



# Stage 1 & 2 Archaeological Assessment

8168 McLeod Road  
Part of Lot 179  
Geographic Township of Stamford  
City of Niagara Falls  
Regional Municipality of Niagara

Prepared for:  
Lotus Land Development Corp.  
c/o Aman Gandhi  
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**Licensee: Shane McCartney**  
**PIF: P321-0330-2022**  
**Original Report**



**Earthworks**  
ARCHAEOLOGICAL SERVICES INC.

Earthworks Archaeological Services Inc.  
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August 25, 2022

## Executive Summary

Earthworks Archaeological Services Inc. was retained to conduct a Stage 1 & 2 archaeological assessment of a 0.80 hectare area located at 8168 McLeod Road, City of Niagara Falls, Regional Municipality of Niagara, historically part of Lot 179, Geographic Township of Stamford, Welland County, Ontario. The assessment was undertaken in support of an Application for Site Plan Approval was conducted as part of the requirements defined in Section 4.10 of the *City of Niagara Falls Official Plan*, which requires an archaeological assessment to be undertaken when a proposed development, site alteration, or redevelopment of lands has the potential to adversely affect archaeological resources or areas of archaeological potential.

The study area contains evidence of archaeological potential. The location of the study area within 65 metres of a historic tributary of the Welland River and within 300 metres of two registered archaeological sites indicates the potential for recovering Pre-Contact Indigenous archaeological material. Additionally, the location of the study area within 100 metres of McLeod Road, a historically documented transportation route, indicates that there is potential for Euro-Canadian artifacts to be present. In summary, a Stage 2 archaeological assessment was determined to be required in order to identify and document any archaeological material that may be present. The residential nature of the study area precluded the possibility of ploughing for a pedestrian survey, and as a result, a test pitting survey was determined to be required.

The Stage 2 archaeological assessment of the study area was conducted on May 9, 2022 under PIF #: P321-0330-2022, issued to Shane McCartney, M.A. (P321). The weather during the survey was sunny and warm. At no time were weather or lighting conditions detrimental to the observation or recovery of archaeological material.

Approximately 91% of the study area was assessed through a test pit survey, with the remaining area not assessed due to evidence of previous disturbance from the construction of the house, outbuilding, and gravel driveways. Test pits were spaced at maximum intervals of five metres apart. Each test pit was excavated by hand to 30 centimetres in diameter and was excavated into the first five centimetres of subsoil. Depth varied between 25 and 30 centimetres. Each test pit was examined for stratigraphy, cultural features, or evidence of fill, and all soil was screened through wire mesh of 6 millimetre width. All test pits were backfilled. The subsurface stratigraphy consisted of a dark brown clay topsoil horizon over an orange clay subsoil. No archaeological material was identified during the course of the survey.

Based on the results of the Stage 2 test pit survey the study area is considered to be free of archaeological material, and no additional archaeological assessments are recommended.

The Ministry of Heritage, Sport, Tourism and Culture Industries is requested to review this report and provide a letter indicating their satisfaction that the fieldwork and reporting for this archaeological assessment are consistent with the Ministry's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences, and to enter this report into the Ontario Public Register of Archaeological Reports.

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## Project Personnel

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<b>Report Production:</b>	<b>Shane McCartney, M.A. (P321)</b>
<b>Mapping:</b>	<b>Kelsea Dawn, GIS (PG)</b> <b>Shane McCartney, M.A. (P321)</b>



# 1.0 Project Context

## 1.1 Development Context

Earthworks Archaeological Services Inc. (Earthworks) was retained by Aman Gandhi to conduct a Stage 1 & 2 archaeological assessment of a 0.80 hectare area located at 8168 McLeod Road, City of Niagara Falls, Regional Municipality of Niagara, historically part of Lot 179, Geographic Township of Stamford, Welland County, Ontario (Map 1). The assessment was undertaken in support of an Application for Site Plan Approval was conducted as part of the requirements defined in Section 4.10 of the *City of Niagara Falls Official Plan*, which requires an archaeological assessment to be undertaken when a proposed development, site alteration, or redevelopment of lands has the potential to adversely affect archaeological resources or areas of archaeological potential (City of Niagara Falls 2019:3-25).

The objectives of the Stage 1 & 2 archaeological assessment, as outlined by the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), are as follows:

- To document archaeological resources located on the property
- To determine whether any identified archaeological resources require further assessment
- To recommend Stage 3 assessment strategies for any archaeological sites determined to require additional assessment.

As part of this assessment, background research was conducted in Earthworks corporate library, the OnLand Registry Database, and the Federal Canadian Census located online at Library and Archives Canada.

Permission to access the property was provided by the proponent.

## 1.2 Historic Context

### 1.2.1 Pre-Contact Indigenous History

Table 1 provides a breakdown of the general culture history of southern Ontario, as based on Ellis and Ferris (1990).

**Table 1: Pre-Contact Indigenous Culture History of Southern Ontario**

Culture Period	Diagnostic Artifacts	Time Span (Years B.P.)	Detail
Early Paleo-Indian	Fluted Projectile Points	11,000-10,400	Nomadic caribou hunters
Late Paleo-Indian	Hi-Lo, Holcombe, Plano Projectile Points	10,400-10,000	Gradual population increase
Early Archaic	Nettling and Bifurcate Points	10,000-8,000	More localized tool sources
Middle Archaic	Brewerton and Stanly-Neville Projectile Points	8,000-4,500	Re-purposed projectile points and greater amount of endscrapers
Narrow Point Late Archaic	Lamoka and Normanskill Projectile Points	4,000-3,800	Larger site size
Broad Point Late Archaic	Genessee, Adder Orchard Projectile Points	3,800-3,500	Large bifacial tools. First evidence of houses
Small Point Late Archaic	Crawford Knoll, Innes Projectile Points	3,500-3,100	Bow and Arrow Introduction
Terminal Archaic	Hind Projectile Points	3,100-2,950	First evidence of cemeteries
Early Woodland	Meadowood Points, Cache Blades, and pop-eyed birdstones	2,950-2,400	First evidence of Vinette I Pottery
Middle Woodland	Pseudo-scallop shell	2,450-1550	Burial Mounds
	Princess Point pottery	1550-1100	First evidence of corn horticulture
Late Woodland	Levanna Point	1,100-700	Early longhouses
	Saugeen Projectile Points	700-600	Agricultural villages
	Nanticoke Notched Points	600-450	Migrating villages, tribal warfare

### **1.2.2 Post Contact Indigenous History**

The surrounding area enters the historic record in 1626, when Father Daillon, a French missionary, spent three months in the Hamilton region attempting to conclude a trading alliance with the Neutral Confederacy. These negotiations ultimately failed due to opposition from Huron allies (White 1978:409). By 1638, the Neutral had expanded east to the Niagara River in response to a void left by the Wenro migrating to Huronia and the Erie migrating southwest. By the early 1640s, the Neutrals were engaged in large scale warfare with the Assistaeronons to the west while maintaining a neutral stance between the Huron and the League of Five Nations Iroquois. The City of Niagara Falls was located within the territory of the Onguiarahronon tribe, with the village of Onguiaahra located on the east side of the Niagara River (Noble 1978). European influence in the region was generally restricted to the beaver pelt trade, and Aboriginal groups practiced a way of life that did not differ significantly from the pre-Contact period. By the late 1640's, the increasing scarcity of beaver pelts prompted the invasion of the Neutral by the League of Five Nations Iroquois. By 1651, the Neutral were destroyed and either moved west out of Ontario or were absorbed into the League of Five Nations (Trigger 1994:57).

