census data shows a significant decline in agriculture in the Niagara Falls area over the five year period. This is consistent with what has been observed in the study area.

5.10 Alternative Site Assessment

To be consistent with the Section 2.5.4.1 of the PPS, the AIA included an assessment of alternative locations. Due to the depth of extraction, rehabilitation back to an agricultural after use will not be feasible. Therefore, alternatives for the proposed quarry were considered. In parallel with the alternate site assessment completed for the AIA, MHBC also undertook an alternative site assessment. MHBC was only able to identify three potential locations within Walker's market area. They concluded that the alternative sites were unsuitable in comparison the proposed site.

Using a different methodology to identify and assess alternative sites, the AIA also concluded that the other locations would be unsuitable in comparison to the proposed Uppers Quarry location. The Alternative Site Assessment is presented in Appendix B.

6.0 ASSESSMENT OF IMPACTS TO AGRICULTURE

The PPS requires that impacts from any new or expanding non-agricultural uses on surrounding agricultural operations and lands be mitigated to the extent feasible. The Growth Plan requires that new mineral aggregate operations in prime agricultural areas be supported by an agricultural impact assessment; and that that where possible, new mineral aggregate operations should seek to maintain or improve connectivity of the Agricultural System. Where negative impacts on the agri-food network are unavoidable, the Growth Plan requires that they be assessed, minimized, and mitigated to the extent feasible.

The AIA has considered a wide range of potential impacts that may arise as a result of the introduction of a new mineral aggregate operation to the study area. These impacts are assessed in this Section. Mitigation measures to avoid or minimize, where possible, the potential long-term negative impacts are provided in Section 7 of the AIA. A discussion of net impacts is provided in Section 8.

6.1 Loss of Agricultural Resources

6.1.1 Prime Agricultural Land

Eighty six percent of the Subject Lands are considered to be prime agricultural land, consisting of mainly of CLI Class 3 lands with small portions of CLI Class 2 and some CLI Class 5. Extraction activities will result in the loss of approximately 89.1 ha of prime agricultural land.

No impact to adjacent prime agricultural lands is anticipated. They will continue to be available for agricultural purposes.

6.1.2 Agricultural Infrastructure

There is no agricultural infrastructure in the Primary Study Area. Therefore, there will be no loss of farm infrastructure as a result of resource extraction.

No impacts to agricultural infrastructure will occur within the Secondary Study Area.

6.1.3 Land Improvements

According to OMAFRA's Artificial Drainage Systems mapping there is no artificial tile drainage within either the Primary Study Area or Secondary Study Area. No other agricultural land improvements were observed within the Primary Study Area. Therefore, no agricultural land improvements will be lost due to resource extraction.

The rootstock and trellis associated with the vineyard to the south is the only other land improvement observed in the Secondary Study Area. It will not be impacted by aggregate extraction.

6.1.4 Changes to Drainage Features

Through review of the current site plan, the existing water course is proposed to be relocated as a result of the proposed quarry operation, which will result in significant changes to that drainage feature. The existing water course will be relocated in

such a way as to maintain appropriate flow and drainage of surrounding lands. The relocated water course will be designed to enhance both form and function.

The changes to the drainage feature will have no impact on farm operations and farmlands in the Primary and Secondary Study Areas.

6.1.5 Alterations to Climactic Conditions due to Changes in Landforms, Elevations and Slope

Microclimatic conditions are important for specialty crop production of tender fruits. The Subject Lands and broader study area are not located within a specialty crop area where tender fruit production is common (i.e., the Niagara Fruit Belt).

There is some limited potential that during the operational life of the proposed quarry, some minor climactic benefit for lands in the Primary Study Area may be realised, as the quarry itself may serve as a cold air sink. The majority of crop production in both the Primary and Secondary Study Areas is for common field crops. Any benefits resulting from improved cold air drainage will not be significant for common field crops. Therefore, any measurable changes to local microclimate will be largely inconsequential for the crops grown in this area.

6.2 Impacts to Agricultural Operations

6.2.1 Disruption to Agricultural Operations

Farm operations can be adversely impacted by new non-farm development on adjacent lands. The Subject Lands are not located near other active agricultural operations which greatly reduces the potential for disruption to farm operations.

6.2.2 Fragmentation of Agricultural Lands

As discussed in Section 5.7, the proposed quarry will result in the fragmentation of two of the larger lots at the south end of the Subject Lands. The resulting lot sizes will both exceed 15 ha minimizing the impact of fragmentation and be consistent with the average farm parcel size in Niagara Falls.

6.2.3 Loss of Existing and Future Farming Opportunities

The removal of the Subject Lands from agricultural production will result in the loss of some existing and future farming opportunities, namely the production of common field crops. Approximately 89.1 ha (83.8%) of the Subject Lands are currently in agricultural production and will eventually be removed from production. This will also remove the future potential of farming these lands. However, adjacent lands will still be available for agricultural uses.

6.2.4 Noise, Vibration, Dust and Traffic

Quarry operations are likely to create the potential for increases in noise, vibration, dust and truck haul traffic within the Study Area. These issues have been addressed in detail in separate reports by other consultants. Because there are few agricultural operations in close proximity to the proposed quarry, increases in noise, vibration, dust and truck traffic no significant impact on agriculture or agri-food

businesses have been identified. The continuation of common field crop production will not be negatively impacted by any potential increase in dust, noise or vibration concerns.

The only livestock identified in the area are associated with the five small hobby farms located within the Secondary Study Area. Impacts are not expected to adversely affect hobby farms located in the Study Area.

6.2.5 Road Travel for Farm Vehicles

Farm operators can be adversely affected by increases in the volume of trucks on roads commonly used to move farm implements. A large increase in truck traffic may impede the use of the roads normally used to move farm equipment and increase safety issues.

For this application, it is understood that the haul routes will not substantially change from those currently used by the Walker Brothers Quarry operation in Niagara Falls which is located just 2.1 km to north of the proposed Uppers Quarry. The new haul route for the proposed Uppers Quarry will include a section of Townline Rd which will connect to the existing haul route along Niagara Stone Road. Townline Rd is a Regional road designed for the transport of goods and services.

In addition, extraction rates will remain approximately the same as with the existing quarry and therefore traffic will not be significantly altered with the opening and use of the proposed Uppers Quarry on the Subject Lands.

Farm traffic using Upper's Lane is minimal and will need to use other available routes to access lands and farm operations. The majority of the lands along Uppers Lane are leased by Walkers to a custom farm operation. It is expected that Walkers will continue to provide access to the custom farm operator.

6.3 Economic Impacts

6.3.1 Loss of Available Farmland

The proposed quarry will have no direct impacts on the agri-food network. As discussed in section 6.2.3, the loss of approximately 89.1 ha of prime farmland will occur as a result of the proposed quarry operation. This loss will have a minor economic short-term impact on the area as the farmer currently leasing the lands will continue to have access to farm lands. The cumulative impact will increase over the decades as the extraction operation progresses.

However, the long-term impact will be limited to one custom farm operation. Therefore, there will be only a minor economic impact. The Subject Lands are not important to the broader agricultural system in the Region.

6.3.2 Removal of Investments in the Agri-food Sector

There are no agri-food service related operations located within the Study Area. Therefore, no investments in these facilities will be removed or otherwise impacted by the proposed Uppers Quarry.

6.3.3 Loss of Community Benefits

No agriculture-related services that support or benefit the local agricultural system community, or agri-tourism operations and agricultural education facilities were identified. The farm operations and agriculture-related uses identified are well removed from the proposed quarry and will not be impacted.

7.0 MITIGATION MEASURES

Mitigation measures recommended to avoid or minimize the impacts identified in the preceding sections are discussed in Table 7 below.

