


North American Tungsten Corporation Ltd.

MACTUNG PROJECT

2006 ARCHAEOLOGICAL INVESTIGATIONS

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December 2006

Yukon Archaeological Sites Regulations Permit 06-01ASR
Northwest Territories Archaeological Permit 2006-988

CREATING AND DELIVERING BETTER SOLUTIONS

POINTS WEST HERITAGE CONSULTING LTD.

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EXECUTIVE SUMMARY

Points West Heritage Consulting Ltd. was contracted by EBA Engineering Consultants Ltd. to conduct a preliminary archaeological assessment of the proposed MacTung Project near the Yukon/Northwest Territories border northwest of Macmillan Pass; the work was conducted for North American Tungsten Corporation Ltd in August, 2006. The primary objective was to determine if there was sufficient archaeological potential to require more detailed investigation once finalized development plans are available. Because potential for developments on both sides of the border were identified, archaeological permits from both territories were applied for and received: Yukon Archaeological Sites Regulations Permit 06-01ASR and Northwest Territories Archaeological Permit 2006-988. Jean Bussey directed the field investigations with the assistance of Brian Apland, of Points West, and Harold Dick of the Ross River Dena Council.

Since a number of development possibilities have been identified, this study has indicated which areas have sufficient archaeological potential to justify further archaeological investigation if selected during the final planning of the MacTung Project. Areas that would not require further work have also been identified, but it should be acknowledged that changes to development plans could result in a requirement for additional archaeological assessment.

In the Yukon, further work is required in the following areas if they are selected: vicinity of Mill #3; landforms between the waste rock storage area and upper tailings dam; and limited areas within or adjacent to the upper tailings pond.

In the NWT, further work is required along the northern portion of the tailings pond and between the two tailings dams if this alternative is selected. During this reconnaissance, the archaeological significance of previously recorded KhTg-1 should be assessed. Once a final location for the airstrip east of the NWT tailings pond has been determined, it will be necessary to assess the selected area and ground reconnaissance will likely be required.

If Mill #1 (NWT) or Mill #2 (Yukon) are selected, steps must be taken to ensure that cairns marking the Yukon/NWT border are not indirectly or directly impacted. From an archaeological perspective, either Mill #1 or Mill #2 are preferred over Mill #3 since the latter has some potential for archaeological sites. Disturbance has already occurred and there is existing access to Mill #2, thus, it is slightly preferred over Mill #1.

Regarding the two tailings pond locations, no preference can be identified with the information currently available. Although the NWT location is adjacent to a recorded site, it is near access and the majority of the area has low archaeological potential and was previously examined by an archaeologist, thus, there is slightly less potential for additional sites in the Dale Creek valley. There are a number of landforms with archaeological potential near the Yukon Creek upper tailings pond and since no previous archaeological investigation has been conducted, there are no recorded sites. A further consideration is the fact that the Yukon option has not been significantly disturbed and there is no permanent access; new access or associated facilities could impact areas that have not been considered in this assessment. Only one waste rock storage area was identified and although potential within the defined development area is generally low, adjacent areas have archaeological sensitivity.

It is predicted that any archaeological sites located in this project area would be small. Further, it is most likely that they would be characterized by sparse to moderate quantities of artifacts. However, because little is known of the archaeology of the region, any information that can be collected would be of value.

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1. INTRODUCTION

Points West Heritage Consulting Ltd. (Points West) was contracted by EBA Engineering Consultants Ltd. (EBA) to conduct a preliminary assessment of a proposed mine northwest of Macmillan Pass along the Yukon/Northwest Territories border. Known as the MacTung Project, the work was conducted on behalf of North American Tungsten Corporation Ltd. The primary objective of the 2006 work was to determine if there was sufficient archaeological potential to require more detailed archaeological investigation once finalized development plans were available.

Originally, proposed developments associated with the 2006 MacTung Project were to be limited to the Yukon side of the border and only a Yukon Archaeological Sites Regulations Permit was applied for and received (Permit 06-01ASR). Because of terrain constraints, Points West was later informed that some of the proposed mine infrastructure might be located on the NWT side of the border and a Northwest Territories Archaeological Permit was applied for and received (Permit 2006-988). Both permits were Class 1 since it was not expected that detailed reconnaissance would be required in 2006. Jean Bussey directed the field investigations, which were conducted in August, 2006. She was assisted by Brian Apland, of Points West, and Harold Dick of the Ross River Dena Council.

Since a number of development possibilities have been identified, this study has indicated which areas would require further archaeological investigation if selected during the final planning of the MacTung Project. Areas that would not require further work have also been identified, but it should be acknowledged that changes to development plans that identify new areas of potential use would likely result in a requirement for additional archaeological assessment.

Following this introduction, which includes a summary of archaeological legislation and types of archaeological investigation, is a brief discussion of the project and study area. References that provide more detailed information on various aspects of the study area are provided when possible. Section 3 contains the methodology. A summary of the areas examined and the results of the investigation are provided in Section 4. Conclusions and recommendations are included in Section 5, followed by a list of references cited.

1.1. Protection of Heritage Resources

Heritage resources, which include archaeological and historical sites, are non-renewal resources protected by legislation. The Government of the Yukon and Government of the Northwest Territories are responsible for protecting these resources.

In the Yukon, heritage resources are protected from disturbance under the Yukon Historic Resources Act, Yukon Archaeological Sites Regulations (YASR). The regulations that apply to archaeological sites and artifacts in the NWT include the Northwest Territories Archaeological Sites Regulations (NTASR) and the Mackenzie Valley Land Use Regulations (MVLUR).

In the Yukon, historical resources include cabins, caches, graves, camps, other man-made structures and features or objects that have been abandoned and are more than 50 years of age. Archaeological sites are generally pre-contact and consist of the remains of ancient camps, hearths

and stone tools and debris. Palaeontological resources are the remains of extinct plants and animals, such as fossils, and are also protected under the Act. More information on the Yukon Historic Resources Act and YASR can be found at www.yukonheritage.com.

In the NWT, as defined in the NTASR, archaeological artifacts are *any tangible evidence of human activity that is more than 50 years old, in respect of which an unbroken chain of possession cannot be demonstrated.* An archaeological site is defined as a location where an archaeological artifact is found. Under the Mackenzie Valley Resource Management Act "heritage resources" are defined as *archaeological or historic sites, burial sites, artifacts and other objects of historical, cultural or religious significance, and historic or cultural records.* Additional information can be found on the Prince of Wales Northern Heritage Centre website at pwnhc.learnnet.nt.ca. Thus, although the definitions vary slightly in the two territories, both the Yukon and NWT consider all evidence of past human activity to have value.

In both the Yukon and NWT, archaeological permits are required to conduct archaeological investigations. The NTASR states: *No person shall search for archaeological sites or archaeological artifacts, or survey an archaeological site, without a Class 1 or Class 2 permit.* It also states: *No person shall excavate, alter or otherwise disturb an archaeological site, or remove an archaeological artifact from an archaeological site without a Class 2 permit.* In the YASR, it is stated that: *no person shall survey and document the characteristics of archaeological sites without a Class 1 or Class 2 permit;* and further states that: *no person shall excavate, alter, or otherwise disturb an archaeological site, or remove an archaeological object form an archaeological site without a Class 2 permit*. Further, in both territories if heritage resources are discovered, all work in the vicinity should cease and the relevant minister/government department must be notified.

1.2. Types of Archaeological Studies Required

All archaeological studies that involve fieldwork must be conducted by a qualified archaeologist holding a Yukon or NWT archaeological permit. Under the regulations in both territories, qualified archaeologists can be granted two types of archaeological permits. Class 1 permits entitle the holder to survey and document the characteristics of an archaeological site in a manner that does not alter or otherwise disturb the site. Class 2 permits entitle the holder to: a) survey and document the characteristics of an archaeological site; b) excavate an archaeological site; c) recover archaeological artifacts from a site; and, d) otherwise alter or disturb an archaeological site.

