



REVISED REPORT

Stage 1 and 2 Archaeological Assessment

Arnott Pit Part Lot 3 Concession V Geographic Township of Lanark

Licensee: Shan Ling, M.A. (P340)

PIF Number: P340-0054-2017

Submitted to:

Phil White

Thomas Cavanagh Construction Limited
9094 Cavanagh Road
L0A 1B0

Submitted by:

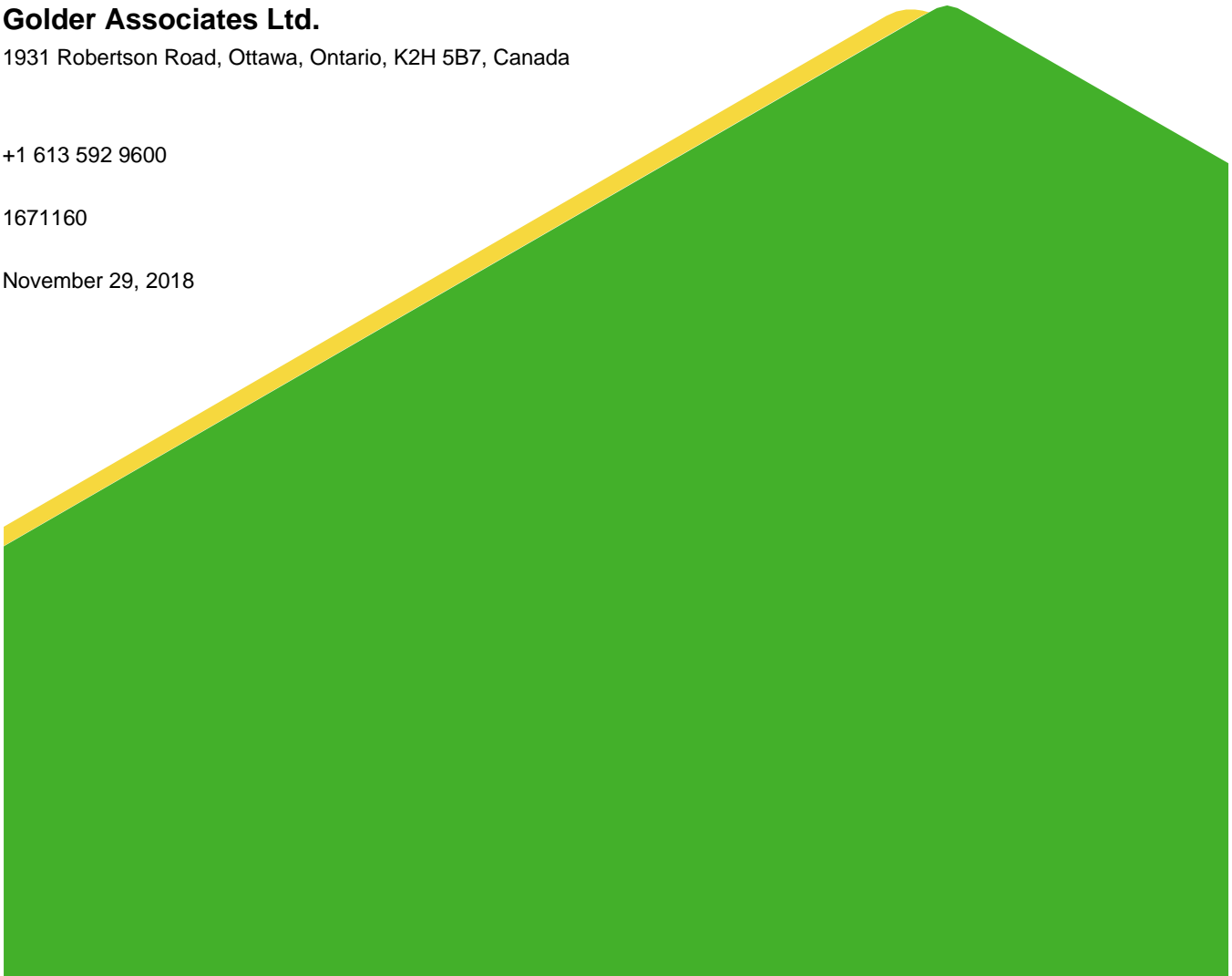
Golder Associates Ltd.

1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada

+1 613 592 9600

1671160

November 29, 2018



Distribution List

1 e-copy - Thomas Cavanagh Construction Limited

1 e-copy - Ministry of Tourism, Culture and Sport

1 e-copy - Golder Associates Ltd.

Executive Summary

The Executive Summary highlights key points from the report only; for complete information and findings, as well as the limitations, the reader should examine the complete report.

Golder Associates Ltd. (Golder) was retained by Thomas Cavanagh Construction Limited (Cavanagh) to undertake a Stage 1 and 2 archaeological assessment for the proposed Arnott Pit located on Part 3, Concession V in the Geographic Township of Lanark (now part of the Township of Lanark Highlands).

There is evidence for human occupation of Eastern Ontario dating to at least 9,000 years before present (B.P.), following the retreat of the Champlain Sea. Based upon the existing data the study area first became available for human occupation in the late Palaeo-Indian or very early in the Archaic Period (7,000 B.P.). The rugged terrain and widespread wetlands would likely not have attracted seasonally mobile hunter and gatherer bands except where transportation was possible over navigable water ways, or along a series of well drained ridges.

The objective of the Stage 1 assessment is to compile available information about the known and potential archaeological resources within the assessment area and to provide specific direction for the protection, management and/or recovery of these resources, consistent with Ontario Ministry of Tourism, Culture and Sport's (MTCS) Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011). The purpose of this Stage 1 is to determine what potential impact development of the proposed pit might have on archaeological resources.

Golder applied criteria utilized by MTCS to assess the archaeological potential of the general study area to provide an assessment of the study area. Archaeological potential was determined in the entire study area due to proximity to historic roadways and structures, proximity to secondary water sources, as well as having well drained soils.

Fieldwork was conducted on May 25 and June 1, 2017 by a licensed archaeologist and permission to access was granted by the Cavanagh. Photographs were taken of the study area during the field investigations. The entire study area consisted of agricultural fields which were ploughed and then subjected to a pedestrian survey at 5-metre intervals.

Two find spots were identified on site which were labelled at AP001 (BgGb-5) and AP002 (BgGb-6). Cavanagh has adapted their development plan to avoid the two sites. A 70-metre buffer has been placed around each site in order to ensure that no construction activities disturb either sites AP001 or AP002.

On the basis of the above information, the following recommendations are made:

- 1) Given that the material found on AP001 (BgGb-5) had been dated to the early 19th century, it is recommended that a Stage 3 archaeological assessment be conducted by a licenced archaeologist. This Stage 3 should consist of a controlled surface pickup followed by the excavation of 1x1-metre units at 10-metre intervals to determine the nature of the site. According to Standard 3.2.3.1 Table 3.1 a total of 42 1x1-metre units will be to be excavated.
- 2) Given that the material found on AP002 (BgGb-6) has been dated to the early 19th century, it is recommended that a Stage 3 archaeological assessment be conducted by a licenced archaeologist. This Stage 3 should consist of a controlled surface pickup followed by the excavation of 1x1-metre units at 5-metre intervals to determine the nature of the site. According to Standard 3.2.3.1 Table 3.1 a total of 9 1x1-metre units will be to be excavated.

- 3) Any Stage 3 archaeological assessment will follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).
- 4) No ground disturbance can occur within the 70-meter buffer around the limits of BgGb-5 and BgGb-6, as established by this assessment prior to Stage 3 assessments of either one or both locations, depending on the extent of the planned disturbance, to further delineate the nature and extent of the occupations and determining if any further archaeological investigations (Stage 4 mitigation) are required.
- 5) There is no further archaeological investigation required in the areas outside of the buffer zones. As such, it is requested that the Ministry of Tourism, Culture and Sport issue a letter confirming that no additional archaeological investigations are required for this area.

The Ontario Ministry of Tourism, Culture and Sport is asked to review the results and recommendations presented herein, accept this report into the Provincial Register of archaeological reports and issue a standard letter of concurrence with the findings presented herein.

Project Personnel

Client Contact	Phil White
Project Director/Senior Archaeologist	Hugh Daechsel, M.A.
Project Manager	Jamie Oxtobee, M.S.c, P.Geo.
Senior Archaeologist/Reviewer	Hugh Daechsel, M.A. (P051)
Licensed Archaeologist	Shan Ling, M.A. (P340)
Report Preparation	Shan Ling, M.A. (P340)
Field Crew	Shan Ling, M.A. (P340)
	Cassandra Sue Masse, M.A. (R1140)
	Caley Ferguson, B.A.
	Ibrahim Nouredine, PhD. (P350)
	JoAnne Bisson, B.A.
GIS/Mapping	Bojan Radojevic
Administration	Courtney Adey/Melanie Duffy

Abbreviations

Cavanagh	Thomas Cavanagh Construction Limited
Golder	Golder Associates Ltd.
m	Metre(s)
MTCS	Ministry of Tourism, Culture and Sport

Table of Contents

EXECUTIVE SUMMARY	i
PROJECT PERSONNEL	iii
1.0 PROJECT CONTEXT	1
1.1 Development Context.....	1
1.2 Objectives.....	1
1.3 Approach.....	1
2.0 HISTORICAL CONTEXT	2
2.1.1 Regional Pre-Contact Aboriginal History	2
2.1.2 Regional Euro-Canadian History	3
2.1.3 Lanark Highlands Township.....	3
3.0 ARCHAEOLOGICAL CONTEXT	4
3.1.1 Stage 1 Assessment Area Overview	4
3.1.2 The Natural Environment.....	4
3.1.3 Previous Research and Archaeological Investigations.....	4
3.2 Archaeological Potential.....	5
3.2.1 Assessing Archaeological Potential	5
3.2.3 Potential for Archaeological Resources.....	6
4.0 STAGE 2 ARCHAEOLOGICAL ASSESSMENT.....	7
4.1 Field Methodology	7
5.0 RECORD OF FINDS	8
6.0 ARTIFACT ANALYSIS	10
7.0 CONCLUSIONS.....	12
8.0 RECOMMENDATIONS	13
9.0 ADVICE ON COMPLIANCE WITH LEGISLATION.....	14
10.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT	15
11.0 IMAGES	16
12.0 MAPS	23
13.0 REFERENCES.....	31

