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ORIGINAL REPORT

Stage 1 & 2 Archaeological Assessment Brigil Homes Part Lots 29 & 29 Former Township of Cumberland Russell County, City of Ottawa

PIF Number: P350-025-2012

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Submitted to:

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REPORT



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Distribution:

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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 Brigil Platinum Inc. (Brigil) to complete a Stage 1 and 2 Archaeological Assessment located on part Lots 28 and 29, first Concession from the Ottawa River in the geographic Township of Cumberland, Russell County, City of Ottawa. The study area (Ha 4.8) is located on the western side of the regional Road 174, north of the intersection of Trim Road and Regional Road 174. Brigil is proposing to construct condominiums and a retirement home on the subject property. This Stage 1 & 2 Archaeological Assessment was triggered by the Planning Act as a requirement prior to construction.

The objectives of this archaeological study were to identify known archaeological resources within the study area, to provide information on previous archaeological studies conducted in the area, to assess the archaeological potential of the subject property, and to provide recommendations as to whether any additional archaeological investigations are required.

The primary source of information regarding known archaeological sites in the vicinity of the study area is the Ontario Ministry of Tourism, Culture and Sport's archaeological site database. As of February 4, 2013, there were no registered archaeological sites on or within one kilometre of the study area

The potential for pre-contact archaeological resources within the study area is considered to be high based on the proximity to the Ottawa River, the tributary creek traversing near the property and the identification of the area as a potential source for hunting ungulates and waterfowl prior to the development of the region. The historical archaeological potential is also considered to be high based on the use of the Ottawa River as a historic transportation route and the nineteenth century settlement patterns within the subject property.

This investigation has provided the basis for the following recommendations:

- 1) That the study area requires no further archaeological assessments and as a consequence that the Ministry of Tourism, Culture and Sport issue a letter concurring that no additional archaeological investigations are required for the study area;
- 2) Should development extend beyond the boundary of the study area, further archaeological investigations may be required based on the archaeological potential of the general vicinity;



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1.0 OBJECTIVES

This Stage 1 and 2 Archaeological Assessment was completed to identify known archaeological resources on and in the vicinity of the study area, the property's archaeological potential and determine through field testing if there are archaeological resources on the subject property. The assessment will determine if any additional archaeological investigations are required. The objectives of a Stage 1/2 investigation generally flow from principles outlined in the *Ontario Heritage Act (Consolidated 2007)* and the *Standards and Guidelines for Consulting Archaeologists (2011)*. More specifically, studies were completed with the following objectives:

- To provide information about the subject 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 further investigations for all or parts of the property;
- To document archaeological resources on the property;
- To determine whether the property contains archaeological resources requiring further assessment; and
- To recommend appropriate strategies for a Stage 3 archaeological assessment, if required.



2.0 PROJECT CONTEXT

2.1 Development Context

Golder Associates Ltd. (Golder) was retained by Brigil Platinum Inc. (Brigil) to complete a Stage 1 and 2 Archaeological Assessment for the property located on part Lots 28 and 29, first Concession from the Ottawa River in former Township of Cumberland, Russell County. The study area is located on the western side of Regional Road 174, north of the intersection of Trim Road and Regional Road 174 as outlined in (Maps 1 - 3, pp.28 - 30). Brigil is planning construct condominiums and a retirement home within the study area. This Stage 1 & 2 Archaeological Assessment was triggered by the Planning Act as a requirement prior to construction.

2.2 Previous Research

Almost all of the archaeological investigations in Cumberland Township have been cultural resource management studies. Previous work in close proximity to the study corridor includes a Stage 1 Archaeological Assessment for part of Lots 34 to 38, Concession 1 (Kennett, 2005), Stage 1 and 2 Assessments for the Orleans Hotel located on part of Lot 34, Concession 1 (Golder, 2008), a Stage 1 and 2 Assessment for a water feedermain extending through Lot 30, Concession 1, east of Trim Road (Sattleburger, 1994) as well as Stage 1 (ASI, 1998) and Stage 2 (Golder 2011a, 2011b, 2011c) archaeological investigations for the Trim Road widening/realignment project.

Additional studies completed near the study area include a Stage 1 (Daechsel, 1990a) and 2 (Daechsel 1990b) assessment of the Tenth Line Road access ramps to Ottawa Road 174, a Stage 1 and 2 assessments for the public beach development on Petrie Island (Kennett 2002; 2003), a Stage 1 assessment for the hydro transmission corridor between Hawthorne Station and the Cumberland Junction (Kennett, 1999), a Stage 1 (Kennett, 2001a) and 2 (Kennett, 2001b) archaeological investigation for a proposed quarry site on part of Lots 13 and 14, Concession 1 and Stage 1 (Daechsel, 1995a) and 2 (Daechsel, 1995b) assessments for the Consumers Gas Pipeline project between Tenth Line Road near Innes Road. Additional research work encompassing Cumberland Township includes a background study of the South Nation River drainage area (Daechsel, 1980).



3.0 HISTORICAL CONTEXT

3.1 Pre-European Aboriginal Contact

The present understanding of the local sequence of human activity in the area following the recession of the last ice sheet and the Champlain Sea some 11,000 years ago is very incomplete. It is possible, however, to provide a general outline of prehistoric occupation in the area based on archaeological investigations of south-eastern Ontario.

The earliest human occupation of southern Ontario dates back approximately 12,000 years ago with the arrival of small groups of hunter-gatherers referred to by archaeologists as Paleo-Indians who moved into Ontario as the last of the glaciers retreated northward. Characterized by their nomadic lifestyle, these highly mobile peoples relied on the caribou, small game, fish and wild plants found in the sub-arctic environment of the time.

The Ottawa Valley remained very much on the fringe of occupation during this period. The ridges and old shorelines of the Champlain Sea and Ottawa River, including part of the Prescott Russell Sand Plain, would be the most likely areas to find evidence of Paleo-Indian occupation.

The environment of southern Ontario approached present conditions during the succeeding Archaic period that extended from 9,000 to 3,000 years ago. Stone tool technologies changed during this period as a broader range of tool types were created although the skill and workmanship decreased from the Paleo-Indian standards. Ground stone tools appeared, such as adzes and gouges, tool types which indicate increased wood working and adaptation to new environmental conditions. During the middle and late portions of the Archaic period, trading networks spanning the Great Lakes developed. By 6,000 years ago, copper was being mined in the Upper Great Lakes and was traded into southern Ontario region.

Several Archaic sites have provided the first definitive evidence for human occupation in the general vicinity of the study area. Archaic artifacts have been found at Jessup's Falls near the mouth of the South Nation River and at Spencerville near the source of the river (Daechsel, 1980). There was also a significant occupation of the St. Lawrence Valley with a number of "Laurentian" or Middle Archaic sites in the vicinity of Cornwall (Dailey and Wright, 1955). Closer to the study area, Late Archaic sites have been identified at Leamy Lake near the junction of the Gatineau and Ottawa Rivers, in the Rideau Lakes (Watson, 1982).

The Archaic period was followed by the Woodland period, beginning around 2,500 B.P. in Ontario, and lasting until 450 B.P.. This period is distinguished by the first appearance of ceramics, while there is also evidence of ceremonial rituals including the interment of elaborate grave goods. Woodland subsistence strategies were still based on hunting and gathering and their migratory routes followed seasonal patterns to proven hunting locations rather than following migrating herds. Trade networks continued to flourish throughout the Woodland Period and reached their peak around 1,800 years ago when they covered much of North America.

Towards the end of the Middle Woodland period (approximately 1,300 years ago) agriculture was introduced and began to take on a larger role in subsistence strategies. It began with the cultivation of corn, beans and tobacco and eventually led to the development of semi-permanent and permanent villages. Many of these villages were surrounded by large palisades, indicating increased hostilities between neighbouring groups. This settlement pattern was more common in regions with arable land such as southern Ontario. The impact of these changes did not appear to have been significantly felt in the areas north of the St. Lawrence Valley which continued to be used as a hunting area and trade route where populations retained a semi-nomadic lifestyle. Middle Woodland



sites have been identified in the South Nation Drainage Basin (Daechsel, 1980) and along the Ottawa River including the northwest end of Ottawa at Marshall's and Sawdust Bays (Daechsel, 1981).

