

JAY PROJECT INFORMATION REQUESTS DIRECTED TO THE AGENCY

Review Board IR #77

Topic: EA Approach-ToR s. 4.1 Significance determination factors; DAR s.6.2.2, Table 6.2-1 Assessment endpoints and measurement indicators; 6.7 Residual Impact Classification and Determination of Significance; 8.7.1.2 Determination of Significance (water quality); 9.1.3 Fish and Fish Habitat-VC

Comment: The developer has provided its framework for significance, in terms of assessment endpoints for the Key Lines of Inquiry (e.g., pg. 12-129 for caribou; pg. 8-4 and 8-448 for water quality; pg. 9-6 and table 9.1-2 for fish; 14-6 for community benefits and impacts). These are summarized in column 3 of Table 6.2-1 (pg. 6-8). This helps the Review Board to understand what is meant when the DAR describes the developer's views on the potential significance of project impacts.

Recommendation: To all parties: For each of the Key Lines of Inquiry (except Alternatives), please state your views on Dominion's choice of assessment endpoints for characterizing significant impacts.

Response:

The Agency does not have a mandate with regard to community benefits and impacts from the Jay Project, other than how environmental aspects may influence these matters. The Agency believes that other parties, in particular Aboriginal governments and the GNWT will be better positioned to respond to the Review Board on the matters of community benefits and impacts from the Jay Project.

As the Agency outlined in our Information Request #47 to DDEC, GNWT-ENR and Environment Canada, the Agency does not believe or support the endpoints as set out by DDEC in Table 6.2-1 and elsewhere in the Developer's Assessment Report. Our rationale was as follows:

Several of the valued components (Key Line of Inquiry/Subject of Note) analysed indicate they would be significant if the assessment end point is exceeded. "Results from the residual impact classification are then used to determine the environmental significance from the Project (and other developments) on assessment endpoints." (pg. 6-30). For wildlife and vegetation valued components, the following is described as the assessment endpoint: "Self-sustaining and ecologically effective populations (and communities)". Ecological well-being is an important indicator of the significance of environmental effects for these valued components. However, societal values should play an important role in determining significance of

environmental effects. For example, whether an environmental effect violates a law, whether it contradicts a management plan, program or policy for the valued component, or whether it conflicts with Aboriginal plans for use of the valued component for traditional purposes. These do not appear to have been considered in determining the significance of environmental effects for wildlife and vegetation valued components. For the record, the Agency believes that violations of laws or regulations caused by the project (alone or cumulatively) would be a strong indicator that the effect is significant. The Agency believes that contradicting an approved management plan, policy or program, or conflicting with Aboriginal plans for use of the valued component for traditional purposes would also be an indicator that the effect is significant.

DDEC did not respond to the Agency's IR #47 in its initial round of responses filed on March 20, 2015. In the absence of a response from DDEC, GNWT-ENR or Environment Canada, it is difficult for the Agency to recommend any further guidance to the Review Board on more appropriate significance endpoints.

The Agency has some specific observations on the measurement indicators and endpoints DDEC has chosen for the Key Lines of Inquiry as follows:

Water Quality and Quantity—The Agency was surprised to see that continued and future safe use of waters such as Lac de Sauvage and Lac de Gras for drinking water and domestic fisheries were not identified by DDEC as endpoints for water quality. CCME and Health Canada have developed measurement indicators for safe water.

Fish and Fish Habitat—The Agency recommends that DDEC should include parasite infestation rates and other health indices as measurement indicators in its assessment of Jay Project effects on fish and fish habitat.

Caribou—The Agency also recommends that DDEC include safety of caribou for human consumption and continued ability of Aboriginal communities to sustainably harvest caribou as endpoints. Measurement indicators for these endpoints should be available from Health Canada for caribou consumption and for sustainable harvest from GNWT-ENR and the Wek'eezhii Renewable Resources Board as part of the overall Bathurst caribou herd management.

Excerpt from Table 6.2-1 Assessment Endpoints and Measurement Indicators Associated with Valued Components, Key Lines of Inquiry, and Subjects of Note

KLOI: Water Quality and Quantity

Valued Components

Groundwater(a)

Surface hydrology(a)

Surface water quality

Assessment Endpoints

- Suitability of surface water quality for healthy and sustainable ecosystems

Measurement Indicators

- Groundwater levels and flow rates
- Spatial and temporal distribution of groundwater
- Concentrations of physical analytes (e.g., pH, conductivity)
- Concentrations of major ions and nutrients
- Concentrations of total and dissolved metals
- Lake water levels and outflow discharge rates
- Stream channel parameters (e.g., channel depths, widths) and shoreline integrity
- Basin water yields
- In situ water quality parameters (e.g., temperature, dissolved oxygen, pH, conductivity)
- Major ions, suspended solids, nutrients, and metals in water
- Distribution of particle size in surficial sediment
- Nutrients and metals in sediment

KLOI: Fish and Fish Habitat

Valued Components

Aquatic life other than fish(a)

