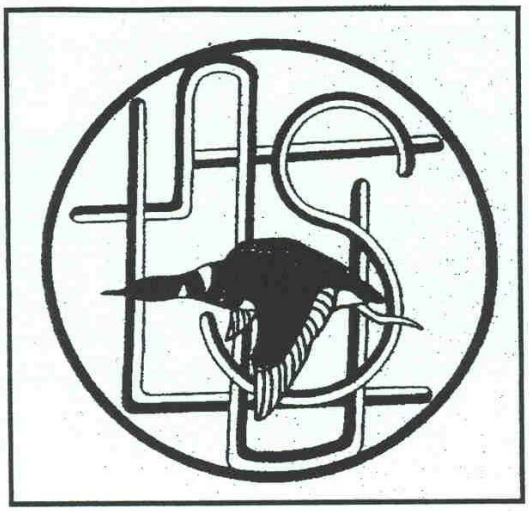
Appendix F
Archaeological Report

Report on Stage 1 Archaeological Assessment of the Manitoulin Island Wind Farm, by Northland Power, in Northeast Manitoulin and the Islands



Work conducted under Archaeological License P-100
Project Number P-100-016-2009

Dr. P. Julig
Archaeological Survey of Laurentian University
Sudbury, Ontario
Feb. 23, 2009

For: Dillon Consulting
235 Yorkland Blvd. Suite 800
Toronto, Ontario M2J-4Y8

COVER PAGE INFORMATION

Municipal Development File Number	N/A
"T" Number	None
Property Name	Northland Power, Manitoulin Island Wind Farm
Location of Project	Northeast Manitoulin and the Islands (NEMI) in the Township of Howland, District of Manitoulin
Lot Numbers	Part of 66 Lots, within Township of Howland, see Figure 2 Map boundary
Concession Numbers	Concessions within Township of Howland, boundary shown in Figure 1, but not all turbine locations yet determined.
Township	Townships of Howland
Plan Number	N/A
Client	Northland Power (Agent, Dillon Consulting, 235 Yorkland Blvd., Toronto, ON. M2J 4Y8)
Name of Consulting Firm	Archaeological Survey of Laurentian University (ASLU),
Name(s) of Consultant(s)	P. Julig
Project Number	P-100-016-2009
License Number	P-100
Report Completed	June 2009

HERITAGE ACT INFORMATION SUMMARY

This is a Stage 1 Archaeological Assessment of Manitoulin Island Wind Farm, being developed by Northland Power, in the Township of Howland, the Municipality of NEMI (Northeast Manitoulin and the Islands), in the District of Manitoulin.

This Wind Farm, being developed by Northland Power is being proposed on an area including parts of about 66 lots, located on an elevated plateau and on ridges above about 800 feet asl, in the Township of Howland, overlooking parts of Georgian Bay and the North Channel. This Stage 1 archaeological assessment was conducted under License No. P-100. A Field assessment was done on April 23, 2009, with Mr. Rick Martin of Northland Power, to assess possible beach ridge landforms and to evaluate archaeological potential. The Stage 1 background research and final report was completed in June 2009.

The license holder is Dr. Patrick Julig, License # P-100, who conducted the research at Laurentian University as part of the Archaeological Survey of Laurentian University, and compiled the final report.

No departure has been made from the information provided in the license application.

No sites were reported on the actual lots being planned for development. However the broader study area being assessed has several previously reported sites, the Giant site and the Buttermilk Falls site; however they are over 250 meters from planned development.

Permission to conduct the field visit was obtained from Mr. Rick Martin of Northland Power, who accompanied P. Julig, to visit a number of the proposed turbine locations April 23, 2009.

Report on Stage 1 Archaeological Assessment of the Manitoulin Island Wind Farm, by Northland Power, in Northeast Manitoulin and the Islands

1.0 Introduction

This is a Stage 1 archaeological assessment of the Manitoulin Island Wind Farm, by Northland Power, and the associated transmission line. This development is situated in the municipality of NEMI (Northeastern Manitoulin and the Islands), within the Manitoulin region, near Little Current, and is situated in the Borden square designated BlHl (Figures 1, 2). The purpose of the Stage 1 assessment is to conduct background archeological, archival/historical and environmental studies, to determine the potential for cultural heritage resources including archaeological sites. The development is planned along ridges and bluffs overlooking Georgian Bay, and certain ancient beach terraces in this part of Manitoulin Island have potential for archaeological sites. The Stage 1 assessment was mandated by the Ministry of Culture in the planning process. This report covers all aspects of the Stage 1 assessment process, which is primarily a "desk-top" research. We will first review what is required for the Stage 1 assessment research and then present the research findings. This is followed by some observations made in a field visit to more carefully assess archaeological potential. This report will provide the classes of information required by the Technical Guidelines of the Ministry of Culture, with respect to the Ontario Heritage Act.

1.1 Background to Stage 1 Assessment

There are four main classes of information used to determine archaeological potential as part of the Stage 1 archaeological assessment.

1. the presence of any known reported archaeological sites on or within 250 meters of the project,

2. specific physiographic features on or close to the property, such as permanent water bodies and specific landforms such as sand and gravel deposits, which may indicate high potential for archaeological sites,

3. certain cultural historical information and features, and

4. specific location information for the development, including local knowledge and site disturbance.

Each of these four categories of information will be evaluated to determine how they contribute to archaeological site potential for the Manitoulin Island Wind Farm. In addition, the traditional pattern of prehistoric and early historic site locations in the eastern Great Lakes forest in the study area vicinity will be evaluated. Specifically, the location and context of previously located archaeological sites will be examined. This overview will provide a regional perspective for site potential. The location of the development on the high bluffs and ridges in Northeastern Manitoulin suggests a moderate potential for archaeological sites in some places, as some sites have been found in similar locations in this part of Manitoulin. The Stage 1 assessment will provide

background research to evaluate the site potential for the entire development property, including the flat uplands away from the bluff zone. For example, some quarry/workshop sites for stone tool manufacture, and hunting sites are located in uplands away from shorelines, where suitable geological materials are situated. Previous reports and surveys have found numerous sites in northeast Manitoulin Island, over the past 10,000 years, including Sheguiandah quarry site (BlHl-2).

The Manitoulin Island Wind Farm is planned on a number of properties, being bounded approximately by the line shown in Figure 1. The specific properties and turbine locations, as well as proposed access roads are shown in more detail on Figure 2. Additionally the associated 15 kV transmission line development is shown on Figure 1, connecting the substation in the northeast part of the development to the grid near Little Current. The precise details of this connection are yet to be finalized, according to Mr. Martin of Northland Power.