During the Late Woodland period, the South Nation River basin appears to have been a zone of interaction between Iroquoian speaking populations who relied primarily on domesticated crops to the south and Algonquian speaking groups who continued as hunter-gatherers to the north. The Huron peoples along the north shore of Lake Ontario had moved to the Lake Simcoe – Georgian Bay region, leaving the area of eastern Ontario, except for some small Algonquin groups, unoccupied by the time the first French explorers arrived in the beginning of the seventeenth century. Six St. Lawrence Iroquoian villages dating to ca. 1400 AD have been found in the Spencerville area, while an Algonquian site has been investigated near Casselman (Clark, 1905).

3.2 Post European Aboriginal

The St. Lawrence Iroquois disappeared in the sixteenth century not long after initial contact with Jacques Cartier in 1535. Etienne Brule is reported to have been the first European to pass through what is now the Ottawa area. He portaged at the Rideau Falls in 1610, followed by Champlain in 1613. The Ottawa River served as a major route for explorers, traders and missionaries throughout the seventeenth and eighteenth centuries. A series of trading posts and forts were constructed by the French along the river in the early eighteenth century.

The French documented three Algonquin groups in the regional vicinity of the study area (Heidenreich & Wright, 1987). These included the Matouweskariini along the Madawaska River, the Onontcharonon in the Gananoque River Basin, and the Weskarini, the largest of the three, situated on the Petite Nation River Basin. It is likely that prolonged occupation in the Ottawa area was avoided at this time because of hostilities with Iroquoian speaking populations to the south, although it is suggested that at least the northern reaches of the South Nation River Basin were used as hunting territories by these groups.

Settlement in the Ottawa area was not actively encouraged by the colonial government until the late eighteenth century after John Stegman, the deputy surveyor for Upper Canada, established four townships straddling the Rideau River in 1793.

Commonly acknowledged as the first permanent European resident in the area, Philemon Wright settled in Hull Township with five families and thirty-three men in 1800 (Bond, 1984). This community grew over the next few years along the north shore of the Ottawa River and by 1805 Wright had begun significant lumbering activity in the area. Settlement of the south shore was very slow through the early nineteenth century. In 1809 another American, Jehiel Collins, erected a store at what was to become known as Bellows and later Richmond Landing. The first settler in the area was Ira Honeywell, who, in 1810, constructed a cabin west of the Chaudiere Rapids (Bond, 1984). Another early settler was Braddish Billings, who established a small cabin in Gloucester Township in 1812. Billings went into the lumbering business with Philemon Wright and developed his homestead into a large family estate along the banks of the Rideau River.

The construction of the Rideau Canal (1827 - 1832) provided the new settlement of Bytown with its first major growth in population. This resulted in the development of two areas: Lower Bytown to the east of the canal, primarily populated by French Canadian and Irish labourers and merchants, and Upper Bytown to the west with a predominantly white Anglo-Saxon Protestant population. Bytown was incorporated as the City of Ottawa on January 1, 1855, with a population of 10,000. The selection of Ottawa as the capital of Canada in 1857 was the major catalyst in the subsequent development of the city.



3.2.1 Cumberland Township

The Ottawa River was an important transportation route during the early trading days of settlement in the area. Fur trading posts were erected along the Ottawa River where the Algonquin peoples traded goods with the Europeans. A French trading post was situated across the river from Cumberland in modern day Buckingham in 1761. This area was controlled by France until 1763, when the British gained control of the region following the end of the seven year war.

The Ottawa River shoreline through Cumberland Township was first surveyed in 1789 as part of an official policy to settle the area through crown land grants, although no actual settlement is recorded at this early date. The majority of accessible land fronting the Ottawa River was granted to United Empire Loyalists and their descendants, many who remained absentee landowners having already settled along the St. Lawrence River or on the north shore of Lake Ontario. The scarcity of roads and the poor state of transportation beyond the Ottawa River shore slowed settlement in other parts of the township (Belden, 1881).

The first documented settlers in Cumberland, Amable Foubert and Abijah Dunning, arrived in 1801. By 1807, Foubert had established a trading post in the township. Dunning and his family had arrived from Massachusetts and secured 800 acres in the township and over the next few years increased his holdings to 3,000 acres with the addition of land in Buckingham and Onslow Townships. With none of the promised improvements to roads and bridges in the area completed by 1812 Abijah Dunning left Cumberland, though his son William returned in 1817. By 1822, there were only six settlers recorded on the waterfront lots in Cumberland Township, and by 1832 this number had only risen to fifteen (Serre, 1998).

The population of Cumberland Village had increased to over 1,000 by 1858, with an additional 2000 residents in the rural parts of the Township. Cumberland became a major seasonal forwarding center along the Ottawa River in the 1870's, where two wharves were built and several forwarding companies were established, including one owned by the Foubert brothers. This helped facilitate a small ship building industry in the township during the mid 19th century (CTHS n.d.). The first major road, Montreal Road (Originally called L'Original-Bytown Rd.) was built in 1850 and ran directly through Concession 1 along the Ottawa River (CTHS n.d.; McGilvray 2005).

The emergence of railways in the late nineteenth century resulted in population shifts and Cumberland Village lost much of its earlier influence. The Grand Trunk Railway line was built through Vars in 1882 and in 1899 the Canadian Pacific Railway was constructed through Leonard. The Canadian Northern Railway was extended through Cumberland Village in 1909, but less than thirty years later this line had closed due to improved road transportation access. In 1952, Highway 17 (now Ottawa Road 174) was completed along the former railway bed (Andreae, 1997).

3.2.2 Property History

Lot 28, Concession 1

In May 1836, Matilda Cozeno was granted the Crown patent for Lot 28, Concession 1, Cumberland Township. It is probable that Matilda was granted a free lot in the township as a daughter of a United Empire Loyalist and was likely an absentee landlord.

Although the land registry records for Lot 28, Concession 1 have deteriorated due to age, it appears that Matilda no longer had possession of this property by 1839 (Inst. No. 2777). Lot 28 was bought in 1847 (Inst. No. 4351)



and had changed ownership at least twice previously, by which time William Lough had purchased the property in 1862 (Inst. No. 7577). Lough is identified on Lot 28 in Walling's 1862 map of the area (Map 4, p.31).

The 1871 census records for Cumberland Township indicate that William Lough owned four hundred acres that encompassed both Lots 28 and 29. Although the property is not divided in the census records, it is probable that fifty-nine year old William Lough lived on one Lot with his wife Jane (age 57) and children Maggie (age 24), Mary (age 20), Daniel (age 16) and Martha (age 14), while William's namesake son thirty-one year old William lived on the other Lot with his wife Olive (age 23) and their five-month old son Robert. Of the four hundred acres owned by Lough, forty-five were improved with twenty-three reserved for pasture and three acres for an apple orchard. The crops cultivated on the farm included oats, peas, potatoes and hay.

Five dwelling houses are recorded as being within the four hundred acres in addition to four barns/stables, while the Lough's owned four carriages/sleighs, four wagons/sleds, one plough, one thrashing machine and one fanning mill. In addition to the two hives of bees, livestock on the farm included cows, sheep and swine which allowed the Lough family to produce butter, cheese and wool. Part of the wooded portion of the property was utilized for the consumption of firewood for heating and cooking. The Lough family also owned two pleasure boats, sixty-four shares in a steam vessel and five barges totalling 435 tons.

The 1881 census for Cumberland Township listed forty year old William Lough as a merchant which suggests the responsibilities for the farming activities on the property were being undertaken by others. In addition to William's wife Olive and ten year old son Robert, new additions within the past ten years to the Lough clan include Thomas (age 8), Magie (age 7), Olive (age 2) and Mary (age 3 months). The absence of William Lough Sr. in the census records may indicate that he had passed away sometime in the previous ten years. Belden's 1881 map shows two structures on the property located on the north side of Old Montreal Road (Map 4, p.31).

An aerial photograph from 1959 depicts what appears to be a structure north of Ottawa Road 174, although by 1993 it was no longer standing. Other structures on this property in the mid-twentieth century are located closer to Montreal Road in the southern part of Lot 28 (Map 5, p.32).

Lot 29, Concession 1

In 1836, Diana Cozeno was granted the Crown patent to Lot 29, Concession 1, in Cumberland Township. Diana, possibly the sister of Matilda who was given Lot 28, likely received the grant as a daughter of a United Empire Loyalist and in all probability never actually settled on the property.