There are a number of different types of archaeological investigations. Prior to conducting detailed field work, archaeological overview assessments may be completed to determine the potential for sites. Such studies involve background research based on a variety of disciplines that contribute to the determination of archaeological potential and may involve some level of preliminary field investigation. The amount of background research may vary depending on the size of the development area and whether or not preliminary field reconnaissance was conducted. Preliminary reconnaissance can be limited to an area overflight that assist in terrain identification or can involve varying levels of ground work; an archaeological permit is required for any field investigations.

The next level of study, which involves detailed field investigations, is commonly referred to as an archaeological inventory or survey and involves ground reconnaissance. The objective of this phase of study is primarily to identify and record archaeological/heritage resources; such inventory is conducted under an archaeological permit.

If the work being conducted is development driven it is usually necessary, either as part of the inventory or as a separate study, to determine if archaeological resources are threatened by impact. Generally, it is also necessary to assess any sites that are threatened; again, this may be part of the inventory, part of the impact assessment and/or a separate study, depending on the circumstances and timing of the project. Subsurface testing is generally required to assess sites, while impact can be determined primarily on the basis of location, in conjunction with the type, degree and extent of the disturbances associated with the proposed development. Any activities that may involve disturbance to a site must be conducted under a Class 2 archaeological permit.

If sites are threatened by development activity, it is the responsibility of the archaeologist to recommend viable mitigation measures. These are measures that will eliminate or ameliorate the impact of archaeological sites. The mitigation recommendations are usually submitted to the Yukon Heritage Resources Unit or Prince of Wales Northern Heritage Centre for approval. The preferred mitigation option is avoidance, but the relocation of a development or portion of a development is not always feasible and might not protect the site in the long run. If complete avoidance is not possible, there are a number of protection options that can be applied under the right circumstances. For example, a site may be buried under a protective layer of material or fenced to protect it from accidental impact during the construction phase of a project. However, when dealing with the intensive development activity associated with mines, mitigation commonly involves the collection of data, including artifacts, from sites in advance of any land-altering activity.

Mitigation through data collection may be limited to detailed recording, mapping and the collection of surface artifacts or may require the excavation of a portion of the site or the entire site area. Regardless, a Class 2 permit is required before initiating any data recovery. An advantage of mitigation is that the artifacts and data collected are available for future study when analysis techniques may have improved. An archaeologist, even under permit, only has the artifacts on loan; all collected specimens must be submitted to an approved repository upon completion of analysis. Currently, artifacts are submitted to Yukon Heritage Resources Unit in Whitehorse or the Prince of Wales Northern Heritage Centre in Yellowknife. Other forms of mitigation undertaken during or after the construction process, such as surveillance to protect sites or monitoring to discover deeply buried sites, may also be recommended.

There is an official Canada-wide grid system, known as the Borden System that is used to identify archaeological sites based on their location (Borden 1952). It employs a four letter (two capital letters and two small case letters) designation followed by a number. The four letters represent a specific area within the grid and the letters are assigned consecutively as sites are found. Thus, the designation KhTg-1 refers to the first site found in the NWT portion of the MacTung project area. The Borden and site numbers are assigned by the Archaeological Sites Office of the Canadian Museum of Civilization (CMC). Depending on its size, a project area can contain more than one Borden designation.

2. PROJECT DESCRIPTION AND STUDY AREA BACKGROUND

The MacTung Project is located near the Yukon/NWT border northwest of Macmillan Pass (Figure 1), which is on the route of the historic Canol Road to Norman Wells. Macmillan Pass is situated in the east-central portion of the Yukon approximately 400 km (250 miles) from Ross River and about 370 km (230 miles) from Norman Wells.

2.1. Project Description

The ore body of interest to the MacTung Project is located on steep, unstable slope near the height of land on the Yukon side of the border and was not examined by Points West. A number of possible development areas have been identified in the Yukon, including two possible mill locations, a tailings pond that consists of an upper and lower section and a waste rock storage area. One proposed mill location (Mill #2) is on bare rock in an area that was previously disturbed; the current camp is located on this extensively modified landform. The other proposed mill (Mill #3) is located near the northern edge of a small upland valley, referred to as the Yukon Creek valley for the purposes of this study. The proposed tailings pond is also in this valley, south of the mill site, as is the waste rock storage area; the latter is partly on the north slope west of Mill #3. Points West is not aware of any previous archaeological investigation in the Yukon portion of the MacTung project area.

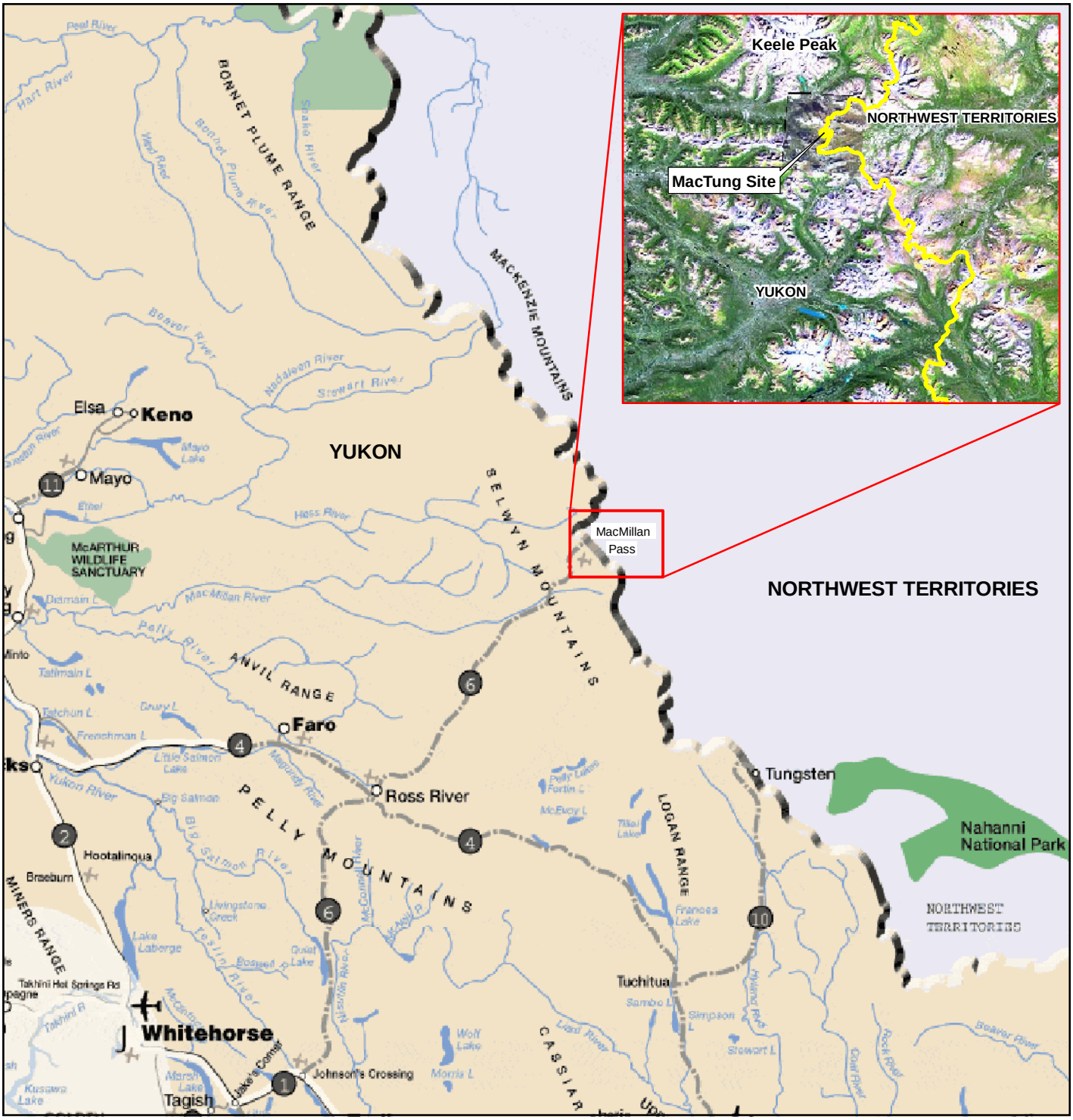
The existing road to the 2006 camp and work area approaches from the NWT and separates from the Canol road approximately 10 km to the east. Near the camp, the road crosses disturbed terrain or ascends/descends steep slope. Potential developments on the NWT side of the border include a mill and residence (Mill #1) and a tailings pond. The proposed tailings pond is located on Dale Creek, a tributary of the Tsichu River. Similar developments in the NWT had previously been examined for archaeological resources with one site, KhTg-1, recorded near the northern edge of the proposed tailings pond, which is similar if not identical to the inundated area identified in 2006.