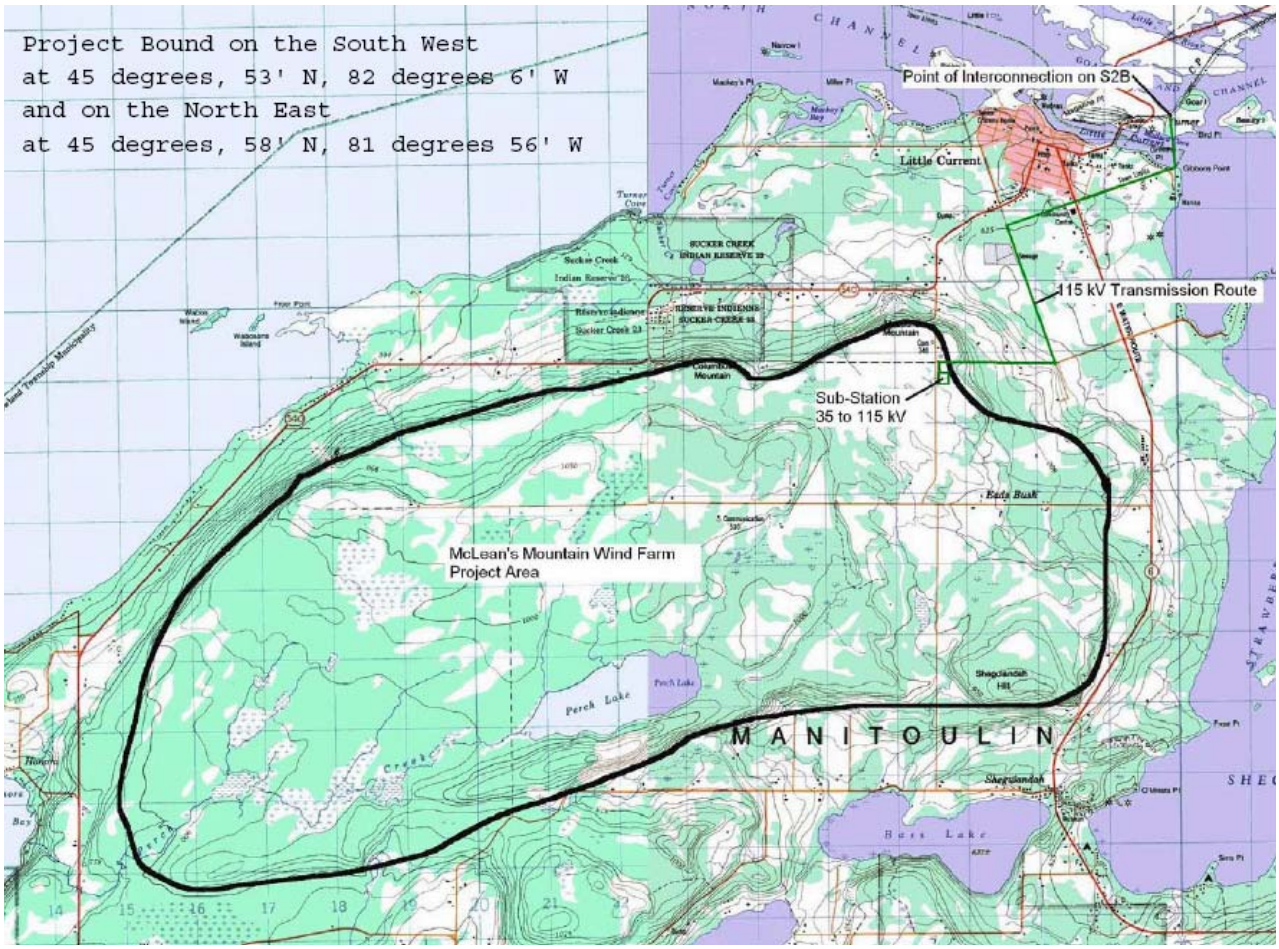


Figure 1. Manitoulin Island Wind Farm approximate project boundary and Transmission Line Route. This project was previously called McLean's Mountain Wind Farm. The grid indicates 1000 meters scale and north is to the top in the figure.

1.12 Proximity to known archaeological sites

The first class of information to determine archaeological potential, according to the Ministry of Culture Guidelines is the presence of archaeological sites on or near the property. There are no known sites (reported sites) on or within 250 meters of the Manitoulin Island Wind Farm proposed project turbine locations, that is, the designated project lots. However a large surface site near Bass Lake (Giant site) and another smaller site (Buttermilk Falls) are fairly near, falling within the boundaries of the larger study area (Figure 2), as discussed below.

The presence of any known reported archaeological sites in the properties being developed, or within 250 meters of the project boundaries, indicates high potential, and would trigger the Stage 2 assessment, that is field survey and test pitting.

The Ontario Ministry of Culture maintains a data-base of known archaeological sites in the province and those in the Manitoulin region (about 48 sites) are listed in Table 1. In addition, there are other sites in the Manitoulin region that have been discovered but not reported in the Borden system, and are thus not in the available Borden Site database. For the purposes of this development project, no barriers to development are posed by the existence of known archaeological sites within 250 meters of the existing project boundaries, as shown in the designated project lots.

However, as mentioned above there is one nearby site of unknown size, the Giant site (BlHl-1), reported by T. Lee in the 1950s, (Julig 2005, see Table 1). This site is located near the boundary of the southeast edge of the development, east of turbine 36, north of Bass Lake Marsh (Figure 2). The Giant Site is a rather large and diffuse scatter of quartzite artifacts in several fields, associated with quarrying and stone tool manufacture from the Paleo-Indian and Archaic period (ca. 9500-7000 years ago). This site's boundaries are poorly defined, as there are numerous surface site lithic scatters associated with the Bar River and Lorraine Formation white quartzite bedrock outcrops around the nearby Sheguiandah (BlHl-2) quarry-workshop site (Julig, 2002). Many fields in the area near the quartzite outcrops at the 225 meter (750-775 ft. asl) elevation have shown some artifacts, however these outcrops are mostly outside of the property. There are also other sites around Sheguiandah associated with the ancient (9500 years ago) Korah beach level, including Buttermilk Falls, west of Burnett's Side road (Figure 2). This site also falls within the yellow "study area" boundary of Figure 2, as well as within the boundaries shown on Figure 1. However, the leased lots shown on Figure 2 have no sites on or within 250 meters. Since the project is not totally finalized as to turbine numbers and locations if any are planned near the existing sites, this would become an issue.