The region appears to have been relatively unpopulated by permanent settlements in the latter half of the seventeenth century, with much of southern Ontario used as a hunting territory by the Iroquois. However, Ojibway groups previously thought to have settled along the northern shores of Georgian Bay and Lake Superior gradually migrated into southern Ontario, and by 1707 had settled in the Niagara region (Rogers 1978:761).

In 1764, British need to control the Niagara portage route in order to supply Detroit led to the forced surrender from the Seneca of a three kilometre strip west of the Niagara River. The overlapping Mississauga claim was addressed in 1781, when increased settlement pressure from refugees of the American Revolutionary War led to the British to purchase a six and half kilometre strip of land along the full length of the west bank of the Niagara River for 300 suits of clothing, in what became known as the Niagara Purchase (Surtees 1994:97). The Mississauga eventually relocated to the Grand River at New Credit in 1847.

### **1.2.3 European Settlement History**

The most famous early description of Niagara Falls was made by Louis Hennepin, who was part of a French expedition to discover North America and which ultimately staked a claim on the Niagara River between 1678 and 1681 (Revie 2003:21). However, French settlements were restricted to the St. Lawrence River and Maritime provinces, and settler immigration did not begin in earnest until 1783, when the Treaty of Paris was signed ending the American Revolutionary War and the British government began offering free land grants to United Empire Loyalists (Hancocks 1984)

The Township of Stamford was first surveyed in 1788, although settlement had begun approximately five years earlier (Hughes 1994). Economic activity centred around tourism and agricultural production due to the presence of fertile, easily worked soils and the proximity to the Niagara Falls. The War of 1812 impacted population growth, but immigration surged following the signing of the Treaty of Ghent in 1814. The study area is located approximately equidistant from the historic settlements of Drummondville and Clifton. The village of Drummondville was

named in honour of Sir Gordon Drummond, the leader of the British forces in the Battle of Lundy's Lane in 1814. It was incorporated as a village in 1831, and renamed to the village of Niagara Falls South in 1882 (Petrie 1967:36,44). The village of Clifton was first laid out in 1832 by Captain Ogden Creighton, and amalgamated with the village of Elgin in 1856 following the construction of Great Western Railroad which connected Hamilton to Niagara Falls, New York in 1855 (Petrie 1967:38). The Town of Elgin was renamed to the Town of Niagara Falls in 1881, and both the town and village were amalgamated into the City of Niagara Falls in 1904. In 1970, the township was merged with the City of Niagara Falls as part of the larger establishment of the Regional Municipality of Niagara.

#### **1.2.4 Land Use History of Study Area**

The study area is located in the historic Lot 179 of the Geographic Township of Stanford, which was first granted to Thomas Silverthorn in 1802. The property was seized by the Sherriff due to tax arrears and granted to Samuel Street in 1833. Mr. Street was a prominent local merchant and land speculator during the early years of Niagara settlement, and at his peak was one of the wealthiest merchants in Upper Canada, owning lands in every district (Parker 1988). Mr. Street sold the lands to Jane Howey in 1836, who is listed as the wife of Isaac Howey, an American farmer residing in a one storey frame house in the 1851 census (Government of Canada 1853:47). Mr. Howey is listed as the owner in the 1862 Tremaine Map of the Counties of Lincoln and Welland (Map 2, Tile 1). There is no indication of Lot 179 being farmed in the 1861 census, and in 1870 the northwest quarter of the lot was sold to William Sutton, who merged it with his existing holdings in the northeast quarter, which is depicted in the 1876 *Illustrated Historical Atlas of the counties of Lincoln and Welland* (Map 2, Tile 2). The land was leased out, and the 1871 census lists the resident as David Fowlis, a Scottish tenant farmer who had cleared 75 of his available 83 acres for agriculture (Government of Canada 1873:33). Analysis of historic topographic maps indicate the study area was vacant agricultural land prior to conversion to a residential lot by 1964 (Map 3)

#### **1.2.5 Historic Plaques**

As per Section 1, Standard 1.1 of the *Standards and Guidelines for Consultant Archaeologists*, Earthworks consulted local historical plaques in order to inform archaeological potential and assessment strategies. No local plaques were found which related to the history of the current study area.

### **1.3 Archaeological Context**

#### **1.3.1 Current Conditions**

The study area consists of a residential lot with a house, outbuilding, associated driveways, and manicured front and back lawns with a woodlot in the southern edge (Images 1 thru 11).



### **1.3.2 Natural Environment**

The study area is situated within a clay plain (Map 4) of the Haldimand Clay Plain physiographic region, a 3500 square kilometre area consisting of a series of parallel clay belts deposited during the time of glacial Lake Warren and includes dunes, cobble, clay, and sand beaches, limestone pavements, and back-shore wetland basins (Chapman and Putnam 1984: 156-157).

The surficial geology consists of glaciolacustrine deep water deposits of clay and silt (Map 5), and soil mapping of the area (Map 6) indicates the study area consists of Niagara Clay, a reddish hued lacustrine heavy clay (Kingston and Presant 1989).

The nearest water source is a tributary of the Welland River that is shown on 1906 topographic mapping as located within approximately 65 metres west of the study area.

