

Date: January 31, 2005.

To: Tony Pearse, T.D. Pearse Resource Consulting

From: Colin Macdonald, Ph.D., Northern Environmental Consulting

Re: Review of The Snap Lake Wildlife Environmental Monitoring Plan (WEMP) and associated documents

Listed below are some comments regarding the monitoring and assessment of effects to the terrestrial wildlife at the Snap Lake Diamond Project (SNDP). For background, I reviewed documents from the Mackenzie Valley Land and Water Board site relating to the SNDP land and water permits and SNDP documents from the Mackenzie Valley Environmental Impact Review Board (MVEIRB) and the Environmental Assessment Report. I also reviewed the Environmental Agreement which outlines the roles and responsibilities of the various parties and establishes the Monitoring Agency. The review has covered most environmental components that would impact the terrestrial environment (air quality and dust, noise, etc).

The review concentrates on the issues relating to terrestrial wildlife, however since virtually all operations and construction may impact the quality of air, water and local habitat, documents in those areas were also reviewed. The Review Board's Reasons for Decision document summarised the major issues and associated material fairly well but doesn't provide the details of the original documents. Background biological data from the Diavik and EKATI mines that is relevant to understanding the potential effects to wildlife from the physical structure of operating mines should also be reviewed but were not available. This may also be an important omission since De Beer's recommends that cumulative impacts to some species be assessed on a large scale (i.e. the Slave geological province) and not on a project-specific basis. At present, there seems to be no effort to pull together the monitoring data for the operating mines and to assess the impacts of all the mines, so how this would take place isn't clear.

The following comments are presented in the context of the role of the Scientific and Technical Review which is to help identify potential issues, provide scientific knowledge in the area and to help determine if the Developer is fulfilling its obligations to the agreements. I look forward to working with the Traditional Knowledge team to track some of these issues as well.

The objectives of the Wildlife Effects Monitoring Program are to:

- verify the accuracy of impact predictions made in the Environmental Assessment Report (EAR);
- implement, through the Environmental Management System (EMS), operational practices that mitigate disturbance to wildlife and wildlife habitat, including migratory birds and their nesting areas, species at risk, and caribou;
- determine the effectiveness of mitigation measures implemented through the EMS;
- consider, and incorporate where possible, traditional knowledge;
- establish action levels or triggers for early warning signs to implement adaptive management and mitigation measures where appropriate;
- provide opportunities for the involvement and active participation of aboriginal parties in the implementation of the WEMP;
- design studies and data collection techniques that are consistent with, and will contribute to, understanding and managing regional cumulative effects; and,
- develop and review the WEMP in collaboration with the Government of the Northwest Territories Department of Renewable Resources and Economic Development.

Many of these objectives will be very difficult to achieve with the current WEMP. Data will be collected, which can be compared to pre-operational levels and reference sites, but the numbers of stations and samples are so low that trends will be very difficult to detect, and the effect of the mine virtually impossible to detect in a scientific manner. Track counts and surveys for the Valued Ecosystem Components (i.e. caribou, grizzly bear, wolverine, wolves, etc.) are important, but will provide little information on whether the mine is having an impact on the species. De Beers recognizes this problem with the grizzly bear (too few to make a reasonable statistical assessment in the Regional Study Area (RSA)) but, in fact, the same case can be made for the other species as well. If caribou are tracked near the mine for five years and they then migrate through a different route for two years, will the mine change any operating procedures? The track counts and surveys are valuable, but there are no management options outlined if numbers increase or decrease significantly. The current plans will probably not provide data to allow adequate hypothesis testing to trigger Adaptive Management policies as described in the Environmental Agreement.

General comments:

- The Environmental Assessment Report (EAR) and the review process identified many of the concerns of impacts to wildlife around developed sites in the NWT and recommended potential solutions to many of the issues. The proponent did a reasonable job in identifying the issues for the EAR, has undertaken discussions with elders from First Nations to identify potential conflicts and concerns, and conducted some predevelopment field work in 1999 and 2000. Potential direct and indirect effects (e.g., the effects of roads, noise, dust, etc.) are well documented in the scientific literature and have also been identified by many of the groups that commented on the SNDP EAR. It is important now to track many of the issues identified during the operation of the mine and ensure that De Beers follows through on its commitments set out in the WEMP and EAR.
- The Valued Ecosystem Components (VEC) in the Wildlife Effects Monitoring Plan (WEMP) include wildlife habitat, caribou, grizzly bear, wolverine, wolves and falcons, which is fewer than the VECs listed in the Environmental Assessment Report. The EAR also included waterfowl, upland breeding birds and foxes.
- Noise and dust are two major concerns from the mine that could impact local wildlife. Table 7.2-12 of the EAR shows what appear to be higher levels of many metals in the snowpack in the two sites near the mine, compared to reference sites (although these look like single observations so determining statistical differences between sites isn't possible). The significance of these data are not discussed in the EAR but it seems that the dust from the mine, particularly after several years of operation, could have a significant impact in the immediate area around the mine. It is important for De Beers to establish a monitoring program with a strong enough statistical basis to be able to determine if this could be occurring. The current program may not accomplish this.
- Some of the commitments of De Beers, as outlined in the Environmental Agreement and the Decision by the Review Board, are very general in nature ("De Beers will consider...", De Beers will look into..., De Beers will seek input..."). This leaves considerable room for interpretation by both De Beers and regulators. It is important that we work to ensure that the activities carried out in these areas adequately fulfill the spirit of the commitments to minimize impacts from the mine.
- De Beers states in several places in the SLDP Environmental Assessment Report that they will be working through the NWT Chamber of Mines, as a member of the NWT Protected

Area Strategy, to assist in the establishment of a representative area of the Coppermine River Upland Ecoregion. It is important that this commitment be continued as part of De Beers activities, however there is no information on this on the NWT Chamber of Mines website.

