Dogrib Treaty 11 Council
May 27, 2002

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Box 412
Rae-Edzo, NT X0E 0Y0

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Mr. L. Azzolini
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Suite 200, 5102 – 50th Avenue
Yellowknife, NT Canada X1A 2N7

Re: Information Requests – DeBeers Canada Mining Snap Lake Diamond Project

Dear Mr. Azzolini,

A team of specialists has reviewed the Environmental Assessment Report and pertinent appendices submitted by DeBeers Canada. Further, we have reviewed the April 15, 2002 compilation of Information Requests (IR) submitted by a number of organizations. We also recognize that DeBeers has not formally responded to this April 15, 2002 IR set. Thus, this round of information requests has been prepared, in some regard, to avoid duplication of earlier requests and, in a large part, to augment some of the issues already addressed. We also request clarification on issues that were not previously addressed.

Our information requests fall under five general categories: Waste Rock Characterization and Management, Resource Uses, Air Quality, Aquatic Resources and Terrestrial Resources. Each request is referenced to the corresponding section of the DeBeers EA report.

Please contact myself at 604 943-4598 (or swilbur@entrix.com) or Ted Blondin at 867-392-6383 regarding these information requests.

Sincerely,

Stephen C. Wilbur, Ph.D., P.Geo.
Senior Consultant, ENTRIX, Inc.

for: Ted Blondin
Lands and Resource Manager
Dogrib Treaty 11 Council

cc: Tony Pearse

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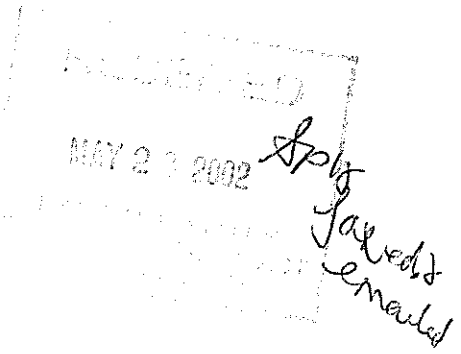

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3.5 Mine Waste Rock, Processed Kimberlite, and Solid Waste Management

3.5.1 Waste Rock Management, Appendix III.1, Section 5.1, and Appendix III.2, Section 8.4

Preamble: North Pile development plan proposes to use metavolcanics and kimberlite as material in berm construction. Experience at Ekati has indicated that even in the presence of high NP kimberlite rock, acidic drainage has been observed. It may be that the kimberlite exposed to naturally acidic (bog) groundwaters infiltrating the base of waste rock piles is depleting their neutralizing capacity and instigating acid rock drainage and metal leaching.

Request: 1) Demonstrate how the proposed waste rock disposal plan will not result in the depletion of NP from waste rock. 2) Please describe the plan to minimize the impact of acidic bog waters on the proposed North Pile development.

Appendix III.2, Section 4.3

Preamble: Ekati kimberlite is most similar to Snap Lake, but most discussion of similarities focuses on Diavik. Ekati kimberlite is contained within a storage facility whereas Snap Lake kimberlite will be partly used as an uncontained construction material.

Request: Discuss further the similarities and differences between Snap Lake and Ekati kimberlites. In this discussion, explain how these similarities and differences affect the management of the various particle sizes of the Snap Lake kimberlite.

Appendix III.2 Section 6.1.1

Preamble: Sobek NP appears to be significantly higher than carbonate NP for metavolcanics.

Request: Please provide an assessment of the relationship of carbonate NP and metavolcanic AP. In this assessment provide a plot of samples showing Carbonate NP versus metavolcanic and determine the numbers of PAG and non-PAG samples.

Appendix III.2 Section 6.1.1, Section 6.1.3

Preamble: Carbonates appear to segregate to the finer fraction due to their presence along fractures in the metavolcanics whereas sulphides are disseminated throughout the rock. The proponent suggests that this will be beneficial for acid neutralization. However, it may lead to preferential loss/dissolution of carbonates from the metavolcanics, thereby decreasing the neutralizing capacity of the rock.

