Designated Office Evaluation Report

for

Quartz Exploration at Tombstone Territorial Park

2010-0107

Proponent: Canadian United Minerals Inc.

Assessment Completion Date: August 5, 2010

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Summary
Canadian United Minerals Inc. proposed an exploration project involving heli-supported diamond and hydracore hydraulic drills, mechanized trenching, development of on-claims trails and off-claim winter trail as well as the re-establishment and use of a camp. The project is located within the Cloudy/Tombstone Mountain range within the Tombstone Territorial Park. This region is renowned for its physical, biological archaeological and cultural values, thus the establishment of this protected area. This project was subject to a controversial history dated back decades regarding the compatibility of mineral exploration and activities and park values. Due to requests for extensions to the public comment period, as well as considerable public interest, the total duration of the Seeking Views and Information period was 59 days. Based on the information provided to the Designated Office and information about the project area, five valued components were identified that would likely be adversely affected by the project activities and which required consideration.

The assessment concluded that effects to all five valued components would be significantly adverse and could not be mitigated. These effects stemmed primarily from the proposed winter access route(s), helicopter access route, and associated activities required for the proponent to access the subsurface minerals. More directly, the long standing park status and the acknowledged interrelatedness of these valued components established a threshold for significance that is lower than a similar proposal if it was located elsewhere.

Outcome
The Dawson Designated Office, pursuant to section 56(1)c of the *Yukon Environmental and Socio-economic Assessment Act,* recommends to the decision body (s) that the project be recommends to the decision body (s) that the project not be allowed to proceed , as the Designated Office has determined that the project will have significant adverse environmental or socio-economic effects in or outside Yukon that cannot be mitigated.

Issued by the Dawson Designated Office on August 5, 2010.

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PART A - INTRODUCTION

1.0 Project Description

1.1 Proponent Information

The proponent, Canadian United Minerals Inc. (CUMI), currently obtains the legal right to sub-surface materials by being the registered claim holder of quartz claims titled *Horn1* thru to *Horn18*. Joel White, the president of CUMI is the applicant; CUMI is represented by Fast Track Land Management during this assessment and permitted process.

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1.2 Geographical Context

YESAA Assessment District: North Yukon

Coordinates:

The proposed project is located on map sheet 116B07. The coordinates used are an approximate location within the proposed project area.

UTM Zone: 7	Degrees, Minutes, Seconds	Decimal Degrees
613811W 7148308N	64° 26’ 29” N 138° 38’ 7” W	64.441389° 138.635278°

Watershed(s) and Drainage Region of Project Area as indicated on the YESAB Geo-Locator:

Claim Block Location

Major Drainage Area: Yukon River

Sub Drainage: Central Yukon

Sub-Sub Drainage: Central Yukon- Sixtymile

Access and down gradient of Project Area

Major Drainage Area: Arctic

Sub Drainage: Peel Southwestern Beaufort Sea

Sub-Sub Drainage: Upper Peel

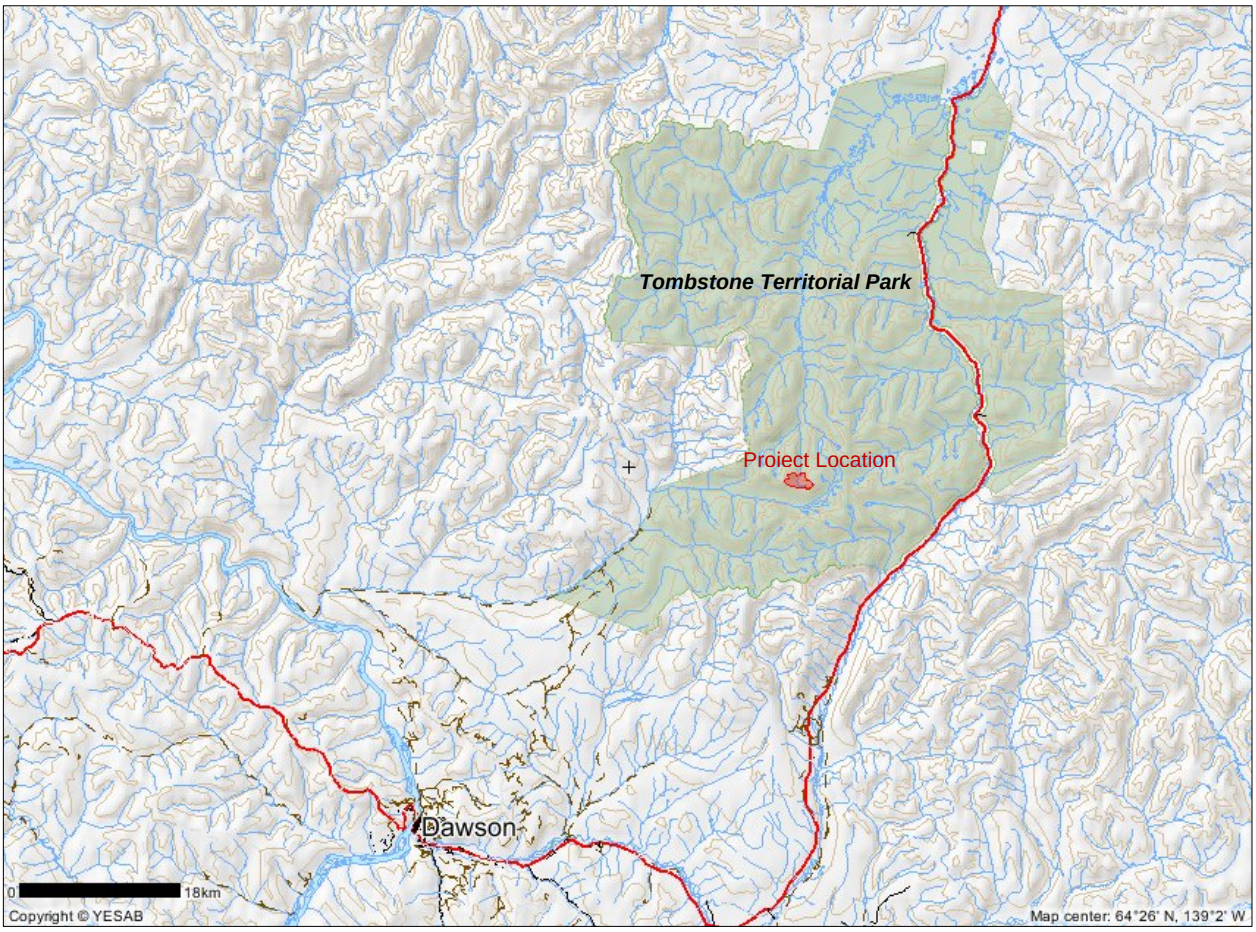

Figure 1: Project Location within Tombstone Park

1.3 History and Introduction

Under the *Yukon Environmental and Socio-Economic Assessment Act*, a final recommendation (to a Decision Body) that is made by the Designated Office shall be made in writing with reasons. As the reader progresses through the evaluation report it will be important to understand the report itself demonstrates the reasons for the final recommendation. In compilation of its reasons, the Designated Office was obliged to consider the history of the project site and general area which is long and controversial. A review of this history is relevant because it builds a level of understanding for the assessor in terms of identifying values typically associated with an area. It also will provide consideration of how this project if allowed to proceed would interact with the natural environment as well as with the relationships that have been built over time built by Yukon First Nations, their people and other residents of the Yukon. The following account provides an introduction and history of the project area in

chronological order; the reader will be able to see how intertwined the cultural, traditional and contemporary interests in the area are.

This area has been used by the Hän, Tukudh and Tetl'it Gwich'in to fish, hunt, travel, gather and make the tools they needed to live; it has been estimated that occupation of the area spans from 8,000- 10,000 years. The Blackstone River and Uplands have been used by these groups during their seasonal rounds instrumental to their cultural upbringing and survival. The Tr'ondëk Hwëch'in hunted in the areas of the Blackstone Uplands and into the Ogilvie Mountains in the winter months then moving towards the Yukon River for the summer fishing months. The Tetlit and Tukudh Gwich'in hunted the upper Blackstone River and Ogilvie Mountains in the fall and winter months as well. These traditional routes and uses are documented in time thru many different facets including oral records and stories shared over generations of these people. There has been extensive research conducted in the Tombstone area that supports this knowledge including evidence of two ancient villages know as Calico Town and Black City, and over 75 archaeological sites. The archaeological sites document caribou fences, cabins, camps, and graves to name a few examples. Many dedicated people and hours have been spent trying to piece together the traditional past of the Tombstone area; some believe the use of the area by human for over 24,000 years. (Yukon Government - Heritage, 2003) (Yukon Governmnet - Heritage, 1999). To this day, the Tombstone area remains an active focal point for Tr'ondëk Hwëch'in citizens for subsistence and traditional pursuits including hunting, trapping, plant harvesting and teaching young generations. (Tr'ondëk Hwëch'in, 2010).

Reviews of assessment reports available at the Yukon Geological Survey indicate there is a century long history of mineral exploration within the Tombstone area. Work dates back to 1901 in the Tombstone Range at Spotted Fawn Gulch with a discovery of silver; this was the only producing mine which was hand mined in the 1920's. In 1914 within the Blackstone Uplands the Marn deposit was discovered although not produced. IN the early 1900's The Yukon Gold Corporation constructed the Yukon Ditch, this structure harnessed waters from 12 Mile and Tombstone Rivers and transported the water to the Klondike Goldfields, almost 160km away.

During the 1950's efforts began to construct the Dempster Highway, an all season road that is one of two in North America to the Arctic. The road went as far as Chapman Lake in 1962, and then was completed in 1979.

Exploration activities within the Blackstone uplands has been scattered yet extensive in terms of mapping, sampling through drilling, trenching and soil sampling. According to past assessment reports, the Geological Survey of Canada mapped the area on the 1960's and in the 1970's extensive deposits of low grade uranium was found. This sparked considerable interests and likely contributed to an increase in exploration.

Also during the 1970's two sites were identified within the Tombstone area as exceptional for the conservation of natural values and cultural properties. An International Biological Program study completed in 1972 identified two sites that were found to be of exceptional biological importance and significance. These sites were described as being floristically significant, ecologically diverse, and as having unique mountain shapes and geological formations, particularly when taking into account the low latitude, as many of these features are characteristic of the Arctic. One of the sites identified in the study encircles Tombstone Mountain having an area of 336km^2, encompassing the area of the Horn mineral claims. The other site was located further north, covering an area 1,476 km^2, including portions of the proponent's various proposed routes.

Shortly after this international recognition, in 1974 the Federal Government at the request of the Yukon Government established a Park Reserve in the vicinity of Tombstone Mountain which included the area of the proposed project. The Park Reserve had no legal protection but denotes the importance of the area. This reserve remained until the Tombstone Territorial Park was established.

In the 1980's the Tr'ondëk Hwëch'in began negotiating their land claims and selected an area twice the size of the Park Reserve and included the headwaters of the 12mile, Klondike and Blackstone Rivers. According to the Tr'ondëk Hwëch'in, the purposes of this selection was to protect the exceptional natural and cultural values in the area. It is at this time where the CUMI and the Tr'ondëk Hwëch'in interlace. Canadian United Minerals Inc began exploring the Tombstone and Blackstone Uplands the late 1980's.

Over the course of the 1990's there was considerable debate and negotiation between the Tr'ondëk Hwëch'in and Yukon Government over the establishment of the Park boundaries. This debate went national and quite political. The Chief of Tr'ondëk Hwëch'in describes in correspondence to the Designated office that at one point there was an offer that a special management area would be established under their land claims agreement and the Tr'ondëk Hwëch'in agreed to drop their original land selection in favour of Tombstone Park. With two changes in Territorial Government since the 1992 agreement there were changes to previous agreements and also some areas were withdrawn from mineral staking by the Federal Government. These changes did not include the desires of the Tr'ondëk Hwëch'in and as it turns out a number of individuals that petitioned the Yukon Government to expand the Park to include the Tombstone Mountains and the Blackstone Uplands.

While agreements were being reached in and around this time, it was in March 1997 that CUMI and a prospector snow machined into the Blackstone uplands and staked claims Horn 1 thru Horn 18; these claims constitute the proposed project as well as access to these claims. Beginning in the summer of 1998 CUMI conducted exploration activities such as magnetometer field surveys, trenching and diamond drilling.

Also in July of the same year the Tr'ondëk Hwëch'in ratified their Land Claims Agreement. In result was the establishment of a Special Management Area known as the Tombstone Territorial Park. Chapter 10 Schedule A of the Tr'ondëk Hwëch'in Final Agreement also resulted in the withdrawal of (new) mineral staking. At the time of ratification there were approximately 150 mineral claims within the new Park. Shortly after, almost all of the claim holders relinquished their claims through various agreements. CUMI was the one exception and continued with exploration activities it started during the summer of 1998.

Exploration work on the Horn claims continued in 1999, 2000 and 2001; this active period was followed by 3-4 years of little to no activity. During this time a public hearing was held (May 2000) in response to CUMI's application for permit to work the Horn Claims. A permit was issued to CUMI to proceed.

Between 2002 and 2007 there were four legal proceedings initiated by the Tr'ondëk Hwëch'in with respect to CUMI mineral claims and the objectives stated in Schedule "A" of Chapter 10 of the Tr'ondëk Hwëch'in Agreement. The Designated Office expresses no voice on the legalities of these proceedings.

Then in 2005 a second (5 year) Mining Land Use permit was issued to CUMI with an expiry date of May 2010. During the term of this permit the claims remained inactive with no work conducted on the claims since 2005. The proponent has indicated that little to no reclamation work has been conducted on site; while some trenches were backfilled there remains open trenches, exposed drill sites, equipment including a drill and broken down Kubota hoe. The camp structures remain as do multiple fuel drums; some drums though empty are open to the elements while some have remaining fuel in them. Since 2005, CUMI has not been back to the property and the site could be considered abandoned for the past 5 years. Inspections from Yukon's Energy Mines & Resources Department have not taken place annually because there has been no activity. The following photos taken in July 2008 have been provided by the

Figure 2: ***(Left)*** Camp and fuel storage area in the foreground, Exposed exploration sites near the top of the photo with equipment and additional exploration sites near the upper right corner. ***(Right)*** closer look at the Kubota hoe, drill and exposed exploration

proponent showing the state of the claims at the time of submission to the Designated Office and expiry of the current Mining Land Use permit. Exposure of the area has resulted in degraded traps, including those used for fuel storage, tipped drums and misplaced debris.

November 2005, the Yukon Environmental and Socio-Economic Assessment Act (YESAA) came into effect; as a result, prior to the issuance of a permit of (in this case), a Decision Document would be required before the Yukon Government could issue a permit. A Decision Document can only be provided upon the recommendation of a Designated Office for Yukon Environmental and Socio-Economic Assessment Board (YESAB).

The Dawson Designated Office received a project proposal for CUMI on April 22, 2010. The submission initiated the current assessment necessary for CUMI to obtain its third 5 year mining land use permit under the authority of the *Quartz Mining Act*. During the adequacy review supplementary information was required and the proponent was notified May 4th. This information was provided to the Designated Office and it was determined at this time that the evaluation could begin on May 14th 2010. The Designated office determined the project scope based on the project proposal, and then notified the proponent and public of the project scope by May 25th. It was on this day that Designated Office notified the proponent, the Decision Body (Yukon Government), Tr'ondëk Hwëch'in Government and interested persons that the Designated Office was seeking their views and information on the project proposal. It quickly became evident that the project proposal and by consequence the project scope contained some inconsistencies and gaps of information. This posed a significant problem in the assessment in that those interested in commented expressed difficulty in doing so because it was unclear what was being proposed in the case of some project activities. Additional information was sought from the proponent and the Designated Office extended the Seeking Views & Information period twice; this provided time for the proponent to supply the information and interested parties to review it. On July 23, 2010 the Designated Office closed the Seeking Views and Information stage of the assessment. The following report documents the assessment conducted by the Designated Office of the Yukon and Environmental and Socio-Economic Assessment Board.

1.4 Project Details

The following the project activities or project components are described in detail.

Access to and from the Horn claim block

As described, access to the site will consist of air access by helicopter and land access by snow machine or snow cat. The helicopter access is proposed to originally base from Dawson and travel to a staging area located at a gravel pit government reserve at km66 of the Dempster Highway. The following figure depicts the proposed air routes and as well as the helicopter landing sites.

Two winter access routes are proposed; the proponent explains that the routes would need to be ground truthed or scouted and this has not occurred to date. The following page in this report provides an illustration of the proposed winter access routes. It is anticipated that 60 to 100 trips per year would take place during over the proposed 120-day winter operating window.

Preferred Route: At the time of preparing this report, the proponent indicated that the preferred access point from the Dempster Highway is Km94. At this preferred site there is an existing gravel pit immediately adjacent to the Highway. Access to the Horn claims from the preferred site would be achieved by travelling overland approximately 15km while heading generally north-east, crossing Slavin Creek then proceeding west towards the Blackstone River. The proponent suggests that the route traverses open ground and has been used in the past with snow machines and proved to be passable in reasonable conditions. Traditional and current hiking or travel routes do not exist in this area. Once the Blackstone River is reached the proposed snow machine or snow cat traffic will proceed (approximately 20km) south along the (west) Blackstone River to headwaters. The proponent indicates that there is an existing route along the Blackstone River. To clarify, travel along the (west) Blackstone River by wildlife and humans mainly for recreational or hunting pursuits is known as a common “route” and not necessarily a “trail”. Although some traveller’s guides also suggest that a well-travelled horse trail follows the Blackstone for most of the route and crosses the river many times. (Yukon's Tombstone Range and Blackstone Uplands, A Traveller's Guide, 2000).

Optional or Secondary Route: The project propsoal also identifies another overland route proposed for winter access by snow machine or snow cat. This route includes a staging area located at km114.6 of the Dempster Highway approximately where the west Blackstone River meets the east Blackstone River. There is an exsitng gravel pit and pull of located adjacent to the Dempster Highway north of where the Highway cross the Blackstone River. This proposed route is the lengtheir of the two at approximtely 46km and travels along the Blackstone River from the Demspter Highway to the Horn claims. Similar to what was explained above, the existing route along the west Blackstone River is recognized as a comon way for travelling within the Blackstone Uplands and there isn’t necessarily a defined trail. Travelling along west Blackstone is suggested by the proponet to be a safer and easier route, though long.

Figure 3: Helicopter Access Routes. Dawson to Dempster & Dempster to Project Area

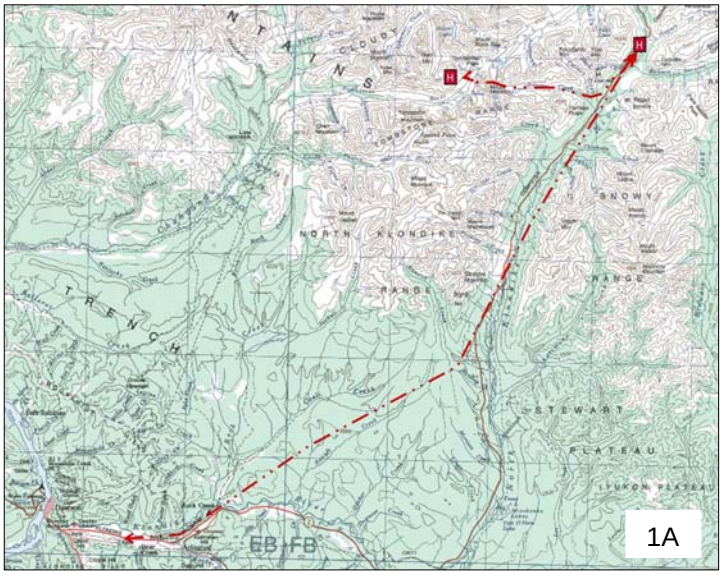

Figure 4: Helicopter access route, Dempster to Project Area

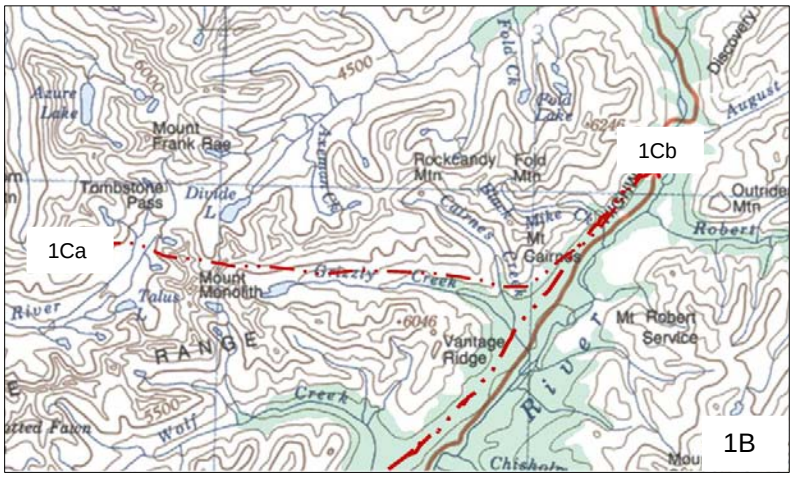

Figure 4: Helicopter Landing at Project Site, Camp.

Figure 5: Dempster Helicopter Staging Area

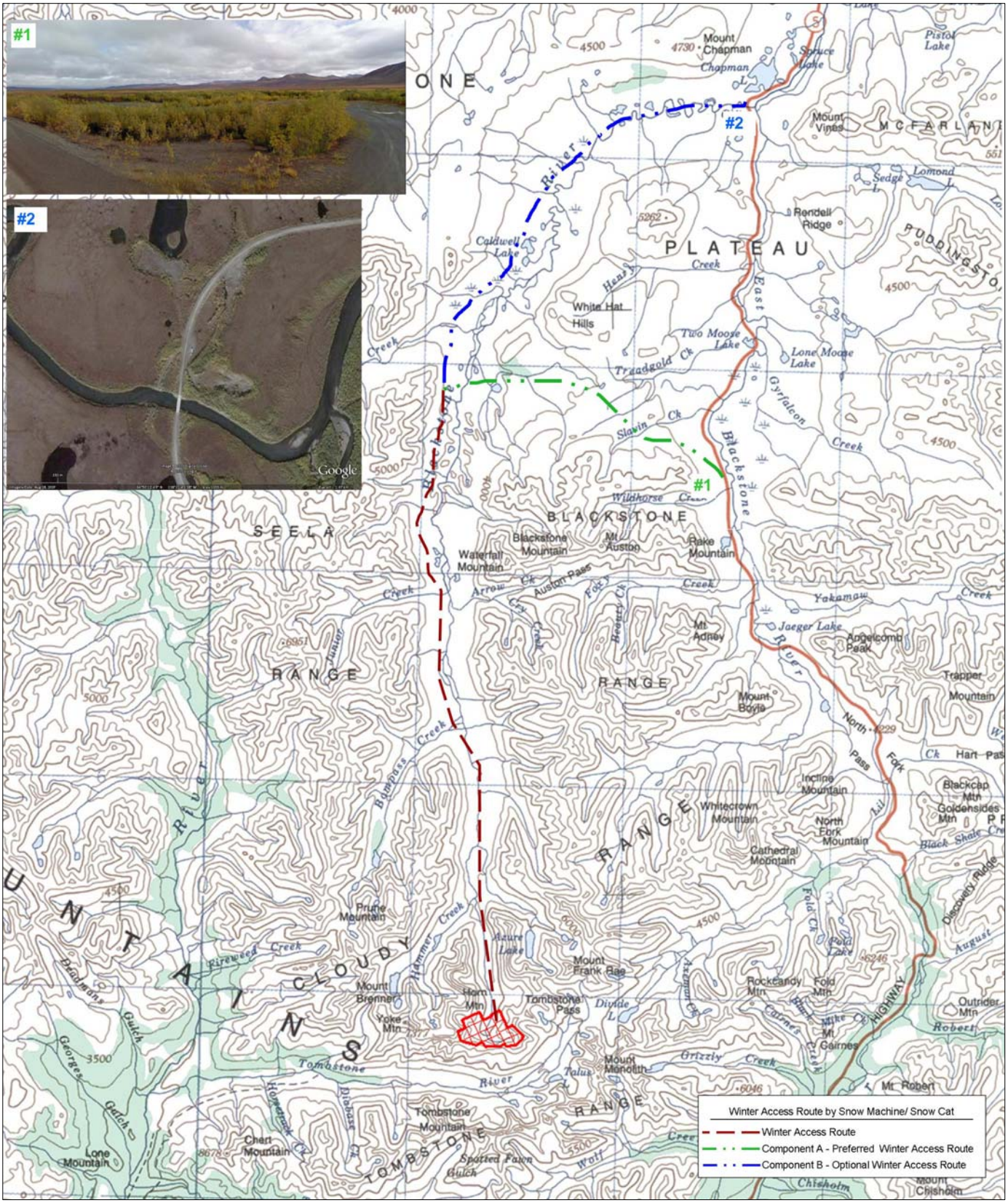

Figure 6: Proposed Winter Access

Camp

The camp structures existing on site require maintenance and upgrading. It is anticipated that the camp will be used by 2-4 people at any given time during the 90 day summer season. There may be times when up to 8 people could be using the camp. During the proposed 120 day winter season the camp will be shut down except for overnight stays while hauling bulk and core samples out during the overland trips. The camp consists of existing structures that include a cookhouse, shack and an outhouse. The location of the camp is on claim Horn 15 and the source for drinking water will be the upper reach of the west Blackstone River, specifically the left tributary within the headwaters. The proposal indicates that catered meals will not be provided and means will be prepared on-site. The outhouse was installed in 1999, is not within 30m of a waterway and is proposed for continued use.

Figure 7: Existing Camp structures; image taken from project proposal.

Fuel Use and Storage

Fuel will be temporarily stored at the staging area along the Dempster Highway and will be transported to the project site by helicopter. Storage will be centralized near the camp and the proposed helicopter landing site. The amount of fuel anticipated for storage on site at any given times is less than 2000L of diesel and less than 400L of gasoline. Fuel will be stored in 45-gallon drums in a proposed bermed area that will be lined with a tarp. The transferring of fuel to equipment will be completed with a pump into 5Ljerry cans.

Waste Management

The project proposal indicates that kitchen waste will be burned in a barrel incinerator, other material will be crushed and recyclable material recycled; all material generated will be evacuated to landfill. Waste will be removed from site during return trips. Empty fuel barrels will remain on-site for additional storage for later use during transport or use during a spill. It is anticipated that 1m^3 /week will be generated. During the winter months at the camp and along travel routes, wastes will be compacted and stored in sealed or bags or empty fuel barrels.

Exploration Activity

The project proposal indicates that exploration activity will consist of soil sampling, trenching and drilling. The proponent has described the proposed work plan as follows:

2010-2011 - Accessing the property and cleaning up remnants of past exploration activity; this stage will include tidying up the abandoned camp and storage areas, backfilling exposed trenches from the 2001 exploration season and plan for access to ne w trench and drill sites.

2011-2013 – This stage of the project will have CUMI begin excavating trenches using a smaller size Kubota excavator to explore for mineral occurrences. The proponent proposes to backfill trenches upon completion of their use or use the exposed area as a drill site for further exploration. Bulk samples taken from trenching activities will be hauled out of the project site for further testing. The proposed method of mobilization will be by helicopter during the summer and early fall (Jun-Sept.); then by snow machine or snow cat during the rest of the year (Nov. - Apr.). Drill equipment may be flown to the project site then set up for continued exploration testing. The proponent anticipates that there will be approximately 20 different locations for the drill program. Drill core will be hauled out of the project area for testing in the same manner as the bulk samples.

2013-2014 – There will either be a continuation drilling activities or if they haven't started yet then drilling Drill equipment will be flown to the project site and set up for continued exploration testing. Again, the proponent anticipates that there will be approximately 20 different locations for the drill program. It is possible that trenching will also continue during this stage as well in which case bulk samples and drill core will continue to be hauled out as outlined previously (land and air).

Term of the permit – At any time during the term of the 5 year permit land based geophysical surveys will be conducted. These surveys aid in identifying areas of interest for trenching and drilling. The land based surveys include project personnel on foot or ATV traversing the project area collecting soil samples, rock samples and using hand held electromagnetic survey equipment.

Reclamation and Decommissioning

The proponent has indicated that the reclamation of all trenches, drill holes, the decommissioning of the camp and removal of all debris and wastes will take place prior to the end of the project. In areas where surface clearing takes place and plants exist the proposal indicates that plant material will be removed and stockpiled, then overburden will be removed separately and stockpiled; once activities are complete these materials will be replaced in reverse order. The proposal indicates that some scarification and re-contouring with fines may take place in preparation for seed with an alpine grass seed mix (if needed).

1.5 Project Scope

The principal activity of the proposed project is mineral exploration on 18quartz claims located within Tombstone Territorial Park. The project area will be accessed via helicopter and winter access trail. Project activities will commence in 2010 and will occur annually from January to December for 5 years.

Principal and Accessory Activities

- Use of equipment and machinery
- Mechanized trenching (20 trenches/100m3 each)
- Diamond drilling (20holes)
- 2-Man X-Ray Portable Drill (20 holes)
- Use of Explosives (350kg to be used in 30days)
- Water use (up to 300 m3 per day)
- Establishment of 5km X 2m of new trails
- Access
    - Air: June-Sep—up to 30 trips/year
    - Land: Nov-Apr—up to 100 trips/year
- Establishment and use of a camp for 8 people
- Waste Management
    - Burn in barrel incinerator
    - Taken to landfill
- Fuel use and storage
    - 200L of Diesel and 400L Gasoline
- Reclamation of Diesel/decommissioning activities

2.0 Environmental and Socio-economic Setting

The physical environment of the project area is varied due to the large area it comprises. Biologists and scientists conducted limited studies as part of the Tombstone Territorial Park land claim negotiations, boundary identification process, and management planning work. These studies as well as multiple travel and research publications provide a much more extensive look into the environmental setting of Tombstone Park, the location of the proposed project. A sample of papers and publications include, but not limited to:

- Ecoregions o f the Yukon Territory, Biophysical Properties of Yukon Landscapes by the Yukon Ecoregions Working Group;
- Yukon's Tombstone Range and Blackstone Uplands, A travellers Guide by Canadian Parks and Wilderness Society;

- "Assessment of the Vegetation, Terrain and Natural Features in the Tombstone Area" by Kennedy, C.E. and C.A.S Smith; and
- "Summary of Wildlife Population and Habitat Information" by Martin Kienzler;

The following is a summation.

