

## **A case study on the use of on-site offsets to mitigate impacts to caribou from diamond mining in Canada's north**

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### **Introduction**

In February 2016, the Mackenzie Valley Environmental Impact Review Board (Review Board) completed its report of environmental assessment and reasons for decision for a proposed diamond mine expansion. A key issue in the environmental assessment was the cumulative impacts of continued mining and road expansion from the project within a critical migration corridor of the Bathurst caribou herd. In addition to direct and indirect impacts to caribou, Indigenous communities who rely on caribou for food and as part of their traditional lifestyle, expressed serious concern that the expansion would erode their way of life and ties to the land.

In its report, the Review Board determined that the project is likely to cause significant adverse project-specific and cumulative impacts on the Bathurst caribou herd. In addition, the Review Board concluded that the mine development would prolong significant impacts to Indigenous culture and traditional way of life by de-valuing the area for traditional uses, leading to the loss of cultural sharing between generations.

In order to address these residual impacts and allow the project to proceed, the Review Board recommended specific offsetting measures at other locations around the mine to achieve net neutral impacts to caribou. In the Review Board's view, these on-site offsets would reduce existing impacts on caribou and the traditional Indigenous lifestyle based on caribou so that the cumulative impacts of the proposed expansion project were no longer significant.

### **Description of the proposed mine expansion**

The Jay Project is an expansion of the existing Ekati diamond mine, located 300 km northeast of Yellowknife, near Lac de Gras in Canada's Northwest Territories. The Ekati diamond mine has been in operation since 1998 and consists of multiple open pits, and various related infrastructure including waste rock piles and roads. In 2013, the mine owners proposed a new open pit mine 30 kilometers from the main Ekati mine site in order to continue supplying the mill with ore for an additional ten years or more.<sup>i</sup> The project includes the construction of a new road to the Jay open pit and continued use of an existing access road to transport ore to the mill site.

### **The project crosses a critical migration corridor of the Bathurst caribou herd**

The Jay Project and Ekati Mine are located in an arctic tundra landscape with no trees and little relief. Lakes account for about 30% of the landscape and ridges known as eskers are a dominant

terrestrial feature. Barren-ground caribou migrate hundreds of kilometers through this area twice a year using eskers and spaces between lakes, or “Tataá” in the Tlicho language, as movement corridors.<sup>ii</sup>

The proposed mine expansion and associated road network crosses a critical migration corridor for the Bathurst caribou herd along an esker travel route at a narrow area between two lakes. There are other mining operations along the herd’s migration route and cumulative impacts from the Jay open pit and road will increase partial barrier impacts to caribou movement. Large mine haul trucks will pass along the Jay road an average of once every 5 minutes.

### **Bathurst caribou population continues to decline**

The population of the Bathurst caribou herd has declined by more than 90% from its historical high of over 400,000 in 1986<sup>iii</sup>. Recent photo survey results from the calving grounds indicate a continuing declining trend from an estimated total population of 35,000 animals in 2012 to between 16,000 and 22,000 in 2015. According to the Government of the Northwest Territories, this decline is “extremely worrisome”, given that surveys also indicate a 50% decline in breeding females over those same three years<sup>iv</sup>. This continued decline is occurring despite a harvesting ban since 2009 along with incentives to harvest caribou predators.

### **The mine developer commits to mitigate impacts on caribou**

During the course of the environmental assessment, project-specific and cumulative impacts to caribou emerged as the key issue to Indigenous groups, regulators and other organizations. In order to address these concerns, the developer proposed a suite of mitigations that, in its view, would reduce residual impacts to caribou so that they were no longer significant.

Specifically, a Caribou Road Mitigation Plan was prepared by the developer to; minimize the risk of caribou mortality from traffic; minimize barrier effects of vehicle use of the road to caribou movement and migration; and, limit the effects of sensory disturbance from roads and traffic on caribou health and behaviour.<sup>v</sup>

### **Parties advise the Review Board that residual impacts to caribou are significant**

The Review Board held public hearings for the Jay Project in Yellowknife and in three Indigenous communities directly affected by the mine expansion in order to hear the public’s views on the impacts of the project on caribou, and on the traditional Indigenous lifestyle related to caribou. During the public hearings, the Review Board heard that impacts on caribou from existing mining development on the herd’s range are already significant, and that the Jay Project expansion would add to those impacts.

