

## 7.13 Archaeology and Heritage Resources

This section describes the archaeological and heritage resources in the project area and provides an assessment of project effects. As noted in Section 7.12: First Nations and Traditional Use, the Kaska First Nation are currently conducting a traditional knowledge study including the project area, which may provide further information relevant to heritage resources. In keeping with the SEPA between YZC and the Kaska First Nation, all information pertinent to Kaska concerns will be vetted by Kaska representatives and mitigation measures developed to the mutual satisfaction of the Kaska and YZC.

This section describes the effects of routine project activities on heritage resources. Potential effects of accidents and malfunctions are discussed in Section 8. As no sites have been found in the area of project facilities and activities, it is unlikely that effects will arise from either routine activities or accidental events.

### 7.13.1 Scope of Assessment

#### ***Issues and VECC Selection***

Heritage resources are identified as a VECC based on the *Yukon Historic Resources Act*, consultation with members of Kaska First Nation (Section 5: Project Consultation and Section 7.12: First Nations and Traditional Use) and the EA Report Guidelines (Yukon ECO 2005). Under the act, heritage resources include historical, archaeological and palaeontological sites where “historic value” is based on site significance as

*“an illustration of the historic or pre-historic development of the Yukon or a specific locality in the Yukon, or of the peoples of the Yukon or locality and their respective cultures; or...the natural history of the Yukon or a specific locality in the Yukon...”*

As such, these resources have importance and value to the scientific, cultural, and public communities.

Heritage resources within the project area potentially can be disturbed by exploration and pre-production assessment activities, tree clearing, ground disturbance for facilities and access road construction, potential induced erosion during project construction, maintenance or development activities requiring incremental ground disturbance during operations, and any incremental ground disturbance and erosion associated with decommissioning and reclamation activities.

Because of the potential for disturbance of palaeontological, archaeological, historical and traditional sites and materials during surface and subsurface altering activities related to the project development, these resources, collectively referred to as heritage resources, constitute a VECC.

#### ***Temporal Boundaries***

The temporal boundaries for this assessment are based on the need to complete a historical resources assessment as well as required mitigation prior to any ground disturbance for construction. It recognizes the potential for required heritage resource monitoring during construction. Historical resources are administered under the *Yukon Historic Resources Act* and the *Yukon Archaeological Sites Regulations*. Because of the

fragile and non-renewable nature of historic resources, inventory, assessment and mitigation must precede initiation of construction activities. Results of the Historical Resource Impact Assessment must be reviewed and accepted by both the Yukon Heritage Resources Branch and the Kaska First Nation, respectively. In addition, all required mitigation must be completed prior to construction.

For the purposes of the project and cumulative effects assessment, the temporal boundaries span the period encompassing current baseline conditions, including effects of pre-production mine development, construction in 2006, operations from 2007 to 2019 and decommissioning in 2020. No further effects are anticipated at closure.

### **Study Area**

The LSA is the project footprint and is defined as the area potentially subject to surface and subsurface ground disturbance. It includes all the areas potentially affected by project facilities and encompasses the minesite, industrial complex, camp, borrow area, airstrip and access road (Figure 7.13-1). An RSA is also defined for the purpose of assessing project effects on historical resources relative to a broader cultural and environmental area. The RSA includes the adjacent Pelly Mountains, which represents an extension of an exploitive region for Aboriginal occupants (Figure 7.13-2). In addition, because of the relatively limited detailed information currently available for this area and the southeastern Yukon in general, reference is also made to information for areas outside of the RSA, to permit a more valid evaluation of effects on past and recent human use/fossil evidence within a generally homogeneous ecological setting.

## **7.13.2 Baseline Conditions**

### **7.13.2.1 Methods**

The information used to establish baseline conditions for heritage resources was obtained from a site file search, review of current literature relevant to the project area, and field work. A site file search was completed of NTS map sheets 105G/8 and 9 and 105H/5, which encompass the project area, for information on previously recorded archaeological sites, their locations, and contents. The literature review included reports pertaining to Quaternary geology, previous archaeological studies and archaeological context, and regional history.