2.1. Physical Environment

The proposed project will occur within the Blackstone River watershed, a tributary to the Peel River. The project area (claims and winter access trail) is located the Taiga Cordillera ecozone of Canada, while also in two Yukon ecoregions, the North Ogilvie Mountains and the Mackenzie Mountains. The project also traverses four ecosections identified for the Tombstone area these are: the Blackstone River Valley, Cloudy/Tombstone Ranges, Blackstone Range and an undocumented fourth ecosystem. The physiography of the Cloudy/Tombstone Range which is where the claim clock lies includes cirque basins with mountain summits that are extremely steep with near vertical walls. Classic horns, arêtes and rock glaciers are all present in this landscape. The U-shaped valleys, cirque basins and alpine glacial features are the result of Pleistocene glaciations. The elevation gain from the gravel reserve 116-B-11 to the top of Surfbird Mountain is approximately 900 feet or 290 metres. While along the Blackstone River valley there is an elevation gain of 2300 feet or 741metres from Chapman Lake to the claim site. As well, there are steep sided mountains that come together in an incised gorge several kilometers downriver of the claims.

2.2. Biological Environment

The area hosts many endemic plants as well as several species of rare and uncommon occurrence. Few other areas in the Yukon provide such a varied and diverse set of natural features in such concentration (e.g., moraines, frost mounds, palsas, ice thaw lakes, pingos, and patterned ground from ice wedge polygons). The vegetation and natural features are almost indistinguishable from the low arctic. Soils in the proposed routes range from being underlain with permafrost and very poorly drained soils, to increased drainage with less permafrost, to thicker, peaty cover which promotes permafrost development. Vegetation ranges from tundra with cottongrass tussocks, to shrub cover- primarily dwarf birch and willows.

In the downstream portion of the route, vegetation is low growing; while further upstream, in what is known as "the West Blackstone River valley," willow and dwarf birch and low lying ground vegetation is expected. Continuing further upstream, into the very upper end of the West Blackstone valley, the project is above the brush line with high angle slopes and large rocks. A 500 metre ravine is present immediately downstream of Horn Lake as well as steep ground immediately downstream of the Horn claims.

A key issue with Option A is that the use of snow machines in steep and/or rugged terrain is more likely to result in loss of snow cover and greater impacts to vegetation. Yukon Environments comments submission provides an excellent summary specific to the proposed project:

> The site visit conducted by Environment identified the camp as situated at the upper end of the creek along a south, southwest facing slope. High, steep, relatively barren cliffs surround the claims. The camp is located near the upper edge of vegetation. Vegetation is a typical alpine heath dominated by rock and bare ground (about 40% right at the camp site), moss, *Dryas octepetala*, and *Cetraria cucculata. Silene acaulis, Oxytropis*, and *Cassiope tetragona* are also common. There were some *Pedicularis, Cladina rangiferina*, and *C. stellaris* present. Some grasses were present (early phenology) closer to the camp site. No willows or rare or unusual species were noted though it may be too early in the season for identification.
>
> Given the unique vegetation communities present in the Park, there is potential for rare species to be located on the Horn Claims. Potential species include Ogilvie Mountain Spring Beauty (*Claytonia ogilviensis),* known from only 3 sites in the world – all within the southern Ogilvie's and a species of interest to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Podistera yukonensis is only known from ten populations in the world (7 sites in the Yukon and 3 in Alaska), one of which is in Tombstone Territorial Park. This species is having a COSEWIC status report commissioned in 2012. Other species of interest to COSEWIC and potentially present at the site include Draba stenopetala, D. murrayi, Phacelia mollis, Stellaria dicranoides, and Viola biflora. It must be emphasized that the rare endemic species, plant diversity and isolation in Tombstone make it unique and highly valued. Plants such as Draba ogilviensis, Poa porsildii, Silene uralensis ssp. ogilviensis, Pedicularis labradorica var. sulphurea and Antennaria densifolia are all also endemic to the area, though locally, are relatively common. (Yukon Government, 2010)

The proposed project is occurring in an area of diverse wildlife populations and it is home to a variety of species; including small game such as beaver, red fox, and hare, furbearers such as wolf and wolverine, and big game animals such as moose, caribou, black bears, grizzly bears and sheep. The region is known for its wealth of bird species- 145 species have been recorded (Tombstone Territorial Park Management Plan). The following subsections provide greater detail for species that were identified as having key wildlife habitat in the project area and/or were specifically noted as being a concern during the Seeking Views and Information period.

Dall's Sheep

The proposed project directly overlaps the south edge of a sheep distribution range on the mountain block between the Tombstone River and the Blackstone uplands. Overlap also exists along an east-west movement corridor between the North Fork Pass area and the Chandindu River area. Important Dall 's sheep winter habitat and lambing ranges are located in the Blackstone Mountain area. Sheep migrate

from winter/summer ranges across the proposed access snow machine route along the Upper Blackstone River Valley. As such, sheep are expected to use the area year-round and overlap with proposed project activities.

Other known sheep ranges exist within the project footprint. For example, the Yukon Government Wildlife Key Area Database identities winter sheep habitat several kilometres to the west and north of the claims, as well as lambing ranges and mitigation corridors along the mountain ranges on either side of the Blackstone River. A survey conducted in July 2000 also identifies sheep at the headwaters of the Blackstone River, north of Azure Lake as key sheep winter range with extremely heavy use.
Sheep habitat is defined by physical terrain rather than vegetative considerations and areas are used year after year. Sheep require steep cliff faces to escape from predators, which are also the areas where spring laming occurs. Key sheep habitats include: winter ranges, lambing areas, rutting areas, mineral licks and traditional movement routes or migration trails (Kienzler). Winter range is characterized by lower elevation, open, wind-blown, south facing slopes that allow access to vegetation and, by its proximity to escape terrain. Limited snow depth is critical for sheep during winter; therefore, quality habitat is located where wind, sun or gravity redistributes snow to create snow-free areas.
Generally speaking, lambing range is a specific portion of winter range; or in the very close proximity. Lambing range is used predictably, year after year, from the beginning of May through mid- June. Summer range is generally less well-known (i.e. documented) and is often not surveyed, but is considered to be primarily an extension of winter range wherein escape terrain may be more that 1 km away.

Grizzly Bears

Grizzly Bears are year-round resident of Tombstone Territorial Park with a moderate population density of 18 bears per 1000 km2. The range of grizzly bear densities in the Yukon generally range from 8- 22 bears per 1000 km2. The typical home range of grizzly bears (male/female) can be approximately 200-600 km2. Grizzly bears in the area may spend 6-7 months (October-April) in their winter den and are active for a period of 5 months from May to September.
Bears typically utilize valley bottom and stream corridors as travel routes, as well as alpine and sub-alpine areas. The proposed project directly overlaps with known grizzly bear habitat. The proposed helicopter flight path along Grizzly Creek and the proposed snow machine routes (along the Blackstone River) traverse areas depicted as grizzly bear habitat in the Tombstone Territorial Park Management Plan. Additionally, bear habitat has been identified along the North Klondike River area and is likely within auditory range of the proposed project activities.

Caribou

There are two caribou herds that use the Tombstone Territorial Park; the Porcupine Caribou Herd (a barren-ground herd) and the Hart River Caribou Herd (a woodland herd). Although the Horn Claims themselves do not overlap caribou habitat, proposed access traverses known winter range for the Porcupine herd and year-round range for the Hart River herd.

Key habitat for barren-ground caribou are calving areas, rutting areas and migration corridors- winter range is not considered key habitat. The population of Porcupine Caribou has declined within the last few decades. Herd size in 1989 was estimated at 178,000 caribou and today is estimated to be between 90, 000 and 100,000 caribou. Although wildlife populations are known to fluctuated, it is believed that the herd's decline may be in excess of normal fluctuations. Wildlife managers have indicated that since 1994 the population has been in decline at the rate of 4%.

In 2006 the Hart River Caribou herd was estimated at 2,200 individuals (Population Status of the Hart River Caribou Herd, 2006). The Hart River herd is one of the Northern Mountain populations of Woodland caribou species that have been listed as a species of special concern by Committee on the Status of Endangered Species in Canada [COSEWIC], and a special concern status listed on Schedule 1 under the Species at Risk Act. A species of special concern is defined as having characteristics that make it particularly sensitive to human activities or natural events. Key habitat for woodland caribou includes; rutting areas, migration corridors and winter range. As such, the proposed project will overlap with key habitat for the Hart River herd.

Caribou have specific habitat requirements that make them dependent on discrete, specialized habitats. Caribou feed on terrestrial lichens, which take a minimum of 40 -50 years to establish. As result, caribou rely on old-growth open canopy forests with lichen ground cover, and/or alpine lichens. Areas with a high density of lichen create higher quality habitat wherein caribou do not need to expend as much energy foraging. Unlike barren-ground caribou, Hart River caribou and other Northern Mountain Caribou herds migrate over small distances primarily from low elevations in winter to higher elevations in summer. Caribou make use of windy alpine locales and ice and snow patches to escape harassment by insects.

Moose

Moose are a common ungulate known to Tombstone Territorial Park occurring in estimated densities of 100 moose per 1000 km2 (Kienzler 1999). Moose tend to concentrate in lowland and riparian habitats with good willow growth in late winter. Important areas for moose along the Blackstone River Valley are identified in the Tombstone Management Plan (Figure XX). Yukon Environment conducted a moose survey in 2009 that identified several moose observations in small patches of willow habitat in the Blackstone Valley.

Fish

Fish species within the Tombstone Territorial Park may include Arctic grayling in the tributaries of the Yukon River drainage, Dolly Varden and Arctic char. (Gnieser, 2000) Dolly Varden is a species currently being assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
The Blackstone River is important habitat for grayling and Dolly Varden. Additionally, there is a small lake 2.3 km downstream of the Horn Claims where Dolly Varden has been found and may be an important overwintering site. Proposed travel routes for this project involve an estimated 42 stream crossings. Yukon Environment may be conducting a fisheries assessment in the Tombstone Territorial Park during the summer of 2010.

Avifauna

The avifauna is exceptionally rich with sightings of over 100, mostly migrant, bird species in Tombstone Territorial Park. Examples of common observations include; Golden Eagle, Northern Harrier, American Kestrel Short-Eared Owl, Alder Flycatcher American Pipit, Gray-crowned Rosy Finch, Horned Lark, Lapland Longspur, Bufflehead, Harlequin Duck, Mew Gull Northern Wheatear, Rock Ptarmigan, White-tailed Ptarmigan Willow Ptarmigan Wandering Tattler, loons, plovers and warblers (Gnieser 2000).
A 10 km section of the central Blackstone River valley is identified as key habitat for birds of prey-gyrfalcons and golden eagles (Figure XX). The area may be used during sensitive periods such as breeding and nesting. A Raptors survey is being planned for the summer of 2010.
Surfbirds are relatively rare shorebirds that are known to nest on ridges that directly overlap with the preferred snow machine access route. The current global breeding range for surfbirds is generally limited to Alaska and the Yukon.

2.3. Socio-economic Environment

Traditional use

The project area has been used by First Nations people for millennia, and the specific heritage values in and adjacent to the site are notable. This area has been used by the Hän, Tukudh and Tetl'it Gwich'in to fish, hunt, travel, gather and make the tools they needed to live; it has been estimated that occupation of the park spans from 8000- 10 000 years (Tr'ondëk Hwëch'in, 2010). Objects and sites within the project area are likely to include the following: hunting/fishing implements, food cache structures, historic brush structures, camp remains, and hunting blinds. Several areas within the area of the project are of high and moderate heritage potential based on wildlife values, topographical features, proximity to waterways, and logical stopping points along travel routes.

Hunting and Trapping

The project area is used by a commercial Outfitter, Hunt Yukon, who has been offering guided hunts here for the past 45 years. Hunt Yukon is the registered holder of Yukon Outfitting concession #3 which is approximately 10,000km². The Blackstone Uplands is a focal point for their hunts because of the area in general supports five large mammal species, the same species that are sold for hunts. There are approximately 24 hunts a year and they tend to occur within the late summer and fall seasons (Aug-Oct). Hunt Yukon has a base camp and at least four other camps located within the Blackstone Valley and subject to overlap with the proposed project.

There is also a Registered Trapping Concession (RTC#20) holder whom is a Tr'ondëk Hwëch'in beneficiary that utilizes the West Blackstone River watershed. Trapping activities focus on small mammals and season dates range between October and May depending on the species. Trapping provides concession holders with a unique lifestyle and financial benefits.

The project area is within Game Management Areas (GMA) #223 and #228. GMA 228 is split by the Dempster Highway and therefore provides easier access for hunters. Moose and Caribou are the primary targets for resident subsistence hunters.

Wilderness Tourism

Tombstone Park, in which the proposed project lies, is a Yukon wilderness destination with an accessible government campground and nature trails, roadside wildlife viewing and a new interpretive centre add to the Parks' appeal to highway and wilderness travelers. Visitor use in Tombstone Territorial Park has increased steadily since 1986 (Figure 6).

Knowledgeable Yukon wilderness tourism guides enhance visitors' experience by providing interpretation and information, ensuring clients have the skills necessary to safely enjoy the park and ensuring that Park resources are respected and protected.

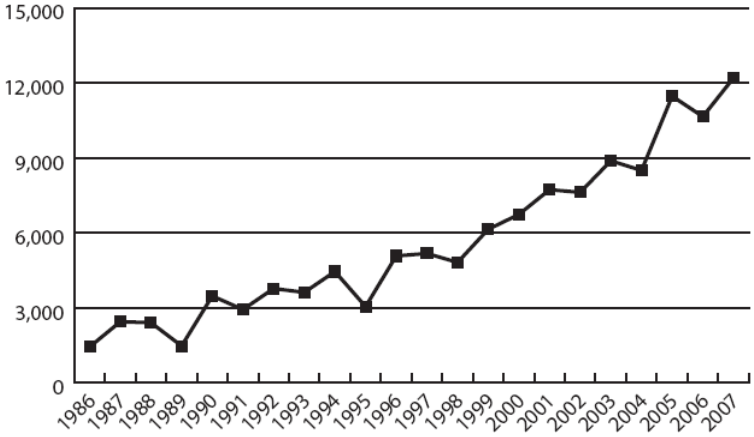

Figure 7: Visitor numbers at the Dempster Highway Interpretive Centre (Source: Tombstone Park Management Plan).

3.0 Requirement for an Assessment

An assessment by the Designated Office is required under the following circumstances:

1. An activity is proposed to be undertaken that is listed in Schedule 1 of the Assessable Activities, Exceptions and Executive Committee Projects Regulations (Activity Regulations) and not excepted. The proponent proposes to undertake activities listed in Part*, 1,* Item 1 of the Activity Regulations, specifically:

   "On other than an Indian reserve, exploration for the purpose of quartz mining, or other activity in relation to exploration for the purpose of quartz mining, on a quartz grant"

2. The project is being undertaken in the Yukon; and
3. An authorization or the grant of an interest in land by a government agency or first nation is required for the activity to be undertaken.

Decision bodies and authorizations have been identified based on information in the project proposal and information submitted to the Designated Office during the assessment.

Decision Body	Authorization(s) Required	Act or Regulation
Yukon Government – Energy, Mines and Resources Branch	Class III Mining Land Use Permit	*Quartz Mining Land Use Act*
	Park Permit	*Parks and Land Certainty Act*

Table 1: Decision Body(s) and Authorizations Required

4.0 Scope of the Assessment

Scope of the Project

The foundation of any assessment includes the determination of the scope of the project. In the process of developing the scope of the project, the assessor identifies the activities in the proposal as well as related activities that are likely to occur. The activities that form the scope of the project are identified in Section 1.5 of this report. The activities included the scope of the project form the basis upon which views and information are submitted into t he assessment and are considered by us when scoping the assessment of potential environmental and socio-economic effects.

Changes to the Project Scope

During the Seeking Views and Information Period of this evaluation the proponent made numerous changes to the project activities. These changes resulted in changes to the scope of the project and caused unnecessary delays and complexity in the assessment. Examples of project changes include:

- A decrease in the volume of material transported by snow machine from 2500 tonnes to 250 tonnes over 5 years;
- An increase in the number of trips proposed for winter access;
- A change of the type of equipment to be used (additional equipment added or provided as optional);
- An alteration of the underground structures to be constructed (i.e., adit removed from proposal) and an estimated decrease in the amount of material to be removed;
- Repeated changes to location and frequency of helicopter access routes and staging areas along the Dempster Highway;
- Repeated changes to winter land based access routes and staging areas along the Dempster Highway;
- A change to the proposed amount of explosives to be used; and
- Different operating days proposed, seasonally, through the year.

While YESAA allows for changes in project scope during assessments, this is balanced with ensuring that those with an interest in the assessment have an opportunity to:

- Properly understand the project activities;
- Develop their views and information on the project and its potential effects; and,
- Submit their views and information into the assessment.

The Designated Office received multiple submissions where those interested in participating in this assessment (organizations, governments and individuals) state that during the evaluation there were times where they were unclear as to 'what to comment on'. While participants were able to submit their views and information, the process was inefficient and less effective due to repeated changes to the project scope. In these submissions, participants also raised frustrations regarding how their time and effort spent to develop and submit comments could be wasted if the comments become irrelevant due to ongoing changes in the project scope.

Consideration of Comment Submissions

The number of comments received during this assessment exceeded past assessments conducted by this Designated Office. Six hundred and seventy-seven (677) comment submissions were received, including submissions from individuals; interested parties such as the local outfitter (Hunt Yukon); organizations (Yukon Conservation Society; CPAWS; Wilderness Tourism Assoc.; Canadian River Expeditions and Nahanni River Adventures and Mining Watch Canada); First Nation governments (Tr'ondëk Hwëch'in, Nacho Nyak Dun and Gwich'in Tribal Council) and the Yukon Government (Environment, Tourism and Culture, and Energy, Mines and Resources). Comment submissions assisted in identifying valued components related to the environmental and socio-economic setting as well as potential effects and in some cases suggested mitigations. A summary of the comment submission is

provided in Table 2 at the end of section 4.0; please note that the table provides a summary of comments received. The record of comments received during this evaluation can be viewed on the YESAB Online Registry at www.yesab.ca/registry or at the Dawson Designated Office

Consideration of Valued Environmental and Socio-Economic Components
The Designated Office has organized this report using the following valued environmental and socio-economic components (VESECs):

- Wildlife and Wildlife Habitat (section 5.0)
- Contemporary Lifestyle - Wildlife Harvesting (section 6.0)
- Parks and Protected Areas Values and Interests (section 7.0)
- Traditional and Cultural Interests (section 8.0)
- Ecological Integrity (section 9.0)

While links between these values are commonly found in assessments, we found this to be particularly prevalent during this assessment. For the purposes of the evaluation report, we present effects on particular values separately. During this assessment there was often overlap between effects and multiple values. As a result, there is some duplication in the text that could not be avoided. For example, when characterizing the effects on ecological integrity, the baseline quality of the environment has been given a certain elevated importance because it is a Park and protected area, likewise with wildlife and wildlife habitat. In the same way that the value of a Park and Protected area is weighted with its traditional and cultural interests, the value of the park ensures preservation of the traditional and cultural interests and identity to the area.

During this assessment, comments were received that discussed both the rights of the mineral claim holder and the appropriateness of mining activities in a park. For the purposes of this assessment, we recognize that mineral rights are a socio-economic value that would only be positively affected should the project proceed. Beneficial effects are considered in assessments under YESAA, but significant adverse effects determine the assessment recommendation. We recognize that the mineral claims pre-exist the establishment of Tombstone Territorial Park and considered the statutory regime governing mining and exploration, including the Tr'ondëk Hwëch'in Final Agreement.

Table 2: Summary of Comment Submissions and further consideration of comments.

Description	Summary	Sections that demonstrate further consideration
Environmental Impacts		
	▪ Erosion, scarring and slumping ▪ Noise pollution ▪ Risks of pollution and contamination of Blackstone River and Peel Watershed ▪ Adverse effect of blasting and drilling ▪ Negative impacts to eco-system ▪ Soil compaction, rutting, permafrost exposure, erodible materials ▪ Changes in soil temperatures and melting permafrost ▪ Creek flow disruption and changes to local hydrology ▪ Toxic tailing ponds ▪ Potential damage to vegetation and soil ▪ Potential location and destruction of rare plants ▪ Introduction of non native plant species ▪ Generation of solid and special wastes ▪ Adverse effects of snow compacting ▪ Climate change	5.0 Wildlife and Wildlife Habitat 7.0 Parks and Protected Areas 9.0 Ecological Integrity
Wildlife and Wildlife Habitat		
	▪ Disturbance, displacement and abandonment	

	▪ Sensitive and fragile habitat ▪ Risks to Porcupine and Hart River caribou herd ▪ Adverse effects ▪ Potential threats ▪ Key habitat for a wide variety of plant/wildlife identified in the project area ▪ Overlap with range for the Porcupine and Hart River caribou herd and moose winter range ▪ Animals' ability to adjust ▪ Facilitation of predation ▪ Increased bear-human interactions ▪ Attracting bears to claim and nearby Talus Lake backcountry campground	5.0 Wildlife and Wildlife Habitat 6.0 Wildlife Harvesting 8.0 Traditional and Cultural Interests
Recreational Pursuits	▪ Deterrent to tourists ▪ Loss ▪ Reduced enjoyment of the area ▪ Disruptive to hikers ▪ Negatively impact territory's tourism industry ▪ Adverse affects on wildlife tourism and guided hunting activity and potential	6.0 Wildlife Harvesting 7.0 Parks and Protected Areas
Area's Significance	▪ Cultural, Spiritual and Subsistence ▪ Popular travel destination ▪ Important to wildlife and water quality	5.0 Wildlife and Wildlife Habitat 6.0 Parks and Protected Areas

	▪ Social and environmental ▪ First Nation traditional territory ▪ Historical and Natural	8.0 Traditional and Cultural Interests 9.0 Ecological Integrity
Access Routes		
	▪ Descriptions of past and present use of existing routes ▪ Impacts to historical significance ▪ Concerns and issues associated with helicopter access ▪ Risks and threats to vegetation, wildlife and waterways ▪ Suitability and feasibility of access methods ▪ Issues with winter access routes	5.0 Wildlife and Wildlife Habitat 6.0 Wildlife Harvesting 7.0 Parks and Protected Areas
Mining and activities		
	▪ Required/Recommended use, maintenance and storage of equipment and materials ▪ Acts and regulations to abide by ▪ Horn claim history ▪ Project location ▪ Incompatibility with Tombstone Territorial Park's management plan ▪ Long term impacts for industry ▪ Industry's importance to Yukon economy ▪ Concerns regarding location ▪ Opportunity costs	Information provided assists with effects characterization, significance determination and consideration of adequate mitigation. This types of views and information will be considered for the most part in the following sections: 5.0 Wildlife and Wildlife Habitat 6.0 Wildlife Harvesting 7.0 Parks and Protected Areas 8.0 Traditional and Cultural

	▪ Concerns regarding proposed mitigations ▪ Adverse effects on ecological integrity ▪ Cumulative impact ▪ Impact on Yukon and park's reputation ▪ Risks involved ▪ Concerns about allowing claims to remain within the park ▪ Concerns regarding reclamation and its effectiveness ▪ Permits required and procedures to follow from beginning to cessation ▪ Interaction with park officials during activities	Interests 9.0 Ecological Integrity
Tombstone Territorial Park	▪ Chronology of events relating to Tombstone Territorial Park and its origination ▪ Description of Tombstone Territorial Management Plan and its significance ▪ Park's Attributes ▪ Purpose of park designation ▪ Intrinsic value ▪ Economic benefits of preservation	1.0 Project Description 2.0 Environmental and Socio-Economic Setting 7.0 Parks and Protected Areas
Scope of the Assessment	▪ Comments regarding changes to project scope	4.0 Scope of the Assessment

PART B – EFFECTS CHARACTERIZATION AND REASONS FOR RECOMMENDATION/REFERRAL

5.0 Wildlife and Wildlife Habitat

5.1 Overview

The proposed project is occurring approximately 57 km northeast from Dawson City, in the Cloudy Range of the Ogilvie Mountains. The project area is encompassed within the boundaries of Tombstone Territorial Park which is rich in both species diversity and vegetation communities due to its physiographic and climate. Notably, the Park is home to sufficient densities of five large mammals which is unusual for this latitude and over 100 species of avifauna have been documented within the park.

The project area includes the proposed project site (Horn Claims) and access routes (land and air). The Horn Claims comprise of a relatively small area of land within the headwaters of Blackstone River. Overland access may occur from November 1st to April 15th via snow machine along one of two proposed access routes; a preferred route and a secondary route (Figure XX). The preferred route is approximately 15 km initiating at Km 94 of the Dempster Highway before heading in the general direction of north-east, crossing Slavin Creek then proceeding west towards the Blackstone River. The route then generally follows the Blackstone River west to the project site. The secondary (or optional) route is approximately 46 km starting at Km 114.6 of the Dempster Highway approximately where the west Blackstone River meets the east Blackstone River. The route generally follows the Blackstone River west to the Horn Claims.

Up to 30 helicopter trips per year may occur between June and September. The proposed helicopter route initiates at a staging area along the Dempster Highway and follows Grizzly Creek, over Mount Monolith, traversing the Tombstone River valley, before reaching Horn Mountain.

The proposed project is unique as it is occurring in Tombstone Territorial Park- an area designated for protection in part to its ecological diversity and richness. General practice for YESAB assessments is to identify important wildlife and wildlife habitat areas with the aid of Yukon Government's wildlife key area maps. However, as the entire footprint of the proposed project is located in a protected Park, all wildlife and its habitat is considered central to fulfilling the intent of the Tombstone Management Plan (the Plan). The maps that have been used to indicate key areas have been taken from the Plan and will be used and referenced throughout this Section. *Note: Maps were taken directly from the Plan and were not altered to reflect the project site and access routes. Please refer to figures 4, 5 and6 for a visual depiction of access locations.*

The proposed project area overlaps directly with known important habitat for Dall's sheep, Porcupine Caribou, Hart River Caribou, bears and raptors. Project activities could result in effects to wildlife and wildlife habitat such as habitat loss and alteration, displacement and stress, and direct injury and/or mortality. These effects will be considered for the following species, as these species are considered to be most at risk and/or are of particular social and cultural importance:

- Sheep
- Bears
- Moose
- Caribou
- Avifauna

The Designated Office has determined that the project will result in significant adverse effects to wildlife and wildlife habitat that cannot be mitigated. The rationale for this determination is discussed below.

Residual and Cumulative Effects

The assessment of cumulative effects under YESAA considers the residual effects of this project on Wildlife and Wildlife Habitat in combination with of the residual effects of:

(i) other projects for which proposals have been submitted under subsection 50(1)[of YESAA][, or
(ii) other existing or proposed activities in or outside Yukon that are known to the designated office, executive committee or panel of the Board from information provided to it or obtained by it under the Act; (YESAA s42(1)(d))

This evaluation has determined that there are significant adverse project effects to wildlife and wildlife habitat that cannot be mitigated. It follows that the cumulative effects are also significant and adverse on wildlife and wildlife habitat and further consideration is not detailed here.

5.2 Project Effects

Habitat loss and disruption of foraging, watering, and reproductive behavior can occur when wildlife are displaced or stressed as a result of noise disturbances associated with drilling, blasting, human presence, as well as helicopter and snow machine use. This can result in further habitat fragmentation, stress, and avoidance which could potentially affect the long-term survival and reproductive success of wildlife. Site clearing and drilling activities can result in the degradation of limited topsoil, damage to vegetation, and changes to the surface and sub-surface hydrology. This will decrease the ability of the area to regenerate to pre-disturbance conditions, affecting the long-term habitat productivity of the area. Project activities could also result in direct injury and/or mortality, such as through human-wildlife conflicts due to

inadequate waste management and/or the potential for increased harvest pressure due to increased access.

These project effects will be discussed in more detail in the following specific species sections.

i. Dall's sheep

The proposed project area directly overlaps with known sheep range and movement corridors. Project activities that have the potential to adversely affect sheep and sheep habitat include mineral exploration activities (drilling, trenching, use of explosives, camp operations) and access to the site by helicopter and snow machine. Proposed project activities are occurring year-round, therefore a direct overlap with the project and sheep exists.

Key sheep habitat areas for sheep include; winter ranges, lambing areas, rutting areas, mineral licks and movement corridors. Sheep habitat is defined by the physical terrain rather than vegetative considerations. Sheep require steep cliff faces to escape from predators, which are also the areas where spring lambing occurs. Winter range is characterized by open, wind-blown south facing slopes that allow access to vegetation, and by its proximity to escape terrain. Summer range, Generally speaking, summer range occurs on the ridge tops and north facing slopes. The specific terrain requirements of sheep cause them to exist in discrete, localized areas.

Land Access

Spatially, snow machine routes along the Blackstone River will directly overlap with important sheep habitat and movement corridors. Although land access is proposed when sheep are in their winter range (i.e. not present low in the valley), YG Environment noted in their comment submission that as per a July 2000 survey, the headwaters of the Blackstone River (north of Azure Lake) are identified as key winter range with extremely heavy use. Particular concern exists regarding the noise disturbance from frequent snow machine in an area of key sheep winter range that has extremely heavy use by sheep. Snow machine use of such frequency (up to 100 trips between November 1st and April 15th) would represent a significant amount of disturbance, particularly as during the winter months sheep are already energetically stressed.

