APPENDIX 8:

PIN-E CAPE PEEL INTERMEDIATE
DISTANT EARLY WARNING (DEW)
LINE SITE REMEDIATION PROJECT

ARCHAEOLOGICAL IMPACT ASSESSMENT

FINAL REPORT

ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF THE PIN-E INTERMEDIATE DEW LINE SITE, CAPE PEEL, NUNAVUT

Submitted to:

The Department of Culture, Language, Elders and Youth (CLEY), Nunavut
Nunavut Permit No. 2009-023A

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EXECUTIVE SUMMARY

During August of 2009, Golder Associates Ltd. conducted an Archaeological Impact Assessment (AIA) of the PIN-E Intermediate DEW Line Site in Cape Peel on behalf of Public Works and Government Services Canada (PWGSC). This AIA was carried out in conjunction with the Phase III Environmental Site Assessment, Hazardous and Non-Hazardous Materials Audit, Geotechnical Evaluation and Remedial Action Plan. All required fieldwork was completed under an Archaeological Permit (2009-023A) issued by the Department of Culture, Language, Elders and Youth (CLEY), Nunavut to Brent Murphy of Golder.

The Intermediate DEW Line Site is located at Cape Peel, approximately 80 km west of Cambridge Bay Nunavut. Low-level aerial reconnaissance of the site area was conducted in order to assess the locations of all structures and debris requiring further investigation and to identify areas of archaeological potential. Lack of vegetation and sedimentation enabled surface examination of the facility areas to adequately assess for the presence of cultural materials. As requested, areas which will not be impacted during remediation were not examined. During the study two sites were identified and documented as per the *Nunavut Archaeological and Palaeontological Sites Regulations*.

PWGSC has fulfilled the requirements to indentify the potential for impact to heritage resources during the proposed remediation/reclamation of the PIN-E DEW Line site at Cape Peel. The AIA included the participation of Richard Angivrana and Gary Avalak from the local community of Cambridge Bay, who acted as bear monitors and participated in the identification and recordation of the heritage resource sites.

During the investigations two heritage resource sites, NgNj 1 and NgNj 2 were newly recorded. It is recommended that avoidance of NgNj 1 be required during the remediation process; however NgNj 2 is considered to be of limited significance and no further work is recommended. There were also several sites that, while not meeting the technical requirements to be classified as heritage resources, are cultural markers of a recent occupation as described in this report.

It is recommended that PWGSC have met their obligations to assess the potential for impact to heritage resources during the proposed Remedial Action Plan. It is also recommended that the newly identified site NgNj 1 be avoided during reclamation activities.

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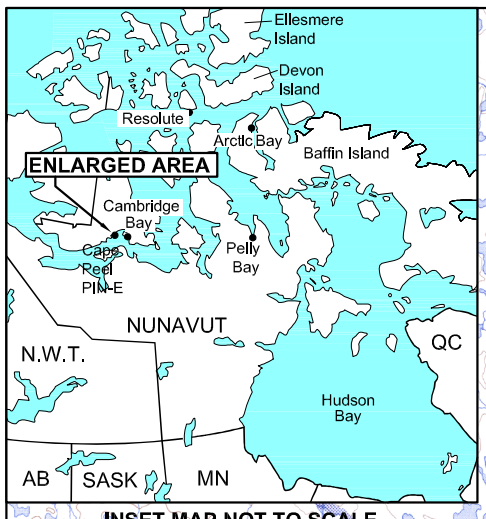
Low-level aerial reconnaissance of the site area was initially flown in order to assess the locations of all structures and debris requiring further investigation and to identify areas of archaeological potential. The AIA was intended to identify any artifacts or heritage resource areas that might be impacted by a remediation program and, as such, only those areas of previous and potential disturbance were assessed. Artifacts collected under Archaeological Permit (2009-023A) will be submitted to the collections repository at the Prince of Wales Northern Heritage Centre located in Yellowknife, Northwest Territories. The intent of this program was not to conduct a full AIA of the entire Cape Peel area. However, during traverses of the former DEW Line station some lands outside of proposed impacts were surveyed (Figure 1).

The amount of previous disturbance associated with the DEW Line site and lack of vegetation facilitated assessment of the facility areas and increased visual assessment for the presence and/or absence of cultural materials. As requested, areas that will not be impacted during remediation were not fully examined. Two previously unrecorded heritage resource sites were identified by the archaeologist during the program, which were documented as per the *Nunavut Archaeological and Palaeontological Sites Regulations*.



INSET MAP NOT TO SCALE

CB-36/77D
CB-39/77A, C, D
CB-39/77 A, C, D
CB-19/77 A
VICTORIA
SUSSEX HILLS
NUNAVUT
WELLINGTON BAY
DEASE STRAIT
Lemming Islets
Cape Enterprise
Tikigayok Pt
Duncan Island
Nicol Island
Norberg Islands
Cape Alexander
Cape Peel
Keyhole Lake
Oxford Bay
Starvation Cove
Musk-ox Lake
ISLAND

5 0 5
SCALE KM

LEGEND

PROJECT AREA

REFERENCE

TOPOGRAPHIC MAP O77D AND 077A OBTAINED FROM SoftMap. © 2002 HER MAJESTY THE QUEEN IN RIGHT OF CANADA. DEPARTMENT OF NATURAL RESOURCES. ALL RIGHTS RESERVED. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 13.