The 2005 field study consisted of an aerial overflight of the project area and a predisturbance assessment of the proposed locations of the access road, tailings pond (with 100 m buffer), camp, mill site, borrow area expansion and diversion ditch between the plant and tailings pond to identify and evaluate archaeological, historical and recent traditional use sites in potential conflict with these facilities. Standard assessment methodology was employed, consisting of inspection of surficial exposures and excavation of shovel tests. In addition, exposures associated with the existing mine portal, waste rock storage, site water management facilities, old winter road between the portal and existing camp, campsite and borrow area were examined to determine whether sites had been disturbed by these preliminary development activities.

## **Figure 7.13-1 Archaeology and Heritage Resources – Local Study Area (Vol. 2)**

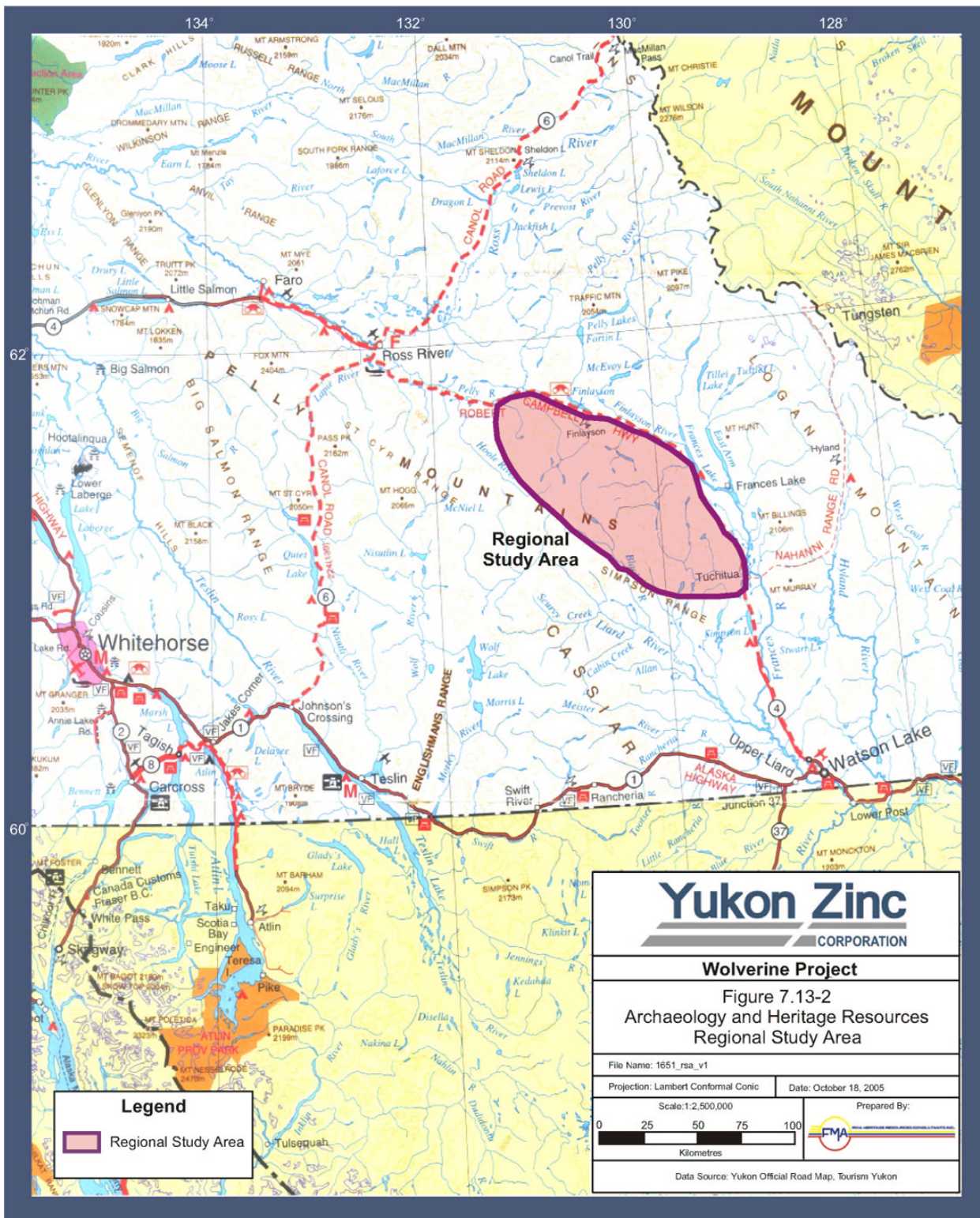


Figure 7.13-2 Archaeology and Heritage Resources – Regional Study Area

Field assessment of the proposed access road (a 50 m corridor centred on the route indicated in Figure 7.13-1) focused on terrain features of high to moderate potential. Approximately 75% of the total access route was traversed on foot and much was found to be either poorly drained or on side slopes. Bedrock outcrops were examined for potential precontact quartz quarry activities. Much of the diversion ditch and tailings pond are also associated with poorly drained marshes. Although evidence for traditional use is included in the archaeological impact assessment, traditional use was not a part of this program. A separate report on Traditional Knowledge is in preparation by the Kaska First Nation (Section 7.12: First Nations and Traditional Use).

### 7.13.2.2 Results

#### ***Regional Context***

##### *Palaeontology*

The project area falls within the Omineca Belt of the Canadian Cordillera (Clague 1989), which is characterized by metamorphosed and plutonic rocks of middle Proterozoic and middle Paleozoic ages. This assemblage precludes fossil occurrences. Quaternary deposits, including glacial till, outwash, glaciolacustrine sediments, alluvium, colluvium and aeolian sediments (predominantly loess) are common, particularly in the valleys. Quaternary fossils may be present in some of these deposits.