TABLES

Table 1: Inventory of Documentary Record.....	8
Table 2: Distribution of Arnott Pit 001 Artifacts by Material.....	10
Table 3: Distribution of Arnott Pit 001 Artifacts by Design.....	10
Table 4: Distribution of AP002 Artifacts by Material.....	11
Table 5: Distribution of Arnott Pit 002 Artifacts by Design.....	11

IMAGES

Image 1: Landscape showing topography of Operation 1 facing southwest.....	17
Image 2: Crew flagging and recording AP001 facing northeast.....	17
Image 3: Landscape showing soil conditions facing north east.....	18
Image 4: Crew field walking in Operation 1 facing south east.....	18
Image 5: Landscape showing north section of Operation 1 facing northwest.....	19
Image 6: Test pit in Operation 2.....	19
Image 7: Field Crew test pitting Operation 2 facing southeast.....	20
Image 8: Field Crew test pitting around farmhouse in Operation 2 facing northeast.....	20
Image 9: Field crew test pitting around barn structure facing east.....	21
Image 10: Artifacts from Arnott Pit 001: A teaspoon and a pocket knife.....	21
Image 11: Ceramic tableware decoration types from Arnott Pit 001: (top, left to right) asymmetrical edged, unscaloped edged, banded industrial slipped, cat's eye and banded industrial slipped. Bottom, left to right: late palette hand painted, purple transfer printed, blue transfer printed, and blue sponged.....	22
Image 12: Ceramic tableware decoration types from Arnott Pit 002: (top) three examples of early palette hand painted. Bottom, left to right, green edged, plain creamware and banded industrial slipped.....	22

MAPS

Map 1: Key Plan	24
Map 2: Site Plan	25
Map 3: Physiographic Features.....	26
Map 4: Belden's 1880 Historic Atlas.....	27
Map 5: Aerial photos.....	28
Map 6: Archaeological Potential.....	29
Map 7: Photo Locations.....	30

APPENDICES

APPENDIX A

Artifact Inventory

APPENDIX B

Avoidance and Protection Plan

1.0 PROJECT CONTEXT

1.1 Development Context

Golder Associates Ltd. (Golder) was retained by Thomas Cavanagh Construction Limited (Cavanagh) to undertake a Stage 1 and 2 archaeological assessment of the proposed Arnott Pit located on Part 3, Concession V in the Geographic Township of Lanark (now part of the Township of Lanark Highlands), Ontario (Maps 1 and 2). This project was triggered as part of a licencing approval for a new aggregate pit under the *Aggregate Resources Act*.

1.2 Objectives

This Stage 1 and Stage 2 archaeological assessment was completed to identify known archaeological resources on and in the vicinity of the study area as well as assess the potential for further archaeological investigations that may be required for the subject property. The assessment will determine if any additional archaeological investigations are required. The objectives of both a Stage 1 and Stage 2 assessment generally flow from principles outlined in the *Ontario Heritage Act* (Consolidated 2007), the *Standards and Guidelines for Consulting Archaeologists* (2011). More specifically, studies were completed with the following objectives:

- To provide information about the property's geography, history, previous archaeological fieldwork and current land condition;
- To evaluate in detail the property's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property;
- To document all archaeological resources on the property;
- To determine whether the property contains archaeological resources requiring further assessment, and;
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

1.3 Approach

The results of the Stage 1 and 2 investigation are outlined in four sections. The first provides an overview of the general sequence of Pre-Contact and Historic Euro-Canadian Occupation of the study area, followed by the local environment and previous research. The third section reviews identified archaeological sites and is followed by an assessment of the area's archaeological potential. The fourth section describes the Stage 2 field assessment.

A summary of the results based on the analysis of previously completed archaeological reports, known archaeological sites in the vicinity of the study area and the current landscape and environmental conditions is provided. Relevant references are listed at the end of this report.

2.0 HISTORICAL CONTEXT

Our understanding of the local sequence of human activity in the study area following the recession of the last ice sheet and the Champlain Sea is incomplete. It is possible, however, to provide a general outline of Pre-Contact occupation in the Ottawa region based on the archaeological investigations conducted throughout eastern Ontario.

2.1.1 Regional Pre-Contact Aboriginal History

Human occupation of southern Ontario dates back approximately 11,000 years. Known to archaeologists as Paleo-Indians, these first peoples moved into Ontario as the last of the glaciers retreated northward. Although there is little information on their lifestyle, available evidence suggests that Paleo-Indians were highly mobile hunters and gatherers relying on migratory caribou, small game, fish and wild plants found in the sub-arctic environment. Their sites have been located along the former shores of glacial lakes such as Lake Algonquin and along the north shore of present day Lake Ontario.

Sites from this period are generally rare in Eastern Ontario. Two Paleo-Indian points have been reported from the Rideau Lakes area. Evidence has also been found in the Napanee Valley, including a reported fluted point found southeast of Napanee and two late Paleo-Indian sites along the Napanee River near Yarker, Ontario.

During the succeeding Archaic Period (9,000 to 2,800 B.P. or Before Present), the environment of southern Ontario approached present conditions and more land became available for occupation. While Archaic groups remained as hunter-gatherers, their tool kit appears to have become more diversified, reflecting a change in focus towards more local food resources and abandoning the highly mobile lifestyle of their predecessors. Ground stone tools, including adzes and gouges, were produced suggesting heavy wood working activities such as dug-out canoes. The Middle to Late Archaic Periods saw the development of extensive trade networks involving the exchange of copper from the north shore of Lake Superior among other exotic items.

The first significant evidence for occupation in the region appears at this time. Archaic sites have been located along the Rideau River system as well as further north along the Ottawa River near Pembroke.

The Woodland Period (2800 to 450 B.P.) is distinguished by the introduction of ceramics into southern Ontario. Despite this innovation, Early Woodland people continued to live as hunters, gatherers and fishers in much the same way as the Archaic people had done. They also shared elaborate burial ceremonialism which often saw exotic artifacts included in graves. Extensive trade networks continued through the early part of this period and Early Woodland populations in Ontario appear to have been heavily influenced by groups to the south, particularly the Adena cultures of the Ohio Valley.

A large number of Woodland sites have been registered in the region, although very few have been systematically investigated. These include sites on the Big Rideau Lake east of Perth and on Bob's Lake southeast of Perth. The Wyght Site, excavated by Gordon Watson (1980), has provided evidence for the use of the Rideau Lakes area throughout the Woodland Period.

Algonquin populations were most likely to have utilized the Rideau Lakes area towards the end of the pre-contact period, although the region would have been visited by Iroquoian groups, in particular the Huron, for hunting and trade. The area to the south was most likely part of a territory utilized by the Huron who settled along the north shore of Lake Ontario. It has generally been contended that conflict between the Huron and the neighbouring Iroquoian groups along the St. Lawrence River and south shore of Lake Ontario would have discouraged the

construction of permanent villages in the area. However, the identification of a Middleport hamlet site in west Kingston and work on the Upper Gap site along the north shore of Lake Ontario clearly indicate the permanent residency of Late Woodland populations in the region.

2.1.2 Regional Euro-Canadian History

With the advent of European activity in North America during the sixteenth century, there was a significant redistribution of native populations. The Huron moved further inland from Lake Ontario, to eventually settle in the Lake Simcoe and Georgian Bay area. The St. Lawrence Iroquois were either absorbed by other Iroquoian groups including the Huron or dispersed to other areas in Eastern Ontario. As a result, the study area became part of a no man's land only visited by groups moving between the Great Lakes and the Ottawa Valley.

Samuel de Champlain is credited as being the first European in the region who passed through the Bay of Quinte in 1615. While a French presence in the region continued through the seventeenth and early eighteenth centuries, there is little record of their activities. The Huron had left the area by the time of Champlain's arrival and following their dispersal from Huronia by the Five Nations in 1649, the Cayuga occupied the north shore of Lake Ontario.

2.1.3 Lanark Highlands Township

Historical records indicate that at the start of the nineteenth century, settlement of the future County of Lanark was virtually non-existent, with the exception of small numbers of native groups and a few United Empire Loyalists near the site of Merrickville along the Rideau River. Lanark began as part of the judicial District of Bathurst in 1816 after Lord Bathurst issued a proclamation announcing the British Government's intention to help immigrants populate the region (Brown, 1984: 2 - 4; McGill 1968: 61).

Promptly after Lord Bathurst's proclamation, Drummond, Beckwith and Bathurst Townships were each named and initially surveyed in preparation for settlement by British immigrants and demobilized army and navy personnel after the War of 1812. Americans were increasingly taking hold of land and it was in the best interest of the British Government to encourage a more loyal population base through creation of military settlements populated by disbanded soldiers. The first of the military towns to be populated in the new district and established as the regional administrative centre was Perth in Drummond Township, giving jurisdiction over the settlement of the surrounding townships including Bathurst (Brown 1984: 9 - 17 and 94; McGill 1968: 62).

While survey of each township continued, the economic depression in Scotland following the Napoleonic wars amplified. The Glasgow weavers' wages were reduced more than half from 25 shillings a week in 1803 to 5½ shillings by 1819, forcing people to pawn their belongings in order to meet costs of food and shelter (McGill 1968: 61). As a result, several societies in Scotland had been formed to urge the British Government to action. By 1820, Lord Dalhousie, now Governor General, had arranged for the large group emigration from Southern Scotland to be settled in the north half of Lanark County. The townships of Dalhousie, Lanark and Ramsay were surveyed and named for the reception of these families and others then arriving (Brown 1984: 19-32). Lanark Township, where the village of Lanark was founded in 1820 as the chief local administrative base of the North Lanark settlements, thus gained its name before the present County of Lanark was formed.

Most of the first North Lanark farm settlers came from overpopulated towns and countryside of Lanark County in the South of Scotland, including Glasgow, and Lanark, the county of Lanarkshire. Smaller communities later formed in Lanark Township include Middleville, Hopetown, Brightside, Herron's Mills (formerly Gillies Mills), Halpenny, Rosetta and Boyd Settlement (Brown 1984:14).

3.0 ARCHAEOLOGICAL CONTEXT

3.1.1 Stage 1 Assessment Area Overview

A site visit was conducted on May 4, 2017 to ascertain the field conditions of the study area. The study area consists primarily of agricultural fields with a small section of the north east containing a house, several outbuildings and some open grassed areas. As such the study area has been divided into two segments. Operation 1 consisted of the agricultural fields that were assessed by pedestrian survey and Operation 2 the area with the house, outbuildings and open grassland that were assessed by test pitting

3.1.2 The Natural Environment

The rugged relief which identifies the northern portion of Lanark County is associated with the Precambrian Shield in Ontario (Chapman and Putnam, 1984). The area south of the Precambrian Shield is defined as the largest area of shallow soil over limestone in southern Ontario. The thin soils are usually less than 30 centimetres (cm) thick over limestone. Numerous hills with thin soil deposits and bare rock outcrops occupy the western and northern parts of the County while level thin soils on sedimentary rock occur in the southeast.