PROJECT

PIN-E DEW LINE SITE
CAPE PEEL

TITLE

PIN-E LOCATION

Golder Associates
Calgary, Alberta

PROJECT 09.1333.0018.8430			FILE No. 09133300188430A001	
DESIGN	BM	11/05/09	SCALE AS SHOWN	REV. 1
CADD	RML	11/01/10		
CHECK	BM	10/02/10		
REVIEW	DB	10/02/10		

FIGURE: 1

2. LOCATION, POTENTIAL IMPACTS, AND OBJECTIVES

2.1 Location

The PIN-E Intermediate DEW Line site is located at Cape Peel, Victoria Island 80 km west of Cambridge Bay, on Victoria Island, Nunavut. Cape Peel is the western entrance to Wellington Bay from the Dease Strait. The site area is characterized as being relatively flat with the abandoned site area being the highest point of land at about 60 m above sea level (Plates 1 and 2). The PIN-E site was constructed in 1959 and included a module train, warehouse, garage, fuel tanks, Inuit house and a Doppler antenna. In addition to the main site a beach landing area, gravel road linking various facilities and two airstrips, one earlier abandoned, were constructed. The site was deactivated in 1963 and has remained this way since.

Plate 1 Aerial photo of the PIN-E Intermediate DEW Line site facilities.

Plate 2 Aerial photo of the beach landing area showing roads, barrels and former location of POL tanks.

2.2 Potential Impacts

The potential impacts to heritage resources around the PIN-E site at Cape Peel are dependent upon the proximity of those resources to the remediation activities that will be conducted to remove the remnants of the former PIN-E site. Heritage resource sites are non-renewable resources that may be located at or near ground level or may be deeply buried. Prehistoric or precontact archaeological sites are those sites which contain features, artifacts or ecofacts reflecting the use of a given land base by people prior to European influences and technologies. Features are non-portable articles that indicate a human modification of the local environment such as hearths, pits, tent rings, stone cairns and Inuksuit. Artifacts are portable items that have been modified by people at some time in the past. These include such items as projectile points, stone flaking debris, and cut and modified bone. Ecofacts are naturally occurring items such as preserved plant remains or pollen that can aid in the interpretation of archaeological sites. Historic

archaeological sites include the features, artifacts and ecofacts relating to the past few hundred years of human occupation. These sites are typically identified by the presence of buildings or structural remains, but may include any site that has evidence of historic use of the landscape.

Alteration of the landscape can result in the damage or complete destruction of all or portions of historic resource sites. These alterations often involve the displacement of artifacts resulting in the loss of valuable contextual information or may involve the destruction of the artifacts and features themselves resulting in complete information loss. These losses are permanent and irreversible. Primary, secondary and tertiary impacts are possible with any new development. Remediation can be considered a new development in this context if it impacts previously undisturbed areas during operation.

Primary impacts include those disturbances resulting immediately from a project. The primary impact zone is the area within the remediation footprint including access roads, temporary work zones, borrow pits and dumps. Individual sites are likely to be affected to varying degrees if they are located within the development area. Artifact context is fundamental to interpretation of archaeological sites. By disturbing the context in which artifacts and features are recovered, interpretations of heritage resources sites and, ultimately, past lifeways are affected negatively.

Secondary impacts can occur when the support services or additional access required by development adversely affects heritage resources outside the primary target areas. The remediation project should have no secondary effect on heritage resources.

Tertiary impacts are the results of project induced changes in demography and land use patterns. Increased rates of intentional and unintentional impacts can be expected as a result of increased visitation to an area if the project were large enough to affect regional population bases. Tertiary impacts are anticipated to be very low for this project, especially because changes to the site through remediation will probably not affect the visitation rates.

The study detailed in this report is intended to identify areas of possible impact and to determine whether the current proposed project will disturb those heritage resources located in proximity to the development.

2.3 Project Objectives

The objective of the 2009 study at the PIN-E Intermediate DEW Line site located at Cape Peel is to ensure that heritage resources are not inadvertently impacted by the proposed clean-up and remediation project. The purpose of this AIA is to:

- conduct a pre-impact assessment of the proposed remediation areas;
- identify any archaeological sites within those areas (if present);
- make recommendations to CLEY and PWGSC to mitigate or avoid those sites;
- make recommendations on surveillance and monitoring;
- provide a cost estimate on implementing the recommendations during the construction phase; and
- prepare a draft Final Report to be reviewed by PWGSC, followed by a Final Report for distribution as required and submission to CLEY.

3. PHYSICAL AND CULTURAL SETTING

3.1 Environmental Context

An understanding of past environmental conditions and the environmental factors that shape human approaches to subsistence and settlement patterns enable archaeologists to not only locate sites, but also to provide more accurate interpretations of individual sites. The physical aspects of the environs (topography, drainage, climate and soils) as well as resource availability (flora, fauna, lithic materials and water) are prime criteria for the identification of site location and function. Assessments of the universal cultural activities of site location, travel within and through the area, and resource exploitation are key components of any archaeological site analysis.

The anthropological theory of environmental determinism suggests that, to a great extent, environmental factors condition human behavioural and cultural adaptations, or patterns of behaviour. The environment has likely influenced many of the activities that contribute to the character of the regional prehistoric record. All available environmental variables must be considered as indicators of prehistoric use of the landscape.

The regional environment influences where specific activities and occupation are located in a pattern of seasonal movements according to the availability of resources: a seasonal round. The variables of archaeological site distribution can be identified and combined into useful criteria for suggesting the potential of an environment to hold heritage resources that includes a wide variety of landforms frequently associated with coastlines and lake shores, river banks, eskers and kames, and bedrock knolls in Arctic environs. Distribution patterns partially reflect environmental opportunities presented to human groups as well as cultural preferences demonstrated by site location. Topography influences much human activity including travel, communication, resource catchments, dwelling locations and eventually constrains human activity areas to defined localities. Based on existing heritage resources, the environment is a key factor in human settlement patterns.