Table 7. Impacts & Mitigation Recommendations

OBJECTIVE	MEASURES CONSIDERED	MITIGATION RECOMMENDATIONS
Avoiding Impacts		
Avoid the loss and fragmentation of agricultural land	Avoid Prime Agricultural Areas Identify and select alternative locations	Impacts are unavoidable. The quarry cannot avoid prime agricultural lands in a prime agricultural area. Extraction will occur predominantly on low priority agricultural lands. An Alternative Site Assessment completed (See Section 5.10 and Appendix B). No reasonable alternatives were identified.
	Direct the location of non-agricultural uses to settlement areas or rural lands not used for agriculture	No mitigation necessary.
Avoid Impacts from increased non-agricultural road use in agricultural areas	Use alternate routes or roads	It is understood that the proposed haul route will utilize the existing haul routes currently used by Walker's Niagara Falls aggregate operation. The haul routes will utilize regional roads which are intended for the movement of goods including large trucks. Thorold Townline Road, also a Regional Rd., will also be used as a haul route. It is maintained by the Region and is intended for use by heavy traffic including trucks. It is anticipated that the use of these haul routes will not have a significant impact on the movement of agricultural equipment or products. No mitigation necessary.
Avoid impacts from changes in water quality and quantity	Maintain permeable surfaces and drainage patterns	Impacts to water and water quality are addressed in detail by the hydrogeological impact assessment and the natural environment study. One potential impact will be in the relocation of an existing creek However, the proposed creek relocation will be designed to ensure any potential off-site drainage impacts are mitigated so drainage patterns and the health of the creek are maintained. The quarry operation will take place in phases ensuring that permeable surfaces remain available for as long as possible.

Table 7. Impacts & Mitigation Recommendations

OBJECTIVE	MEASURES CONSIDERED	MITIGATION RECOMMENDATIONS
		It is recommended that a groundwater monitoring program be implemented as part of ongoing quarry operations in order to ensure water sources for farms remain viable.
Minimizing/Mitigating Impacts		
Minimize the loss of agricultural land	Select areas with less agricultural land and lower priority agricultural lands	Although the proposed quarry is located within a prime agricultural area, an alternative site analysis has been conducted to ensure that the lowest priority agricultural lands that are viable for the quarry operation are used (Appendix B). No further mitigation required
	Rehabilitate the land to an agricultural after use of similar quality	Given that extraction of high quality mineral aggregate resource will take place below the water table, rehabilitation to an agricultural use is not feasible in this case.
	Re-Use of Soil Resources	Topsoil is an important soil resource. Topsoil not needed for berm construction and should be considered for re-use to improve the agricultural conditions for cultivation at other locations where opportunities exist.
	Phase development	Development of the quarry will take place in phases, with undeveloped phases remaining in agricultural production until such time as extraction is to occur. Progressive agricultural rehabilitation is not possible in this instance.
Minimize the fragmentation of agricultural land	Maintain farm parcels	Farm property lines will be followed in most cases. Two lots in the southern portion of the Subject Lands will be severed. The retained parcels will still be available for agricultural purposes and their sizes will be consistent with farm parcel sizes common in Niagara Falls.
Minimize impacts on farmland and agricultural operations	Edge Planning	Aggregate operations are considered to be "non-critical" edges and can be moderately compatible with agricultural uses adjacent if properly mitigated. In this case, appropriate buffer techniques will be employed, including such things as vegetated berms, which can offer both visual and physical buffers, dust suppression techniques and noise management according to appropriate regulations.

Table 7. Impacts & Mitigation Recommendations

OBJECTIVE	MEASURES CONSIDERED	MITIGATION RECOMMENDATIONS
	Minimum Distance Separation (MDS)	MDS guidelines are not applicable to aggregate operations. No mitigation necessary.
	Compatibility of proposed land uses	If properly mitigated, aggregate operations are considered to be a compatible land use with agricultural land uses.
	Design to support agriculture e.g., help farms to continue to operate; help prevent and reduce trespassing and vandalism	There are no farm operations or facilities adjacent to the proposed quarry, and therefore there is no need to design the proposed quarry operation in a manner that will ensure the continuation adjacent farms or prevent trespassing and vandalism. Impacts to farm operations as a result of trespass and vandalism are not typically associated with aggregate operations.
Minimize and mitigate changes in water quality or quantity	Implement a groundwater monitoring program	In accordance with the recommendations of the hydrogeological assessment, a groundwater monitoring program will be implemented for the Uppers Quarry in order to identify and monitor any changes related to ground water resources surrounding the quarry operation. If any mitigation is proposed Walker will ensure that adequate water supply is available for adjacent farm operations.
Mitigating impacts during construction or operations (e.g. mitigate dust, noise	Adjust operational procedures to accommodate agriculture in the area Maintain compliance with Ministry and conditions of licence	There are no significant livestock operations located in close proximity to the Subject lands. Local farms will be consulted regularly, and communications will be open in order to ensure that complaints are investigated and, if caused by the quarry operation, will be addressed. Dust suppression will be maintained at levels at or better than regulatory requirements as set out by the Air Quality Assessment.
	Vegetative berms	Walker has successfully maintained vegetative berms around the existing Walker Brothers Quarry operation to the north and will continue to do so as needed in the area surrounding the Proposed Uppers Quarry.
	Maintain, restore or construct farm infrastructure	There are no municipal drains located within close proximity to the Subject Lands. No field tile is located within the Subject Lands or within the Study Area.

Table 7. Impacts & Mitigation Recommendations

OBJECTIVE	MEASURES CONSIDERED	MITIGATION RECOMMENDATIONS
Mitigate ongoing Impacts from new development	Implement measures that can be in place post development to support compatibility with agriculture	Non-invasive plant species will be selected for use in berm plantings and other landscaped features surrounding the quarry operation.
Education to achieve greater compatibility between agricultural and non-agricultural uses	Education and Awareness	Communications with adjacent farmers and property owners will be ongoing in order to ensure the maintenance of 'good neighbour' relations.
The Agricultural System		
Proactively plan for agriculture	Implement local official plan policies and programs to support agriculture in the area	The Subject Lands will be re-designated as Extractive Industrial for the purposes of the proposed quarry operation; however, the surrounding lands that are not already designated as urban will remain in Good General Agriculture and will continue to be protected as such.
Protect the agricultural base	Evaluate alternative locations, avoid fragmentation	An alternative site assessment has been completed for the proposed quarry operation, however no other suitable locations are available within the market area (full study available in Appendix B). Significant portions of the lands to the east and west of the quarry are already urban and highly fragmented (or are planned to be). Fragmentation of the agricultural land base will be limited two agricultural parcels.

Table 7. Impacts & Mitigation Recommendations

OBJECTIVE	MEASURES CONSIDERED	MITIGATION RECOMMENDATIONS
Maintain or enhance the geographic continuity of the agricultural base	Plan future land uses to maintain and enhance farmland continuity	The contiguity of farmland in the area will be maintained in the short-term. As extraction activity progresses the connection of the southern agricultural area to the north will be lost. The Subject Lands will not be rehabilitated to agriculture due to proposed extraction below the water table. The severing of the connection will not be entirely caused by the proposed quarry operation. Existing and proposed urban development also contribute to the severing of the agricultural land base.
Maintain the functional and economic connection of the agri-food network	Plan and support the agri-food network	A review of the agri-food network in the area reveals few significant agri-food industries are established in the area and none are likely to be impacted. No infrastructure used to support these operations will be removed as a result of the proposed quarry operation. However, there is also little opportunity or need for investment in the agri-food network in this area due to the lack of farm operations present and the proximity of urban areas from both the City of Thorold and the City of Niagara Falls. It is a low priority agricultural area.

8.0 NET IMPACTS

Net impacts include any and all impacts that will still occur assuming that all mitigation measures outlined above are implemented. In the case of the proposed development the largest net impact is the removal of the Subject lands from agricultural production as extraction will occur below the water table and rehabilitation will not be feasible. Given that the lands will not be rehabilitated to agricultural use following aggregate extraction it is a significant net loss of agricultural lands, however the need for the high quality bedrock resources as well as the lack of appropriate site alternatives does justify the removal of the lands. The majority of the lands removed are equivalent to CLI Class 3 lands and are therefore have the lowest priority for preservation among prime agricultural lands.