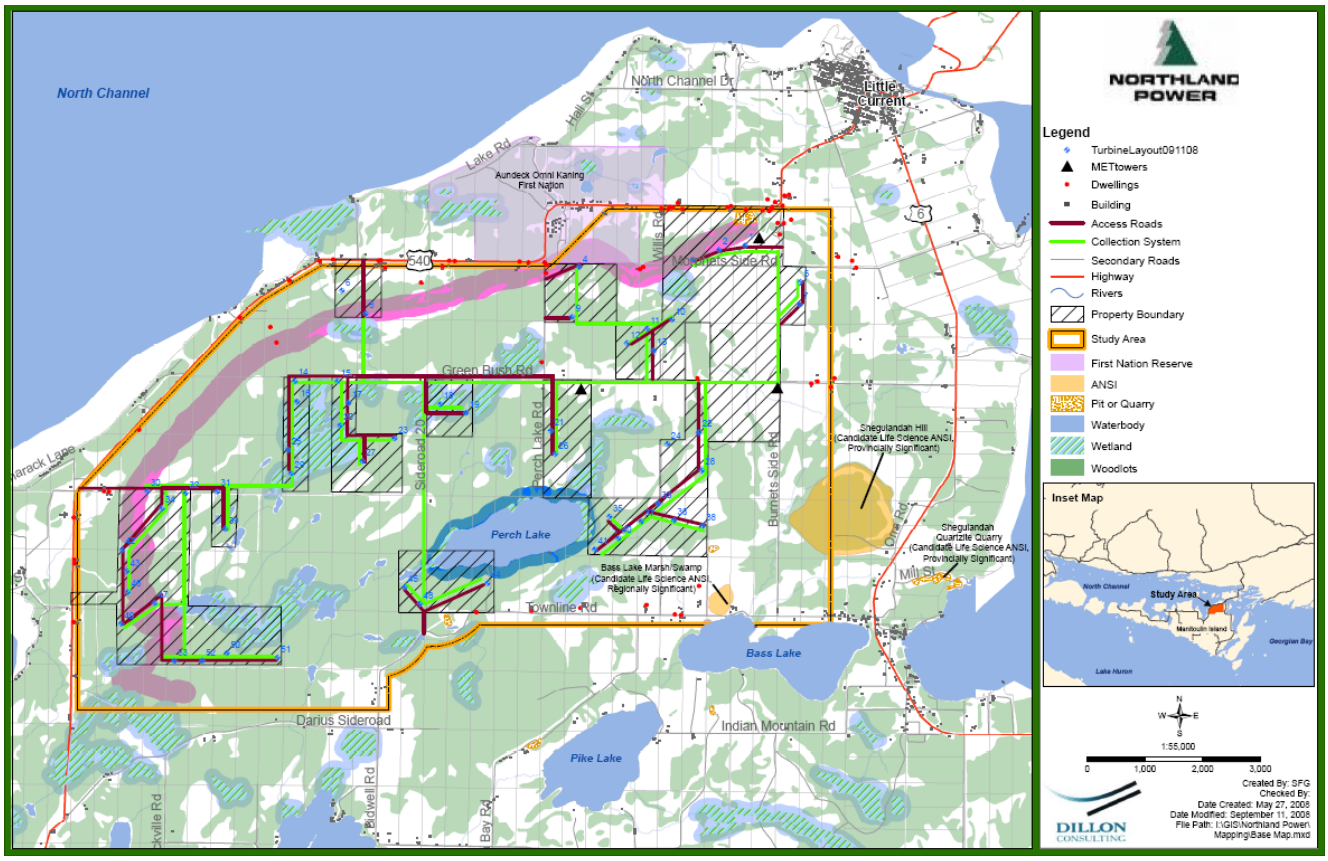


Figure 2. Manitoulin Island Wind Farm showing property boundaries, access roads, transmission lines, the potential 53 turbine locations, and environmental details including water bodies (not all turbine location may be developed).

1.13 Physiographic features indicating high potential for archaeological sites

The main physiographic features that determines archaeological site potential in Northern Ontario is proximity to permanent water bodies. A second criterion is association with certain land-forms and formations. Thirdly, and possibly less importantly, site potential is determined by the presence of well-drained sandy soils.

Specific physiographic features such as proximity to permanent water bodies can signal increased archaeological potential. Other specific landforms such as sandy beaches and sand ridges and deposits such as eskers and moraines, as well as proximity to ancient water (old beach ridges), indicates high archaeological potential. The Manitoulin Wind Farm project is located on relatively high topography, with elevations typically over 900 feet (275 m) (asl) (Figure 1). These elevations of turbine locations are above the ancient (9500 year) Korah Phase beach levels (about 750-775 ft asl) where the first Paleoindian sites, such as Sheguiandah site, are typically located (Julig 2002).

The present permanent water bodies and wetlands associated with the project are shown on Figures 1 and 2. There are three parcels bounding on Perch Lake, the main water body, with extensive associated wetlands. A buffer zone has been established around

Perch Lake, with no turbine locations or access roads within the buffer zone. There are numerous seasonal ponds and wetlands on these rocky limestone (dolomite) uplands. The bedrock is at or near the surface, with a thin layer of till or clay in the depressions. The bedrock is fairly porous, and many seasonal ponds fill in the spring and may dry out in the late summer. Buffer zones are also placed around most of these wetlands, and the development is mostly away from these buffers. There are some exceptions with respect to the hydro lines crossing wetlands and/or buffer zones in some places, as well as some access roads, specifically west of Perch Lake. It appears that the turbine locations # 44, 45, 48, originally beings planned for near Perch Lake have now been cancelled (pers. comm. Mr. Martin).

There are no local esker ridges or major sand deposits in the higher elevations of the development property, however there are some sand and gravel deposits just below the main bluff at the south side of the project, with gravel pits in the near vicinity of the turbine locations 38 and 48, as well as near the northern edge at turbine location 6. These gravel deposits are mostly below the main bluff and with one exception (turbine 6 location), more than 250 meters away from the proposed developments.

One other type of unusual geomorphic feature was considered as contributing to archaeological site potential, and that was high ridge "look-out" locations, such as on McLean's Mountain location where turbine Location 1 and 2 are located. The access roads follow the crest of some of the ridges at several "look-out" locations.

As a result a field visit was conducted to visit several of these "look out" locations to check if the ridges were sand or gravel, and to evaluate the archaeological site potential and this is considered in a later section.