3.2 Regional Environment

Prior to contact with Europeans, the environment in which the people of North America lived strongly influenced their culture and economy. The people who inhabited the North took advantage of the seasons and all the resources that were available.

Victoria Island is mainly moraine covered low-lands and drumlin fields, with many raised beaches (Collignon 2005). The vegetation is typical of a tundra environment and consists of arctic willows, marshy lowlands and lichen on rocky outcrops. Inland small herds of musk-oxen and caribou as well as white foxes, wolves, ptarmigans and Arctic owls are found on the island; while seals and polar bears inhabit the coastal areas.

The PIN-E site area is characterized by hummocks, rolling hills and raised beaches compost of coarse grained gravel. The station facilities were constructed on a raised beach (Plate 3) sloping toward Dease Strait. During the study the only wildlife that was observed were a small heard of musk-oxen, very little vegetation was observed at this location.

3.3 Heritage Resources

Archaeology is the study of human history through the material remains of culture, now known as heritage resources. The ultimate goal in archaeology is to describe the cultures and events responsible for the creation and deposition of the remains at a given archaeological site. As such, archaeologists use material remains to determine the nature and age of cultural occupations at a site. Artifacts, ecofacts and features deposited into the natural environment, along with their inter-relationships, are the integral parts that make up an archaeological site. The Nunavut Archaeological and Palaeontological Sites Regulations (2003) define heritage resources as: “but not limited to, archaeological and historical sites, burial grounds, palaeontological sites, historical buildings and cairns.”

Plate 3 View north of PIN-E sites, in the background, from an intermediate beach ridge showing typical topography of the study area.

Predating the arrival of Europeans, precontact archaeological sites are comprised of artifacts, features and residues of native origin typically characterized by modified bone and stone, and stone structures. Historic sites are those structures, features, and objects of European influence that date back to contact with the Europeans but can also represent more recent activity of more than 50 years. Depending on the context, sites less than 50 years old may be considered to represent traditional land use and are identified to document continued use and occupation of an area to the present time. A key component of the historic period record are the sites, artifacts and affiliated resources relating to post-contact Aboriginal people's use of the landscape. These include both archaeological sites and objects such as standing and collapsed cabins, campsites, graves, and traditional sites and resources, such as special places, hunting and plant collecting areas, traplines and their associated remains, oral traditions and various documents. These latter

resources are usually identified through consultation procedures such as Traditional Use Studies (TUS) or community consultations.

Additionally, heritage resources include, as well as the sites where events took place in the past, all of the objects that they contain and any of the contextual information that may be associated with them and will aid in their interpretation, including natural specimens and documents or verbal accounts.

Heritage resources are non-renewable and are susceptible to alteration, damage, and destruction by construction and development activities. The value of heritage resources cannot be measured in terms of individual artifacts or biological specimens, rather the value of these resources lies in the integrated information which is derived from the relationship of the individual artifacts and fossil specimens, associated features, spatial relationships (distribution), and contextual situations. Interpretation of heritage resource materials, and the ability to interpret the significance of particular sites in a landscape, is based on an understanding of the nature of the relationship between individual archaeological and palaeontological materials as well as the sediments and strata within which they are contained. As such, removal or mixing of cultural or fossil bearing sediments results in the permanent loss of information basic to the understanding of these resources. As a result, heritage resources are increasingly susceptible to destruction and depletion through disturbance.

Similarly, tundra areas north of the tree line are characterized by extremely slow rates of soil development and sediment accumulation. Accordingly, at repeatedly occupied sites, there is little chance of distinguishing occupations relating to different periods within the 10,000-year record of human occupation in the region without recovering a diagnostic indicator. Some areas of high sediment deposition rates are present within the study area, but these are not the typical scenario.

The lack of temporally diagnostic artifacts, the absence of materials suitable for radiocarbon dating, and the natural mixing of shallow archaeological deposits serve to

limit the definition of the recognized prehistory for the region. In contrast, extant documents, records, and oral testimony provide a firmer basis for understanding the historic period of the region.

3.3.1 Cultural Chronology

Many of the archaeological materials in the project area represent human activity after the ice sheet receded about 8,000 years ago. Most heritage resources sites have been located on eskers in this regional environment (Noble 1981: 97) and Wright (1995: 121) refers to this early period, 8,000 to 4,000 B.C., as the Early Shield culture and suggests a direct development out of eastern and northern predecessors based on technological characteristics and trends.

Between approximately 6,000 and 3,000 B.P. lanceolate projectile points are seen as horizon markers. The Shield Archaic is replaced by the Arctic Small Tool tradition (ASTt) components, attributable to *Palaeo-Eskimo* peoples.

3.3.1.1 Arctic Small Tool tradition (4200 B.P. to 2800 B.P.)

There is presently little evidence to link Palaeo-Arctic tradition occupations to the Arctic Small Tool tradition (ASTt) occupations that succeed them. The ASTt represents a widespread cultural manifestation that covers all of the Canadian Arctic as well as parts of Alaska and Greenland. The ASTt is typically thought to date between approximately 4,200 and 2,800 B.P. (McGhee 1990). It includes the Denbigh Flint complex in northern Alaska, the Independence I culture of the Canadian High Arctic, the Inuvik Phase and the Pre-Dorset culture in Arctic Canada, and the Sarqaq culture in Greenland. It is thought that the ASTt relates to a separate migration of peoples from Siberia and does not appear to be related to the preceding Palaeo-Arctic tradition. As the name implies, the toolkit of the ASTt is comprised of lithic artifacts that are finely made and smaller than tools of similar function and age from elsewhere in North America. These include microblades and microcores, burins, gravers, small side and end scrapers, side and end blades, and

bipointed (arrow) and triangular (harpoon) projectile points (Wright 1995). In Alaska it appears to have developed into the cultures of the Norton tradition while in Canada it developed into the Dorset culture.