Net impacts to the surrounding farmlands are minimal. Any potential impacts that remain are already present as a result of existing and planned non-farm land uses. More specifically, the traffic along haul routes may cause an impediment to farm traffic in the area which will be extended south from the current routes based on the proposed operation location. These impacts are expected to be minimal based on the fact that the access and haul route will use a Regional Road. This route is already in use and intended for high traffic volumes as well as large vehicle traffic. Noise, vibration and dust will be minimized and kept within provincial standards and to ensure proper mitigation is in place reducing potential impact on neighbouring uses.

In addition, agricultural operations and hobby farms located within the Secondary Study Area have already felt the impacts of significant levels of fragmentation common in Niagara Falls. The agricultural land base is being compromised by the encroaching urban boundary to the east and future development to the west (Rolling Meadows Secondary Plan Area). These lands are low priority agricultural lands which are in a continuing decline. The proposed quarry will not result in any additional decrease in agricultural activity in the area.

9.0 STUDY CONCLUSIONS AND RECOMMENDATIONS

9.1 Study Recommendations

The proposed quarry development will have some impact on agriculture and the agricultural system within the Study Area. It is recommended that the mitigation measures discussed above be fully implemented in order to reduce or eliminate these impacts however the removal of 106.3 ha of prime agricultural lands will still occur if the proposed development is carried out. Agricultural rehabilitation is not feasible in this instance due to the presence of substantial high quality mineral aggregate resources as low as ±28 m to ±39 m below the potentiometric surface. Therefore, the lands will be permanently removed from agricultural use. It is recommended that extraction take place in phases in order to preserve the lands for agricultural use as long as possible.

During the life of the operation, it is recommended that an appropriate groundwater monitoring program be implemented in order to ensure that adverse impacts on groundwater users and surface water features as a result of quarry development are recognized and appropriately mitigated. Following the completion of extraction activities, it is recommended that the lands be rehabilitated as per provincial standards.

9.2 Conclusions

The purpose of the AIA is to characterize the agricultural features of the Study Area, identify potential impacts to those features, recommend mitigation measures to eliminate, reduce or mitigate identified impacts, recognize any net impacts and provide recommendations for pre-extraction, during quarry operations and post-extraction.

This AIA has described the land uses, agricultural investments, and activities, and components of the agri-food system within the Subject Lands and the broader Study Area. The Subject Lands are not located within a Specialty Crop Area and they do not share the microclimatic benefits other areas in the Niagara Region have for growing specialty crops. The Subject Lands are located on lands which are considered to be prime agricultural lands, with an overall HPI score identifying them as equivalent in productivity to a CLI Class 3. CLI Class 3 lands have the lowest priority for preservation among prime agricultural lands. The proposed Uppers Quarry will not have a direct impact on any farm operations, retire any agricultural infrastructure or other agricultural related facilities, or result in the loss of investment in land improvements such as tile drainage installations.

The majority of the lands are currently in common field crop production and are leased by a single farmer who will continue to farm the lands until required for extraction purposes. No active livestock operations were identified in either the Primary Study Area (i.e., the Subject Lands) or within the Secondary Study Area. There are some retired farm operations and approximately five small hobby farms within the Study Area. There are a few agri-food operations and some agriculture-related uses such as greenhouse and market garden outlets. Overall, although the lands are considered to be prime agricultural lands in a

prime agricultural area, there is minimal agricultural activity within the Study Area other than the production of common field crops.

Within the study area, there are several non-farm land uses including existing and future residential areas and rural residential dwellings, recreational areas, and several commercial and industrial uses. The presence of these non-farm land uses and the relative absence of agricultural operations and investments within the Subject Lands reduces the agricultural priority of the lands.

The main impact that the proposed Uppers Quarry will have on the local agricultural system is the eventual removal of lower priority agricultural lands from the agricultural land base.

Any potential impacts to agriculture will be mitigated through the findings and measures laid out in other technical reports completed as part of the application, including noise, air quality and blasting and vibration impact reports. The implementation of mitigation measures suggested in these reports will address the specific impacts associated with the proposed Uppers Quarry. Potential agricultural impacts such as noise, vibration and dust will be kept at levels required by provincial standards. Groundwater monitoring will occur to ensure that if groundwater in the area is impacted, the problem is identified immediately and adequate water supply to farming operations or agriculture-related uses is maintained.

Mitigation measures recommended for the proposed Uppers Quarry are discussed in Sections 7. With the implementation of these measures the net impact of the quarry will be minimal with the exception of the removal of agricultural lands from production. This impact cannot be avoided; however, it can be mitigated by continuing to farm the lands that are not actively used for extraction or other purposes.

We have undertaken an alternative site evaluation and determined that there are no other reasonable alternative sites within the market area and with reasonable access to the high quality aggregate resource that avoids the prime agricultural area. We have also reviewed the draft Alternative Site Analysis dated September 2021 completed by MHBC and agree with the conclusions made in that report. The proposed Uppers Quarry is located in a lower priority agricultural area. Therefore, the choice of location is consistent with PPS Policy 2.3.6.1.

The proposed Uppers Quarry will be consistent with the Provincial and Municipal agricultural policies.

Sean Colville, B.Sc., P.Ag.

Colville Consulting Inc.

10.0 BACKGROUND INFORMATION

Agricultural System Portal. (n.d.). Retrieved September 28, 2018, from Agricultural System for the Greater Golden Horseshoe OMAFRA: http://www.omafra.gov.on.ca/english/landuse/gis/WCAG_AGOL/index.html?appid=3cbd2393a1e548949450e21d90646353

Brown, D.M., G.A. McKay, and L.J. Chapman. 1968. The Climate of Southern Ontario. Department of Transport Meteorological Branch.

Canada Land Inventory. 1971. Agricultural Capability for Common Field Crops. 1:50,000 scale.

Chapman, L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario – Third Edition. Ministry of Natural Resources.

City of Niagara Falls. January 2015. City of Niagara Falls Official Plan

Environment Canada. 2011. National Climate Data and Information Archive. Online: www.climate.weatheroffice.ec.gc.ca

Hoffman, D. W., 1971. The Assessment of Soil Productivity for Agriculture. ARDA Report No. 4

Kingston M., and T. Presant. 1989. The soils of the Regional Municipality of Niagara, Volume 1: Report No. 60 of the Ontario Institute of Pedology. Ontario Ministry of Agriculture, Food and Rural Affairs.

Niagara Region. Farming in the Niagara Region: Structure, Trends and Land Use Policies. Pub. 75-8 Planning and Development Department. October, 1989.

Ministry of Agriculture, British Columbia. 2015. Guide to Edge Planning. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/planning-for-agriculture/823100-3_edge_guide_2015.pdf

Ontario Ministry of Agriculture and Food. January 1991. Freeze Risk During Spring and Autumn in Ontario. Order No. 91-006.

Ontario Ministry of Agriculture and Food. October 1993. Crop Heat Units for Corn and Other Warm Season Crops in Ontario. Order No. 93-119.

Ontario Ministry of Agriculture and Food. (2016). Retrieved January 2017, from Agricultural Information Atlas: http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?site=AIA&viewer=AIA&locale=en-US

Ontario Ministry of Agriculture and Food. Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018)

Ontario Ministry of Municipal Affairs and Housing. 2019. Places to Grow: Growth Plan for the Greater Golden Horseshoe.https://files.ontario.ca/mmah-greater-golden-horseshoe-place-to-grow-english-15may2019.pdf

Ontario Ministry of Municipal Affairs and Housing. 2014. *Provincial Policy Statement*. MMAH: Toronto, Ontario.

Ontario Ministry of Municipal Affairs and Housing. 2020. *Provincial Policy Statement*. MMAH: Toronto, Ontario.

