Northwest Territories Environment and Natural Resources

March 2, 2012 VIA EMAIL

Chuck Hubert, Panel Manager
Gahcho Kué Environmental Impact Review Panel
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Dear Mr. Hubert,

Re: GNWT IR Responses (Round 1) #s 18-19, EIR0607-001 (2006), Gahcho Kué Diamond Mine Project

I am pleased to provide responses from the Government of the Northwest Territories (GNWT) to Round One Information Requests (IR) #s 18 and 19 for the Gahcho Kué Diamond Mine Project.

Please note the GNWT Response to IR #20 is still under development. This response will be provided as soon as possible.

Please contact me at gavin_more@gov.nt.ca if you have any questions regarding the attached submission.

Sincerely

Gavin More

Gavin More
Manager
Environmental Assessment and Monitoring
Environment and Natural Resources

cc. Veronica Chisholm, Permitting manager, DBCI (via email)

IR Number: GKP 18

Source: Gahcho Kué Panel

To: Government of the Northwest Territories

Reference: Section 7

Subject: Uncertainty over the assessment of residual effects for caribou populations based on the Developer's energetics model.

Preamble: The Developer has taken a similar approach as GNWT's approach to estimating cumulative effects in the Bathurst caribou herd (NWT Cumulative Impact Monitoring Program: Capacity Building & Monitoring Projects 2008-2009). However, there are differences especially for the energetics model. The Developer's model is based on Boertje (1985).

Request / Response:

1. Is the developer's energetics model consistent with techniques used by GNWT?

The GNWT's Bathurst caribou cumulative effects modeling project is nearing completion (i.e. a report is under development). The modeling project parallels the modeling carried out by the Developer's consultant. The GNWT's Bathurst caribou summer range project includes: spatial analysis using a Resource Selection Function (RSF) model; application of a linked pair of energetics and population models[1] (see Russell et al. 2005); and adaptation of the ALCES model[2] to population ecology of barren-ground caribou. The Developer also used a combination of spatial modeling, energetics modeling, and population modeling to assess potential impacts of the Gahcho Kue mine on barren-ground caribou which considers other mines and their effects on caribou. In this sense, the GNWT believes due credit should be given to the developer for a multi-faceted approach through a combination of models to assessing potential effects on caribou.

In meetings with the Developer and their consultants, the GNWT noted the linked models of Russell and Daniel were likely the best available to try to assess possible effects of disturbance to caribou feeding behaviour; having been developed by biologists with many years of experience studying the Porcupine caribou herd. The Developer responded that they had attempted to gain access to the Russell models but had been unsuccessful. This is possible as these are not "off-the-shelf" models readily available. The Russell models were also re-built with updated information in the last 2-3

[1] Developed by Don Russell and Colin Daniel

[2] Developed by B. Stelfox in Alberta

years. The GNWT would still consider the Russell models to be the most appropriate for barren-ground caribou, but if these were not available, then use of Boertje's modeling approach is reasonable.

2. Can ENR-GNWT describe how appropriate the developer's energetic model is to assess residual effects and whether they are under-estimated?

In the GNWT's Bathurst barren-ground caribou cumulative effects project mentioned above, the likely energetics costs of disturbed behaviour by caribou near one of the diamond mines were assessed using the Russell models. The underlying premise is that feeding behaviour of female caribou disturbed by traffic, dust, machinery or noise near the mines may negatively affect their condition. If the effect is severe enough, cows might be in poor condition during the fall breeding season which could translate to a negative effect at the population level. Recent behavioural data on activity of Bathurst caribou during the summer collected by graduate student L. Witter (Witter 2010) were used, as well as recent data on condition collected by ENR biologist B. Croft and colleagues. Initial evaluation of the results suggests the net effect on Bathurst caribou by this type of pathway was relatively small. This is in part because there is a zone of avoidance around the mines (i.e. caribou avoid the mines) and the proportion of the herd that spends time near the mine has been small. In addition, caribou were most likely to be near the existing diamond mines during spring or fall migration, thus they were rarely near the mine long enough for a significant effect to occur. The condition of Bathurst cows assessed during fall and winter periods in recent years has been good, making it unlikely that limited disturbance to feeding would have a measurable effect on the herd's pregnancy rate.