The Canadian Tundra Tradition (3,300 – 2,600 B.P.) has been described as a local variant of the ASTt which focused on caribou exploitation (Noble 1981). Sites of this cultural tradition are widespread, being represented in sites on Great Slave and Great Bear Lakes eastward to North Henik Lake near Hudson Bay. Characterized by large lenticular and oval bifaces, small triangular and side notched points, side blades, burin and microblade technology, these assemblages are most commonly associated with orange/pink and white quartzites. Native copper appears in some sites toward the end of this period.

Following the ASTt is the Taltheilei Shale Tradition (2,500 B.P. to 100 B.P.), seen as ancestral to development of the Athapaskan people (Noble 1981). Artifacts of siliceous shale originating on the eastern arm of Great Slave Lake are characteristic; although Taltheilei artifacts have also been identified in the Barrens south of Kugluktuk at Itchen Lake (Blower 2003). Lanceolate projectile points continue to be important in the tool assemblage but small corner and side notched points occur in the latter half of the tradition. The prominent biface and burin and microblade technologies of the preceding phase are notably absent.

3.3.1.2 Dorset Culture (2,500 B.P. to 1,000 B.P.)

The Dorset culture occupied the Canadian Arctic from 2,500 BP until at least 1,000 BP. (McGhee 1990). Best known for miniature carvings, Dorset appears to have been a more successful adaptation to the conditions of the north than the preceding ASTt cultures from which it developed. This is demonstrated by the huge area occupied by Dorset groups and by evidence that they had perfected winter hunting on the sea ice. Cooler conditions in the northern hemisphere around 3,000 years ago resulted in expansion of the sea ice and a shift away from terrestrial hunting of caribou and hunting of sea mammals from boats in open water to a procurement of sea mammals from coastal edges

and sea ice. This is evidenced in the archaeological record with a shift away from bow hunting to harpoon and spear hunting (McGhee 1990). Artifacts recovered from sites representing this period are more diverse and "reflect a richer and more secure way of life than that of earlier Palaeo-Eskimos." including the establishment of permanent winter villages (McGhee 1990).

However, when the people of the Thule culture arrived in the Canadian Arctic approximately 1,000 years ago, the Dorset culture had largely or entirely disappeared for reasons that are not well understood (McGhee 2001; Wright 1999).

3.3.1.3 Thule (1,000 B.P. to 400 B.P.)

The Thule tradition dates from approximately 1,000 to 400 B.P. and is derived from the Norton tradition in northern Alaska. More specifically, Thule grows out of the Old Bering Sea and Punuk traditions, which have numerous similarities to Thule cultural assemblages. These assemblages suggest subsistence based on maritime resources such as seals and whales that were hunted from kayaks or umiaks as identified by harpoon floats. Thule represented a new kind of adaptation to the Arctic environment, based on the hunting of large sea mammals in open water through the use of drag floats attached to the harpoon line. Large skin boats and the use of dogs to pull large sleds were other Thule innovations. Winters were spent in sometimes large communities of semi-subterranean houses, subsisting on a stored surplus obtained most typically by hunting bowhead whales. The introduction of Thule into the Canadian Arctic is noted by a distinct change in a number of cultural markers from the Dorset culture. The earliest Thule occupations currently recognized are on islands in the Bering Strait and exhibit an almost complete reliance on maritime resources; however, later sites demonstrate that both maritime and terrestrial resources were utilized (McGhee 1990). Climatic changes following the thirteenth century likely caused the Thule to modify their way of life into that of the various historic Inuit groups.

3.3.2 Historic Inhabitants

Historic use of the project area is identified with the 'Copper Inuit'. The traditional territory of the Copper Inuit extends from the Coppermine River east to the Perry River and the south coast of Banks Island south to Great Bear Lake (Damas 1984). The subsistence, economy and settlement pattern of the Copper Inuit was greatly influenced by seasonal fluctuations. In the spring they would leave their more sedentary villages along the coast to hunt and fish inland. Subsistence from late May until November was reliant on caribou, fish, fowl and small game common on the interior tundra. In the fall during the caribou migration hunting caribou was often the most dominant form of subsistence. The Copper Inuit would return to the coast in the fall to build villages for the winter; breathing-hole sealing was the most prevalent activity during the winter months. This method involved specialty trained dogs to locate the seals' breathing holes; each hunter would station themselves at a hole and quietly wait for a seal to come up to breathe (Damas 1984). Other resources that were occasionally used include polar bears in the winter and musk-oxen in the summer.

The largest grouping of Copper Inuit was during the winter months when they would gather in villages along the coast (more people was beneficial for breathing-hole sealing). Over the summer they split up into smaller groups and even individual nuclear families when subsistence was based on fishing, hunting small animals and foraging. In the late autumn many of these groups would reunite for the sewing period, when sewing their winter garments was the most important task (Damas 1984).

Although many of the characteristics described are similar with other Inuit groups there are some distinguishing characteristics that the Copper Inuit have. According to Damas (1984) aside form the territory that they inhabited, the Copper Inuit were also known for their wide use of copper; their distinctively tailored clothing; and their social and familial organization.

3.3.3 Heritage Studies

Prior to the current study of the PIN-E Intermediate DEW Line site at Cape Peel, no heritage resources sites were recorded in the Nunavut or Canadian Museum of Civilization database for this location. However, exploration of the region has been taking place throughout the past century and even prior to this with early explorers trying to find the Northwest Passage.