Responses to such auditory and visual disturbances include escaping from the source of the disturbance, (e.g. fleeing, running, walking, moving to another location), and/or increasing vigilance behaviour (Frid 2003). Increased vigilance refers to a change in behavior and/or a shift in activities whereby individuals spend less time engaging in fitness-enhancing behaviour (e.g. bedding, foraging, nursing, mating, etc.) and more time engaging in anti-predator behaviour (e.g. standing, watching, moving to other areas). There is a trade-off between these behaviours, with one behaviour occurring at the expense of the other. While there is an optimal balance between these behaviours that enable populations to survive, where

this balance shifts toward anti-predator behaviour due to chronic disturbances, effects to individuals and the larger population ensue. These effects include: physical stress, reduced body condition, reduced fecundity, changes in parental investment that impact the survival of young, and habitat selection for alternate areas with less disturbance stimuli but which may be of lower quality (Frid, 2003; Bleich et al.,

1994; Beckstead, 2004). Where animals are displaced into lower quality habitats, impacts to the population may be exacerbated (Johnson et al., 2005). Disturbance can also result in indirect mortality, particularly for young animals. For example, ewes fleeing from disturbances can become physically separated from their lambs, increasing opportunities for lamb predation (Frid, 1995). Examples of this have been documented wherein golden eagles opportunistically preyed on lambs in the wake of helicopter disturbance (Bleich, 1994; Frid, 1995). These effects can lead to overall population declines and/or habitat abandonment, particularly where disturbance is frequent and intense (Frid, 1995; Bleich, 1994).

Research conducted in other jurisdictions has shown that sheep only habituate to motorized vehicles after spending a high frequency of exposure (hundreds or thousands of trips) over a long period of time). In their comment submission, Yukon Environment states that sheep may become habituated to the snow machine use within the year, but not in between the years. This means that sheep will not habituate to the chronic disturbance of the proposed activities for the life of the project- the duration of effects is long.

Helicopter Access

Approximately 30 helicopter trips to the project area will occur annually over four months from June to September. With reference to the Important Sheep Habitat value map from the Tombstone Territorial Park Management Plan (Figure 8), the proposed route will fly in the direct area of a small range of important sheep habitat just east of Mount Monolith. Helicopters will fly directly over known movement corridors in the Tombstone River Valley before landing within another identified sheep range at the project site. Initial helicopter activity will occur during the sensitive lambing period and may be as frequent as eight return trips per day during the weekly or bi-weekly runs.

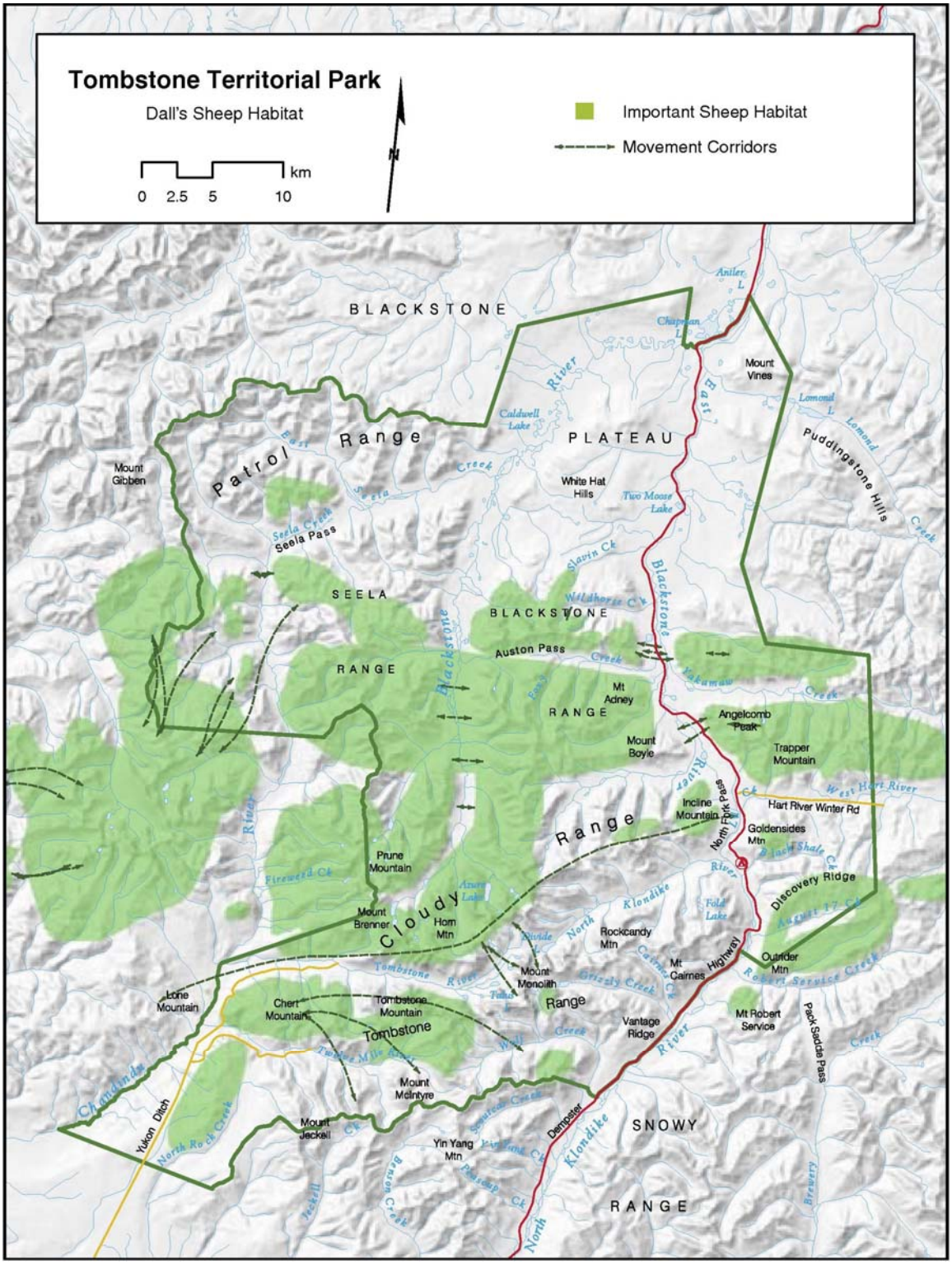

Figure 8: Important Sheep Habitat in Tombstone Territorial Park

It is well known that helicopter use is a significant disturbance that is known to adversely affect sheep. In conversation with Jean Carey, at Yukon Environment, sheep see a helicopter as an avian predator. Responses to helicopter disturbance include fleeing to escape terrain (if available), abandon the range all together and possibly moving to a lower quality habitat, or remaining vigilant within the range. Even after a disturbance has passed, it may take up to 45 minutes to resume pre-disturbance activity (Flying in Sheep Country, 2006). The initial effect of the helicopter noise in an area can be so acute that mountain sheep continued to move during the day (Bleich, 1994)). Frid (2003) suggested that Dall's sheep responded more strongly to the first flight of the day than to subsequent overflights but found that after months of study the proportion of sheep fleeing from aircraft overflights did not change. Long-term habituation to sustained aircraft overflights has not been intensively studied, and the speculations are contradictory. Frequent disturbances could eventually affect body condition and reproductive success which is likely to comprise the overall health of individuals and the population at large.

For example, in one study conducted in the Kluane National Park area of southwest Yukon helicopter disturbance caused a substantial energetic cost to sheep. Sheep demonstrated escape behaviour when exposed to helicopter flights, escaping from helicopters 75% of the time (Frid, 1995). At a mean distance from the helicopter of 2.2 km sheep responded to helicopters via escaping and/or increasing vigilance behaviour (Frid, 1995). As well, habituation did not occur throughout the study. This lack of habituation is consistent with the findings of other studies (Bleich, 1994). Evidence indicates that sheep will abandon ranges when exposed to disturbances from helicopter use. This sensitivity of sheep to disturbance, combined with their dependency on discrete and restricted habitats, makes their population particularly vulnerable to project activities due to the effects previously described (e.g. vigilance, habitat displacement, reduced fecundity). Sheep are strongly disturbed if helicopter suddenly appears over a ridge without warning. Topography may provide auditory and visual buffers until the helicopter is within very close proximity to sheep (Frid, 2003). As noted, the proposed helicopter route is proposed over Mount Monolith and across the Tombstone River Valley before reaching Horn Mountain.

In between season, sheep move from their summer to winter range. Known movement corridors are considered to be key habitat areas and a known east-west movement corridor extending from the North Fork Pass area to the Chandinduu River area lays in the immediate area of the Horn Claims. Movement corridors are considered critical habitat areas for sheep as sheep are at increased vulnerability to predation while they are low in valleys and outside of their seasonal ranges. Furthermore, knowledge of migration/movement corridors to other ranges is passed onto younger animals by older members of the herd. Therefore, if movement corridors to other suitable ranges have been interrupted, knowledge of migrations trails may essentially be "forgotten" within the herd.

In a response to information request dated May 10, 2010, the proponent states that with respect to local sheep populations, the proposed project "does not have significant effects on its surroundings, being of very small size compared to the natural features surrounding it". As previously noted, the Horn Claims may only represent a small area; however, the overall project footprint overlaps a significantly higher proportion of Tombstone Park and its wildlife habitat because of the project's zone of influence.

The proponent further states that a wildlife log kept in 2001 yielded limited sighting of sheep. Although sheep may not have been using the area of the Horn Claims at the time of this observation they do utilize this area and range in close proximity. The southern Ogilvie's reportedly have the best habitat and densest sheep populations within the Dempster Highway Corridor (Kienzler, 1999). Evidence of sheep utilizing the area exists and includes; the proponent has stated that sheep have been spotted within 2 km of the site, during a flyover in June 2010, Yukon Parks saw 12+ nursery sheep and several sheep approximately 1 km north of the Horn Claims and Yukon Environment identified the headwaters of the Blackstone River, north of Azure Lake as key winter range with extremely heavy use. Lastly, the range has been identified as important sheep habitat based on the environmental features it provides and although recent use has been limited, it does not preclude that this area of the identified range won't be used in the future, This means that contrary to the Proponent's limited observation of sheep in the project area, evidence otherwise exists.

Significance Determination

The project footprint overlaps known sheep habitat and movement corridors. The above section outlines the potential for the proposed project to adversely affect sheep and demonstrated the potential impact of these affects.

The significance of the effects described (population declines due to range abandonment/ vigilance, etc), is underlined by the value of this sheep population within Tombstone Territorial Park. Sheep habitat in the Tombstone Territorial Park is of excellent quality, containing year-round ranges and offers limited human presence and/or disturbance. The incorporation of proposed project activities such as 100 snow machine trips in a 120 day span and 30 return helicopter flights have a high likelihood of resulting in significant adverse effects to sheep such as, habitat abandonment and increased vigilance. These effects could have significant impact to the population where/if they relocate to less optimal habitats and/or habitats that are population sinks. If sheep populations are significantly impacted as a result of project activities, the entity of Tombstone Territorial Park will also be adversely affected.

The proponent has not committed to specific mitigations to address the impacts to sheep from chronic disturbances from frequent access (snow machine and helicopter), human presence and mining activities (such as blasting, drilling and the establishment of a camp). The proponent has committed to the following broad mitigation with respect to minimize disturbance to sheep:

- Consultation with experiences users/managers of the area will take place to ensure that most environmentally benign operations possible.

Although the above mitigation may be useful and is encouraged, it should take place in the project planning stage prior to a submission to YESAB. Under YESAA, projects are assessed and effects are determined to be insignificant/significant based on a proposed project. Proper planning and consideration of potential effects of project activities must be demonstrated in a proponent's submission; as project planning is not the responsibility of YESAB assessors, nor is the assessment process the correct venue.

To address short-comings in proposed the proposed project, the following additional possible mitigations were considered, some of which were recommended by YG Environment.

- Snow machine travel shall occur in valley bottoms and avoid alpine areas
- The proponent should follow guidelines outlined in the "Flying in Sheep Country" publication
- In the absence of knowing helicopter access routes to the site, no helicopter access during lambing (May 1- June 15)
- Explosive work should occur well after the lambing period (preferably in late July and August) and not in late-winter when animals are in a sensitive physical condition.
- No recreational use of ATVs or snowmobiles outside of the access route and camp and activity sites.
- The proponent must use helicopter routes that avoid alpine areas where possible
- Adaptive route planning should occur in collaboration with the Dawson Regional Biologist and First Nation Wildlife Managers.

Due to the sheer proximity and overlap of the project area and the proposed snow machine routes, several of the above mitigations are not likely to be effective and/or cannot be implemented. Firstly, the above mitigations will not adequately reduce the effects of chronic disturbance to sheep resulting from access. During the winter months, approximately 100 return trips by snow machines have been proposed in Blackstone River area. By recommending that snow machine access be localized in low in river valleys will reduce potential effects to sheep because when sheep flee from disturbance, it is less dangerous for them to escape up terrain rather than down. However, this mitigation has the potential to result in significant effects to other species. Wildlife such as caribou, bears and moose rely on habitat found low in river valleys, as well as utilizes them as movement corridors to travel from one range to another. Reducing effects to one species should not occur at the expense of effects to another. Furthermore, as the project is occurring in an alpine area, snow machine travel will not be limited to low valley regions.

There are concerns relating to the feasibility of mitigations that are essential to reducing potential effects to sheep. For example, adherence to the Flying in Sheep Country document has been recommended and is a general requirement for all projects within areas of sheep habitat. YG Environment stated in their

comment submission that the guideline should be strictly adhered with. The first guideline within the document states; “Whenever possible, fly more than 3.5 km from known sheep ranges”. As the proposed project is located in an identified sheep range and within close proximity of other known important habitat, the Designated Office is significantly concerned that this will never be complied with; and in fact it will be impossible to ever fly more than 3.5 km from known sheep ranges. The Flying in Sheep Country guidelines were not designed to address frequent and intense flight activity in localized areas and directly within known ranges.

Finally, as demonstrated in the overview of effects, sheep only habituate to motorized vehicles after a high frequency of exposure over a long period of time. Sheep may eventually become habituated to snow machine use over a single season, but not in-between years. As a result, chronic disturbance effects will occur for a long duration of time- the five-year proposed life of the project. Effects of chronic disturbance may have significant consequences to individual body condition and reproductive success; which over a long period of time will undoubtedly decline the overall health of the population.

To summarize, project activities cannot be mitigated for the following reasons;

- The Designated Office does not have confidence that adequate consideration has been given to sheep and sheep habitat.
- Project activities directly overlap, or are in the direct vicinity of important sheep habitat, including key sheep winter range with extremely heavy use at the headwaters of the Blackstone River.
- If significant adverse effects to sheep occur, the vision of Tombstone Territorial Park and principles of the management plan has been compromised.
- Frequent disturbance within known sheep range is not adequately addressed by the “Flying in Sheep Country” guidelines.
- The duration of effects is long to the overall health of the local sheep population; therefore the consequence is high.

Therefore, the Designated Office has determined that the proposed project will result in significant adverse effects to sheep due to disturbance that cannot be mitigated.

ii. Grizzly Bears

The proposed project is occurring in a remote area of the Yukon that supports a moderate density of grizzly bears at 18 bears per 1000 km2. Average densities within the Yukon range from 8- 22 bears per 1000 km2. Areas important to bears include denning areas (especially in permafrost areas), major feeding areas (gravel bars/riparian areas, berry areas), and movement corridors (Kienzler 1999).

When compared to other large carnivores, grizzlies are considered to have a lower ecological resilience, which is characterized by low population density, low fecundity, and low dispersal ability through developed areas (Weaver et al., 1996). As a result, grizzly bears are extremely vulnerable to extinction as their populations cannot quickly recover from decline. Low resilience also suggests that grizzlies are especially vulnerable to development-related disturbance (Edwards, 2006). As such, grizzly bears are identified as a species of concern by COSEWIC.

Impacts to bears have the potential to be adverse due to their critical ecological function. As well, grizzly bears are a widely-held symbol of wilderness, and each year thousands of people visit the Yukon and its Tombstone Park looking for an extreme wilderness experience. Guided bear viewing and hunting trips generate many economic benefits to the Yukon and its communities.

Bears typically utilize valley bottom and rivers as travel routes. The proposed project is located in-between the Blackstone and Tombstone River valleys; two areas depicted as important bear habitat in the Tombstone Territorial Management Plan (Figure 9). The Tombstone River valley also contains a movement corridor which is in the direct vicinity of the project location and overlaps the proposed helicopter access route. Although grizzly bears have the ability to travel almost anywhere they choose, much of their movement is predictable in that they typically use the easiest route which also provides feeding opportunities (MacHutchon, 1997).

Two main concerns with respect to grizzly bears exist: bear habitat and waste management.

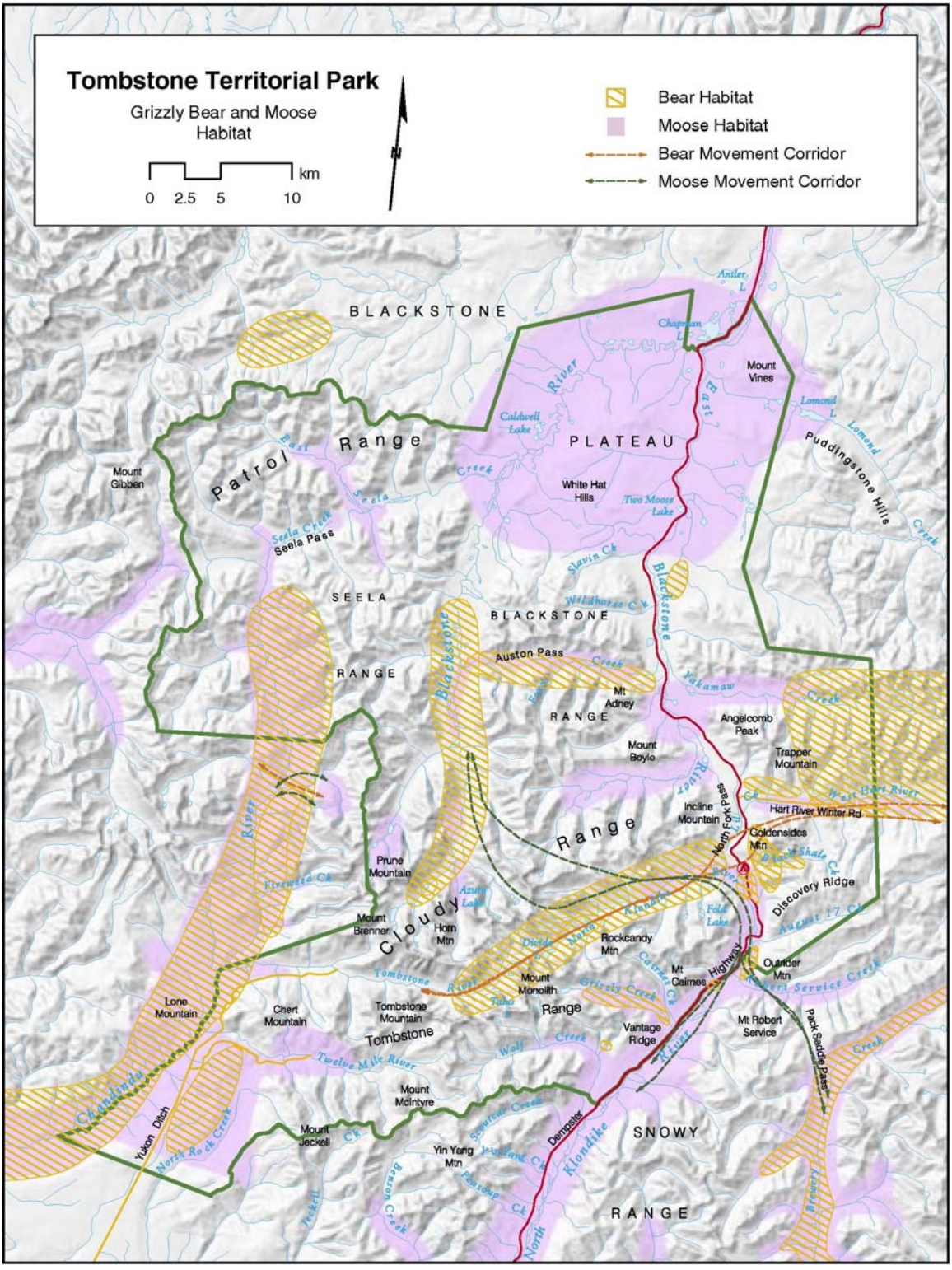

Figure 9- Important Grizzly Bear and Moose Habitat, Tombstone Territorial Park

Bear Habitat and Range Use

The proposed project affects an area that has a relatively high density of year-round resident grizzly bears. Detailed study and census data on local populations have not been collected; however, the Yukon Parks Technical Report indicates that densities of bears are higher along the Tombstone and Blackstone Rivers.

Bears are inactive for approximately 6- 7 months (October – April) per year while they are denning. Personal correspondence with Rob Florkiewicz, Manager, Species Program at Yukon Environment, indicated that heavy snow machine disturbance could wake up denning grizzly bears. If hibernation is disrupted, bears may require an increase in energetic reserves which is of particular concern in the Yukon as the winter is long and harsh. If snow machine disturbance occurs when bears are tending their young, it could negatively affect nursing and the survival of the cubs.

Upon emergence from dens in the late winter/early spring, bears are especially sensitive as they search for food. If their denning period has been disturbed, bears may emerge earlier in the season at a time when there is little/no forage resources. This could have significant impacts to bear populations in the Tombstone Park. Winter access both spatially and temporally overlaps when bears are denning and at the time they emerge from their dens.

Information provided by YG Carnivore Biologist Ramona Maraj indicates that although no studies have been done related to bear denning in the area, it is expected that good denning habitat exists on some of the south, southeast and southwest slopes in the region. Disturbance from approximately 100 round trips by snow machine from November 1st to April 15th in the direct area of dens has a high potential to negatively impact grizzly bears.

Waste Management

Human-wildlife encounters can be fatal, particularly with bears, as a result of habituation to humans and camps. Habituation is almost always connected with an event or history of feeding on human foods or garbage. Garbage and debris that is not handled appropriately may attract bears and other wildlife to camps and other areas frequented by people. Food conditioning in itself proves generally positive for bears as evidenced by increases in body size, reproductive rate and average litter size; however it poses a significant safety concern to wildlife and human safety from consequences of interactions (Despain et al., 1986). Habituated bears that are successful at procuring garbage as a food source are particularly at risk and will typically result in close human-bear encounters to which a bear may respond unexpectedly

with curious investigation or a potentially injurious charge (Gnieser, 2000). Aggressive or investigative bear behaviour towards humans usually results in the destruction of the bear. Bear populations cannot handle high-rates of human-caused mortality and studies in the Yukon show that in a stable bear population of 100 animals, only one female bear per year can be killed before adverse effects to bear population occur (Parks Technical Report, 2010).

Open burning of garbage as a sole bear deterrent is unlikely to be successful due to residual odours resulting from incomplete burns. Frequent burning of garbage in a fuel fired or forced air incinerator increases combustion and concentrates heat to provide a more complete burn, eliminating garbage and odours in camp.

The proponent has made the following commitments in their Mining Land Use (MLU) application and Form 1 (Proponent Proposal)

- Daily burning of solid material will be done in a burn barrel non-burnable with recycling sorted, and evacuated to landfill.
- All food and wildlife attractants will be removed at seasonal camp closure.

Yukon Parks expressed concern regarding human waste management in their comment submission. The proponent has identified that a pit privy would be used and that human waste would triple-bagged and flown out periodically. Parks has concern as the pit could be a bear and small fur-bearing animal attractant-- bears marmots and ground squirrels are attracted to un-enclosed outhouses. Furthermore, Yukon Parks expressed further concern over the lack of detail provided with respect to waste management (i.e. how bagged human waste will be contained and stored while awaiting removal, if triple bagged human waste is sufficient for slinging from a helicopter, details of waste management for the winter operating season, etc).

Prior to making a significance determination, the requirements of the following legislation have been considered:

- Solid Waste Regulations, particularly Part 1- Littering, and Part ll-Dumps and Waste Disposal Facilities.
- *Wildlife Act*, specifically Section 93 on making wildlife a nuisance and dangerous wildlife protection orders.

Significance Determination

With consideration of the potential effects to bears through the above sections, the Designated Office has determined the outlined legislation will aid in reducing project effects related to human-wildlife conflicts.

However, special consideration must be given to bear-human interaction as the project is occurring in a heavily used, year-round Territorial Park. A habituated bear resulting from project activities would pose a significant threat to all people who utilize the Park; including nearby campers. As a result, further mitigations are required to ensure that the project does not result in significant adverse effects to bears.

Mitigation

The following mitigation measures are specific to eliminate, reduce or control significant adverse effects of the project:

- The proponent shall complete a bear denning survey along the proposed snowmobile access prior to commencing project activities.
- The proponent shall refer to the "Guidelines for Industrial Activity in Bear Country" booklet for best practices to reduce impacts on bears.
- The proponent shall equip each camp with bear deterrent devices and maintain such devices in good working order throughout the duration of camp occupation as per the Guidelines for Industrial Activity in Bear Country.
- The proponent shall keep all attractants, including waste, in a container that prevents access by bears and other wildlife, until properly disposed of.
- Camp infrastructure, including but not limited to kitchen/dining facilities, sleeping accommodations, daily solid waste storage, the incinerator, and privy/wash house facilities, shall be enclosed in an electrified bear fence.
- The proponent will notify the Regional Biologist and Conservation Officer if any bears are frequenting the camp or exploration areas for advice on further mitigation.
- All electric fencing must be maintained and in good working order at all times of year that bears are active (April to October).
- Ensure skirting is installed on any buildings/trailers that are elevated above ground to prevent bears and wolverines from taking refuge.
- Ensure open line of sight in camp among pathways between common use and personal use area.
- Helicopter landing pads shall remain in a consistent location. There should be no helicopter landing outside of these designated areas.
- Camp, roads, human activity or infrastructure should not be located within 2km of any historical or known wolverine or bear denning areas.
- Snowmobile access must be located so as not to pass over or within 2km of denning habitat. Minimal number of trails need should be used and only designated trails should be used.

- The proponent shall work with Yukon Parks to develop a waste management plan for all wastes generated at the project site (i.e. food waste, human waste, garbage, etc) and design specifications for a suitable backcountry privy.

If the above mitigations are implemented, adverse effects to bears as a result of disturbance and direct injury and/or mortality will not be significant at this time.

iii. Caribou

As noted in Section 2, the proposed access overlaps area of known winter range (from December 1st to March 31st) for the Porcupine Caribou Herd as well as year round range for the Hart River Caribou Herd (Figure 10- Important Woodland and barren-ground Caribou Habitat). As such, it is reasonable to expect that individual animals or groups may be encountered. The main project activities that will have an effect on caribou in the area are the development of winter access and chronic disturbance resulting from up to 100 return snow machine trips per year. Effects from helicopter use are not anticipated to be chronic to caribou as proposed helicopter access is located several kilometres away from identified caribou habitat.

Caribou are sensitive animals that can be disturbed by continuous human activity. Frequent disturbance from people and their machines can affect the health of caribou during key life stages. Geist (1975) stated that when disturbed, the regulatory systems of caribou require additional energy that would normally be allocated to growth, maintenance or reproduction. Chronic disturbance therefore could result in reduced growth rates, poor body condition and decreased reproductive rates that may in turn, increase adult and calf mortality. Flight is the most common response for unhabituated caribou that perceive humans as predators which, apart from using up energy reserves, can increase the chance of physical injury /death during stampedes to escape disturbance (Webster 1997).

Caribou may abandon or reduce the use of their functional range when it overlaps with human activity. Habitat avoidance and individual disruption of wildlife due to disturbances (mostly noise effects but also visual cues from movement) associated with project activities may lead to loss of habitat, stress reactions, unnecessary energy expenditures, and abandonment of feeding opportunities. Caribou are migratory animals and move from winter ranges to summer ranges annually; although woodland caribou movements are much less dramatic as their overall range is much smaller.