The study area is located within the Niagara District of the Lake Ontario – Lake Erie Ecoregion, which itself is situated within the Mixedwood Plains Ecozone. This region encompasses 2,185,845 hectares, and contains a diverse array of flora and fauna. It is characterized by a mix of Carolinian forest remnants of tulip-tree, black gum, sycamore, Kentucky coffee-tree, pawpaw, various oaks and hickories, and common hackberry, in addition to the more widespread sugar maple, American beech, white ash, eastern hemlock, and eastern white pine:

*Typical mammals inhabiting this ecoregion include white-tailed deer, northern raccoon, striped skunk, and the Virginia opossum which has increased its distribution and abundance since the latter half of the 20th century. Characteristic birds include green heron, Virginia rail, Cooper's hawk, eastern kingbird, willow flycatcher, brown thrasher, yellow warbler, common yellowthroat, northern cardinal, and savannah sparrow. Wild turkey has been re-introduced into the ecoregion. Herpetofauna, is diverse, including several provincially rare species (e.g., spiny softshell turtle), as well as more frequent species such as eastern red-backed salamander, American toad, eastern gartersnake, and Midland painted turtle. Longnose gar, channel catfish, smallmouth bass, yellow perch, walleye, northern hogsucker, banded killifish, and spottail shiner are among the fish species found in the lakes and rivers in this ecoregion.*

Crins et al. 2009:52

### **1.3.3 Known Archaeological Sites**

A search of registered archaeological sites within the MHSTCI Archaeological Sites Database was conducted. A total of 29 archaeological sites are located within one kilometre of the study area and are summarized in Table 2. Additionally, AgGs-116 and AgGs-410 are located within 300 metres of the study area.

**Table 2: Registered Archaeological Sites located within one kilometre of Study Area**

<b>Borden Number</b>	<b>Site Name</b>	<b>Time Period</b>	<b>Affinity</b>	<b>Site Type</b>
AgGS-277		Other		Otherfindspot_
AgGs-116	Garner Estates	Post-Contact	Euro-Canadian	homestead

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<b>Borden Number</b>	<b>Site Name</b>	<b>Time Period</b>	<b>Affinity</b>	<b>Site Type</b>
AgGs-278		Other		Otherfindspot_
AgGs-279		Woodland, Early	Aboriginal	findspot
AgGs-280		Post-Contact	Euro-Canadian	homestead
AgGs-281		Other		Otherfindspot_
AgGs-282		Archaic, Early	Aboriginal	scatter
AgGs-283		Other		Otherfindspot_
AgGs-284				
AgGs-286		Pre-Contact	Unknown	Unknown
AgGs-287		Other		Otherfindspot_
AgGs-288		Archaic, Early	Aboriginal	Unknown, scatter
AgGs-289		Pre-Contact	Aboriginal	scatter
AgGs-290		Archaic, Late	Aboriginal	scatter
AgGs-291		Archaic, Middle	Aboriginal	scatter
AgGs-292		Woodland, Late	Aboriginal	findspot
AgGs-293	P23			
AgGs-294				
AgGs-295		Woodland, Late	Aboriginal	findspot
AgGs-296		Pre-Contact	Aboriginal	camp / campsite
AgGs-297		Archaic, Early	Aboriginal	findspot
AgGs-298		Archaic, Early	Aboriginal	camp / campsite
AgGs-299				
AgGs-300		Archaic, Middle	Aboriginal	findspot
AgGs-301		Archaic, Late	Aboriginal	findspot

<b>Borden Number</b>	<b>Site Name</b>	<b>Time Period</b>	<b>Affinity</b>	<b>Site Type</b>
AgGs-302		Archaic, Early	Aboriginal	findspot
AgGs-303		Archaic, Late	Aboriginal	findspot
AgGs-395		Post-Contact	Euro-Canadian	Unknown
AgGs-410		Post-Contact		homestead

### **1.3.4 Adjacent Archaeological Assessments**

A total of two archeological assessments conducted within 50 metres of the study area were identified.

The neighbouring property at 8100 McLeod Road was subject to a Stage 1 & 2 archaeological assessment in 2017 by Detritus Consulting Ltd. under PIF #: P017-0628-2017. A Stage 2 test pit survey was conducted, with no archaeological material recovered (Detritus 2017a).

The neighbouring property at 8196 McLeod Road was subject to a Stage 1 & 2 archaeological assessment in 2017 by Detritus Consulting Ltd. under PIF #: P017-0645-2017. A Stage 2 test pit survey was conducted, with no archaeological material recovered (Detritus 2017b).

## **1.4 Summary**

As documented in Section 1.0 the study area contains evidence of archaeological potential. The location of the study area within 65 metres of a historic tributary of the Welland River and within 300 metres of two registered archaeological sites indicates the potential for recovering Pre-Contact Indigenous archaeological material. Additionally, the location of the study area within 100 metres of McLeod Road, a historically documented transportation route, indicates that there is potential for Euro-Canadian artifacts to be present. In summary, a Stage 2 archaeological assessment was determined to be required in order to identify and document any archaeological material that may be present. The residential nature of the study area precluded the possibility of ploughing for a pedestrian survey, and as a result, a test pitting survey was determined to be required.

## 2.0 Field Methods

The Stage 2 archaeological assessment of the study area was conducted on May 9, 2022 under PIF #: P321-0330-2022, issued to Shane McCartney, M.A. (P321). The weather during the survey was sunny and warm. At no time were weather or lighting conditions detrimental to the observation or recovery of archaeological material.

Approximately 91% of the study area was assessed through a test pit survey (Image 12), with the remaining area not assessed due to evidence of previous disturbance from the construction of the house, outbuilding, and gravel driveways.

Test pits were spaced at maximum intervals of five metres apart. Each test pit was excavated by hand to 30 centimetres in diameter and was excavated into the first five centimetres of subsoil. Depth varied between 25 and 30 centimetres. Each test pit was examined for stratigraphy, cultural features, or evidence of fill, and all soil was screened through wire mesh of 6 millimetre width. All test pits were backfilled. The subsurface stratigraphy consisted of a dark brown clay topsoil horizon over an orange clay subsoil (Image 13). No archaeological material was identified during the course of the survey.

The results of the Stage 2 archaeological survey are presented in Map 7.

## 3.0 Record of Finds

Table 3 provides an inventory of the documentary record generated in the field.

**Table 3: Information Inventory of Documentary Record**

Document	Location	Description
Field Notes	Earthworks Office Project File	1 page of notes
Photographs	Earthworks Office Project File	51 digital photographs
Field Map	Earthworks Office Project File	1 page

## 4.0 Analysis and Conclusions

A Stage 1 & 2 Archaeological Assessment was conducted on a 0.80 hectare area located at 8168 McLeod Road, City of Niagara Falls, Regional Municipality of Niagara, historically part of Lot 179, Geographic Township of Stamford, Welland County, Ontario. The Stage 2 test pit survey was conducted on May 9, 2022.

The Stage 2 archaeological survey did not yield any evidence of archaeological material. As a result, no additional archaeological assessments are required

## 5.0 Recommendations

Based on the results of the Stage 1 background investigation and the subsequent Stage 2 test pit survey the study area is considered to be free of archaeological material, and no additional archaeological assessments are recommended.