In the early 1900s researchers were travelling around the southern coast of Victoria Island learning about the geography of the land and studying the people who inhabited it. Two of the more well known researchers/explorers were Diamond Jenness and Vilhjalmur Stefansson who created a basis for further archaeological research in the region. The first organized archaeological survey was in the early 1960s. In 1963 the National Museum of Canada sent William E. Taylor out to identify any heritage resources in the vicinity of the DEW Line sites between Lady Franklin Point and Cambridge Bay, N.W.T. (Taylor 1972).

Across Wellington Bay, 50 km east from the study area, Iqaluktuuq is one of the most studied regions on Victoria Island. The Iqaluktuuq area (a place of many fish) is located along a short stretch of the Ekalluk River between Ferguson Lake and Wellington Bay, 50 km northwest of Cambridge Bay. Iqaluktuuq is a traditional hunting and fishing ground that is well known for the migrating caribou that pass through this area as well as its annual run of arctic char (Friesen 2002). Both sides of the river contain dense archaeological remains that reflect the continuous occupation of this region beginning with the Pre-Dorset tradition (1800 to 500 B.C.). William E. Taylor conducted three seasons of extensive fieldwork in this area and recorded 28 heritage resources (Friesen 2002). Jack Brink is also known for the work he did in this area, specifically regarding lithic reduction at the Cadfael site (Brink 1992). More recently Max Friesen has led a multi-year archaeological project of the Iqaluktuuq region (Kitikmeot Heritage Society).

To the west of the PIN-E DEW Line site a single archaeological site was recorded and mitigated in advance of the construction of the Cape Peel West Short Range Radar Station (Helmer 1989). The site, NgNl 1, consisted of a tight cluster of nine stone tent rings on an esker. NgNl 1 is approximately 20 km from the current study area.

4. METHODOLOGY

4.1 Field Inventory and Assessment

All field work was conducted under a valid Class II Archaeological Permit issued by CLEY. The field program focused on assessment of all areas of high and moderate archaeological potential within the disturbed DEW Line site, and the proposed borrow source locations. The purpose of the field investigation was to identify archaeological materials, document location and content and provide data to be used in the development of recommendations for future remediation programs. Inventory and assessment techniques followed established practices and consisted of the following:

- visual examination of the identified areas to determine the presence of such surficial features such as standing or collapsed buildings, dumps, cache pits, cabin foundations, etc. and exposed precontact cultural materials such as stone tool making debris and tools;
- visual examination of the identified areas to determine the presence of items of historical military interest;
- excavation of shovel tests (ca. 40 x 40 cm) to varying depths to determine the potential for subsurface precontact cultural remains if deposition is present;
- visual examination of bedrock exposures (if any) or gravels for precontact quarrying activity;
- excavation of either additional shovel tests or 1 x 1 m units for the purpose of identifying the distribution, density, and nature of cultural remains associated with sites identified through inventory procedures;
- documentation of the location (GPS coordinates), nature, size, and complexity of each identified site; and
- documentation of individual site features to record content, context, potential identity, and to provide information required to develop a mitigation program.

These results, along with updates and recommendations will be included in written submissions to CLEY as required by the Permit to conduct the AIA, and discussed with the Chief Archaeologist of Nunavut.

4.2 Heritage Feature / Structure Evaluation

Evaluations of heritage features and standing structures were to be completed for features/structures that are observed during the investigations. These evaluations would consider perceived heritage resource value and community cultural value as well as the predicted impact from the proposed program. In general, disturbed sites with limited cultural remains would be assigned lower archaeological resource values than undisturbed sites, large sites with large amounts of cultural material, complex sites, and multicomponent sites. Undisturbed multicomponent sites would generally be assigned the highest heritage resource value.

Community input will play a role in the evaluation of site value, and the inclusion of members of the local community on the field crew aided in the in-field discussions regarding site significance.

4.3 Detailed Archaeological Site Investigations / Mitigation

If required, mitigation of significant heritage resources sites may include a number of different options. Prior to evaluation of these mitigative options, the perceived value of the identified archaeological sites will be discussed with the PWGSC Project team to determine the feasibility of avoiding important sites. Only if site avoidance is not possible, will other mitigative measures such as collection and documentation, and controlled mapping/excavation be considered. In areas of no sediment deposition surface collection and mapping of artifacts and features may satisfy regulatory requirements for mitigation. Recommendations for excavation may include a controlled excavation mitigative plan and will specify the number of square metres and suggest locations for excavation units/blocks.

Overall mitigative options may be summarized by:

- collection and documentation undertaken at the time of the field assessment at all sites with low archaeological resource value;
- avoidance if feasible at all sites assigned high archaeological resource value;
- mitigative excavations which will be recommended at those sites assigned high archaeological resource value that could not be avoided by borrow source relocation; and
- a management plan for required mitigation relative to the proposed construction schedule will be discussed with the site project team.

4.4 Reporting

Analysis of collected artifacts includes cleaning, cataloguing, identification, inventory, and description of each individual piece for inclusion in the final report. GPS site information is provided for mapping relative to the former site structures at the site and to CLEY, but not included in the final versions of this report. Archaeological site maps, photographs, and artifact scans are prepared as digital files.

Upon completion of the field component and the artifact curation, a draft report was prepared. This final permit report on the archaeological studies will be forwarded to PWGSC for their review, and then on CLEY for their review. This report includes a project description, the environmental setting, the historical and archaeological context for the project area, field methodology, and the results of the field reconnaissance. The report includes both descriptive, as well as mapped data on the sites, artifacts, and features identified, as well as detailed information on the nature, content, and significance of the artifacts and features identified. Cultural material recovered has been inventoried, described, and discussed within the report text to aid in evaluation of scientific and interpretive value. All identified sites have been documented on appropriate site inventory forms.

If required, a summary of the findings will be prepared for inclusion in a screening document.