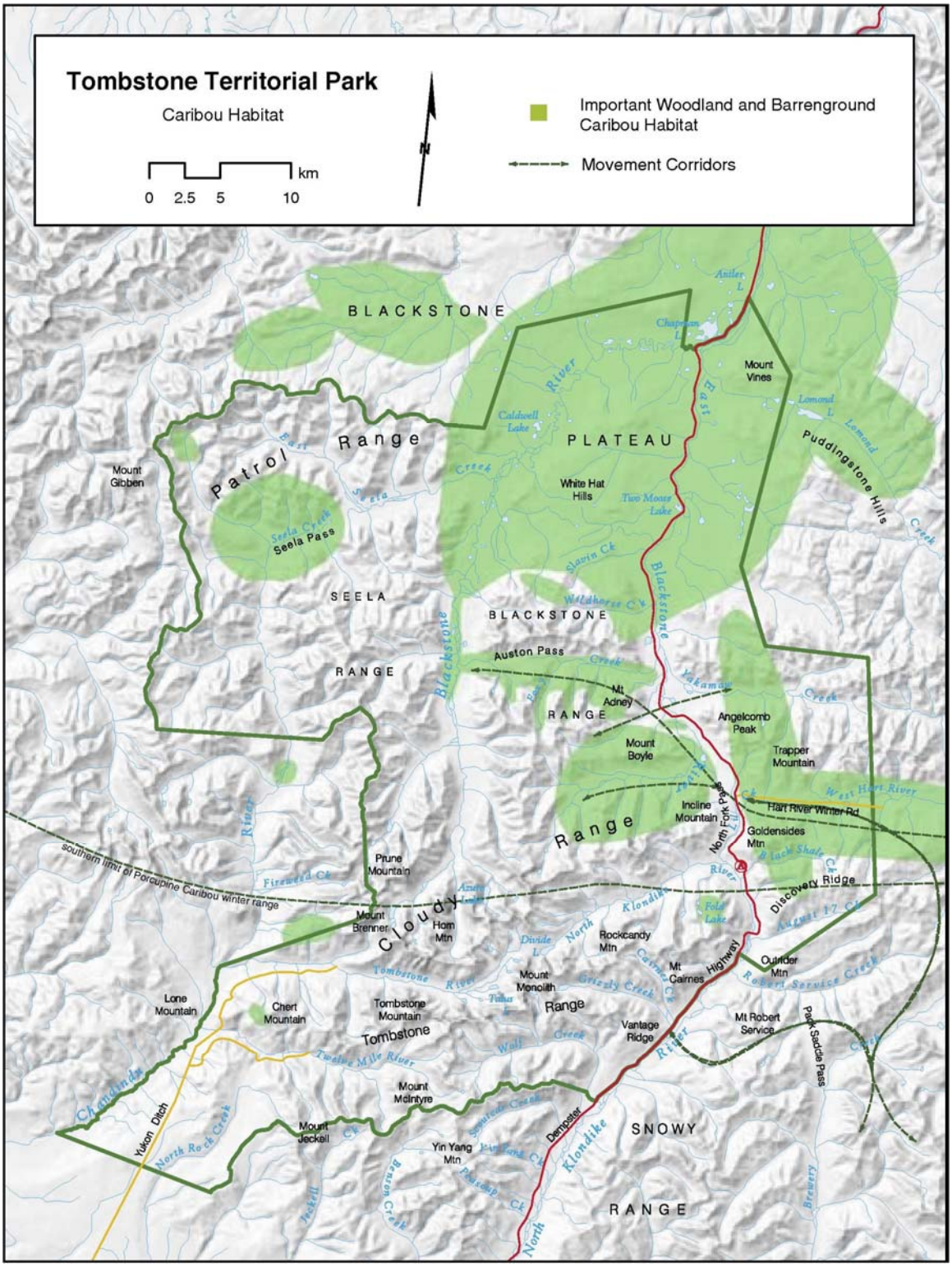

Figure 10-Important Woodland and barren-ground Caribou Habitat, Tombstone Territorial Park

The areas chosen by caribou for rutting habitat are very site specific and human activity occurring within travel corridors may force caribou to avoid these necessary areas. Alienation of wildlife from limited suitable habitats is considered an adverse effect, particularly as species at risk require suitable habitat for healthy populations. Furthermore, caribou movements and range use may be impeded as a result of new linear developments (i.e. snow machine route) and result in habitat fragmentation. Fragmentation occurs when a once continuous range is divided into two or more areas as the result of development. Fragmentation of caribou range may reduce local population sizes and cause local extinctions (Dyer, 2002).

Caribou are also subject to hunting pressures with the Tombstone Territorial Park. Yukon people, particularly First Nations, rely on successful caribou hunts every year. Where caribou have been hunted the herd is more likely to experience additional stress from associating man with danger (Webster, 1997). The increase in access to the area resulting from a wide-track, heavily used snow machine route may also increase hunting pressure on caribou. Hunting of caribou ends on October 31st of each year; unless the Porcupine herd is still in the area then it will extend until January 31st. If extended, the hunting season will overlap with the proposed project and snow machine trails would provide easy access into previously inaccessible areas within known caribou range.

Frequently used snow machine trails also provide a hard packed travel corridor for predators to move into the alpine. Wolf predation is often responsible for adult morality and low recruitments of caribou populations (Webster 1997).

Specific effects to Porcupine Caribou

Porcupine Caribou may be prone to social disruption as they attempt to migrate through or in proximity to the project area. Frequent snow machine access is proposed over a duration of five years and it has been demonstrated that Porcupine Caribou utilize the area of the proposed access as part of their winter range from December 1st to March 31st. It is therefore reasonable to assume that snow machine disturbance will occur as the Porcupine herd enters and leaves the area. Social disruption due to noise and disturbance effects may in turn cause distress, increase energy expenditures, confusion and separation from the herd.

One study noted that large groups of machines, such as snowmobiles, caused an immediate flight reaction from sound alone (at an average distance of 286m) and then from visual cue (at an average distance of 139m); flight distances were up to 1km. Another study noted that “while roads alone are likely not perceived as a threat to Rangifer, road traffic frequently is”.

Specific effects to the Hart River Caribou herd

Proposed snow machine access traverses year-round, core range for the Hart River Caribou. Unlike Porcupine Caribou, the Hart River herd does not undertake significant migrations and therefore, all life stages (i.e. fall rut, winter range, calving and post calving.) likely occur within the identified range. Project activities overlap temporally with the fall rut/breeding winter range season, and therefore may affect caribou during these periods when animals are most sensitive to disturbance. As animals are generally amass during these periods, one disturbance event can affect multiple animals. Disturbance during the rut will affect breeding behaviours such that it could impact reproductive success of the next year. For example, due to an already short rutting season of approximately 3 weeks, multiple disturbances during this time and over the 5 year life of the project could permanently disrupt behaviours with subsequent impacts to the reproductive success of the herd.

Significance Determination

As noted with Dall 's sheep, the proponent has not considered potential effects of proposed project activities to caribou and caribou habitat. Chronic disturbance during the migration of the Porcupine herd and the fall migration and winter range of the Hart River Herd is likely to have significant effects to both species.

In particular, concerns exist for the Hart River caribou herd as their range is spatially small and localized. Furthermore and importantly, woodland caribou herds are identified as species of concern due to continued population declines; therefore, populations are known to be sensitive and vulnerable. Disturbance during the winter range may have significant consequences as the herd may be essentially forced out of one area, into an area with lower quality habitat. Furthermore the disturbance from frequent snow machine use may result in caribou allocating their energy reserves away from growth and reproduction, potentially compromising the overall health of the population.

Further consideration was given to the requirements of the following non-discretionary legislation when making a significance determination:

- The *Wildlife Act*, particularly Section 3 which outlines the hunting seasons and bag limits

Although the above legislation will reduce adverse effect to caribou, in terms of harvest management, it will not reduce the effects of chronic disturbance. As such, the Designated Office has determined that, without further mitigation, the project will result in significant adverse effect.

Mitigation

The following mitigation measures are recommended to reduce and/or minimize the effects of the proposed project to caribou:

- The proponent shall develop a wildlife management plan that includes a contingency plan for encountering wildlife along winter access routes
- Wildlife to be given right of way on the winter access route.
- The proponent should follow guidelines outlined in the “Flying in Caribou Country” publication.
- Report any caribou sightings to the Regional Biologist to allow for adaptive management in mitigating project effects on caribou.

If the above mitigations are implemented, adverse effects to caribou as a result of disturbance and hunting pressure will not be significant at this time.

iv. Moose

Moose typically concentrate in lowland and riparian habitats with good willow growth in the late winter. Moose habitat is identified in the general project area and directly overlaps with proposed winter access as it occurs along creeks and valley bottoms. Key moose habitat includes winter ranges, traditional calving areas and mineral licks (Keinzler 1999).

Important areas for moose along the Blackstone River valley were identified as part of an aerial survey and interviews with local people during the Tombstone Park boundary and management plan discussions. Further, Yukon Environment conducted a late winter moose survey in 2009 that identified several moose observations in small patches of willow habitat in the Blackstone valley.

Noise and disturbance from frequent snow machine trips is likely to cause significant disturbance to moose. Disturbance may force moose out of their late-winter feeding habitats which they depend on. Winter is a particularly vulnerable season for moose as populations are most concentrated and individuals are energetically stressed. Furthermore, the access that will be developed introduces the risks of movement impediment and habitat fragmentation. Habitat fragmentation results when a once continuous range is divided by linear disturbances such as roads, trail or seismic lines. Habitat fragmentation has a negative impact, particularly for wildlife such as moose that require large areas of continuous habitat or are sensitive to habitat disturbances.

Finally, linear disturbances through known range of wildlife provide pathways for predators and hunters into new areas which in turn have a negative impact to moose. Predators such as wolves can move much faster along linear corridors created by frequent access much faster than through vegetation. Moose hunting season occurs in the Yukon from August 1st to October 31st, with most non-licensed First Nation hunts also occurring during this period. As with caribou, the development of new trails will create easier access to new areas within moose habitat and further pressure overall moose population.

Proposed activities involve the creation of 20 trenches over the life of the project for exploration purposes. Wildlife in the project area (particularly moose) is known to become entrapped in pits and trenches in the case where these structures are left open. Injury or death of wildlife may result when wildlife step into these open structures. Trapped animals will become stressed and exert considerable energy in their attempt to escape. Unnecessary exertion can decrease the animal's critical energy stores, leaving it fatigued during key life-cycle periods and vulnerable to predation and possibly starvation. Although the likelihood of moose being in the direct area of project activities is thought to be low, the potential consequences are high and therefore have been considered.

Further consideration was given to the requirements of the following non-discretionary legislation when making a significance determination:

- The *Wildlife Act*, particularly Section 3 which outlines the hunting seasons and bag limits, Section 5 on prohibited wildlife and Section 46 on limited entry hunts.

The Designated Office has determined that the proposed project will result in significant adverse effects to moose as a result of increased disturbance and linear disturbance or entrapment.

<u>Mitigation</u>

- The proponent shall ensure excavated trenches will only be open for the duration of mapping and sampling, trenches will immediately be reclaimed.
- The proponent shall maintain a ramp at the end of each open trench so that wildlife cannot become trapped.
- The proponent shall maintain low snow berms along trail to allow for easy escape for wildlife.
- In areas where high snow depth is encountered, provide periodic gaps in snow berms along route to allow for wildlife escape, particularly where tracks are observed.
- Transit be conducted in convoys and grouped over the shortest period of time practicable.

If the above mitigation measures are implemented, adverse effects to moose as a result of disturbance and entrapment will not be significant at this time.

v. Avifauna

The proposed project is occurring in Tombstone Territorial Park, an area supporting a wide range of habitats. This diversity in landscape provides quality habitat for a wealth of bird species. The Yukon seasonally hosts a wide range of migratory bird, as well as several year-round residents. Proposed project activities that have the potential to adversely impact avifauna include; the noise generated from mining exploration (i.e. blasting, drilling, use of heavy machinery, etc.), human presence and the auditory and visual disturbances resulting from snow machine and helicopter access.

Known key wildlife areas of golden eagle and gyrfalcon directly overlap the project footprint; specifically areas of proposed access (Figure 11). These species are both “apex” predators that are key indicators of ecosystem health and ecological viability. Also overlapping the proposed access is key habitat for two known ground nesting birds; Willow Ptarmigan and Surfbirds. Key habitat for Willow Ptarmigan is found in valley bottom willows along the length of the Blackstone River valley. Surfbirds are a relatively rare species which nest on the ridge of Surfbird Mountain, directly overlapping the preferred access route.

The area where the proposed access is intended to occur is mapped as important nesting grounds for alpine raptors, namely golden eagle and gyrfalcon. There are two known Gyrfalcon nests located along the Blackstone River valley near Junior Creek and a known Golden Eagle nest approximately 2.5 km north of the Gyrfalcon nest (Parks Technical Report, 2010). Gyrfalcons are known to over-winter in this area while golden eagles return in the late winter to their nesting areas. Breeding activity for these birds’ beginnings in February, while the laying of eggs through fledging occurs from approximately April 1st to July 31st. Nesting usually occurs along cliffs which are considered to be the most important feature for breeding with the same areas being reused for decades.

As noted in Section 2, an abundance of migratory birds are common to the project area. Nesting of migratory birds often occurs from May 1st – July 31st in any year. Section 6 of the Migratory Bird Regulations, prohibits the disturbance and/or destruction of a nest, egg, and/or shelter of a migratory bird. The project will overlap with the nesting period of raptors and migratory birds.

As noted, known surfbirds habitat is located within the route of proposed snow machine access Option A (Preferred Route). Surfbird Mountain is sensitive arctic tundra which provides breeding habitat for this rare shorebird. Surfbird breeding is currently limited to the Yukon and Alaska. Although proposed snow machine access will not have a temporal overlap with the presence of surfbirds, potential impacts to the

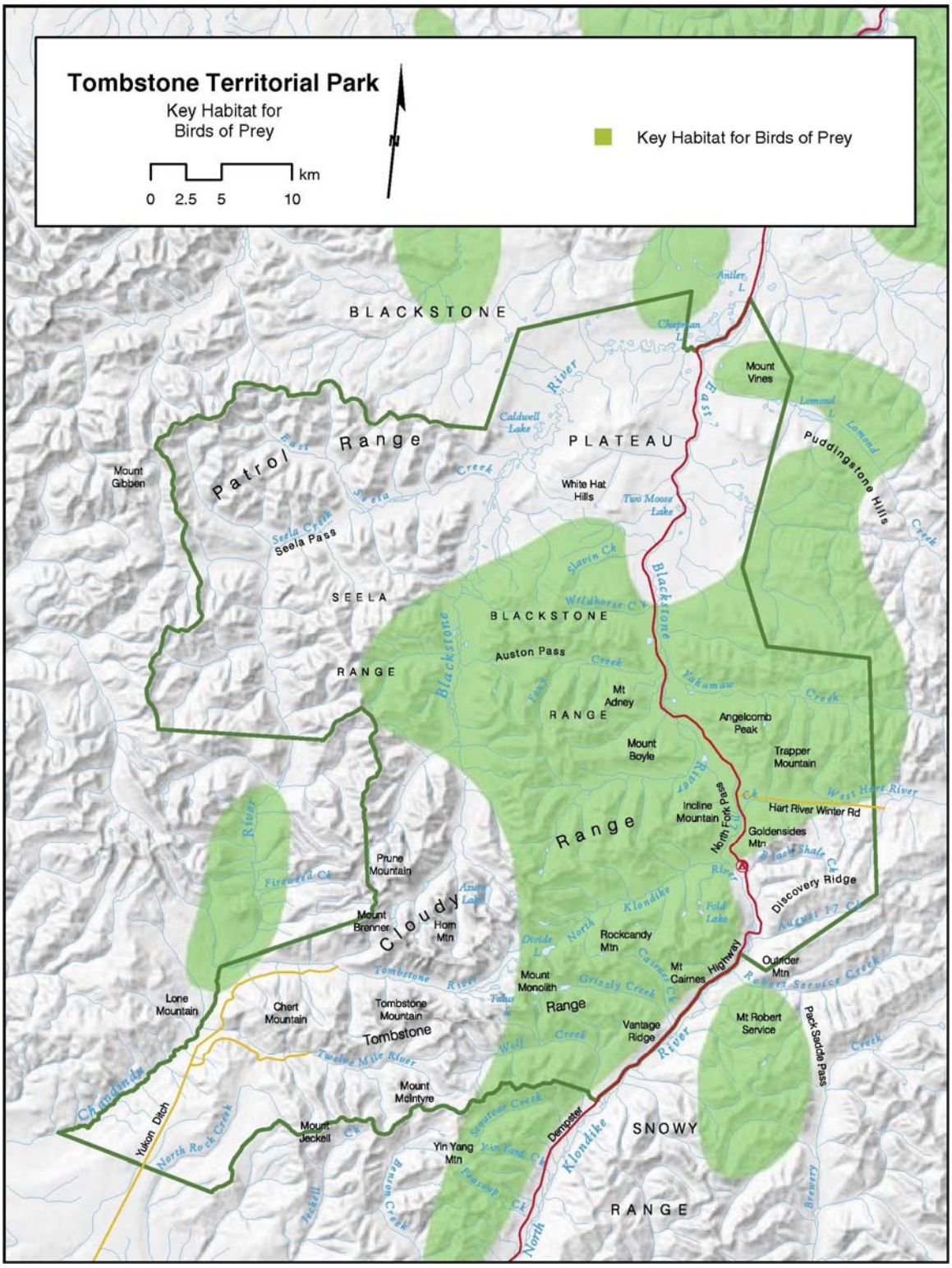

Figure 11-Important Birds of Prey Habitat, Tombstone Territorial Park

vegetation and terrain may directly impact the quality of their breeding grounds. Willow Ptarmigan are a keystone species that also utilize lowlands as their prime habitat.

Noise generated from mining activity and helicopter use during nesting season could result in disturbance of nesting birds, either while they are on the nest or while foraging. Golden eagles are known to be sensitive to disturbances, especially early in the nesting period and will abandon nests more readily then other species (Yukon Parks Technical Report, 2010). Adult raptors that are disturbed may frequently leave the nest and have less success in foraging. This exposes chicks to stress and the natural elements, as well as a decrease in feeding opportunities. Flying 30 trips per season and approximately 100 return trips via snow machine, is likely to affect the nesting and fledging stages of golden eagles and if maintained over the lifetime of the project could reduce the health and survival rate of the local population.

Non-discretionary legislation is unlikely to adequately reduce or control the significant adverse effects of the project on raptors and migratory birds. As such, the Designated Office has determined that without further mitigation, the project will result in significant adverse effects to migratory birds and raptors.

Mitigation

The following mitigation measures are specified to eliminate, reduce or control significant adverse effects of the project relating to nesting of migratory birds, gyrfalcons and golden eagles:

- Prior to snowfall and the commencement of project activities, the proponent shall ground-truth both of the proposed route options for nesting sites.
- The proponent shall contact the Yukon Government Department of Environment for information on the location of nesting sites.
- The proponent shall avoid flying over known raptor nesting sites or if it cannot be avoided, fly at a minimum of 600 m above ground level, where possible.
- The proponent should enter into discussions with the Regional Biologist and/or Habitat Programs Branch of the Department of Environment for information on the location of the gyrfalcon nests
- No exploration activity within 1 km of a known raptor nest between April 15 and July 31.
- Avoid flying over raptor nesting sites or if it cannot be avoided, fly at a minimum of 600 m above ground level (agl).

Conclusion

The Designated Office has determined that the proposed project will result in significant adverse effects to wildlife and wildlife habitat that cannot be mitigated, due to effects resulting from chronic disturbance to sheep. The result of determining that any one significant effect cannot be adequately mitigated is to recommend that the proposed project does not proceed. As such, no further consideration of potential effects are required (i.e. no residual or cumulative effects).

The project has been assessed in consideration of a 5 year duration with year-round mineral exploration activity involving snow machine (approximately 100 round trips) and helicopter (approximately 30 trips per year) access. Both land and air access directly overlaps sensitive critical range for sheep, caribou, raptors and surfbirds. Sheep and caribou are particularly sensitive to this kind of disturbance. The Designated Office has identified no mitigations to adequately address chronic disturbance to extremely sensitive species in areas directly overlapping critical range.

It is also noteworthy that mitigations recommended for one specific species, may in turn cause additional adverse effects to another species. For example, to properly reduce potential effects to sheep during lambing, a proposed mitigation of keeping snow machine access low in the valley has been recommended. However, the low valley area is critical during the same timeframe for species such as moose, caribou and bears. Furthermore, as the project is occurring in an alpine area, it is not possible for snow machine access to be limited to low valley use. In fact, as the proposed winter route approaches the headwaters of the Blackstone River, snow machines will be in the close proximity to alpine areas that are heavily utilized key sheep winter range.

Additionally, it is worth reiterating that the overall significance of effects is also related to the lack of confidence in the proponent's consideration of potential effects to wildlife and wildlife habitat. Particular consideration must be given as the project is occurring within a protected territorial park and to the fact that the project footprint extends well beyond the mining claims. Consideration to wildlife beyond the claim blocks (i.e. overlap with proposed access routes) has not been demonstrated. The proponent has the mineral rights to the Horn Claims; however, their development should not occur at the expense of the unique characteristics of this region that make it both an ecologically and socially important wildlife area, underlining the significance of effects to wildlife and wildlife habitat in this region.

6.0 Contemporary Lifestyle - Wildlife Harvesting

6.1 Overview

The proposed project is located in an area of notable local, regional and International importance, to those that have established a lifestyle reliant on the harvesting of wildlife specific to this area. The Contemporary lifestyles associated with outfitting, trapping and hunting were identified for evaluation in this assessment.

Project activities that are likely to impact the above uses and values include: frequent and intense helicopter flight activity; winter access trail, mechanized trenching; development of access trails; drilling; and, the establishment of a camp. The Designated Office has determined that the project will result in significant adverse effects to these contemporary lifestyles. The rationale for this determination is discussed in the following sections.

6.2 Project Effects

i. Trapping

As described in Section 5.0 (Wildlife and Wildlife Habitat), the proposed project will adversely affect wildlife and wildlife habitat. Subsequently, this may indirectly affect the livelihood of the registered trapper who relies on the presence of wildlife for financial rewards. Given that wildlife will likely become dispersed or relocate due to diminishing habitat and activity avoidance, trapping efforts may be effected by:

- Having to travel new and different routes to set traps
- Having to establish new traplines to harvest furbearing animals that have an economic value
- Effects of new and existing trails on wildlife movements

Other potential effects include destruction/damage to traps and trapping infrastructure, trapping infrastructure being buried underneath packed snow, and damage to snowmobile and other access trails. The requirement for proponents to advise trappers is to create the opportunity for the proponent to work with the trapper in identifying the locations of trapping infrastructure that run the risk of being damaged by placer mining activities. Similarly, the mitigation also allows for discussions between the trapper and the proponent with regards to measures that can be used to protect habitat that have been identified as critical to the maintenance of a healthy furbearing population. There is a direct overlap with the timing of the project and the trapping season, the likelihood of trapping infrastructure remaining on the ground and becoming damaged also exists; as does the effect to wildlife as it relates to harvesting a resources. It has

not been determined that the proposed project would result in significant adverse effects to smaller game; as such the relationship with wildlife and wildlife habitat has been considered no further.

When considering the potential effects of the proposed project on trapping activities the proponent offered the opinion that full cooperation was expected. Though it is beneficial to have all parties using the area to communicate with each other; the onus is on the proponent to communicate with other users. The proponent should contact the trapping concession owners as soon as practicable, prior to the actual commencement of activities to identify trapping infrastructure that could be impacted by the project as well the timing of the proposed winter access trips. Without this communication, the proposed project will result in significant adverse effects to the register trapping concession holder.

Mitigation

The following mitigation measure is specified to eliminate, reduce or control significant adverse effects of the project relating to trapping:

- The proponent shall communicate plans and timing of activities to with the trapping concession owner as soon as practicable, prior to the actual commencement of activities, to reduce land use conflicts and any negative impacts on others interests.

ii. Outfitting

Hunt Yukon has been outfitting in the area for 45 years in which their commercial venture offers wilderness tourism and guided hunts for Sheep, Moose, Caribou and Grizzly as well as wolf and wolverine. To facilitate these hunts Hunt Yukon has a base camp located at km91of the Dempster Highway and 4 cabins in the valley of upper Blackstone River (headwaters) as well as the lower Blackstone. In Yukon Hunts comment submission, they describe how the summer fall hunts for their operation takes place on a yearly bases and this includes typically 24 hunts a year in which the Blackstone Uplands are the focal point and generate the majority of their annual revenue; thus are critical to its' future viability and success. Hunts range from approximately $17,000 for a 10-day sheep hunt to $19,500 for a 12-day sheep, caribou or moose hunt. It is these hunts that provide the outfitter and their four guides with a living in an economic sense but also a lifestyle that has been established over 45 years of working in the area.

Most guided hunts take place west of the Dempster Highway and guides and hunters travel by horse and on foot to hunt. Five camps located in the project area are used each year: two along the Blackstone

River near Auston Pass, one near the headwaters of the Blackstone, one camp near Blue Lake (one valley east of the claim) and one camp west of the claim.[1]

According to Yukon Government, Hunt Yukon has made a significant investment in their business, developing and maintaining infrastructure, identifying hunting locations and marketing and delivering hunts. The outfitter purchases supplies from Yukon businesses, hires Yukon employees and has been contributing to Yukon's economy from this concession area for forty five years. Hunts in the project area are critical to the success and viability of this business.

As a result of the years spent within this area, Hunt Yukon has an intimate knowledge of habitats, predator-prey relationships, seasonal movements of animals, wildlife population fluctuations, and any adverse environmental developments. It is this knowledge that Hunt Yukon provided to the Designated Office when describing the project effects to the wildlife in the area; as well as to their operation. These activities are conducted by horse packing or on foot. The Blackstone Uplands is of particular importance to the outfitter, for which the area contains diversity of wildlife that allows the guided hunts to best utilize existing infrastructure and promote hunter success.

Effects to the local wildlife population will adversely affect the outfitter, particularly where wildlife are displaced from their range and/or suffer increased harvest pressure due to unintended increased access by ORVs, (refer to Section 5.0 for a complete discussion of effects to wildlife). This displacement would not only affect the use of existing camps; but would also affect wildlife populations thereby affecting hunting success over the temporal scope of the project and beyond. Hunt Yukon has had to change planned hunts in the past as a result of wildlife displacement that is believed to be attributed to previous exploration activity on the Horn claims. These hunts are planned and sold 8-24 months in advance; these hunts are planned for where the wildlife (such as sheep) area, an unsuccessful hunt that may result because displacement adversely affects the Outfitters reputation and business opportunities. The infrastructure required for the outfitting business is crucial to their success, they depend on using familiar trails, routes and hunting grounds; consequently the outfitter has invested in his operation to a degree that these areas hold monetary value for him. The effects to wildlife and wildlife habitat, and in particular to sheep, cannot be mitigated, the outfitter will also be adversely affected.

Additionally, project activities will result in auditory and visual disturbances that will reduce the quality of client experience by affecting the wilderness character of the region. This may result in short-term direct impacts to client experience, as well as long-term impacts to the reputation of the business. The use of an excavator for mechanized trenching and the operation of a drill will likely be heard from a distance of

[1] The locations are approximate.

several kilometres, depending on wind direction and topography. These activities will directly impact visitor (non-resident hunter) enjoyment, hunting success, wildlife and other wilderness values, reducing the appeal of the guided hunting destination. This will have a direct impact on the outfitter their guides.

The project proposal does not consider potential effects on outfitting activities and no commitments have been proposed by the proponent in terms of mitigating these effects. There will be an overlap of project activities and guiding activities and there is likelihood that given the length of guiding trips those adverse effects will be moderate to high in duration and magnitude. It is also likely that the frequency of the effects will be experienced occasionally or at a moderate level because the level of helicopter activity is proposed to double in frequency during the peak guided hunting time. Due to the spatial and temporal overlap of project activities with an area of particular significance to the outfitter, there is a high likelihood for this business to be adversely affected by the proposed project.

The Designated Office has determined that effects to the outfitter's business are significantly adverse, due to the importance of this particular region to the outfitting business and the overlap of project activities. The proposed project activities will also directly impact the service and experience being offered by the outfitter by undermining the wilderness characteristics of the region and adversely affecting wildlife populations.

Conclusion

The Designated Office has determined that effects to the outfitter's business are significant and adverse, due to the importance of this particular region to the outfitting business and the overlap of project activities. Project activities will directly impact the service and experience being offered by the outfitter by undermining the wilderness characteristics of the region and adversely affecting wildlife populations. The Designated Office recognizes that multiple use of the land base is important, and that one use should not unfairly take precedence over another. Some uses when directly overlapping are simply not compatible. In this case, the dependency on wildlife and the significant adverse effects to wildlife as well as the reliance of a positive wilderness experience to maintain a reputation contribute to the incompatibility. The impacts of most auditory and visual disturbances will be for the duration of the project, and therefore, are not considered significant to this value in the long-term. However, significant adverse effects to wildlife that will affect the existing and future use of the area for hunting, and the intrinsic value of the region, are considered significant adverse effects of the proposed project that cannot be mitigated, (refer to Section 5.0, Wildlife and Wildlife Habitat). In deliberation of possible mitigations, the Designated Office considered Outfitter suggestion for an alternative to the helicopter route relocation and snow machine access as being the only solution.

Consideration of Alternatives

During the course of this evaluation there has been repeated dialogue, some of which resulted in changes to the project scope, regarding alternatives to various proposed activities, In this evaluation, we consider alternatives to, or alternative ways of undertaking, the project (YESAA s.42(1)(e)) where those alternatives, and sufficient detail describing the alternatives, are included by the proponent in their project proposal (YESAA s.50(2)(a)). It is not the role of the assessment to make project planning decisions, rather we assess the activities proposed and whether or not they will have significant environmental or socio-economic effects. Any alternative activity would need to be assessed with full information in order to determine whether significant adverse effects on environmental and socio-economic values would occur and, as such, whether an alternative route (for example) is an appropriate alternative/mitigation.

As such, the significant adverse effects to the contemporary lifestyle of guided wildlife harvesting cannot be adequately mitigated because if the Outfitters dependency on wildlife health and stability.

Residual and Cumulative Effects

The assessment of cumulative effects under YESAA considers the residual effects of this project on Contemporary Lifestyle in combination with of the residual effects of:

(i) other projects for which proposals have been submitted under subsection 50(1)[of YESAA][, or
(ii) other existing or proposed activities in or outside Yukon that are known to the designated office, executive committee or panel of the Board from information provided to it or obtained by it under the Act; (YESAA s42(1)(d))

This evaluation has determined that there are significant adverse project effects to a contemporary lifestyle habitat that cannot be mitigated. It follows that the cumulative effects are also significant and adverse on wildlife and wildlife habitat and further consideration is not detailed here.

7.0 Parks and Protected Area Values and Interests

7.1 Overview

The proposed project occurs within the boundaries of Tombstone Territorial Park, a culturally and ecologically significant protected area. This park was established pursuant to the Tr'ondëk Hwëch'in Final Agreement (THFA). A Tombstone Territorial Park Management Plan was developed by parties involved in Park management and signed by the Yukon and Tr'ondëk Hwëch'in governments in August 2009. The mineral claims in which this project is proposed pre-date the formal establishment of the Park.

