De Beers
Group of Companies

DRAFT TECHNICAL MEMORANDUM UPDATE

Gahcho Kué Winter Access Road 2014 Caribou Monitoring

Introduction

The Gahcho Kué winter access road (GK access road) connects the Gahcho Kué project site to the Tibbitt to Contwoyto winter road beginning at kilometre 271 on MacKay Lake. The 125 km long road is located at the northern edge of the winter ranges of the Bathurst, Beverly and Ahiak caribou herds. There have been few recorded interactions between the GK ice road and caribou over the past several years, however beginning in last few days of January of 2014, a large herd of caribou moved into the area. There have been two separate collisions between vehicles and caribou since the caribou arrived. One along the main Tibbitt to Contwoyto winter road, and one on the GK winter access road.

The proximity of this large herd to the GK winter road presents both a serious cause for concern in terms of safety for the animals and drivers, but also an opportunity to better understand the interactions between the caribou and winter roads in the NWT through monitoring. This document describes De Beers approach to monitoring wildlife, with a strong focus on caribou, along the GK winter access road during the 2014 haul season. It is a working document which may be revised and adjusted as additional information becomes available.

Regulatory Background

The potential effects of the winter access road on caribou were assessed within the Environmental Impact Statement submitted to the Mackenzie Valley Environmental Impact Review Board in 2012. Following completion of the review process, the Review Panel issued their decision report (EIR 0607-001) recommending approval of the project (July 19, 2013). The decision report includes three measures related to caribou.

Measure 1 De Beers will:

- *Minimize impacts to caribou and the extent of the zone of influence around the mine site to the extent that is technically feasible.*
- *Prior to construction, develop a caribou protection plan that ensures protection of caribou and caribou habitat. The caribou protection plan should include an adaptive management framework demonstrating how the Wildlife Effects Monitoring Program and the Wildlife and Wildlife Habitat Protection Plan are linked.*

Measure 2 De Beers will:

- *Construct and operate the Winter Access Road in a way that minimizes its adverse effects as a partial barrier to caribou movement and migration;*
- *Monitor to determine the presence and behaviour of caribou along the winter access road using means in addition to satellite collar data, such as track counts and visual observations; and*
- *Ensure that the caribou protection plan, the wildlife effects monitoring program and the wildlife and wildlife habitat protection plan address the effects on caribou movement and behaviour along the winter access road.*

Measure 3 De Beers will:

- *Monitor project specific effects (e.g. size of the Zone of influence, changes in habitat, effects of the Winter Access Road on caribou movement and behaviour) and will report to the GNWT and make the results public on how project specific effects contribute to cumulative effects for the duration of the Project.*

In addition to the measures above, the Review Panel suggested that any follow-up barren-ground *caribou monitoring programs should include, but not be limited to:*

- *monitoring the zone of influence and its likely causes (e.g. noise, dust, mine activity) (can be completed as part of the Wildlife Effects Monitoring Program);*
- *using results from monitoring the extent of the zone of influence and likely causal mechanisms (completed as part of the Wildlife Effects Monitoring Program) to intensify or reduce mitigations that will minimize the zone of influence;*
- *monitoring the presence of caribou along the winter access road and the effects of the road on caribou movement and behaviour;*
- *describing action levels that will be used to determine when monitoring or mitigations or changes to existing mitigation are necessary; and*
- *demonstrating how existing baseline information (such as the caribou trails as a model for likely caribou approaches to the site) and Traditional Knowledge are incorporated in monitoring and management plans.*

The primary mechanisms for addressing the above measures and guidance are the Wildlife and Wildlife Habitat Protection Plan (WWHPP), the Wildlife Effects Monitoring Plan (WEMP). Drafts of the WWHPP and WEMP, incorporating caribou protection measures, were submitted to the Mackenzie Valley Land and Water Board as part of the mining and milling Type A Land Use Permit (MC2005C0032) and Water Licence (MV2005L2-0015) applications. Once the review processes for those applications concludes, both plans (WWHPP and WEMP) will be updated to address comments received and knowledge gained

during the review. A concordance table relating the MVEIRB measures to De Beers application materials is included as Table 1.