The study area lies within the Algonquin Highlands which is underlain by granite and other Precambrian rocks. The soils in this region are generally shallow and acidic making them sub marginal for agricultural purposes. The area has undergone significant mining as there are good outcrops of usable rocks. Vegetation in the general area include sugar maple, yellow birch, and a scattering of white pines, hemlock, and balsam fir. Other varieties include of white and black spruce as well as white cedar (Chapman and Putnam 1984). These variables are important in assessing the potential food resources available for exploitation by prehistoric populations.

3.1.3 Previous Research and Archaeological Investigations

There are a number of publications and accounts dealing with the various aspects of the region's historic development. A nineteenth century account of the early development of Lanark Village and Township can be found in Belden's **Illustrated Historical Atlas of Lanark and Renfrew Counties** (1881). **In Search of Lanark** by Carol Bennett (1982) provides an outline of the history of Lanark Village and Lanark Township that include references to a number of heritage buildings. The history of Lanark County is addressed in varying degrees of detail by Jean McGill's **A Pioneer History of the County of Lanark** (1968) and Howard Morton Brown's **Lanark Legacy: Nineteenth Century Glimpses of an Ontario County** (1984). A number of booklets and pamphlets provided by the Corporation of the Township of Lanark Highlands located in the Village of Lanark's Community Service Centre also present a brief history, description and illustration of a number of heritage buildings still present within the village.

Almost all of the archaeological work in the region has been undertaken as a result of Cultural Resource Management studies. In comparison to other parts of Ontario; however, very few archaeological assessments have been completed in the Village of Lanark and the surrounding areas. Studies by Adams Heritage Inc. include both a Stage 1 and Stage 2 assessment of the proposed Lanark truck route northeast from Herron Mills to just south of the village (Adams, 2004a, 2004b), and a Stage 1/2 assessment of the Tatlock quarry site just north of the village (Adams, 2002).

The majority of the archaeological investigations undertaken thus far have been located southeast of the Village of Lanark in Perth. The focus for these studies has been on Perth's heritage properties including Inga Va (Stewart 1987, Dieterman 1988), McMartin House (Stewart 1987) and the Court House (Adams 1997). Adams Heritage also completed a subdivision study north of the Court House (Adams 2000) with a second subdivision assessment completed in 2000 by Ken Swayze (2000). Heritage Quest Inc. completed the Stage 1 and 2 studies of the Highway 7 corridor from Innisville to Perth and the Stage 3 excavation of the Orange Hall site, BgGb-2 (Kennett 2000, 2001).

The primary source of information regarding known archaeological sites in the study area is the Ontario Ministry of Tourism, Culture and Sport's (MTCS) archaeological site database. The results specify that there are no registered archaeological sites within the vicinity of the study area (Accessed July 12, 2017). Although not documented; however, it has been noted that a cache of "native arrowheads and burials" have been found by local property owners northwest of the study area on Lot 14, Concession 5 (Alice Borrowman per. com. 2011).

3.2 Archaeological Potential

3.2.1 Assessing Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. In accordance with the MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* the following are features or characteristics that indicate archaeological potential:

- Previously identified archaeological sites;
- Water sources:
 - Primary water sources (lakes, rivers, streams, creeks);
 - Secondary water sources (intermittent streams and creeks; springs; marshes; swamps);
 - Features indicating past water sources (e.g. glacial lake shorelines indicated by the presence of raised gravel, sand, or beach ridges; relic river or stream channels indicated by clear dip or swale in the topography; shorelines of drained lakes or marshes; and cobble beaches);
 - Accessible or inaccessible shoreline (e.g. high bluffs, swamps or marsh fields by the edge of a lake; sandbars stretching into marsh);
- Elevated topography (eskers, drumlins, large knolls, plateaux);
- Pockets of well drained sandy soil, especially near areas of heavy soil or rocky ground; Distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases (there may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings);
- Resource areas including:
 - Food or medicinal plants;
 - Scarce raw minerals (e.g. quartz, copper, ochre or outcrops of chert);
 - Early Euro-Canadian industry (fur trade, mining, logging);
- Areas of Euro-Canadian settlement; and,
- Early historical transportation routes.

In recommending a Stage 2 property survey based on determining archaeological potential for a study area, the MTCS stipulates the following:

- No areas within 300 metres of a previously identified site; water sources; areas of early Euro-Canadian Settlement; or locations identified through local knowledge or informants can be recommended for exemption from further assessment;
- No areas within 100 metres of early transportation routes can be recommended for exemption from further assessment; and
- No areas within the property containing an elevated topography; pockets of well-drained sandy soil; distinctive land formations; or resource areas can be recommended for exemption from further assessment.

3.2.2 Features Indicating Archaeological Potential has been removed

Archaeological potential can be determined not to be present when the area has been subject to extensive and deep land alterations that severely damaged the integrity of any archaeological resources, including:

- Quarrying;
- Major landscaping involving grading below topsoil;
- Building footprints; and,
- Sewage and infrastructure development.

3.2.3 Potential for Archaeological Resources

The aerial photographs represented in Map 5 show very little change within the study area to the present day aerial photographs. To the north west of the study area there appears to be some development on adjacent properties. A house is present in the norther west section of the study area is shown in the earliest air photo and is still standing and in use today.

Pine grove Road and Concession 6A both appear in the historic maps that extend through Lanark Township. As such, 100 meters on either side of these roads are considered to have historic Euro-Canadian potential due to their proximity to historic roadways. An unknown structure appears in the historic atlas adjacent to the study area (Map 4). Though the nature of the structure is not identified in the atlas the structure was within 100 m of the study area. The structure does not appear in the 1926 aerial photograph.

The study area also lies in an area of drumlinized till plain directly adjacent to an area of peat and much which during pre-contact times may have been a large lake and possibly focus for pre-contact habitation. As such, the entire study area has potential for Pre-Contact archaeological resources. Archaeological potential is represented in Map 6.

4.0 STAGE 2 ARCHAEOLOGICAL ASSESSMENT

4.1 Field Methodology

All areas in Operation 1 were ploughed and disked in accordance to the standards identified in the MTCS Standards and Guidelines for Consultant Archaeologists 2011. The field was walked at 5 metre intervals and surface visibility was at least 80% or better. Permission to access the property was granted by the client.

All other areas in Operation 2 were test pitted at 5-metre (m) intervals with test pits measuring 30x30cm and excavated into subsoil, examined for stratigraphy, cultural features and/or fill and then backfilled. Test pits were dug to within 1 metre of built structures. All soil was passed through 6 millimetre metal mesh screen to look for artifacts. Both test pitting and field walking assessments were conducted in accordance to the MTCS *Standards and Guidelines for Consultant Archaeologists* (2011).

A field logbook was maintained for the duration of the investigation detailing pertinent information and digital photographs were taken of the tested areas, topography, and specific representative test pits. All UTM coordinates were surveyed with Garmin GPS MAP64 units. The Garmin MAP64 GPS unit is a 12 channel SiRFstar III high-sensitivity GPS receiver (WAAS-enabled), which continuously tracks and uses up to 12 satellites to compute and update plotted positions. The accuracy of the unit is ~3 meters 95% typical. The positions recorded for this Stage 2 investigation were typically accurate to between 1 and 3 m, when the points were averaged. The projection used was Universal Transverse Mercator (UTM), Grid Zone 18, and referenced to the North American Datum (NAD) 1983.

Relevant UTM coordinates for all locations are presented in the Supplementary Documentation, separate from this report.

A map with the location and direction of photographs taken in the field represented on Map 7.

5.0 RECORD OF FINDS

The study area was divided into two Operations based on survey type. The results of these surveys are presented below. Table 1 lists the documentary record of the Stage 1 and 2 field investigation as well as the current location of these documents.

Table 1: Inventory of Documentary Record

Document Type	Current Location of Document	Additional Comments
Artifacts	Golder Office in Ottawa	1 Box
Artifact Catalogue	Golder Office in Ottawa	Filed stored digitally in project file.
Field Notes	Golder Office in Ottawa	Hard copies stored in project folder and digitally in project file.
Maps provided by Client	Golder Office in Ottawa	Files stored digitally in project file.
Digital Photographs	Golder Office in Ottawa	Files stored digitally in project file.

Operation 1

Survey Method: Pedestrian Survey

Area: 31.44 hectares (ha)

Number of Artifacts: 61

Date Tested: May 25, June 1, 2017

Weather Conditions: Overcast 17 degrees – Sunny with cloud 22 degrees

Surface Visibility: 80%-85%

Number of sites found: 2

Operation 1 measures approximately 31.44 ha in area and consists of agricultural fields containing medium brown sandy soil with 80-85% surface visibility. The topography in this area was relatively flat in the east with some rolling hills in the western sections. AP001 (BgGb-5) was located near the southern central area and measured approximately 60 m x 20 m in size. Artifacts, discussed below, includes a variety of ceramics many of which had decoration types that could date to an early 19th century occupation. A sample of these artifacts was collected and a Stage 3 archaeological assessment is recommended for this find spot. AP002 (BgGb-6) was located approximately 50 m to the northeast of AP001 and had fewer artifacts, discussed below, dating to the 19th century. Where artifacts were found the transects for field walking was reduced to 1 m intervals within a radius of 20m from the finds as in accordance with the MTCS standard 2.1.1 section 7. No further artifacts or features were identified during the Stage 2 survey of Operation 1 (Images 1-5, pp.17-19).

Operation 2

Survey Method: Test Pitting

Area: 2.15 ha

Number of Artifacts: 0

Date Tested: June 1, 2017

Weather Conditions: Sunny with cloud 22 degrees

Soils: Topsoil - medium brown sand, Subsoil – orange brown sand

Number of sites found: 0

Operation 2 measures approximately 2.15 ha in area and consists of a grassed area surrounding the house that exists on the property. The house borders Pine Grove Rd along with several outbuildings associated with agricultural activities (i.e., barn). The southern section of Operation 2 consists mostly of grassland with a mowed path bordered by a wooden log fence. Soils in this area consist of a medium brown sand topsoil followed by an orange sand reached at 15-20cm in depth. Based on the aerial photographs it would appear that this area was at one point used for agricultural purposes as is in the case of the soils in Operation 1. The colouring and composition of soils in both operations are similar. No artifacts or features were found in this operation (Images 6-9, pp.19-21).