At the time of the 2006 field investigations, the specific areas of development had not been finalized and a number of possible alternates were examined to varying degrees. Once final development areas have been defined, it is likely that fewer areas will be threatened and that less archaeological follow-up will be required than is proposed in this report.

2.2. Biophysical Summary

EBA was contracted to conduct the necessary environmental studies for the MacTung Project. In 2005, a wildlife baseline study was initiated and further work was conducted in 2006, but the results are not yet available. Earlier studies conducted in the late 1970s and early 1980s suggested that moose, woodland caribou, Dall's sheep, and grizzly bear were the primary species of interest in this area (EBA 2006). It should be acknowledged that the study area for the wildlife study is broader than that examined for archaeological resources, since animals are mobile and move seasonally while archaeological sites are location specific.

In 2005, moose were sighted in riparian willow, scrub birch and open spruce communities in river and tributary valleys (EBA 2006). No woodland caribou were sighted in 2005, but fresh



LEGEND

Site Location

N
W
E
S

NOTES Landsat TM imagery Earthsat acquired Sept,17, 1995
Bands 432 enhanced

MACTUNG

Location of Study Area

PROJECTION: UTM Zone 9		DATUM: NAD83	
0 5 10 20 30 40 Kilometres			
FILE NO.: 1200163_Arch_Figure1			
PROJECT NO.: 1200163.008	DWN: TJS	CKD: JB	REV: 0
OFFICE: EBA-VANC	DATE: February 2006		

EBA Engineering Consultants Ltd.

Figure 1

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tracks and trails were observed. The tracks were observed at elevations ranging from 1300 m to 1650 m. Within the study area, caribou move from the valleys to higher elevations in spring, reside in alpine/subalpine areas between June and October, and then return to lower elevations for the winter, thus, are near the MacTung project area during the summer (EBA 2006). Although no Dall's sheep were noted in 2005, they are known to occupy the Mackenzie Mountains and have been sighted during previous studies in this region. Grizzly bears occupy much of the Yukon and NWT, including the Mackenzie Mountains, and are considered common (EBA 2006). Fresh grizzly bear sign was documented in 2005. Bears utilize alpine areas intensively in June and July, then shift to subalpine areas in August, but may alternate between the two zones until the end of September (EBA 2006). Winter denning in the alpine is typical, but can also occur in subalpine and forest environments. The MacTung project area is a suitable habitat for grizzly bears (EBA 2006).

The other species located during the EBA survey include the Common Raven, Ptarmigan, wolf, red fox and beaver. Raven, of course, have a broad range of habitats. Ptarmigan tend to prefer valleys with suitable buds and twigs. Beaver require a source of water suitable for their dams, lodges and food caches and are found along rivers in this region. Wolves and fox are found in a variety of environments. Other species that might occur in the region include Peregrine Falcon, wolverine and Short-eared owl (EBA 2006). Ground squirrel signs were encountered by the archaeological crew during their 2006 ground reconnaissance and a black wolf was seen from the air.

The region is characterized by rugged mountain terrain, which forms part of the continental divide and are known as the Mackenzie Mountains. Considered a northern extension of the Rocky Mountains, the region includes some very high peaks. Climatic conditions vary with elevation and vegetation varies in response, with primarily alpine and subalpine open woodland zones. Barren talus slopes are also evident. The region was glaciated during the last ice advance and numerous glacial features have been identified. Permafrost is discontinuous (Environment Canada 2000). The headwaters of the Hess River are evident on the Yukon side of the border and the headwaters of the Keele River are present in the NWT.

Although the majority of the MacTung Project is situated in an alpine environment (dominated by grasses, lichen, moss and small shrubs) or on rock-scree slopes, extensive stands of shrub communities are evident nearby, including within both the lower Yukon and NWT tailings ponds. Shrub birch and willow appear to be dominant and are dense (EBA 2006). The nearest settlements are Ross River in the Yukon and Norman Wells in the NWT.

2.3. Cultural Summary

Ethnographically, the areas around Macmillan Pass were utilized by the Upper Pelly Indians (Yukon), associated with the Kaska, and the Mountain Indians (NWT). This area would only have been used periodically by either group. The Mountain Indians originally inhabited the eastern slopes of the Mackenzie Mountains east to the west side of the Mackenzie River. Most of the Upper Pelly group were massacred by the Mountain Indians around 1886, likely prompted by competition for furs. By the 1900s, the Mountain Indians were hunting, trapping and fishing in the upper Hess, North and South Macmillan and Ross rivers. They utilized a number of trails to access Yukon posts for trade, one of which later became the Canol Road (Greer 1982).

The reader is referred to Denniston (1966), Gillespie (1981), Greer (1982), Honigmann (1964, 1981) and McClelland and Denniston (1981) for more detailed information on the Upper Pelly and Mountain Indians. As Greer (1982) indicates, there is little information on the Upper Pelly and virtually nothing is known on the hunting and fishing practices that may have been carried out in the Macmillan Pass areas.

Construction of the Canol Road (for Canadian Oil) and pipeline resulted in an influx of people and money. It was undertaken by the United States army during World War II and was conceived following the Japanese attack on Pearl Harbour in December 1941. The objective was to ensure a supply of oil from Norman Wells for the Pacific forces. The Canol Road runs from Norman Wells to Whitehorse via Ross River. The project was initiated in 1942 and abandoned in 1945. Most of the pipe was salvaged, but all other equipment, including graders, trucks and camp structures were left behind (Hanks et al. 1993). The Canol Road was responsible for opening up the area to increased use and continues to provide access. Current activities in the Macmillan Pass area include hunting, both individual and with guide outfitters, mineral exploration and recreation.

2.4. Archaeological Background

Little archaeological investigation has been conducted in this region of the Mackenzie Mountains. Prior to the 2006 investigations by Points West, four previous archaeological studies were conducted in the general vicinity, including one in the NWT portion of the MacTung project area.

2.4.1. Previous Yukon Study

In 1981, two studies were conducted as one project. Ruth Gotthardt directed the North Canol Road impact assessment and Sheila Greer conducted a regional archaeological inventory of the Yukon Macmillan Pass area; Greer (1982) prepared the final report. The former study area consisted of a corridor along the existing road between Ross River and Macmillan Pass, which represents the northern portion of the Yukon section of the Canol Road. The objective of this study was to identify sites threatened or impacted by the existing road. The regional study area consisted of an 11,000 square kilometre area that included Macmillan Pass. This project was initiated because of a need for resource data for planning and assessment purposes (Greer 1982). Greer's (1982) report provides a good summary of the geological, glacial, paleoenvironmental, biophysical and archaeological characteristics of the general region; readers are referred to this report for more detailed information.