1.14 Historical features and cultural knowledge indicating site potential

Historical cultural features can also signal site potential. These include traditional-use extractive sites, such as ancient quarry sites, aboriginal settlements and cemeteries (including old lumber camps, or trading posts), and historic transportation routes, such as portages and old trails.

Other natural resources that may signal ancient prehistoric sites is suitable silicious lithic materials to make stone tools (chert/flint, fine-grained quartzite, etc.). There are both Fossil Hill Formation chert and fine-grained quartzite on Manitoulin Island, and both materials were used for making stone tools locally, as well as transported around the region for thousands of years (Julig 2002). There are exposed Bar River and Lorrain Formation bedrock quartzite outcrops in the area from Sheguiandah to north of Bass Lake, within the southeast portion of the project area. These were was quarried and used for making stone tools at workshop sites such as Sheguiandah (BlHl-2 outside the project area) and Giant site (BlHl-1, within the project area), and also at the outcrop at Burnett's side road, at Buttermilk Falls (Figures 1,2). There are no bedrock deposits of Fossil Hill formation chert/flint in the project area; however is present fairly nearby, in the central and south side of Manitoulin from Lake Manitou to Wikwemikong (Julig 2005).

1.15 Knowledge specific to the location and evidence for site disturbance

Local knowledge of specific sites or features, and the degree of recent disturbance to the study area are two other types of information of the study area that are researched in the Stage 1 process. Specific local knowledge and findings reported may signal increased archaeological potential; however this would have to be confirmed. For example, there is a built U-shaped dry-stone structure to the west of Burnett's Side Road, within the project area. However it is over 250 meters from any proposed turbine locations (east of turbine 38, Figure 2). This structure is of unknown age, and while it has been used as a deer-hunting blind in recent times, it appears to be of considerable antiquity. It is located near an upland trail and later wagon road trail that ran from Sheguiandah to Little Current (ASI, 1992). There are other reports of local finds of archaeological or early historical interest within the general area from Little Current to Bass Lake, including some Archaic era finds, but these are outside the project boundaries.

Extensive and intensive surface ground disturbance would contribute to low archaeological potential. In terms of recent disturbance to the study area, the surface is somewhat modified by logging, farming, pasturing and old trails; however this would not reduce the archaeological potential too much.

This report will now review the Native culture history of the surrounding Manitoulin and adjacent mainland region and consider archaeological site potential based on the existing reports, site data bases, and unpublished reports.

2.0 STAGE 1 BACKGROUND RESEARCH

Manitoulin Island has a rich prehistoric archaeological record extending from the Paleoindian period at about 10,000 years ago (Julig 2002) until the arrival of the first Europeans in the 16th century. The Great Lakes were an important focal point for prehistoric Native cultures because of the productive coastal environments for many resources, including terrestrial game and the rich fresh-water fishery. Manitoulin, as well as being the largest island, was also part of a traditional canoe travel route through northern Lake Huron. The prehistoric cultural periods represented in this region will be briefly reviewed, along with select key archaeological sites reported in the Manitoulin district. Also part of the Stage 1 research is to determine if there was any historical evidence for use of the survey property, or any significant early historical sites.

2.1 Early Culture History

The prehistory of Ontario goes back to the end of the glacial period or Pleistocene era at about 11, 000 years ago. The first people to occupy the region were Paleoindians (ca. 11, 000 - 7500 B.P. (years before present)) who moved into the Great Lakes from the south and west while glaciers receded in the north. The late Paleoindians, referred to as the Eastern Plano, occupied Manitoulin Island at sites such as Sheguiandah (BlH1-2) by

9500 years ago (Julig 2002; Julig et al. 1991). The Archaic periods (ca. 7500 to 2000 B.P.) and Woodland periods (ca. 2000 B.P. to European contact) followed and all are present on Manitoulin Island, and artifacts from these cultures have been found at the Sheguiandah site, and elsewhere on Manitoulin. All of these cultural periods will be briefly reviewed. The Georgian Bay and Manitoulin regions were to some extent used by both Northern and Southern Great Lakes cultures, as this was an area of trade and considerable cultural exchange occurred (Julig et al.1998).

Paleoindians were mobile hunter-gatherer bands that relied mainly on hunting large and medium size game species. The Paleoindians arrived in the part of North America from northeast Asia, and spread through the Americas before 12,000 years ago. In the western plains regions they hunted the extinct mammoth (*Mammuthus primigenius*) and other large game species with Clovis type fluted-point spears. In the Great Lakes region early Paleoindians lived and traveled along the shorelines of the early Great Lakes (by ca. 11, 000 B.P.), such as Lake Algonquin, a high water stand of Lake Huron. Glacial ice was still present along the north shores of the Great Lakes and taiga and tundra-like environment was present between 10, 000 and 11, 000 B.P. (Julig 2002).

These early colonists appear to have been small mobile bands that depended on herd animals such as caribou as well as elk, moose, possibly mastodon (*Mammut americanum)*, small game and fish. However, archaeologists have not recovered many bones of the food sources they used, or their houses, so we do not have good information on their life ways and subsistence settlement patterns. Because they left silica stone tools of flint and quartzite from widely spaced source regions, we know they traveled (or traded) widely. These artifact distributions of distant materials tell us they traveled long distances.

The high water levels of Lake Algonquin covering most of Manitoulin Island, and fell after about 10, 500 years ago, as the glaciers started to recede. The Late Paleoindians moved into Manitoulin Island, which was connected to the Bruce Peninsula of south-central Ontario at that time. The upper Great Lakes drained through the French River outlet and though the Ottawa valley drainage system, via Lake Nipissing at that time. There was a low-water period, when Georgian Bay was actually a separate lake, and also several flood events that occurred from the west into Lake Superior as the glaciers melted. As these floods cascaded into Lake Huron life would have been unstable as the beach zones and hunting and fishing areas would have changed regularly.

There is limited direct evidence for the Paleoindian way-of-life in the north. Few artifacts other than stone tools have survived; however, inferences have been gained from site locations, size and context. Their chipped stone tools include materials from widely spaced geological sources, indicating considerable mobility and interaction with other widely spaced bands (Julig et al. 1989). Their tool forms include large lanceolate shaped points, large bifaces used for as knives, and many unifacial tools made from flakes, such as scrapers and engraving tools. Such tool kits or assemblages have been recovered at Sheguiandah (B1H1-2) and in Killarney, along with the waste products (debitage) from the tool making activities (Julig et al. 1991; Julig 2002; Lee 1957). The Paleoindians preferred obtaining these stone tool materials from bedrock outcrops rather than from secondary deposits such as tills and gravels. The Sheguiandah site (B1H1-2) and the nearby Giant site (B1H1-1) on the north shore of Bass Lake (within the study area) are local examples, and there are many others (ASI 1992; Julig 2002; Julig et al. 1991).