The results of the Stage 2 excavation are represented on Map 8, provided in the supplementary documentation.

6.0 ARTIFACT ANALYSIS

A total of 61 artifacts were found during the Stage 2 Pedestrian Survey. These artifacts were found in two locations, AP001 and AP002. A total of 31 artifacts were recovered from AP001, while 30 were found at AP002.

AP001 (BgGb-5)

A total of 31 artifacts were recovered from AP001. All of the artifacts were of a food/beverage function, except for one, the remains of a pocket knife (Image 10, p.21). All of the food/beverage artifacts were ceramic, except the bowl of a teaspoon (Image 10, p.21). The majority of the food/beverage ceramic sherds were tableware, however two sherds of coarse red earthenware were likely from either kitchen or storage vessels. Ceramic tableware ware types are summarized in the following tables.

Image: Artifacts from AP001: A teaspoon and a pocket knife.

Table 2: Distribution of Arnott Pit 001 Artifacts by Material.

Material 2	Sum of # of Artifacts
pearlware	1
refined white earthenware	23
yellowware	3
Total	27

Ceramic ware types can be general indicators of a historic site's period of use, ceramic decoration types provide much better dating information. The following table summarizes the decoration types found on ceramic tableware and provides available dating information. Decoration types can be seen in Image 11, p.22.

Table 3: Distribution of Arnott Pit 001 Artifacts by Design.

Decoration	Dating	#	Reference
edge decorated	most common decorative types used between 1790 and 1860	2	(Hunter and Miller 1994:443)
edge decorated: asymmetrical scalloped rim with impressed curved lines	1775 to 1810	2	(Miller 2013:488)
edge decorated: unscalloped, simple impressed repetitive patterns	1800 to 1830	1	(Miller 2013:488)
hand painted: late palette	1830s to 1870s	4	(Miller 1991:8)
industrial slip	introduced in the 18 th century, used to 20 th century	3	(Sussman 1997:1)
Industrial slip: cat's eye	A decoration type made with a 'multi-chambered' slip pot, which was patented in 1811	1	(Rickard 2006:13)
Sponged: blue	1840 to 1870	1	(Jouppien 1980:26-27)
transfer printed	Technique invented circa 1753, peak period of production was 1820 to 1840	7	(Kybalova 1989:212),
transfer printed: purple	Other colours become more popular than blue in the 1840s	2	(Little 1969:15)

Based on the number and date of the ceramics the AP001 site is determined to be of cultural heritage value, and as a consequence will require a Stage 3 assessment to further assess this value including better determining the nature and extent of the site.

AP002 (BgGb-6)

A total of 30 artifacts were recovered from AP002. All of the artifacts were of a food/beverage function, except for one fragment of animal bone. All of the food/beverage artifacts were ceramic tableware. Two types of ceramic tableware were identified, pearlware and creamware. As pearlware and creamware were the only refined ceramic types identified, it is likely that the artifact assemblage dates to the early 19th century, prior to ceramic types such as refined white earthenware which are still produced today (Miller 2000:13).

Table 4: Distribution of AP002 Artifacts by Material.

Material 2	Sum of # of Artifacts
pearlware	16
creamware	13
Total	29

As mentioned above, ceramic decoration types provide useful dating information. The following table summarizes the decoration types found on ceramic tableware and provides available dating information. Decoration types can be seen in Image 12, p.22.

Table 5: Distribution of Arnott Pit 002 Artifacts by Design.

Decoration	Dating	#	Reference
edge decorated: green	becomes rare by around 1840	1	(Miller 1991:6)
hand painted: early palette	1795 to 1820s	4	(Miller 1991:8)
hand painted: blue	circa 1775 to 1830	1	(Samford 2014)
Industrial slip	introduced in the 18 th century, used to 20 th century	1	(Sussman 1997:1)

Based on the number and date of the ceramics the AP002 site is determined to be of cultural heritage value, and as a consequence will require a Stage 3 assessment to further assess this value including better determining the nature and extent of the site.

7.0 CONCLUSIONS

On behalf of Cavanagh, Golder conducted a Stage 1 and 2 archaeological assessment for the development of the proposed Arnott Pit in the Township of Lanark Highlands, Ontario. The objective of this assessment was to identify known archaeological sites on and within the vicinity of the study area, and to assess the archaeological potential of the property under investigation, followed by a field assessment to determine if there were any archaeological sites on the property.

A site visit was completed on May 4, 2017 while permission to access the site was granted by Cavanagh. Other sources used to assess the archaeological potential of the study area include aerial photographs and historic maps.

The Stage 1 archaeological assessment identified that the entire area has archaeological potential based on the proximity to historic roadways and structures as well as having well drained soils. A Stage 2 archaeological investigation was conducted on May 25 and Jun 1, 2017 which included both field walking and test pitting surveys conducted at 5 m intervals. Two historic archaeological sites (AP001 (BgGb-5) and AP002 (BgGb-6)) were identified during the field walking survey in the southern area of Operation 1. The material recovered from both these sites suggest an early 19th century occupation. As such both of these sites are being recommended for further archaeological work.

It was decided by the client that both AP001 (BgGb-5) and AP002 (BgGb-6) would be avoided. As part of the site protection and avoidance strategy a 70-metre buffer has been placed around each of the locations in order to ensure that any construction activities would not disturb the integrity of the archaeological sites. This buffer area is illustrated in map 8 supplied within the avoidance and protection plan in the supplementary documentation for this report.

8.0 RECOMMENDATIONS

Based on the background research, the following methods are recommended are made:

- 1) Given that the material found on AP001 (BgGb-5) had been dated to the early 19th century, it is recommended that a Stage 3 archaeological assessment be conducted by a licenced archaeologist. This Stage 3 should consist of a controlled surface pickup followed by the excavation of 1x1-metre units at 10-metre intervals to determine the nature of the site. According to Standard 3.2.3.1 Table 3.1 a total of 42 1x1-metre units will be to be excavated.
- 2) Given that the material found on AP002 (BgGb-6) has been dated to the early 19th century, it is recommended that a Stage 3 archaeological assessment be conducted by a licenced archaeologist. This Stage 3 should consist of a controlled surface pickup followed by the excavation of 1x1-metre units at 5-metre intervals to determine the nature of the site. According to Standard 3.2.3.1 Table 3.1 a total of 9 1x1-metre units will be to be excavated.
- 3) Any Stage 3 archaeological assessment will follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).
- 4) No ground disturbance can occur within the 70 meter buffer around the limits of BgGb-5 and BgGb-6, as established by this assessment prior to Stage 3 assessments of either one or both locations, depending on the extent of the planned disturbance, to further delineate the nature and extent of the occupations and determining if any further archaeological investigations (Stage 4 mitigation) are required.
- 5) There is no further archaeological investigation required in the areas outside of the buffer zones. As such, it is requested that the Ministry of Tourism, Culture and Sport issue a letter confirming that no additional archaeological investigations are required for this area.

The Ontario Ministry of Tourism, Culture and Sport is asked to review the results and recommendations presented herein, accept this report into the Provincial Register of archaeological reports and issue a standard letter of concurrence with the findings presented herein.

9.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Minister of Tourism, Culture and Sport, 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 Tourism, Culture and Sport, 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 archaeological 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, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ontario Ministry of Consumer Services is also immediately notified.

Reports recommending further archaeological fieldwork or protection for one or more archaeological sites must include the following standard statement: "Archaeological sites recommended for further archaeological fieldwork or protection remains subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence".

10.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Golder Associates Ltd. has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the archaeological profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

This report has been prepared for the specific site, design objective, developments and purpose described to Golder by Thomas Cavanaugh Construction Limited (the Client). The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges the electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client cannot rely upon the electronic media versions of Golder's report or other work products.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project.

Special risks occur whenever archaeological investigations are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain archaeological resources. The sampling strategies incorporated in this study comply with those identified in the Ministry of Tourism, Culture and Sports' *Standards and Guidelines for Consultant Archaeologists* (2011).

11.0 IMAGES



Image 1: Landscape showing topography of Operation 1 facing southwest.



Image 2: Crew flagging and recording AP001 facing northeast.



Image 3: Landscape showing soil conditions facing north east.



Image 4: Crew field walking in Operation 1 facing south east.



Image 5: Landscape showing north section of Operation 1 facing northwest.



Image 6: Test pit in Operation 2.



Image 7: Field Crew test pitting Operation 2 facing southeast.



Image 8: Field Crew test pitting around farmhouse in Operation 2 facing northeast.



Image 9: Field crew test pitting around barn structure facing east.



Image 10: Artifacts from Arnott Pit 001: A teaspoon and a pocket knife.