The caribou monitoring described in this document is designed to address the MVEIRB's measures and suggestions as they relate to activities planned for the 2014 winter road operation. These early works activities are authorized under the Exploration Type B Land Use Permit (MC2008C022) and the Type A Pioneer Earthworks Land Use Permit (MV2013C0019). Mitigation for caribou is described in the WWHPP.

MONITORING APPROACH

The 2014 GK access road monitoring program takes a multi-tiered, multi-scale approach. There are 4 main components to the program:

- Wildlife Sightings Log
- Winter Access Monitoring
- Behavioural Monitoring
- Distribution Monitoring

The wildlife sightings log and winter access monitoring will take place along the full length of the GK access road. The behavioural monitoring will occur where caribou are present and visible from the road and the distribution monitoring will occur within approximately 20 km the road. Each survey will contribute additional information regarding the occurrence, behaviour, movements, and distribution of caribou in the vicinity of the GK access road. Each method will build on knowledge gained from the others. This multi-scale, multi-tiered approach will enable De Beers to respond appropriately to the occurrence of caribou in the area and will provide valuable information regarding potential influence of the road on caribou.

In addition to these site-based monitoring programs, De Beers sponsors range-scale monitoring and research of the Bathurst caribou herd led by the Government of Northwest Territories, Department of Environment and Natural Resources. A summary of this program, and De Beers involvement in it will be included in the final Wildlife Effects Monitoring Program associated with the Class A Land Use Permit currently under review.

WILDLIFE SIGHTINGS LOG

The wildlife sighting log program allows staff and contractors working at site and along the GK road to record and report wildlife observations. The program encourages communication among staff and builds interest and understanding of wildlife issues and company environmental policies. The Environmental Coordinator on site will administer the program. The primary objectives of the wildlife sightings log program are to:

- Create a record of all incidental wildlife sightings
- Encourage environmental awareness and participation by staff

Methods

Wildlife sighting logs will be maintained at various locations around the Project site, including the kitchen and the main office where staff regularly check-in and out for the day. Staff and contractors will be asked to record their wildlife observations each day at the end of their shift. The data form will include the following information: species, age and sex, location (UTM/km along the road), number, behaviour, and comments.

Reporting of caribou observations (as well as wolverines and grizzly bears) is mandatory for all staff and contractors. A summary of wildlife sightings will be provided annually within the wildlife monitoring report.

Frequency and Duration

The Wildlife Sighting Log program will operate 365 day/year. The log will be maintained throughout construction, operations, and closure. The Environmental Coordinator will review the logs weekly and ensure that observations of key species are relayed to staff as necessary. ENR will be updated regarding wildlife occurrences on a weekly basis.

Action Levels

All caribou sightings must be reported on the wildlife sightings lg form or directly to the Environmental Coordinator/site security.

If caribou are observed at any designated construction areas, the presence of caribou will be announced on the radio and the Environment Coordinator will be called immediately. The Environment Coordinator will work with the necessary staff to ensure work in construction areas is delayed until the caribou move on. Environment and Natural Resources (ENR) will be notified.

If large animals such as caribou or bears are located in close proximity to the road, an announcement will be made on the radio with the number of animals seen, the location, and an order to slow down in the area. If wildlife are on the road, traffic will stop and wait for them to cross (i.e. wildlife have the right-of-way).

WINTER ACCESS ROAD MONITORING

The access monitoring program involves security personnel driving the entire length of the GK and SL access roads on a regular basis during the hauling season. The observers will monitor recreational/hunter use of the road, wildlife harvesting from the road, as well as wildlife occurrence

along the road. An Aboriginal Environmental Monitor will frequently accompany the road monitoring crew.