The MHSTCI is requested to review this report and provide a letter indicating their satisfaction that the fieldwork and reporting for this archaeological assessment are consistent with the Ministry's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences, and to enter this report into the Ontario Public Register of Archaeological Reports

## 6.0 Advice on Compliance with Legislation

This report is submitted to the Ministry of Heritage Sport Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage Sport Tourism and Culture Industries, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.



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## 8.0 Images



*Image 1: Study Area Conditions. Facing South.*



*Image 2: Study Area Conditions. Facing Southwest.*

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*Image 3: Study Area Conditions. Facing West.*



*Image 4: Study Area Conditions. Facing West.*

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***Image 5: Study Area Conditions. Facing Northwest.***



***Image 6: Study Area Conditions. Facing Northeast.***



*Image 7: Study Area Conditions. Facing North.*



*Image 8: Study Area Conditions. Facing North.*



***Image 9: Study Area Conditions. Facing East.***



***Image 10: Study Area Conditions. Facing Northeast.***





*Image 11: Study Area Conditions. Facing South.*



*Image 12: Stage 2 Test Pit Survey in Progress. Facing Southeast.*

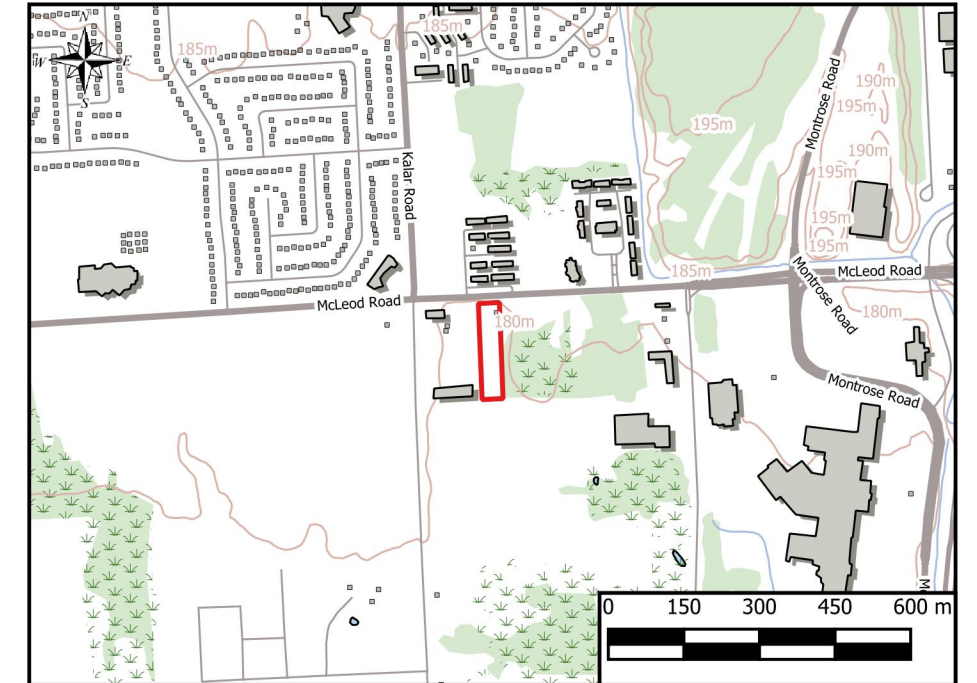
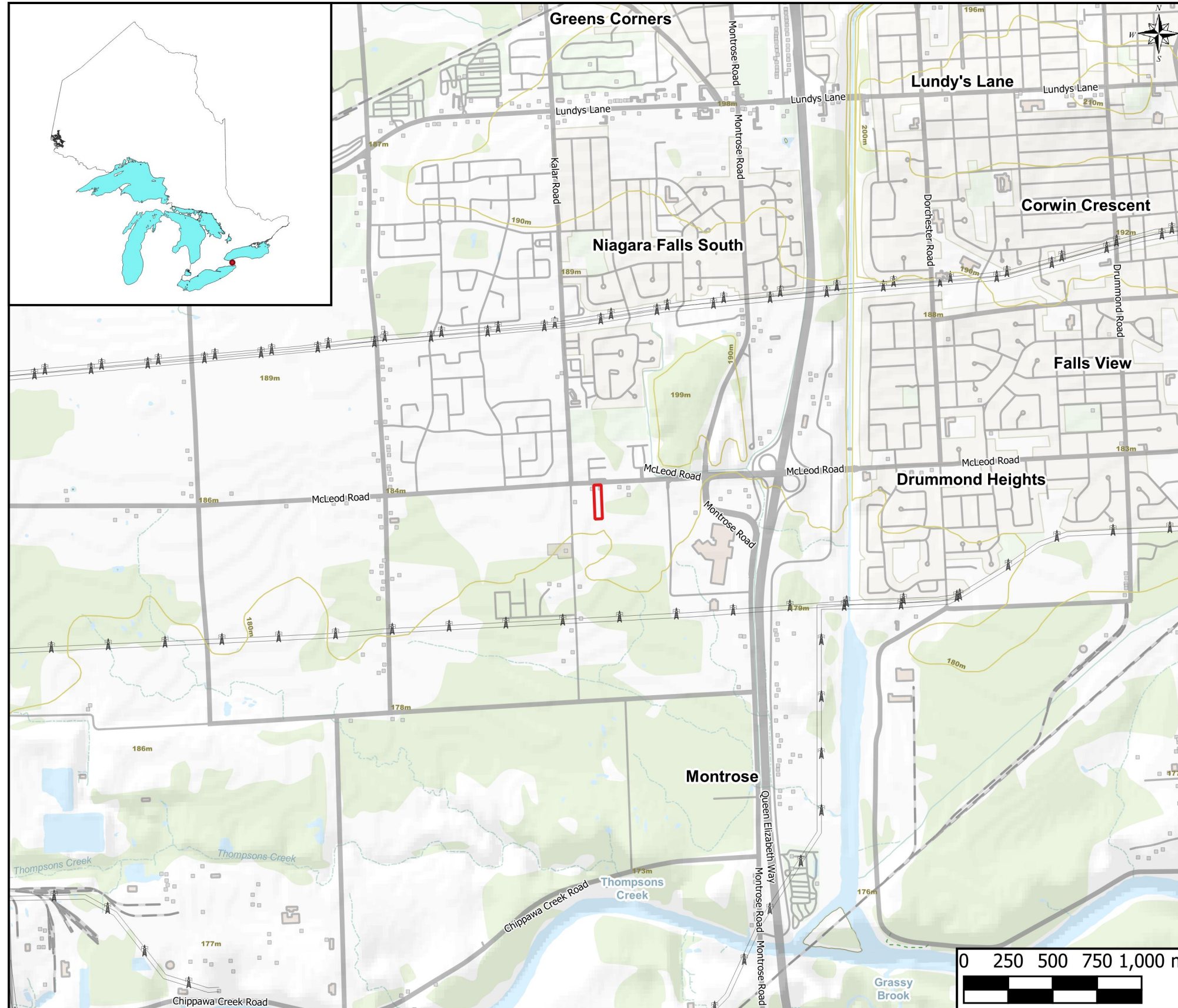