Regional Municipality of Niagara. 2014. The Niagara Region Official Plan.

Statistics Canada. Table 32-10-0403-01 Farms classified by farm type https://doi.org/10.25318/3210016601-eng

Statistics Canada. Table 32-10-0404-01 Farms classified by total farm area https://doi.org/10.25318/3210040401-eng

Statistics Canada. Table 32-10-0406-01 Land Use https://doi.org/10.25318/3210040601-eng

Wolf, R. (1993). An inventory of inactive quarries in the Paleozoic limestone and dolostone strata of Ontario; Ontario Geological Survey, Open File Report 5863.

APPENDIX A

Curriculum Vitae

COLVILLE CONSULTING INC.

SEAN M. COLVILLE, B.Sc., P.Ag.

EDUCATION
B.Sc. Geology, Acadia University, 1986
Soil Science, University of Guelph, 1984

PROFESSIONAL AFFILIATIONS
Ontario Institute of Agrology
Agricultural Institute of Canada

POSITIONS HELD

2003 – Present	Colville Consulting Inc., St. Catharines, Ontario. President
2001 – 2003:	ESG International Inc., St. Catharines, Senior Project Manager/Office Manager
1998 – 2001:	ESG International Inc., Guelph, Senior Project Manager
1988 – 1998:	ESG International Inc., Guelph, Project Manager
1984 – 1988:	MacLaren Plansearch Ltd., Halifax, Nova Scotia, Soil Scientist
05/1982 - 09/1983:	Nova Scotia Department of Agriculture and Marketing, Nova Scotia, Assistant Soil Scientist

EXPERIENCE
Sean M. Colville, B.Sc., P.Ag. is the president of Colville Consulting Inc., and has over 25 years of consulting experience involving land use planning involving issues related to agriculture and the natural environment.

Agriculture

Agricultural consulting experience involves soil survey and agricultural resource evaluation, agricultural impact assessment and soil and climatic rehabilitation/restoration. Sean also has extensive experience interpreting agricultural land use policies as they relate to development applications.

Sean is a Professional Agrologist, a member of the Ontario Institute of Agrology and has been recognized by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) as an expert in the identification of Prime Agricultural Areas and the interpretation of the Minimum Distance Separation requirements for livestock operations. Sean's experience is summarized below.

Agricultural Impact Assessment and Alternative Site Studies
Sean specializes in agricultural impact assessment and alternative site studies for development applications and urban boundary expansion proposals. His experience includes well over 100 agricultural impact assessments and soil surveys for a wide variety of projects including Class EAs for linear facilities, waste management facilities, municipal services, impact assessments for aggregate operations, residential, commercial, recreational, industrial and institutional developments. Many of these projects require the interpretation of agricultural land use policies, inventory and assessment of the agricultural resources, land use, land tenure, an assessment of conflict potential including determination of minimum distance separation requirements, identification of prime agricultural lands and areas, and interpretation of the agricultural priority of lands proposed for development.

Justification of the location for development proposals in agricultural areas is required by the Provincial Policy Statement and can often be addressed by an alternative site study.

Sean has also been retained by municipalities to prepare agricultural impact assessment and to peer review studies submitted involving agricultural impacts and minimum distance separation requirements.

Examples of some of the agricultural impact assessments and alternative site studies include:

- Agricultural Impact Assessment for multiple sites in City of Ottawa for Walton Development (2011)
- Agricultural Land Assessments for Richcraft Homes, Orleans and Riverside South, City of Ottawa (2012)
- Agricultural Land Assessment for South Barrhaven Development Corporation, Nepean, City of Ottawa (2013)
- Agricultural Land Assessment for Jack May Chevrolet Buick GMC, Nepean, City of Ottawa (2013)

- Agricultural Impact Assessment for Canadian Motor Speedway racetrack in Fort Erie (2007-2012)
- Agricultural Impact Assessment of the Alloa Reservoir, Pumping Station and Feedermain, Class EA - Regional Municipality of Peel (2008)
- Agricultural Impact Assessment of the Zone 6 Reservoir and Feedermain, Class EA - Regional Municipality of Peel (2009)
- Agricultural Impact Assessment of the North Bolton Elevated Tank and Feedermain, Class EA - Regional Municipality of Peel (2009)
- Urban Boundary Expansion – Mayfield West Phase II Secondary Plan Agricultural Impact Assessment – Town of Caledon (2008)
- Urban Boundary Expansion – South Albion/Bolton Community Plan Agricultural Impact Assessment – Town of Caledon(2008)
- Urban Boundary Expansion - Agricultural Screening Study for the Township of West Lincoln's Growth Management Study, Regional Municipality of Niagara (2007)
- Urban Boundary Expansion - Agricultural Impact Assessment and Alternate Site Study for West Kanata/Stittsville, City of Ottawa (2004, 2011)
- Urban Boundary Expansion - Agricultural Impact Assessment for Barrhaven South, City of Ottawa (2005)
- Urban Boundary Expansion - Agricultural Studies for Niagara Gateway Estates, Town of Grimsby, Regional Municipality of Niagara (2003)
- Urban Boundary Expansion - Agricultural Impact Assessment and Alternative Site Study for Regional Official Plan Amendment #9 Secondary Plan – City of Hamilton (2003)
- Urban Boundary Expansion - Agricultural Impact Assessment and Alternative Site Study for Deanfield Property, Town of Grimsby, Regional Municipality of Niagara (2003)
- Niagara Region Mid-Term Waste Disposal Alternatives Study (2003)

Soil Survey and Resource Evaluation

As a Pedologist (soil scientist), Sean is highly experienced in completing soil surveys, soil resource evaluations and assessing the productivity of soil for common field crops using the Canada Land Inventory system (CLI) of soil classification and for soil suitability for production of specialty crops using the system developed by the Ontario Ministry of Agriculture and Food. He has extensive experience interpreting the soil landscape, glacial landforms and soil forming processes; is skilled in the use of aerial photography for stereoscopic interpretation and identification of soil landforms for soil map production. Sean is recognized by the Ontario Ministry of Agriculture, Food and Rural Affairs as a Consulting Pedologist and a qualified soil scientist capable of preparing soil capability assessments based on the Canada Land Inventory (CLI) Soil Capability Classification for Agriculture (ARDA, 1965).

Sean has lead and participated in a number of large soil survey programs in Ontario, Nova Scotia and New Brunswick. Sean's soil survey experience includes:

- conducting well over 200 soil surveys of various size and scale to assess the soil capability for identification of prime and non-prime agricultural lands for agricultural impact assessments and other studies;
- conducting soil surveys along linear facilities to determine depth of topsoil and subsoil, assess soil capability along the route to determine baseline conditions and identify areas that pose limitations to construction;
- the preparation of soil maps, CLI maps and reports for solar farm applications to address the Ontario Power Authority's requirements for ground-mounted solar project on agricultural lands;
- conducting county level soil survey reports that included the delineation, evaluation and mapping of soils series and the assessment of the soil capability for selected areas in Cumberland County, Colchester County, Hants County and Kings County, Nova Scotia;
- conducting county level soil survey reports that included the delineation, evaluation and mapping of soils series and the assessment of the soil capability for selected areas in Westmoreland County, New Brunswick; and
- conducting soil surveys for paired watershed studies assessing the benefits and effectiveness of no-till cultivation compared to traditional methods in Oxford County, Ontario.

Agricultural Rehabilitation and Monitoring
Mr. Colville has prepared a number of rehabilitation plans for the aggregate industry and for highway and pipeline construction. Mr. Colville also has experience assessing the economic impacts for compensation related to the temporary or permanent loss of use of agricultural land often associated with the construction of linear facilities.

Publications
Rees, H.W.; Duff, J.P.; Colville, S.; Soley, T. and Chow, T.L. 1995. **Soils of selected agricultural areas of Moncton Parish, Westmoreland County, New Brunswick**. New Brunswick. Soil Survey Report No. 15. CLBRR Contribution No. 95-13, Research Branch, Agriculture and Agri-Food Canada, Ottawa, Ont.