Fifty-five archaeological sites were recorded by Greer and Gotthardt: one historic and 54 prehistoric, some of which also included historic material. Two-thirds of these sites were small or very small with sparse archaeological material. Nearly half of the sites were associated with lakes, including all but one of the large sites, however, emphasis was placed on such water bodies. The larger sites are suggested to represent family hunting and fishing base camps. Most archaeological deposits were encountered beneath a layer of White River Ash (dated to 1250 years Before Present [BP]). Greer suggested that not enough work was undertaken in the high plateau and mountain top areas and recommended further work (Greer 1982).

The nearest Yukon sites to the MacTung project area are KgTg-1 and KgTg-2 on the upper portion of the South Macmillan River; the closest is approximately 15 km distant. KgTg-1 is located on a knoll on the side of the narrow valley bottom. The site is small in area, but testing yielded a lanceolate point base and 262 medium and small flakes and fragments. Four lithic materials are represented: black and various grey cherts and/or grey silicified sedimentary materials. The site is interpreted as a possible small hunting camp and/or a lookout and chipping station (Greer 1982:42).

Further south is KgTg-2 on the edge of a terrace overlooking the river. Another small site, it predates the White River ash fall. A total of 29 pieces of lithic were recovered, including large, medium and small sized flakes, a possible exhausted core and blocky pieces of core shatter. Only one material type is represented, a pale green chert. This site is interpreted as a possible hunting camp and/or lookout and chipping station (Greer 1982:42). These are the types of sites that it is predicted would most likely occur within the MacTung project area.

2.4.2. Two Previous Northwest Territories Studies

Portions of two projects have involved work in the general region on the NWT side of the border. The most recent project is discussed first.

In 2005, Tom Andrews of the Prince of Wales Northern Heritage Centre in Yellowknife conducted a study directed toward locating potential ice patch sites, locations where the retreat of glaciers has exposed archaeological material (Andrews, pers. comm. 2006). Two such sites were discovered in the eastern Mackenzie Mountains, but are well removed (over 20 km) from the MacTung project area; however, potential for ice patch sites does exist in the vicinity. A final report is not yet available, but site records indicate that KfTe-1yielded a spirally-fractured caribou bone and has high potential for additional material, while KhTe-1 consisted of a scatter of 13 wood fragments and a single piece of cut caribou antler (NWT Cultural Places Program 2006).

The Canol Road was also subjected to archaeological and historic assessment in the NWT. In 1989, a preliminary architectural and archaeological survey of the road was conducted from Norman Wells to the Yukon border. Six sites associated with the US Army were examined as were 47 indigenous pre-European contact, contact and post-contact sites. Evidence of the former consists of a base camp, pump stations, road maintenance camps and emergency shelters. Evidence of the latter includes hunting stands, camps, trails, quarries and sheep fences (Hanks et. al. 1993).

The nearest recorded archaeological site in the NWT, KhTf-1, is west of Mile 222 camp and airstrip (nearest historic site) and is a traditional site consisting of broken Athapaskan-type snow shoes representing recent Dene use of the region. The site is located on an esker-like feature on the south side of the Tsichu River and Hanks (et. al. 1993) indicates there is potential in the vicinity for additional archaeological sites. All other sites associated with this Canol Road project are greater than 20 km from the MacTung project area. Traditional and archaeological sites and trails could occur in the MacTung project area.

2.4.3. Previous Study in the MacTung Project Area

In 1983, Stan Van Dyke conducted an archaeological inventory of the MacTung Project, which included investigations on both sides of the Yukon/NWT border. The development areas examined in 1983 included a mine portal, milling site, new and improved access roads, a water supply line and pump stations, an airfield, a tailings pond and lines, and a camp. The ore body located beneath Mount Allen is in the Yukon, but the proposed facilities required for mining and processing were in the NWT. Areas that were already disturbed at the time these archaeological investigations were conducted included the camp (not the same as currently in use), the existing access road, a number of tote roads, several dugouts and similar features. The 1983 investigations involved foot traverses of the proposed road, the perimeter of the tailings pond, the area of the milling plant and the site of the proposed pumping station on nearby Cirque Lake. Areas that were not defined on the ground were subjected to a more generalized assessment (Van Dyke 1984).

Ground reconnaissance included examining exposures and shovel testing on landforms that were characterized by archaeological potential, but lacked natural exposures. Unfortunately, the report does not detail the locations that were tested, thus, it is not possible to eliminate previously examined areas. One archaeological site was recorded. It is located on a knoll-like feature on the north side of the proposed tailings pond in the Dale Creek valley. Three artifacts were collected from the exposed area of the site. The lithic material of one artifact was similar to basalt and may be an argillaceous shale and the other two were greywacke, both of which Van Dyke (1984) indicated are available locally.

Van Dyke (1984) identified a second possible archaeological site, but because it was outside of his project area, it was judged not to be of concern. In his study, he indicated that the proposed extension and upgrading of the airfield and the Canol Road between Mile 222 and the proposed access road could impact potentially significant historic resources; the airstrip was subsequently relocated (Van Dyke 1984:12). No mapping of the revised location was included in the report. Van Dyke further determined that should prehistoric sites exist, they would be small, non-residential sites, would be few in number and would be associated with well defined terrain features. The recorded site, KhTg-1, was judged to be of limited value other than to indicate sites are present in the region and further work was not recommended. Van Dyke (1984:14) also stated that KhTg-1 was not examined in any detail and that two similar landforms were of archaeological interest suggesting that they were not tested.

3. METHODOLOGY

The primary objective of the 2006 archaeological investigations was to determine if there was sufficient archaeological potential in the MacTung project area to justify additional archaeological reconnaissance. Because of the small size of the project area, the emphasis was placed on aerial and ground reconnaissance and only limited background research was conducted; the emphasis in research was on past archaeological work in the region. This plan permitted detailed examination of the various landforms within proposed development areas, but was not intended to include subsurface testing, which is why only a Class 1 permit was obtained in both the Yukon and NWT.

Prior to conducting any ground reconnaissance, a series of low and slow helicopter overflights were completed. Most proposed development areas within the Yukon portion were characterized by heavy vegetation cover, while Mill #2 was located in a disturbed upland area. The tailings pond in the NWT was also characterized by heavy vegetation cover and Mill #1 was in a rugged, upland area that was typified by good exposure. The objective of the helicopter overflights was to determine if any landforms were evident that had sufficient archaeological potential to justify ground reconnaissance.

Points West was provided recent development plan maps at a scale of 1:12,500. The mapping was excellent and showed contours, water bodies, possible development area boundaries and contained a UTM grid and reference points. Points West was also provided with a map showing the developments as proposed in 1983 when Van Dyke (1984) conducted his archaeological assessment (see above Section 2.4.3). When reading the Van Dyke report, the descriptions provided agreed with the developments as shown on this map. The mill/residence and tailings pond located in the NWT and examined by Van Dyke appear to be essentially the same as provided to Points West in 2006. The existing access also appears to be that discussed by Van Dyke. It should be noted that the camp in Van Dyke's time is different; the 2006 camp is within the proposed location of Mill #2 in an extensively disturbed area that has been leveled and contains a number of structures and work areas. The 1983 camp was northwest of the bend in the access road on the north side of the Dale Creek Valley.