These early inhabitants also used small amounts of local Fossil Hill Formation cherts (flints) of Silurian age, probably from the Wike Flint site (BjH1-1) to the east side of South Bay, on the Wikwemikong reserve. Further to the east, in Killarney Park, there are similar indications of Paleoindian activity at the George Lake site (Greenman 1966) at an ancient quartzite quarry.

The Archaic period cultures (ca. 7500 to 2000 B.P.) had many similarities to the Late Paleoindians in the upper Great Lakes. In the Boreal forest it is referred to as the Shield Archaic (Wright 1995), and along the St. Laurence lowlands as the Laurentian Archaic. The hunting-gathering-fishing way of life continued with evidence of some larger macro-bands using the larger lakes and rivers throughout the region, and greater focus on specific resources such as fish. The regional use of native copper from Lake Superior for tools and ornaments occur prior to 6000 years ago (Beukens et al. 1992). There was continued use of local quartz, quartzite, as well as poorer quality stone such as greywacke materials for stone tools. Studies indicate repetitious use of sites including Sheguiandah (B1H1-2), Giant (B1H1-1), Cummins (DcJi-1) and others along the north shore from Paleoindian to Archaic times (Julig 2002).

New hunting technology is evident from the Archaic era with the recovery of side-notched Early Archaic spear points. In addition other new stone tool forms appear such as ground stone gouges and trihedral chipped adzes, which indicate a variety of woodworking activities. Certainly watercraft such as dugout canoes, were used at this time. Few Early Archaic sites have been radiocarbon dated in local region, however, the Foxie Otter site on Spanish River, north of Manitoulin, has a date of 7670 +- 120 B.P., one of the earliest dates for the Early Archaic occupation in these regions (Hanks 1988). On Manitoulin such ground stone gouge tools have been found at Little Current, an atlatl weight from near Pike Lake (west of Bass Lake), and copper artifacts are reported from sites around Gore Bay and Lake Woseley on Manitoulin Island.

Archaic era sites are often difficult to clearly identify unless specific tool forms such as those mentioned above are recovered. Since water levels in the Georgian Bay Basin were at times both lower and higher than currently (fluctuated) many coastal Archaic sites were flooded depending on their elevation. The specific property in this study is above the ca. 5,500 B.P. Nipissing beach level, and was available for the Archaic era peoples, however the upland bluffs (most turbine locations) would have been well back from the beaches at that time.

The Woodland period, after ca. 2,000 years ago, is marked by a number of changes in technology, social organization and burial practices; however, much continuity is evident in basic subsistence practices and resources used. The Woodland period is normally subdivided into Middle Woodland (ca. 2,000 to 1,000 B.P.) and Late Woodland (ca.1,000 B.P. to Historic contact), with the Middle Woodland across the region manifest as the Laurel culture that extends from Northern Minnesota to Quebec (Wright 1995), and the Point Peninsula Culture also present across the Lower Great Lakes.

Burial mounds and larger villages are part of the Laurel Middle Woodland culture pattern, along with new technology, particularly the appearance of ceramic (clay) pottery vessels. At Killarney (Speigel site), a Middle Woodland burial mound complex is present (Greenman 1966). The East Sheguiandah site (B1H1-3) near the Government

dock at Sheguiandah was identified by T. Lee (1963) as a Middle Woodland village, and others are present in the region.

During the Middle Woodland the use of fishing nets is evident from net sinkers. Copper continued to be used for tools and ornaments along with bone harpoons and a variety of stone tools, as well as the distinctive stamp decorated finely made pottery. At the Speigel site in Killarney, the presence of chert artifacts of southern flint and the Adena burial mound complex indicates social connections to the southern Lake Huron region and beyond. The Middle Woodland people had very widespread social interaction and trade networks, and some artifacts of non-local materials have been found at the nearby Sheguiandah East Middle Woodland site.

The Late Woodland period (1,000 B.P. to contact) is marked by the appearance of a variety of ceramic styles from the northern Great Lakes as well as Iroquoian influence from the southern shores. Considerable trade is evident throughout the Manitoulin region, which culminated with the arrival of the Europeans and the establishment of the fur trade. The trade networks of the Odawa of Manitoulin were well established with the Huron and other groups, with whom they traded.

There are several recorded sites on Manitoulin Island that date to this period, including the Shawana site (BkHk-1) (at Wikwemikong Reserve), and at Providence Bay (BkHn-2), as well as on the west side of South Bay, and in the Slash area of Manitoulin. The artifact assemblages of the Late Woodland include the characteristic ceramics and small triangular and side-notched points, and at around 1620 A.D., the appearance of European trade goods such as glass trade beads and some European copper kettles and steel tools.

The Historical Period on Manitoulin begins in the early 17th century (1600s) when the reports of the early French explorers and missionaries of hunters, fishers and gatherers who lived in the lands and islands of Georgian Bay and spoke Algonquian language, different from the Huron and other Iroquoian tribes to the south. The Ojibway, Odawa and Potawatomi Nations became known as the Confederacy of the Three Fires, with the Odawa occupying Manitoulin Island and the Bruce Peninsula, Potawatomi in upper Michigan and the Ojibway the north and east shores of Georgian Bay and elsewhere across the southern Canadian Shield and down the Ottawa valley (Fox 1990).

The first European visit with the Ottawa (Odawa) tribes of Manitoulin is recorded by Champlain in 1615, who met with a group of 300 men at the mouth of the French River. They were known to Samuel de Champlain as the Cheveux relevés or “standing hairs”, because they greased and painted their very straight hair. The term Odawa is from the Algonquian term *adawe* which means to trade, to buy, to sell, as they were great traders and travelers (Fox 1990: 457).

Manitoulin is derived from *manitou* the Ojibway term for spirit; however the term first appearing in the *Jesuit Relations* is the Huron word “Ekaentoten”. The Jesuit mission of St. Peter on Manitoulin dates to 1648 (Major 1943).

In the mid-1600’s warfare developed with the Iroquois to the south, and the Huron and other tribes were driven westward from their territories (Hiedenreich 1987: Plate 37). The Ojibways and Odawas were also involved in these wars, and were somewhat successful in their battles. The region was somewhat depopulated after 1660, and European diseases spread throughout the region. By the later part of the 1600s the

hostilities declined, and Algonquian bands moved back along the North Shore and on Manitoulin.