##### *Archaeology*

Archaeological studies in the LSA and RSA are limited. There has been insufficient work on which to base a cultural chronology specific to the RSA or define local cultural constructs. Because of the lack of detailed studies in the southeastern Yukon, the chronology of human occupation in the project area is largely extrapolated from work completed in other areas in the Yukon and the adjacent portions of British Columbia. Evidence of early occupation is associated with the Bluefish Caves south of Old Crow in central Yukon (Cinq Mars 1979). This assemblage consists of a hammerstone, flakes and bone tools in association with the remains of mammoth, wild horse, bison, caribou, moose, muskox and mountain sheep. Based on carbon 14 dates, these remains date from 17,000 to 12,000 years ago. Other possible very early bone tools have also been reported near Dawson and along the Steward River (McClellan 1987). Better-documented early cultural entities consist of assemblages associated with big game hunting (potentially ca. 8,000 to 6,000 B.C.) during grassland incursions into these regions. Cultural horizon markers of this early period of occupation include fluted points, collected in the interior of Alaska and in the southern Yukon, and lanceolate projectile points identified in the Champagne and Little Arm Phases (MacNeish 1964) of the southwest Yukon and to the east in the western District of Mackenzie (Millar 1981). Bone awls and stone points, burins (a specialized tool with an engraving edge) and gravers (a tool used for engraving wood and bone) are associated and commonly occur with bifaces (tools flaked on both faces generally thought to have been used as knives) and scrapers. Toward the end of this time period, microblades (small rectangular blades struck from small prepared cores) and microblade cores (parent nodule from which blades are removed for manufacture of tools) appear. Faunal remains suggest a preference for bison and elk with lesser emphasis on muskox, caribou and small game.

Microblade technology appears as early as 9,000 B.C. in western Alaska, spreading to southern Yukon and northern British Columbia by 4,000 B.C. These assemblages characterize the archaeological record until perhaps 3000 to 2500 B.C. (MacNeish 1964; Workman 1978; Clark 1981; Wright 1995). MacNeish's data suggests that small game, trapping and fishing became important aspects of the subsistence economy in this period.