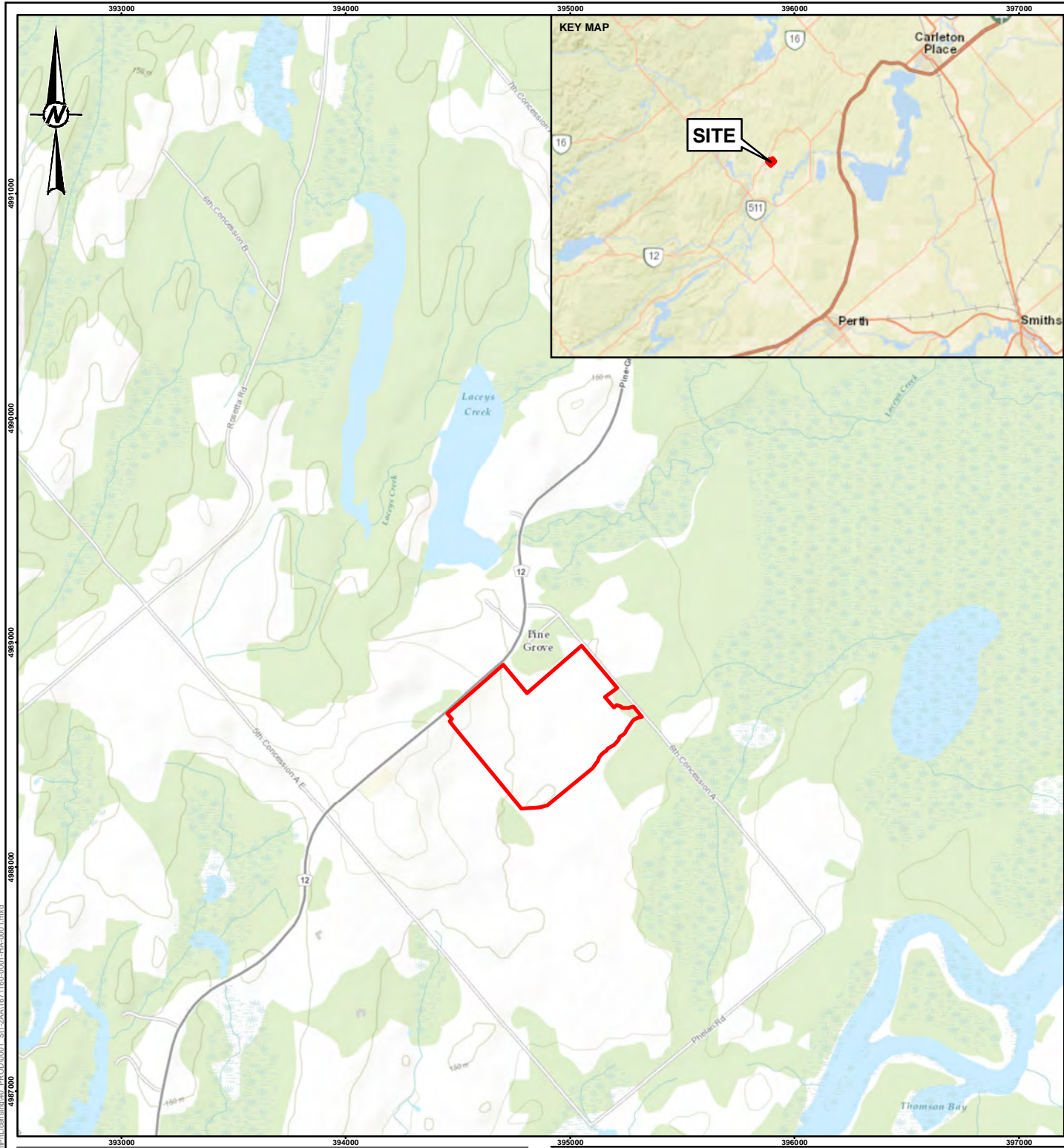


Image 11: Ceramic tableware decoration types from Arnott Pit 001: (top, left to right) asymmetrical edged, unscalloped edged, banded industrial slipped, cat's eye and banded industrial slipped. Bottom, left to right: late palette hand painted, purple transfer printed, blue transfer printed, and blue sponged.



Image 12: Ceramic tableware decoration types from Arnott Pit 002: (top) three examples of early palette hand painted. Bottom, left to right, green edged, plain creamware and banded industrial slipped.

12.0 MAPS



LEGEND

 SITE BOUNDARY



NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

KEY MAP



CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT,
ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO

TITLE
KEY PLAN

CONSULTANT



YYYY-MM-DD	2018-02-05
DESIGNED	----
PREPARED	BR
REVIEWED	SL
APPROVED	HJD

PROJECT NO.
1671160

CONTROL
0001

REV.
0

MAP
1

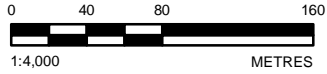
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 25mm



- LEGEND**
- SITE BOUNDARY
 - OPERATION
 - ROADWAY
 - TOPOGRAPHIC CONTOUR, metres
 - WATERCOURSE
 - WETLAND
 - LOT FABRIC

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

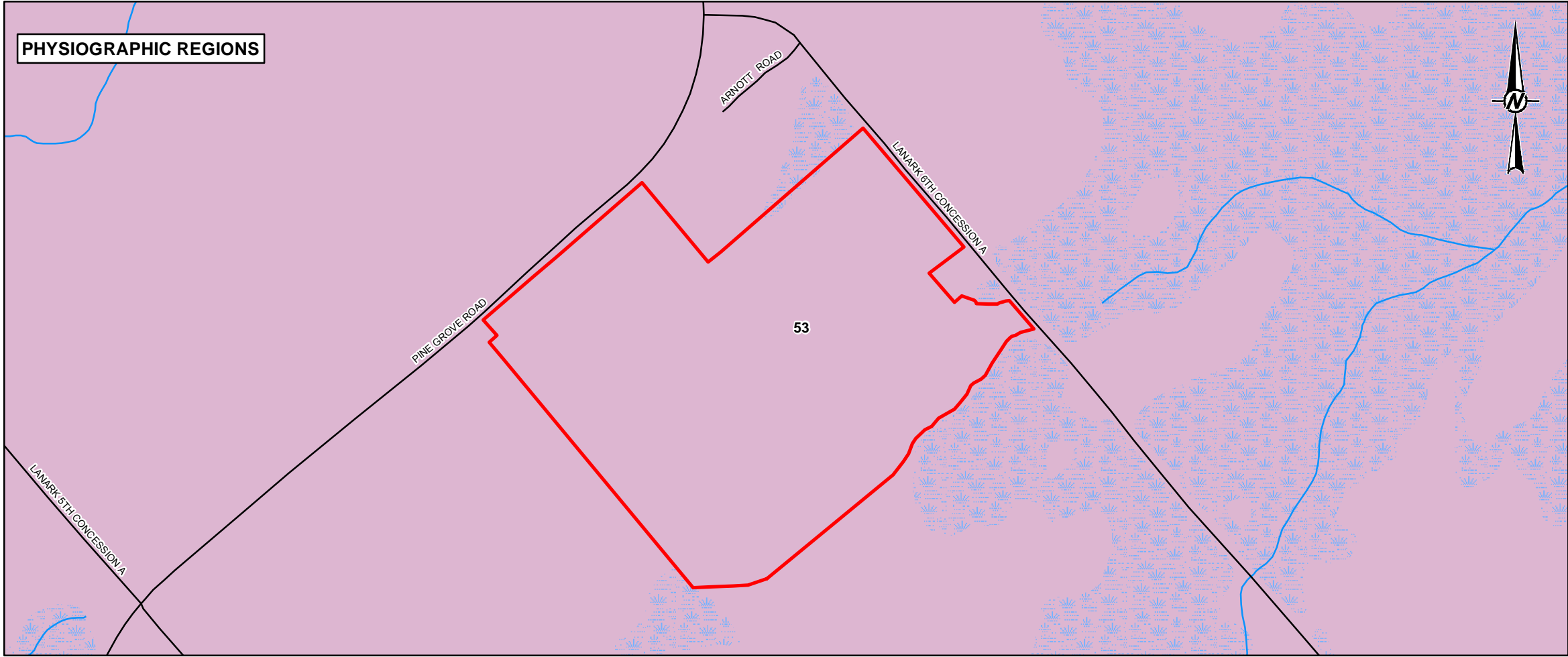
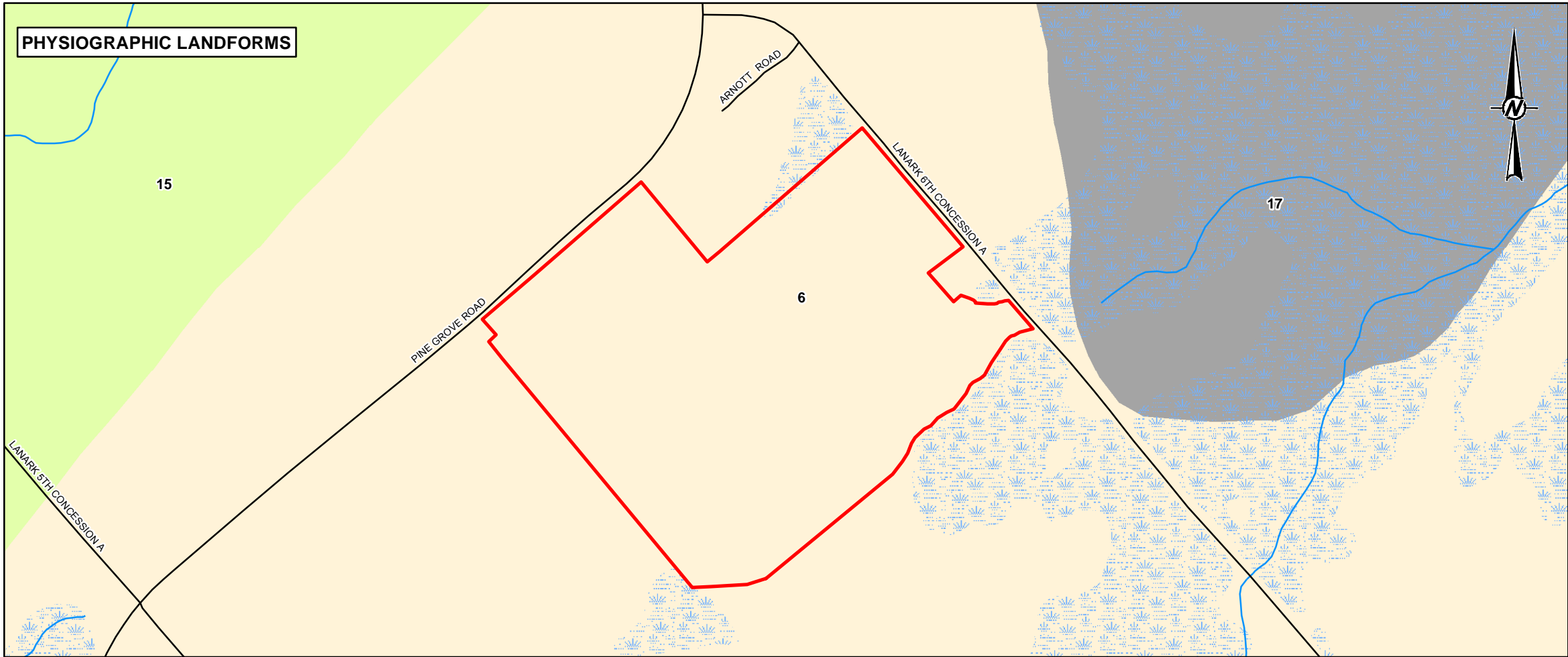


CLIENT THOMAS CAVANAGH CONSTRUCTION LIMITED			
PROJECT STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT, ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO			
TITLE SITE PLAN			
CONSULTANT		YYYY-MM-DD	2018-02-05
		DESIGNED	---
		PREPARED	BR
		REVIEWED	SL
		APPROVED	HJD
PROJECT NO. 1671160	CONTROL 0001	REV. 0	MAP 2

Path: N:\Active\Spatial_MIT\ThomasCavanagh\Arnott_Pit\89_PRQ\1671160_Cavanagh_Archaeo\1671160-0001-1A-0002.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 28mm

Path: N:\Active\Spatial_MIT\ThomasCavanagh\Arnot_Pit\98_PRCU\1671160_Cavanagh\Arnot_Pit\98_PRCU\1671160-001-1A-003.mxd



LEGEND

- SITE BOUNDARY
- ROADWAY
- WATERCOURSE
- WETLAND

PHYSIOGRAPHIC LANDFORMS

- 17: PEAT AND MUCK
- 15: SHALLOW TILL AND ROCK RIDGES
- 6: TILL PLAINS (DRUMLINIZED)

PHYSIOGRAPHIC REGIONS

- 53, ALGONQUIN HIGHLANDS

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)


1. CHAPMAN, L.J. AND PUTNAM, D.F. 2007. PHYSIOGRAPHY OF SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, MISCELLANEOUS RELEASE—DATA 228.

