JAY PROJECT

DENINU KUE FIRST NATION

TECHNICAL REPORT RESPONSES

August 2015

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Abbreviations

Abbreviation	Definition
AQEMMP	Air Quality and Emissions Monitoring and Management Plan
DAR	Developer's Assessment Report
DKFN	Deninu Kue First Nation
Dominion Diamond	Dominion Diamond Ekati Corporation
IR	information request
MVEIRB	Mackenzie Valley Environmental Impact Review Board
Project	Jay Project
TSP	total suspended particulate

1 INTRODUCTION

Dominion Diamond submitted a Developer's Assessment Report (DAR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) in November 2014. Following completion of the DAR, Dominion Diamond submitted Round 1 and Round 2 information request responses (April 7, 2015 and July 3, 2015, respectively), and attended Technical Sessions hosted by MVEIRB in Yellowknife between April 21 and 24, 2015, to address regulator and parties' questions and concerns in regard to the Jay Project (Project) and the DAR.

On July 31, 2015, Deninu Kue First Nation (DKFN) submitted their technical report to MVEIRB for the Project outlining recommendations on remaining topics of concern. This report provides responses to those recommendations outlined in the DKFN technical report (DKFN 2015), with the intent of clarifying these remaining topics as the Project moves into the MVEIRB Hearings Phase.

2 RECOMMENDATION AND RESPONSE

2.1 Bathurst Caribou Herd

2.1.1 Recommendation 1: Self-sustaining and Ecologically Effective Caribou Populations

We are concerned in the way that Dominion Diamond has used the assessment endpoint and has carried it forward into the determination of significance. Dominion Diamond considered an effect to be Not significant when impacts were measurable at the individual level, and strong enough to be detectable at the population level, but were not likely to decrease resilience and increase the risk to a self-sustaining and ecologically effective caribou population. An effect was considered Significant when impacts were measurable at the population level, and were likely to decrease resilience and increase the risk to the maintenance of a self-sustaining and ecologically effective caribou population. A significant effect may also result from habitat loss and fragmentation that reduces migratory or seasonal range movements to the point that it disrupts (breaks} population connectivity. Also, a significant effect would be considered when the loss of habitat resulting from a project causes permanent adverse changes to survival or reproduction at the population level.

Dominion Diamond has determined that the Jay Project should not have a significant influence on the ability of the Bathurst caribou herd to be self-sustaining and ecologically effective, as per the definition of an effect that is Not significant, and the Jay Project is not likely to decrease the resilience of the Bathurst caribou herd. Further, in consideration of the definitions used for a Not significant and Significant effect, it can be argued that the resilience of the Bathurst caribou herd is already at a compromised state. When herds are declining or at low numbers they are less resilient to environmental change and hunter harvest than when herds are increasing or at high numbers (Environment and Natural Resources 2015). For caribou, ecological resilience is measured by the amount of disturbance that is absorbed before an individual or herd changes behavior. Considering human-caribou interactions, the concept of resilience also applies to the ability of social and cultural systems to build and increase the capacity for learning and adaptation by people. Resilience in social and cultural systems, and ultimately well-being, is closely tied to the concept of sustainability and the challenge of meeting current demands without degrading the potential to meet future requirements, to sustain and enhance the capacity of social and cultural systems to adapt to change (Gunn et al. 2010). The relationship between Aboriginal peoples well-being and barren-ground caribou is paramount in this concept of resilience.

As mentioned above, it can be argued that the Bathurst caribou herd is currently not self-sustaining or ecologically effective; although, it is unclear if recent populations declines are within the range of natural variability and more information is required. Regardless, the current state of the Bathurst caribou herd has caused heightened sensitivities by Aboriginal people around the species and any impact whether identified as significant or not in the environmental assessment review process is not an acceptable level of change. Until more information known about the current state of the Bathurst caribou herd development should only proceed at a precautionary level.