Arctic Grayling

Lake Trout

Lake Whitefish

Assessment Endpoints

- Self-sustaining and ecologically effective fish populations

Measurement Indicators

- Ongoing fisheries productivity
- Concentrations of chlorophyll *a*, nutrients
- Phytoplankton species composition, abundance, and biomass
- Zooplankton species composition, abundance, and biomass
- Benthic invertebrate species composition, richness, abundance, and biomass
- Habitat quantity (includes surface hydrology and water quality indicators)
- Habitat arrangement and connectivity (fragmentation)
- Habitat quality (includes surface hydrology and water quality indicators)
- Survival and reproduction
- Abundance and distribution of fish

KLOI: Caribou

Valued Components

Caribou

Assessment Endpoints

- Self-sustaining and ecologically effective caribou populations

Measurement Indicators

- Habitat quantity
- Habitat arrangement and connectivity (fragmentation)
- Habitat quality (occupancy, movement, and behaviour)
- Survival and reproduction

- Abundance and distribution of caribou

a) No assessment endpoint because the VC represents measurement indicators and pathways to other VCs with assessment endpoints.

b) Determination of significance from the Project on assessment endpoints is completed in applicable KLOIs.

KLOI = Key Line of Inquiry; VC = valued component; e.g. = for example.

Review Board IR #103

Topic: Caribou Section 12.7; Table 1.2-1 Adaptive management

Comment: Table 1.2-1 lists six adaptive management actions but no details on the relationship between monitoring and decisions about mitigation. Five listed actions refer to mitigation for roads and caribou. The DAR states the Ekati Mine Wildlife Effects Monitoring Program is designed to provide evidence for adaptive management. IEMA's mandate includes overseeing wildlife monitoring at Ekati.

Recommendation: To IEMA: Please provide information on whether and how IEMA has documented how monitoring led to changes in mitigation (such as changes in method, reduction or intensification) for the effects of roads on caribou and habitat (including dustfall) at Ekati. Based on these findings please provide specific steps to improve adaptive management for improving crossing of roads by caribou.

Response:

Introduction

The Agency does not possess detailed knowledge of how the company's wildlife monitoring programs and results have fed into improved mitigation through adaptive management. Some of these matters would be better directed to the company itself.

The Agency has been pushing the company for many years to develop an up-to-date Ekati Wildlife Management Plan that should document its adaptive management system for wildlife at the site, and in particular, mitigation for caribou. The Agency has consistently raised this issue in the context of our Annual Report (for example see our [2010-11 Annual Report](#) page 28-29), through comments provided during the three-year [Environmental Impact Reports](#) and during the recent diamond mine wildlife monitoring program review 2007-10 (for example, see the Agency's [April 14 2011 letter to BHPB](#)).

Part of the reason why there has not been an explicit link between wildlife monitoring and adaptive management is the absence of a defined process for formally reviewing the company's wildlife monitoring program and management. There is a formal process in place for the regular review of the Ekati aquatic effects monitoring program through the water licence, and the current requirement for an [Aquatic Response Framework](#)

(which is still under development). Although both the company and GNWT committed to a regular review of wildlife monitoring and management in response to an Agency recommendation in 2011 (see the Agency's [2010-11 Annual Report](#) page 2), this has not happened in practice. The Agency itself issued a Jay Project Information Request (#26) for an updated Wildlife Management Plan to better understand lessons learned from wildlife monitoring and how that has been used to better mitigate effects on wildlife.

Adaptive Management Actions

All of the “adaptive management actions” listed in Table 1.2-1 took place in the late 1990s to mid-2000s at or very soon after initiation of operation of the mine and construction of the Misery Road. Not all management actions were technically management responses to monitoring.

Inuksuits

Inuksuits were installed in response to concerns from Elders from Kugluktuk that caribou could be at risk in areas of the mine site. Kugluktuk Elders and the Agency recommended that there be monitoring of the effectiveness of the Inuksuits (see Agency [Annual Report 2007-08](#) pages 31 and 32) but the Agency is not aware of any efforts to conduct this monitoring. The Agency suggested that motion-activated cameras might be used as a means to measure effectiveness.

Caribou Road Crossings

Caribou crossing structures (ramps; areas of low roadside angles and fine top-covers) were constructed and signage placed along the Misery Road in response to observations of caribou crossing at specific locations and were modified based on input from Elders. The Agency does not have any information related to the effectiveness of such crossings or how they were originally located. The camera studies undertaken in from 2011 to date are interesting in terms of beginning to understand the potential barrier effects of site roads. However, the limitations in terms of the field of view and interpretation of caribou behaviour and the company's erroneous conclusions has led the Agency to call for a better monitoring design ([6 January 2015 Agency letter to DDEC](#)).