3.1. Archaeological Potential Determination

Each archaeologist has a slightly different way of assessing archaeological potential, but most use essentially the same criteria. As a general rule, the more criteria that combine in any particular location, the higher the archaeological potential identified. Factors or criteria that are considered in the assessment include:

- locations near or similar to those containing previously recorded archaeological sites
- flat to gently sloping, well drained, elevated landforms adjacent to extinct or extant streams, rivers, lakes or marshes, including locations near strandlines, deltas and beaches associated with proglacial and post-glacial lake levels
- proximity to animal or plant food resources
- proximity to wood or other fuel for heating and cooking
- proximity to possible and known travel routes (both animal migration corridors and human travel routes, such as passes)

- locations with a view of surrounding areas (both for sighting game and defense)
- proximity to bedrock exposures in geological formations suitable for stone tool production (quarries)

Ratings that are commonly used include low, moderate and high archaeological potential. Occasionally, there are landforms that appear to have low-moderate (not quite low, but not quite moderate either) or moderate-high archaeological potential, such as was the case with one area in the NWT portion of the MacTung project area. The definitions for low, moderate and high archaeological potential are provided below:

Low potential areas are locations and/or landforms that are waterlogged, semi-waterlogged, or moderately to steeply sloped, but other factors must be considered as well. For example, within a sloped area, the presence of bedrock outcrops could result in an assessment of sufficient archaeological potential (that is, low-moderate to moderate) to justify ground reconnaissance based on potential for rock veins that may have been used as a source for stone tools. The interior of large undulating landforms with little relief, terrain typified by boulder fields and unstable scree slopes are also judged to have low archaeological potential. Low potential areas may contain sites, but the frequency and visibility of such sites is expected to be low.

Moderate potential areas include the interior of large, relatively level and elevated landforms, minor benches or raises within large landforms and locations at some distance from water, but with a strategic viewpoint or protected location. Landforms or locations that are accessible along potential travel routes (such as a pass or series of discontinuous esker remnants) are also judged to have moderate archaeological potential.

High potential areas are locations that are elevated, level and well drained and are near a source of water (extinct or extant). Although not present in this area, landforms such as eskers, even sections that are not near water, are judged to have high potential since they served as travel routes (human and animal), provide wildlife habitat and often contain cobbles of stone suitable for tool manufacture. The shores of medium and large lakes are judged to have high potential unless there are widespread, waterlogged deposits or continual slope. The banks of well defined creeks and rivers, especially near a confluence, are also examples of locations generally assessed as having high archaeological potential, except when located in upland or sloping areas where potential would be lower (that is, low to moderate).

3.2. Archaeological Ground Reconnaissance

Most landforms suggestive of sufficient archaeological potential to justify ground reconnaissance were generally restricted in area. As a result, the three person archaeological crew walked a series of traverses that covered most of each of these areas. On the narrow ridges, traverse spacing was generally less than 5 m. On wider benches, spacing ranged from 5 m to 30 m in an effort to locate areas with some exposure, since shovel testing is not possible with a Class 1 permit. Only two traverses were undertaken in the low saddle between the Yukon and NWT because no development was proposed. Any natural exposures encountered were examined, but these were limited in size and number and the lack of artifacts does not preclude potential for sites. Each location examined on the ground was identified by GPS co-ordinates and/or plotted on the 1:12,500 scale field map; two locations were not examined and are discussed in Section 4.

4. RESULTS OF ARCHAEOLOGICAL ASSESSMENT

With the exception of a large hill located between the two tailings dams in the NWT and the "possible airstrip" to the east, a portion or the entirety of all landforms judged to have sufficient archaeological potential to justify ground reconnaissance were traversed on foot. In addition, some areas with low potential were examined in the process of accessing the more sensitive landforms. Provided below is a discussion of the areas examined and the results of the archaeological investigations. It should be noted that investigations were primarily limited to proposed development areas although if well defined landforms were located immediately adjacent, they were also examined.

4.1. Areas Examined During Ground Reconnaissance

Because the majority of the project area was suggestive of low archaeological potential, most of the landforms with moderate or greater archaeological potential were traversed on foot in the hopes that exposures would be evident. Although there were some natural exposures and ground squirrel "diggings" have created disturbances on many of the landforms walked, this was not considered sufficient to determine whether or not archaeological sites are present.

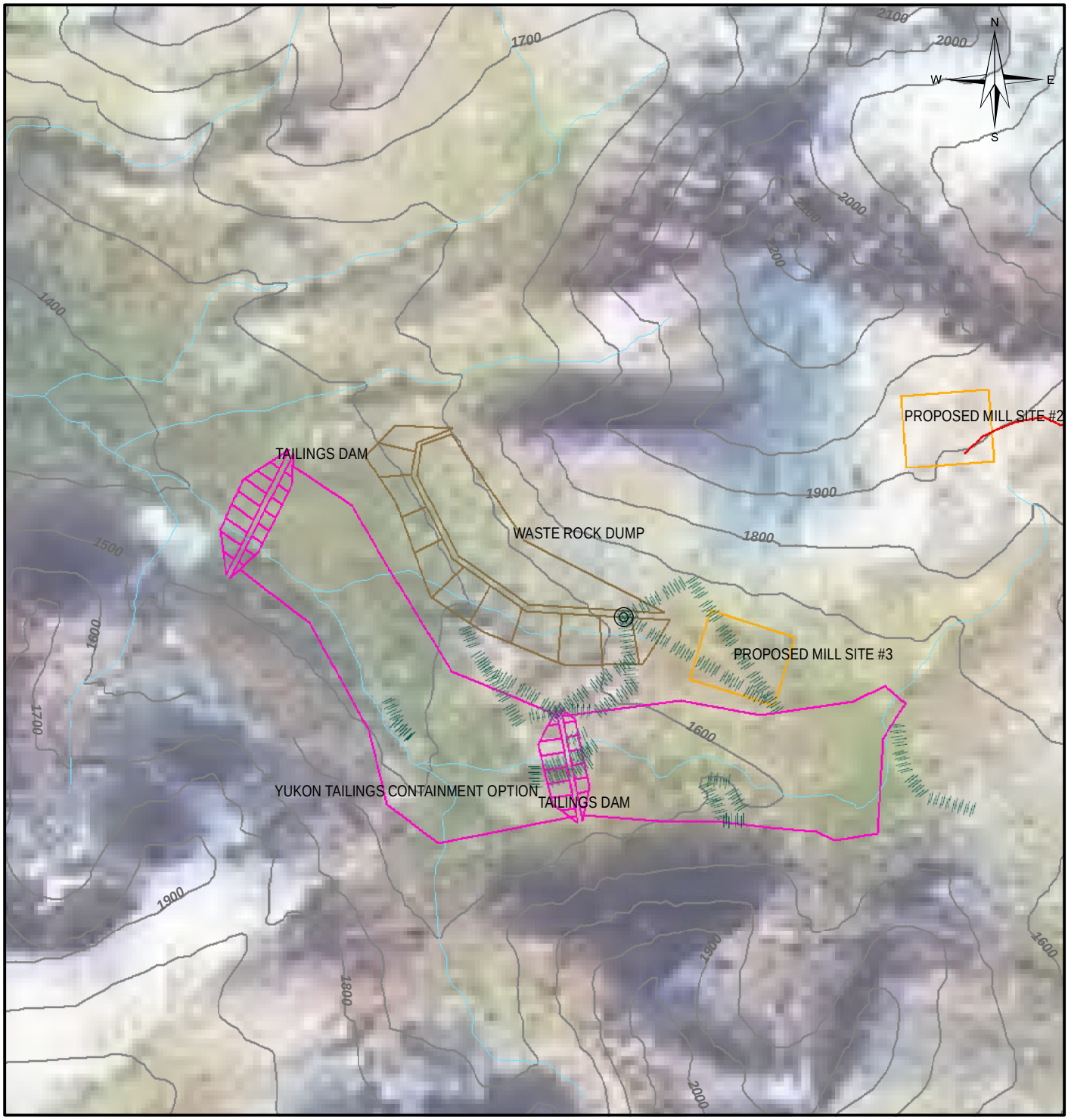
Possible development areas in the Yukon portion of the project area that were eliminated during the aerial reconnaissance because of low archaeological potential include (see Figure 2):

- upper mill site (Mill #2) location, which is part of current camp (disturbed context)
- majority of the lower tailings pond and adjacent valley (typified by continual slope and/or low relief with poor drainage)
- waste rock storage area (typified by steep slope, including a seasonal gully with steep sides)
- interior portions of the upper tailings pond (low relief and poor drainage with shallow creek and no banks or relief)