2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014

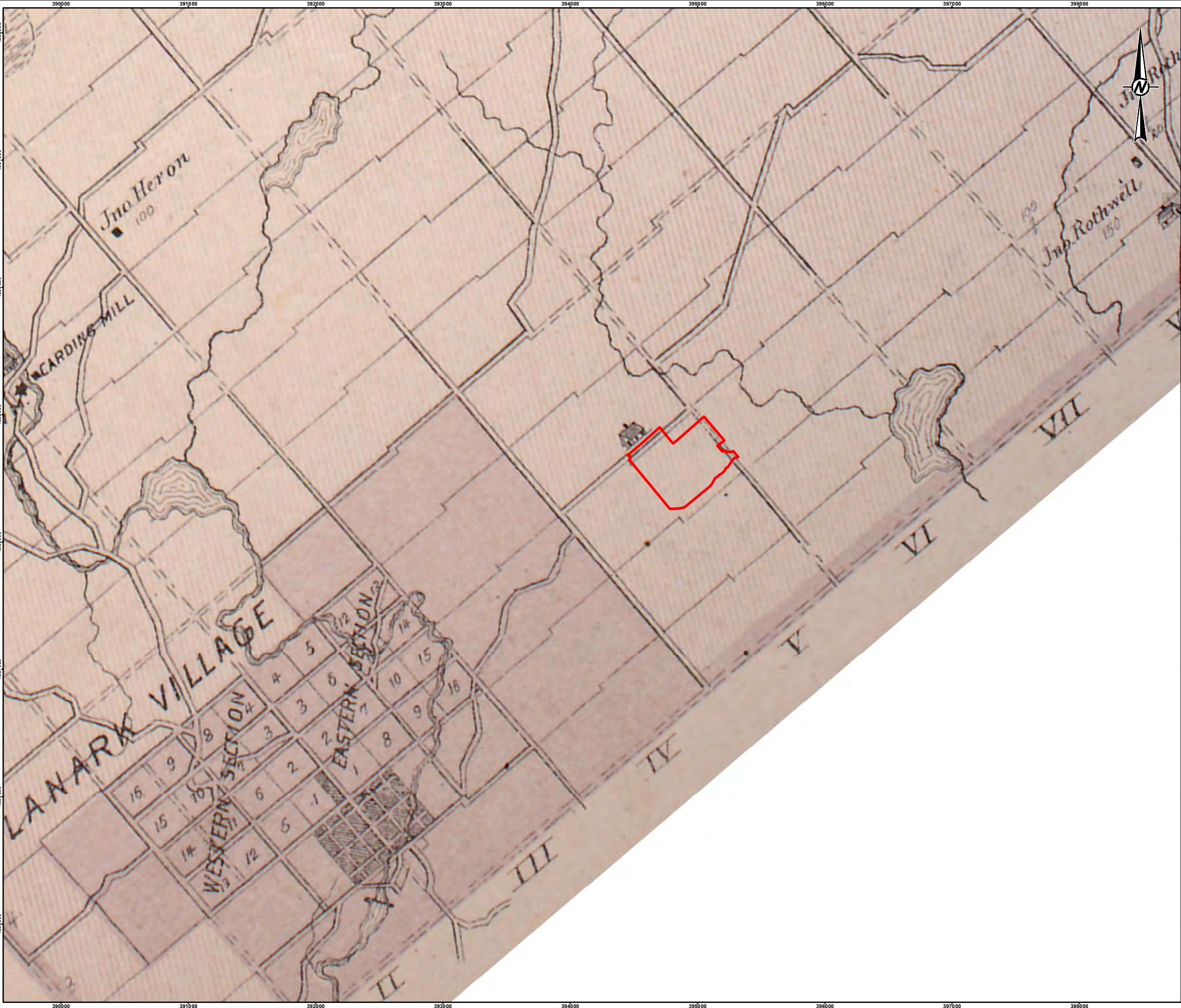
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT			
THOMAS CAVANAGH CONSTRUCTION LIMITED			
PROJECT			
STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT, ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO			
TITLE			
PHYSIOGRAPHIC FEATURES			
CONSULTANT		YYYY-MM-DD	2018-02-05
		DESIGNED	---
		PREPARED	BR
		REVIEWED	SL
		APPROVED	HJD
PROJECT NO.	CONTROL	REV.	MAP
1671160	0001	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 28mm



SCALE 1:400,000

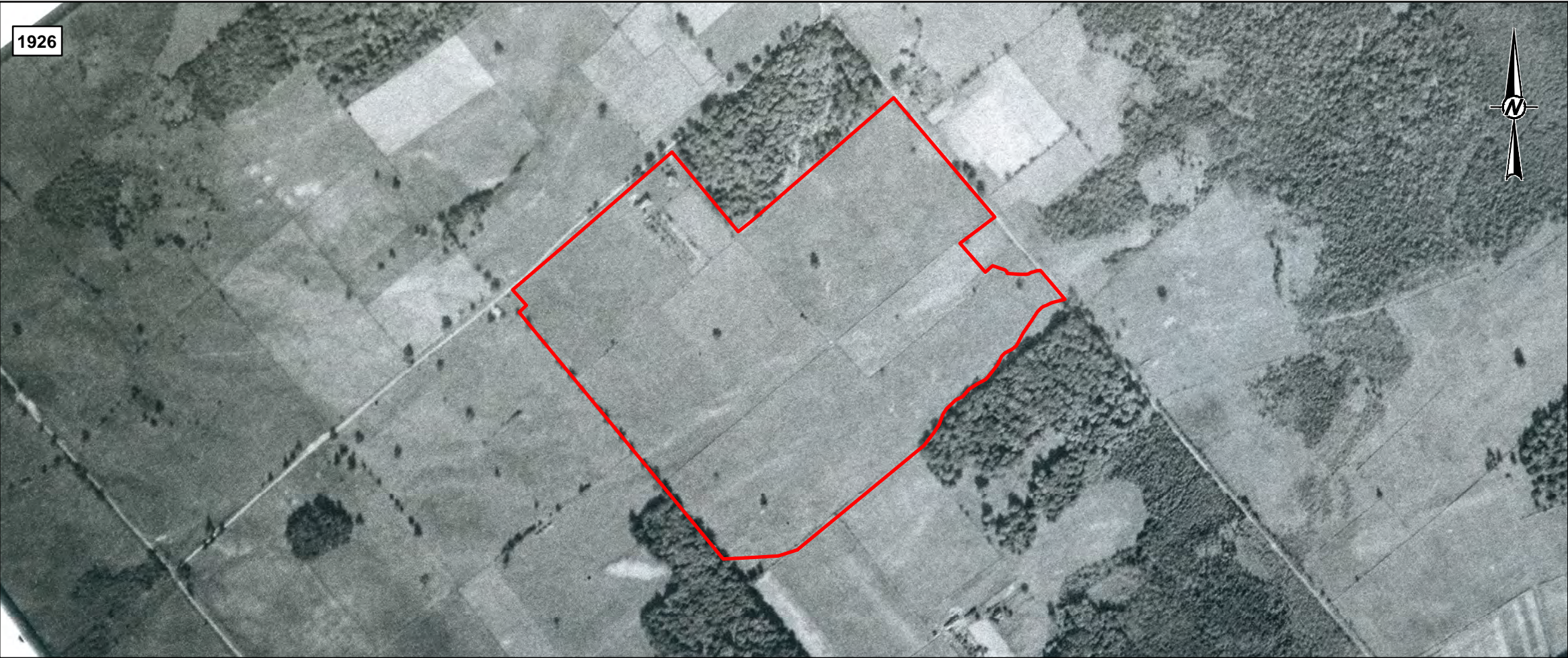
LEGEND
 SITE BOUNDARY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. BELDEN, H & CO. (1880). ILLUSTRATED HISTORICAL ATLAS OF LANARK AND RENFREW COUNTIES, ONTARIO. REPRINTED, 1972, PORT ELGIN : ROSS CUMMING.
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT THOMAS CAVANAGH CONSTRUCTION LIMITED			
PROJECT STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT, ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO			
TITLE BELDEN'S HISTORIC ATLAS OF LANARK COUNTY 1880			
	CONSULTANT	YYYY-MM-DD	2018-02-05
	DESIGNED	---	
	PREPARED	BR	
	REVIEWED	SL	
	APPROVED	HJD	
PROJECT NO.	CONTROL	REV.	MAP
1671160	0001	0	4