Many of the comments received during the evaluation were related to the public perception and expectations of the purpose and intent of "parks". The following section has tried to characterize the intangible societal values related to "parks", while focussing on potential effects to the specific goals and management objectives established for Tombstone Territorial Park under the THFA and its management plan. This section also examines potential effects to associated park uses, such as recreational use and tourism. To this end, the Designated Office has determined that the proposed project will have effects to the following components of this value:

- Societal expectations related to the park designation, management goals and associated values[2]
- Recreational use, visitor experience, and tourism

The Designated Office has determined that the project will have significant adverse effects to the valued component that cannot be mitigated. The rationale for this determination is presented in the following sub-section below.

7.2 Project Effects

i) Societal expectations related to the park designation and associated values

Societal expectations related to parks

As described in the scope of this evaluation report, Tombstone Territorial Park is rich in biodiversity due to an overlap of low Arctic flora and fauna with the northern boreal forest. Its notably high biodiversity value, its related traditional and cultural importance, and its exceptional aesthetic beauty, resulted in its

[2] Please note that the societal values associated with "parks" in this section have been characterized within the context of non-First Nation Western culture. For example, the concept of "wilderness" may not be relevant or emotionally resonant for some First Nations people. The cultural and traditional importance and associated social values for First Nations people, in particular the Tr'ondek Hwech'in, will be discussed in Section X of this report, Traditional and Cultural Values.

establishment as a territorial park, as per the Tr'ondëk Hwëch'in Final Agreement (discussed further in Section 8.0, Traditional and Cultural Interests). The Yukon Government Department of Tourism and Culture and the Parks Branch noted that Tombstone Territorial Park is widely regarded as Yukon's "premier park", which will be discussed in greater detail in subsections to follow, demonstrating its particularly significant social value.

Over 600 of the 677 comments submitted to the Designated Office concerning this project, expressed the sentiment that mining exploration does not belong in a protected area. These comments express a view that a "park" is a place in which it is expected that resource extraction and other consumptive industries will not occur. Many of these comments expressed a broader view of this project representing an undesirable trend of continued and accelerated loss of natural spaces and species.

Parks can be managed for a variety of purposes, but there is an expectation that activities should adhere to more stringent standards. Tombstone Territorial Park is managed in manner in which evidence of human use and presence is extremely limited and/or non-existent (Yukon Parks Technical Review). The importance of maintaining this important management goal re-iterated in a large number of the comments, including Yukon Parks, Chief Eddie Taylor of the Tr'ondëk Hwëch'in and the Tr'ondëk Hwëch'in government. This is consistent with the world-wide expectations for protected areas; while there are many variations on the extent of protection afforded to an area, the vast majority entail non-consumptive uses as a primary characteristic of the designation. The World Conservation Union (IUCN) defines a protected area as "*an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means*." Additionally, the IUCN has provided a six category classification system for protected areas ranging from strict wilderness protection to management areas that allow for some limited resource development to meet community needs in a sustainable manner.

Yukon Government has indicated that Tombstone Territorial Park is a Category II park under the IUCN classification system, (the same classification as Canada's National Parks), which is defined as follows:

> *"Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible."*

The Tombstone Territorial Park Management Plan (TTPMP) vision statement articulates clearly the purpose of its designation as follows:

> *"Tombstone Territorial Park is to protect for all time the unique ecological and cultural integrity of Tombstone Territorial Park by preserving the physical, biological, archaeological and cultural values as well as enhancing the understanding and appreciation of the natural and cultural resources of the Park in a manner that keeps it unimpaired for future generations."*

Similarly, Schedule A of Chapter 10 of the Tr'ondëk Hwëch'in Final Agreement states that the purpose of the park is to:

> "…*protect for all time a natural area of territorial significance which includes representative portions of the Mackenzie Mountains ecoregion, including the Ogilvie Mountains and Blackstone Uplands areas, and contains important physical and biological features, as well as sites of archaeological, historical and cultural value by the establishment of a territorial park under the Yukon Parks Act, to be known as Tombstone Territorial Park."*

The preceding definitions and statements with respect to the purpose of Tombstone Park and the park designation are instructive in understanding societal values and expectations for potential future development in the park. The TTPMP contains management principles and key actions that reflect the core spirit and intent of the purpose of the park i.e., maintaining the ecological integrity of the park as a primary aim, but also its wilderness character and cultural value. (These principles are identified throughout this evaluation report as they also can form the basis upon which to assess environmental and socio-economic effects). The above statements reinforce that one of the most important values to be maintained within Tombstone Territorial Park is its natural state. Parties involved in the establishment and management of Tombstone Territorial Park expect that projects in the Park will not have significant adverse effects on the values and purposes behind the park designation.

Intangible values associated with parks

To the general public, parks are synonymous with being areas protected from development. The emphasis on the function of a park has changed throughout Canada and the world over the past several decades from places of exceptional aesthetic quality and recreational value to places whose chief function is the conservation of ecological integrity and world biodiversity (Dearden, P and Dempsey, J., 2004). In both cases, there is the expectation that a park must be left in its natural state. As development continues to erode natural spaces around the world, parks play an increasingly crucial role to both conservation of species and the preservation of the inherent value of natural environments (Dearden, P. and Dempsey, J., 2004; Harmon and Putney, 2000). It is the latter that is most difficult to define, but which also carries great emotional resonance for people (Krakoff, 2003; Harmon and Putney 2000; Avant, 1999). It may best be embodied in comment submissions by words such as *remoteness, pristine,* and

wilderness. The knowledge that such places exist where these characteristics may be found, potentially experienced or simply imagined, are an important part of their societal value.

While protecting ecological integrity is an important value of parks for many people, there is also a diversity of associated social values attached to the perceived importance of this protection. The social and intangible values of parks are, in the first place, still tied to their ecological value as intact natural environments. However, there is often a social component to this, as the underlying motivation for people *to care* about protecting natural environments from human development is based on values that are sometimes challenging to articulate. (Instead, the abundance of artwork and photography that pays homage to this region is perhaps a more appropriate indicator of the existence of these values). For example, Harmon and Putney (2000) describe these values in their book "The Full Value of Parks: From Economics to the Intangible", as follows:

> *"Yet parks, and other categories of protected areas, are highly valued by important segments of society, even when they are unfamiliar with biodiversity values. For many people around the world, protected areas are perceived not so much as in situ repositories of genetic wealth, but as primal landscapes of Creation that deeply touch spiritual, cultural, aesthetic and relational dimensions of human existence. These are fundamental aspects of the human spirit that inspire and move, that trigger responses of awe, appreciation and for the keen observer, the understanding that all is related."*

To designate an area as a park is an act that necessarily implies that there exists a social worth to areas of exceptional ecological, and in the case of Tombstone Territorial Park, cultural importance. The park designation formally recognizes the existence of these values as being particularly relevant for the area inside Tombstone Territorial Park.

Many of those who commented, (of which a substantial portion were from the United States, Europe, and other provinces of Canada), have not been to Tombstone Territorial Park, or have only driven through it by way of the Dempster Highway. This fact serves to demonstrate that parks have value to people regardless of their actual visitation to the park or to the area of the proposed project. For example, it was observed in one comment submission that "part of Canadian identity is *wilderness*" (Vadenboncouer, YOR document 2010-0107-284-1). Similarly, another person observed that there are "those who experience (the park) just by knowing it is there" (Schenck, M. YOR document #2010-0107-615-1). These examples support the idea that parks are imbued with a diversity of philosophical, emotional, spiritual and ethical values for individuals (Harmon and Putney, 2000; Krakoff, 2003). Indeed, parks are often viewed as symbols and icons of "wilderness", where people can engage in activities that provide a "wilderness experience" with spiritual, emotional and physical rewards that cannot be experienced otherwise (Avant,

2000; Krakoff, 2003). Equally important to some is the knowledge that “wilderness” exists and will remain as such, via the protected area designation.

An understanding of the social value of Tombstone Territorial Park is informed by the history of its establishment as a Park. As described in the letter from Chief Eddie Taylor to the Designated Office, the area of Tombstone Mountain and parts of the Cloudy Range that included the Horn claims were identified as an area of exceptional natural and cultural conservation value by scientists working pursuant to the United Nations Environmental Scientific and Cultural Organisation World Heritage Convention in 1972. Thereafter, Yukon Government identified a small area for a Park Reserve that included the Tombstone Mountain area and the Horn claims, and which remained as a Park Reserve with no legal protection until Tombstone Territorial Park was formally established. The Tr’ondëk Hwëch’in made a Category A land selection in this same area in 1989 that was approximately twice the size of the identified Park Reserve, designated as R-10, which would effectively protect the area from sub-surface mineral exploration, further demonstrating the ecological and cultural values of this region. TH indicates that this land selection was dropped based on an offer by Yukon Government to develop a Park in the region as a Special Management Area (SMA) pursuant to a Land Claims Final Agreement that would be approximately 80,000 hectares and included the area of the Horn claims. However, the Yukon Government later proposed boundaries of the Park were smaller, at about 38,000 hectares, and did not include any portion of the Blackstone drainage area.

During this time, continued research into the area further revealed the ecological and historical significance of the Blackstone drainage region and Cloudy Range. Several environmental groups campaigned to expand the boundaries of the Park, culminating in a public demonstration which included Tr’ondëk Hwëch’in people. Environmental groups, members of the general public and the Tr’ondëk Hwëch’in called for the creation of a Park that was approximately 200,000 hectares, and presented a petition to the government in this regard. It is noted in the publication *Yukon’s Tombstone Range and Blackstone Uplands: A Travellers Guide* that the expansion of Tombstone Territorial Park became an important election issue and political promise (Canadian Parks and Wilderness Society, 2000). During the negotiations for the Park boundaries under the Land Claims process, the proponent staked the Horn mineral claims, generating heated public debate and outcry. Subsequently, Yukon Government withdrew 80,000 hectares of the proposed Park from mineral staking until such time as the Park could be formally established.

It was effectively 30 years from the first proposed Tombstone Park Reserve in 1974 by Yukon Government to the establishment of Tombstone Territorial Park in 2004 as a Special Management Area under Chapter 10 of the Tr’ondëk Hwëch’in Final Agreement. This long-standing effort, political interest, and controversy indicate the importance of the region to the general public and the Tr’ondëk Hwëch’in. As well, it demonstrates the relevance and importance of the size and boundaries of the Park, given the

previous public effort, which indicate that the value of the park is also based on the region as a whole, rather than specific, individual areas. While there are many areas within the park boundaries that receive little use by people, this does not mean that these areas are of less significance to the ecological and cultural value of the Park. As such, the potential lack of visibility of the proposed project to users of the park does not reduce its impact on park values as described above in this section.

Significance determination

The proposed project is in conflict with the social expectation that parks are protected from the effects of extractive resource industries. For Tombstone Territorial Park specifically, this social expectation is reflected in the purpose behind the establishment of the Park as well as management goals set out in the management plan. These guiding principles focus on protecting biodiversity and intact, wilderness environments for ecological and recreational purposes. Tombstone Park is highly valued by society in this regard, which is in large part due to the importance of the intangible values associated with the natural environments, as described above.

There are activities proposed and resulting effects that are inconsistent with the goals and management objectives for Tombstone Territorial Park as set out in the TTPMP. These effects are not limited to the values and area within the claims and will extend to values and areas of the Park outside of the claim blocks. The proposed access routes traverse 46 km of the Blackstone River valley, or Slavin Creek to the Blackstone River valley. Effects to wildlife and vegetation over this area will impact park values, such as wildlife, subsistence harvest, and wilderness aesthetics that are not in conformance with intent of the Park vision statement or objectives for these values. Further, and as discussed further in the subsection below respecting recreation and tourism values, helicopter over flights will impact visitor enjoyment in the most popular hiking area of the park, while other auditory disturbances on-claim (e.g. drills, heavy equipment, explosives) will travel further than the boundaries of the claim-block with potential impacts to wildlife and visitors, particularly those using the areas of Azure and/or Syenite Lakes (discussed further in section respecting recreation and tourism values).

In particular these aspects of the proposed project run counter to the goals and management objectives for Tombstone Territorial Park as set out in the Management plan as follows:

- 100 snowmobile trips pulling loads through the Blackstone River valley in areas outside designated Point A to Point B travel routes;
- The creation of a visible trail via trampled vegetation and potential disturbance of the vegetative mat;
- Use of helicopters over the most heavily used times and areas of the Park; and

- Visual and auditory disturbance due to trenching, drilling, use of explosives, trail-building and use of heavy equipment, snowmobiles and ATvs in designated wildland zones and cultural value zones;
- Longer-term use of a stationary camp (requiring waste management and he storage of industrial materials and equipment on-site) within the Park in a wildlands zone.

The Designated Office has considered project effects on the many interconnected values that are represented through the establishment of, and management goals for, Tombstone Territorial Park. This project contains activities that will have significant adverse effects on these values and will result in effects that are inconsistent with goals of the park management. Options to make activities consistent with the park management goals and have not been provided and we are not aware of suitable mitigation for these effects Therefore, the Designated Office has determined that the proposed project will result in significant adverse effects to the values and social expectations related to Tombstone Territorial Park, which cannot be mitigated.

ii) Recreational Use, Visitor Experience and Tourism

Overview

The proposed project will affect recreational use and visitor experiences within Tombstone Territorial Park, as well as the business activities and potential of commercial wilderness tourism operators. As noted in the Yukon Parks Technical Review, "Tombstone Territorial Park has a considerable international reputation to uphold with growing iconic value" (pg. 15, YOR document 2010-0107-676-1), which is likely to be impacted by the proposed project and to subsequently affect tourism uses, experiences, and growth, in particular backcountry travel. The following discussion will consider the impacts of project activities to recreational use, visitor experience and tourism within the context of values and expectations for the park environment.

Significance of Tombstone Territorial Park to Yukon Tourism

It has been noted that Tombstone Territorial Park includes some of the most recognizable and iconic landscapes of the Yukon. It is a powerful and recognizable symbol of the natural and intangible values associated with parks, as well as of Yukon's "larger than life" natural environment that attracts visitors from around the world. Several comments identified the territorial, national and international significance of this area as a park.

Tombstone is a recognizable icon of Yukon landscapes, and as noted by Yukon Parks and the Department of Tourism and Culture, has been featured prominently in promotion and marketing by governments, tourism industry organizations and businesses. Images of Tombstone are used frequently

as part of the Yukon Larger than Life marketing campaign to appeal to potential international visitors seeking pristine mountain scenery and experiences. These images are also used to promote the Territory as a destination for business, meetings and events and as place to live. Numerous private businesses feature Tombstone images in their promotional material. Further, the images of many well-known photographers and artists feature Tombstone Territorial Park. The foregoing contributes to making Tombstone an iconic destination for tourists and residents alike.

Additionally, the park designation for the Tombstone region is a draw in and of itself, as there is a "common expectation from the public that parks contain lands and resources that are unusual or special" (Tourism and Culture, YOR document 2010-0107-676-1). Tombstone Park has experienced continued growth in visitor use since its designation as a park. In 2004, the first year after its formal establishment, the number of day hikes was estimated at approximately 187. In 2007, this number was approximately 1159, representing a 600% increase in just three years. Today, the number of visitors to the park is estimated overall to be 10,000. Yukon Parks has commented that there is a strong "sense of place" attachment to the park, which was evidenced by the many comment submissions describing personal visitor experiences. While the foregoing is a good indicator of the significance of Tombstone Territorial Park to tourism in the Yukon, the economic and social significance of Tombstone Park may still be underestimated: The economic impact of park use and the value placed on it by society is large throughout Canada and the USA, and has been found to be consistently under-reported (Eagles, et al, 2000).

Tourism values are explicitly identified within the Tombstone Park Management Plan, and direction is given in this regard for the management of the park. Such values, therefore, must be respected in accordance with the legally binding objectives of the Park Plan. These tourism values have been identified as follows (pg. 57):

- Tombstone Territorial Park is a tourist destination and an important part of many Yukon Alaska tours;
- The Park offers of range of outstanding natural, cultural, and historic features that appeal to guided and independent wilderness adventurers, day hikers and highway travelers; and
- Protecting the natural, cultural, and historic features that attract visitors is crucial to maintaining the appeal of the area to visitors and residents alike.

The above recognizes that Tombstone is an important tourist draw, and indicates that maintaining this appeal requires protection of its natural features. The potential effects of the proposed project to these tourism values are evaluated in the subsections below.

Recreational Uses/Areas in the park

It is recognized that "wilderness experience is a growing and important component of the local economy" (YG Tourism and Culture 2010-0107-676-1). In this regard, Tombstone Territorial Park is highly valued for its recreational opportunities and receives a considerable number of recreational users every year. The number of day hikers has increased in the area of Grizzly Lake from 187 in 2004 to over 1100 in 2007, while the Tombstone Park 2008 Year End Report notes that approximately 1635 hikers were counted by the trail counter on Grizzly Trail. Similarly, visits to Divide and Talus Lakes have received increasing use, necessitating the development of backcountry campsite facilities (i.e. tent pads, outhouse, bear-proof containers). Further, areas that have historically not been frequented by backcountry visitors are starting to receive greater use, such as Azure and Syenite Lakes. Snowmobiling is also permitted in a designated front-country area of the North Klondike River valley, for which a minimum of 15-30cm of snow cover is required. In the area north of the Cloudy Range, including the Blackstone River valley proposed access route and the project area, other recreational activities include guided hunting, horse-packing, and paddling on the Upper Blackstone River[3].

Recreationists and others are drawn to the area for a variety of reasons, most of which relate to its wilderness qualities. YG Tourism and Culture noted that "rugged, challenging terrain and remote wilderness landscapes with few signs of human intrusion provide solitude, rest and health benefits that are increasingly important motivators for tourists" (2010-0107-676-1). Yukon Parks has indicated that the Park Management Plan is clear in providing a "range of recreational opportunities, including solitude and wilderness experience." Management principles for recreation as described in the plan convey the importance of leaving the area in a wilderness setting, dispersing human use, and maintaining its wilderness qualities. Further, the park management plan states that Yukon Parks is required to manage backcountry areas "so visitors can experience a sense of freedom, inspiration, solitude, challenge and self-reliance" (2010-0107-676-1). These characteristics of a "wilderness experience" in recreational pursuits are anticipated and expected, particularly in those areas zoned as backcountry wildland zones.

Effects of helicopter over-flights

The proposed project involves helicopter access during the summer and fall months when snow conditions do not permit overland access. The proposed flight path traverses the most heavily used recreational areas of Tombstone Park, beginning near Cairnes Creek and travelling northwest over Grizzly Creek, the North Klondike River valley near Divide Lake, and over the Cloudy range to the Horn claims, which are situated approximately 3 km from Talus Lake. As mentioned before, Divide, Talus, and Grizzly Lake are the most popular backcountry areas within the park. Based on the project proposal there two areas that will experience and increase of over-flights; the route between Dawson City and the Dempster Highway staging area; and Grizzly Trail (Dempster to Project location). The proposal indicates

[3] Paddling was noted as an activity in one comment submission, YOR document 2010-0107-XXX-1

that there could be up to 12 round trips between Dawson City and the Staging area; these trips will occur on a weekly basis for June and September and bi-weekly for July and August. During these flights the proponent will optimize the use of the helicopter and make multiple trips between the Dempster Highway and the project location. The later could result in up to 48 return trips based on the proposed operating plan however the proposal also indicates that there would be up to 30 flights maximum, Any increase in helicopter disturbance in this region is considered significant due to the sensitivity of backcountry travellers to this kind of disturbance.

Helicopter overflights were cited as a negative experience by visitors during the park consultation process from 2000-2002, which were likely related to the activities of the proponent on their claims at that time. Recognizing the impact that overflights have on visitor use in the backcountry, the Park Plan notes that "aircraft activity will be managed to enhance visitor experiences and protect Tombstone Territorial Park resources." As noted by Yukon Parks, the proposed route for helicopter access contravenes this management principle.

The frequency of visitor disturbance is relatively low, limited to one day approximately every two weeks, with up to four flights occurring throughout that day. However, visitors of the Park that are subjected to frequent helicopter disturbances on that day are likely to be adversely affected. Similarly, visitors that embark on multi-day trips who have travelled deeper into the backcountry will be negatively affected by such disturbances and, in many cases will have higher expectations for solitude and a sense of remoteness while travelling in the backcountry (described further in "effects of crowding" below). These visitors will not make a distinction between their own personal experience and the larger context of helicopter activity within the Park. Passing on their experiences to others and/or to media will subsequently adversely affect the reputation of the Park. Further, such disturbances also run counter to the objective of the vision statement to enhance "the understanding and appreciation of the natural and cultural resources of the Park."

Effects to visual aesthetics

As described in the section on environmental quality, the use of an overland access route to haul equipment, ore, and personnel via snowmobile and/or a snow-cat, is highly likely to result in trampled vegetation and erosion, and subsequently, will leave a visual scar on the landscape (see section 9.0). As recreational snowmobiling is not permitted in this area, the extent of snowmobiling activity associated with the project (i.e. 100 snowmobile trips in 60 days), is a relatively high increase in snowmobiling activity that is not in accordance with the management principles for this area respecting snowmobile use. The length of the proposed access through the Blackstone valley means that this impact is geographically quite large, increasing the extent of the impact. The site itself will also create a discontinuity to the wilderness environment, through the development of trails, trenches and camp. While there is currently evidence of the previous workings at the site, the proposed project will increase the scale of this visual disturbance.

Further, the park itself has seen increasing use of proximal areas, (e.g. Syenite and Azure Lakes), and so the continued and additional impacts to the wilderness aesthetics resulting from the proposed activities are increasingly significant.

Currently, the park is managed so that impacts to the environment are not visible and/or minimized. Research on visitor impacts in Tombstone has shown that a tent site in one location for two nights can cause trampling of the vegetation that is visible for one to two years (Gneisser, 2000). The heavy use of the popular lake hikes in the Tombstone/North Klondike valleys (Divide, Grizzly, and Talus), resulted in the creation of braided trail networks. These types of visible impacts are being managed by Yukon Parks to reduce their occurrence via tent pads and marked trails, and seasonal trail closures. Further, options to develop other trail routes are being explored in order to disperse the impact of visitor foot traffic (Tombstone Park 2008 Year End Report). The latter demonstrates the importance of the "leave no trace" management ethic for the park, as visible impacts alter the backcountry experience for visitors and the intent of the park to leave areas unimpaired for future generations.

While the Park plan provides a guiding principle (principle 6.11) that appears to contradict the "leave no trace" ethic described above in relation to potential access development for the Horn claims, other guiding principles indicate the extent to which impacts of exploration and associated access may be unacceptable, where/if such impacts compromise the management objectives for other values. For example, guiding principle 6.3 states that "All Tombstone Territorial Park operations and management will be conducted in a manner that protects ecological and cultural resources," for which the standard may be higher than other regions outside of the Park environment.

Effects of auditory disturbance

Noise from the use of explosives and the operation of heavy equipment, drills, a water pump, generator, ATV's and snowmobiles will also impact visitor experience. Explosives will be heard from several kilometers away. Talus Lake, often described as "the jewel" of Tombstone Park (Canadian Parks and Wilderness Society, 2000), is only 3 km from the project area, and is highly likely to experience noise from any blasts. Such a disturbance would be incongruous with the otherwise pristine, remote, and exceptional beauty of this area for visitors. In a previous study of auditory impacts of mineral exploration on sheep in Ruby Range, southwest Yukon, noise from the excavator was documented from up to 4 km away (Frid, 1995), and a similar range of noise has been documented for drilling activity. The range wherein auditory disturbances can be heard is dependent on factors such as terrain. In this case, while the Cloudy Range will undoubtedly block some portion of disturbance originating at the project area from backcountry users in the Tombstone valley, visitors at Azure and Syenite Lakes will likely be more affected. As the latter are even deeper into the heart of the park, there is an even greater expectation that disturbances will not occur, as described below with respect to crowding. Moreover, multi-day users of the Park, particularly

backpackers travelling within the surrounding areas, have a higher likelihood of being disturbed/affected by project activities over multiple days, which increases the magnitude and extent of this impact.

Effects of "crowding"

The proposed project will result in visual and auditory disturbances, as well as impacts to the perception of wilderness that may result in the experience of "crowding" for visitors seeking solitude, which is considered an adverse effect to recreational use and enjoyment in parks (Manning et al., 2000; Krakoff, 2003). Extensive literature on this subject has been developed since at least 1960 and earlier, and is a key issue for visitor management in parks. Often, this issue is dealt with via zoning, which differentiates between front-country and backcountry uses. In this case, the proposed project is entirely within the backcountry wildlands zone wherein the Plan objective is to "preserve undisturbed natural landscapes and offer backcountry experiences." As such, visitors within the backcountry zones have high expectations for a wilderness experience that involves few auditory and visual disturbances, including limited contact with other backcountry travellers (Manning et al., 2000).

The characteristics of a region are central to people's decision to visit that place, and to the activity being pursued. The reputation of Tombstone is one of remoteness, pristine, wilderness environments. It is well-known that there is only one formal trail in the park, and visitors are expected to be self-reliant. As such, visitors who are seeking these attributes in a wilderness experience are most likely to be attracted to the park. As use has increased in the park, some visitors are choosing to go to relatively unused locations deeper into the heart of the park, such as Syenite and Azure Lake. Research on crowding demonstrates that backcountry travellers to areas in the interior of parks are visitors who are particularly sensitive to the impacts of crowding, which can include visual and auditory evidence of human presence as well as overt disturbances such as helicopter overflights and ATVs (Manning et al., 2000; Rollins, 1999). Further, due to the *expectation* that the interior areas of parks will have fewer disturbances compared to the periphery, or front-country, regions, visitors to the interior of parks are less tolerant to disturbances in these areas, and activities that may be acceptable in other locations can be significant.

Effects to commercial wilderness tourism operators

Comments from YG Tourism and Culture noted that six Yukon companies and several more Canadian and European companies operate wilderness tourism operations in the park. All of these operations involve trips within Grizzly Valley and other Tombstone destinations. Further, in 2009 there were several commercially guided trips to Azure and Syenite Lakes (Dorian Amos, Park Ranger, personal comm., July 22, 21, 2010). As such, these businesses may all potentially be affected by the proposed project due to helicopter over flights and other disturbances described above. These trips are important economic revenue generators for the local operators, as well as the territory's general economy. To illustrate, six to ten day trips cost 2000 - 4000 dollars per person. These tour operators depend on maintaining wilderness qualities, for which the park designation is important for providing certainty that a high quality wilderness

landscape will be sustained. In addition to these commercial operators, guided outfitting will be discussed in section 5.0 Wildlife Harvest. Further, Yukon Parks has indicated that they have made a demonstrated effort to increase ecotourism in Tombstone Park, such as with the interpretive centre, the construction of new interpretive trails and the hiring of staff for interpretation and guided hikes. The proposed project may, therefore, also conflict with the general goal of increasing this type of economic activity and tourism in the park.

Effects to wildlife impacting wilderness tourism values and recreation

As described in the wildlife section, the existence of a year-round camp increases the potential for bears to become habituated. Considering that the park is used by visitors and residents for wilderness-based endeavours (e.g. hiking, hunting) wherein people are at great distances from help and are expected to be self-reliant, potentially more aggressive bears could create an unacceptable risk for many backcountry travellers. Disturbances that displace wildlife from the region will result in a loss of wildlife viewing opportunities. Staging areas and the helicopter access routes will impact both the Dempster Highway corridor and the popular hiking region in this respect. Effects to wildlife, such as habituation, displacement, or general population declines, will also affect visitor perceptions of the pristine nature of the park, and subsequently affect visitor experience. The latter relates to the values described throughout this section, including intangible values, societal expectation for parks and Tombstone Territorial Park, and wilderness and biodiversity values.

Mitigations committed to by the proponent

The proponent has indicated the following mitigation measures to reduce effects to recreational and visitor use:

- Avoiding weekends and special events for helicopter overflights;
- Prior notification of blasts to be given to Park management 48 hours in advance;
- Mitigations as discussed in Section 5.0, Wildlife and Wildlife Habitat with respect to bear/human conflict management;
- Mitigations as discussed in Section 9.0, Ecological Integrity, with respect to minimizing surface disturbance via reclamation and minimum snow cover of 30 cm on the proposed overland access route.

The above mitigation measures do not adequately address the impacts to recreational use, visitor experience and tourism. In particular, the volume of auditory and visual disturbance resulting from use of the access and the proposed helicopter flight path over the most popular hiking area in comparison to the general standards expected within a park environment, are not adequately addressed by the above mitigations.

The Designated Office has further considered the following additional potential mitigation measures:

- Limit discharge of explosives during the peak hiking season to the off-season (i.e. mid-September to May);
- Helicopter landing pads shall remain in a consistent location. There should be no helicopter landing outside of these designated areas. *This mitigation will reduce the geographic dispersal of disturbance from helicopters and increase certainty for backcountry travellers regarding the location of activity.*
- Notices shall be posted in locations where visitors can be reasonably expected to see them informing potential backcountry visitors of project activities. *This mitigation will reduce the impact that visual and auditory disturbance will have on backcountry travellers' expectations by reducing the possibility for negative surprises.*
- Helicopter overflights shall be minimized to the greatest extent possible.

Significance determination

The proposed project will adversely affect the wilderness experience of visitors through the creation of visual and auditory disturbances, (helicopter overflights; surface disturbance along the Blackstone River valley and at the project site; noise from drilling, heavy equipment, explosives, and camp operations; trail development on site; inadequate reclamation), degraded wilderness aesthetics and characteristics (e.g. abundant wildlife populations), as well as by undermining visitor's perception of the region as a pristine wilderness environment. Adverse effects to other valued components, such as environmental quality, wildlife and wildlife habitat, and the cultural values of the region, also serve to degrade the qualities of the region that are central to its value as a visitor destination and the high quality of recreational opportunities.