*Image 13: Open Test Pit showing Subsurface Stratigraphy.*

## 9.0 Maps



Earthworks Archaeological Services Inc.  
 Stage 1 & 2 Archaeological Assessment  
 8168 McLeod Road  
 Niagara Falls



**Legend**

Study Area

Reference:  
 Canvec Data. Scale 1:50000  
 Ontario Basic Mapping. Scale 1:10000  
 Niagara Region 2020 Aerial Imagery

**Map 1: Regional Map**



**Legend**

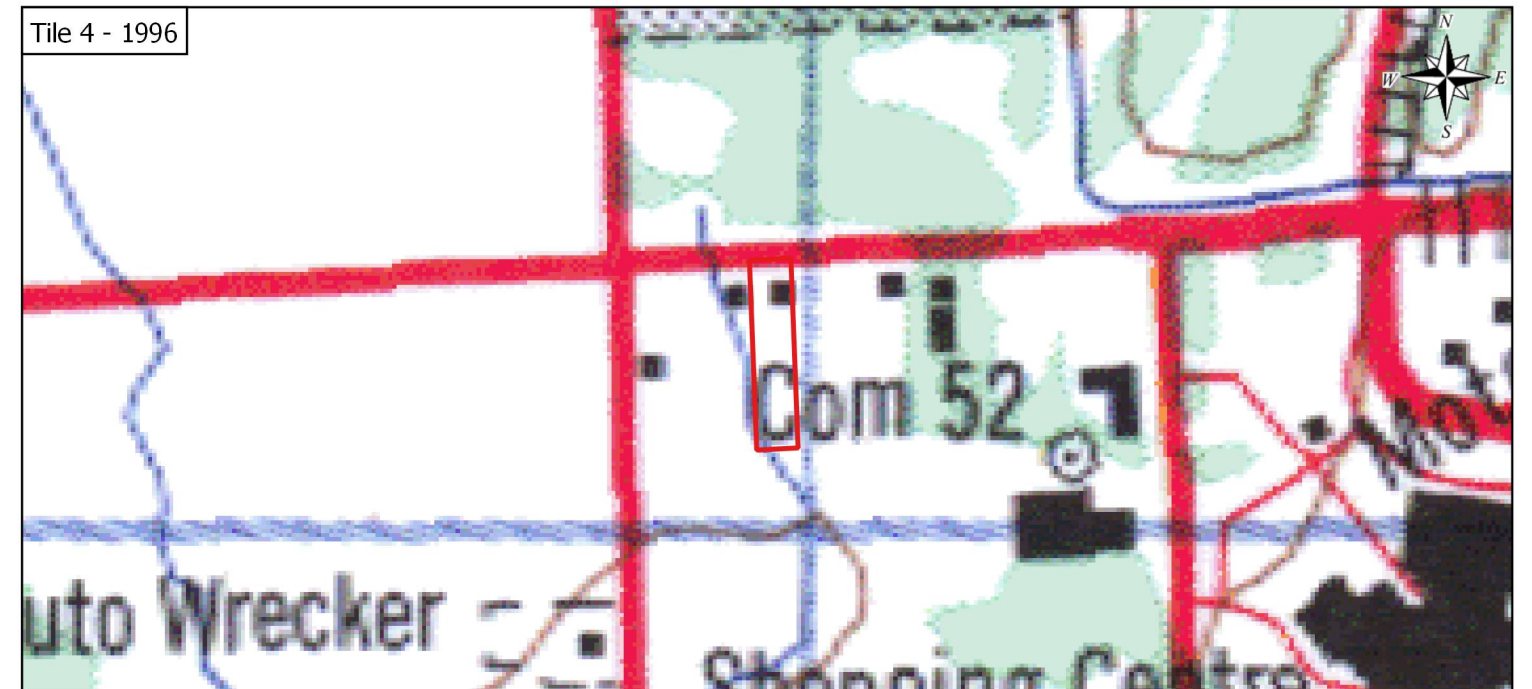
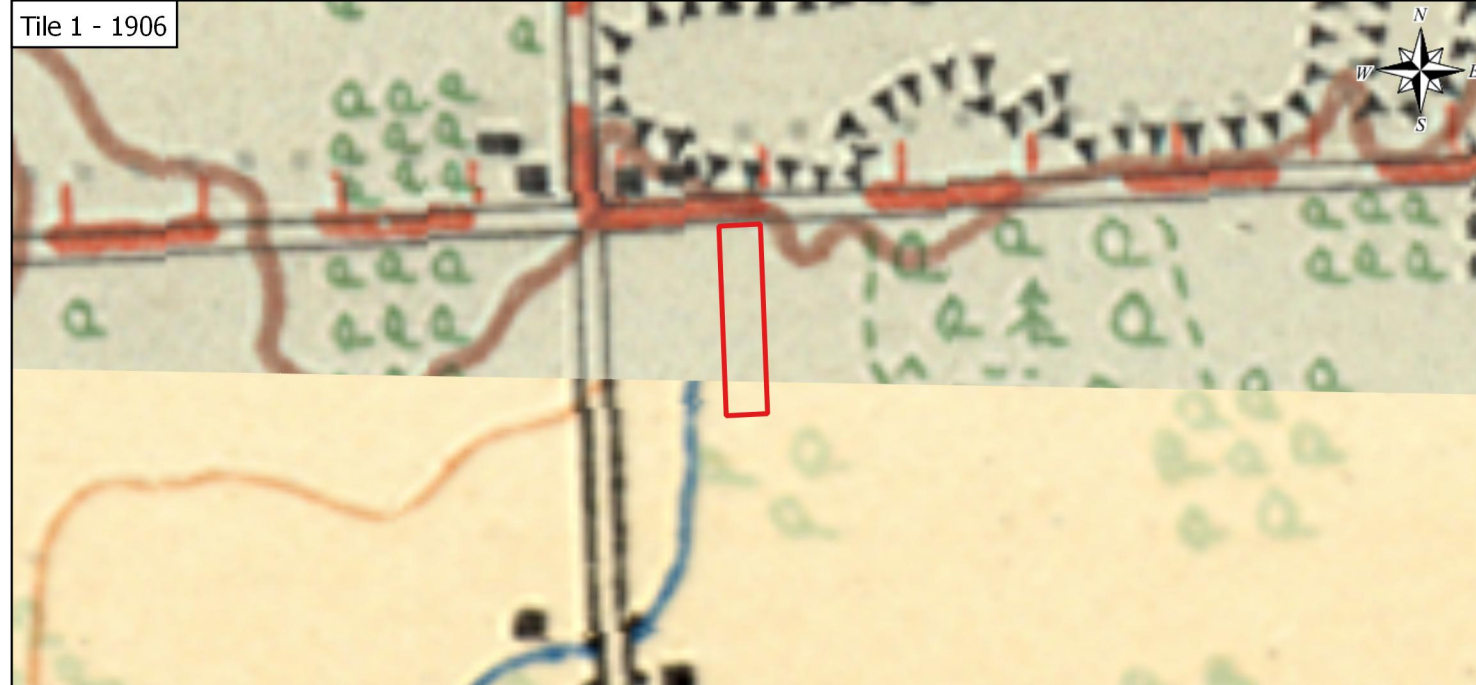
 Study Area