The Aishihik Phase in the southwest Yukon archaeological sequence, temporally delimited by White River Ash and the onset of the historic period at approximately A.D. 1800, is considered to be ancestral to the historic Athapaskan culture. White River Ash was deposited during two eruptions dating to 1887 and 1140 years ago (West and Donaldson 2000) and is significant archaeologically as it serves not only as a temporal horizon marker, but is hypothesized to have provided the impetus for southward migration of Athapaskan peoples from the Yukon area (Workman 1977). Associated with tools indicative of woodworking, newly introduced implements consist of the bow, small notched stone arrow heads, and the use of copper arrows, awls and 'danglers' (hanging ornaments attached to clothing or other items) (McClellan 1987). Fishing as well as hunting of caribou, moose, and mountain sheep characterized the economic pursuits of the occupants. During the Aishihik Phase, glaciers descended from the St. Elias Mountains and dammed valley lakes. Lake Alsek, the largest of these lakes, located near Haines Junction, did not disappear until the end of the 19<sup>th</sup> century.

The Bennett Lake Phase, representing the last 100 to 200 years and the ancestors of the Yukon First Nations, completes the archaeological record. Initially defined by MacNeish (1964) on the basis of sites at Bennett Lake, comparable sites occur on the Alsek River, Aishihik Lake, Taye Lake, Annie Lake and Little Atlin Lake (McClellan 1987). Cabins and campsites containing European trade goods such as glass beads, metal axes, knives, traps, chisels and kettles characterize these assemblages.

### *History*

The historic period is associated with the arrival of European fur traders and explorers. The project area was occupied by Kaska Dena at that time. They practiced generalized subsistence exploitation in which caribou and fish predominated but moose, mountain sheep, goat, smaller game and plant resources were also used. Summer and fall were the seasons of intensive communal hunting for caribou with the aid of fences and compounds. Fish were taken by traps, particularly during spawning runs. Winter economic activities tended to consist of solitary stalking and snaring of caribou and moose and gill netting of fish. Although stone was used extensively in the manufacture of tools and implements, antler and bone were also used for points and toggles. Wood was commonly used for hafts of composite tools. Copper was characteristic of the tool kit, being hammered into points and into decorative accessories. Clothing and coverings for shelter were made of hide, which was also used for construction of boats and sleds, and for lashing, thread and nets. Although summer shelters were made of poles covered with hide or bark and brush, in some areas winter pit houses were common (Honigmann 1954, 1981).

The social groupings of all First Nations in the Yukon varied throughout the year, reflecting both the necessity for cooperation in obtaining local resources and the availability of large numbers of particular resources, particularly caribou and fish, at specific seasons. In summer and fall when caribou and fish could be most efficiently taken through communal effort, several families camped and worked together. When

resources were scarce, large groups dispersed into smaller ones, perhaps composed of nuclear families (Honigmann 1954,1981).

Trade goods consisting of glass beads, tobacco and metal items, such as knives, that represent European contact, entered the southern Yukon via the coastal Tlingit by the late 1700s. By the early 1800s Hudson's Bay Company men such as John McLeod, John Bell and Robert Campbell journeyed into the interior to establish trade routes. In 1842, Robert Campbell established a fur post at Frances Lake and in 1846, one was built in the upper Pelly River basin. These posts as well as trading posts on the upper Mackenzie River served as the primary centers for exchange of furs for European trade items. Later, scientific explorers such as German geographer Arthur Kraus (1882), Lieutenant Frederick Schwatka of the U.S. Army (1883) and George Dawson and William Oglivie of the Geological Survey of Canada (late 1880s) also traversed the region of southeast Yukon (McClellan 1981).

In contrast to the isolated explorations, thousands of non-native prospectors entered the southwest Yukon during the Klondike gold rush of 1898. Subsequent smaller discoveries, such as the Chisana rush, continued to attract prospectors into the area over the next few decades. However, the associated residency was usually temporary as many prospectors failed at their attempts to strike their fortune. The main focus of prospecting was within the Shakwak trench along the White River and on smaller watercourses such as Burwash Creek. Single, isolated operations were characteristic and had little direct effect on the local indigenous population. The area remained largely inaccessible and culturally unaltered (Fedirchuk et al 2002). It was not until 1942 that major cultural impact occurred as construction of the Alaska Highway was initiated, followed by the CANOL pipeline project in 1943.