By January 1862, all two hundred acres of this Lot had been purchased by William Lough, who also owned Lot 28 at this time. The succession of owners following William Lough is difficult to trace, although like Lot 28, by 1885 Isedone Cardinal owned at least part of the property. By the time Isedone Cardinal purchased the land in 1885 a saw and grist mill apparently stood approximately 240 meters east of the present Ault Foods plant. Although the original construction date for the mill is not known, it was still in operation up to the 1950's (Sattelberger, 1994). While individual pieces of Lot 29 were sold off, including a parcel to the Canadian Northern Ontario Railway in 1908 (Inst. No. 9597), members of the Cardinal family still owned land within this Lot in the 1930's.

Ottawa Road 174 replaced the former railway that extended through the northern portion of Lot 29 in 1952 and an aerial photograph dating to 1959 shows the majority of structures at this time were situated along Montreal Road in the southern portion of the lot (Map 5, p.32).



4.0 ARCHAEOLOGICAL CONTEXT

4.1.1 Archaeological Sites

The primary source of information regarding known archaeological sites in the vicinity of the study area is the Ontario Ministry of Tourism, Culture and Sport's archaeological site database. As of February 4, 2013, there were no registered archaeological sites on or within one kilometre of the study area. The nearest registered archaeological sites to the subject property are a historic settlement site (BiFu-5) and a pre-European contact lithic scatter (BiFu-6) located approximately two kilometres south of the study area.

4.1.2 Property Inspection

The objective of the inspection was to help determine the appropriate Stage 2 archaeological assessment strategy and to determine the presence or absence features of archaeological potential. The inspection consisted of walking through the subject property and randomly spot checking different locations within it. The inspection covered the entire study area and was conducted in sunny weather, with temperatures at 5 degrees Celsius. Field notes were recorded and photographs of the property were taken. A catalogue of photographs taken during the site inspection is included as Appendix A.

The terrain extending out from the drainage ditch parallel to the roadway through Lot 29 is open and fairly flat (Images 1, & 2, p.21). Towards both the north and north western limits of the study area, there is a wooded area (Image 3, p.22).The wooded area continues along the north and north-western side of the study area; it extends partly through Lot 28. The wooded area of the terrain is a mixture of small sumac and larger deciduous trees.



5.0 STUDY AREA ENVIRONMENT

The study area lies within the Ottawa Valley Clay Plain Physiographic Region which consists of clay plains interrupted by ridges of rock or sand (Chapman and Putnam, 1973). This topography was most significantly influenced by the post glacial sequence of events in the region. The clay soils, deposited by the Champlain Sea (ca. 10,500 to 8,000 BCE), were subsequently covered by sand deposits from the merging fresh water drainage which included the formation of a delta at the confluence of the Champlain Sea and an earlier, larger channel of the Ottawa River between Hawkesbury and Ottawa (Darbyshire, n.d.). The clay plains region are generally characterized by a flat, poorly drained topography (Chapman and Putnam, 1973). Prominent features to the southeast of the study area include an undrumlined till plain and a limestone plain (Map 6, p.33).

The surficial geology within the study area consists primarily of fine textured glaciomarine silt and clay containing a minor component of sand and gravel (Map 7, p.34). The eastern tip of the subject property enters into an area characterized by organic deposits featuring a substantial amount of peat, muck and marl. Ridges of fluvial terracing are present to the north and south of the study area and represent the outline of a former floodplain. Closer to the Ottawa River the geology includes an element of modern alluvial deposits.

The main soil deposit throughout the study area is identified as St. Rosalie clay (Map 8, p.35). This soil type is characterized as stone free, light grey in color, with light grey non-calcareous parent materials. These soils generally have poor drainage and are considered to be fair cropland particularly for hay and grain pasture. Two eroded stream banks also cut through the study area. The northern channel is identified as Leonard Creek, while the southern one is not labeled (Wickland and Richards, 1962).

The study area lies within the Upper St. Lawrence sub-region of the Great Lakes – St. Lawrence forest region. The deciduous trees characterizing this sub-region include sugar and red maple, beech, yellow and white birch, basswood, white ash, red and burr oak and large-tooth aspen. Coniferous species include eastern hemlock, eastern white pine, alder, willow, white and black spruce and balsam fir (Rowe, 1977). The original forest which covered this area is no longer present, having been cleared during the nineteenth century for lumbering and agricultural development. The ecosystem around Petrie Island has been investigated and many additional vegetation and tree species have been identified (Brunton, 1999; Dugal, 1977). The Ottawa River is located less than one kilometre north of the study area at its furthest point. Cardinal Creek (also known as Leonard Creek) extend near the study area) (Map 9, p.36).

5.1 Archaeological Potential

A number of factors are employed when determining archaeological site potential. In addition to the proximity to known archaeological sites, factors for determining pre-contact archaeological potential include altitude (elevation), watershed area (primary and secondary watercourses), distance from water, morphology of water course (e.g. bay, point, island), geomorphologic features (e.g. drumlins, eskers, relic beaches, etc), elevated topography (e.g. knolls, drumlins, eskers, plateaus, etc), soils, drainage and biological features (distribution of animal resources before colonization). Also proximity of know archaeological sites is a consideration. Although many of these features also help to identify historical archaeological potential, by reviewing available historical literature additional factors can be identified such as known settlement sites, cemeteries, public buildings and known historic transportation routes.



STAGE 1 & 2 ARCHAEOLOGICAL ASSESSMENT BRIGIL HOMES

Based on these criteria, and following the *Ontario Ministry of Tourism, Culture and Sport Standards and Guidelines* for establishing archaeological potential an overlay has been created to specifically address the landscape of potential for the study area under consideration (Map 9, p.3636). Criteria used to determine pre-contact archaeological potential for the study area includes the proximity to the Ottawa River, the tributary creek traversing near the property and the identification of the area as a potential source for hunting ungulate and waterfowl prior to the mid to late twentieth century development of the region.

Potential for archaeologically significant historic material cultural residues include the use of the Ottawa River as a historic transportation route and the indication that a significant area encompassing Lots 28 to 29 were settled and occupied since at least 1871, and most likely earlier.

The study area is considered to have archaeological potential according to the Archaeological Master Plan of the Regional Municipality of Ottawa Carleton (ASI, 1999), although this potential would only be limited to areas not previously disturbed by construction and grading activities associated with the construction of Ottawa Road 174 and the existing building located on the property.



6.0 FIELD METHODS

6.1 Methodology and results

6.1.1 Stage 2 Field Work

The Stage 2 investigation was conducted on April 23, and May 13, 2013. The weather conditions for this assessment were cloudy to sunny, with temperature that varied from 3°C to 7°C.

The Ministry of Tourism and Cultures' Standards and Guidelines (2011) require that pedestrian survey be conducted in all areas where ploughing is feasible. 90% of the study area was ploughed, disked and allowed to weather in accordance to Ministry standards. The field was then walked at 5 m intervals, with the intensification of intervals to 1 m upon discovery of an artifact. Recovered artifacts were to be recorded with a Garmin 62 handheld GPS, and then bagged, labelled and recovered for conservation and analysis unless otherwise noted. Surface visibility was above the 80% required by Ministry standards.

In areas where pedestrian survey was not possible, test pit surveying was conducted. This consisted of the hand excavation of test pits at 5 m intervals, with the backdirt screened through 6 mm mesh, with each test pit backfilled upon examination. Should artifacts or features of archaeological interest were identified, the test pit interval was intensified to 2.5 m around positive pits. All artifacts recovered will be bagged and labelled with GPS coordinates. A general description of the field work will be maintained in a field log. Following the fieldwork, recovered artifacts will be washed, sorted and inventoried. Representative or diagnostic artifacts will be photographed with scale. A site plan will be compiled with the location of archaeological finds.

The study area consisted of a field of about 180X75 to 160 metres wide located on the western side of OR 174, north of the intersection of Trim Road and OR 174 in the east end of Ottawa. Following a review of aerial photography it was determined that the vicinity of study area had originally been open farmland that has been impacted in many sections by residential and commercial development as well as the construction of the current nearby residential building. Most of the study area was physically possible to plough and a pedestrian survey method was undertaken over 100% of the ploughed area (Map 10, p.37)



7.0 RECORDS OF FINDS

Operation one consisted of subsurface testing in areas where ploughing was not possible. The subsurface tested areas are located in the Northern portion of the study area and the area adjacent to the OR 174 (Image 4, p.22). The southern portion of the study area is either disturbed or already developed (Map 10, p.37).