- The presence of De Beer's Adaptive Management strategy is encouraging, however it is not clear how AM will be implemented, and the levels of the indicators that will trigger the process. This is very important given the nature of some of the information expected to come from the monitoring programs. If a rigorous scientific conclusion is necessary for AM to kick-in, then some of the programs may not be able to deliver good enough information to make decisions.
- De Beers outlines a strategy for collaring caribou, however this is probably an RWED initiative and the program probably won't be conducted if RWED drops it. In addition to the helicopter surveys and track counts, this information is critical to determining the number of caribou passing through the area in the first few years of operation. Is De Beers committed to the project, whether or not RWED can fund it?
- The need for a larger assessment of the cumulative impacts of several small developments is clear, particularly in regards to species such as caribou, grizzly bear and wolverine. The onus is currently on the Developer to demonstrate there are no effects to the local populations of the species, however there are not enough individuals (e.g., grizzly bear), or the numbers are inconsistent enough (e.g., caribou), that uncertainty is very high and it is difficult to demonstrate whether effects have occurred or not. Assessments which integrate the data from the monitoring plans for all developments, in the context of the Slave geological province, will be much more likely to track changes in populations of VECs. It would be assuring to see the mine operators show cooperation in this area.

Specific comments:

Habitat Changes to habitat in the Zone of Influence (ZOI) could be one of the most important long-term impacts of the site but the details of how the changes will be assessed aren't given in much detail. There is little indication of the criteria used to test for major changes in the ELC's (abundance, diversity, presence/absence of certain species) or whether the data collected will be able to test for significant changes. It is also not clear what the normal rates of changes are, for example, the distribution of lichen species, especially given the changing climate in the NWT. It is also not clear what De Beers is prepared to do if effects are observed, or at what threshold action is required.

Caribou Understanding the potential direct and indirect effects to caribou, specifically the Bathurst herd, are of paramount importance to most parties. This is even more significant given the new population estimates for the herd (320,000 in 1996 versus 180,000 in 2004) and the uncertainty for the reasons behind the decline. In its decision, the Review Board noted that upper estimates of caribou in the area of the SLDP may reach 30,000, which is a much larger proportion of the herd with the new population estimates.

The health of caribou is a continuing concern and has remained a focus of all parties in the review process. It is important that all parties contribute to a better understanding of the possible cumulative effects of SNDP and other developments to reduce the uncertainty and ensure that undue stress is not placed on the Bathurst herd.

There is clearly a need to develop a unified approach to monitoring wildlife with the other major developments in the Slave Province, particularly with caribou. Standard methods of data collection and exchange of data between sites will greatly assist in determining potential cumulative effects at the population and community levels.

Grizzly Bears

The research into the potential effects to grizzly bears is important but it will probably be difficult to quantify effects due to the small number of animals involved and the uncertainty in these kinds of studies. At the very least, documenting the presence of bears within the zone of influence of the mine will help to document the behavior (attraction or avoidance from the mine) of the bears near the SNDP and help to answer some general questions about whether the solid waste management system is working. Annual surveys for sign and tracks and den use will probably be sufficient to determine potential effects on a very small number of animals. The number and size of plots isn't given in the WEMP but can be finalized in discussions with RWED biologists. Also, no control or reference site is mentioned.

Wolverines

Wolverines are a threatened species and populations can be significantly impacted by developments because of the attraction of individuals to developed areas. Running transects during winter for wolverine tracks, and recording all incidents with wolverines, will provide a record of the numbers of individuals directly affected by the site. The procedures outlined by De Beers for the handling of food and kitchen waste should also significantly reduce the attraction to the site by individual animals.

Wildlife Incidents

The recording of wildlife incidents is important but there is no definition of wildlife in the WEMP. For example, the presence of small mammals or birds in the mine site could be considered wildlife incidents. The presence of waterfowl on Snap Lake, and the surrounding lakes, either nesting or during migration is also important information that should be recorded to provide baseline information. The company would probably want to place some limits on the types of species to which this policy applies. Recording too much information could limit the usefulness of the data relating to the VECs.

Additional Studies not Mentioned in the WEMP

There is no mention in this report of lichen sampling programs to determine the levels of contaminants transported from the LSA by fugitive dust, although this may be included under the vegetation sampling program. Annual sampling and metal analysis of lichen from plots downwind from the site, with reference or control sites several kilometers away from the site, would provide baseline information on metal levels in dust-fall, and also provide data to estimate the exposure of caribou to metals in the dust.

The developer may also consider using small mammals as indicators of the environmental quality near the site. Annual sampling of the numbers and distribution of voles, for example, in the area will give population trends on an annual basis. Analysis of metal levels in gut contents and tissues every two or three years will also provide an estimate of the levels of contamination in the RSA and how much of the contamination is entering the food web.