These effects geographically extend from the claim block, along the length of the overland access route, helicopter flight path and the areas over which sound from the proposed activities can travel. There is direct overlap between the activities proposed and some of the most densely and frequently used areas of Tombstone Territorial Park. Even where areas are less popular and/or travelled to by visitors, the adverse impact to visitor experience increases in magnitude since people expect fewer disturbances in more remote areas. Though auditory disturbances may be finite and short-term, the visual impacts of the proposed project and those to wildlife may last several decades or more. Of particular significance is the impact of helicopter over flights during the main hiking season over the most widely used area of the park. The Designated Office cannot at this time recommend an alternative flight path without assessing the resultant effects of any alternative. As it stands, the proposed flight path will have significant adverse effects to recreational use, which will impact visitors over five consecutive seasons. These impacts over consecutive seasons may result in reduced visitation to these areas of the park and effects to commercial

wilderness tourism businesses that could last beyond the temporal scope of the project. Further, the potential for access development in this region, including increased snowmobile use due to the visibility of an established route, could have long-term consequences to a variety of valued components that will alter sense of place values fundamental to recreational and visitor enjoyment.

Even where effects can be reduced, such as by limiting explosive use to less busy times of the year, or by reducing the number of overflights where possible, they cannot be mitigated to the standard implemented for activities within the park, as described in the management plan. Activities and associated effects not in accordance with the management principles of the park deter visitor use, enjoyment, tourism growth and potential. Tombstone Territorial Park is an iconic destination wherein visitors have high expectations about the wilderness environment. The management principles for the park reflect the value placed on maintaining the quality of visitor experience in terms of this wilderness aesthetic and tourism values, and includes language around solitude, self-reliance, and remote, pristine environments. Therefore, the Designated Office has determined that the proposed project will result in significant adverse effects to recreation, visitor use, and tourism that cannot be mitigated.

Residual and Cumulative Effects

The assessment of cumulative effects under YESAA considers the residual effects of this project on Parks and Protected Areas Values and Interests in combination with of the residual effects of:

(i) other projects for which proposals have been submitted under subsection 50(1)[of YESAA][, or
(ii) other existing or proposed activities in or outside Yukon that are known to the designated office, executive committee or panel of the Board from information provided to it or obtained by it under the Act; (YESAA s42(1)(d))

This evaluation has determined that there are significant adverse project effects to wildlife and wildlife habitat that cannot be mitigated. It follows that the cumulative effects are also significant and adverse on wildlife and wildlife habitat and further consideration is not detailed here.

8.0 Traditional and Cultural Interests

8.1 Overview

As described in Section 1.0 and Section 2.0, the proposed project lies within the traditional territory of the Tr'ondëk Hwëch'in, and was also used by the Tetl'it Gwich'in and Tukudh.
The project area and proposed access are completely within the Tr'ondëk Hwëch'in Special Management Area (SMA) of Tombstone Territorial Park, as established under Schedule A of Chapter 10 of the Tr'ondëk Hwëch'in Final Agreement. Tombstone Territorial Park and, therefore, the project area are considered to be of significant cultural and traditional importance. Effects to traditional and cultural interests have been summarized as:

- Damage and/or destruction of heritage/historic resources; and,
- Effects to 'sense of place' as a cultural interest of the region. (Sense of place will be defined in the effects assessment below).

With respect to sense of place, the Designated Office concluded from the comments and information submitted that the natural setting of the area has intrinsic value to the First Nations listed above, and in particular for the Tr'ondëk Hwëch'in, that is not necessarily tied to a value for which effects are measurable and/or direct. 'Sense of place' has been used as an umbrella term in this assessment, which includes a variety of potential impacts to traditional and cultural interests, such as subsistence harvesting.

The significance of effects to traditional and cultural interests has been evaluated within the context of Schedule A, Chapter 10 of the Tr'ondëk Hwëch'in Final Agreement. Specifically, the following stated objectives have been considered:

- *To recognize and honour Tr'ondëk Hwëch'in history and culture in the area through the establishment and operation of the Park;*
- *To encourage public awareness, appreciation and enjoyment of the natural, historical and cultural resources of the Park in a manner that will ensure it is protected for the benefit of future generations; and*
- *To protect for all time a natural area of territorial significance which includes representative portions of the McKenzie Mountains ecoregion, including the Ogilvie Mountains and Blackstone Uplands areas, and contains important physical and biological features as well as sites of archaeological, historical and cultural value, by the establishment if a territorial park under the Parks Act to be known as Tombstone Territorial Park.*

After reviewing the comments and information submitted, the potential effects identified in previous sections, and evaluating the issues in the context of the purpose and objectives of Tombstone Territorial Park pursuant to Chapter 10 of the Tr'ondëk Hwëch'in Final Agreement, the Designated Office has determined that the proposed project will result in significant adverse effects to traditional and cultural use that cannot be mitigated. The following sections provide a rationale for this determination.

8.2 Project effects

Overview of traditional and cultural use and history in Tombstone Territorial Park

As described in Section 1.3, the project area and access routes lay within Tombstone Territorial Park, a culturally significant region, for which human occupation has likely spanned 8,000 – 10,000 years, and possibly longer. The Han, Tetl'it Gwich'in and Tudkudh converged on this region, perhaps due to high biodiversity values and species richness, such as abundant game populations, overlap of boreal forest and low arctic ecosystems, and different watersheds containing a diversity of culturally important fish species. Initial heritage assessments conducted prior to and during the planning of Tombstone Park documented over 75 prehistoric and historic sites, and more sites may be present.

The cultural and traditional significance of the region is well-known and documented in several publications, such as the *Preliminary Archaeological Inventory Proposed Tombstone Mountain Territorial Park, 1993*, (R.M Gotthardt, Yukon Government Heritage Branch), the *Gwich'in Historic Sites in the Upper Blackstone Area* (Ingrid Kritsch, Gwich'in Social and Cultural Institute) and the *Tombstone Territorial Park Management Plan* (2009). These documents note the high intensity of use in the area, the long and consistent occupation of the area over the past 8,000 – 10,000 years or more, and the consistency of use patterns within the region of the Park. Of noteworthiness to the Tr'ondëk Hwëch'in is the presence of the two villages of Black City and Calico Town, which were important annual hunting villages. Elders of the Tr'ondëk Hwëch'in are living links to these areas, having had family members who were raised in these areas, or who were born there themselves, and who continue to use the region today.

Cultural use of the region included hunting, fishing, trapping, tool-making, migration routes, and plant harvesting, and all other activities required to sustain the livelihoods and cultural activities of the First Nations people who utilized this area. TH notes that the region was referred to as a "wealth country" providing food and shelter to the Tr'ondëk Hwëch'in. Caribou hunting was particularly important, as this area forms the wintering grounds for two caribou herds, the barren-ground Porcupine Herd and the woodland Hart herd, which have shown consistent migration patterns and use of wintering areas for millennia (Gotthardt, 1993). Oral histories for the region also describe the daily lives of people in this area, such as playing traditional games (Kristch, 1999).

It is this richness of traditional and cultural use that formed the fundamental basis for the establishment of a Special Management Area under Schedule A of Chapter 10 of the TH Final Agreement. The letter from Chief Eddie Taylor notes that the Horn claims are entirely within one area noted in 1972 by the United Nations Environmental Scientific and Cultural Organisation World Heritage Convention as being of exceptional value for the "conservation of natural values and cultural properties." Further, TH has asserted that a land claim selection was too be made that included the area of the Horn claims, but was dropped on good faith that a Park would be created to include this region and would subsequently protect their cultural interests in this region. The long history of land claims negotiations and legal battles over the size of the Park and the protection of this area from mineral exploration provide additional background substantiating the cultural importance of the region to the Tr'ondëk Hwëch'in.

The cultural importance of the project area and of Tombstone Territorial Park to Gwich'in people is indisputable. As stated in the letter from Na-Cho Nyak Dun Chief Mervyn, Gwich'in Tribal Council President Nerysoo and Tr'ondëk Hwëch'in Chief Taylor, "it would be impossible to exaggerate the cultural and spiritual value of this place to our peoples." However, as a Special Management Area established under the Tr'ondëk Hwëch'in Final Agreement, the traditional and cultural interests of the region to Tr'ondëk Hwëch'in are of particular relevance to the following effects assessment, though it is recognized that other First Nations also have vested interests in the region.

i. Damage and/or destruction of heritage/historic resources

Land clearing and earthworks associated with the construction of drill pads, drilling activities mechanized trenching and the establishment and use of access trails may result in the damage or destruction of items of historical or heritage value occurring within the project site. Land clearing activities and earthworks may adversely impact heritage or historic resources by destroying or altering all or part of a resource, isolating a resource from its natural setting, and introducing physical, chemical or visual elements that are out of character with the historic or heritage resources and its setting. (Potential effects related to the visual elements of trail development will be evaluated in the section on 'sense of place' below).

Yukon Government, Heritage Resources Branch indicated in their comment submission (YOR document 2010-0107-676-1) that there are no known historic resources in the project area. It is also possible that any historic resources on site have been damaged or destroyed since CUMI first staked the claims and conducted work beginning in 1998. It must also be recognized that the definition of historic resources used by Yukon Government as defined in the Yukon *Historic Resources Act* is not the same definition as used by Tr'ondëk Hwëch'in to define *heritage* resources. While Yukon Government's definition is limited to sites, objects, etc. Tr'ondëk Hwëch'in include in their definition a variety of other elements of traditional and cultural importance, such as harvestable resources (e.g. medicinal plants), areas of importance, (e.g.

migration routes), and intangible resources, such as traditional knowledge and place names, to name a few examples. Tr'ondëk Hwëch'in has indicated that many heritage resources are easily damaged, such as graves sites or medicinal plants.

The project may affect historical/heritage resources on-site, as well as along the proposed winter access routes. In terms of the latter, the access route would traverse the Blackstone River valley accessed from either Chapman Lake (Option B) or from Slavin Creek (Option A). In particular, Option B that traverses the entire length of the Blackstone River from the Dempster Highway is an area of significant historical cultural use and importance. The Blackstone River valley to its confluence with the Seela Pass is an area of concentrated historic sites along an established travel and migration route, and which demonstrates a consistent pattern of use for many thousands of years (Gotthard, 1993). Included in these historic sites are the ancient village of Calico Town, and several cabins of cultural significance to the Tr'ondëk Hwëch'in. In the Tr'ondëk Hwëch'in comment submission it was stated that the access route, (Option B) is located in an area of "High Cultural Value", as noted in the *Tombstone Territorial Park Management Plan* (2009), and which "traverse(s) culturally sensitive terrain, with a high possibility of being permanently damaged by repeated travel with heavy loads" (pg.9).

While the project area itself may not contain any known historic resources, it is worth noting that there is one known historic site in relative proximity to the project area, as observed in the *Preliminary Archaeological Inventory Tombstone Mountain Park, 1993* (Gotthard, 1993). Further, due to the extensive historical cultural use of the region, the statement that there are no known historic resources on-site does not preclude the possibility of their occurrence, and mitigation was given by Yukon Government in this regard, as per the Operating Conditions of Schedule 1 of the Quartz Mining Act.

In determining the significance of project effects, the requirements of the following non-discretionary legislation have been considered:

- The *Yukon Historic Resources Act* and the Archaeological Sites Regulation.
- The Tr'ondëk Hwëch'in Final Agreement, Chapter 13 – Heritage. In particular, the following provision has been considered: "Heritage sites related to the culture and history of Yukon First Nations people within Tombstone Territorial Park will be managed with respect for Yukon First Nations values and culture."
- The *Quartz Mining Act* and the Quartz Mining Land Use Regulation, in particular Section E of Schedule 1. Section E discusses a 30 m set back (from archaeological or paleontological sites only), reporting of discoveries to the Chief (Mining Land Use), and cessation of activities within 30 m of sites containing archaeological or palaeontological objects or human remains or burial sites, until the Chief indicates in writing that activities may be resumed.

The above non-discretionary legislation provides for some mitigation that is reactive and does not, therefore, adequately prevent the accidental destruction of heritage/historic resources that are often at or near the surface. The fact that heritage resources are rarely reported during mining and exploration projects may be an indication that unskilled personnel are not able to recognize heritage/historic resources, rather than being an indication that such resources are not present.

In this case, due to the high importance of the area to protect heritage/historic resources, the Designated Office has determined that without additional mitigation, significant adverse effects to heritage/historic resources due to damage and/or destruction will occur. Further, the definition of heritage resources held by the Tr'ondëk Hwëch'in is not the same as the definition held by the Yukon Government. Tr'ondëk Hwëch'in and/or the Yukon Government have legislative mandates and expertise for management of heritage resources in Tombstone Territorial Park. The legislative requirements listed above include provisions for notification of the Yukon Government. Mitigation which requires the notification of the TH will result in all those parties with legislative mandate and expertise being aware of the potential resources that are present in the project area. In this case, all parties will be in a position to offer timely advice regarding the protection and/or management of resources should these resources be deemed significant. As such, the Designated Office has determined that without further mitigation, the project will result in significant adverse effects on newly discovered heritage resources.

More important than notification is the mitigation that special care be taken to ensure that no historic/heritage resources are damaged in the first place. Due to the historical significance of the entire region and the context of the project area within the Park, the significance of any damage and/or destruction of historic/heritage resources is very high. The proponent should be required to ensure that no resources are damaged in this regard. Further to this, key action 10.5.5 of the Tombstone Management Plan states that "Archaeological and historical inventory and salvage work will be conducted in areas of known high potential prior to any increase in human use or development. Ongoing oral history work will be conducted to identify these areas." As the proposed project represents an increase in human activity through a designated zone of high cultural value within the park, additional inventory and salvage work may also be required in order that the management actions of the Plan are respected and implemented.

Mitigation

The following mitigation measures are specified to eliminate, reduce or control significant adverse effects of the project relating to heritage and historic resources:

- The proponent shall undertake a detailed field assessment of the project site prior to undertaking project activities. The services of an archaeological consultant qualified to

undertake this work shall be enlisted and advice obtained regarding appropriate mitigation where/if resources are found.

- Known heritage trails and/or those discovered in the course of a heritage field assessment, shall not be disturbed.
- While undertaking project activities, if the proponent discovers any ethnographic moveable heritage resources not identified during the field assessment which are directly related to the culture and history of First Nations people, the proponent shall notify the Heritage Department of the Tr'ondëk Hwëch'in, in addition to notifying the Chief of Mining Land Use, as per the Mining Land Use Regulation, as well as the Yukon Parks Branch.
- If the proponent is unable to readily determine whether a moveable heritage resource found within the project area is an ethnographic object directly related to the culture and history of First Nations people, the proponent shall notify the Heritage Departments of the Tr'ondëk Hwëch'in in addition to notifying the Chief of Mining Land Use, as per the Mining Land Use Regulation, as well as the Yukon Parks Branch.

While it is recognized that the Yukon Government is responsible for heritage resources on Crown Land, Chapter 13 of the Final Agreement states that ownership of ethnographic moveable heritage resources is to the First Nation. Therefore, the First Nation has a vested interest and responsibility for such resources. Further, Tombstone Territorial Park is a Special Management Area under Chapter 10 of the TH Final Agreement. Notifying the First Nation in the case that a moveable ethnographic resource is found or which the status of the object cannot be readily determined will ensure that those with a legislated mandate to manage these resources and those of the Park are notified during process of its identification and transfer.

Although the above mitigation measures will provide protection of tangible historic resources, such as objects and sites, effects to heritage resources as defined by the Tr'ondëk Hwëch'in, (e.g. medicinal plants, harvestable resources, migration routes, etc.) may not be adequately mitigated. Effects to these kinds of heritage resources will be described below, in reference to sense of place, as the interrelatedness of heritage resources with the natural environment setting is conducive to a broader discussion on the traditional and cultural interests as they relate to place.

ii. Effects to sense of place

'Sense of place' is a concept that refers to a person's relationship to the landscape (Windsor, et al, 2005; Nordstrom, 1993). This relationship may be further defined as being built on knowledge, history, emotion and identity with respect to place (McCoy, 2004). Indeed, identity is often cited as the defining aspect of 'sense of place' in that personal and cultural identity is "intimately bound up with place identity" (Buttimer,

1980: pg. 158). In this way, sense of place may be subjective and unique for individuals, but similar and connected within cultural groups based on shared knowledge, history, values and experiences of place. Therefore, sense of place may be considered to be a component of the traditional and cultural interest of the project area, (such as contributing to the continuation of a cultural identity), as the comments from Chiefs of the Tr'ondëk Hwëch'in and Na-cho Nyak Dun First Nations, and the President of the Gwich'in Tribal Council attest.

As noted in the TH comment submission, the traditional and cultural interests of the project area are inextricable from the natural environment values discussed in other sections of this report, demonstrating sense of place values. For this reason, protecting the traditional and cultural interests of the area means also preserving natural environment in a way that is representative of the traditional and cultural values, (e.g. protecting wildlife and wildlife habitat, such that traditional pursuits can continue to be undertaken. This is also described in greater detail in Section X, Wildlife Harvesting, with respect to subsistence hunting). Illustrating the relatedness of place with cultural and traditional values is the description of the heritage values of the project area and Tombstone Park more generally by the Tr'ondëk Hwëch'in, which are at times indistinguishable from environmental values. These include the following:

- Harvestable resources
- Migration routes, waterways, salt licks, calving areas, trap-lines
- Medicines
- Raw materials – bark, wood, stone, bone, fibres, dyes
- Place names – the stories and where they connect with the land
- Camps, trails, caches, burial sites
- Sacred sites
- Traditional knowledge
- Archaeological and Historic sites

From this list it is evident that while there are some discrete heritage resources, such as specific sites or objects, a number of the above "heritage resources" defined by TH relate to the protection of the natural environment, such as the harvestable resources, and therefore to sense of place values. Place names, migration routes, and traditional knowledge are examples of the latter, wherein the physical alteration of areas may change the connection people have with the land and in some cases destroy the heritage resource (e.g. the destruction of a historic site related to a place name) .

The sense of place values associated with the project area and access route have also been given geographic dimensions by Tr'ondëk Hwëch'in, which is understood by the Designated Office to be the holistic value of Tombstone Territorial Park. TH has described this value as follows: "For the Tr'ondëk

Hwëch'in, the heritage resource value of the park as a whole is just as important as the individual heritage sites which are scattered throughout its boundary." The importance of the geographic dimension of this value is demonstrated in the legal history of its establishment as a Special Management Area. Additionally, a quote from elder Mabel Henry summarizes succinctly the sense of place values for Tombstone Park by stating "…they didn't want this place to be disturbed because there's something there….but we'll try to protect it because there's a lot of sacred things there."

Effects to a sense of place are those that undermine or degrade the existing relationship to the land, and/or destroy the physical evidence of this relationship. At its worst, the result of these effects is a loss of identity (Windsor et al, 2005; Smith, 1995). In the context of this assessment, impacts to sense of place may include, but are not limited to:

- Physical alteration of the natural/ wilderness character of the region, such that the memory of the former landscape and its use is eventually forgotten/ lost; and
- Destruction or degradation of unprotected culturally important sites, (e.g. trails, graves, gathering sites, hunting areas) as described above but elaborated on in this section to include other heritage resources;
- Changes to the biophysical characteristics of the region affecting cultural resource harvesting practices, (e.g. changes to the abundance and quality of fish and wildlife populations);

The proposed project will alter the physical environment within the project area and potentially along the proposed access routes. Two of the proposed routes traverse through areas designated as "High Cultural Value", while the preferred route along Slavin Creek is said to have been used by subsistence hunters traditionally and contemporarily." The scarring of the landscape via surface disturbance, trampling of vegetation, changes to the type of vegetation present, and the subsequent introduction and expansion of visual elements that are out of place with the existing character of the region, represent effects to sense of place values in this region.

Moreover, the inadvertent development of an established trail is likely to result in its receiving greater use. While these areas of the Park are generally not open to snowmobiler use with the exception of Point A to Point B travel, they are open for hunters. Winter hunters may include Tr'ondëk Hwëch'in people, but also First Nation people from around the territory and/or Canada. As well, compacted snow along a trail will take longer to melt and, combined with the visibility of trampled/broken vegetation, may be visible to non-motorized traffic in the spring and early summer. Subsequently, more use throughout the summer season and into the fall may occur. Increased use of trails in these areas will exacerbate effects to wildlife, ecological integrity, hunting activities, and potentially compromise historic resources. The latter are project effects that are unacceptable to the Tr'ondëk Hwëch'in, who assert that the proposed project

risks “severe impacts to a large portion of very sensitive culturally and spiritually important values (heritage resource values).” In addition to direct visual disturbances, the use of the access routes and auditory disturbances from snowmobiles that displace wildlife will also displace Tr’ondëk Hwëch’in people from subsistence harvest activities.

Effects to sense of place values may impact cultural identity, and the continuation and preservation of a cultural heritage that is protected by the preservation of the visual and physical elements of the environment. For example, TH notes that “it must be emphasized that these areas are places of teaching and learning for the Tr’ondëk Hwëch’in people. For many these landscapes were and still are a classroom. For many this landscape is inherent to who they are as individuals.” The introduction of visual, chemical and auditory elements and disturbances out of character with the region may therefore affect the sense of place values associated with the Park, which has been described as “a sanctuary, set aside to provide protection for all time.”

Significance determination

Determining the significance of effects to sense of place values is a challenging undertaking for assessors at the YESAB. “Sense of place” values are often subjective and relate to impacts that are brought on by change. Therefore, it is unreasonable for the Designated Office to determine that all effects to individuals “sense of place” are significant. If a person has walked the same route with their dog to a beach from their house for the last 10 years, that person may have a strong attachment to every nuance of the trail, nostalgia, or a profound sense of home. However, the destruction of that trail for the development of a residential lot may not be considered significant in the larger context due only to one person’s sense of place.

In the context of the proposed project, several factors have been considered in order to make a significance determination. First, the potential extent of project effects is geographically dispersed and even widespread throughout the Park, affecting the whole of the Blackstone River Valley. There is a likelihood that vegetative resource will experience trampling such that a trail will be visible, and/or in a worst case scenario that the vegetative mat will be damaged. The fact that a horse trail may already be present only serves to compound the influence of snowmobile and/or snow-cat use to further entrench the visibility of a trail and its use. The visibility of a trail will cause it to receive more use by snowmobilers, (as permitted for hunting purposes), and potentially other traffic in the summer and fall months that will increase the impact of this effect on the landscape. As this area is a traditional migration route with a number of heritage sites and resources, there is the possibility that further heritage sites and resources could be damaged, and the physical and visual alteration of this culturally significant landscape.

Second, sense of place values are not localized to one person. Rather, these impacts are part of a larger cultural sense of place to the region, affecting the Tr'ondëk Hwëch'in, but also the Tetl'it Gwich'in and the Tukudh. Finally, the objectives of the Park Plan and Schedule A have been considered. These articulate and demonstrate the validity and importance of cultural and traditional interests, including sense of place, but outlining clear goals and objectives for their protection for all time. As noted in the overview to this section, the objectives of Schedule A of Chapter 10 are as follows:

- *To recognize and protect the traditional and current use of the area by Tr'ondëk Hwëch'in in the development and management of the Park;*
- *To recognize and honour Tr'ondëk Hwëch'in history and culture in the area through the establishment and operation of the Park;*
- *To encourage public awareness, appreciation and enjoyment of the natural, historical and cultural resources of the Park in a manner that will ensure it is protected for the benefit of future generations; and*
- *To protect for all time a natural area of territorial significance which includes representative portions of the McKenzie Mountains ecoregion, including the Ogilvie Mountains and Blackstone Uplands areas, and contains important physical and biological features as well as sites of archaeological, historical and cultural value, by the establishment if a territorial park under the Parks Act to be known as Tombstone Territorial Park.*

The above is the noted legal context for the Park and the Objectives of this Special Management Area. While the Designated Office is not concerned with the administration of the rights and objectives of the Park, these objectives are instructive in determining the significance of effects, since they provide a context in which to determine significance, recognizing that some areas have more sensitive values than others. The sensitivity of the traditional and cultural values in this area is extremely high, as previously described.

Given the above, the Designated Office has ascertained that the 1) the project area cannot be separated from the larger context of Tombstone Territorial Park; 2) Effects to ecological integrity and wildlife and wildlife habitat that have already been deemed to be significant will consequently adversely affect cultural and traditional interests as an integral part of cultural identity; and, 3) Tombstone Park, a substantial portion of the proposed access route, and areas in and around the project area, are of immense cultural and traditional importance, as noted in the rationale for establishment of the SMA as Tombstone Territorial Park. These factors mean that the proposed project will have a significant adverse effect to traditional cultural interests by affecting wildlife and wildlife harvesting, impacting historic resources, and damaging the natural environment in a way that will alter the cultural sense of place values for which standards have been developed to protect for all time the natural setting of the region.

Conclusion

Mitigation to reduce the effects to traditional and cultural interests in terms of sense of place are the same as for those recommended for wildlife and wildlife habitat, ecological integrity, wildlife harvesting, and fish and fish habitat. However, it has been determined for several of these valued components that mitigation will not adequately reduce the significant adverse effects. Therefore, due to the interrelatedness of the natural environment valued components with sense of place, the Designated Office has determined that the project will result in significant adverse effects to traditional and cultural interests. Furthermore, the proposed project conflicts with intangible values of traditional and cultural importance that formed part of the basis for its establishment as an SMA under the TH Final Agreement. These values have been described by the Tr'ondëk Hwëch'in as a "classroom", as a "sanctuary", as "sacred", and as being of "immense cultural and spiritual value."

Effects to wildlife and wildlife habitat and ecological integrity have been deemed to be significant, which subsequently affect sense of place values associated with the project area, access routes, and Tombstone Territorial Park as a whole. Further, due to the extreme sensitivity of the traditional and cultural values for Tombstone Park, for which there are no available mitigations, it has been determined that the project will result in significant adverse effects to Traditional and Cultural Interests that cannot be mitigated.

Residual and Cumulative Effects

The assessment of cumulative effects under YESAA considers the residual effects of this project on Traditional and Cultural Interests in combination with of the residual effects of:

(i) other projects for which proposals have been submitted under subsection 50(1)[of YESAA][, or
(ii) other existing or proposed activities in or outside Yukon that are known to the designated office, executive committee or panel of the Board from information provided to it or obtained by it under the Act; (YESAA s42(1)(d))

This evaluation has determined that there are significant adverse project effects to Traditonal and Cultural Interests that cannot be mitigated. It follows that the cumulative effects are also significant and adverse on wildlife and wildlife habitat and further consideration is not detailed here.

9.0 Ecological Integrity

9.1 Overview

In determining the effects of the proposed project on Ecological Integrity, the assessment focused on the effects of establishment and use of trails, excavation of trenches sites and sumps, drilling activities, storage of bulk samples, waste management, fuel use and storage, and reclamation.

Instrumental in this assessment will be the ability to maintain the ecological viability within the Park; this of course being directed by the Parks and Land Certainty Act which defines this as the ability *to sustain the natural functioning and evolution of ecosystems on a long-term scale* (Comission of Yukon, RSY 2002, c.165). As described in section 4.0, valued components identified in this assesment are inextricably linked; as such consideration of project effects on this valued component cannot help but include in some form consideration of the ther values identified.

Designated Office has determined that the proposed project will have adverse effects on the ecological integrity in the following ways:

- Acid Rock Drainage
- Sedimentation
- Contamination;
- Degradation of soil/permafrost
- Damage to and alteration of vegetation

The Designated Office has determined that the project will have significant adverse effects to the valued component that cannot be mitigated. The rationale for this determination is presented in the following sub-section below.

6.2 Project Effects

The proposed project activities will result in alterations to the ecological system that represents Tombstone Park. These alterations can be at a microscopic level (i.e. benthic organisms) or more pronounced (i.e. shrub tundra). The unique ecological and biological integrity inherit of Tombstone Park is to be protected for all time, as stated in the THFA and the management plan for Tombstone Territorial Park. Project effects include alterations to the movement, distribution and quality of water resources; degradation of alterations to permafrost, loss of soil structure and the ability to support life, as well as the damage or loss of endemic plants.

i) Acid Rock Drainage

The method of trenching and in some cases drilling site preparation or trail development involves the removal of the top vegetative mat and overburden in order to expose potentially high mineral rock. This rock will be gathered and stockpiled along and bulk samples will be taken. The removal and storage of the vegetative mat and overburden increases the chance for acid rock drainage and metal leaching. Acid rock drainage (ARD) refers to the outflow or release of acidic water that has passed through rocks with an abundance of sulfide materials. This process occurs naturally in some cases but is exacerbated by large-scale earth disturbances such as rock pilings or underground mining. Acid generation occurs when rocks containing sulphide are exposed to the weathering effects of oxygen and water. ARD occurs when the generated acidity comes in contact with water and increases the pH. Metal leaching (ML) is associated with ARD due to high metal solubility and sulphide weathering rates under acidic conditions. ML and ARD are major concerns in the mining industry because mining greatly increases the amount of rock surface being exposed to water and oxygen. The stock piling of large amounts of sulphide minerals does not always result in ML or ARD. Often the alkalinity of the drainage area, neutralizing minerals and dilution all play a role in reducing the potentially adverse effects. Acidity will only occur if the rate of generation is faster than the rate of neutralization.

The presence of ARD in an environment can create an effective “kill zone” in which plants and vegetation growth can be retarded and regeneration impaired due to elevated acidity. If ARD entering surface waters results in decreased pH, changes in the affected aquatic ecosystems are highly likely. ARD/ML can result in increases in dissolved metals entering surface waters. Depending on the type of metals, their form and their concentration this input can be chronically or acutely toxic.

Typically, after the rock has been stockpiled and sample materials have been removed the remaining rocks will be placed back into the hole and the area will be reclaimed using the original vegetative mat. Properly restoring the area to its original state will allow a naturally decrease rock exposure to oxygen and water. However, if the tranches are not backfilled, is a risk that rock with high ARD/ML potential will not be isolated from water (e.g. precipitation, surface runoff etc) and oxygen. Proper reclamation should also aim to minimize any flow of ARD/ML contaminated water into adjacent areas/waters.. Information provided to the Designated Office (YOR #2010-0107-011-1) notes that trenches dug on these claims as far back at 2001 have not been properly backfilled.