7.1 Operation 1

Survey Method: Shovel tests at 5 m intervals

Number of Artifacts: 0

Date Tested: April 23, 2013

Weather Conditions: Sunny, 3°C 7°C

Despite the apparent disturbance near the ditch and shoulder of the OR 174 (Images 5 & 6, p.23), this Operation was shovel tested at 5 metre intervals where ploughing was not possible. Nearly 40% of the study area was avoided due to land development or disturbance (Images 7 & 8, p.24). The topsoil consisted of light greyish brown with yellowish brown subsoil varied between 25 and 35 cm (Image 9 & 10, p 25). No artifacts or culturally significant features were identified in Operation 1.

7.2 Operation 2

Survey Method: Pedestrian Survey at 5 m intervals

Number of Artifacts: 0

Date Tested: May 13, 2013

Weather Conditions: Cloudy, 5°C

This operation consisted of an open area portion of the study area (Map 10, p.37). This open area had a triangular shape, bordered by woodlot on its north and northwest sides (Images 11 & 12, p 26) and adjacent to OR 174 on its eastern side. This open field was ploughed, weathered with a surface visibility of over 90% and was surveyed at 5 m intervals. However, no artifacts or cultural features of significant archaeological interest were identified in the study area. This operation was undertaken on May 13 and the weather conditions were cloudy with 5°C.



8.0 ANALYSIS AND CONCLUSIONS

On behalf of Brigil, Golder conducted a Stage 1 & 2 Archaeological Assessment for the study area encompassing parts of Lots 28 to 29, Concession 1 in the former Geographic Township of Cumberland, Russell County, City of Ottawa, Ontario. This assessment was completed in advance of construction near the existing building on the property (Map 11, p.38) The objectives of this assessment was to identify known archaeological sites on and within the vicinity of the study area, to assess the archaeological potential of the properties under investigation and determine if there are archaeological resources on the subject property that will be impacted by the planned development.

The study area consisted of a field of about 180 by 75 to 160 metres wide located on the western side of OR 174, north of the intersection of Trim Road and OR 174 in the east end of Ottawa (Map 2, p.29), in the vicinity of commercial, industrial and residential properties as well as the Ottawa River at the north-eastern extent. The earliest historical records consulted suggest portions of the study area had been settled by residential occupation by 1871, although this most likely occurred much earlier. Census and land registry documents confirm that portions of the subject property have been in continuous use from the nineteenth century to the present day.

The Stage 2 assessment was undertaken on the morning of April 23, and May 13, 2013. The study area was assessed through 2 methods of surveying, a sub-surface survey that consisted of the hand excavation of shovel test pits placed at 5-metre intervals with backdirt screened through 6-mm mesh in areas where was not possible to plough, and pedestrian survey in the field where it was ploughed . No artifacts, structures, or features of archaeological significance were identified in the study area during the Stage 2 investigation.

This report concerns the specific development area outlined in the maps of this report. Should further development be planned beyond the boundary of the specified study area, additional archaeological assessment may be required.



9.0 RECOMMENDATIONS

Golder, on behalf of Brigil, conducted a Stage 1 & 2 Archaeological Assessment in the area to be affected by the construction of a building west of the OR 174, North of the intersection of OR 174 and Trim Road in the community of Orleans in the east end of Ottawa.

The study area consisted of a field of about 180X75 to 160 metres wide located on the western side of OR 174, north of the intersection of Trim Road and OR 174 in the east end of Ottawa (Map 2, p.29).

The Stage 2 investigation was undertaken on April 23, and May 13, 2013. No artifacts, structures, or features of archaeological significance were identified in the assessment.

This investigation has provided the basis for the following recommendations:

- 1) That the study area requires no further archaeological assessments and as a consequence that the Ministry of Tourism, Culture and Sport issue a letter concurring that no additional archaeological investigations are required for the study area; and
- 2) Should development extend beyond the boundary of the study area, further archaeological investigations may be required based on the archaeological potential of the general vicinity.



10.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Ministry 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 Archaeological 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 *Cemeteries Act* R.S.O. 1990 c. C.4 and 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.



11.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Golder Associates Ltd. (Golder) 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 the Brigil Platinum Inc. (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 and Culture's Standards and Guidelines for Consulting Archaeologists* (2011).



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13.0 IMAGES



Image 1: Drainage ditch within the study area on the western side of OR 174 looking south.



Image 2: The study area as seen from the ditch near the Hwy 174, looking northwest.



Image 3: Wood lots on north and north-western limits of the study area, looking north.



Image 4: Shovel testing in areas that are not possible to be ploughed, looking north.



Image 5: Ditch on the eastern limit of the property near the OR 174, looking south.



Image 6: Small culvert running parallel to the OR 174, looking south.



Image 7: Developed area in the south western portion of the study area, looking northwest.



Image 8: Developed area in the south western portion of the study area, looking west.



Image 9: Test pit showing Greyish brown topsoil and yellowish brown subsoil at 35cm.



Image 10: Test pit showing subsoil at 35cm.



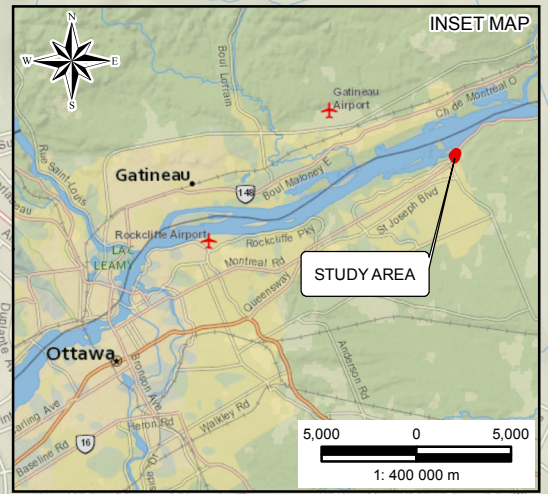
Image 11: Pedestrian survey at the ploughed portion of the study area, looking north.




Image 12: Pedestrian survey at the ploughed portion of the study area, looking south.



14.0 MAPS



LEGEND

 STUDY AREA

NOTE

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REFERENCE

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DATE	18 Jul. 2013
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TITLE

KEY PLAN

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PROJECT STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT FOR A RETIREMENT HOME, ORLEANS

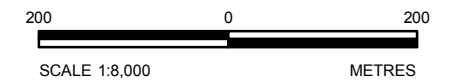
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STUDY AREA




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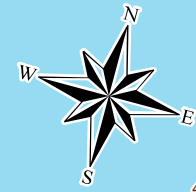
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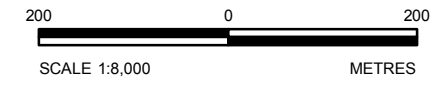
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LEGEND

- + SPOT HEIGHT (m)
- BUILDING POINT
- ROAD
- UTILITY LINE
- CONTOUR LINE (5m)
- WATERCOURSE, PERMANENT
- - - WATERCOURSE, INTERMITTENT
- WATER AREA, PERMANENT
- WETLAND AREA, PERMANENT
- CONCESSION/LOT
- BUILDING FOOTPRINT
- WOODED AREA
- STUDY AREA