Rees, H.W.; Duff, J.P.; Soley, T.; Colville, S.; and Chow, T.L. 1996. **Soils of selected agricultural areas of Shediac and Botsford parishes, Westmoreland County, New Brunswick.** New Brunswick. Soil Survey Report No. 16. CLBRR Contribution No. 95-13, Research Branch, Agriculture and Agri-Food Canada, Ottawa, Ont. 127 pp. with maps.

Training and Workshops
Minimum Distance Separation Formulae (OMAFRA, 2006)
Professionalism and Ethics (OIA, 2004)
Project Management Training (PSMJ, 2003)
Manure Management Seminar (OMAFRA, 2003)
Certification for Nutrient Management Planning (OMAFRA, 2003)
APAO Pit and Quarry Rehabilitation Seminars (1998-2002)
Fundamentals of Nutrient Management Planning (2001)
Nutrient Management Planning – Applications using NMan 2001
Canadian Red Cross First Aid and CPR (2002)
Valid Drivers – Class G

APPENDIX B

Alternate Site Study

ALTERNATIVE SITE STUDY

FOR

THE UPPERS QUARRY

PREPARED FOR:

COLVILLE CONSULTING INC.
404 QUEENSTON STREET
ST. CATHARINES, ONTARIO
L2P 2Y2

C16065
DECEMBER, 2020

Introduction

Colville was retained by Walker Industries (Walker's) in 2016 to conduct an Agricultural Impact Assessment (AIA) for the proposed Uppers Quarry. The scope of the AIA includes an evaluation of the conformity of the extraction proposal with provincial policy.

Subject Lands

The proposed site is located within the Regional Municipality of Niagara's prime agricultural area and the lands are designated Good General Agriculture. The provincial soil mapping shows that the majority of the Subject Lands are comprised of Canada Land Inventory (CLI) Class 3 lands which are considered to be prime agricultural land. The Provincial Policy Statement (PPS, 2014) permits aggregate extraction in prime agricultural areas under certain conditions.

These conditions are outlined under Policy 2.5.4 - Extraction in Prime Agricultural Areas. Section 2.5.4.1 states that:

> "In prime agricultural areas, on prime agricultural land, extraction of mineral aggregate resources is permitted as an interim use provided that the site will be rehabilitated back to an agricultural condition.
>
> Complete rehabilitation to an agricultural condition is not required if:
>
> a) outside of a specialty crop area, there is a substantial quantity of mineral aggregate resources below the water table warranting extraction, or the depth of planned extraction in a quarry makes restoration of pre-extraction agricultural capability unfeasible;
>
> b) in a specialty crop area, there is a substantial quantity of high quality mineral aggregate resources below the water table warranting extraction, and the depth of planned extraction makes restoration of pre-extraction agricultural capability unfeasible;
>
> c) other alternatives have been considered by the applicant and found unsuitable. The consideration of other alternatives shall include resources in areas of Canada Land Inventory Class 4 through 7 lands, resources on lands identified as designated growth areas, and resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands shall be protected in this order of priority: specialty crop areas, Canada Land Inventory Class 1, 2 and 3 lands; and
>
> d) agricultural rehabilitation in remaining areas is maximized.

Extraction will occur below the depth of the water table and the after use for the proposed quarry will result in the formation of a lake. Agricultural rehabilitation will not be feasible. Therefore, to comply with policy 2.5.4.1, it must be demonstrated that other alternatives have been considered and found to be unsuitable.

Study Area

To scope the Study Area to a reasonable area of consideration we limited the area to Walker's "market area". We then screened out the urban designated areas, the NEC lands and the Greenbelt area. It is assumed that there are no suitable areas with aggregate resources on lands identified as designated growth areas within Walker's market area. This exercise eliminated the consideration of lands designated Unique Agriculture (i.e., Specialty Crop Lands). The only lands remaining after the screening exercise are lands designated Good General Agriculture, which are included within the Region's prime agricultural area.

Identification of Lower Capability Lands (Non-prime Agricultural Lands)

The next step was to determine whether there are any suitable locations with resources that are located in areas of CLI Classes 4-7. We obtained the soils mapping and attribute data from the Province's soil resource database. Most of the soil polygons mapped in the Study Area are comprised of complex soil units, that is, there are at least two soil types within each soil polygon. These soils may have different limitations for agricultural production of common field crops which would potentially result in there being two different CLI Classes within the same polygon. The soil attribute data includes the percentage of the soil types mapped within each individual soil polygon. To determine whether there are areas suitable areas of CLI Class 4-7 we used the Hoffman Productivity Indices (HPI) to assign one value to each soil polygon within the Study Area. Each polygon was then assigned an equivalent CLI Class. A map was produced showing the CLI Classes and not-mapped areas.

The CLI Class 4, 5 and 6 lands mapped are all associated with drainage features and are typically appear on the mapping as long narrow, sinuous strips. For several obvious reasons, these areas would not be suitable for extraction of aggregate.

There are no CLI Class 7 lands mapped within the Study Area. There are however several areas of Not Mapped lands. These areas correspond to existing built up areas, aggregate extraction, waste management operations, and recreational facilities. The Not-Mapped areas are not suitable for locating the proposed quarry.

Assessment of Agricultural Priority

No reasonable alternative locations were identified on lower capability lands; therefore, we narrowed our search to areas containing prime agricultural lands. As stated in the PPS, the order of priority for protection is as follows: specialty crop areas, Canada Land Inventory Class 1, 2 and 3 lands. Among the prime agricultural lands, CLI Class 3 lands have the lowest priority for preservation.

In Niagara, the majority of the soil units shown on the soil mapping for the region are considered to be complex soil units. That is the soil map units contain two distinct soil types and/or different slope classes. This results in soil units that can contain two different CLI capability classes. We used the Hoffman Productivity Indices (HPI) to obtain a value for each soil map unit. The value relates to the agricultural productivity of the soil map unit. It is determined by the relative percent of each soil capability class present in the soil map unit and provides an equivalent CLI capability class. The equivalent CLI capability class was determined for each of the soil map units in the Study Area and is shown in the attached figure.

The figure shows that there are no reasonable areas that avoid prime agricultural lands. There are other lands in the Study Area that are predominantly CLI Class 2. The proposed quarry avoids these areas of higher capability lands.

The Subject Lands are located in an area that is comprised predominantly of CLI Class 3 lands with some minor amounts of CLI Class 2 and CLI Classes 4 and 5. Overall, the HPI for the property is equivalent to that of CLI Class 3 lands.