In general, the following workplan is followed:

- avoidance has been recommended if feasible at all sites assigned high archaeological resource value (this to include all constructed features: burials, tent rings, caches, hunting blinds, hearths);
- collection and documentation has been undertaken as a mitigative option of sites with low archaeological resource value as a method of protecting the heritage resource from future undocumented impacts due to increased personnel activity in the vicinity; and
- acceptable methods of mitigation are discussed with CLEY and the Territorial Archaeologist, and may lead to a recommendation for detailed mapping, collection and/or test excavations at those sites assigned high archaeological resource value that cannot be avoided by reclamation project.

A management plan for required mitigation, monitoring or surveillance relative to the proposed remediation will be developed as part of the contracted services deliverable to PWGSC. This includes site mitigation, additional survey of any project re-locates required due to site avoidance, and verification of those heritage sites located outside the proposed development activity area that should remain outside re-located areas.

4.5 Community Consultation

Consultation regarding the PIN-E Intermediate DEW Line site Phase III Environmental Site Assessment, Hazardous and Non-Hazardous Materials Audit, Geotechnical Evaluation, Remedial Action Plan is ongoing. Community meetings were held in regard to the Project in Cambridge Bay in January of 2010. The presentation included the results of this study, sites identified, and recommendation.

5. RESULTS

A search of the Canadian Museum of Civilization database yielded no information on previously recorded heritage resources sites at Cape Peel prior to conducting the AIA. As such, no revisits or information updates to existing sites was required.

The AIA assessment included all of the areas of moderate to high archaeological potential that has been disturbed by the PIN-E DEW Line site as well as areas identified as having potential for future borrow sources or dumps. The disturbed areas that were surveyed included the Station Area (Plate 4), airstrip, beach (Plate 5), barrel dumps, landfills (Plate 6) and all the existing roads and anywhere there was evidence of a bull dozer push or any other disturbance. Previously undisturbed areas that were examined included the periphery of all the impacted areas as well as several areas that were identified as potential borrow areas, landfills and landfarms for remediation activities (Plates 7 and 8).

During the survey two heritage sites were identified and recorded. The sites include a stone cairn, NgNj 1, and an isolated find, NgNj 2 which are described in more detail below. In addition to the heritage sites, a land use site consisting of the remains of three Inuit houses and a grave as well as two modern stone tent rings were observed. Although the structures have been removed from the beach, material culture left behind indicates that at least three Inuit houses were present on the beach approximately 300 m south of the former location of the POL tanks and beach landing area (Plate 9 and 10). Material culture observed includes domestic artifacts such as children's toys, flat glass, clothing, rubber garden hose, ceramic and plastic plate fragments, bed frame, container glass, an ulu (Plate 11), seal and bird bone as well as electrical wire, metal strapping, electrical switches and other unidentified artifacts from the DEW Line site.

Plate 4 View northeast of antenna, PIN-E DEW Line Site.

Plate 5 View north of barrels on the beach.

Plate 6 View east of Landfill 1 location.

Plate 7 View north of PIN-E site with potential borrow area in the foreground.

Plate 8 View east of potential borrow area off the west end of the runway.

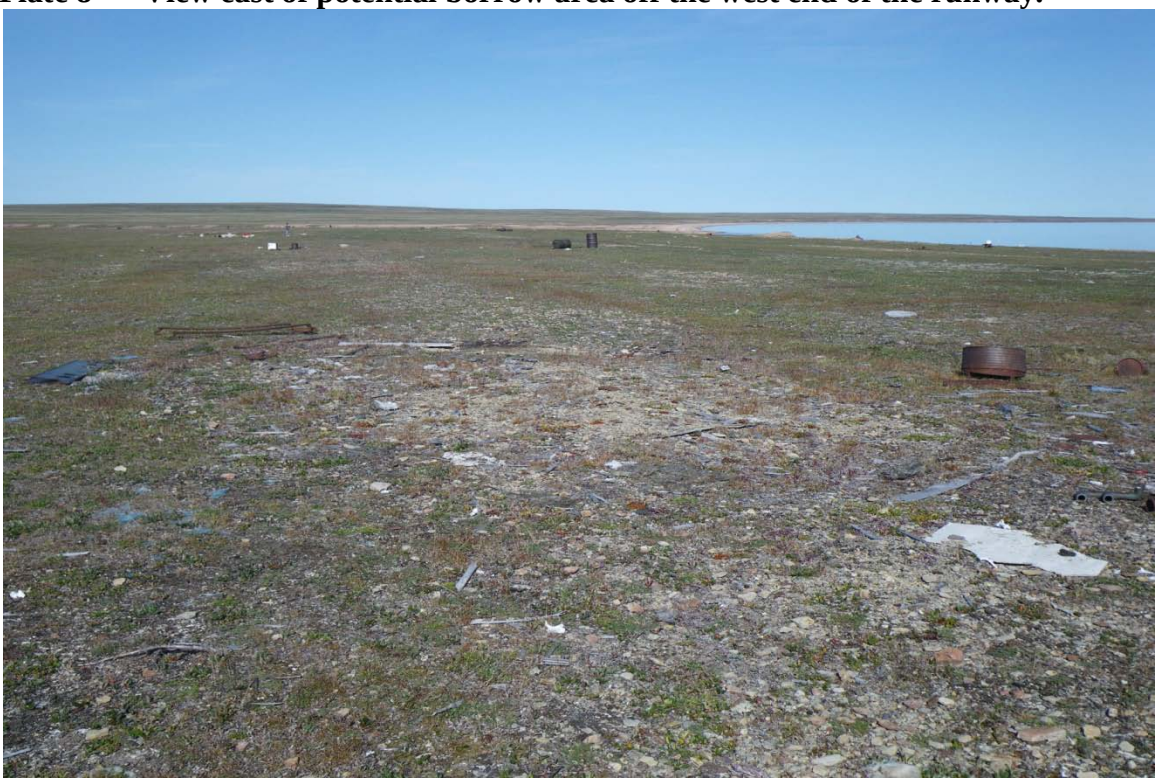


Plate 9 View east of former house location and general site area.