2.1.2 Response 1

In adopting the assessment endpoint of self-sustainability and ecological effectiveness, Dominion Diamond based its assessment of the effects of the Project on barren-ground caribou on sound ecological

principles. The resulting determination of non-significance is supported by the assessment. In the DAR, all factors related to the effects of the Project and other developments on the Bathurst herd were formally assessed and considered before arriving at the determination of significance. Further, at MVEIRB's request, the effects of the Project were incorporated into a population model created for the Bathurst herd (Adequacy Review Item 8.8 response DAR-MVEIRB-15). The population model parameters were selected to examine the maximum potential effects of all human-related development on the Bathurst herd. Despite the application of maximum effects, the conclusion of the population modelling was that additional energetic costs from changes in movement and behaviour associated with the Project and other developments were not expected to decrease population resilience and increase the risk to the viability of the Bathurst herd at any phase of the population cycle. The negative trend in Bathurst herd population growth associated with the current estimates of vital rates for reference conditions were predicted to be similar with and without the development-related cumulative changes in habitat quantity and quality, and caribou behaviour and energetics. That finding was consistent with Adamczewski et al. (2009) who indicated that effects from the previous and existing mines are limited and unlikely a major contributing factor in the recent decline of the Bathurst caribou herd.

As discussed in the Round 2 information request (IR) response DAR-MVEIRB-IR2-03, with respect to human-caribou interactions, the analysis in DAR Section 15 predicted that the incremental and cumulative changes to measurement indicators from the Project and other developments would not result in a significant effect to continued opportunities to participate in traditional wildlife harvesting. In assessing the incremental and cumulative effects from the Project and other developments on the continued opportunities for traditional use of caribou, the DAR considered the evidence that the population of barren-ground caribou herds changes greatly over decades of time. The effects from development on traditional use of caribou was assessed while also considering the natural processes that affect the availability (abundance, distribution, and access) of animals.

Natural cycles in the abundance and distribution of caribou populations have been reported in several Traditional Knowledge and scientific studies (Thorpe 2000; Zalatan et al. 2006; Sandlos 2007; Bergerud et al. 2008; Adamczewski et al. 2009; Boulanger et al. 2011; Festa-Bianchet et al. 2011). Previous historic periods of low Bathurst numbers occurred when there were no mines, and the Ahiak and Blue-nose East herds have declined rapidly between 2000 and 2006 without the influence of mining (Adamczewski et al. 2009). A large part of the Bathurst herd's decline (and other barren-ground populations) is the result of a natural demographic cycle reflecting large-scale weather patterns and natural factors including predation and harvest (Adamczewski et al. 2009; Boulanger et al. 2011; Festa-Bianchet et al. 2011). The relative contribution of the Jay Project, an expansion in an already disturbed area that is largely within an existing zone of influence, to the residual effects on caribou is expected to be small. The natural decline of the Bathurst caribou herd since the 1990s may be considered or perceived as statistically, ecologically, and culturally significant. However, the weight of evidence in the DAR and additional analyses provided in adequacy review and information request responses indicates that previous and existing developments had little measurable effects on caribou survival and fecundity, and no significant contribution to the decline.

Opportunities to harvest Bathurst caribou and other herds have traditionally been subject to the fluctuating availability of animals based on the phase of the population cycle (Festa-Bianchet et al. 2011). The current low population level of the Bathurst herd, as with historic low population levels, have always affected the amount of sustainable harvest from the population. As well, harvest opportunities and ability

have been and will continue to be influenced by the number of hunters, a shift to wage-earning, and changing technologies for hunting (e.g., snowmobiles, all-terrain vehicles, aircraft, winter roads, and rapid communications). Threats to caribou abundance and distribution, and sustainable harvest of animals (self-sustaining and ecologically effective populations) can occur when changes in hunting technologies adversely alter the relationship between harvest rate and animal abundance, or the population is currently in decline from other factors (Boulanger et al. 2011; Festa-Bianchet et al. 2011).

The analyses in the DAR, and the additional analysis completed in the adequacy review and information requests provides a comprehensive assessment of the Project-specific and cumulative effects of development on ecological and societal values of barren-ground caribou. The weight of evidence indicates that the incremental and cumulative effects from the Jay Project and previous, existing, and future developments (including Sable, Diavik A21, and Jay underground) do not significantly influence the ability of caribou to be self-sustaining and ecologically effective, or provide continued opportunities to participate in traditional wildlife harvesting.