The project geologists for CUMI explain that the pyrrhotite skarn which is prominent in the project area is known to be acid generating (Tenney, 1999). The proponent and experts of the past have indicated that the abundant presence of limestone in the area naturally neutralizes the acidity of the host rock (CUMI, 2010) Where neutralization potential in rock exceeds acid generation potential this can be an accepted

mitigation for ARD/ML. This assessment is not aware of any acid base accounting or other geochemical characterization of local rocks supporting this position.

The ecological sensitivity within and down gradient of the mineral claims to ARD/ML were considerations during previous regulatory processes for prior exploration activities on these claims. Permit terms and conditions for those activities included the monitoring of waters on the project site and downstream for ARD/ML. The assessor is not aware of any project site or downstream water monitoring for ARD/ML over the past 5 years. The current status of reclaimed and un-reclaimed trenches is unknown in terms of water pooling or groundwater seepage. Similarly, down gradient water sources haven't been monitored since previous work.

Given the presence of pyrrhotite and the absence of information on both neutralization potential and effects monitoring for previous activities the Designated Office has determined that the project will result in significant adverse effects to Ecological Integrity through the the generation of acid rock drainage and metal leaching.

Mitigations

- Drilling wastes shall be recycled and an aboveground removable tank shall be used in place of an excavated sump.
- Final disposal of drilling wastewater and cuttings shall be fully settled prior to discharge of waste water. Drill cuttings, sludge and material waste shall be buried.
- Prior to permitting any future activities, the results of a follow-up program to previous workings and a detailed ARD predicting model shall be prepared to determine for certainty the natural host rocks long-term capacity for neutralizing ARD and metal leaching as well as the acid potential of the HORN claims shall be provided to the regulator(s).
- Overburden used to backfill trenches will be compacted, re-contoured to ensure natural drainage with no pooling of surface water, and replacement of the vegetative mat or oxidized horizon soils.
- While awaiting removal drill core and bulk samples which contain sulphide minerals shall be protected from the elements including eliminated oxidization potential.
- Continual follow-up monitoring for acid rock drainage of reclaimed areas and down gradient areas shall take place, and reports shall be submitted on an annual basis to the Mining Lands.

ii) Sedimentation

Proposed excavation of trenches has the potential to lead to sedimentation of down gradient water courses. Alterations to surficial geology have the potential to alter existing drainage and runoff patterns. The use of equipment on and off roads/trails, especially during wet conditions, may cause rutting and

gouging of the ground surface thereby increase sediment loading into streams. Clearing and mechanical stripping of overburden during trenching requires the removal and storage of the vegetative mat for future reclamation of the site. Drill wastes generated will be disposed of in sumps excavated downslope of the drill operation. The purpose of the sump is to collect drill water that by its very nature contains drilling mud and drill cuttings (which is rock and sediment). The drill water is disposed of into the sumps by gravity and the sumps are to retain the water allowing settling to occur. The resident time for settling is largely dependent on the ground conditions; it is possible that sumps can overflow if they have not been constructed with the appropriate capacity. It is also possible for water to be lost immediately to ground if ground conditions are talus and porous. There is evidence that drilling did not produce wastewater to the surface in some drill holes, while others did (Proponent, 2010). It is impossible to predict which drill holes will produce waste water (to the surface) and which will not however in both scenarios there is the potential for sedimentation to be lost to groundwater and surface water.

Proposed land based access routes are intended to traverse tracks of land up and multiple creek or water course crossings. Option A (the preferred route) involves approximately 11 crossings within an area that is described as being underlain by permafrost and containing poor drained soils that show signs of frost churning (Yukon Parks, 2010). Option B, the lengthier route (46km) along the Blackstone River will result in approximately31 stream crossings including the Blackstone River itself. Along the River soils that are common range from gravel to silt.

The proposal indicates that winter access will take place once there is a minimal 30cm of snow cover in place. The proposed number of trips has varied considerable throughout the course of this assessment with the final estimate being 100 return trips. The type of equipment has also changed and the assessors concluded that either two snow machines towing a carrying capacity of 1000lbs each or a snowcat with a carrying capacity of either 1500lbs or 11,000lbs will be used. The type of equipment will depict the magnitude and duration of effects and for the purposes of this assessment the Designated Office will considered project effects within a range.

Experts familiar with the Blackstone River valley indicate that snow depth tends to be highly variable given high winds and it is not uncommon that many areas have very little snow cover, even in late winter (Yukon Parks, 2010). The proposed activity has will compact snow and snow compression with repeated passes of weight has the potential to change soil temperatures in response and affect permafrost and/or local hydrology. For example, the compaction of snow/ice in an area of a watercourse that is crossed may take longer to melt in comparison with the rest of the watercourse. As a result, water flow above or around these compacted areas has the potential to erode shorelines and banks.

iii) Contaminants

During the course of the exploration program, wastes that may be generated include, but are not limited to, drill wastes, scrap metal, buildings and/or building materials, and petroleum and domestic wastes (i.e. kitchen waste and sewage). Waste products such as drill wastes and fluids, fuel drums, filters, machinery parts, oil, lubricants and containers containing petroleum products that are used during the project have the potential to significantly contaminate surface and/or groundwater, soil, vegetation, create fire hazards, and affect the aesthetic quality of the surrounding environment if not properly disposed. .

The use and storage of large volumes of petroleum fuel and refuelling on project sites increases the potential for fuel spills and leaks into the surrounding environment. Contamination due to fuel spills while transporting, storing or refuelling equipment may result in fuel being absorbed into the environment that could persist for years decreasing the environmental quality of the area. The use of 205L fuel drums for fuel storage will reduce the chance of a large scale fuel spill and allow for easy transfer of fuel if a leak is detected when compared to the prospect of using a large tank. Spills, leaks, accidents, or malfunctions during refuelling and normal use of heavy equipment during the proposed mining operation may lead to contamination of the surrounding environment. The storage of petroleum fuels poses similar hazards, with greater risks to the environment from the effects of potential spills, leaks, accidents or malfunctions of large capacity storage containers. The use of pumps, storage or transportation of fuel on or adjacent to water bodies has the potential for chemical contamination of water resources associated with spillage/leakage of petroleum hydrocarbon fuels and lubricants. Contaminants that may be released due to the proposed project may include, but are not limited to: diesel fuel, gasoline, hydraulic fluids, coolants, lubricants, solvents, and cleansers. Soil contaminated with fuel can affect the productivity of terrestrial habitats, pollute adjacent water resources, harm vegetation, and may create fire hazards. Contamination of the surrounding environment may affect the long-term survival of organisms or populations within the area and, in high enough concentrations, be lethal. While guidelines exist for the storage and management for hydrocarbons the location of this project in a disproportionately important ecological area means the significance of effects related to accidents or hydrocarbon mismanagement are more likely to be significance.

While storage of fuel at least 30 m from watercourses will help prevent entry of spilled fuel into the surrounding watercourses, spilled fuel will still have the opportunity to enter tributaries and be transported to fish-bearing waters by groundwater migration. No Spill Prevention and Remedial Action Plans were submitted by the proponent that includes specific action to be taken in the event of a spill to land or water and a list of the equipment available on-site to address spills. Additionally, all personnel should be trained on the selection of appropriate equipment and on its proper use. Having a spill prevention plan in place that details and outlines the specific actions to be taken by site workers is recommended so site works

are able to take the proper actions to mitigate spills when /if they occur to ensure that the project will not result in adverse effects to Ecological Integrity.

Emergency/accidental dropping of such items could result in the spillage of deleterious substances and contamination of the environment. Items that will be transported by helicopter include a diamond drill as well as fuel drums. Considering that the project involves frequent transport of equipment and deleterious substances, maintaining the safe and secure transport of these materials is necessary to ensure that the project will not result in adverse effects to Ecological Integrity.

Pollution of the surrounding environment may also occur as a result of inadequate waste management, such as improper sewage treatment, domestic waste, and special wastes related to project activities (e.g. waste petroleum products). The current camp utilizes an outhouse. The use of a sewage disposal system and disposal of kitchen waste may result in soil contamination through inadequate waste disposal. Human waste is known to be a vector for a number of known pathogens (ex. E. coli bacteria) and parasites (ex. Giardia spp.). Transmission occurs with the consumption of untreated/unfiltered water from contaminated sources such as creeks. Effects can range from minor illness to death in some strains of bacteria. Parasites such as Giardia, which causes “beaver fever”, move throughout the environment using humans, pets, and wild animals, specifically their waste, as the distribution system. Improper management of human wastes or the failure of a waste management system has the potential to contaminate water sources, and soil that supports vegetation.

iv) Degradation of soil/ permafrost

The proposed project is occurring in an area that hosts a diverse set of natural features such as moraines, frost mounds, palsas, ice thaw lakes, pingos and patterned ground from ice wedge polygons. These features are highly sensitive to disturbance; and though they may be able to recover it is believed that the recovery pattern will shift from the original conditions (Tr'ondek Hwech'in, 2010). For example, if the proposed winter access occurs in areas of permafrost and adequate protection is not in place, which may be the case on steeper slopes, damage could occur to the insultating layer. If the insulating layer is altered, warmer trends will occur and permafost will melt. Vegeation that forms the insulating layer will grow back however in areas where ponding or routing has taken place then a regrowth will likely be of a different vegetation (J. C. Jorgenson, 2010).

The removal of thawing of frozen properties adversely affects the stability of the soil (slumping) which may lead to erosion and rutting. The effects of seasonal freezing and thaw on excavated overburden and vegetative matter (including root and seed stocks) may lead to the deterioration of such stocks rendering them unsuitable for natural re-vegetation. Improper separation and storage of soils and vegetative mat

may affect soil structure and the ability of vegetation to regenerate, resulting in long-term erosion and environmental degradation. Also, the use of equipment especially in wet conditions may cause rutting and gouging of the ground surface, thereby altering original conditions.

v) Damage to and alteration of vegetation

The proposed access routes will require traversing areas with dense vegetation. The proponent "hopes" that clearing will not be required and based on experience travelling in the area 10 years ago also anticipates there to be no requirement for clearing. As described previously, the proposed access routes have changed destination many times and in fact the final proposed route hasn't been ground truthed by the proponent. In some sections of proposed routes brush reaches 7ft tall and unless slashed will likely severely restrict the proponents travel. (Yukon Parks, 2010) Yukon Parks provided descriptions of critical points along the route in their comment submission that support this. The assessor does not have reasonable confidence that this project can proceed as proposed without some level of vegetation alteration to allow passage of snow machines.

Snow machines can damage vegetation through direct physical injury as well as indirectly through snow compaction. Adverse effects on soil and vegetation include hindered growth, erosion, and physical damage (Buthmann, 2005). When machines are used on steep slopes or in areas with inadequate snow cover the adverse effects can become intensified. When snow machines ride on snow in areas that are vegetated, such as the proposed route, there is an increased likelihood that that abrasion and breakage of seedlings, shrubs, and other exposed vegetation will occur (Olliff, 1999).

(Neumann, 1972) showed that direct mechanical effects by snowmobiles on vegetation at and above snow surface can be severe. After only a single pass by a snowmobile, more than 78% of the saplings on the trail were damaged, and nearly 27% of them were damaged seriously enough to cause a high probability of death. In fact, the study conducted concluded that when the test areas were compacted and crusted rigid woody stems of 2.5cm in diameter which were the most susceptible would snap off.

Snow compaction from snow machines can also lower soil temperatures and reduce the survival of plants and soil bacteria that is essential to the plant-food cycle (Olliff, 1999). When compacted by snow machines, the ability for heat transfer is greatly increased, resulting in both greater temperature fluctuations and overall lower soil temperatures (Buthmann, 2005). This in turn inhibits the growth and reproductive success of early spring flowers is delayed and reduced (Olliff, 1999). Compacted trails can also dilute important sunlight "cues" that filter down to plants and stimulate them to grow or reproduce (Olliff, 1999). The management plan recognizes the potential harm resulting from snow machine use and requires a snow pack of 15-30.5cm over frozen ground and limits snow machine use to very specific

portions of the Park. As described in previous sections, there is an increased likelihood that other snow machine users will take advantage of the proposed trail. The induced trail use will further exasperate the adverse effects to vegetation.

The proponent indicated in their land use permit application that, if necessary, the area may be seeded with alpine grass. The proposed use of a seed mix could further increase the rate of diffusion of invasive species regardless of the northern mix intended for use. The flora and fauna present in the project area and Tombstone Park is well documented for pockets of rare or unusual plants, plants used traditionally for medicinal purposes or plants such as lichens and mosses. The potential for introduction of invasive species exists and the likelihood of these host plants being adversely affected is high. (CPAWS, 2000) The loss of any populations of the localized species is considered to be of significance because of their unique characteristics to the area (Yukon Parks, 2010). The Park supports a huge range of flora and fauna found nowhere else in North America. Significant negative effects of introducing exotic plant species Tombstone Park is possible, and these introductions could have far reaching impacts to the surrounding ecosystem.

The following is a list of commitments or mitigations that the proponent considered for the proposed project:

- Special attention to avoid leaks
- Storage in a flat bermed are with impermeable tarp
- Storage greater than 30m from watercourse
- Removal of hazardous wastes, and recyclables regularly by helicopter
- Burning of kitchen and burnable wastes. When not in use, the barrel will be emptied, cleaned and stored either in a shelter or tarped.
- Triple bag human waste from pit privy and remove (by helicopter) periodically

The following non-discretionary legislation in conjunction with the project proposal in making a significance determination on this valued component:

- The *Quartz Mining Act* and Quartz Mining Land Use Regulations, Schedule 1 Operating Conditions, specifically sections F, G, H, and I. These sections relate to the use and management of deleterious substances, such as fuel storage and vehicle maintenance;
- The Yukon Contaminated Sites Regulation (CSR) standards for commercial land use and for the protection of freshwater aquatic life and drinking water; and Part 3 – Restoration of Contaminated
- Sites;
- The *Environment Act*, specifically Part 9 - Release of Contaminants and Part 11 – Spills;
- The Spills Regulations;
- The Special Waste Regulation, and

- The *Fisheries Act*, specifically section 36(3) which speaks to no person depositing a deleterious substance in water frequented by fish or in any place where the deleterious substance may enter any such water.
- The Tr'ondëk Hwech'in Final Agreement, Schedule "A" Chapter 10 Objectives
- Tombstone Territorial Park Management Plan, 8.3 Management Principles
- Dempster Highway Development Area Regulations

Significance determination

The proponent's mitigations together with compliance with the above legislation will not adequately reduce the likelihood for adverse effects to the valued component. The threshold for significance ascertained for this valued component is low. When considering significance, emphasis is placed managing principles contained in the Tombstone Territorial Park Management Plan such as: *distinct geomorphological features, wildlife/fish/avian habitat, and plants will be given special consideration when managing human use in Tombstone Territorial Park*.; or Park objectives *to protect for all time a natural area of territorial significance which includes representative portions of the Mackenzie Mountains ecoregion, including the Ogilvie Mountains and the Blackstone Uplands area, and contains important physical and biological features as well as sites of archaeological, historical and cultural value*. The Designated Office has determined that the project will result in significant adverse effects to the Ecological Integrity.

The Designated Office has further considered the following additional potential mitigation measures:

- The proponent shall install a barrier to prevent precipitation from collecting on the fuel drums.
- The Spill Prevention and Remedial Action Plan should be developed further using the "Spill Contingency Plan Guidelines" and "Spill Response Plans" documents to include specific action to be taken in the event of a spill to land or water, and a list of the equipment available on-site to address spills.
- The proponent shall adhere to Yukon Parks waste management practises and policies for handling of camp wastes and industrial wastes.
- The proponent shall provide a security deposit in the amount sufficient enough to ensure adequate reclamation and determined by the regulator to be held under the Quartz Mining Act, prior to commencement of the proposed project activities.

Conclusion

This assessment recognizes that the project is proposed in a relatively remote area with limited transportation options. Few other options are available to meet challenges with accessing the project site which increases the concern as to the feasibility to react effectively to emergencies and adopt additional

mitigations. During more than one operating season, the proponent has ended a season with broken down equipment which resulted in reclamation work not being completed. The reasons provided in the proposal and in past assessment reports ties this to the expense of accessing the area and availability of parts (Tenney, 2002) (CUMI, 2010). When determining the signifcance of adverse effects the assessor considered likelihood of mitigations successfully reducing, controlling or avoiding those effects. .
The current undesirable condition of the project site due to past exploration activities was noted in several submissions received during this assessment (e.g. Yukon Parks YOR#2010-0107-676-1, Trondek Hwechin YOR # 2010-0107-700-1). It appears that the proponent has not been back on site since 2005 to ensure adequacy of past reclamation efforts, repair equipment or clean up the site. Tthere is little evidence that there has been any form of work including reclamation work since the 2001 operating season. The project area is currently in a state that challenges the principles and objects of the park Management plan. The vision for Tombstone Park speak specifically to protect for all time the unique ecological integrity of the Park by preserving the physical and biological values as well as enhancing the understanding and appreciation of the natural resources in a manner that keeps it unimpaired for future generations.(Yukon Government and Tr'ondek Hwech'in, 2009).

Given the:

- ecological significnace of the area embodied by the Tombstone Territirial Park purpose, objects and princliples; and
- The irreversibility and likelihood of project effects on the sensitive ecological system; including in the event of an accident or malfunction; and

The Designated Office has determined that the proposed project will result in significant adverse effects to ecological integrity of Tombstone Park including the basis of its the park designation which cannot be mitigated.

Residual and Cumulative Effects

The assessment of cumulative effects under YESAA considers the residual effects of this project on Wildlife and Wildlife Habitat in combination with of the residual effects of:

(i) other projects for which proposals have been submitted under subsection 50(1)[of YESAA][, or
(ii) other existing or proposed activities in or outside Yukon that are known to the designated office, executive committee or panel of the Board from information provided to it or obtained by it under the Act; (YESAA s42(1)(d))

This evaluation has determined that there are significant adverse project effects to Ecological Integrity habitat that cannot be mitigated. It follows that the cumulative effects are also significant and adverse on Ecological Integrity and further consideration is not detailed here.

APPENDIX 1 – LIST OF KEY MITIGATIONS THE PROPONENT HAS COMMITTED TO UNDERTAKE

The following is a compilation of the key mitigations proposed by the proponent and noted in this report and/or the following the documents:

- Daily burning of solid material will be done in a burn barrel non-burnable with recycling sorted, and evacuated to landfill.
- All food and wildlife attractants will be removed at seasonal camp closure.
- Consultation with experiences users/managers of the area will take place to ensure that most environmentally benign operations possible.
- Special attention to avoid leaks (fuel & fuel storage)
- Storage in a flat bermed are with impermeable tarp (fuel & fuel storage)
- Storage greater than 30m from watercourse (fuel & fuel storage)
- Removal of hazardous wastes, and recyclables regularly by helicopter
- Burning of kitchen and burnable wastes. When not in use, the barrel will be emptied, cleaned and stored either in a shelter or tarped.
- Triple bag human waste from pit privy and remove (by helicopter) periodically
- Avoiding weekends and special events for helicopter overflights
- Prior notification of blasts to be given to Park management 48 hours in advance;
- Mitigations as discussed in Section 5.0, Wildlife and Wildlife Habitat with respect to bear/human conflict management;
- Minimizing surface disturbance via reclamation and minimum snow cover of 30 cm on the proposed overland access route.

These mitigations are important because they help to mitigate significant adverse effects of the project. The Designated Office is confident that the proponent will implement these mitigations and expects the Decision Body and Regulators will ensure that these activities are undertaken as proposed.

APPENDIX 2 – LIST OF RELEVANT NON-DISCRETIONARY LEGISLATION APPLICABLE TO THE PROJECT

The following is a notation of the key legislation and associated sections are relevant to this project. These provisions help to ensure that significant adverse effects do not occur. Note that this list is not intended to be a comprehensive list of all the relevant legislation that applies to this project. Rather it is a reflection of the legislation that was discussed in this report. The Designated Office is confident that the proponent will adhere to this legislation, and expects the Decision Body and Regulators will enforce the legislation.

Legislation	Key Provisions
Solid Waste Regulations	Part I, Part II
Wildlife Act	Section 93, 3, 5, 46
Migratory Birds Regulations	Section 6
Quartz Mining Act	Section 139
Quartz Mining Regulations	Schedule 1 Operating Conditions
Environment Act	Part 9
Yukon Contaminated Sites Standards	Part 3
Fisheries Act	Section 36(3)
Tr'ondëk Hwëch'in Final Agreement	Schedule "A" Chapter 10, Chapter 13
Dempster Highway Development Area Regulations	
Yukon Historic Resources Act	
Archaeological Sites Regulations	

APPENDIX 3 – LIST OF SUBMISSIONS MADE BY INTERESTED PERSONS AND OTHERS DURING THE ASSESSMENT

Name of Person or Party	Type of Submission	YOR Document Number	Date Posted
YG Environment	Request for Information	2010-0107-022-1	May 26, 2010
Joost van der Putten	Comment Submission	2010-0107-021-1	May 31, 2010
Ian Gibson	Comment Submission	2010-0107-026-1	May 31, 2010
Dawson Mining District	Request for Extension	2010-0107-024-1	May 31, 2010
Tr'ondëk Hwëch'in	Request for Extension	2010-0107-027-1	June 1, 2010
M. Whitley	Request for Extension	2010-0107-028-1	June 1, 2010
Proponent	Response to Information Request	2010-0107-032-1	June 7, 2010
Proponent	Proposal Information	2010-0107-031-1	June 7, 2010
Tr`ondëk Hwech`in, Na Cho Nyak Dun, and Gwich`in Tribal Council	Comment Submission	2010-0107-035-1	June 8, 2010
Proponent	Proposal Information	2010-0107-033-1	June 8, 2010
Proponent	Proposal Information	2010-0107-034-1	June 8, 2010
Yukon Government	Comment Submission	2010-0107-036-1	June 9, 2010
Wilderness Tourism Association	Comment Submission	2010-0107-037-1	June 16, 2010
Yukon Government	Request for Extension	2010-0107-038-1	June 17, 2010
Mark Essiembre	Comment Submission	2010-0107-042-1	June 21, 2010
Proponent	Proposal Information	2010-0107-045-1	June 22, 2010
Katie English	Comment Submission	2010-0107-046-1	June 22, 2010
Maria Ledergerber	Comment Submission	2010-0107-044-1	June 22, 2010
Roch Nadon	Comment Submission	2010-0107-047-1	June 22, 2010
Sebastian Jones	Comment Submission	2010-0107-048-1	June 23, 2010
Yukon Conservation Society	Comment Submission	2010-0107-049-1	June 24, 2010
Yukon Conservation Society	Comment Submission	2010-0107-050-1	June 24, 2010
Proponent	Proposal Information	2010-0107-053-1	June 29, 2010
Proponent	Proposal Information	2010-0107-054-1	July 2, 2010
Roch Nadon	Comment Submission	2010-0107-056-1	July 8, 2010
Yukon Parks	Comment Submission	2010-0107-055-1	July 8, 2010
Yukon Conservation Society	Comment Submission	2010-0107-057-1	July 9, 2010
Proponent	Proposal Information	2010-0107-059-1	July 12, 2010
Kate Alexander	Comment Submission	2010-0107-060-1	July 13, 2010
Jennifer Breault	Comment Submission	2010-0107-061-1	July 14, 2010
Joy Snyder	Comment Submission	2010-0107-062-1	July 14, 2010
Ryan Hennessey	Comment Submission	2010-0107-063-1	July 16, 2010

S. Greenberg	Comment Submission	2010-0107-339-1	July 20, 2010
S. Kozack	Comment Submission	2010-0107-340-1	July 20, 2010
S. Hrehirchuk	Comment Submission	2010-0107-341-1	July 20, 2010
A. Albert	Comment Submission	2010-0107-065-1	July 20, 2010
A. Bonvouloir	Comment Submission	2010-0107-066-1	July 20, 2010
A. Briggs	Comment Submission	2010-0107-067-1	July 20, 2010
A, Capobianco	Comment Submission	2010-0107-068-1	July 20, 2010
A. Binder	Comment Submission	2010-0107-069-1	July 20, 2010
A. Card	Comment Submission	2010-0107-070-1	July 20, 2010
A. Chianis	Comment Submission	2010-0107-071-1	July 20, 2010
A. Jackson	Comment Submission	2010-0107-072-1	July 20, 2010
A. Maheu	Comment Submission	2010-0107-073-1	July 20, 2010
A. Rudolph	Comment Submission	2010-0107-074-1	July 20, 2010
A. Weiler	Comment Submission	2010-0107-075-1	July 20, 2010
B. Beaudry	Comment Submission	2010-0107-077-1	July 20, 2010
B. Birn	Comment Submission	2010-0107-078-1	July 20, 2010
A. Holtham	Comment Submission	2010-0107-079-1	July 20, 2010
B. Cogswell	Comment Submission	2010-0107-080-1	July 20, 2010
B. Morello	Comment Submission	2010-0107-081-1	July 20, 2010
B. Varellas	Comment Submission	2010-0107-082-1	July 20, 2010
C. Collins	Comment Submission	2010-0107-083-1	July 20, 2010
C. Griffith	Comment Submission	2010-0107-084-1	July 20, 2010
C. Griffiths	Comment Submission	2010-0107-085-1	July 20, 2010
C. Huestis	Comment Submission	2010-0107-086-1	July 20, 2010
C. Joseph	Comment Submission	2010-0107-087-1	July 20, 2010
C. Jurvzewski	Comment Submission	2010-0107-088-1	July 20, 2010
C. Kroehler	Comment Submission	2010-0107-089-1	July 20, 2010
C. Mills	Comment Submission	2010-0107-090-1	July 20, 2010
C. Roch-Cunill	Comment Submission	2010-0107-091-1	July 20, 2010
C. Veaux	Comment Submission	2010-0107-092-1	July 20, 2010
C. Wilde	Comment Submission	2010-0107-093-1	July 20, 2010
C. Wrench	Comment Submission	2010-0107-094-1	July 20, 2010
A. Brandariz	Comment Submission	2010-0107-095-1	July 20, 2010
B. Elkin	Comment Submission	2010-0107-096-1	July 20, 2010
C. Stephen	Comment Submission	2010-0107-097-1	July 20, 2010

A. Macdonald	Comment Submission	2010-0107-098-1	July 20, 2010
A. Montapert	Comment Submission	2010-0107-099-1	July 20, 2010
C. Zellerman	Comment Submission	2010-0107-100-1	July 20, 2010
D. Brown	Comment Submission	2010-0107-101-1	July 20, 2010
D. Crist	Comment Submission	2010-0107-102-1	July 20, 2010
D. Dragotis	Comment Submission	2010-0107-103-1	July 20, 2010
D. Dufault	Comment Submission	2010-0107-104-1	July 20, 2010
C. Van Lare	Comment Submission	2010-0107-105-1	July 20, 2010
D. Feerny	Comment Submission	2010-0107-106-1	July 20, 2010
AD. Godley	Comment Submission	2010-0107-107-1	July 20, 2010
D. Lee	Comment Submission	2010-0107-108-1	July 20, 2010
D. O`Donnell	Comment Submission	2010-0107-109-1	July 20, 2010
CK. Borg	Comment Submission	2010-0107-110-1	July 20, 2010
D. Romesburg	Comment Submission	2010-0107-111-1	July 20, 2010
D. Simms	Comment Submission	2010-0107-112-1	July 20, 2010
D. vanEyk	Comment Submission	2010-0107-113-1	July 20, 2010
E. Hebert-Daly	Comment Submission	2010-0107-114-1	July 20, 2010
E. Johansson	Comment Submission	2010-0107-115-1	July 20, 2010
E. Lancaster	Comment Submission	2010-0107-116-1	July 20, 2010
E. Peter	Comment Submission	2010-0107-117-1	July 20, 2010
A. Farr	Comment Submission	2010-0107-118-1	July 20, 2010
F. Saykaly	Comment Submission	2010-0107-119-1	July 20, 2010
F. Vermeulen	Comment Submission	2010-0107-120-1	July 20, 2010
G. Cross	Comment Submission	2010-0107-121-1	July 20, 2010
G. Lappano	Comment Submission	2010-0107-122-1	July 20, 2010
G. Michaux	Comment Submission	2010-0107-123-1	July 20, 2010
G. Simpson	Comment Submission	2010-0107-124-1	July 20, 2010
B. Morrow	Comment Submission	2010-0107-125-1	July 20, 2010
G. Waldman	Comment Submission	2010-0107-126-1	July 20, 2010
A. Steinke	Comment Submission	2010-0107-127-1	July 20, 2010
C. Campbell	Comment Submission	2010-0107-128-1	July 20, 2010
C. Ollson	Comment Submission	2010-0107-129-1	July 20, 2010
D. Anzelmo	Comment Submission	2010-0107-130-1	July 20, 2010
C. Andre	Comment Submission	2010-0107-131-1	July 20, 2010
D. Moses	Comment Submission	2010-0107-132-1	July 20, 2010