NOTE

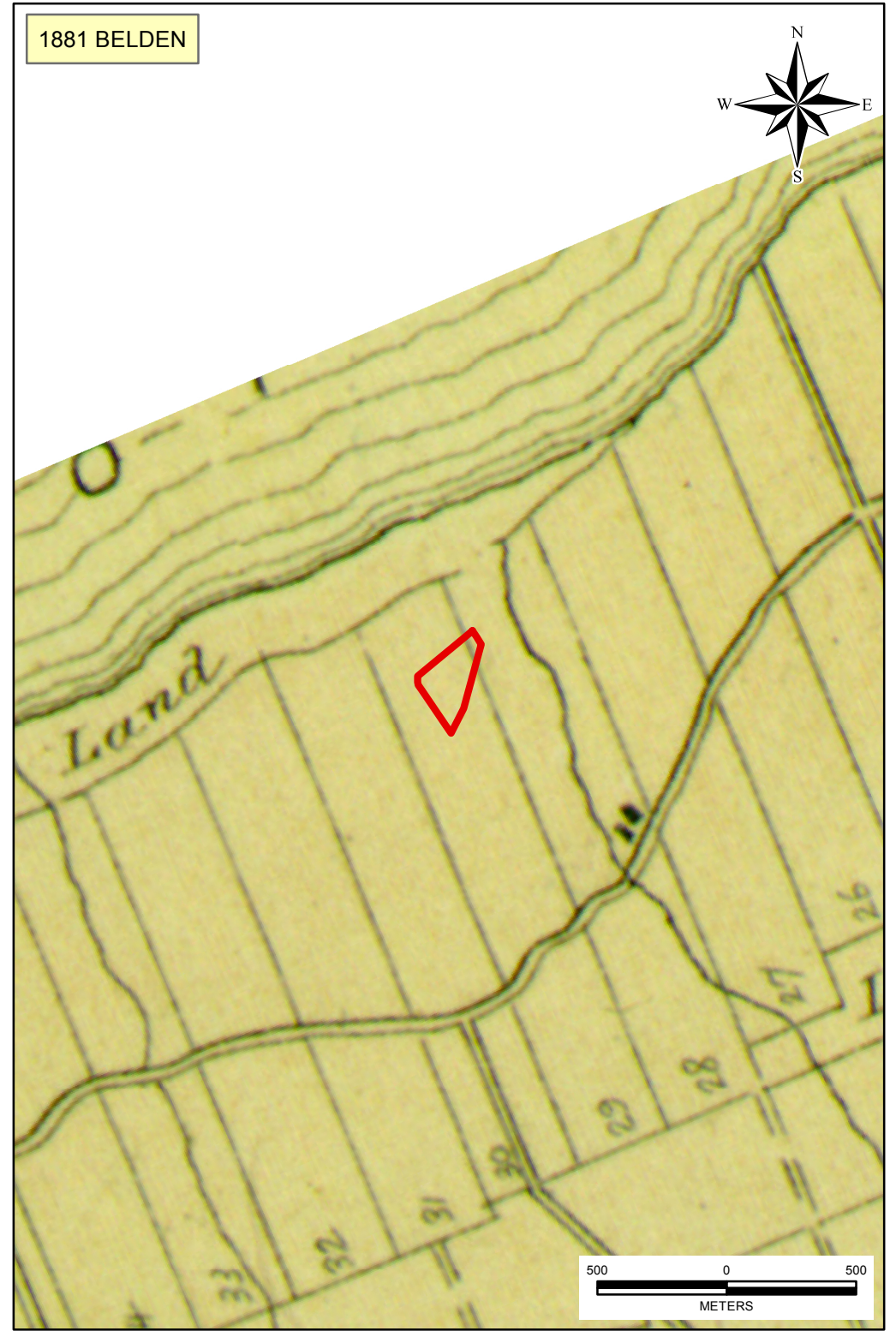
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LEGEND

 STUDY AREA

NOTE
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STUDY AREA

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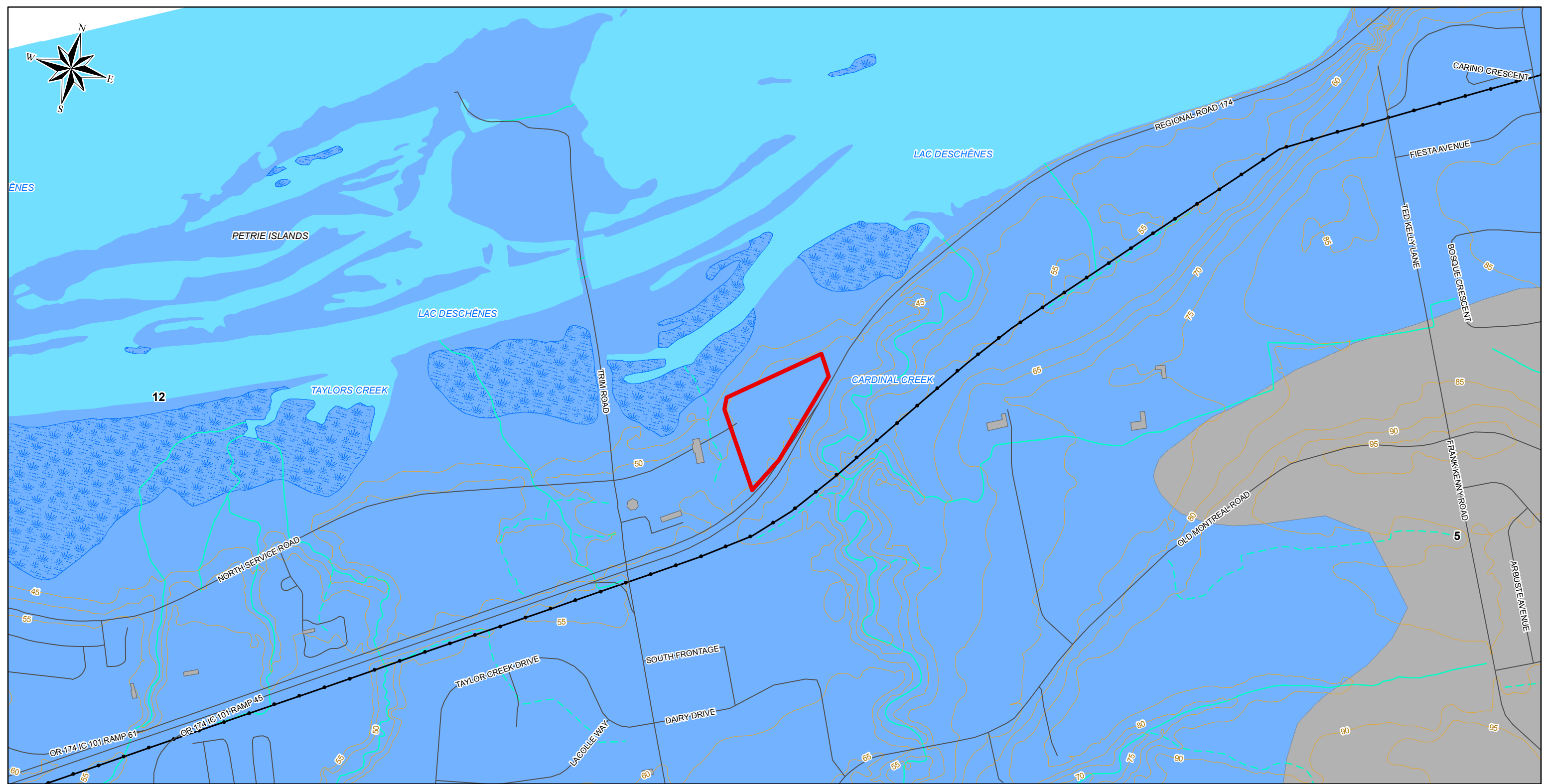
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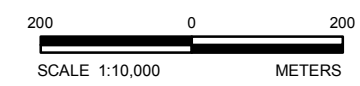