### ***Previous Studies***

Archaeological research in southern Yukon and northern British Columbia was pioneered by Johnson and Raup (1964) and R. S. MacNeish in the 1940s. MacNeish's work continued into the 1950s and 1960s when a number of excavations were completed in southwest Yukon, adjacent British Columbia and the western District of Mackenzie, Northwest Territories (MacNeish 1954). This work resulted in a sequence of cultural development spanning some 12,000 years. The initial sequence defined by MacNeish (1964) was re-examined and revised, largely through academic research in the 1970s.

Resource management projects with archaeological and historical site survey and salvage were associated with hydroelectric development at Aishihik Lake (Gates 1972, 1973, 1974; Wilmeth 1976), the Alaska Highway Gas Pipeline (Van Dyke 1978), the Dempster Lateral (Van Dyke 1979), and more recently (1980s, 1990s) by the Yukon Heritage Branch. In 2001 historical resource studies were completed in Yukon and northern British Columbia as part of a feasibility study for the Alaska Gas Producers Pipeline (Fedirchuk, Gryba and Malasiuk 2002; Blower, Fedirchuk, Tischer and Malasiuk 2002). Regionally, relevant work also includes the research results from the Stikine River (Smith 1970, 1974) and the Callison Site in British Columbia (MacNeish 1960), at Fisherman Lake in the western District of Mackenzie (Millar 1968, 1981; Fedirchuk 1970), and the recovery of Kwaday Dan Ts'inchí from a glacier in northwestern British Columbia (Beattie et al. 2000).

Closer to the RSA, archaeological studies were undertaken on the Ross River/North Canol road (Gotthardt 1981), in the MacMillan Pass (Greer 1982), at Francis Lake (Gotthardt 1986) and upper Liard and Frances Lake rivers (Gotthardt 1989) (in Greer

1996). Frances Lake was also investigated by Van Dyke (1981) relative to the NCPC Dam planning (Site File Data).

### *Regional Study Area*

The results of the site file search indicate that two archaeological sites, both on Frances Lake, occur externally to the LSA. One of these sites contains seven graves and precontact lithic scatters both above and below ash (assumed to be White River Ash). The other site is a precontact campsite with a hearth feature and lithic debris. Based on the nature and terrain associations of the recorded sites both in the LSA and surrounding RSA, it is expected that lake shores hold the greatest potential for precontact sites. Historic sites such as graves, cabins and camps are associated with a wider variety of features but tend to be associated with water bodies such as lakes and streams.

### *Local Study Area*

In 1966, a heritage/archaeology study of the Wolverine Lake Project was completed (Greer 1996) and consisted of the following:

- background archival research pertaining to the archaeological and historic development in the area
- literature research regarding regional surficial geology
- approximately three days of interviews with Ross River Dena
- two overflights of the project area by helicopter and fixed wing aircraft
- approximately three days of site recording

This study focused on the collection of oral history information from the Ross River Dena regarding both archaeological and historic sites in the immediate locale. The overflight included the perimeter of Wolverine Lake, uplands north of Wolverine Lake, upper Money Creek, Sheep Mountain, and North Lakes. The three-day field survey was carried out primarily to locate and document sites identified through the interview process. During the helicopter overflights, family graves and cabin at the north end of Wolverine Lake, graves at Nougha Creek and a cabin at Van Bibber Creek were identified. In addition, potential access routes were flown and in-field investigations were conducted at the inlet and outlet of Wolverine Lake, along the north shore of Wolverine Lake fronting the island and the area of the then proposed tailings pond. Reported 'camp sightings' were also verified in the field (Greer 1996: 13-14) (Figure 7.13-3).