Not to Scale

Tile 1 - Tremain's Map of the Counties of Lincoln and Welland, Canada West. Compiled and Drawn from actual surveys by the Publishers Geo. R. Tremain & G.M. Tremain. Toronto, 1862.

Tile 2 - Illustrated historical atlas of the counties of Lincoln & Welland, Ont. H.R. Page & Co. 1876

## Map 2: Nineteenth Century Historic Mapping



**Legend**

 Study Area

0 150 300 450 600 m



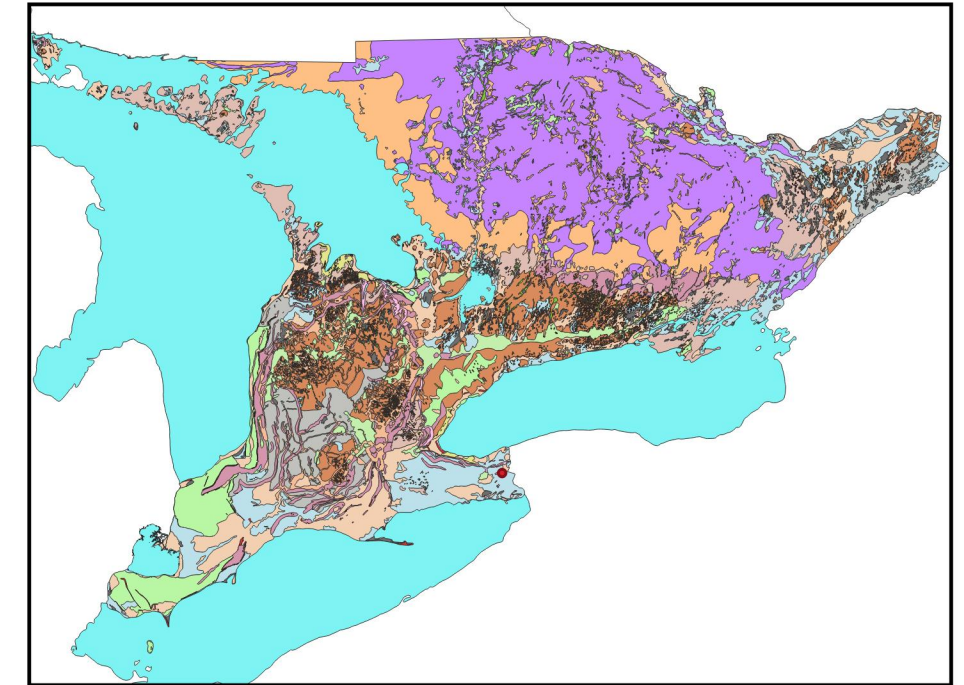
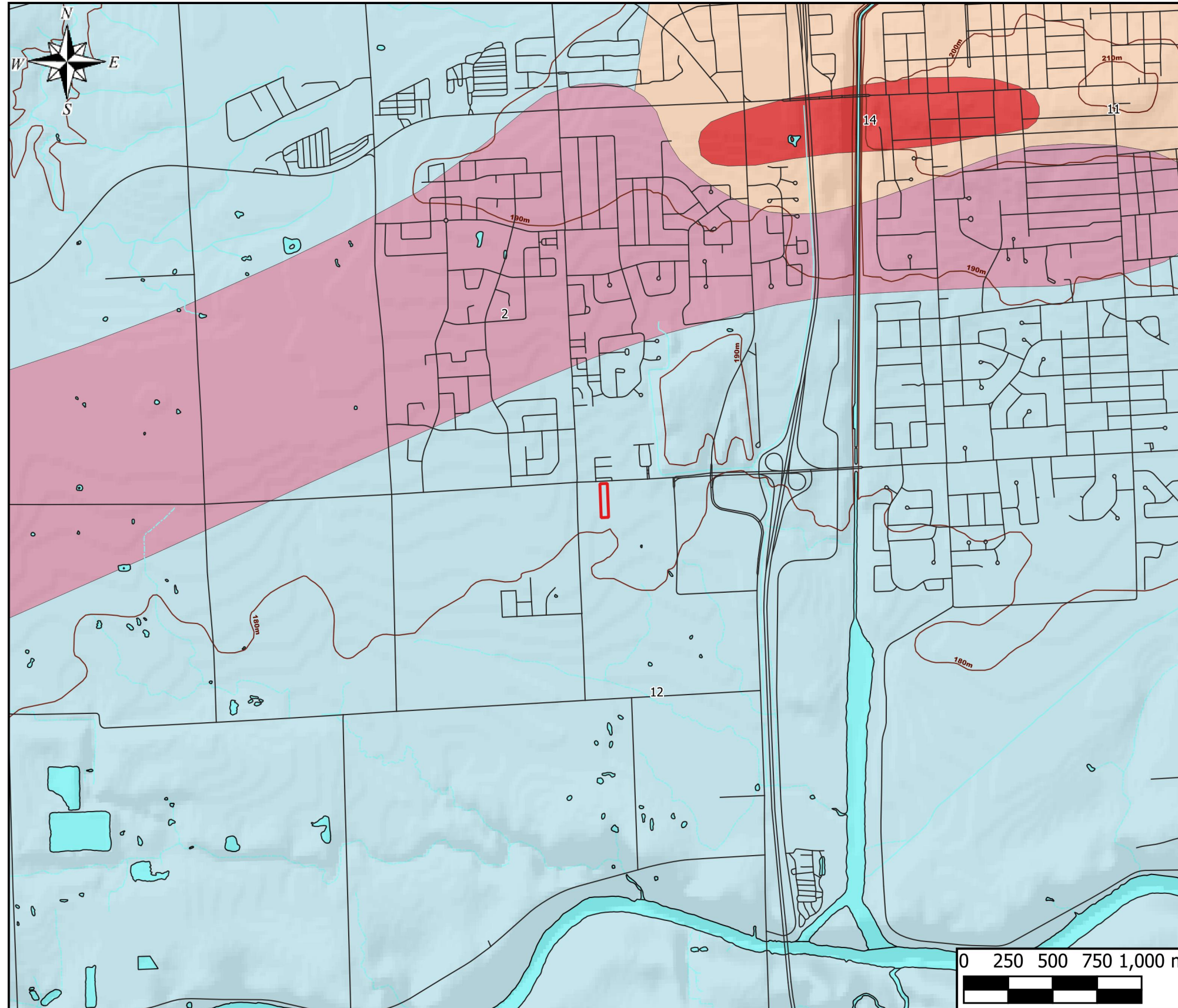
Tile 1 - Canada, Department of Militia and Defence [Department of National Defence]. Niagara, Ontario. 1:63,360. Map Sheet 030M03, [ed. 1], 1906.