SCALE 1:400,000

LEGEND

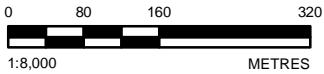
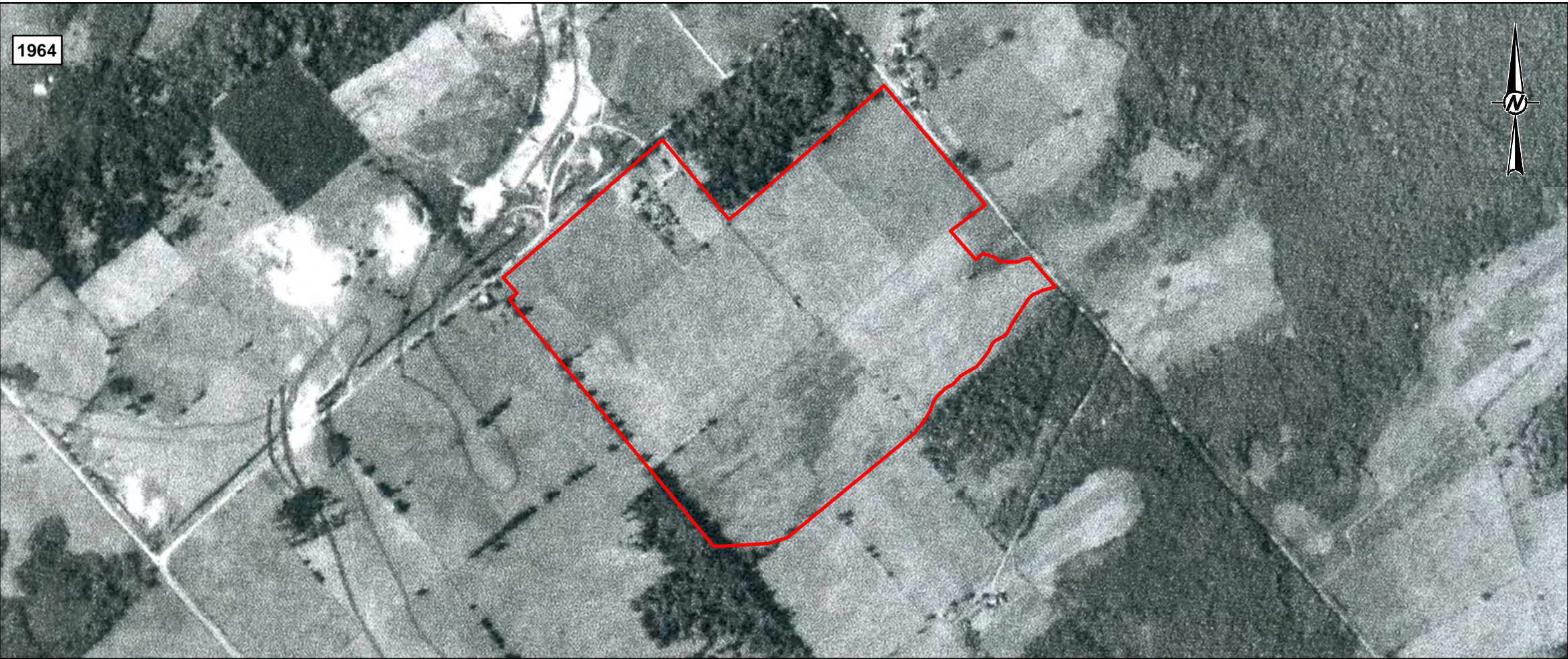
SITE BOUNDARY

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1926 AERIAL PHOTO - NAPL - HA122-49
2. 1964 AERIAL PHOTO - NAPL - A18523-126
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT

THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT

STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT,
ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO

TITLE

AERIAL PHOTOGRAPHS

CONSULTANT	YYYY-MM-DD	2018-02-05
	DESIGNED	---
	PREPARED	BR
	REVIEWED	SL
	APPROVED	HJD



PROJECT NO.	CONTROL	REV.	MAP
1671160	0001	0	5

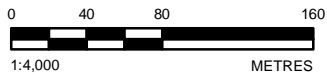



LEGEND

- SITE BOUNDARY
- ROADWAY
- TOPOGRAPHIC CONTOUR, metres
- WATERCOURSE
- WETLAND
- LOT FABRIC
- ARCHAEOLOGICAL POTENTIAL

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. SERVICE LAYER CREDIT'S: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT THOMAS CAVANAGH CONSTRUCTION LIMITED		
PROJECT STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT, ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO		
TITLE ARCHAEOLOGICAL POTENTIAL		
CONSULTANT	YYYY-MM-DD	2018-02-05
	DESIGNED	---
	PREPARED	BR
	REVIEWED	SL
	APPROVED	HJD
PROJECT NO. 1671160	CONTROL 0001	REV. 0
		MAP 6

Path: N:\Active\Spatial_MIT\ThomasCavanagh\Arnot_Pit\89_PRQ\1671160_Cavanagh_Arnot_Pit\89_PRQ\1671160-001-1A-0006.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 28mm



SCALE 1:400,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- PHOTO LOCATION POINTING DOWN
- SITE BOUNDARY
- ROADWAY
- TOPOGRAPHIC CONTOUR, metres
- WATERCOURSE
- WETLAND
- LOT FABRIC

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT,
ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO

TITLE
PHOTO LOCATIONS

CONSULTANT	YYYY-MM-DD	2018-02-05
	DESIGNED	---
	PREPARED	BR
	REVIEWED	SL
	APPROVED	HJD

PROJECT NO. 1671160 **CONTROL** 0001 **REV.** 0 **MAP** 7

13.0 REFERENCES

Adams, Nicholas

- 2004a **Stage 1 Archaeological Assessment of the Proposed Lanark Truck Route, Township of Lanark Highlands, County of Lanark.** Consultants report prepared for NCE Ltd. by Adams Heritage Inc.
- 2004b **Stage 2 Archaeological Assessment of the Proposed Relocation of County Road 9, Concession 6 to Highway 511, Township of Lanark Highlands, Lanark County.** Consultants report prepared for OMYA (Canada) Inc., by Adams Heritage Inc.
- 2002 **Stages 1 & 2 Cultural Heritage Assessment in support of Site Plan License Application for a Category 2, Class "A", Quarry Below Water OMYA Canada inc. Tatlock Quarry Property Township of Lanark Highlands County of Lanark, Ontario.** Consultants report prepared for OM YA (Canada) Inc., by Adams Heritage Inc.
- 2000 **An Archaeological Assessment (Stages 1 & 2) of the Proposed Subdivision Development, Part of the Northeast Half and Southwest Half of Lot 3, Conc. 2, Township of Drummond, Town of Perth.** Prepared by Adams Heritage.
- 1997 **Archaeological Monitoring of the Development of Barrier Free Access and Landscape Alterations at the Lanark County Courthouse, Perth, Ontario.** Prepared by Adams Heritage for the Ontario Realty Corporation.

Belden, H. and Co.

- 1880 **Illustrated Historical Atlas of the Lanark and Renfrew Counties, Ontario.** Reprint Port Elgin 1972.

Bennet, Carol

- 1982 **In search of Lanark.** Juniper Books, Renfrew, Ontario.

Brown, Howard Morton

- 1984 **Lanark Legacy-Nineteenth Century Glimpses of an Ontario County.** The Corporation of the County of Lanark, Perth, Ontario.

Chapman, L. J. and D. F. Putnam

- 1984 **The Physiography of Southern Ontario (Third Edition).** Ontario Ministry of Natural Resources, Toronto.

Dieterman, Frank

- 1988 **Inga-Va Estate, Perth- 1988 Field Season.** Prepared by the Cataraqui Archaeological Research Foundation for the Ontario Heritage Foundation.

Hunter, Robert R., Jr. and George L. Miller

- 1994 **English Shell-Edged Earthenwares.** Antiques, March 1994: 432-443.

Jouppien, J.K.

- 1980 **The Application of South's Mean Ceramic Dating Formula to Ontario Historic Sites.** Arch Notes May/June 1980:24-29.

Kennett, Brenda,

- 2001 **Stage 3 Archaeological Assessment of the Drummond Centre, Orange Hall Site (BgGb-2). Highway 7 & Gardiner Road, Drummond Township, Ontario.** Prepared by Heritage Quest.
- 2000 **Stage 1 Archaeological Assessment of Proposed Passing Lanes & Improvements to Highway 7 Between Perth & Innisville, Drummond Township, Ontario.** Prepared by Heritage Quest Inc.

Kybalova, Jana

1989 **European Creamware** Hamlyn, Prague.

McGill, J.S.

1968 **A Pioneer History of the County of Lanark**. T.H. Best Printing Company Ltd., Toronto, Ontario.

Miller, George L.,

2013 **Identifying and Dating Shell-Edged Earthenwares**. From Ceramic Identification on Historical Archaeology: The View from California, 1822-1940.

2000 **Telling Time for Archaeologists**. Northeast Historical Archaeology. Vol.29. p1-17.

1991 **A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880**. Historical Archaeology Volume 25:1, 1-25.

Ontario Ministry of Tourism, Culture and Sport (MTCS)

2011 **Standards and Guidelines for Consulting Archaeologists**. Queens Printer, Ontario.

Rickard, Jonathan

2006 **Mocha and Related Dipped Wares, 1770-1930**. University Press of New England, New Hampshire.

Samford, Patricia

2014 **Colonial and Post-Colonial Ceramics**. Jefferson Patterson Park & Museum: State Museum of Archaeology. Available Online: <http://www.jefpat.org/Documents/Colonial-PostColonialCeramics.pdf>

Stewart, Bruce

1987 **An Archaeological Assessment of Three Ontario Heritage Foundation Properties: McMartin House, Perth; Cartwright House, Kingston; Inge-Va, Perth**. Prepared by Cataraqui Archaeological Research Foundation for the Ontario Heritage Foundation.

Sussman, Lynne

1997 **Mocha, Banded, Cat's Eye, and Other Factory-Made Slipware**, CNEHA

Swayze, Ken

2000 **A Stage 1 & 2 Archaeological Assessment of the Sheridan Subdivision on Part Lot 1, Conc. 4, Drummond Township (Geo), Lanark County**.

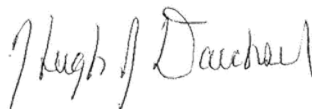
Signature Page

We trust that this report meets your current needs. If you have any questions, or if we may be of further assistance, please contact the undersigned.

Golder Associates Ltd.