Parties also observed that there was uncertainty in predicting project impacts on caribou as well as a lack of detail on how proposed caribou monitoring would detect those impacts and trigger appropriate and effective management actions. Parties described specific ways that construction and operation of the Jay Project could impact caribou including: dust from trucks degrading the

smell and taste of caribou forage; visual and acoustic disturbances from road traffic creating a partial barrier to caribou migration and energy losses resulting in reduced pregnancy success<sup>vi vii</sup>.

Parties advised the Review Board that these potential impacts would likely pass the threshold for significance due to the already vulnerable state of the caribou herd at a time of declining population trend.

### **Indigenous communities contend that adverse impacts to well-being and traditional way of life are significant**

During public hearings in Indigenous communities, people told the Review Board that the decline in caribou numbers has occurred over the same two decade time period that the Ekati mine and other developments have been in operation. Extremely low and declining caribou numbers has resulted in reduced traditional harvesting and less time spent on the land by Indigenous people. This has resulted in a significant loss of cultural experience and knowledge transfer in the area for an entire generation. Indigenous people stated that this mine expansion will continue to degrade the value of the area for harvesting and continue to discourage traditional use of the land during the operational life of the mine expansion<sup>viii</sup>. In the view of members of Indigenous communities, any activity that inhibits the recovery of caribou, prevents traditional harvesting of caribou, and limits the transfer of intergenerational cultural knowledge and on the land experience is significant<sup>ix</sup>.

### **Public hearings and follow-up compensatory mitigation meetings**

During public hearings held by the Review Board, it was clear that Indigenous communities and other organizations did not agree that the developer's proposed mitigations would be sufficient to mitigate adverse impacts to caribou from the project. The developer proactively addressed this shortcoming by hosting a meeting following the public hearings with all parties to address the insufficiency of the proposed caribou mitigations. The purpose of the meeting was to find ways to positively compensate for or "offset" impacts from the mine expansion on caribou. As a result of the meeting, the developer submitted a plan for additional compensation (offsetting) beyond what could be achieved through standard mitigation techniques<sup>x</sup>.

### **Review Board finds that project-specific and cumulative impacts on caribou and Indigenous use of caribou are significant**

The Review Board's findings were based on both written evidence on the public record and on testimony presented during public hearings in the communities. In its February 2016 *Report of Environmental Assessment and Reasons for Decision*, the Review Board determined that the Jay Project is likely to cause significant adverse project-specific and cumulative impacts to the Bathurst caribou herd because:

1. The mine expansion is located at a critical migration corridor during a time when herd numbers are declining;
2. Existing cumulative impacts on the caribou herd are already significant and Jay Project impacts are additional stressors;

3. The new roads, powerlines and pipelines create physical barriers to caribou movement along their migration corridor, in addition to sensory disturbance from lights, smells, dust and noise; and
4. Cumulative effects on the caribou herd and its range that inhibit the ability of the Bathurst herd to recover, will adversely affect the well-being, health and culture of Indigenous communities <sup>xi</sup>.

### **Why the Review Board recommended offsetting measures**

Mitigation measures proposed by the developer were not sufficient in the Board’s view to reduce the impacts of the project on caribou below the significance threshold. Additional actions to reduce residual impacts were thus required. The purpose of offsets is to reduce the impacts from the mine expansion on caribou to a neutral or even positive degree, so that the Bathurst caribou herd would at least be no worse off if the project were to proceed. Implementation of additional actions, such as offsets, is intended to compensate for residual effects that cannot be addressed through other forms of mitigation alone.

### **The Review Board’s novel and creative approach: on-site offsets**

The Review Board’s solution to mitigating impacts on caribou and Indigenous way of life was to incorporate on-site offsetting measures. On-site offsets are actions taken to set aside areas of the project footprint that result in an overall net neutral or positive effect.