E. Kraynak	Comment Submission	2010-0107-133-1	July 20, 2010
C. King	Comment Submission	2010-0107-134-1	July 20, 2010
C. Davidson	Comment Submission	2010-0107-135-1	July 20, 2010
B. Chandwick	Comment Submission	2010-0107-136-1	July 20, 2010
B. Fairley	Comment Submission	2010-0107-137-1	July 20, 2010
B. Deleebeeck	Comment Submission	2010-0107-138-1	July 20, 2010
B. Webster	Comment Submission	2010-0107-139-1	July 20, 2010
D. Maksins	Comment Submission	2010-0107-140-1	July 20, 2010
F. DeAngelis	Comment Submission	2010-0107-141-1	July 20, 2010
G. Fenwick	Comment Submission	2010-0107-142-1	July 20, 2010
G. Haszard	Comment Submission	2010-0107-143-1	July 20, 2010
H. Charnquist	Comment Submission	2010-0107-144-1	July 20, 2010
H. Hill	Comment Submission	2010-0107-145-1	July 20, 2010
H. Sellers	Comment Submission	2010-0107-146-1	July 20, 2010
J. Ball	Comment Submission	2010-0107-147-1	July 20, 2010
J. Bird	Comment Submission	2010-0107-148-1	July 20, 2010
J. Burrell	Comment Submission	2010-0107-149-1	July 20, 2010
J. Capozzelli	Comment Submission	2010-0107-150-1	July 20, 2010
J. Carruthers	Comment Submission	2010-0107-151-1	July 20, 2010
J. Carter	Comment Submission	2010-0107-152-1	July 20, 2010
J. Cornfield	Comment Submission	2010-0107-153-1	July 20, 2010
J. Cotgrave	Comment Submission	2010-0107-154-1	July 20, 2010
J. Goodman	Comment Submission	2010-0107-155-1	July 20, 2010
J. Halvorson	Comment Submission	2010-0107-156-1	July 20, 2010
J. Hunter	Comment Submission	2010-0107-157-1	July 20, 2010
J. Istvanffy	Comment Submission	2010-0107-158-1	July 20, 2010
J. Lawrence	Comment Submission	2010-0107-159-1	July 20, 2010
J. Lewis	Comment Submission	2010-0107-160-1	July 20, 2010
J. Marshall	Comment Submission	2010-0107-161-1	July 20, 2010
J. Pelleg	Comment Submission	2010-0107-162-1	July 20, 2010
J. Phillips	Comment Submission	2010-0107-163-1	July 20, 2010
J. Pitcher	Comment Submission	2010-0107-164-1	July 20, 2010
J. Ramsay	Comment Submission	2010-0107-165-1	July 20, 2010
J. Robertson	Comment Submission	2010-0107-166-1	July 20, 2010
J. Rogers	Comment Submission	2010-0107-167-1	July 20, 2010

J. Ross	Comment Submission	2010-0107-168-1	July 20, 2010
J. Smith	Comment Submission	2010-0107-169-1	July 20, 2010
J. Specken	Comment Submission	2010-0107-170-1	July 20, 2010
J. Stufflebeam	Comment Submission	2010-0107-171-1	July 20, 2010
K. Borth	Comment Submission	2010-0107-172-1	July 20, 2010
K. Davison	Comment Submission	2010-0107-173-1	July 20, 2010
K. de la Barre	Comment Submission	2010-0107-174-1	July 20, 2010
K. Eliot	Comment Submission	2010-0107-175-1	July 20, 2010
K. English	Comment Submission	2010-0107-176-1	July 20, 2010
K. Fisher	Comment Submission	2010-0107-177-1	July 20, 2010
K. Friesen	Comment Submission	2010-0107-178-1	July 20, 2010
B. Jones	Comment Submission	2010-0107-179-1	July 20, 2010
C. Schroeder	Comment Submission	2010-0107-180-1	July 20, 2010
K. Kallenbach	Comment Submission	2010-0107-181-1	July 20, 2010
D. MacLean	Comment Submission	2010-0107-182-1	July 20, 2010
B. McClarty	Comment Submission	2010-0107-183-1	July 20, 2010
K. Kalmenson	Comment Submission	2010-0107-184-1	July 20, 2010
K. Karzynska	Comment Submission	2010-0107-185-1	July 20, 2010
K. Kazmierowski	Comment Submission	2010-0107-186-1	July 20, 2010
K. Kennedy	Comment Submission	2010-0107-187-1	July 20, 2010
K. Lapointe	Comment Submission	2010-0107-188-1	July 20, 2010
K. Lopez	Comment Submission	2010-0107-189-1	July 20, 2010
C. Richards	Comment Submission	2010-0107-190-1	July 20, 2010
K. Mauthner	Comment Submission	2010-0107-191-1	July 20, 2010
K. Nicholson	Comment Submission	2010-0107-192-1	July 20, 2010
L. Bagot-Parker	Comment Submission	2010-0107-193-1	July 20, 2010
L. Finora	Comment Submission	2010-0107-194-1	July 20, 2010
L. Garceau	Comment Submission	2010-0107-195-1	July 20, 2010
L. Gillespie	Comment Submission	2010-0107-196-1	July 20, 2010
L. Hammond	Comment Submission	2010-0107-197-1	July 20, 2010
L. Hofstede	Comment Submission	2010-0107-198-1	July 20, 2010
L. Levine	Comment Submission	2010-0107-199-1	July 20, 2010
L. Manheim	Comment Submission	2010-0107-200-1	July 20, 2010
L. Mercier	Comment Submission	2010-0107-201-1	July 20, 2010
L. Moss	Comment Submission	2010-0107-202-1	July 20, 2010

C. Richards	Comment Submission	2010-0107-203-1	July 20, 2010
A. Nicholson	Comment Submission	2010-0107-204-1	July 20, 2010
L. Nordstrom	Comment Submission	2010-0107-205-1	July 20, 2010
B. Mock	Comment Submission	2010-0107-206-1	July 20, 2010
D. Pernitsky	Comment Submission	2010-0107-207-1	July 20, 2010
L. Oshaunaghnessy	Comment Submission	2010-0107-208-1	July 20, 2010
L. Phillips	Comment Submission	2010-0107-209-1	July 20, 2010
L. Squires	Comment Submission	2010-0107-210-1	July 20, 2010
L. Tremblay	Comment Submission	2010-0107-211-1	July 20, 2010
L. Valestuk	Comment Submission	2010-0107-212-1	July 20, 2010
L. Watson	Comment Submission	2010-0107-213-1	July 20, 2010
L. Withers	Comment Submission	2010-0107-214-1	July 20, 2010
L. Wyatt	Comment Submission	2010-0107-215-1	July 20, 2010
M. Andronescu	Comment Submission	2010-0107-216-1	July 20, 2010
M. Bogard	Comment Submission	2010-0107-217-1	July 20, 2010
M. Eastman	Comment Submission	2010-0107-218-1	July 20, 2010
M. Eveleigh	Comment Submission	2010-0107-219-1	July 20, 2010
M. Finley	Comment Submission	2010-0107-220-1	July 20, 2010
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C. Maurice	Comment Submission	2010-0107-222-1	July 20, 2010
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M. Kerrigan	Comment Submission	2010-0107-226-1	July 20, 2010
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M. Madden	Comment Submission	2010-0107-228-1	July 20, 2010
A. LaRue	Comment Submission	2010-0107-229-1	July 20, 2010
A.Mabee	Comment Submission	2010-0107-230-1	July 20, 2010
C. Pylypowycz	Comment Submission	2010-0107-231-1	July 20, 2010
D. Armitage	Comment Submission	2010-0107-232-1	July 20, 2010
D. DeTora	Comment Submission	2010-0107-233-1	July 20, 2010
E. Booth	Comment Submission	2010-0107-234-1	July 20, 2010
G. Neff	Comment Submission	2010-0107-235-1	July 20, 2010
H. Smith	Comment Submission	2010-0107-236-1	July 20, 2010
J. Hagen	Comment Submission	2010-0107-237-1	July 20, 2010

J. Jensen	Comment Submission	2010-0107-238-1	July 20, 2010
J. Overduin	Comment Submission	2010-0107-239-1	July 20, 2010
J. Taylor	Comment Submission	2010-0107-240-1	July 20, 2010
J. Ostoich	Comment Submission	2010-0107-241-1	July 20, 2010
K. Bogard	Comment Submission	2010-0107-242-1	July 20, 2010
G. Callihoo	Comment Submission	2010-0107-243-1	July 20, 2010
H. Greer	Comment Submission	2010-0107-244-1	July 20, 2010
D. Chan	Comment Submission	2010-0107-245-1	July 20, 2010
K. Brown	Comment Submission	2010-0107-246-1	July 20, 2010
L. Olson	Comment Submission	2010-0107-247-1	July 20, 2010
L. Overmire	Comment Submission	2010-0107-248-1	July 20, 2010
M. Dickinson	Comment Submission	2010-0107-249-1	July 20, 2010
M. McLean	Comment Submission	2010-0107-250-1	July 20, 2010
M. Mills	Comment Submission	2010-0107-251-1	July 20, 2010
M. Mount	Comment Submission	2010-0107-252-1	July 20, 2010
M. Mutch	Comment Submission	2010-0107-253-1	July 20, 2010
M. Nenonen	Comment Submission	2010-0107-254-1	July 20, 2010
M. Papadopoulou	Comment Submission	2010-0107-255-1	July 20, 2010
M. Paulsen	Comment Submission	2010-0107-256-1	July 20, 2010
M. Peterson	Comment Submission	2010-0107-257-1	July 20, 2010
M. Pinque	Comment Submission	2010-0107-258-1	July 20, 2010
M. Pound	Comment Submission	2010-0107-259-1	July 20, 2010
M. Quon	Comment Submission	2010-0107-260-1	July 20, 2010
M. Rantala	Comment Submission	2010-0107-261-1	July 20, 2010
M. Rehmer	Comment Submission	2010-0107-262-1	July 20, 2010
Y.Lim	Comment Submission	2010-0107-263-1	July 20, 2010
M. Tidwell	Comment Submission	2010-0107-264-1	July 20, 2010
M. Tipperman	Comment Submission	2010-0107-265-1	July 20, 2010
M. Varichak	Comment Submission	2010-0107-266-1	July 20, 2010
Y. Kumagae	Comment Submission	2010-0107-267-1	July 20, 2010
Melissa B.	Comment Submission	2010-0107-268-1	July 20, 2010
Mr & Mr B. Revesz	Comment Submission	2010-0107-269-1	July 20, 2010
W. Francis	Comment Submission	2010-0107-270-1	July 20, 2010
N&C. Campbell	Comment Submission	2010-0107-271-1	July 20, 2010
N. Allan	Comment Submission	2010-0107-272-1	July 20, 2010

V. Sorensen	Comment Submission	2010-0107-273-1	July 20, 2010
N. Carr	Comment Submission	2010-0107-274-1	July 20, 2010
V. Cousineau	Comment Submission	2010-0107-275-1	July 20, 2010
N. Cooley	Comment Submission	2010-0107-276-1	July 20, 2010
N. Edson	Comment Submission	2010-0107-277-1	July 20, 2010
N. Engelmann	Comment Submission	2010-0107-278-1	July 20, 2010
U. Easterbrook	Comment Submission	2010-0107-279-1	July 20, 2010
N. Esteban	Comment Submission	2010-0107-280-1	July 20, 2010
N. Frazer	Comment Submission	2010-0107-281-1	July 20, 2010
N. Shpiller	Comment Submission	2010-0107-282-1	July 20, 2010
N. Thiele	Comment Submission	2010-0107-283-1	July 20, 2010
N. Vadeboncoeur	Comment Submission	2010-0107-284-1	July 20, 2010
T. Tucker	Comment Submission	2010-0107-285-1	July 20, 2010
O. MacMillan	Comment Submission	2010-0107-286-1	July 20, 2010
T. Routley	Comment Submission	2010-0107-287-1	July 20, 2010
O. Milne	Comment Submission	2010-0107-288-1	July 20, 2010
P. Bjarnason	Comment Submission	2010-0107-289-1	July 20, 2010
T. Reeves	Comment Submission	2010-0107-290-1	July 20, 2010
P. Duenner	Comment Submission	2010-0107-291-1	July 20, 2010
P. Gumplinger	Comment Submission	2010-0107-292-1	July 20, 2010
P. Morello	Comment Submission	2010-0107-293-1	July 20, 2010
T. Rauscher	Comment Submission	2010-0107-294-1	July 20, 2010
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P. Wantuch	Comment Submission	2010-0107-296-1	July 20, 2010
T. Polcelli	Comment Submission	2010-0107-297-1	July 20, 2010
P. Wilkey	Comment Submission	2010-0107-298-1	July 20, 2010
P. Young	Comment Submission	2010-0107-299-1	July 20, 2010
Paul B.	Comment Submission	2010-0107-300-1	July 20, 2010
T. Pender	Comment Submission	2010-0107-301-1	July 20, 2010
T. Markle	Comment Submission	2010-0107-302-1	July 20, 2010
T Knott	Comment Submission	2010-0107-303-1	July 20, 2010
R. Cavanaugh	Comment Submission	2010-0107-304-1	July 20, 2010
R. Cyr	Comment Submission	2010-0107-305-1	July 20, 2010
R. Dabrusin	Comment Submission	2010-0107-306-1	July 20, 2010
T. Hornbein	Comment Submission	2010-0107-307-1	July 20, 2010

R. Davidson	Comment Submission	2010-0107-308-1	July 20, 2010
R. Dudonis	Comment Submission	2010-0107-309-1	July 20, 2010
T. Grier	Comment Submission	2010-0107-310-1	July 20, 2010
R. Duncan	Comment Submission	2010-0107-311-1	July 20, 2010
R. Fahlman	Comment Submission	2010-0107-312-1	July 20, 2010
S. van Veen	Comment Submission	2010-0107-313-1	July 20, 2010
R. Graham-Gardner	Comment Submission	2010-0107-314-1	July 20, 2010
R. Johnson	Comment Submission	2010-0107-315-1	July 20, 2010
R. Keegan-Henry	Comment Submission	2010-0107-316-1	July 20, 2010
S. vanRijn	Comment Submission	2010-0107-317-1	July 20, 2010
R. Koester	Comment Submission	2010-0107-318-1	July 20, 2010
R. Loki	Comment Submission	2010-0107-319-1	July 20, 2010
S. Sleeper	Comment Submission	2010-0107-320-1	July 20, 2010
R. Loucks	Comment Submission	2010-0107-321-1	July 20, 2010
R. White	Comment Submission	2010-0107-322-1	July 20, 2010
S. Richardson	Comment Submission	2010-0107-323-1	July 20, 2010
S. Allofs	Comment Submission	2010-0107-324-1	July 20, 2010
S. Park	Comment Submission	2010-0107-325-1	July 20, 2010
S. Bjorge	Comment Submission	2010-0107-326-1	July 20, 2010
S. Blackburn	Comment Submission	2010-0107-327-1	July 20, 2010
S. Nodurft	Comment Submission	2010-0107-328-1	July 20, 2010
S. Couch	Comment Submission	2010-0107-329-1	July 20, 2010
S. Dale Dale	Comment Submission	2010-0107-330-1	July 20, 2010
S. MacKinnon	Comment Submission	2010-0107-331-1	July 20, 2010
S. Donovan	Comment Submission	2010-0107-332-1	July 20, 2010
S. Easson	Comment Submission	2010-0107-333-1	July 20, 2010
S. Elmeligi	Comment Submission	2010-0107-334-1	July 20, 2010
S. MacDonald	Comment Submission	2010-0107-335-1	July 20, 2010
S. Farrell	Comment Submission	2010-0107-336-1	July 20, 2010
S. Lee	Comment Submission	2010-0107-337-1	July 20, 2010
S. Farrell	Comment Submission	2010-0107-338-1	July 20, 2010
M. Sheldon	Comment Submission	2010-0107-532-1	July 21, 2010
M. Shearer	Comment Submission	2010-0107-531-1	July 21, 2010
N. Danneberg	Comment Submission	2010-0107-533-1	July 21, 2010
L Christensen	Comment Submission	2010-0107-534-1	July 21, 2010

K. Gage	Comment Submission	2010-0107-342-1	July 21, 2010
A. Brown	Comment Submission	2010-0107-343-1	July 21, 2010
A. Lyn	Comment Submission	2010-0107-344-1	July 21, 2010
A. Schmidt	Comment Submission	2010-0107-345-1	July 21, 2010
A. Singleton	Comment Submission	2010-0107-346-1	July 21, 2010
B. Lazarus	Comment Submission	2010-0107-347-1	July 21, 2010
B. Pearce	Comment Submission	2010-0107-348-1	July 21, 2010
B. Robinson	Comment Submission	2010-0107-349-1	July 21, 2010
Brian O.	Comment Submission	2010-0107-350-1	July 21, 2010
C. Close	Comment Submission	2010-0107-351-1	July 21, 2010
D. Freeman	Comment Submission	2010-0107-352-1	July 21, 2010
D. Porter	Comment Submission	2010-0107-353-1	July 21, 2010
G. Kokuryo	Comment Submission	2010-0107-354-1	July 21, 2010
H. Schamehorn	Comment Submission	2010-0107-355-1	July 21, 2010
I. Wright	Comment Submission	2010-0107-356-1	July 21, 2010
J. Bruhn	Comment Submission	2010-0107-357-1	July 21, 2010
J. DeSpain	Comment Submission	2010-0107-358-1	July 21, 2010
J. Jordan	Comment Submission	2010-0107-359-1	July 21, 2010
J. May	Comment Submission	2010-0107-360-1	July 21, 2010
J. Thouin	Comment Submission	2010-0107-361-1	July 21, 2010
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L. Reynolds	Comment Submission	2010-0107-363-1	July 21, 2010
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M. Teetzel	Comment Submission	2010-0107-367-1	July 21, 2010
M. Zimmermann	Comment Submission	2010-0107-368-1	July 21, 2010
P. Gauthier	Comment Submission	2010-0107-369-1	July 21, 2010
P. Moss	Comment Submission	2010-0107-370-1	July 21, 2010
S. Audet	Comment Submission	2010-0107-371-1	July 21, 2010
S. Jennings	Comment Submission	2010-0107-372-1	July 21, 2010
S. Schwartz	Comment Submission	2010-0107-373-1	July 21, 2010
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C. Russell	Comment Submission	2010-0107-411-1	July 21, 2010

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J. Robinson	Comment Submission	2010-0107-479-1	July 21, 2010
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J. Swift	Comment Submission	2010-0107-482-1	July 21, 2010
J. Turk	Comment Submission	2010-0107-483-1	July 21, 2010
K.&R. Sinclair	Comment Submission	2010-0107-484-1	July 21, 2010
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L. Satter	Comment Submission	2010-0107-504-1	July 21, 2010
M&J Ward	Comment Submission	2010-0107-505-1	July 21, 2010
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M. Malac	Comment Submission	2010-0107-521-1	July 21, 2010
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M. Prins	Comment Submission	2010-0107-526-1	July 21, 2010
Michael Rudy	Comment Submission	2010-0107-527-1	July 21, 2010
Maxine Rudy	Comment Submission	2010-0107-528-1	July 21, 2010
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N & J Schaefer	Comment Submission	2010-0107-702-1	July 22, 2010
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N. Jones	Comment Submission	2010-0107-536-1	July 22, 2010
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N. Van de Kamp	Comment Submission	2010-0107-540-1	July 22, 2010
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P. Chippet	Comment Submission	2010-0107-543-1	July 22, 2010
P. Endisch	Comment Submission	2010-0107-544-1	July 22, 2010
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P. Meeker	Comment Submission	2010-0107-549-1	July 22, 2010
R.&E. Power	Comment Submission	2010-0107-550-1	July 22, 2010
R. Beauchamp	Comment Submission	2010-0107-551-1	July 22, 2010
R. Blair	Comment Submission	2010-0107-552-1	July 22, 2010
R. Carriere	Comment Submission	2010-0107-553-1	July 22, 2010
R. Ellison	Comment Submission	2010-0107-554-1	July 22, 2010

R. Fyfe	Comment Submission	2010-0107-555-1	July 22, 2010
R. Hasted	Comment Submission	2010-0107-556-1	July 22, 2010
R. Klei	Comment Submission	2010-0107-557-1	July 22, 2010
R. Lawford	Comment Submission	2010-0107-558-1	July 22, 2010
R. McCallion	Comment Submission	2010-0107-559-1	July 22, 2010
R. Rothgeb	Comment Submission	2010-0107-560-1	July 22, 2010
R. Thompson	Comment Submission	2010-0107-561-1	July 22, 2010
R. Tyson	Comment Submission	2010-0107-562-1	July 22, 2010
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S. Curtis-Norcross	Comment Submission	2010-0107-567-1	July 22, 2010
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G. Hack	Comment Submission	2010-0107-612-1	July 22, 2010
H. Richman	Comment Submission	2010-0107-613-1	July 22, 2010
B. & D. Rudzewitsch	Comment Submission	2010-0107-614-1	July 22, 2010
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J. Otton	Comment Submission	2010-0107-621-1	July 22, 2010
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J. White	Comment Submission	2010-0107-628-1	July 22, 2010
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L. Gontard	Comment Submission	2010-0107-647-1	July 22, 2010
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R. Mueller	Comment Submission	2010-0107-653-1	July 22, 2010
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R. Wurtak	Comment Submission	2010-0107-655-1	July 22, 2010
S. Kitchen	Comment Submission	2010-0107-656-1	July 22, 2010
S. Marino	Comment Submission	2010-0107-657-1	July 22, 2010
R. O`Bryant	Comment Submission	2010-0107-658-1	July 22, 2010
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V. & B. Veale	Comment Submission	2010-0107-660-1	July 22, 2010
A. Church	Comment Submission	2010-0107-661-1	July 22, 2010
G. Senichenko	Comment Submission	2010-0107-662-1	July 22, 2010
J. Schou	Comment Submission	2010-0107-663-1	July 22, 2010
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Bruno B.	Comment Submission	2010-0107-667-1	July 22, 2010
C. Antaya	Comment Submission	2010-0107-668-1	July 22, 2010
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M. Marchand	Comment Submission	2010-0107-672-1	July 22, 2010
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S. Zilker	Comment Submission	2010-0107-674-1	July 22, 2010
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J. Cornelia	Comment Submission	2010-0107-693-1	July 22, 2010

L. Intering	Comment Submission	2010-0107-694-1	July 22, 2010
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L. Herndon	Comment Submission	2010-0107-698-1	July 22, 2010
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Tr`ondek Hwech`in (YFN)	Comment Submission	2010-0107-700-1	July 22, 2010
R. Sabo	Comment Submission	2010-0107-701-1	July 22, 2010
Proponent	Proposal Information	2010-0107-719-1	July 23, 2010
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B. Zimmer	Comment Submission	2010-0107-707-1	July 23, 2010
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C. Sim	Comment Submission	2010-0107-709-1	July 23, 2010
Canadian River Expeditions and Nahanni River Adventures	Comment Submission	2010-0107-710-1	July 23, 2010
E. Baron	Comment Submission	2010-0107-711-1	July 23, 2010
E. Smith	Comment Submission	2010-0107-712-1	July 23, 2010
E. Spurr	Comment Submission	2010-0107-713-1	July 23, 2010
E. Spurr	Comment Submission	2010-0107-714-1	July 23, 2010
H. Grünberg	Comment Submission	2010-0107-715-1	July 23, 2010
J. Polyck	Comment Submission	2010-0107-716-1	July 23, 2010
Marko Marjanovic	Comment Submission	2010-0107-718-1	July 23, 2010
S. Ward	Comment Submission	2010-0107-720-1	July 23, 2010
T. Burke	Comment Submission	2010-0107-721-1	July 23, 2010
V. Vincent	Comment Submission	2010-0107-722-1	July 23, 2010

APPENDIX 4 – REFERENCES AND SOURCES

Avant, B. 2000. Environmental ethics of wilderness visitors. *Proceedings of the Society of American Foresters 1999 National Convention*: 232 – 241.

Beckstead, D. 2004. 2004 Sheep Report: The Effects of Military Jet Overflights on Dall's Sheep in Interior Alaska. National Parks Service, US Department of the Interior. [online] URL: http://www.arlis.org/docs/vol1/58732389/index.html Accessed Aug 4, 2010.

Buthmann, E. B. (2005). *Snowmobiling in the Adirondack Park.* St. Lawerance University, Dept. of Biology.

Bleich, V.C., Bowyer, R.T., Pauli, A.M., Nicholson, M.C., and Anthes, R.W. 1994. Mountain Sheep (*Ovis canadensis*) and Helicopter Surveys: Ramifications for the Conservation of Large Mammals. *Biological Conservation.* 70: 1 – 7

Comission of Yukon. (RSY 2002, c.165). Parks and Land Certainty Act.

CPAWS. (2000). *Yukon's Tombstone Range and Blackstone Uplands, A Travellers GUide.*

Dearden, P., and Dempsey, J. (2004). Protected areas in Canada: A Decade of Change. *Canadian Geographer*: 48(2): 225

Dyer, S. J., J. P. O'Neill, S. M. Wasel, and S. Boutin. 2001. Avoidance of industrial development by woodland caribou. Journal of Wildlife Management 65:531–542.

Eagles, P.F.J., McLean, D., and Stabler, M.J. 2000. Estimating the Tourism Volume and Value in Parks and Protected Areas in Canada and the USA. *The George Wright Forum*. 17 (3): 62 – 82

Frid, A. 1995. Dall's Sheep of the Killermun Lake Region: Ecological and Behavioural Data in Relation to Mineral Exploration. *Prepared for*: Yukon Fish & Wildlife and Archer Cathro & Associated LTD, August, 1995.

Frid, A. 2003. Dall's sheep responses to overflights by helicopter and fixed-wing aircraft. *Biological Conservation,* 110 (3): 387 – 400.

Geist, V. 1975. Harassment of large mammals and birds. Rep. to the Berger commission submitted by Arctic Gas Study Ltd. Calgary, Alberta. 62p.

Gnieser, Christoh. 2000. Ecological consequences of recreation on subarctic-alpine tundra: Experimental assessment and predictive modeling as planning tools for sustainable visitor management in protected areas. Calgary, Alberta, 2000.

Harmon, D. and Putney A.D. *Eds* 2000. "The Full Value of Parks: From Economics to the Intangible." Rowman & Littlefield Publishers, Inc., Maryland, USA.

Harmon, D., 2004. Intangible Values of Protected Areas: What are they? Why do the matter? *George Wright Forum*. 21(2): 9 – 22

Inspector, D. M. (2009, March 9). (D. D.-A. Officer, Interviewer)

J. C. Jorgenson, e. a. (2010). Long - term recovery patterns of arctic tundra after winter seismic exploration. . *Ecological Applicaitons.V20 N1* , pp. 205-221.

Johnson, C.J., Boyce, M.S., Case, R.L., Cluff, H.D., Gau, R.J., Gunn, A., Mulders, R. 2005. Cumulative Effects of Human Developments on Arctic Wildlife. *Wildlife Monographs,* 160: 1 – 36.

Krakoff, S. 2003. Mountains Without Handrails…Wilderness Without Cellphones. *Harvard Environmental Law Review*. 27: 417 – 521.

Laberge Environmental Services. (2001). Water Characterization - Horn Claims. *Results for the July 4, 2001 Survey* .

Manning, R., Valliere, W., Minteer, B., Wang, B., and Jacobi, C. 2000. Crowding in Parks and Outdoor Recreation: A Theoretical, Empirical and Managerial Analysis. *Journal of Park and Recreation Administration.* 18 (4): 57 – 72

McLelland, Jamie, M. O'Donoghue, D. Cooley, M. Kienzler. 2007. Population Status of the Hart River Caribou Herd- September 2006.

Neumann, P. a. (1972). Ecological Effects of Snowmobiles. *Canadian Field Naturlist, V 86* , 207-212.

Olliff, T. K. (1999). *Effects of winter recreation on wildife of the Greater Yellowstone Area; a literature review and assessment.* Wyoming.

Proponent. (2010, Apr 22). Ref 2010-0107-002-1 YESAB Form 1, Part 7. *Identification of Potential Environmental and Socio-Economic Effects and Proposed Mitigation Measures.* .

Proponent. (2010, May). Response to Request for Information (Ref 2010-0107-011-1).

Proponent. (2010, June). Response to: Information Request from various YG Dept.

Quon, H. (n.d.). Personal Communication regarding the National Pollutant Release Inventory GUide and Requirements.

Stuart A. Alexander, F. l. (2003). *Birds of the Yukon.* Vancouver-Toronto: UBC Press.

Tenney, D. (2002). *Assessment Report on 2001 Exploration of Horn 1-18 Claims, Tombstone Mountains, Yukon Territory.*

Tenney, D. (1999). *Report on 1998/99 Exploration of teh Horn 1-18 Claims, Tombstone Mountains, Yukon Territory.*

The World Conservation Union (IUCN). Protected Areas Management Categories. http://www.unep-wcmc.org/protected_areas/categories/index.html

Tr'ondek Hwech'in. (2010, July). *Comment Submission, Ref 2010-0107-0700-1.* Retrieved from YESAB, Online Registry.

Tr'ondëk Hwëchin v. Her Majesty The Queen in Right of Canada, et., 2003 YKSC 7 (Supreme Court of the Yukon Territory 2003).

Tr'ondëk Hwëch'in V HMQRC, Et al., 2003 YKSC 7, S.C. No 01-A0235 (2003).

Tr'ondek Hwech'in v. HMTQ, et al, 2020 YKSC 37, S.C. No. 01-A0235 (Supreme Court of Yukon Territory 07 08, 2002).

Yukon Government - Heritage Branch .

Yukon Government - Heritage. (2003). *Upper Blackstone River Heritage Site Survey.*

Yukon Government and Tr'ondek Hwech'in. (2009). *Tombstone Territorial Park Managemetn Plan.*

Yukon Government. (2010, July). Comment Submission,Environment Yukon Assessment Comment YOR 2010-0107-676-1.

Yukon Governmnet - Heritage. (1999). *Additional Archaeological Investigations in the Tombstone Mountain Territorial Park.*

Yukon Parks. (2010). *Yukon Parks Technical Review.* YG Environment.

Yukon, C. o. (2003). Quartz Mining Act O.I.C. 2003/64. *Security* .

Yukon's Tombstone Range and Blackstone Uplands, A Traveller's Guide. (2000). Whitehorse: Candian Parks and Wildierness Society.

Weaver, J.L., P.C. Paquet, and L.F. Ruggiero. 1996. Resilience and conservation of large carnivores in the Rocky Mountains. Conservation Biology 10:964-976.

Webster, Lara. 1997. The Effects of Human Related Harassment on Caribou (*Rangifer tarandus*). Prepared for Jim Young, August 1997.