In view of these results, the GNWT finds the developer's modeling results showing that effects on caribou from energetic costs of disturbed feeding are likely to be limited, as reasonable, given recent information for the herd. It is worth remembering, however, that caribou in the Bathurst herd are currently at relatively low numbers, that caribou behaviour is unpredictable, and that caribou in poor condition with reduced pregnancy rates have occurred in this herd. At a future time, a larger herd or unpredictable changes in caribou distribution could increase the number of caribou near the Gahcho Kue mine and the time they spend in that area. The potential for an increased energetic cost could increase under those conditions, particularly if the cows are already in poor condition.

D.E. Russell, R.G. White and C. J. Daniel. 2005. Porcupine Caribou Herd Energetics: A Computer Simulation Model. Technical Report Series No. 431. Canadian Wildlife Service, Ottawa, Ontario, 64 pp.

Witter, L. A. 2010. Interrelationships between weather, parasitic insects, and barren-ground caribou (Rangifer tarandus groenlandicus) behavior in Northwest Territories and Nunavut. MSc Thesis, University of Northern BC, Prince George, BC.

IR Number: GKP 19

Source: Gahcho Kué Panel

To: Government of the Northwest Territories

Reference: Section 7

Subject: Uncertainty for the assessment of increased access for harvesting.

Preamble: The assessment of the effect of the Tibbett-Contwoyto winter road and spur winter road on harvesting lacks information including the proportion of caribou harvests along the winter roads relative to the total harvest and the caribou annual winter distribution. In Section 7, the effects pathway "increased access for traditional and non-traditional harvesting may alter caribou movement and behaviour, which can affect survival and reproduction" is rated as a secondary pathway. This pathway refers to the behavioural responses to hunting. But there is no information on the effect of hunting on caribou behaviour. Instead, Page 7.77 describes previous total harvests and current restrictions. The description of the pathway (rated secondary) states that the increase in access to the region [for hunting] associated with the winter roads is limited to eight to twelve weeks each year, and should result in minor changes to the annual harvest rate of caribou relative to baseline conditions.

The Environmental Impact Statement does not address the likelihood that the current restrictions will likely be changed if herd abundance increases. Additionally, when herds are in the phase of low numbers, even any increased harvest during the early stages of a herd recovery can be significant and even irreversible. The Environmental Impact Statement does not include any mitigation and mitigation for access to hunting on the Tibbett-Contwoyto winter road and spur winter road. In addition, the Environmental Impact Statement does not describe information on access and hunting elsewhere.

Request / Response:

1. Can ENR-GNWT provide information for the total harvest, the proportion of the harvest from the winter roads (based on harvest locations or monitoring such as check stations) relative to annual winter distribution of caribou?

A report by GNWT (Adamczewski et al. 2009) includes information from the winters of 2007-2008 and 2008-2009 from a joint Tlicho-ENR study to monitor caribou harvest in the winter. These were the last two winters before the Bathurst harvest was reduced by about 95% in 2010. A map showing the locations of caribou kills in the winter of 2008-2009 was in this report, and is included below. There is a second similar map in the report from the 2007-2008 winter. Based on a grid of 10 km by 10 km squares, the relative numbers of caribou taken in the Bathurst winter range are shown as coloured

squares. The map also shows radio-collar locations for Bathurst and Bluenose-East caribou.