Possible development areas walked within the Yukon portion of the MacTung project area include (see Figure 2):

- series of ridges and knolls on north side of the tailings pond in area of the upper dam
- both sides of "canyon" on creek in area of the upper dam
- northern edge of bench on south side of upper tailings pond in area of the upper dam
- east end of the upper tailings pond and the rocky saddle connecting with the NWT
- irregularly, elevated terrain on the south side of valley overlooking a central portion of the upper tailings pond
- west facing bench overlooking the lower tailings pond
- southern portion of Mill #3 location and traverses to and from a mineral claim cairn in the waste rock storage area
- creek edge in the lower tailings pond that appeared to be relatively level (proved not to be level)

Two areas in the NWT portion of the project area were not examined on the ground, but were viewed from the air. One area is a low hill located between the two proposed dams on the



LEGEND

- Cairn
- Existing Road
- Mill
- Tailings
- Waste Rock
- Area of Archaeological Ground Reconnaissance
- Watercourse
- Contours 100m

NOTES

Base data source:

MACTUNG

Areas of Archaeological Assessment in the Yukon

PROJECTION	DATUM
UTM Zone 9	NAD83

Scale: 1:20,000

300 150 0 300

Meters

EBA Engineering Consultants Ltd.

FILE NO.: 1200163_Arc_Map2

PROJECT NO.	DWN	CKD	REV
1200163	KMW	RH	1

OFFICE	DATE
EBA-VANC	January 15, 2007

Figure 2

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tailings pond. It was not examined on the ground because of its relatively large size, the lack of visible exposures, the presence of a hunter's camp and the fact that although potential was greater than low, it did not appear to justify a rating of moderate. Although this landform is elevated, the terrain edges are poorly defined. The other location is a "possible" airstrip located several kilometres to the east on another tributary creek. It was not identified as a potential development prior to the initiation of the field work although it was evident on the 1:12,500 scale map. The proximity of the creek to this possible development and the topography along this watercourse suggests that moderate or possibly high archaeological potential could be represented, depending on its final location.

Possible development areas in the NWT portion of the MacTung project area that were eliminated during the aerial reconnaissance because of low archaeological potential include (see Figure 3):

- mill and residence (Mill #1 - sloped rocky interior of upland area that was characterized by exposures and had been previously examined by Van Dyke)
- majority of interior portion of tailings pond (waterlogged or poorly drained with no defined creek banks)

Possible development areas walked within the NWT portion of the MacTung project area include (see Figure 3):

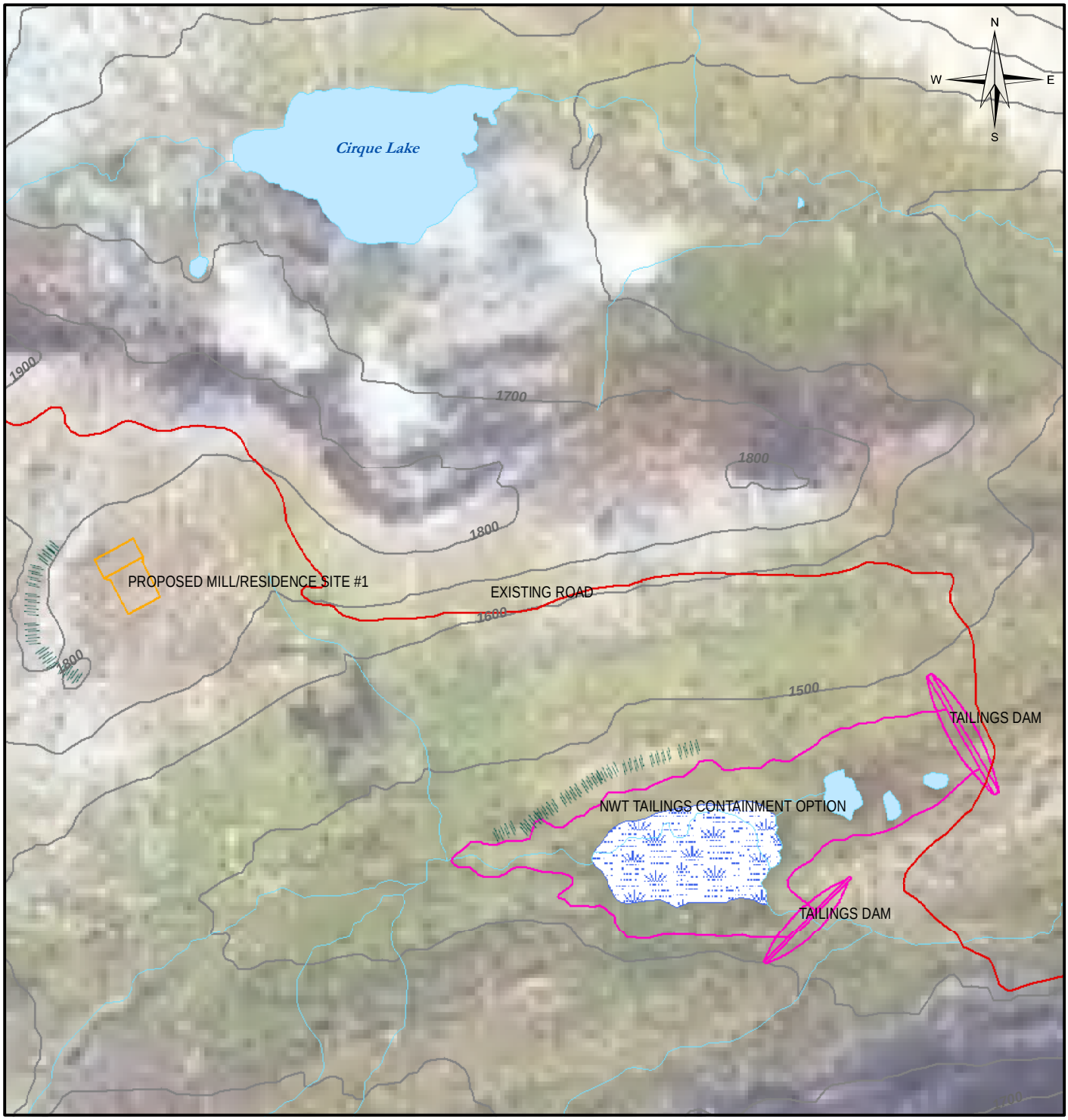
- rocky elevated ridge, a portion of which forms the NWT-Yukon border, immediately west and south of Mill #1 (numerous cairns denoting the border were encountered)
- bench along a portion of the northern edge of the tailings pond
- three isolated knolls near the northern edge of the tailings pond

4.2. Results of Archaeological Ground Reconnaissance

No new archaeological sites were discovered during the ground reconnaissance conducted in either the Yukon or NWT in 2006. However, there are landforms judged to have moderate potential for archaeological sites in both territories as evidenced by the discovery in 1983 of a small site on a knoll. This site, KhTg-1, is located in the NWT portion of the project area and was revisited in 2006.

Much of the terrain included within or adjacent to proposed development areas are actually suggestive of low archaeological potential, but portions of several have moderate sensitivity. Potential in the vicinity of the proposed NWT airstrip could be moderate to high, depending on its final location. The creek in that area has defined banks and terrain is sufficiently high to suggest slightly more archaeological potential than in the areas that were examined. This area was not examined because it is a tentative location.

The majority of the landforms judged to have low potential were not walked, although some limited areas so rated were traversed in the process of accessing other areas. In addition, one section of the Yukon Creek bank in the proposed lower tailings pond was examined as a test of the low assessment rating of that area.



LEGEND

- Existing Road
- Mill
- Area of Archaeological Ground Reconnaissance
- Watercourse
- Contours 100m
- Waterbodies
- Wetland

NOTES

Base data source:

MACTUNG

Areas of Archaeological Assessment in the Northwest Territories

PROJECTION	DATUM
UTM Zone 9	NAD83

Scale: 1:20,000

300 150 0 300

Meters

FILE NO.: 1200163_Arc_Map3.mxd

PROJECT NO.	DWN	CKD	REV
1200163	MEZ	RH	1

OFFICE	DATE
EBA-VANC	January 15, 2007

EBA Engineering Consultants Ltd.