Access monitoring is designed to address three main objectives with respect to wildlife:

- documenting recreational use of the winter roads;
- detecting wildlife occurrence along the roads
- informing the mitigation and management of the roads

Methods

During the daily drive of GK road security staff will monitor the use of the road by truck traffic and recreational users. Security staff will note the type of vehicles present on the road and types of activity of the users. Where possible the following types of information will be recorded regarding recreational use of the road: location, number and type of vehicles, number and type of accessory vehicles, number of people in party, purpose of trip, species hunting for etc.

Security staff will note the location of any wildlife carcasses seen, the species (if possible), day, time and any other related information such as whether or not scavengers are present. Photographs and a GPS location at the site will be taken if possible. Disclosure of information by recreational users is purely optional and voluntary.

The daily drive of the GK road will also used to collect information about wildlife occurrence. All wildlife observed along the roads will be noted and recorded by security staff. Start and end times of the drive will be noted. When an animal is detected, the observer will estimate the distance from the road to the animal. The location of the observation will be recorded. A photo will be taken where conditions are favourable. The species and age of the animal (adult vs. juvenile) will be recorded.

Frequency and Duration

Winter access road monitoring will occur daily, so long as conditions are safe, during the hauling season in February and March.

Action Levels

If wildlife are on the road, traffic will stop and wait for them to cross (i.e. wildlife have the right-of-way). If large animals such as caribou or bears are located in close proximity to the road, an announcement will be made on the radio with the number of animals seen, the location, and an order to slow down in the area.

If a wildlife collision occurs, the Environment Coordinator will be called immediately. The Environment Coordinator will report the collision to ENR.

At the end of every survey, the results of the survey will be conveyed to the Environment Coordinator. The Environment Coordinator will distribute the information to other users of the road as necessary.

BEHAVIOURAL MONITORING

Behavioural monitoring of caribou along the winter road will be initiated in areas where herds of caribou are present during the haul season. The objective of the behavioural monitoring program is to:

- describe caribou behaviour in relation to the winter road
- inform management and mitigation of the road to ultimately reduce effects on caribou

Behavioural monitoring methods will be consistent with those implemented at Diavik and Ekati mines. The monitoring will be conducted by a crew of two observers stationed along the winter road in a truck. Observers will conduct instantaneous behavioural scans of caribou groups at 8 minute intervals for at least 40 minutes (a minimum of four observations per group). The response of caribou to stressors such as vehicle or aircraft traffic will also be recorded. This will be repeated at multiple locations along the road where caribou are present. In addition to behaviour, observers will record the number, sex composition, and location of each group.

Frequency and Duration

Monitoring will occur during the haul season while caribou are present.

Action Levels

Behavioural monitors will report their observations to the Environment Coordinator daily and inform him of any particular areas of elevated risk to caribou or drivers. They will also advise as to any additional factors that seem to stress caribou or alter their behaviour negatively (e.g speed of vehicles).

DISTRIBUTION MONITORING

Winter track counts or aerial surveys may be conducted in order to document the distribution of caribou in relation to the road. Collection of these data will help to inform questions of the extent and distribution of caribou in the area as well as potentially providing information on the zone of influence of the road on caribou.

Methods

The choice between aerial survey or ground based winter track count will be made on the basis of animal welfare, abundance and distribution of caribou observations, site conditions, and the availability of staff and equipment. ENR will be consulted prior to initiation of either of these surveys.

If an aerial survey is conducted, the methods will follow general survey techniques outlined in the WEMP. The pilot will maintain a minimum altitude to avoid disturbing caribou. The flight will follow pre-determined transects and the location of all caribou will be recorded in UTM.

The methods used for the ground-based snow tracking survey will also follow standard methods for winter tracking. Observers will use snow-machines to travel transect lines at increasing distance from the road. All animal tracks will be recorded. These data will be used to estimate track counts/km/day, to identify and delineate caribou trails, cratering locations, bedding locations and other signs of caribou in the area.