2.2 Air Quality

2.2.1 Recommendation 2: Compliance with Applicable Regulatory Ambient Air Quality Standards (AAQS) and Objectives

In the conceptual Air Quality and Emission Monitoring and Management Plan (AQEMMP) for the Jay Project, the fifth objective is to provide data including dust deposition to evaluate effects to aquatic and terrestrial ecological receptors. To address this objective an adequate amount of monitoring stations located in appropriate locations around the Jay Project area must be employed. The current plan is to have one monitoring station east of the Jay Pit - conceptual designs place this monitoring location on one of the small islands in Lac de Sauvage. Additionally, a transect for dustfall, lichen and snow chemistry is proposed for the Jay Road. To improve the integrity of the monitoring program, we recommend that the monitoring transect along the Jay Road be placed so that the monitoring stations correspond with potential caribou crossing locations. We also recommend that TSP monitoring also be conducted along the esker that lies adjacent to the waste rock storage pile and on the east side of Lac de Sauvage.

2.2.2 Response 2

The monitoring transect proposed along the Jay Road in the Conceptual Air Quality and Emissions Monitoring and Management Plan (AQEMMP) will be designed and sited to optimize the potential to monitor elevated concentrations and deposition rates, and to capture the potential effects from the Jay Road and the Jay Pit. As described in the responses to information requests, much of the main section of the Jay Road (i.e., roughly between King Pond Dam and the approach to the active operations area at Lac du Sauvage) will be constructed with frequent and wide caribou crossings to allow for caribou movement. It also may be important to consider siting the lichen stations in particular some distance from a well-established caribou crossing area, so that the supply of lichen needed to facilitate the monitoring program is not consumed.

The location of the total suspended particulate (TSP) monitoring that has been conceptually proposed for the east side of the Jay Pit is subject to ongoing evaluation and engagement. It may be the case that the engagement process leads to installing the station on the west side of the Jay Pit, but still in an area of higher predicted concentrations. Siting the station needs to consider the following:

- dispersion modelling results (areas of predicted higher concentrations);
- wind speed and wind direction;
- proximity to sensitive receptors (potentially including the esker);
- year-round access; and,
- power supply.

As described in the Dominion Diamond's July 24, 2015 letter posted to the MVEIRB public registry regarding the Draft Engagement Program for Amendments to the Ekati Mine Wildlife and Air Monitoring and Management Plans to Incorporate the Jay Project, additional engagement on the AQEMMP (including station locations) will occur following the Environmental Assessment approval and prior to construction of the Project.

2.3 Conclusion

2.3.1 Recommendation 3: Degree of Conservatism

We want to acknowledge that Dominion Diamond has taken an overly conservative approach in its assessment of potential effects related to both the Bathurst Caribou herd and air quality. However, we want to caution Dominion Diamond in taking this approach as a high degree of conservatism can lead to a Type 1 error or reporting and effect that is not present. This in turn can lead to a Type 2 error or failing to detect and effect that is present. Understanding these types of error are particularly critical especially when dealing with a keystone species like the Bathurst caribou herd that is currently experiencing population declines. As such, the confidence of the effects assessment is called into question. If it is the intent of Dominion Diamonds to protect the Bathurst caribou herd, as is stated in its use of the assessment endpoints, then explicit actions are required to monitor the potential effects.

2.3.2 Response 3

Dominion Diamond agrees that the conservative approach taken in the assessment can lead to a Type I statistical error. A Type I statistical error occurs when there is no real effect but the assessment approach, analysis and results detects an effect. This is sometimes referred to as a false alarm; selection of conservative methods and confidence levels contribute to this result and can be part of a precautionary approach. The analyses in the DAR applied a conservative, precautionary approach to increase confidence that effects would not be underestimated. In other words, the approach used in the DAR and responses to the Adequacy Review and IRs was intended to avoid committing a Type II error, which can be considered to be more critical in matters of wildlife conservation. The results declared that there was an effect of the Project on barren-ground caribou and it is possible that a Type I error occurred. The consequence of the result was to take additional precautionary steps, including subsequent population modelling. Despite the conservative analyses, the magnitude of change was determined to be too small to have a significant effect on the ability of the Bathurst herd to be self-sustaining and ecologically effective.

As noted above, a Type I statistical error occurs when there is no real effect but an effect is detected by the method used. In contrast, a Type II statistical error occurs when there is a failure to detect a real

effect. That is, a Type II error is always associated with a failure to detect an effect (a false negative) while a Type I error is always associated with the detection of an effect (a false positive). Each assessment can only have one conclusion: either there is an effect or there is not. Both errors are not possible at the same time.

Monitoring for caribou is included in the Conceptual Wildlife Effects Monitoring Plan (WEMP) (Dominion Diamond 2015a) which also includes the Caribou Road Mitigation Plan (CRMP) as an appendix (Dominion Diamond 2015b).

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