Plate 10 View west of former house location and general site area.

Plate 11 Ulu identified amongst cultural material.

The grave is located approximately 450 m southwest of the Inuit house remains on a beach ridge (Plate 12). The grave is marked with a wooden cross made of dimensional lumber and the coffin is partially exposed as the lid has collapsed and is only shallowly buried. The coffin is small, approximately 2 feet by 4 feet, and is made of plywood. Remains can be seen under the collapsed lid that appears to be immature rib bones. After recording the grave site Gary Avalak, who assisted in recording the grave, asked his mother Mary Avalak about the grave and she thought it might have been the grave of Alice Kaotalok who had lived in the area with her husband David and her parents. According to Mary, Alice has died of cancer and was buried around the same time as the operation of the DEW Line Site. Although this is a possibility, the grave appears quite small for an adult and may possibly contain the remains of a child.

Plate 12 View northwest of grave and surrounding terrain.

The two modern stone tent rings were located on the beach beside the river along the northeastern edge of the study area. The two tent rings are 3 and 5 m in diameter and are

made of seven and eight large stones respectively (Plate 13). Material culture around the two stone rings includes shotgun shells, plastic oil containers and food cans.

Plate 13 View east of modern tent ring.

5.1 Newly Identified Heritage Resource Site

5.1.1 NgNj 1

NgNj 1 is a stone feature site that is made up of a single stone cairn that was recorded on an intermediate ridge line (Plate 14). The cairn was recorded on the fourth beach ridge just below the location of the PIN-E DEW Line site. The cairn is made up of at least 14 flat stones with a diameter of 1 m (Plate 15). There was no additional cultural material observed around the stone feature. Although the area just north of the site has been previously disturbed by a bulldozer the site area has not. The stones also exhibit a lichen patterning that would indicate prolonged exposure and therefore is thought to predate the DEW Line Site. NgNj 1 is considered to be of moderate potential and it is

Plate 14 View north of NgNj 1 with PIN-E Site in the background.

Plate 15 Detail of stone cairn, NgNj 1.

recommended that any impacts to the site be avoided. At this time there are no plans to disturb NgNj 1 during the remediation activities.

5.1.2 NgNj 2

NgNj 2 is an isolated find site consisting of a single modified flake. The flake was surface collected on the second beach ridge approximately 230 m from the water (Plate 16). The flake is made of red quartzite and is relatively large (55 x 68 x 16 mm) with three flake scars on the dorsal side. The flake appears to be broken, missing the platform, and has been bifacially modified along both lateral edges and distal edge. The distal edge also appears to show signs of having been utilized. No additional cultural material was observed around the site area and four shovel tests were negative for cultural material. Due to the limited cultural assemblage, NgNj 2 is thought to be of limited significance and no further work is recommended.

Plate 16 View northeast of NgNj 2 site area.

6. SUMMARY AND RECOMMENDATIONS

The AIA of the PIN-E Intermediate DEW Line site conducted under Nunavut Permit 2009-023A produced the results discussed in Section 5 and outlined in Table 1. The disturbed nature of the site and lack of vegetation and sedimentation enabled a high visibility surface examination of the facility areas to adequately assess for the presence of cultural materials. As requested, areas which will not be impacted during remediation were not fully examined. During the study two heritage resource sites, NgNj 1 and NgNj 2, were identified and are documented as per the *Guidelines for Applicants and Holders of Nunavut Territory Archaeology and Palaeontology Permits* (Government of Nunavut 2003).

Table 1 Heritage Site Recommendations

Site	Type	Significance	Recommendations
NgNj 1	Stone cairn	moderate	Avoidance is recommended
NgNj 2	Isolated find	low	No further work is recommended

PWGSC has fulfilled the requirements to indentify the potential for impact to heritage resources during the proposed remediation/reclamation of the PIN-E DEW Line site at Cape Peel. The AIA of the PIN-E Site included the participation of Richard Angivrana and Gary Avalak from the local community of Cambridge Bay, who acted as bear monitors and participated in the identification and recording of the heritage resource sites.

The AIA identified two heritage resource sites, NgNj 1 and NgNj 2. The site NgNj 1 is considered to be of moderate significance and it is recommended that this site be avoided during remediation activities. NgNj 2, however, is considered to be of limited significance and no further work is recommended.