Shan Ling, M.A.
Staff Archaeologist



Hugh J. Dachsel, M.A.
Principal, Senior Archaeologist

STWL/HJD/ca

\\golder.gds\galottawa\active\2016\3 proj\1671160 cavanagh arnott pit ara licensing\archaeology\reporting\final\p340-0054-2017_29nov2018_rr.docx

Golder and the G logo are trademarks of Golder Associates Corporation

APPENDIX A

Artifact Inventory

Artifacts

ID	Prov 1	Prov 2	Material 1	Material 2	Function 1	Function 2	Object	Fragment	Attribute 1	Attribute 2	Alteration	# of Artifacts	Note
2071	AP 001	CSP 009	ceramic	refined white earthenware	food/beverage	tableware	teabowl/cup	footring/footrim	hand painted	polychrome: late palette		1	
2072	AP 001	CSP 005	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	rim	sponged	blue		1	
2073	AP 001	CSP 001	ceramic	yellowware	food/beverage	tableware	holloware: cylindrical	body	glaze: Rockingham	brown		1	
2074	AP 001	CSP 001	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	body	transfer printed	blue		1	
2075	AP 001	CSP 001	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: blue	indeterminate		1	
2076	AP 001	CSP 002	ceramic	refined white earthenware	food/beverage	tableware	indeterminate	body	hand painted	polychrome: late palette		2	
2077	AP 001	CSP 002	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	body	industrial slip	banded		1	brown, lt blue
2078	AP 001	CSP 002	ceramic	yellowware	food/beverage	tableware	holloware: cylindrical	body	industrial slip	banded: white		1	
2079	AP 001	CSP 002	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	handle	transfer printed	blue: light		1	
2080	AP 001	CSP 007	ceramic	refined white earthenware	food/beverage	tableware	flatware	base	transfer printed	purple		1	
2081	AP 001	CSP 007	ceramic	refined white earthenware	food/beverage	tableware	teabowl/cup	rim	hand painted	polychrome: late palette		1	
2082	AP 001	CSP 007	ceramic	refined white earthenware	food/beverage	tableware	flatware	footring/footrim	plain	clear/colourless		1	
2083	AP 001	CSP 007	ceramic	refined white earthenware	food/beverage	tableware	flatware	body	transfer printed	blue		1	
2084	AP 001	CSP 008	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	body	industrial slip	cat's eye		1	grey bkgrd, blue/white/brown eye with brown banding
2085	AP 001	CSP 008	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: blue	impressed curved lines/unscaloped		1	
2086	AP 001	CSP 008	ceramic	coarse earthenware: red	food/beverage	indeterminate	holloware: cylindrical	body	glaze: lead	brown: light		1	
2087	AP 001	CSP 006	ceramic	refined white earthenware	food/beverage	tableware	flatware	footring/footrim	transfer printed	purple		1	
2088	AP 001	CSP 006	ceramic	yellowware	food/beverage	tableware	holloware: cylindrical	rim	industrial slip	banded: white		1	
2089	AP 001	CSP 006	ceramic	coarse earthenware: red	food/beverage	indeterminate	holloware: cylindrical	body	glaze: lead	brown		1	
2090	AP 001	CSP 006	ceramic	pearlware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: blue	impressed bud/scalloped		1	
2091	AP 001	CSP 006	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: clear	impressed curved lines/unscaloped		1	
2092	AP 001	CSP 006	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: blue	indeterminate/unscaloped		1	

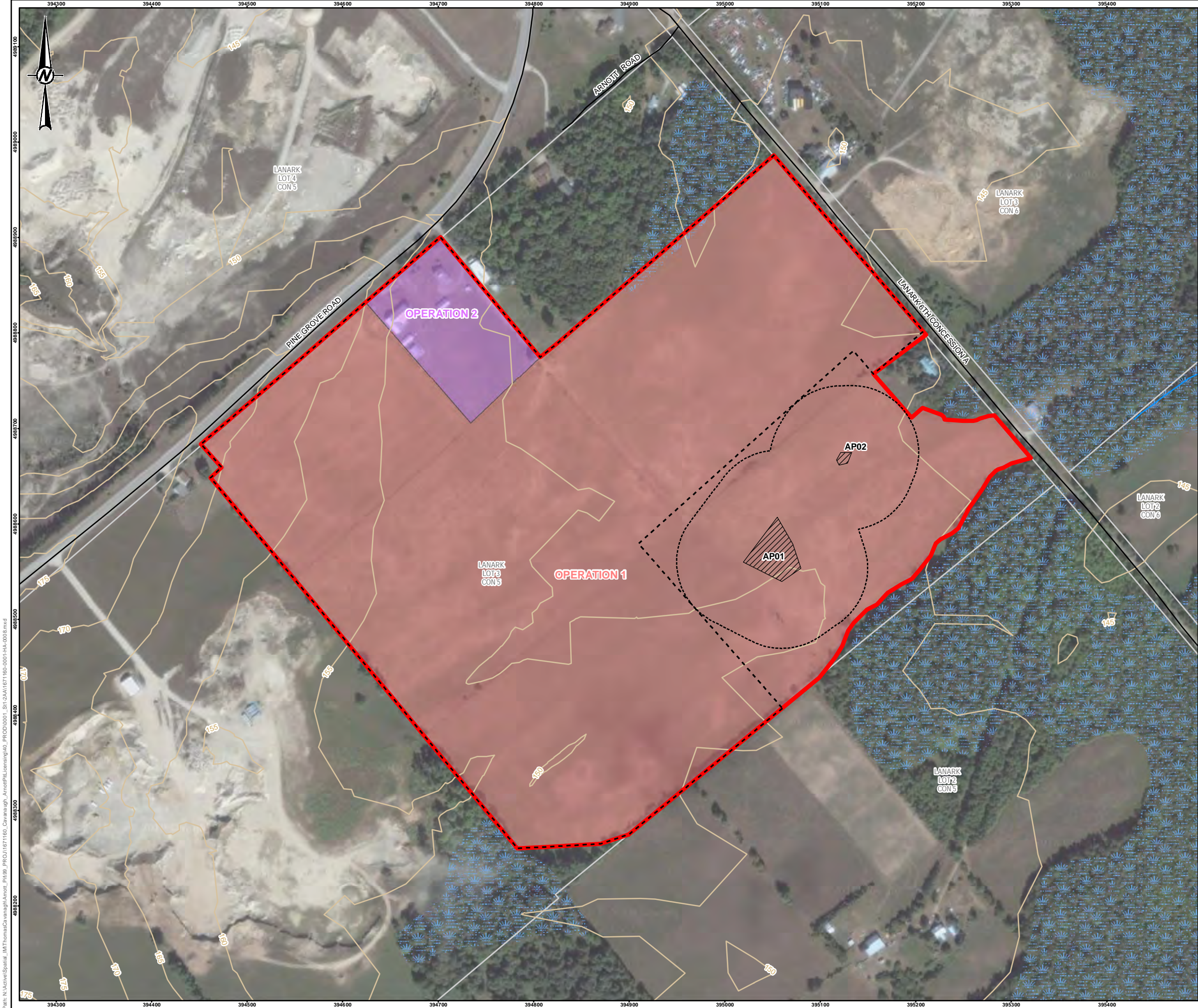
ID	Prov 1	Prov 2	Material 1	Material 2	Function 1	Function 2	Object	Fragment	Attribute 1	Attribute 2	Alteration	# of Artifacts	Note
2093	AP 001	CSP 006	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	footring/footrim	transfer printed	blue		3	
2094	AP 002	CSP 007	ceramic	creamware	food/beverage	tableware	indeterminate	body	plain	clear/colourless	spalled	1	creamware?
2095	AP 002	CSP 006	ceramic	pearlware	food/beverage	tableware	indeterminate	body	hand painted	polychrome: early palette		3	
2096	AP 002	CSP 006	ceramic	pearlware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		1	
2097	AP 002	CSP 006	ceramic	creamware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		1	
2098	AP 002	CSP 002	ceramic	creamware	food/beverage	tableware	holloware: cylindrical	body	plain	clear/colourless		1	
2099	AP 002	CSP 002	ceramic	pearlware	food/beverage	tableware	teabowl/cup	rim	hand painted	polychrome: early palette	spalled	1	
2100	AP 002	CSP 002	ceramic	pearlware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		3	small sherds
2101	AP 002	CSP 003	ceramic	creamware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		4	
2102	AP 002	CSP 003	fauna	bone	fauna: indeterminate		mammal	incomplete				1	
2103	AP 002	CSP 001	ceramic	creamware	food/beverage	tableware	holloware: cylindrical	body	industrial slip	banded		1	brown/white/yellow
2104	AP 002	CSP 001	ceramic	pearlware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: green	indeterminate/scalloped	spalled	1	
2105	AP 002	CSP 001	ceramic	pearlware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		4	small sherds
2106	AP 002	CSP 004	ceramic	pearlware	food/beverage	tableware	indeterminate	body	hand painted	blue		3	small sherds
2107	AP 002	CSP 004	ceramic	creamware	food/beverage	tableware	indeterminate	body	plain	clear/colourless		5	
2108	AP 001	CSP 003	ceramic	refined white earthenware	food/beverage	tableware	plate: indeterminate	rim	edge decorated: blue	impressed straight lines/unscaloped		1	
2109	AP 001	CSP 003	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	body	transfer printed	blue		1	
2110	AP 001	CSP 004	ceramic	refined white earthenware	food/beverage	tableware	holloware: cylindrical	body	hand painted	polychrome: late palette		1	
2111	AP 001	CSP 004	metal	copper alloy	food/beverage	tableware	spoon: tea	bowl	plain			1	small hole punched where handle should attach
2112	AP 001	CSP 004	metal	iron/copper alloy	personal/societal	personal gear	pen/pocket knife	incomplete				1	

APPENDIX B

Avoidance and Protection Plan

SUPPLEMENTARY DOCUMENTATION – MAP 8 PARTIAL CLEARANCE AND AVOIDANCE AND PROTECTION STRATEGY

The locations of the 20-metre protective buffers plus the 50-metre construction monitoring buffers (70-metre total buffer) for all sites recommended for Stage 3 archaeological assessment within the Arnott Pit study area are illustrated on Map 8. As shown on Map 8, the proposed license boundary for the Arnott Pit has been selected to remain outside the identified 70-metre buffers.



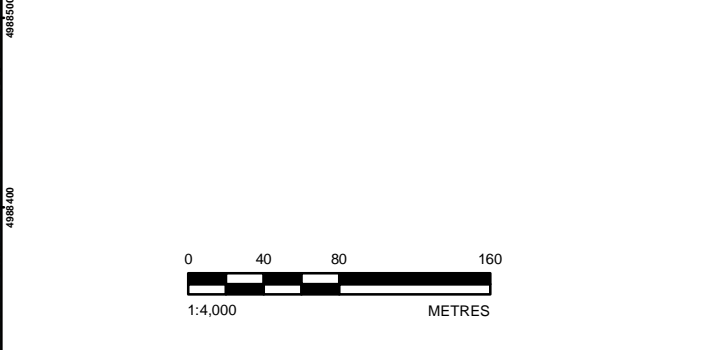
SCALE 1:400,000

LEGEND

- SITE BOUNDARY
- PROPOSED LICENSE BOUNDARY
- 70 METRE BUFFER
- ROADWAY
- TOPOGRAPHIC CONTOUR, metres
- WATERCOURSE
- WETLAND
- LOT FABRIC
- FIELD WALKED AT 5 METRE INTERVALS
- TEST PITTED AT 5 METRE INTERVALS
- AP01 AND APO2

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28



CLIENT THOMAS CAVANAGH CONSTRUCTION LIMITED			
PROJECT STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT, ARNOTT PIT, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO			
TITLE STAGE 2 RESULTS			
	CONSULTANT	YYYY-MM-DD	2018-02-05
	DESIGNED	---	
	PREPARED	BR	
	REVIEWED	SL	
	APPROVED	HJD	
PROJECT NO. 1671160	CONTROL 0001	REV. 0	MAP 8



golder.com