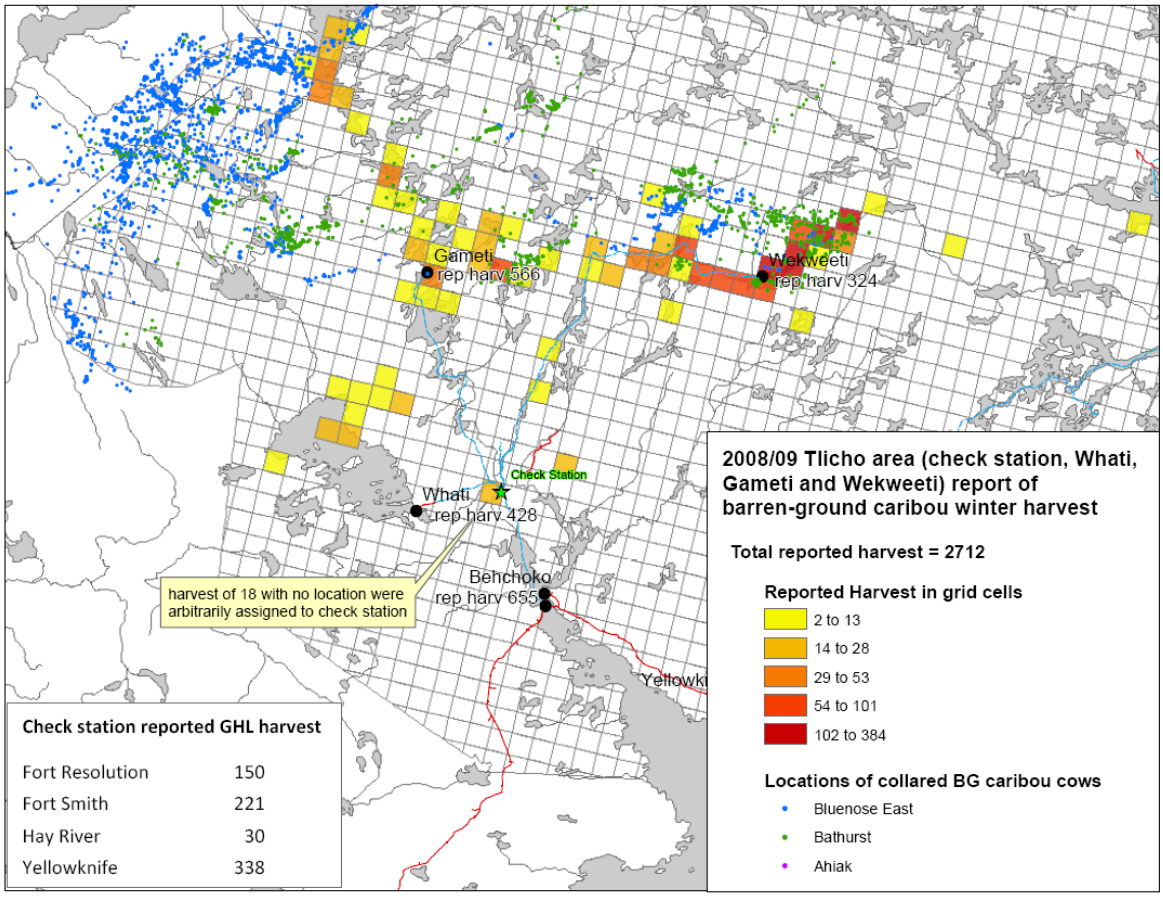

Figure 5.21b. Map showing harvest of caribou in winter 2008/2009 near Tlicho communities north of Yellowknife. The squares are 10x10km blocks and the colour scheme shows where greater and lesser numbers of caribou were taken. Blue dots are winter satellite collar locations of Bluenose-East caribou and green dots are Bathurst satellite collar locations.

The concentration of hunting along the roads to Gameti and Wekweeti is apparent, and matches accounts from hunters and wildlife officers who were in the area. The presence of winter roads that could be driven with pickup trucks meant that hunters from several communities, even south of Great Slave Lake, were able to access caribou from these roads. The reported harvest on the map was incomplete and the likeliest estimate of Bathurst caribou harvest in winter 2008-2009 was 4000-7000 caribou, most of them cows. While much of the decline of the Bathurst herd from peak numbers of about 470,000 in 1986 was likely the result of a natural cycle that has occurred many times previously, at lower numbers the harvest became an important driver in the

decline (Boulanger et al. 2011). Probably 80-90% of the harvest mortality from the Bathurst herd was associated either with winter roads or with a few trails such as the trail to Hottah Lake south of Great Bear Lake. As pickup trucks can carry many more caribou carcasses than skidoo toboggans, roads that can be driven by trucks enable a larger level of caribou harvest in a limited time and location compared to areas accessible only by long skidoo trips. Information from Yukon Environment indicates that about 75% of hunting mortality in the Porcupine herd is associated with the Dempster Highway. Before the Dempster Highway was built, hunting of Porcupine caribou was much more dispersed on the landscape as people hunted in traditional ways. Construction of the road concentrated the harvest to a high degree, much as it has with the Bathurst herd.