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LEGEND		PHYSIOGRAPHY	
■ BUILDING POINT	■ WATER AREA, PERMANENT	■ 17: PEAT AND MUCK	■ 12: CLAY PLAINS
— ROAD	■ WETLAND AREA, PERMANENT	■ 16: BARE ROCK RIDGES AND SHALLOW TILL	■ 11: SAND PLAINS
— UTILITY LINE	■ BUILDING FOOTPRINT	■ 15: SHALLOW TILL AND ROCK RIDGES	■ 10: SHALE PLAINS
— CONTOUR LINE (5m)	■ STUDY AREA	■ 14: BEACHES	■ 9: LIMESTONE PLAINS
— WATERCOURSE, PERMANENT		■ 13: ESKERS	■ 8: BEVELLED TILL PLAINS
— WATERCOURSE, INTERMITTENT			■ 7: DRUMLINS
			■ 6: TILL PLAINS (DRUMLINIZED)
			■ 5: TILL PLAINS (UNDRUMLINIZED)
			■ 4: KAME MORAINES
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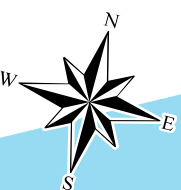
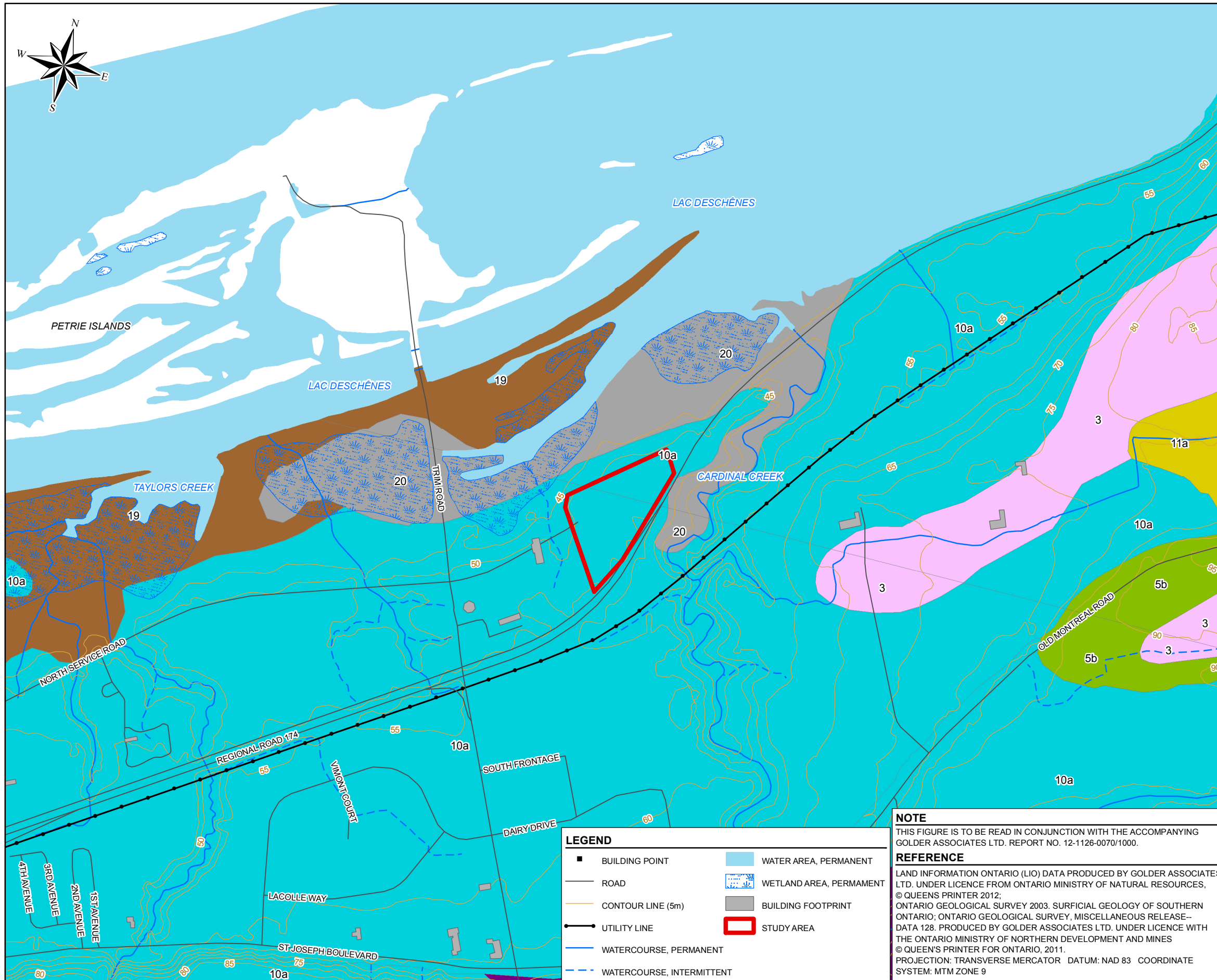


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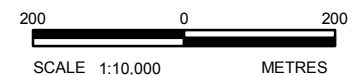


LEGEND	
■	BUILDING POINT
—	ROAD
—	CONTOUR LINE (5m)
—	UTILITY LINE
—	WATERCOURSE, PERMANENT
—	WATERCOURSE, INTERMITTENT
■	WATER AREA, PERMANENT
■	WETLAND AREA, PERMANENT
■	BUILDING FOOTPRINT
■	STUDY AREA

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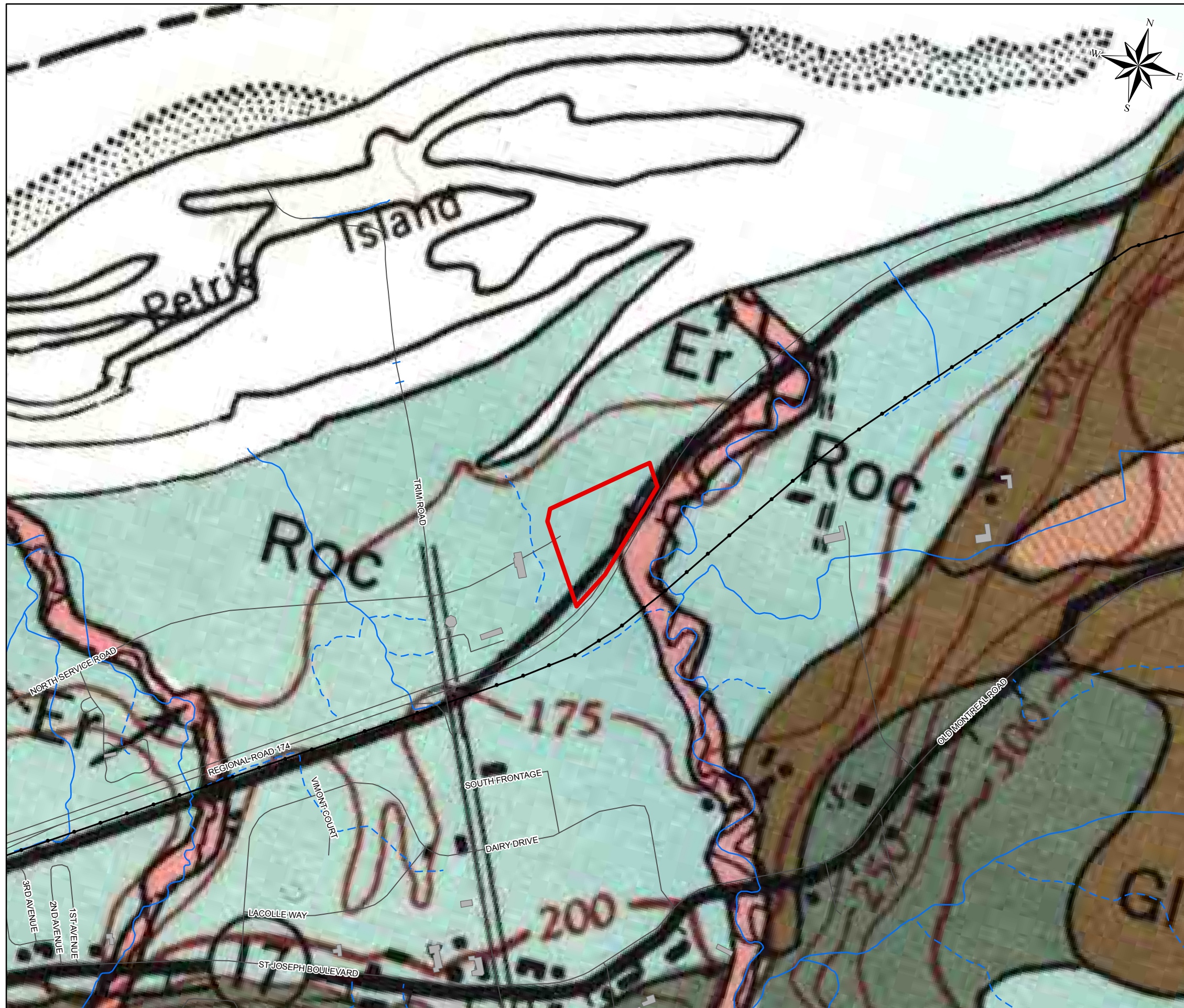
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LEGEND	
SURFICIAL GEOLOGY	
PHANEROZOIC	
CENOZOIC	
QUATERNARY	
RECENT	
21	MAN-MADE DEPOSITS: FILL, SEWAGE LAGOON, LANDFILL, URBAN DEVELOPMENT
20	ORGANIC DEPOSITS: PEAT, MUCK, MARL
19	MODERN ALLUVIAL DEPOSITS: DAY, SILT, SAND, GRAVEL, MAY CONTAIN ORGANIC REMAINS
18	COLLUVIAL DEPOSITS: BOULDERS, SCREE, TALUS, UNDIFFERENTIATED LANDSLIDE MATERIALS
17	EOLIAN DEPOSITS: FINE TO VERY FINE SAND AND SILT
16	COARSE-TEXTURED MARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY
16a	DELTAIC DEPOSITS
16b	LITTORAL DEPOSITS
16c	FORESHORE AND BASINAL DEPOSITS
15	FINE-TEXTURED MARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL
14	COARSE-TEXTURED LACUSTRINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY
14a	DELTAIC DEPOSITS
14b	LITTORAL DEPOSITS
14c	FORESHORE AND BASINAL DEPOSITS
13	FINE-TEXTURED LACUSTRINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL
PLEISTOCENE	
12	OLDER ALLUVIAL DEPOSITS: CLAY, SILT, SAND, GRAVEL, MAY CONTAIN ORGANIC REMAINS
11	COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY
11a	DELTAIC DEPOSITS
11b	LITTORAL DEPOSITS
11c	FORESHORE AND BASINAL DEPOSITS
10	FINE-TEXTURED GLACIOMARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL
10a	MASSIVE TO WELL LAMINATED
10b	INTERBEDDED SILT AND CLAY AND GRITTY, PEBBLY, FLOW TILL AND RAINOUT DEPOSITS
9	COARSE-TEXTURED GLACIOLACUSTRINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY
9a	DELTAIC DEPOSITS
9b	LITTORAL DEPOSITS
9c	FORESHORE AND BASINAL DEPOSITS
8	FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL
8a	MASSIVE TO WELL LAMINATED
8b	INTERBEDDED SILT AND CLAY AND GRITTY, PEBBLY FLOW TILL AND RAINOUT DEPOSITS
7	GLACIOFLUVIAL DEPOSITS: RIVER DEPOSITS AND DELTA TOPSET FACIES
7a	SANDY DEPOSITS
7b	GRAVELLY DEPOSITS
6	ICE-CONTACT STRATIFIED DEPOSITS: SAND AND GRAVEL, MINOR SILT, CLAY AND TILL
6a	IN MORAINES, ESKERS, KAMES AND CREVASSE FILLS
6b	IN SUBAQUATIC FANS
5a	TILL: SILTY SAND TO SAND-TEXTURED TILL ON PRECAMBRIAN TERRAIN
5a	SILTY SAND TO SAND-TEXTURED TILL ON PRECAMBRIAN TERRAIN
5b	STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
5c	STONY, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
5d	CLAY TO SILT-TEXTURED TILL (DERIVED FROM GLACIOLACUSTRINE DEPOSITS OR SHALE)
5e	UNDIFFERENTIATED OLDER TILLS, MAY INCLUDE STRATIFIED DEPOSITS
PALEOZOIC	
4	BEDROCK-DRIFT COMPLEX IN PALEOZOIC TERRAIN:
4a	PRIMARILY TILL COVER
4b	PRIMARILY STRATIFIED DRIFT COVER
3	PALEOZOIC BEDROCK
PRECAMBRIAN	
2	BEDROCK-DRIFT COMPLEX IN PRECAMBRIAN TERRAIN:
2a	PRIMARILY TILL COVER
2b	PRIMARILY STRATIFIED DRIFT COVER
1	PRECAMBRIAN BEDROCK



