



MEMORANDUM

TO Rick Schryer - Fortune Minerals Limited

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CC Jen Gibson

FROM John Virgl, Damian Panayi, Cam Stevens

PROJECT No. 09-1373-1004.9600

**UNDERTAKING #3
DETERMINATION OF SIGNIFICANCE ON CARIBOU (AND OTHER WILDLIFE) ABUNDANCE AND
DISTRIBUTION, AND RELATED EFFECTS TO PEOPLE**

During Day 1 of the Technical Sessions for the NICO Project, the Mackenzie Valley Environmental Impact Review Board (MVEIRB) asked Fortune Minerals Limited (Fortune) to evaluate the likelihood of significance of effects from the NICO Project on caribou abundance and distribution from the five (5) pathways presented in Table 8.7-2 (see below).

Based on the effects analysis in Section 8.5 of the Developer's Assessment Report, the following assessment of environmental significance on caribou abundance and distribution, and related effects to people is provided. This assessment would also apply to the evaluation of significance on wildlife (Section 15), and the pathways described in Table 15.7-2 for determining effects to wildlife abundance and distribution, and related effects to people.

The results of the assessment predict that the incremental and cumulative impacts from the NICO Project and other developments should not significantly influence the population abundance and distribution of the Bathurst caribou herd. In other words, continued opportunities for traditional and non-traditional use of caribou should not be significantly affected with the application of the NICO Project to existing landscape conditions.

The magnitude for the 4 primary pathways impacting caribou abundance and distribution ranges from negligible to moderate, occurring at the local to beyond regional scales (Table 8.7-2). For the first pathway, the magnitude of the cumulative impact from direct habitat loss associated with the NICO Project and previous, existing, and reasonably foreseeable future developments is expected to be less than 1% of the winter range relative to reference conditions (no development). The relative amount of the cumulative decrease in quality habitats from reference conditions to the future case in the caribou study area is estimated to be about 6.1% (second pathway). The incremental impact from the NICO Project on direct and indirect habitat changes is less than 1% relative to 2010 baseline conditions. For the third pathway, the change in energy balance to female caribou from the NICO Project is predicted to decrease the fall calf:cow ratio by less than 1%, relative to a reference condition. Impacts on the abundance and distribution of the Bathurst caribou population from changes in habitat quality, movement, behaviour, energy balance, and calf production from NICO Project activities are expected to be reversible within 5 to 10 years following closure (long-term duration). These 3 pathways are predicted to not have significant adverse effects on caribou abundance and distribution.

The magnitude of the impact from increased access (fourth pathway) is anticipated to be moderate and occur periodically because the distribution of caribou within the winter range can change from year to year, and animals may not be present near the NICO Project Access Road (NPAR) each year (Table 8.7-2). Interviews with community members from Whatl for the Traditional Land Use Study indicated that caribou hunting has



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historically occurred within the regional study area, which includes the area around the proposed NPAR. Gamèti interview participants indicated that people might still hunt caribou in the NICO Project area when the NICO Project is completed. Snow machines and several existing winter roads, including the Tłìchq Winter Road, currently provide access to the region surrounding the NICO Project and a portion of the winter range of the Bathurst herd. Thus, the NPAR will likely increase the duration of access to the region, but is expected to result in a negligible increase in the geographic extent of access. Overall, the NPAR is predicted to result in a moderate increase in access and the number of animals harvested from the region relative to existing conditions, and should not significantly influence the abundance and distribution of caribou.

Changes to the abundance and distribution of the Bathurst caribou population from the NICO Project and other developments may negatively influence the traditional and non-traditional harvesting of caribou in the winter range, which represents the fifth pathway in Table 8.7-2. The predicted magnitude of the incremental decrease from the NICO Project on the amount of good and high quality habitat is less than 1% (pathways 1 and 2 above). Relative to reference conditions, cumulative impacts from the NICO Project and previous, existing, and reasonably foreseeable future developments are expected to reduce good and high quality caribou habitat by 6.1%. The distribution of caribou around the mine site and NPAR will change such that the probability of encountering a caribou will likely decrease within a zone of influence extending up to 15 km from the anticipated mine footprint, and up to 5 km from the NPAR. However, changes to local and regional distributions of caribou will be low in magnitude given that the NICO Project is located at the north-western edge of the historical winter range where caribou encounters with the NICO Project should be minimal. Similarly, the magnitude of the cumulative impact from human-related disturbance events on calf recruitment is predicted to be low (third pathway). Therefore, the magnitude of changes to the harvesting potential of caribou from the incremental and cumulative impacts from the NICO Project and other developments are expected to be low and moderate, respectively (Table 8.7-2). These changes should not significantly influence the continued opportunities for traditional and non-traditional use of caribou.

Overall, the weight of evidence from the analysis of the primary pathways predicts that the incremental and cumulative impacts from the NICO Project and other developments should not have a significant adverse impact on the abundance and distribution of the Bathurst caribou population. Subsequently, cumulative impacts from development should not significantly influence the continued opportunities for the use of caribou by people that value these animals as part of their culture and livelihood. Confidence in these predictions is based on the consistent low effect sizes (i.e., magnitudes of change) that were determined from the incremental and cumulative effects analyses for habitat quantity and quality, and energy balance. Where uncertainty existed, model parameters were typically overestimated so that effects would not be less than anticipated. For example, the fragmentation analysis was completed on the NICO Project Lease Boundary, which is about 4 times larger than the anticipated NICO Project footprint. The habitat quality model contained conservative estimates for the spatial and temporal extent of zone of influence from development to increase confidence that the assessment would not underestimate impacts. The energy balance model assumed that individuals did not compensate for weight loss by increasing quality food intake following a disturbance event and did not become habituated to similar disturbances. A recent review by Adamczewski et al. (2009) also indicates that effects from the mines are limited and unlikely a major contributing factor in the decline of the Bathurst caribou herd relative to other environmental variables.



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Literature Cited

Adamczewski, J., J. Boulanger, B. Croft, D. Cluff, B. Elkin, J. Nishi, A. Kelly, A. D'Hont, and C. Nicholson. 2009. Decline in the Bathurst caribou herd 2006-2009: a technical evaluation of field data and modelling (DRAFT). Technical Report. Yellowknife, NWT. 105 p.



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Table 8.7-2: Summary of Residual Impact Classification of Primary Pathways for Incremental and Cumulative Effects on Abundance and Distribution of the Bathurst Caribou Population and Related Effects to People

Pathway	Direction	Magnitude		Geographic Extent		Duration	Frequency	Reversibility	Likelihood
		Incremental	Cumulative	Incremental	Cumulative				
Physical footprint decreases habitat quantity and causes fragmentation	negative	negligible	negligible	local	beyond regional	long-term to permanent	continuous	reversible to irreversible	highly likely
Sensory effects (e.g., noise, presence, lights, smells) changes the amount of different quality habitats, and alters movement and behaviour of caribou	negative	negligible	low	regional	beyond regional	long-term	isolated or periodic (construction) to continuous	reversible	highly likely
Change in energetic costs from disturbance and displacement, which can influence survival and reproduction	negative	negligible	low	regional	beyond regional	long-term	continuous	reversible	likely
Improved access for harvesting can affect caribou population sizes	negative	low to moderate	low to moderate	regional	beyond regional	permanent	periodic	irreversible	likely
Effects on population size and distribution changes the availability of caribou for traditional and non-traditional use	negative	low	moderate	regional	beyond regional	long-term	continuous	reversible	likely

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