Figure 3

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One additional area was examined when "talk around camp" indicated that one of the environmental teams had encountered a possible spear. The location was well west of the MacTung project area and was situated on a very high, moderately sloping landform on the south side of a mountain ridge overlooking the upper Hess River. The possible spear was laying on the ground down slope a few meters from a rock pile or cairn that was partially collapsed. The possible spear was an axe-sharpened piece of wood about one metre in length that most likely once formed part of this cairn.

Cairns are common in this area and some of those encountered contain stakes that have mine claim tags attached. Numerous cairns, including some that were parallel to one another were noted on the ridge above Mill #1. This series of cairns represent markers along the Yukon/NWT border (Photos 1 and 2).

Although not all portions of all the landforms that were walked have good archaeological potential, there is sufficient sensitivity to recommend that some additional field investigation be conducted. This work should be initiated when finalized development plans are available to ensure all areas that may potentially be impacted have been adequately assessed.

When plans are as tentative as they were in 2006, the objective of the archaeological investigation is to assist in selecting the development locations that would be least likely to impact archaeological sites. With some of the proposed developments, it was evident that archaeological potential was low throughout the area. There are no further concerns with Mill #2 and the waste rock storage area in the Yukon. There is also no concern about Mill #1 in the NWT; it was previously examined by Van Dyke (1984) and is located on terrain suggestive of low archaeological potential. However, care must be taken to ensure that the Yukon/NWT cairns are not impacted. There are also no concerns along the existing access road, which was also examined in 1984 and is primarily on disturbed or sloped terrain.

There are concerns in portions of each of the other possible development areas that were examined and further work is required once the final development locations have been selected.

In the Yukon (Photo 3), further work would be required if any of the following areas were included within selected development areas:

- all benches, ridges and knolls located between the upper tailings pond and the waste rock storage area, including the west-facing bench overlooking the lower tailings pond (Photos 4 and 5)
- the elevated areas within and south of the upper tailings dam, including both sides of Yukon Creek and level landforms associated with the small canyon area (Photo 6)
- the bench and saddle at the east end of the upper tailings pond (Photos 7 and 8)
- the irregular series of landforms south of Yukon Creek in a central portion of the upper tailings pond (Photo 9)
- Mill #3 with emphasis on the southern portion of this landform (Photo 10)

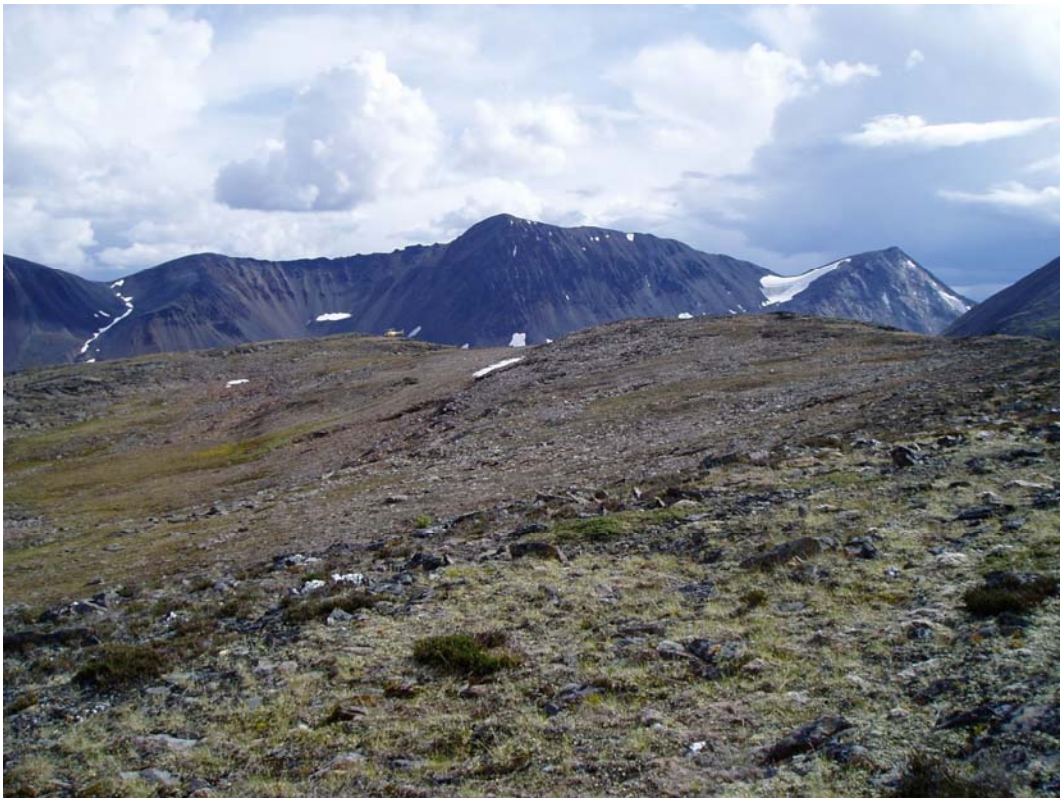

Photo 1. View southeast of a portion of the ridge near the Yukon/NWT border

Photo 2. View south of two of the numerous cairns along the Yukon/NWT border

Photo 3. View southwest of Yukon Creek valley from the Yukon/NWT border ridge

Photo 4. View southwest of one of the ridges north of the upper tailings dam

Photo 5. View west of west-facing bench from eastern end of waste rock storage area

Photo 6. View west of Yukon Creek “canyon” near the upper tailings dam

Photo 7. View east of upper tailings pond with bench and saddle at far end of photo

Photo 8. View southeast of the low saddle or divide between the Yukon and NWT

Photo 9. View southeast of irregular elevated landform south of upper tailings pond

Photo 10. View north of Mill #3 location with ATV tracks on valley slope in background

In the NWT, further work would be required if any of the following areas were included within selected development areas:

- the area adjacent to and immediately north of the tailings pond where there are defined terrain edges and knoll-like landforms (Photo 11)
- selected portions of the hill between the two tailings dams southeast of the tailings pond (Photo 12)
- final location of the airstrip

Because of the dense vegetation cover characteristic of most of the above listed areas, shovel testing is required to determine whether or not sites are present. Testing should be conducted on portions of the landforms listed above that are relatively level to gently sloping, near a terrain edge, well drained and near or overlooking water. Testing requires a Class 2 permit and was not conducted in 2006, but is required if any of these areas are included in the final development plans. The inventory of these areas must be conducted well in advance of development to ensure sufficient time to conduct mitigation if sites are encountered.

If any new archaeological sites are found within a proposed development area, additional subsurface examination should be undertaken to determine the extent of the site (site size), the depth of the archaeological deposits and the type and quantity of archaeological material that is likely represented. Note that since the sites will likely be small and sparse, such testing may represent site mitigation and thus should be undertaken using shallow levels (5 cm) and 3 mm to 6 mm (1/8 to ¼ inch) screening and detailed recording. Any artifacts exposed on the surface or encountered during testing should be collected, analyzed and catalogued before being submitted to either the Yukon Heritage Resources Unit or the Prince of Wales Northern Heritage Centre.

Because of the intensive nature of most of the developments associated with a mine, sites near major development areas could easily be impacted. The small site size and fact that most artifacts are near the surface makes it even more likely that impact could occur at sites within or near development areas.