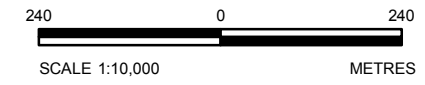
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STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT FOR A RETIREMENT HOME, ORLEANS			
TITLE			
OGS SURFICIAL GEOLOGY			
PROJECT No. 12-1126-0070		SCALE AS SHOWN	REV. 0
DESIGN	IN	05 Feb. 2013	
GIS	BR	19 Jul. 2013	
CHECK	HJD	19 Jul. 2013	
REVIEW	HJD	19 Jul. 2013	
Golder Associates Ottawa, Ontario			MAP 7

Path: N:\Active\2012\1126 - Environmental and Cultural Sciences\12-1126-0070 Stage 1-2_Petrie (s_L_Brigli Platinum)\Spatial\IM\GISMX\Ds\Reporting\1211260070-1000-08.mxd



LEGEND

- BUILDING POINT
 - ROAD
 - UTILITY LINE
 - WATERCOURSE, PERMANENT
 - - - WATERCOURSE, INTERMITTENT
 - BUILDING FOOTPRINT
 - ▭ STUDY AREA
- SOIL TYPE**
- Er ERODED CHANNELS
 - Roc ST. ROSALIE CLAY




NOTE

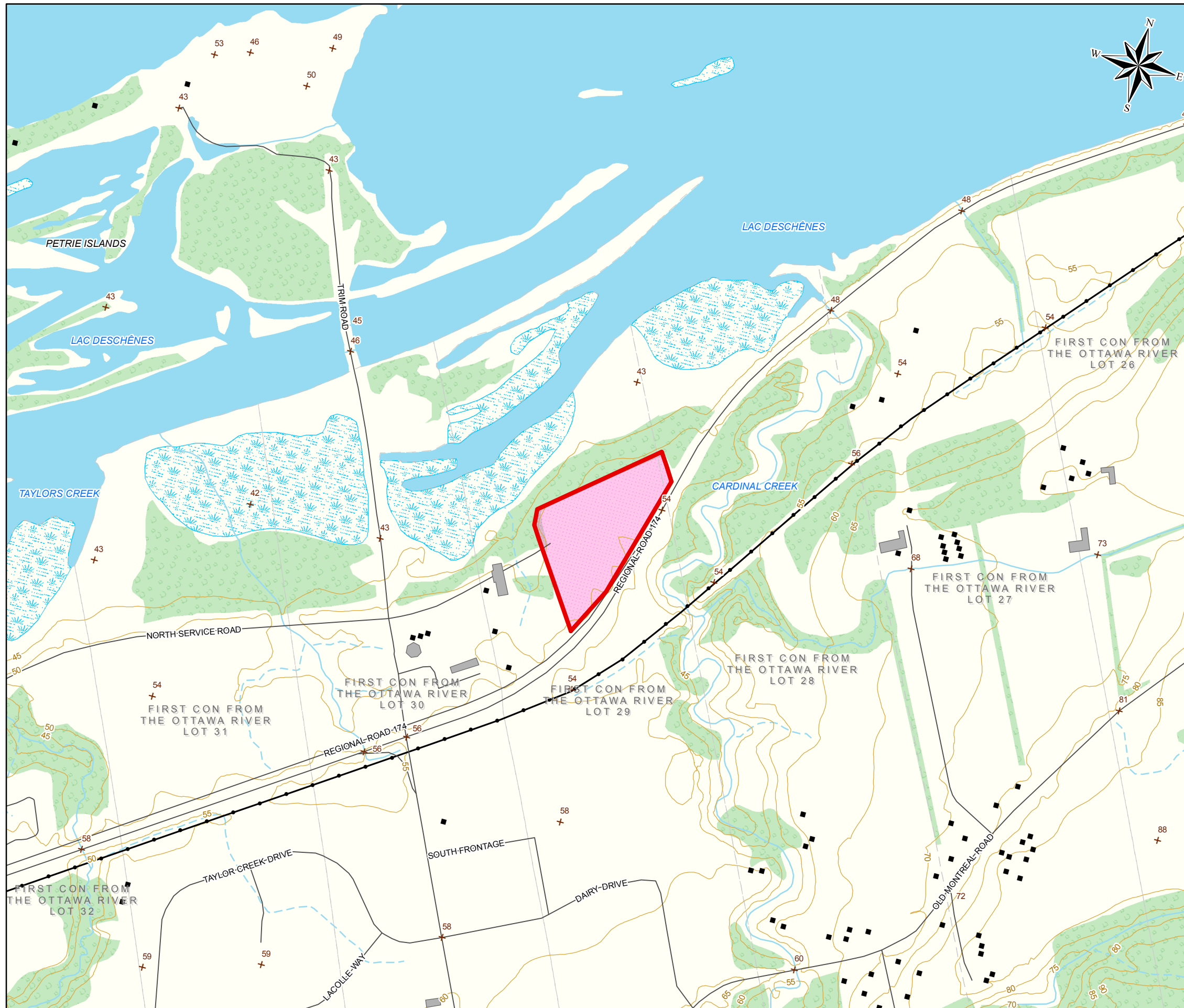
THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 12-1126-0070/1000.