As shown in other maps in the 2009 ENR report, distribution of collared caribou on the winter range varies from year to year. Collared Bathurst caribou have generally wintered north of Yellowknife, but in some winters part of the herd has been southeast of Lutsel K'e and southeast of Great Slave Lake, and, in some winters, overlap with Bluenose-East collared caribou has been substantial. Due to this variability, predicting when Bathurst caribou (and caribou from other herds) will be accessible from particular winter roads is difficult. In recent years, caribou harvest from winter roads to the diamond mines has been limited, largely because caribou have not wintered near these roads in any numbers. However, any readily accessible road may make access to caribou easy if they choose to winter in that area.

Adamczewski, J.Z., J. Boulanger, B. Croft, B. Elkin, J. Nishi, A. Kelly, A. D'Hont, and C. Nicolson. 2009. Decline in the Bathurst caribou herd 2006-2009: a technical evaluation of field data and modeling (http://www.wrrb.ca/public-information/public-registry/).

Boulanger, J., A. Gunn, J. Adamczewski and B. Croft. 2011. Exploration of the decline of the Bathurst caribou herd using a data-driven demographic model. Journal of Wildlife Management 75: 883-896.

2. *Does ENR-GNWT agree with the developer's assessment of the Tibbett-Contwoyto road and the Gahcho Kue spur winter road as a secondary pathway given the herds are in the early stages of recovery and at low numbers?*

In the GNWT's evaluation, increased hunter access and harvest has the potential to be the single largest effect on the caribou of the additional road that will be built to the mine. Because the movements of the Bathurst herd and other caribou herds are unpredictable from year to year, the roads to the Gahcho Kue mine and other diamond mines may for some years have few or no caribou nearby, and hunting from these roads could be minimal for some time. However, if Bathurst caribou or caribou from the Beverly/Ahiak herd change their winter distribution in one winter and this change in

distribution results in large numbers of caribou becoming available from the road to Gahcho Kue, the caribou harvest could suddenly increase substantially. At present, the likelihood of large numbers of Bathurst caribou being taken from any of the roads north of Yellowknife is low, as all harvest except for 300 caribou/year is closed. The herd's relatively low numbers likely will mean that allowable harvest from this herd will remain far below 2008-2009 estimates for some time. The presence of multiple roads in the Bathurst caribou range means that harvest of this herd will need to be monitored and managed for the foreseeable future. The Developer's assessment is likely correct for the next few years, given that all Bathurst harvest is low and likely to remain low. However, the unpredictability of caribou movements from year to year means that the potential for increased hunter access from roads to this mine and other mines will remain for many years, and the possibility exists that this could be a serious effect.

3. What is the ENR-GNWT approach on monitoring and mitigation for access to hunting along the Tibbit-Contwoyto winter road and Gahcho Kue spur road if and when hunting restrictions are changed?

At present, hunting restrictions for the Bathurst herd limit the harvest to 300 caribou/year, with 150 caribou available (each) to the Tlicho and Yellowknives Dene First Nation. Changes to harvest management will not occur before the planned 2012 population survey for this herd, and changes to management of the herd will be determined via co-management processes. In the past, monitoring of caribou harvest conducted by ENR officers and, more recently, by community monitors requires regular travel on the land and in areas known to have caribou and hunters. The GNWT recommends that the regular monitoring on the Tibbit-Contwoyto winter road in the past be continued, that there be support (e.g. access to trailers) for traveling officers or community monitors, and that any observations of increased numbers of caribou or hunting from the road be reported promptly to ENR.