The previously recorded archaeological site, KhTg-1, was easily relocated (Photo 13 and 14). It is situated on a well defined knoll near the northern edge of the tailings pond in the NWT. The three artifacts noted by Van Dyke were collected in 1983 and are at the Canadian Museum of Civilization. They include a flake, a possible exhausted core remnant and a biface fragment. A new artifact, a possible core fragment, was noted on the site surface. It is not evident in the 1983 report whether or not shovel testing was conducted at this site. As a result, if the tailings pond in the NWT is selected for use, it would be necessary to assess this site through subsurface testing. Although Van Dyke indicated that KhTg-1 was of no further concern in 1983, the lack of knowledge about archaeological site content in this region and the fact so few sites are known suggests that testing is justified if the site can not be avoided. Because of the dense ground cover, it is not possible to assess this site without testing. Even if KhTg-1 contains a sparse collection of lithic items, such artifacts have potential to contribute to knowledge of the types of activities conducted in this region of the territories and perhaps the time period as well.

Photo 11. View west of bench north of Dale Creek tailings pond

Photo 12. Distant view of NWT tailings pond; hill between two dams in centre background

Photo 13. View northeast of KhTg-1 with northern bench in background

Photo 14. View southwest of KhTg-1 with tailings pond in background

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the 2006 investigations and recommendations for future work for the MacTung Project are summarized in this concluding section. The 2006 investigations conducted were limited to preliminary reconnaissance because the development areas identified were tentative alternatives. As a result, the primary objective was to determine if there was sufficient archaeological potential to justify more detailed field reconnaissance. The landforms judged to have such archaeological potential were generally characterized by heavy vegetation cover and future work must include subsurface testing.

The investigations conducted in 2006 suggest that in the Yukon further work is required in the following areas if they are selected for or are adjacent to development: Mill #3; selected landforms between the waste rock storage area and upper tailings dam; and limited areas within or adjacent to portions of the upper tailings pond, including the nearby pass. These areas are judged to have sufficient archaeological potential to justify additional field investigation. If any of these locations are included in finalized development plans, archaeological inventory that includes subsurface testing must be conducted.

Although some previous archaeological work has been conducted in the NWT portion of the project area, it is not known where subsurface testing was undertaken and further investigation is recommended along the northern portion of the tailings pond and between the two tailings dams if this alternative is selected. During this reconnaissance, the archaeological significance of previously recorded KhTg-1 should be assessed. Once a final location for the airstrip east of the tailings pond has been determined, it will be necessary to assess this development area and ground reconnaissance will likely be required. Thus, if any of these locations are included in finalized development plans, archaeological inventory that includes subsurface testing must be conducted.

If Mill #1 (NWT) or Mill #2 (Yukon) are selected, steps must be taken to ensure that cairns marking the Yukon/NWT border are not indirectly or directly impacted. Archaeologically, a slight preference for use of the disturbed location at Mill #2, which already has access, is identified, however, Mill #1 is suggestive of low archaeological potential and is near existing access. Either Mill #1 or Mill #2 are preferred over Mill #3 in the Yukon Creek valley.

Regarding the two tailings pond locations, no preference can be identified with the information currently available. Although the NWT location is adjacent to a recorded site, it is near access and the majority of the area has low archaeological potential and was previously examined by an archaeologist, thus, there is slightly less potential for additional sites in the Dale Creek valley. There are a number of landforms with archaeological potential near the Yukon Creek upper tailings pond and since no previous archaeological investigation has been conducted, there are no recorded sites. A further consideration is the fact that the Yukon option has not been significantly disturbed and there is no permanent access; new access or associated facilities might impact areas that have not been considered in this assessment. Only one waste rock storage area was identified and although potential within the defined development area is generally low, adjacent areas have archaeological sensitivity.

Only the developments discussed in this report have been assessed for archaeological potential although adjacent landforms suggestive of moderate sensitivity were included when possible. However, if new development areas or new or revised developments are identified, it would be necessary to assess each to determine if there is sufficient archaeological potential to require ground reconnaissance. It might be possible to conduct such an assessment based on maps and topography, but preliminary field reconnaissance may be required, depending on the location and size of the development area. Examples of potential developments/areas that could result in a requirement for additional archaeological assessment include: interior access roads, revisions to existing access, lines to the selected tailings pond, pipeline to a water source and the associated pump house, and miscellaneous other facilities that may be required to construct and operate a mine.

The presence of road access and the nearby guide outfitter camp indicate that this area has been used recently for hunting; hunters were in camp the day the archaeological field investigations were conducted. It is also possible that, even prior to the road, aboriginal and non-aboriginal hunting could have occurred since earlier studies indicate there are trails throughout the area. Artifacts or features representing recent and traditional or historic activity would likely be visible even with the dense ground cover exhibited by much of the project area, but evidence of prehistoric activity would be more difficult to locate and requires subsurface testing on landforms with good archaeological potential.

It is predicted, based on a review of archaeological studies in the vicinity, that any archaeological sites located in this project area would be small. Further, it is most likely that they would be characterized by sparse to moderate quantities of artifacts. However, because little is known of the archaeology of the region, any additional information that can be collected would be of value.

Field investigations must be conducted well in advance of any development activity in the event that further work is necessary, such as site mitigation. It must be conducted when the ground is snow-free. Because of the intensive nature of mine development and the extensive disturbance that can result, it is necessary to consider sites and landforms with archaeological potential even if located at some distance from the actual activity since ancillary facilities could be required. Any archaeological field reconnaissance must be directed by a qualified archaeologist holding a valid archaeological permit for the Yukon and/or NWT. Because subsurface testing is required, Class 2 archaeological permits are required.

It is recommended that consultation with interested or knowledgeable First Nations be conducted. Consultation and any traditional knowledge that may be collected should be incorporated into future studies to assist in the discovery and assessment of archaeological resources.

REFERENCES CITED

Andrews, T. 2006. Personal Communication. Territorial Archaeologist, Prince of Wales Northern Heritage Centre, Yellowknife.

Borden, C. 1952. A Uniform Site Designation Scheme for Canada. *Anthropology in British Columbia No. 3*, pp.135-154.

Denniston, G.B. 1966. The Place of the Upper Pelly River Indians in the Network of Northern Athapaskan Groups. Ms. on file with the Canadian Ethnology Service, Nation Museum of Man, Ottawa.

EBA Engineering Consultants Ltd. 2006. Environmental Baseline Studies 2005. Preliminary Wildlife Survey MacTung Project Area, Yukon. Report submitted to North American Tungsten Corporation Ltd., Vancouver.

Environment Canada. 2000. Terrestrial Ecozones and Ecoregions of Canada. Website address: http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taicor_e.cfm

Gillespie, B.C. 1981. Mountain Indians. In *Handbook for North American Indians, Vol. 6: Subarctic,* edited by J. Helm, Smithsonian Institute, Washington.

Greer, S.C. 1982. An Introduction to the Archaeology of the Macmillan Pass – North Canol Road Area, Yukon Territory. Report submitted to the Archaeological Survey of Canada, National Museum of Man, Ottawa.

Hanks, C., S. Cross, and S. Irving. 1993. Architectural and Archaeological Survey of the Canol Road, 1989. *Prince of Wales Northern Centre Archaeology Report No. 14*, Yellowknife.

Honigmann, J.J. 1964. The Kaska Indians. *Yale University Publications in Anthropology, No. 51*, New Haven.

Honigmann, J.J. 1981. Kaska. In *Handbook of North American Indians, Vol. 6: Subarctic*, edited by J. Helm, Smithsonian Institute, Washington.

McCelland, C. and G. Denniston. 1981. Environment and Culture in the Cordillera. In *Handbook of North American Indians, Vol. 6: Subarctic*, edited by J. Helm, Smithsonian Institute, Washington.

NWT Cultural Places Program. 2006. NWT Archaeological Sites Database, Prince of Wales Northern Heritage Centre, Yellowknife.

Van Dyke, S. 1984. Archaeological Inventory MacTung Project, Yukon and Northwest Territories. Report prepared for Amax Northwest Mining Company Limited, Edmonton.