Tile 2 - Canada, Department of National Defence. Niagara, Ontario. 1:63,360. Map Sheet 030M03, [ed. 9], 1938.







Tile 3 - Canada, Department of Energy, Mines and Resources [Natural Resources Canada]. Allanburg, Ontario. 1:25,000. Map Sheet 030M03b, ed. 2, 1963

Tile 4 - Canada, Natural Resources Canada. Niagara, Ontario. 1:50,000. Map Sheet 30 M/3, ed. 7, 1996

## Map 3: Twentieth Century Topographic Maps

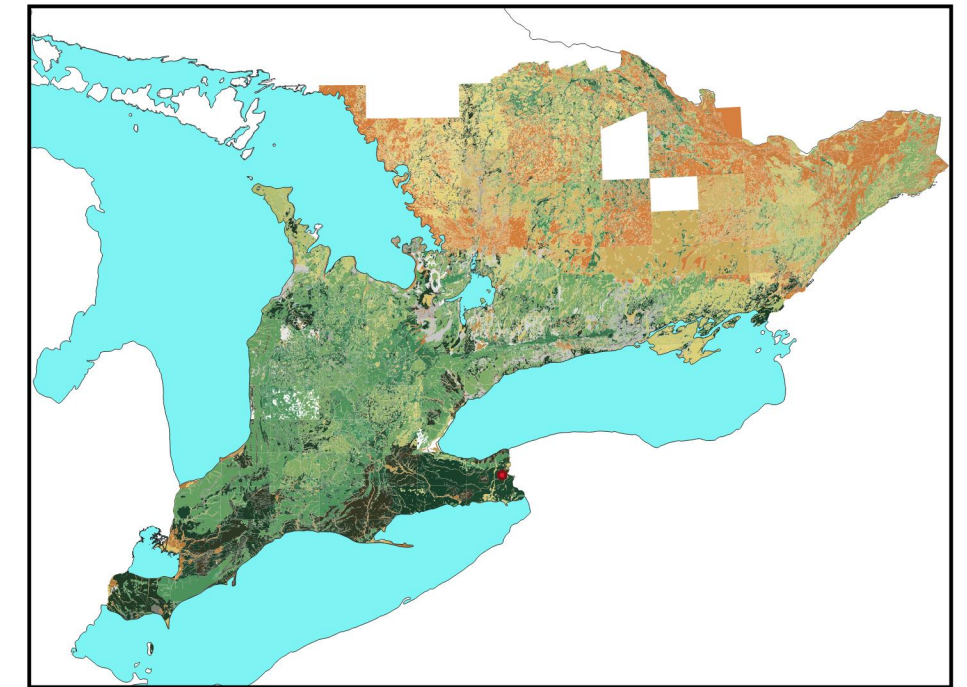
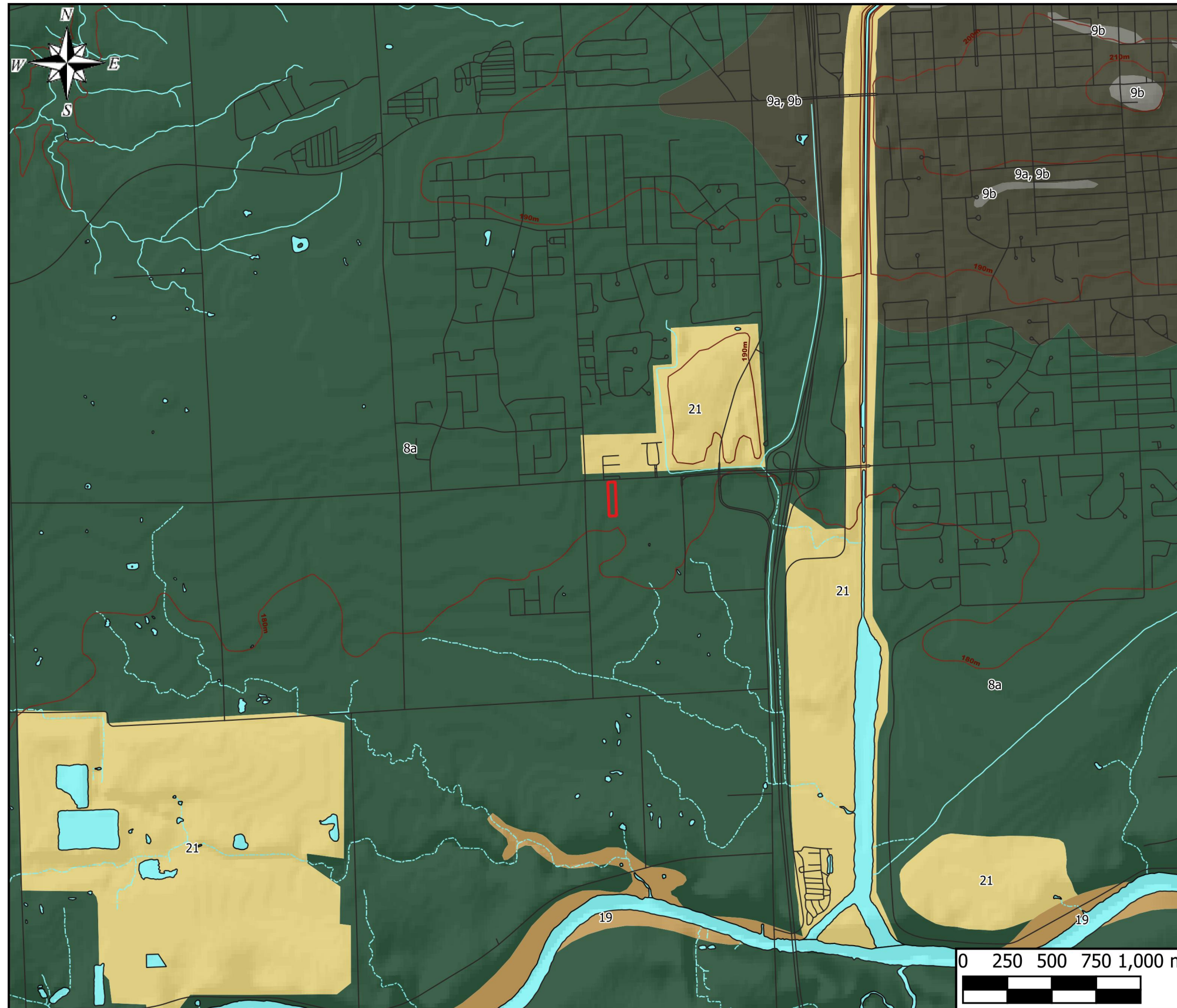


### Legend

-  Study Area
-  Road Network
-  2 - Till Moraines
-  11 - Sand Plains
-  12 - Clay Plains
-  14 - Beaches

Base Data:  
Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.