REFERENCE

SOIL MAP OF RUSSELL COUNTY, ONTARIO, SOIL SURVEY REPORT NO. 33. SOIL SURVEY BY THE DEPT. OF SOILS, ONTARIO, AGRICULTURAL COLLEGE, GUELPH. COMPILED, DRAWN AND PUBLISHED BY THE RESEARCH BRANCH, CANADA DEPARTMENT OF AGRICULTURE, OTTAWA, 1961, FROM BASE MAPS SUPPLIED BY THE DEPARTMENT OF MINES AND TECHNICAL SURVEYS, OTTAWA.
 LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2012.
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

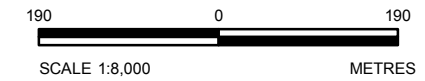
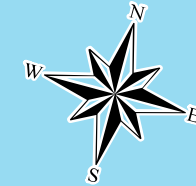
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TITLE		SOILS	
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	GIS	BR 19 Jul. 2013	MAP 8
	CHECK	HJD 19 Jul. 2013	
	REVIEW	HJD 19 Jul. 2013	

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LEGEND

- + SPOT HEIGHT (m)
- BUILDING POINT
- ROAD
- UTILITY LINE
- CONTOUR LINE (5m)
- WATERCOURSE, PERMANENT
- - - WATERCOURSE, INTERMITTENT
- WATER AREA, PERMANENT
- WETLAND AREA, PERMANENT
- CONCESSION/LOT
- BUILDING FOOTPRINT
- WOODED AREA
- ARCHAEOLOGICAL POTENTIAL, CITY OF OTTAWA MASTER PLAN



NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 12-1126-0070/1000.

REFERENCE

ARCHAEOLOGICAL POTENTIAL DATA DIGITIZED FROM CITY OF OTTAWA MASTER PLAN, OBTAINED FROM CITY OF OTTAWA E-MAP WEBSITE, 2012.
 LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2012.
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

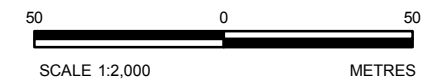
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TITLE	ARCHAEOLOGICAL POTENTIAL		
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	GIS	BR 19 Jul. 2013	MAP 9
	CHECK	HJD 19 Jul. 2013	
REVIEW	HJD 19 Jul. 2013		

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LEGEND

- PHOTO LOCATION (POINTING DOWN)
- ⬇ PHOTO LOCATION AND DIRECTION
- ▭ STUDY AREA
- ▨ PEDESTRIAN SURVEY
- ▨ SUBSURFACE TESTING
- ▨ DISTURBED/DEVELOPED AREA



NOTE

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REFERENCE

LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2012.
 BING MAPS AERIAL BASEMAP PROVIDED BY ARCGIS ONLINE, ESRI, 2013.
 IMAGE DATE: SEPT. 2010.
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

PROJECT		STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT FOR A RETIREMENT HOME, ORLEANS	
TITLE		STAGE 2 SURVEY METHODS	
PROJECT		PROJECT No. 12-1126-0070	SCALE AS SHOWN
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GIS	BR	19 Jul. 2013	
CHECK	HJD	19 Jul. 2013	
REVIEW	HJD	19 Jul. 2013	



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LEGEND

- DEVELOPMENT PLAN
- ▭ STUDY AREA




NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 12-1126-0070/1000.

REFERENCE

LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2012.
 BING MAPS AERIAL BASEMAP PROVIDED BY ARCGIS ONLINE, ESRI, 2013.
 IMAGE DATE: SEPT. 2010.
 DEVELOPMENT PLAN PROVIDED BY BRIGIL, MAY 2013.
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: MTM ZONE 9

PROJECT		STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT FOR A RETIREMENT HOME, ORLEANS	
TITLE		DEVELOPMENT PLAN	
PROJECT No. 12-1126-0070		SCALE AS SHOWN	REV. 0
DESIGN	IN	05 Feb. 2013	 Golder Associates Ottawa, Ontario
GIS	BR	19 Jul. 2013	
CHECK	HJD	19 Jul. 2013	
REVIEW	HJD	19 Jul. 2013	
			MAP 11



CLOSURE

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.

Ibrahim Noureddine, M.A.
Archaeologist

Hugh Daechsel, M.A.
Principal, Senior Archaeologist

IN/HJD/clb
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APPENDIX A

Photographic Catalogue



APPENDIX A Photographic Catalogue

Photo #	Description	Direction	Date	Photographer
1211260070-001	Western limit of the study area	NW	4/23/2013	IN
1211260070-002	The field north of the Brigil building	N	4/23/2013	IN
1211260070-003	The field north of the Brigil building	N	4/23/2013	IN
1211260070-004	Disturbed area near the Parking Lot of the Building	E	4/23/2013	IN
1211260070-005	Parking Lot of the Building	NW	4/23/2013	IN
1211260070-006	Disturbed area near the Parking Lot of the Building	E	4/23/2013	IN
1211260070-007	Ditch on the eastern limit of the property near the OR 174	S	4/23/2013	IN
1211260070-008	Driveway to the underground parking Lot of the Building	NE	4/23/2013	IN
1211260070-009	Driveway to the underground parking Lot of the Building	NW	4/23/2013	IN
1211260070-010	Driveway to the underground parking Lot of the Building	NE	4/23/2013	IN
1211260070-011	Drainage ditch within the study area on the western side of OR 174	S	4/23/2013	IN
1211260070-012	Disturbed area near the eastern end of the parking Lot of the Building	NE	4/23/2013	IN
1211260070-013	The south eastern limit of the study area	SE	4/23/2013	IN
1211260070-014	The south eastern limit of the study area- Shovel tested	SE	4/23/2013	IN
1211260070-015	The south eastern limit of the study area- Shovel tested	SE	4/23/2013	IN
1211260070-016	Disturbed area at the south eastern limit of the study area	SE	4/23/2013	IN
1211260070-017	The south eastern limit of the study area- Shovel tested	NE	4/23/2013	IN
1211260070-018	small culvert running parallel to the OR 174	S	4/23/2013	IN
1211260070-019	Developed area in the south western portion of the study area	NW	4/23/2013	IN
1211260070-020	Test pit showing Greyish brown topsoil and yellowish brown subsoil at 35cm		4/23/2013	IN
1211260070-021	Shovel testing in areas that are not possible to be ploughed	N	4/23/2013	IN
1211260070-022	Shovel testing in areas that are not possible to be ploughed	N	4/23/2013	IN
1211260070-023	Shovel testing in areas that are not possible to be ploughed	W	4/23/2013	IN



APPENDIX A Photographic Catalogue

Photo #	Description	Direction	Date	Photographer
1211260070-024	The field before being ploughed	N	4/23/2013	IN
1211260070-025	the northern limit of the developed area at the verge of the field	N	4/23/2013	IN
1211260070-026	the northern limit of the developed area at the verge of the field	E	4/23/2013	IN
1211260070-027	the Shovel testing at the verge of the field	NW	4/23/2013	IN
1211260070-028	Shovel testing near the limit of the developed area	N	4/23/2013	IN
1211260070-029	Eastern limit of the study area near OR 174	S	4/23/2013	IN
1211260070-030	Eastern limit of the study area near OR 174	N	4/23/2013	IN
1211260070-031	Test pit showing subsoil at 35cm		4/23/2013	IN
1211260070-032	Test pit showing subsoil at 35cm		4/23/2013	IN
1211260070-033	The field after being ploughed	N	4/23/2013	IN
1211260070-034	The field after being ploughed	NW	4/23/2013	IN
1211260070-035	The field after being ploughed	NE	4/23/2013	IN
1211260070-036	pedestrian survey at the ploughed portion of the study area	S	4/23/2013	IN
1211260070-037	pedestrian survey at the ploughed portion of the study area	SW	4/23/2013	IN
1211260070-038	pedestrian survey at the ploughed portion of the study area	N	4/23/2013	IN
1211260070-039	pedestrian survey at the ploughed portion of the study area	N	4/23/2013	IN
1211260070-040	The western limit of the ploughed portion of the study area	N	4/23/2013	IN

IN = Ibrahim Nouredine (P350)

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

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