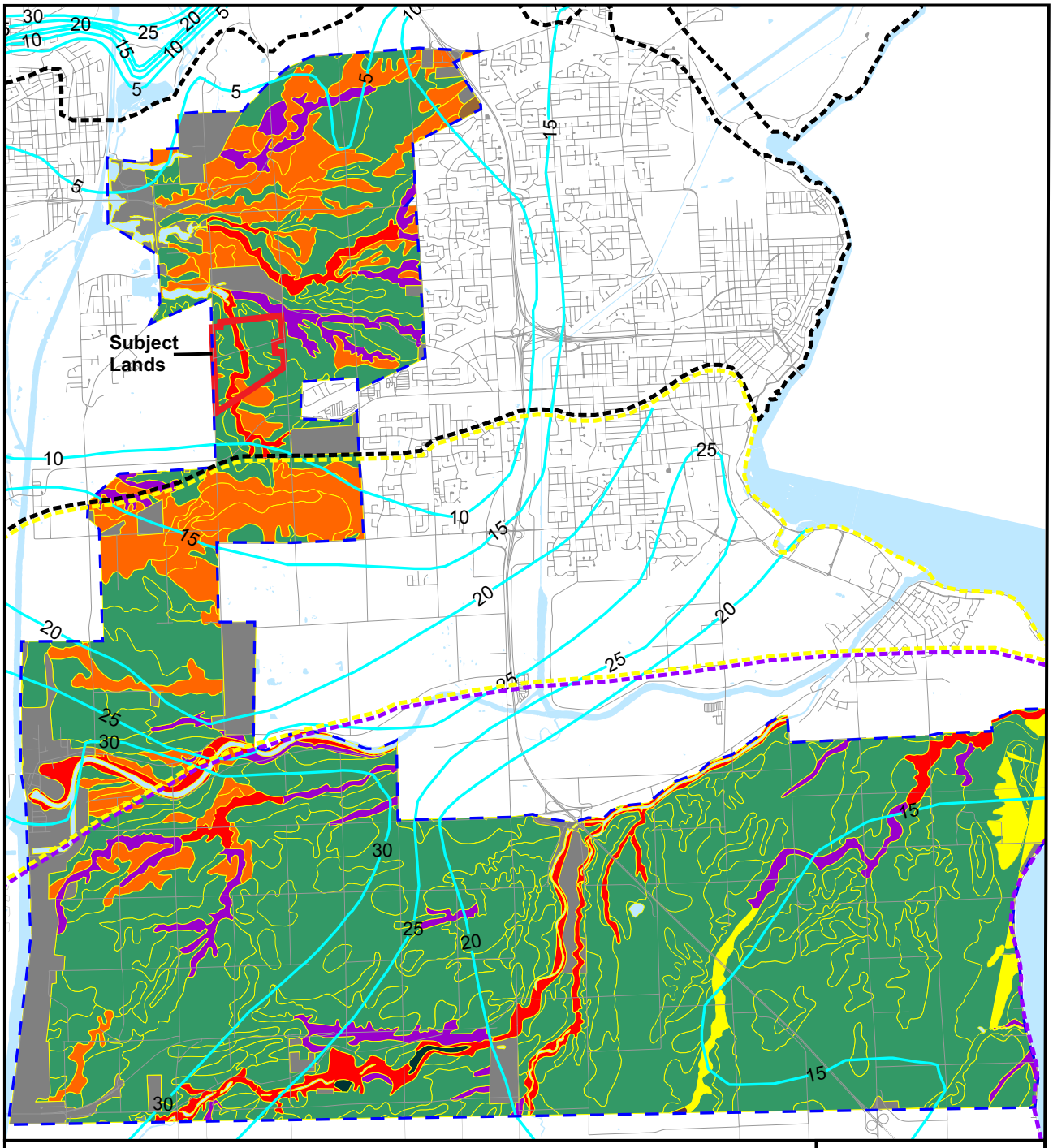
Additional Considerations

There are other areas that are also substantially CLI Class 3 within the Study Area. The southern portion of the Study Area is comprised predominantly of CLI Class 3 lands similar to the Subject Lands. We investigated whether these lands would offer a reasonable alternative location for the proposed quarry. Since the soil capability was essentially the same we looked at other elements that could be used to determine whether the location of the Subject Lands is a more reasonable location than other CLI Class 3 Lands. These elements include the underlying geologic formation and the drift thickness.

The Figure 1 shows that the proposed site is located within the same Lockport formation as Walkers Niagara Falls quarry and the drift thickness ranges from 5 to 10 m.

The Guelph formation, which lies just to the south of Lundy's Lane, would also be a suitable resource for extraction. However, the drift thickness over the Guelph formation increases to 10 to 15 m in the northern portion of the area. This area (just south of Lundy's Lane) is comprised predominantly of CLI Class 2 lands and therefore has a higher priority for preservation. In comparison to the Subject Lands, this area is not a reasonable choice of location.

The southern portion of the Study Area is predominantly comprised of CLI Class 3 lands similar to the Subject Lands. The underlying geologic formations include the Guelph and Salina. The drift thickness ranges from 15 m to 30 m in some areas. Overburden depths of 15 m or more is generally considered to be non-economic for extraction. These CLI Class 3 lands would not be a reasonable choice of location for the proposed quarry.



Legend

HPI Range	CLI Equivalency
0.90 - 1.00	CLI Class 1
0.73 - 0.89	CLI Class 2
0.58 - 0.72	CLI Class 3
0.43 - 0.57	CLI Class 4
0.28 - 0.42	CLI Class 5
0.10 - 0.27	CLI Class 6
0.00 - 0.09	CLI Class 7
0.00 - 0.09	Organic
0.00 - 0.09	Not Mapped

- Drift Thickness (metres)
- Study Area
- Subject Lands
- Lockport Formation
- Salina Formation
- Guelph Formation
- Water

Figure 1
Alternative Site Analysis Mapping

0 1,000 M

N

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC. Agricultural & Environmental

Revised: December 2020 FILE: C16075

Conclusion

The Subject Lands are located in a prime agricultural area on predominantly prime agricultural lands (CLI Class 3). Section 2.5.4.1 of the 2014 PPS states that extraction in prime agricultural areas, on prime agricultural land, is permitted as an interim use provided that the site will be rehabilitated back to an agricultural condition. The proposed quarry will extract resource below the water table making it impossible to rehabilitate the lands back to an agricultural condition. Alternatively, the PPS states that complete rehabilitation to an agricultural condition is not required if the applicant has considered other alternatives and found them unsuitable.

We have considered other alternative locations within the identified Study Area and found them to be unsuitable in comparison to the proposed site. Based on the evaluation of the CLI capability (using the HPI) and the consideration of the geologic formations and depth of overburden, we have determined that the Subject Lands are a reasonable choice of location for the proposed quarry.

APPENDIX C

Canada Land Inventory

Canada Land Inventory Soil Capability Classification for Agriculture

The Canada Land Inventory (CLI) classification system was developed to classifying soil capability for agricultural use for use across Canada. CLI is an interpretative system which assesses the effects of climate and soil characteristics on the limitations of land for growing common field crops. It classifies soils into one of seven capability classes based on the severity of their inherent limitations to field crop production. Soils descend in quality from Class 1, which is highest, to Class 7 soils which have no agricultural capability for the common field crops. Class 1 soils have no significant limitations. Class 2 through 7 soils have one or more significant limitations, and each of these are denoted by a capability subclass.

In Ontario the document, "Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario" (OMAFRA, 2008) provides a Provincial interpretation of the CLI classification system. These guidelines are based on the "Canada Land Inventory, Soil Capability Classification for Agriculture" (ARDA Report No. 2, 1965) and have been modified for use in Ontario. In Ontario, CLI Classes 1 to 4 lands are generally considered to be arable lands and Classes 1 to 3 soils and specialty crop lands are considered to be prime agricultural lands.

The following definitions were taken from Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario (2008).

Definitions of the Capability Classes

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 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.

Definitions of the Prime and Non-prime Agricultural Lands

In Ontario, CLI Classes 1, 2 and 3 and specialty crop lands are considered prime agricultural lands. Non-prime agricultural lands are comprised of CLI Class 4-7 lands.

Organic soils (Muck) are not classified under the CLI system but are mapped and identified as O in the provincial mapping.

Definitions of the Capability Subclasses

Capability Subclasses indicate the kinds of limitations present for agricultural use. Thirteen Subclasses were described in CLI Report No. 2. Eleven of these Subclasses have been adapted to Ontario soils.

Subclass Definitions:

Subclass E - Erosion: Loss of topsoil and subsoil by erosion has reduced productivity and may in some cases cause difficulties in farming the land e.g. land with gullies.

Class	Soil Characteristics
2E	Loss of the original plough layer, incorporation of original B horizon material into the present plough layer, and general organic matter losses have resulted in moderate losses to soil productivity.
3E	Loss of original solum (A and B horizons) has resulted in a plough layer consisting mostly of Loamy or Clayey parent material. Organic matter content of the cultivated surface is less than 2%.
4E	Loss of original solum (A and B horizons) has resulted in a cultivated layer consisting mainly of Sandy parent material with an organic matter content of less than 2%; shallow gullies and occasionally deep gullies which cannot be crossed by machinery may also be present.
5E	The original solum (A and B horizons) has been removed exposing very gravelly material and/or frequent deep gullies are present which cannot be crossed by machinery.