## Map 4: Physiographic Landforms



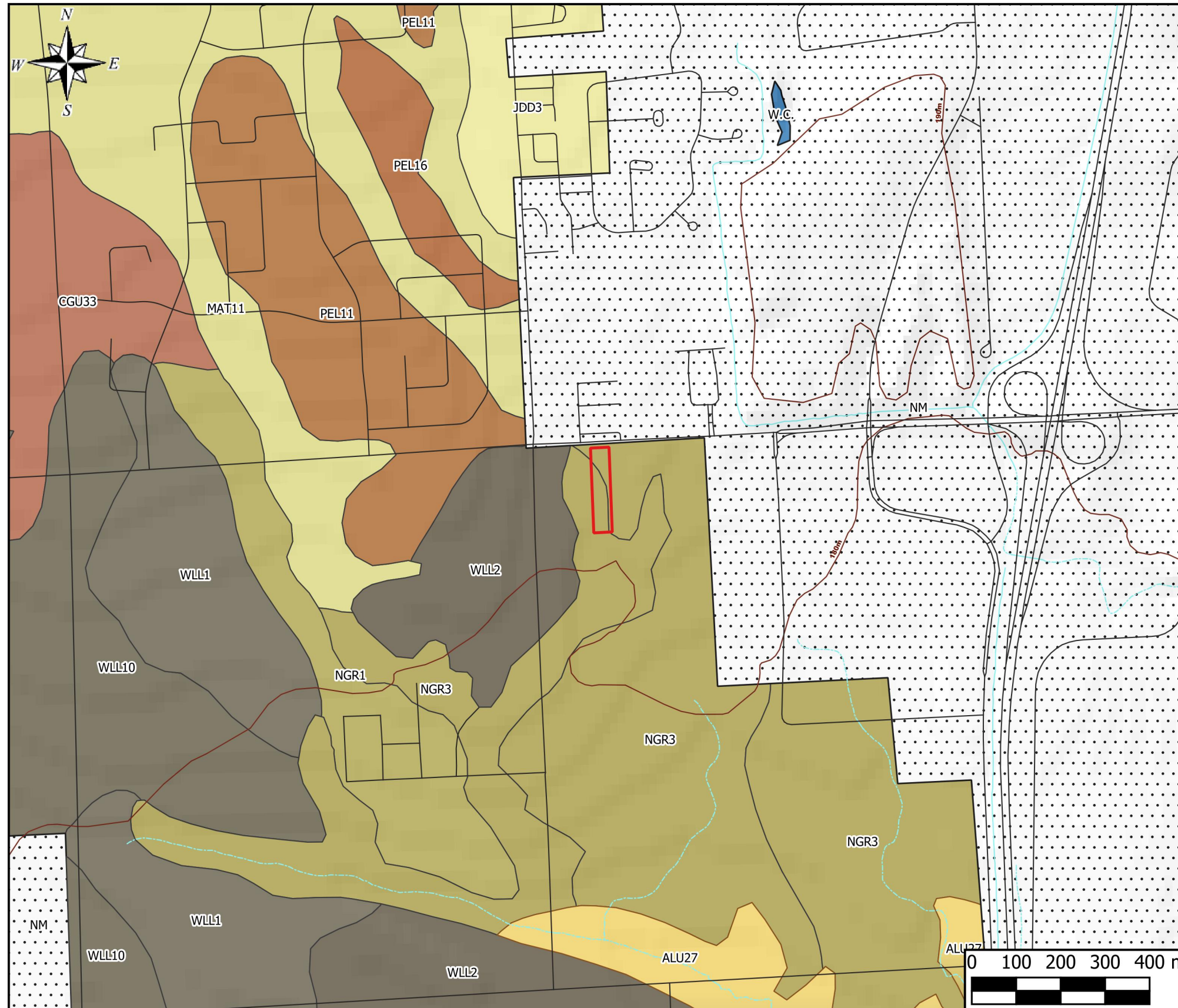
**Legend**

- Study Area
- Road Network
- 8a - Clay and silt
- 9a, 9b - Sand and silt
- 9b - Sand and gravel (Lake Dana)
- 9b - Sand and gravel (other lake stage)
- 19 - Clay, silt, sand and gravel, with organic matter
- 21 - Fill

Base Data:  
 Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data  
 128-REV ISBN 978-1-4435-2483-4

**Map 5: Surficial Geology**





**Legend**





- Study Area
- Road Network
- ALU27 - Alluvium Variable and Ontario Reddish Heavy Clay
- CGU33 - Chinguacousy Reddish-Hued Clay Loam Till
- JDD3 - Jeddo Loam over Reddish-Hued Clay Loam Till
- MAT11 - Malton Reddish-Hued Loamy Textures
- NGR1 - Niagara Reddish-Hued Lacustrine Heavy Clay
- NGR3 - Niagara and Welland Reddish Heavy Clay
- NM - Not Mapped
- PEL11 - Peel and Malton Reddish-Hued Loamy Textures
- PEL16 - Peel Reddish-Hued Loamy Textures over Peel Soil
- WLL1 - Welland Reddish-Hued Lacustrine Heavy Clay
- WLL10 - Welland and Niagara Reddish-Hued Heavy Clay
- WLL2 - Welland Reddish-Hued Heavy Clay & Niagara Loam
- W.C. - Watercourse

Reference:  
 Soil Map of Niagara Region. Soil Survey Report No. 60. Scale 1:63,360

**Map 6: Regional Soil Map**



**Legend**

-  Study Area
-  Area Subject to Stage 2 Test Pit Survey at 5 metre intervals
-  Area of Subsurface Disturbance - Not Assessed
-  Photo Location and Direction

Reference:  
Niagara Region 2020 Aerial Imagery

**Map 7: Stage 2  
Assessment Results**