Of the sites identified by the Ross River Dena, eight were assigned Borden Numbers. Two sites contain precontact components. Three contain historic cabin remains, two contain graves, whereas the remaining three components consist of hunting camps. One site contains both a precontact component and a historic hunting camp component. An additional seven sites were described by community Elders but were not located in the field. Four of these sites contain graves; one is a cabin, one is a man-made moose lick and the last 'site' is represented by other camp locations in the general area. The majority of the sites (4 with assigned Borden Numbers, 1 reported site) are located on the northern shores of Wolverine Lake. One site with a Borden Number and one reported site were identified on the southern end of Wolverine Lake. Six moose licks and three campsites were reported in the area of North Lakes and along Money Creek. Isolated cabins and camps occur on tributaries of Wolverine Lake and along Finlayson River.

### **Figure 7.13-3 Recorded Heritage Sites in the Vicinity of the Wolverine Project (Vol. 2)**

#### ***2005 Field Investigations***

In 2005, an archaeological impact assessment of proposed and existing project facilities sites was undertaken. No palaeontological, archaeological, historical or recent traditional use sites were identified during this reconnaissance. As noted above, two sites were previously reported at the south end of Wolverine Lake, in the vicinity of the exploration camp. Because they occur outside of the proposed disturbance footprint they were not revisited in the field. Consultation with the Kaska Dena to acquire additional information and integrate the results of the archaeological impact assessment with the traditional knowledge data had not occurred prior to report submission. The Kaska Dena are conducting a traditional knowledge study, which may provide additional information on traditional use patterns and the possible occurrence of heritage resources in the project area. The findings of the heritage resources study will be reviewed with the Kaska Dena, in the context of their ongoing traditional knowledge study. If necessary, additional field studies will be undertaken to collect information for inclusion in the archaeological impact assessment and permit report. These activities will be undertaken, as necessary, in consultation with the Kaska Dena, in accordance with the SEPA and in keeping with the EA Report Guidelines (Section 7.12: First Nations and Traditional Use).

#### **7.13.3 Effects Assessment Methodology**

No sites of palaeontological, archaeological or historical age were identified within the proposed project footprint, therefore no effects assessment was conducted.

As noted the Kaska Dena are conducting a traditional knowledge study that may provide information on heritage resources. Any newly identified sites would be evaluated with respect to both heritage and traditional use values in the effects assessment. The objective of this assessment would be to determine the potential loss of these sites and site contents relative to traditional use practices and history of use. In general the assessment would characterize the magnitude of effect, based on the attributes of the site or resource, the nature of the proposed disturbance, and the effectiveness of mitigation measures in sustaining the resource value as defined by the Yukon Heritage Resources Act and/or the Kaska Dena. The following types of information would be considered in determining individual site values and the effects of project development:

- type of site
- rarity of the type of site
- age of the site
- current condition of the site (undisturbed sites versus disturbed sites)
- source and nature of potential disturbance to be caused by the proposed project.

The significance of impacts on identified sites would be characterized in the context of the regional data base and the cultural value based on:

- a review of current literature on archaeological survey work and traditional land use information for the region



- discussions with the Kaska Dena

The specific analytical methodology would be confirmed in consultation with the Kaska Dena.

#### **7.13.4 Project Related Effects**

Based on the 2005 field investigations, no residual adverse project effects on heritage resources are anticipated. Studies consisting of conventional surficial examination and subsurface testing were completed of all identified areas of potential disturbance. Outstanding activities at this time consist of consultation with the Kaska Dena and input of traditional use information. On this basis the likelihood that there will be no effects on heritage resources is uncertain. However, YZC is committed to mitigating effects on any identified sites that may be impacted, to the satisfaction of the Ross River Dena. Accordingly a follow-up program to incorporate input from the Kaska Dena has been identified (Section 7.13.7.1). In addition, contingency measures to identify and protect heritage resources known sites and sites that may be encountered during site preparation and construction are provided in the project Environmental Protection Plan (Section 9.2). Based on YZC's commitment to the follow-up program and implementation of mitigation measures, no significant adverse residual project effects on heritage resources are expected. On this basis the likelihood of effects occurring as predicted is high.