Other Algonquian groups spread to southern Ontario and the Detroit, Michigan area, but by the 1830s many had moved back to Manitoulin as the reserve system was established. The details of the historical era on Manitoulin are complex and beyond the mandate of this report. Relatively few of the historic sites from this era have been recorded on Manitoulin; however more prehistoric sites have been recorded in the vicinity of this study, as will be discussed in the next section.

2.2 Previous Surveys and Recorded Sites

Over forty archaeological sites are recorded for the Manitoulin District and are registered in the database of the Ontario Ministry of Culture in Toronto according to the Borden National Site Registration System (Table 1). Most of these sites have been documented by surveys in the past fifty years, mainly on the eastern half of the island. There has been no systematic survey over most of the island, and there are certainly many more unrecorded sites. There have been excavations of some of the major sites as mentioned in the previous section. Most of the surveys have concentrated in particular areas, such as the between Lake Manitou and Little Current around the village of Sheguiandah, where there are many sites associated with the whitish Bar River and Lorraine Formation quartzite, used by early prehistoric groups for making stone tools. In 1991 the Archaeological Master plan of Howland Township, by Archaeological Services Inc. (ASI 1992) also recorded many new sites in this part of Manitoulin Island.

The first records of prehistoric sites in the district were made by Dr. Robert Bell, Geologist for the Canadian Geological Survey, who in the 1870's collected and excavated from the sites at Killarney. Bell also obtained quartzite specimens from Sheguiandah from J. Nottman, a local collector (Julig 2002).

The first formal archaeological research program in the Manitoulin District was conducted by Dr. Emerson Greenman of the University of Michigan who came annually for seventeen years in the 1930's and 1940's to the Killarney area and he also surveyed on

TABLE 1: ARCHAEOLOGICAL SITES IN EASTERN MANITOULIN VICINITY

BjHl-1 Wike flint site	BlHl-1 Giant site
BjHl-2 Thomas Bay	BlHl-2 Sheguiandah
BjHl-3 Jock Bay	BlHl-3 Sheguiandah East
BjHm-1 Manitou River	BlHl-4 North /W Sheguiandah
BjHm-2	BlHl-5 Bass Lake 1
BjHj-1 Kaboni Beach	BlHl-6 Bass Lake 2
BjHj-2 “ ”	BlHl-7
BkHk-1 Shawana	BlHl-8 Bass Lake 3
BkHk-2	BlHl-9 Bass Lake 4
BkHm-1	BlHl-10 Sheguiandah Hill
BkHm-2 West Bay	BlHl-11

BkHn-1		BlHl-12	
BkHn-2		BlHl-13	
BkHn-3	Providence Bay	BlHl-14	Bass Lake 5
BkHn-4	Dewar	BlHl-15	Gravel Pit
BkHn-5	Arnold Farm	BlHl-16	Garden 1
BkHn-6	Sailor's Rock	BlHl-17	Garden 2
BkHn-7		BjHm-1	East Face
BlHj-1	Speigel	BjHm-2	West Face
BlHj-2		BlHm-3	Valley 1
BlHk-1		BjHm-4	Valley 2
BlHk-3	Bold Point	BjHm-5	Valley 3
BkHl-1		BlHm-6	Valley 4
BkHl-2		BjHm-7	Valley 5

** Names are given for the select prehistoric sites and those mentioned in the text.*

Manitoulin Island. Important sites investigated included Killarney Bay 1 (Speigel, BlHj-1) and George Lake in Killarney, as well as Providence Bay (BkHn-2, Table 1), which was later excavated by T. Conway.

In 1951 Mr. Tom Lee of the National Museum of Canada started a survey of Manitoulin Island and identified a number of sites, most in the vicinity of Sheguiandah village. Included were the large sites of Sheguiandah (BlHl-2), Giant site (BlHl-1) and sites BlHl-3 to 10 (Table1). Most of these sites are of Paleoindian or Archaic affiliation, except Sheguiandah East which is Early Woodland. Lee also reported a site (BkHm-2) on the north shore of Lake Manitou, on the northeast shore of Bass Creek. Further to the north of Lake Manitou Lee reported site BkHl-1, a collection of quartzite artifacts (16) from near a white quartzite outcrop. The local Bar River formation quartzite is excellent for tool stones and native inhabitants quarried glassy outcrops for making stone tools over very long periods (ca.10,000 years).

Thor Conway, former Ontario provincial archaeologist conducted an archaeological survey on Manitoulin Island in the 1980's. He reported a number of sites including the Wike Flint site (BjHl-1), and others ranging from Archaic to Late Woodland (Odawa) and Historic era along the south shore on the Wikwemikong Reserve (Table 1). Two sites (BkHj-1 and BjHj-2), one Late Woodland site and a 19th century village were recorded at Kaboni beach by Conway; however these have not been studied. At the mouth of the Manitou River, Conway reported the multi-component Archaic and Late Woodland Manitou River site (BjHm-1). Conway also reported a number of other late prehistoric sites at West Bay (BkHm-2), Prairie Point on the North Channel (B1Hj-3), and the Providence Bay historic Odawa site (BkHn-3). Conway also reported several Archaic sites near the Mindemoya River (BkHn-4 and BkHn-5), however, none of these have not yet been published on, and only preliminary reports available for some sites such as Shawana (Conway 1989).

In 1991 Archaeological Services Inc. (1992) conducted an Archaeological Master plan for the Township of Howland, as part of the Sheguiandah site investigations. A local

archaeological survey was conducted and eleven new sites were reported, all to the northeast of Lake Manitou. These are sites BlHl-14 (Bass Lake 5) through BlHm-7 (Table 1), and all are assigned to the Late Paleoindian or Archaic periods, based on the types of stone quartzite artifacts recovered.

This summary of known sites and past research indicates many sites reported in eastern parts of Manitoulin Island, of all cultural periods. Some sites such as BkHm-1, are on lakes, and many are at favored fishing locations along rivers and streams, such as the Shawana site. However, a number of sites (8) are found inland (away from the water) such as between Lake Manitou and Sheguiandah, but close to the Bar River quartzite outcrops which were used for tool manufacture. This is a common pattern, since the favored fishing locations were attractions both in prehistoric times and today, however for many thousands of years the local white Bar River formation quartzite was a major resource, as it was used for making stone tools for nearly 10,000 years, and it is still mined today. The southeast part of this project borders into this area of white quartzite outcrops used for making stone tools, and several sites actually lie within the boundaries of the project area, however none really close to planned turbine locations (Figure 2).