Subclass F - Low natural fertility*:* This subclass is made up of soils having low fertility that is either correctable with careful management in the use of fertilizers and soil amendments or is difficult to correct in a feasible way. The limitation may be due to a lack of available plant nutrients, high acidity, low exchange capacity, or presence of toxic compounds.

Class	Upper Texture Group (>40 and <100 cm from surface)	Lower Texture Group (remaining materials to 100 cm depth)	Drainage Class	Additional Soil Characteristics[1]
2F	Sandy	Sandy or very gravelly	Rapid to imperfect	Neutral or alkaline parent material with a Bt horizon within 100 cm of the surface
3F	Sandy	Sandy or very gravelly	Any drainage class	Neutral or alkaline parent material with no Bt horizon present within 100 cm of surface
3F	Sandy	Loamy or Clayey	Any drainage class	Acid parent material
3F	Loamy or clayey	Any Texture Group	Any drainage class	Acid parent material
4F	Sandy	Sandy or very gravelly	Any drainage class	Acid parent material
4F	Very gravelly	Any texture	Rapid to imperfect	Neutral to alkaline parent material
5F	Very Gravelly	Any texture	All drainage classes	Acid parent material

[1] "Acid" means pH<5.5; "Neutral" pH 5.5 to 7.4; "Alkaline" pH>7.4 as measured in 0.01 M CaCl2 (CSSC, 1998). PH 's measured in distilled water tend to be slightly higher (up to 0.5 units).

Bt horizon should be fairly continuous and average more than 10cm thickness

			class	material with no Bt horizon present within 100 cm of surface
3F	Sandy	Loamy or Clayey	Any drainage class	Acid parent material
3F	Loamy or clayey	Any Texture Group	Any drainage class	Acid parent material
4F	Sandy	Sandy or very gravelly	Any drainage class	Acid parent material
4F	Very gravelly	Any texture	Rapid to imperfect	Neutral to alkaline parent material
5F	Very Gravelly	Any texture	All drainage classes	Acid parent material

[1] "Acid" means pH<5.5; "Neutral" pH 5.5 to 7.4; "Alkaline" pH>7.4 as measured in 0.01 M CaCl2 (CSSC, 1998). PH 's measured in distilled water tend to be slightly higher (up to 0.5 units).
Bt horizon should be fairly continuous and average more than 10cm thickness

Subclass M – Moisture deficiency: Soils in this subclass have lower moisture holding capacities and are more prone to droughtiness.

Class	Soil Texture Groups		Drainage	Additional Soil Characteristics
	Upper materials1	Lower materials2		
2M	15 to 40 cm of loamy or finer materials	Sandy to Very Gravelly	Well	
2M	40 to < 100 cm of sandy to very gravelly material.	Loamy to Very Fine Clayey	Well	
2M	Sandy		Rapid to well	Well developed Bt3 horizon occurs within 100 cm of surface
3M	Sandy material to > 100cm		Rapid	Bt horizon absent within 100 cm of surface
4M	Very Gravelly to > 100 cm		Rapid	Bt horizon present within 100 cm of surface
5M	Very gravelly to > 100cm		Very r id	Bt horizon absent within 100cm

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.

Determination of Subclass T for Very Gravelly and Sandy Soils

Slope %	<2		2-5		5-9		9-15		15-3)		30-60		>60	
Slope type	S	C	S	C	S	C	S	C	S	C	S	C	S	C
Class				2T	2T	3T	3T	4T	5T	5T	6T	6T	7T	7T

Determination of Subclass T for Loamy, Clayey and Very Fine Clayey Soils

Slope %	<2		2-5		5-9		9-15		15-30		30-60		>60	
Slope type	S	C	S	C	S	C	S	C	S	C	S	C	S	C
Class				2T	3T	3T	4T	4T	5T	5T	6T	6T	7T	7T

S = Simple Slopes >50 m in length

C =Complex Slopes <50 m in length

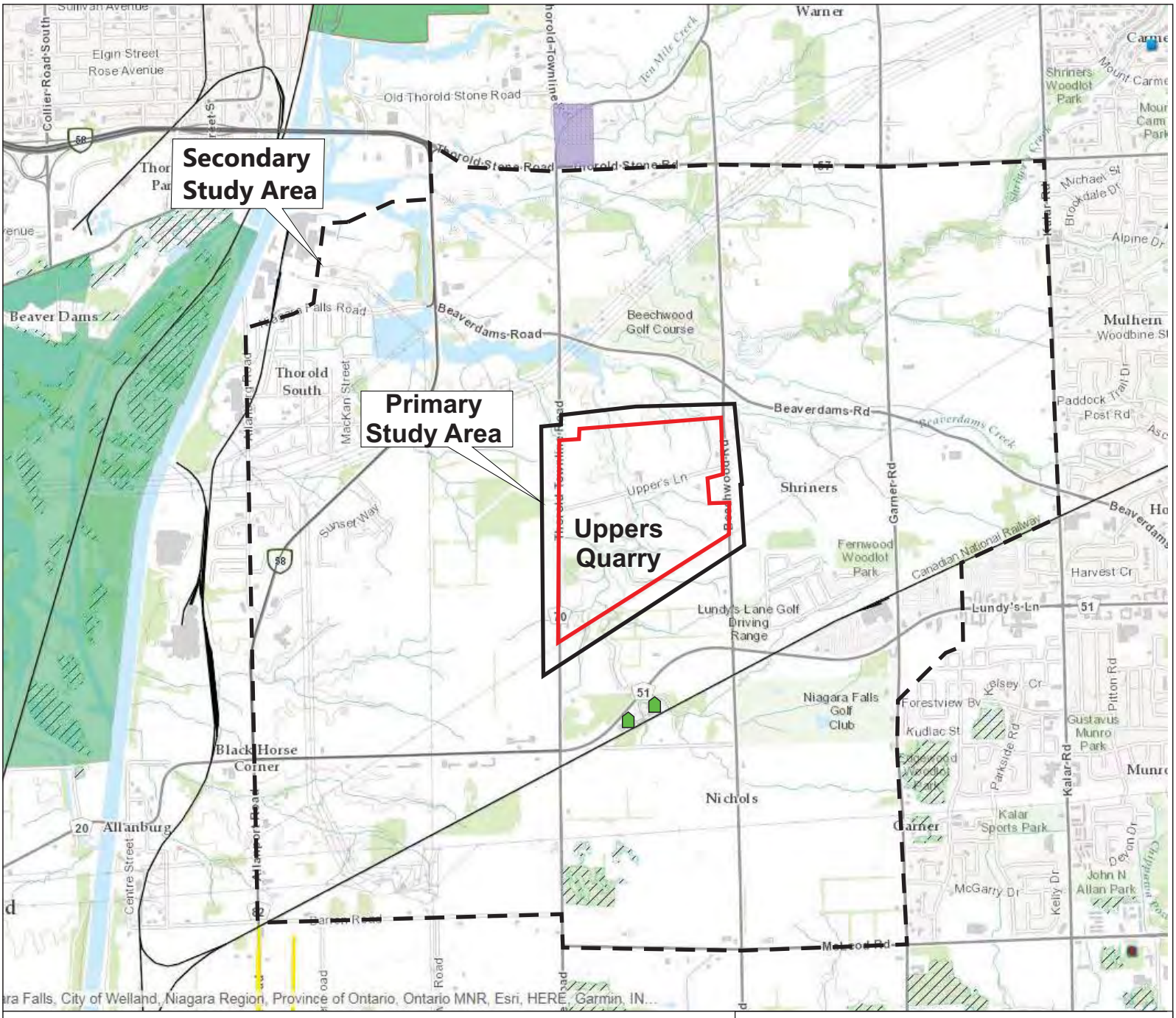
Subclass W - Excess water:

The presence of excess soil moisture, other than that brought about by inundation, is a limitation to field crop agriculture. Excess water may result from inadequate soil drainage, a high water table, seepage or runoff from surrounding areas.