In this case study, offsets had to be developed in a way that caribou and Indigenous uses of caribou would directly benefit from the development. This is consistent with the concept of “like for like” in ecological function expectations as described by Australian environmental assessment practitioners on the effectiveness of offsetting<sup>xii</sup>. For this reason, financial compensation offsets unrelated to caribou or human use of caribou, were not acceptable. Similarly, impact offsetting was necessary near the location of the residual impact in order to achieve a net neutral effect on caribou and human use of caribou as close as possible to any predicted adverse effects.

Determining the effectiveness of impact offsetting can be a challenge. The results of offsets need to be measurable so that their effectiveness in mitigating adverse residual impacts during the operational phase of a project can be evaluated. The Review Board recognized this challenge, given that offsetting terrestrial impacts had no precedent in the Northwest Territories.

Due to the critical importance of caribou to the Northwest Territories and to Indigenous communities that rely on them, the Review Board recommended the following offsetting actions at the Jay Project to ensure that net impacts on caribou from the mine expansion were neutral:

- Accelerate progressive reclamation at the existing mine tailings pond.
- Construct caribou access and egress ramps on existing waste rock storage areas at the main Ekati site, as part of progressive reclamation.
- Incorporate options for scheduling of other Ekati mine operations during caribou migration periods.

- Indigenous elders group to advise on construction and operation of the Jay road esker crossing and waste rock pile egress ramps for caribou.
- Construct and operate an on-the-land culture camp in a traditionally-used area near the mine expansion in order to maintain traditional Indigenous uses of the land and to transfer that knowledge between generations.
- Determine and implement a methodology to measure offsets so that a net neutral or positive impact on the caribou herd can be achieved.

## Conclusion

During the environmental assessment of the Ekati mine, the Review Board determined that significant adverse cumulative impacts to caribou and the Indigenous use of caribou were likely, and that residual impacts could not be mitigated below a significance threshold using standard mitigations proposed by the developer. The Review Board's novel and creative approach using offsets to achieve a net neutral effect on caribou and to Indigenous use of caribou and the surrounding landscape was achieved by recommending on-site offsetting actions that had tangible benefits for caribou habitat that would not otherwise have occurred. In addition, the construction and operation of a nearby culture camp intended to retain indigenous ties to the land will further offset project impacts and provide benefits to local Indigenous communities.

## References

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- <sup>i</sup> Mackenzie Valley Review Board, Report of Environmental Assessment and Reasons for Decision, Jay Project, 01-Feb-2016, pi-iii
- <sup>ii</sup> Tlicho Government Intervention, Jay Project, EA1314-01, 03-Aug-2015, pp5-6
- <sup>iii</sup> Deninu Kue First Nation, EA1314-01, Jay Project - intervention, 31-Jul-2015, pp2-3
- <sup>iv</sup> Government of the Northwest Territories, correspondence to the Review Board, 2015 Bathurst caribou herd survey results, 08-Sep-2015, pp1-2
- <sup>v</sup> Dominion Diamond, Caribou Road Mitigation Plan, in Appendix B of Conceptual Wildlife Effects Monitoring Plan for the Jay Project, 31-Jul-2015
- <sup>vi</sup> Independent Environmental Monitoring Agency Technical Report, EA1314-01, Jay Project, 31-Jul-2015, pp 2-12
- <sup>vii</sup> Tlicho Government Intervention, Jay Project, EA1314-01, 03-Aug-2015, pp4-10
- <sup>viii</sup> Yellowknives Dene First Nation, Jay Project, Technical Report, 03-Aug-2015, pp4-6
- <sup>ix</sup> Mackenzie Valley Review Board, Jay Project Hearing Transcripts, Lutsel K'e, 19-Sep-2015, p61
- <sup>x</sup> Dominion, Diamond, Caribou mitigation measures in Responses to Jay Project Hearing Undertakings, 09-Oct-2015, pp8-15
- <sup>xi</sup> Mackenzie Valley Review Board, *Report of Environmental Assessment and Reasons for Decision*, 01-Feb-2016, p81
- <sup>xiii</sup> Nicole Hayes & Angus Morrison-Saunders (2007) *Effectiveness of environmental offsets in environmental impact assessment: practitioner perspectives from Western Australia*, Impact Assessment and Project Appraisal, 25:3, 209-218