2.3 Present and Past Environment of Area

Archaeologists also study the present and past environment to assist in predicting prehistoric site locations, including the landforms where sites may have been preserved and/or destroyed through time. This section will consider the biophysical environment around eastern Manitoulin Island.

The surficial geological and water level history for this area has been very dynamic, with major changes in shoreline locations through time. The entire area was glaciated prior to about 11,000 B.P., and then covered by Lake Algonquin between ca. 11,500 and 10,500 years ago. The water levels then subsided to uncover major portions of the island, but many areas (below about 225 meters) may have again been flooded at about 9,500 B.P. during the Early Mattawa flood (Lewis and Anderson 1989; Julig 2002). The upper parts of the project area became dry land after about 9,500 until about 5,500 B. P., when portions were again flooded by the rising Lake Nipissing stage, and then dries again after water levels decline by about 2000 years ago until the present. During much of this time the lower elevations were likely thick cedar and mixed deciduous forest.

With respect to the floral environment (forests) vegetation of the area is typical of deciduous-coniferous mixed forest of the Great Lakes-St. Lawrence forest region. These forests are common in areas of good to poor drainage depending on the local soil types. The area historically had large white pine (*Pinus strobus*) in the uplands, and various deciduous species in well-drained areas and tree species such as white cedar (*Thuja occidentalis*) and trembling aspen (*Populus tremuloides*) in the lowlands, and white pine and bur oak in the upland regions. Since there was selective harvesting of conifers in early logging operations and more recent logging of hardwoods sugar maple (*Acer saccharum*) and red oak (*Quercus rubra*), and other species, the forests in the study area are a mixture of many species. In addition to those species mentioned above there are minor amounts of the conifer species, balsam fur (*Abies balsamea*), eastern hemlock (*Tsuga canadensis*), and white spruce (*Picea glanca*), particularly along the shore and in

the lower areas. Other deciduous species scattered through the forest include white ash (*Fraxinus americana*), basswood *(Tilia americana*), elm (*Ulmus americana*) and birches (Betula sp.) In general the topographic lows are mostly cedars and aspen, while the uplands are predominantly hardwood deciduous species of maple, oak, ash and beech, with minor amounts of basswood and poplar. These are now excellent deer cover, and have changed greatly since more permanent settlement and farming, particularly in the past two centuries. Prior this area was more suitable for woodland caribou and moose, as the remains of two butchered caribou wee recovered at the Shawana site (Conway 1989).

The forests have also changed considerably in earlier times, from the Paleoindian period to the present, due to gradual climate change. Initially, after the waters subsided from Lake Algonquin at ca. 10,500 B.P., it was an open pine woodland with other conifer species such as cedar and balsam in the poorly drained areas and some deciduous in the better-drained areas. There was a cooling event related to the Lake Agassiz flood event, and the vegetation changed back to spruce dominance at ca. 9,500 B.P. (Julig 2002). From 8,000 years ago it warmed up, and white pine again became the dominant species, replacing red pine, jack pine and spruce (Julig 2002). Forest fires were common, thus the ecological cycles of vegetation succession would occur. Also, the changing levels of swamps have an effect on local vegetation and land use, which can be affected by climate change, as well as species such as beaver.

Faunal resources (animal species) on Manitoulin Island have likewise changed greatly through time, particularly during the historic period. Woodland caribou (*Rangifer tarandus*) were common on Manitoulin in the early historical and prehistoric times and became locally absent only in the past century. This herding species thrives on climax boreal forest, as they feed on the lichens in such environments. Caribou were likely a major food source of early populations, particularly Paleoindians (Julig 2002), since the early post glacial environment was suitable. The Shawana site dating to about 500 years ago has caribou faunal remains, and is believed to represent a fall butchering site.

White-tailed deer (*Odocoileus virginianus*) are browsing ruminants that prefer secondary growth areas, and as mentioned their numbers have expanded greatly since farming was introduced on Manitoulin Island. They were not common in prehistoric times, except further south. They can be taken in larger numbers when they "yard" in conifers in the winter months. They were an important food and leather source for native populations to the south. However, they were likely rare in the prehistoric past with the predominant climax white pine forests.

Other “big-game” cervid species such as moose (*Alces alces*) and wapiti or elk (*Cervus canadensis*) were also available at various times during the Holocene. During the early and middle Holocene from 10, 000 to 4,000 years ago, with changing water levels, there may have been abundant coastal habitat and land connections to other parts of Ontario, which would have promoted the dispersal of species such as elk. Moose and deer are not too compatible due to disease, and Manitoulin was probably more suitable for moose and caribou in prehistoric times then for elk and white-tailed deer, as they were absent to rare. Black bear was also widely used by natives in the central subarctic.

Native Algonquian populations in the Upper Great Lakes used all smaller species such as beaver, hare, woodchuck, raccoon, and muskrat. Beaver (*Castor canadensis*) was particularly important for boreal forest Algonquian groups such as the Ojibwa and Cree, who prized the fat meat with its high caloric value (Julig 1982). Birds were also

important food sources, including both waterfowl and other species, such as the now extinct passenger pigeon (*Ectopistes migratorus*). The migratory passenger pigeons feed on beech mast and other seeds from deciduous trees and stands of these species existed on Manitoulin.

Fish were the major food source for the Ojibwa, Odawa, Cree and other First Nation cultures in this area of the Great Lakes. Annual spawning runs in the spring and fall (depending on species) were times when large numbers were taken; however, they were procured year round with nets, hooks and spears. Species common to the study area and Georgian Bay include lake trout (*Salveninus namarycush*), lake white fish (*Coregonus upeaformus*), northern pike (*Esox lucius*), lake sturgeon (*Asipenser fulvescens*), as well as many others. Those species, which were naturally fatty, such as whitefish and lake trout, were preferred because of their higher caloric content; however, both large (sturgeon and lake trout) to smaller species (i.e. whitefish, suckers and bullheads) would provide valuable food resources in the area of east Manitoulin Island. Many of these fish species have been identified at Shawana site, from their bones.

Plant resources were likewise many and varied, used for foods, medicines, crafts and building and many other uses. Well over 100 species were used, and Manitoulin is particularly diverse with respect to plant life. The local environment supports species typical of the boreal forest, Great Lakes-St. Lawrence, as well as more southern species. The limestone alvars and uplands, typical of the study area, range from damp to very dry in the summer, and support many unusual and some rare species, some of which were traditional medicines.