Under baseline conditions, the two sites at the south end of Wolverine have been potentially subject to effects of previous permitted activities in that area. Although no facilities or activities are planned for this area under the current project plan. There is potential for project personnel to visit the lake front in their off hours. The current status of these sites and adequacy of protection will be reviewed in consultation with the Kaska Dena. Requirements for any site specific protection to be implemented in the context of the current project will be developed and incorporated in the Environmental Protection Plan (Section 9.2).

#### **7.13.5 Cumulative Effects**

As no significant adverse residual project effects are predicted, no assessment of cumulative effects was conducted. As part of the follow-up program, an assessment of cumulative effects will be conducted, if warranted.

#### **7.13.6 Mitigation Measures**

No known sites will be affected by the project, therefore, no mitigation measures are required. The requirement for site-specific mitigation measures will be confirmed based on the findings of the traditional knowledge study and consultation with the Kaska Dena. General procedures for heritage resource site recognition and protection during project construction and operation are provided in Section 9: Environmental Management Plan. This plan will be refined based on findings of the traditional knowledge study and consultation with the Kaska Dena.

### 7.13.7 Monitoring and Follow-up

#### 7.13.7.1 Follow-up Studies

YZC will conduct the following follow-up studies and activities related to protection of heritage resources:

- A traditional knowledge study, funded by YZC, is being conducted by the Kaska Dena for submission to the ECO, in December 2005.
- As part of that study, the findings of the 2005 heritage resource field study will be reviewed and any additional areas of heritage resource site potential, based on traditional use of the area, will be identified. YZC will conduct site investigations in any identified areas prior to commencement of construction.
- If heritage resources are identified, mitigation measures will be defined to the satisfaction of the Kaska Dena and the Yukon Department of Tourism and Culture, and the assessment of project and cumulative effects will be updated accordingly.

#### 7.13.7.2 Monitoring Programs

Depending on the finding of the traditional knowledge study as it affects the results of the heritage resources study, a monitoring program may be appropriate to support implementation and determine effectiveness of mitigation measures.

**Table 7.13-1 Monitoring and Follow-up Programs for Heritage Resources**

| Potential Project Effect  | Program Objectives  | General Methods   | Reporting   | Implementation |
|---|---|---|---|----------------|
| <b>Follow-Up Programs</b>                                       |   |   |   |                |
| Effects of clearing or ground disturbance on heritage resources | <ul style="list-style-type: none"> <li>• Confirm the absence of heritage resource sites based on information from the traditional knowledge study in preparation and in consultation with the Kaska Dena</li> </ul> | <ul style="list-style-type: none"> <li>• Review of heritage resource assessment findings in conjunction with information on traditional use and potential sites in the project area.</li> <li>• Follow-up ground assessment as required in areas of site potential</li> <li>• Identification of mitigation measures as required.</li> </ul> | <ul style="list-style-type: none"> <li>• Kaska Dena</li> <li>• Yukon Dept of Tourism and Culture</li> </ul> | Proponent      |
| <b>Monitoring Programs</b>                                      |   |   |   |                |
| N/A   | • N/A   | • N/A   | • N/A   | N/A            |

#### 7.13.8 Summary of Effects

Potential effects of the project on heritage resources and effects significance determinations are summarized in Table 7.13-2.

**Table 7.13-2 Summary of Project and Cumulative Effects on Heritage Resources**

| Potential Effect                  | Level of Effect |           |        |          |           |               |                   | Effect Rating   |                   |
|-----------------------------------|-----------------|-----------|--------|----------|-----------|---------------|-------------------|-----------------|-------------------|
|                                   | Direction       | Magnitude | Extent | Duration | Frequency | Reversability | Likelihood        | Project Effect  | Cumulative Effect |
| No effects predicted <sup>1</sup> | N/A             | N/A       | N/A    | N/A      | N/A       | N/A           | High <sup>2</sup> | Not significant | N/A               |

**Notes:** <sup>1</sup> 2005 field investigations did not find any heritage resource sites. Results of traditional knowledge study pending.  
<sup>2</sup> The likelihood of no effects will be confirmed pending results of traditional knowledge study.  
 N/A= Not applicable