Request: Please provide an explanation that demonstrates that this process will not have a detrimental effect on the neutralization capacity of the metavolcanics.

Appendix III.2, Section 8.4

Preamble: Acidic bog waters have been identified at the Snap Lake site.

Request: Please provide an assessment that evaluates the extent of the acidic bog waters on the site, and how these bog waters may affect waste rock and water management plans and activities.

6.0 Resource Uses

6.1.5 General Assessment Method (also 7.1.5 in Air Quality, 9.1.5 in Aquatic Resources, and 10.1.5 in Terrestrial Resources)

Preamble: Long-term reversibility is generally defined for these disciplines as an impact that is reversible if lasting from 26 to 100 years. These time periods are somewhat arbitrary. It is not clear how they were derived nor whether they consider that the biological, chemical and physical processes operate on different time scales, and that certain impacts may have 1) longer lasting impacts but of low consequence, or 2) shorter-term impacts but with high long-lasting consequence.

Request: 1) Please provide an explanation for each long-term reversibility assignment (e.g., why 26, 30 or 100 years), and 2) explain why these values should be applied uniformly for each resource (i.e., cultural, traditional, non-traditional, terrestrial, air and aquatic).

Preamble: In conjunction with the assessment criteria (e.g., magnitude, duration, reversibility, etc.) for defining individual impacts, the relative ranking methodology, which is based largely on increments of a relative value of 5, has been applied throughout the EA when assessing the environmental consequence of an impact.

Request: Please provide recent examples where this type of approach and model has been a) used successfully, b) used successfully for mining projects, and c) used successfully for projects in the subarctic environment.

Preamble: Impacts analyses were conducted on only residual impacts, or on impacts that were assumed to occur only after successful mitigation. It seems that this does not follow the precautionary principal in that DeBeers is apparently assuming that a prescribed mitigation will a) be 100% effective, and 2) be applied 100% of the time. Further, when the mitigation (e.g., water treatment) is based on assumptions regarding poorly known baseline conditions (e.g., groundwater quality and groundwater transport) or a model with inherent large uncertainties (e.g., predicting Snap Lake water quality).

Request: Please provide a general assessment that describes how contingencies will be considered for those impacts that were not deemed to be residual because of an assumed effective mitigation. In this assessment, consider what the level of uncertainty is in assessing the success of the mitigation, and whether this re-assessment will effect the validity of each linkage analysis. This explanation may best be portrayed by examples for each discipline.

6.1.5.3: Resource Uses – Environmental Consequences

Preamble: "The relative positions of negligible, low, moderate, and high, are illustrated on a generic graph (Figure 6.1-3). The position of the lines determining the consequence scale is based on professional judgement. For example, an impact that was of moderate

magnitude, regional extent, medium-term duration, and irreversible was deemed to be a high environmental consequence. If the same impact was reversible in the long-term, it was deemed to be a moderate environmental consequence. If it was reversible in the short-term, it was deemed to be a low environmental consequence. Professional judgement was used *a priori* to determine the method for ranking consequences. The determination of environmental consequence for each residual impact followed this method and was not modified within individual key questions."

Predefined criteria were applied in determining the magnitude, geographic extent, duration and reversibility of an impact for a given component or key question, and these results were then expressed as "stacked" columns in a graph to represent overall environmental consequences, (negligible, low, medium, high). However, the "height" of these "stacked values" has been adjusted using *a priori* professional judgement (e.g., Figs. 6.7-1 to 6.7-3, but this applies to all figures depicting Environmental Consequences). "*A priori*" is commonly defined as "formed or conceived beforehand" (without examination or analysis) and is defined in the glossary of the EA as "relating to or derived by reasoning from self-evident propositions." Self-evident meaning without proof or reasoning. This would seem to be making the methods fit a set of preconceived results, or that the conclusions were self-evident before the methods were applied, which would obviate the need for systematic or quantified methods in the first place.