Soil Textures and Depths	**Depth to Bedrock** (cm)	**Soil Class** (Drainage in place or feasible)	**Soil Class** (Drainage not feasible)
Very gravelly, sandy, or loamy extending >40 cm from the surface, or, <40 cm of any other textures overlying very gravelly, sandy or loamy textures	>100	2W	4W,5W
>40 cm depth of clayey or very fine clayey textures, or, < 40 cm of any other texture overlying clayey or very fine clayey textures	>100	3W	5W
<40 cm of peaty material overlying any texture	>100	3W	5W
All textures	50-100	4W	5W
All textures	0-50	NA	5W

APPENDIX D

Agricultural Systems Mapping



Legend

- Livestock Assests & Services - Meat Distribution (GHFFA)
- Refrigerated warehousing and storage (GHFFA)
- Boundary of the Greenbelt Plan
- Drainage - Drain DFO Classification
  - A
  - B
  - C
- Drainage - Agricultural Tile Drainage (OMAFRA)
  - Random
  - Systematic
- Greenhouse

Appendix E

Agricultural Systems Map
Uppers Quarry AIA

Prepared for: walker

Prepared by: COLVILLE CONSULTING INC.

DATE: December 2020 FILE: C16075

APPENDIX E

Land Use Descriptions

Primary Study Area Land Use Survey Notes

Date	Temperature	Cloud Conditions	Wind
Updated September 30, 2020	12.7° C	Overcast	61 km/h

Site No.	Type of Operation	Land Use	Description of Operation
3	Niagara Cricket Center	Non-Agricultural	Cricket playing field with five natural turf pitches.
4	DMZ Paintball Facility	Non-Agricultural	10 acre play field with a variety of different play areas ranging from full tactical towns to forests.
5	The Niagara Region Model Flying Club	Non-Agricultural	The Niagara Region Model Flying Club (NRMFC) flying field. NRMFC is a group interested in all aspects of building and flying Radio Controlled model airplanes, helicopters and UAVs.
6	Remnant Farm Operation	Non-Agricultural	Buildings and residence no longer existing, area has been demolished.
7	Remnant Farm Former Community Garden		Appears to be abandoned community garden. Buildings removed.
33	Utility station (Thorold Townline road gate station)	Non-Agricultural	Active Utility station
37	Commercial operation	Non-Agricultural	Panoramic Butera Group Properties Inc.
45	Bible Baptist Church	Non-Agricultural	Used to be located at adjacent parcel to the west.

Secondary Study Area Land Use Survey Notes

Date	Temperature	Cloud Conditions	Wind
Updated September 30, 2020	12.7° C	Overcast	61 km/h

Site No.	Type of Operation	Land Use	Description of Operation
1	Country Basket Garden Center and Greenhouses	Agricultural-Related	Country Basket Garden Centre grows and sells flowers, trees, shrubs, vegetables and edibles, along with seeds, fertilizers, soil, mulch.
2	Lundy's Lane Driving Range	Non-Agricultural	Driving range.
8	Non-farm residential	Non-Agricultural	Residence located at the front of the property with multiple storage/utility buildings in behind.
9	Retired Livestock Operation	Agricultural	Large barn with steel silo, multiple implement sheds and small barn located at back of property (Google Earth 3D). Facility appears to be empty; no livestock evident. Harvestore farm equipment and silo.
10	Waggy's Pet Groomer	Non-Agricultural	On property: Barn in poor condition, not capable of housing livestock.
11	Hobby Farm	Agricultural	Active hobby farm with chickens, Shetland pony, a goat and small paddock to the south of the residence.
12	Retired Livestock Operation	Agricultural	Located on same lot as adjacent non-farm residence. Gated driveway. Appears to be a former concrete block livestock operation with remnant uncapped silo.
13	Beechwood Golf and Country Club	Non-Agricultural	Golf course and country club. Previous to becoming a golf course in 1960, Beechwood was worked as farmland for over 100 years.

14	Truck Trailer Storage and parking area	Non-Agricultural	Parking lot with office building located on the southern protion of the property.
15	Thorold Asphalt Plant	Non-Agricultural	Rankin Construction, Thorold asphalt plant.
16	Thorold Auto Parts and Recyclers	Non-Agricultural	Carries auto parts, rebuilds cars and trucks, full-service auto garage and auto recycling.
17	Iafrate Machine Works Ltd.	Non-Agricultural	Iafrate Machine Works (IMW) provides a full range of custom CNC machining, engineering and fabrication to the North American market.
18	Abandon Motel	Non-Agricultural	Property appears to be out of business and used for personal use only. Previously Westlane Motel.
19	Anfra Tile and Stone Ltd.	Non-Agricultural	Anfra Tile and Stone provides floors and countertops for both residential and commercial customers.
20	Golfrangeinn	Non-Agricultural	Active motel.
21	Milan Garden Inn	Non-Agricultural	Active motel.
22	Golden Garden Supply Company Landscaping Supply Store	Non- Agricultural	Offering topsoil, tri mix, river rock, lawn soil and mulches.
23	Marty's Auto Repair	Non-Agricultural	Auto repair shop.
24	L8	Non-Agricultural	Gentleman's club.
25	Niagara Falls Golf Club	Non-Agricultural	Par-72 18-hole course that features a rolling, fully mature layout with of water and sand in play. With contoured fairways, manicured greens, strategic water hazards and mature trees.
26	Express Inn	Non-Agricultural	Active Motel.

27	Campark Resorts Camping and RV Resort	Non-Agricultural	Campground, cabin rental and RV park.
28	Hobby Farm	Agricultural	Active hobby farm with fenced in yard and small sheds. With the possibility of housing chickens.
29	Remnant Farm	Agricultural	Uncapped silo and areas of barn foundation present. Not capable of housing livestock.
30	Hobby Farm	Agricultural	Potential hobby farm with small fenced area to the west and a larger fence area with multiple small structures capable of housing livestock north of the residence. Structures in fair to poor condition.
31	Hobby Farm	Agricultural	Unable to have a full view of operation from roadside, appears to have paddocks with outdoor shelter. Viewing Google Earth©, there appears to be two paddocks located behind non-farm residence with possible small structure capable of housing livestock.
32	Lundy Manor Wine Cellars	Agricultural	Large main building; medium/large building structure located at the back of the property; large parking lot; vineyard located near the entrance/exit of site; two ponds.
34	Niagara Honey	Agricultural-Related	Main building with driveway and small parking area; smaller building structure located at back of property.
35	Industrial/commercial operation	Non-Agricultural	Concrete, asphalt, gravel and scrapyard operation.
36	Italo-Canadian Centennial Club	Non-Agricultural	Main building with large parking lot out front; small L-shaped building located beside the main building.

38	Hobby farm	Agricultural	4 beef cows; steel sided bank barn (great condition); actively being worked
39	Small RV lot	Non-Agricultural	2 RV's and a garage on the property
40	Haunt Manor	Non-Agricultural	Haunted houses and hayrides
41	Niagara Axe Throwing	Non-Agricultural	Small business – axe throwing establishment
42	Kingsway Motel	Non-Agricultural	Active motel
43	Fernwood Subdivision	Non-Agricultural	Newly built subdivision
44	Cemetery (private)	Non-Agricultural	Small private cemetery. ~6 graves.

	Total Number	Active	Retired or Remnant
Agricultural	9	5 - Hobby farm 1 - Winery	3
Agriculture-related	2	1 - Country Basket Garden Center and Greenhouses 1 - Niagara Honey	0
On-farm Diversified	0	0	0
	Total Number	**Commercial**	**Other**
Non-Agricultural	34	18	9 - Recreation 3 - Non-farm residential 2 - Retired farm operation 2 - Abandoned operation