Frequency and Duration

If initiated, distribution monitoring will occur over several days during the haul season.

Action Level

The results of the distribution monitoring will be conveyed to the Environmental Coordinator at the end of each day. The Environment Coordinator will distribute the information to other users of the road as necessary.

Table 1.0 Concordance of Joint Panel Decision Report Measures and De Beers regulatory documents.

Act	Regulatory Mechanism/Decision Report	Requirement	De Beers Document	Responsible Regulatory Agency
Mackenzie Valley Resource Management Act : 135. (1) After considering the report of a review panel, the federal Minister and responsible ministers to whom the report was distributed may agree to (a) adopt the recommendation of the review panel or refer it back to the panel for further consideration	MVEIRB Panel Decision, July 19, 2013. Measure 1	Minimize impacts to caribou and the extent of the zone of influence around the mine site to the extent that is technically feasible.	WWHPP (Section 4)	AANDC
		Prior to construction, develop a caribou protection plan that ensures protection of caribou and caribou habitat. The caribou protection plan should include an adaptive management framework demonstrating how the Wildlife Effects Monitoring Program and the Wildlife and Wildlife Habitat Protection Plan are linked.	WWHPP (Section 4)	AANDC
	MVEIRB Panel Decision, July 19, 2013. Measure 2	Construct and operate the Winter Access Road in a way that minimizes its adverse effects as a partial barrier to caribou movement and migration;	WWHPP (Section 4)	AANDC

		Monitor to determine the presence and behaviour of caribou along the winter access road using means in addition to satellite collar data, such as track counts and visual observations; and	WWHPP : (Section 5.5 and 5.6) and GK Winter Access Road 2014 Caribou Monitoring Technical Memo	AANDC
		Ensure that the caribou protection plan, the wildlife effects monitoring program and the wildlife and wildlife habitat protection plan address the effects on caribou movement and behaviour along the winter access road.	WWHPP : (Section 5.5 and 5.6); WEMP (Section 2.3.7) and GK Winter Access Road 2014 Caribou Monitoring Technical Memo	AANDC
	MVEIRB Panel Decision, July 19, 2013. Measure 3	Monitor project specific effects (e.g. size of the Zone of influence, changes in habitat, effects of the Winter Access Road on caribou movement and behaviour) and will report to the GNWT and make the results public on how project specific effects contribute to cumulative effects for the duration of the Project.	WWHPP (Section 5.5) and WEMP (Section 2.3), SOIL AND VEGETATION MONITORING PROGRAM (Section 3.1)	AANDC

	MVEIRB Panel Decision, July 19, 2013. Suggested Follow-up Program for barren ground caribou	monitoring the zone of influence and its likely causes (e.g. noise, dust, mine activity) (can be completed as part of the Wildlife Effects Monitoring Program);	WEMP (Section 2.3.7.1 & Table B-1)	AANDC
		using results from monitoring the extent of the zone of influence and likely causal mechanisms (completed as part of the Wildlife Effects Monitoring Program) to intensify or reduce mitigations that will minimize the zone of influence;	WEMP (Section 3.0); Adaptive Management Plan	AANDC
		monitoring the presence of caribou along the winter access road and the effects of the road on caribou movement and behaviour	WWHPP : (Section 5.5 and 5.6) and GK Winter Access Road 2014 Caribou Monitoring Technical Memo	AANDC
		describing action levels that will be used to determine when monitoring or mitigations or changes to existing mitigation are necessary;	WWHPP : (Sections 5.5, 5.6, 7.0) and GK Winter Access Road 2014 Caribou Monitoring Technical Memo	AANDC

		demonstrating how existing baseline information (such as the caribou trails as a model for likely caribou approaches to the site) and Traditional Knowledge are incorporated in monitoring and management plans.	WEMP (Table B-1, Section 2.1) , WWHPP (Section 1.3)	AANDC