Speed Limits and Use of Radios

The use of radios to alert drivers to the presence of caribou on or near the road would presumably have followed closely after initiation of commercial ore production on haul roads. Speed limits to enhance wildlife safety and reduce dust would have been in place at the initiation of mining. The BHP Wildlife Effects Monitoring Plan (2000) mentions speed limits and spot-checking of traffic for compliance (pg. 5). However, the

Agency raised the issue of the need for a comprehensive Traffic Management Plan during the Lynx Project and in our [2013-14 Annual Report](#) (pg. 3 and 29). The Agency is not aware of such a Plan or any measures that the company has undertaken to monitor the effectiveness of its mitigation measures in terms of site traffic other regular reporting of vehicle collisions with wildlife, in the annual Wildlife Effects Monitoring Program reports.

Steps to Improve Adaptive Management for Caribou Crossings of Roads at Ekati

Following are suggestions to improve adaptive management for improving crossing of roads by caribou:

1. Ekati has been documenting caribou sightings along the Misery Road for years. Although “results indicate a positive association between crossing events and the presence of these ramps” (*ERM Rescan. 2014. Ekati Diamond Mine: 2013 WEMP Addendum — Wildlife Camera Monitoring Summary Report. Prepared for Dominion Diamond Ekati Corporation by ERM Rescan: Yellowknife, Northwest Territories. pg 4-2*), a quantitative assessment of crossing ramp locations and frequency should be conducted to determine if current caribou crossing ramps are in optimum locations to reduce the filter effect of the road. This should be conducted for the Misery, Sable and Pigeon roads and applicable access roads near the main camp. This is especially important in light of recent realignments to portions of the Misery Road and the addition of the Misery Road power line. Air photo interpretation to determine pre-mine and post-mine caribou trails may also prove of some assistance in understanding the effectiveness of the caribou crossings and placement of additional or future crossings.
2. The inconsistency in estimated deflection rates between 10 years of snow tracking results (2002-2011; 55-60% deflection rate) and the 2011-13 camera study (1-2% deflection rate) provides great uncertainty in monitoring and if and how this may lead to intensification of mitigation. Environmental staff should be used in a monitoring/observation program when caribou are present in the mine area to verify the efficacy of the camera study design to accurately detect deflections and determine the fate of caribou groups approaching the Misery and Sable/Pigeon roads. Correlations with traffic volume, the effectiveness of convoys, and other mitigation measures should be considered. This will require accurate records of traffic counts along the Misery Road.
3. The current proposed mitigation measures for caribou crossings of the Misery Road “Modified traffic patterns and road closures will be used as necessary to mitigate barrier effects to caribou” (pg 12-97) do not provide details nor assurance that deflections will be minimized. The company should develop tiered or hierarchical responses based on distance from road, group size,

season, and group composition, and monitor the effectiveness of this tiered approach to reducing deflection rates by caribou. For example, mitigation responses would presumably be heightened when large groups of cows and calves are observed during July (post-calving) approaching or within 500 m of the roads, compared with scattered groups of bulls at greater distances from the roads in October. This will require environmental monitoring above and beyond cameras. This point ties back of the need for a comprehensive Traffic Management Plan as discussed above.

4. The Ekati Wildlife Management Plan (WMP) should provide details on monitoring and mitigation programs for wildlife management on mine property, particularly after more than 15 years of wildlife monitoring. The last version of this document was from 2002 and therefore is out of date with current best practices for management of wildlife interactions at site. An updated WMP should be developed to detail monitoring and a hierarchical classification of mitigation (addressing mitigation through avoidance, minimizing, or compensation), including the linkage through adaptive management. An updated WMP should also describe how wildlife monitoring program results will be used to improve mitigation in an adaptive management approach, much like what the company is required to do with the Aquatic Response Framework.
5. The impact of the Misery power line on caribou crossings is predicted by DDEC to be inconsequential, but no specific programs are in place to monitor the addition of the power line to the existing road and traffic disturbance. Since no portions of the Misery power line will be buried and the power line will parallel essentially all of the Jay Project roads, separating the influences of the physical road structure, traffic, and the power line is difficult. The Agency has suggested a number of means of attempting to monitor the post-construction effects of the Misery power line in a [August 1, 2014 letter](#) and [submission](#) (see comments 4, 5 and 7) to the Wek'eezhii Land and Water Board.
6. A structured design should be considered to test the effectiveness of dust suppression methods (see the [Agency's 18 July 2014 letter to DDEC](#)). This could include use of different substances (e.g., water, DL-10, Dust-Stop) and application frequencies (especially as related to watering) along sections of the road, with concomitant dustfall measurement. Evaluation of the effectiveness of the dust suppression could then feed back into altered or enhanced mitigation practices to reduce dustfall resulting from the road networks. Such monitoring should be designed to provide live real-time results using partisol samplers rather than less responsive dustfall collectors. A Best Management Practices document might also be helpful and the Agency presented such information to the company in a [presentation](#) at a December 2014 workshop. It should be noted that, should control of dust be demonstrated to be effective, the practices could

be applied elsewhere (e.g., other mines or roads) and it could become a good cumulative effects management practice.