This review of the biophysical environment and available subsistence resources indicated a region very rich in traditional wild resources. In fact, the north shore of Georgian Bay was the traditional homeland for the Ojibwa clans, with the Odawa occupying Manitoulin and other along the North Shore and eastern Lake Superior, and the Potawatomi were to the west in what is now upper Michigan. Fish and other resources were abundant in this part of the Great Lakes. Particularly favored site locations for the Woodland Algonquian cultures, such as the Amikwa, Missisauga, and various Odawa bands were near the Georgian Bay shoreline at major rivers and streams. The coasts and shores were most favored locations, with less use of the interior uplands, except for some hunting and gathering. Major campsites were normally near the water.

From this summary of previous sites and finds, environment and geomorphology, it is apparent that for this upland bluff survey area has relatively low potential for prehistoric and early historic sites. There are few permanent streams or lakes on this bluff (Figures 1 and 2), and most of the planned turbine sites are well above the ancient shoreline, which is a well developed geomorphic feature. Some parts of the upland bluff would have been an island in ancient Paleoindian times, when water levels were high. There may have been hunting of woodland caribou on these upland regions in more ancient times, as the remains of a butchered caribou were recovered at the Shawana site to the east.

The major archaeological attraction in the southeast part of the project area is the presence of the Bar River and Lorrain formation quartzite rock, which was excellent for making spear points, scrapers and other stone tools, and these natural quarries were used for thousands of years. Several sites are known from within the project area, but not specifically at or within any turbine location planned to date (Figure 2).

3.0 Field Visit to Development Property

As mentioned previously, evaluation of archaeological potential of specific landforms required a field visit, to determine if certain ridges along the crests of bluffs and "look-out" spots were sand or gravel, possibly eskers, or alternatively glacial till, and/or coastal ice-pushed features from ancient high water levels. In addition some of the turbine locations were in the vicinity of sand and gravel deposits (sand pits) below the bluff, warranting a visit to check archaeological potential. Representative views are shown below for some of these locations.

In total five locations were field checked as follows:
1. Access road to turbines 1, 2, 3, on McLean's Mountain, which appears to follow the crest of the look-out ridge, with sand deposits below ridge,
2. Access road and turbine location 4, following a ridge,
3. Access road and turbine location 5 at Morphet's Side Road,
4. Access road and turbine location 36, north of Bass Lake, with gravel pit below the bluff, and
5. Turbine locations 30, 34, and access road to turbines 42, 43 and 46, 49. These were at slightly lower elevations around 800-850 feet ASL, when Paleoindians were present in Eastern Manitoulin.

Figure 3. Typical upland terrain near turbine location 36, southern part of study area, showing old roadway along concession line, cedar and bur oak vegetation, and poor drainage with bedrock near the surface, with low archaeological potential.

Figure 4. Turbine location 34, above Honora Bay, view to west, at 850ft ASL, situated above the Korah beach ridge level. This area has been pastured, bedrock is near the surface, with no sand or gravel deposits, and archaeological potential is low.

Figure 5. Ridge on MacLean's Mountain where access road to turbine locations 1, 2, and 3 is planned. This ridge is clay and rock, suggesting a glacial till deposit.

Figure 6. View to northwest of Georgian Bay North Channel from **t**urbine location 2, on McLean's Mountain. The ridge is rock cored with a till veneer and little sand or gravel evident, indicating low archaeological potential.

4.0 Conclusions

In the boreal forest archaeological sites are often found within 300 meters of permanent water sources, particularly major lakes and rivers. Workshops for manufacture of stone tools (chipping of chert, quartz/quartzite, and slate) often occur where such geological outcrops of the raw material are found. In this Manitoulin Wind Farm development project, there were several moderate to high potential surfaces for archaeological sites in the southeastern art of the project, near the outcrops of white quartzite along Burnett's Side Road, where several sites (Giant site, Buttermilk Falls site) are present. However the turbine locations and access roads as presently planned, would not impact this area.

The majority of the development has relatively high topography, above the ancient Korah level beach, associated with Paleoindian sites on Manitoulin. The upland plateau is well removed from most permanent water sources, and there are few other natural features to be attractive for ancient campsites. There are no eskers or sand ridges across these high plateaus, they are quite flat, and we have found no sites on them in survey elsewhere on Manitoulin (Julig 2005).

The major permanent water body in the study area is Perch Lake; however no development is planned within 300 meters or more of this lake (Figure 2). There are several small streams, however most are ephemeral first-order streams that may dry out in late summer, and not suitable for fish spawning. There is some semi-permanent water

(wetlands) associated with the small streams, however this is not permanent water and the majority of the property has bedrock fairly near the surface. The one stream that is permanent runs from Perch Lake to Honora Bay (Figures 1, 2). An access road is planned across this stream, and if this is built in the future, this area of stream crossing should be checked (Stage 2 survey).

The final permanent water associated with this development is the transmission line crossing of the channel east of Little Current, to connect to the main line on Goat Island (Figure 1). The details and precise location of this connection are not yet fully planned, however if there are large towers erected or other soil disturbance then the locations on either side would require Stage 2 survey, as these are high potential shoreline locations.

5.0 Summary and Recommendations

The following is a summary of the archaeological assessment based on the various classes of information. Of these, the only confirmed factors to the Manitoulin Island wind farm development site is proximity to several existing archaeological sites in the southeast portion, near Burnett's Side Road, the white quartzite bedrock outcrops used for stone tool manufacture, and several water crossing locations.

1. The majority of the project area has low archaeological potential, and well removed above most permanent water, is mostly high plateau with near surface bedrock, has no evidence of eskers or similar features, and the vast majority of the area does not contain useable toolstone.
2. The stream draining Perch Lake to Honora Bay is permanent water, has moderate to high archaeological potential, and if an access road is built across, a Stage 2 survey and test-pitting is required.
3. The transmission line crossing east of Little Current may require excavation for transmission towers, and Stage 2 survey, as noted above.
4. In conclusion, because Stage 1 assessment has indicated that three predictors for high potential for archaeological sites are present, namely proximity to several existing sites and suitable toolstone deposits, and two locations with permanent water, some Stage Stage 2 investigations of those areas are recommend if development proceeds.
5. Although this study has found low archaeological potential for much of this property, there is always the possibility of buried deposits. If artifacts or human remains are found in the course of excavation of the property the appropriate authorities should be contacted.

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