7. CLOSURE

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

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APPENDIX I

PHOTOGRAPH LOG

PIN-E AIA Photo Log

Number	Comment
09-023A photo 1	Aerial view of the northwest end of runway
09-023A photo 2	Photo of building foundation - DEW Line Site
09-023A photo 3	Photo of building foundation - DEW Line Site
09-023A photo 4	Photo of DEW Line building
09-023A photo 5	Photo of tower
09-023A photo 6	Photo of tower
09-023A photo 7	Photo of tower
09-023A photo 8	Photo of tower support
09-023A photo 9	Photo of tower - top
09-023A photo 10	Photo of tower - top
09-023A photo 11	Photo of tower
09-023A photo 12	View northeast from DEW Line site of Musk ox
09-023A photo 13	View northeast from DEW Line site of Musk ox
09-023A photo 14	Photo of can dump east of the DEW Line site on hill
09-023A photo 15	Photo of can dump east of the DEW Line site on hill
09-023A photo 16	Photo of can dump east of the DEW Line site on hill
09-023A photo 17	Detail of can dump
09-023A photo 18	Detail of can dump
09-023A photo 19	Photo of Musk ox skull
09-023A photo 20	View west of Landfill 4
09-023A photo 21	View south of tower from Landfill 4
09-023A photo 22	View south of tower from Landfill 4
09-023A photo 23	Control photo of shovel
09-023A photo 24	View north along Landfill 4 area
09-023A photo 25	View south along Landfill 4 area
09-023A photo 26	View south along road to Landfill 4
09-023A photo 27	View north along road to Landfill 4
09-023A photo 28	View south from Barrel Area A from freshwater Lake
09-023A photo 29	View south from Barrel Area A from freshwater Lake
09-023A photo 30	View east of Barrel Area A
09-023A photo 31	Photo of tower - bottom end
09-023A photo 32	Photo of bird's nest in DEW Line site building
09-023A photo 33	View south along fuel line from beach to site area
09-023A photo 34	View south along fuel line from beach to site area
09-023A photo 35	View north along fuel line from beach to site area - site can be seen in the background

PIN-E AIA Photo Log (continued)

Number	Comment
09-023A photo 36	View southeast of east end of runway with plane
09-023A photo 37	View south along river that is east of the site area
09-023A photo 38	View south along river that is east of the site area
09-023A photo 39	View south along river closer to the beach
09-023A photo 40	View north along river close to the beach
09-023A photo 41	Photo of "Toc" for breaking holes in ice
09-023A photo 42	Photo of grave
09-023A photo 43	Photo of grave and surrounding area
09-023A photo 44	View southwest of grave and surrounding area
09-023A photo 45	View northeast of grave and surrounding area
09-023A photo 46	Detail of grave
09-023A photo 47	Detail of grave
09-023A photo 48	Detail of grave
09-023A photo 49	Detail of grave
09-023A photo 50	View north of grave and surrounding area
09-023A photo 51	View north of grave and surrounding area
09-023A photo 52	Detail of grave
09-023A photo 53	View southwest of survey marker
09-023A photo 54	View southwest of survey marker
09-023A photo 55	View northeast along beach
09-023A photo 56	View northeast along beach area - along the second beach ridge
09-023A photo 57	View north of NgNj 1 showing site area
09-023A photo 58	View north of NgNj 1 showing site area
09-023A photo 59	View west of site area, NgNj 1
09-023A photo 60	View east of site area, NgNj 1
09-023A photo 61	View southeast of site area, NgNj 1
09-023A photo 62	Detail of stone cairn, NgNj 1
09-023A photo 63	Detail of stone cairn, NgNj 1
09-023A photo 64	Photo of bull dozer push close to NgNj 1
09-023A photo 65	Photo of bull dozer push close to NgNj 1
09-023A photo 66	View east towards Landfill 1 and Landfill 2
09-023A photo 67	View south east with barrel marking runway
09-023A photo 68	View northeast of two modern tent rings
09-023A photo 69	View southeast of modern tent rings with barrel dump in the background
09-023A photo 70	View southeast of modern tent rings with barrel dump in the background

PIN-E AIA Photo Log (continued)

Number	Comment
09-023A photo 71	Photo of a can associated with the modern tent rings
09-023A photo 72	View south east of modern tent ring area with barrels in the background
09-023A photo 73	View west of barrels from beach area
09-023A photo 74	View south along beach
09-023A photo 75	Photo of concrete foundation for POL tank
09-023A photo 76	View southwest of NgNj 2 site area
09-023A photo 77	View northeast of site area NgNj 2 - with barrel dump in the background
09-023A photo 78	Inuit house remains - first of three
09-023A photo 79	Detail showing shovel and flat glass etc
09-023A photo 80	Inuit house remains - first of three also showing surrounding area
09-023A photo 81	Ulu blade
09-023A photo 82	Inuit house remains - first of three also showing surrounding area
09-023A photo 83	Front forks of a trike
09-023A photo 84	Inuit house remains - two of three showing material culture
09-023A photo 85	Inuit house remains - two of three showing material culture
09-023A photo 86	Inuit house remains - two of three showing material culture
09-023A photo 87	Photo of toilet seat and flat glass
09-023A photo 88	Photo of oil barrels among domestic artifacts
09-023A photo 89	Inuit house remains, three of three
09-023A photo 90	Inuit house remains, three of three
09-023A photo 91	Washing machine left close to the beach
09-023A photo 92	Washing machine left close to the beach
09-023A photo 93	Washing machine left close to the beach
09-023A photo 94	Two oil barrels
09-023A photo 95	Misc piece of electronics
09-023A photo 96	Surrounding area of Inuit huts
09-023A photo 97	View east along the north side of the runway
09-023A photo 98	View east along the north side of the runway
09-023A photo 99	View east on west end of runway of potential borrow sources areas
09-023A photo 100	View east on west end of runway of potential borrow sources areas
09-023A photo 101	View south of proposed borrow pit west of the runway
09-023A photo 102	View northeast from just north of the runway, potential borrow area
09-023A photo 103	View northeast from just north of the runway, potential borrow area
09-023A photo 104	View north towards PIN-E Site of potential borrow source
09-023A photo 105	View southeast from north of the runway with plane in the background

PIN-E AIA Photo Log (continued)

Number	Comment
09-023A photo 106	View west of potential borrow sources north of runway
09-023A photo 107	Aerial view of freshwater lake and access road
09-023A photo 108	Aerial view of road, Barrel Area A and Landfill 4, north end of the site area
09-023A photo 109	Aerial view of PIN-E Site
09-023A photo 110	Aerial view of PIN-E Site
09-023A photo 111	Aerial view of beach area, PIN-E Site
09-023A photo 112	Aerial view of western end of beach area