Request: 1) Please explain why seemingly objective criteria were used to arrive at a qualitative evaluation of overall impacts which were based on "*a priori*" professional judgement.

2) It is also requested that the figures showing the classification of residual impacts (e.g., Figs. 6.7-1 to 6.7-3) be cross-referenced in the text (e.g., Table 6.6-2 should reference Figure 6.7-3) throughout the report (for all sections, since this type of "stacked graph" is used in other sections as well).

Consider for example Table 6.6-2 (Classification of the Residual Impact of Lockhart Lake Camp), in which Magnitude is defined as "moderate," but when translated into graph form in Figure 6.7-3, it is not obvious that this impact was originally designated as moderate (since the overall impact is "low" and only considers magnitude and duration) – unless numerical values are assigned to the Y-axis. This appears to make the assessment process less than transparent.

3) It is therefore requested that a means be devised whereby these classifications are consistently cross-referenced. Please also assign numerical values to the Y-axes on these Figures e.g., 5 at the boundary between Negligible and Low, 20 at the boundary between Low and Moderate, etc.

4) Also, it is requested that a more rigorous explanation for the final assignment of residual impacts be provided, since the preceding steps leading up to the overall assessment are quite systematic and methodical. For example, throughout Section 6.7, the overall environmental consequence of residual impacts are low because.... This is done in some cases, but not all.

5) A further request (using Fig. 6.7-3 as an example) is to 1) refer to Table 6.5-1 in the legend for classification values of the individual components; and 2) refer also to Table

6.1-4 in the legend for an explanation of the overall classification scheme (Generic Residual Impact Classification). This would make the graphs easier to understand.

6.4.1.5.2 Sport Fishing

Preamble: "A no fishing policy for De Beers' employees and contractors is enforced. Therefore, fishing associated with this workforce does not occur in the LSA." Ekati and Lupin Mines are examples of how fish populations in surrounding lakes can be affected by recreational fishing by mine employees, particularly with regard to large lake trout.

Request: 1) Will De Beers' employees and contractors be allowed to fish in the RSA? 2) Please provide an explanation as to how fishing will not occur for employees, contractors and non-employees in the LSA and the RSA. The negligible residual impact classification is dependent on this no fishing policy.

7.0 Air Quality

7.1.5.3 Air Modeling Approach

Preamble: A steady-state two-dimensional version of the CALPUFF model was used to predict air quality conditions as a result of point sources from the mine. The discussion in this section, however, does not provide the data or assumptions (or reference an Appendix for this information) to evaluate the model feasibility, model calibration or model input and output. Further, it is not clear how the far-field conditions (i.e., multi-layered or inverted barometric pressure conditions, or complex wind patterns) would affect model results or validity.

Request: 1) Please provide a discussion (or a stand alone report) that describes the model, evaluates the model feasibility, describes all assumptions, discusses model calibration, and provides all the model input and output. 2) Describe how the far-field conditions were evalauted, and how these conditions affected model validity and model results.

9.2 Hydrogeology

9.2.1.2 Baseline Setting

9.2.1.3 General Setting

Preamble: A brief discussion is provided that describes a general distribution of permafrost and taliks in the LSA and their control on groundwater flow. The discussion refers to permafrost data and information described in Section 10.2.1.5.

Request: 1) Please explain, to the level of detail available, what is actually currently known regarding the subsurface distribution of permafrost and taliks in the LSA and RSA. 2) Further, please provide an assessment of the level of uncertainty of this information and how it will effect the interpretations and assessment of hydrogeologic conditions, groundwater flow and the impacts analyses.

9.2.1.4 Hydrostratigraphy and Groundwater Flow

Preamble: Borehole hydraulic testing data (i.e., packer tests) for shallow and deep zones are discussed that provide preliminary quantification of hydraulic parameters and some initial concepts regarding the groundwater flow regime.

Request: 1) Please explain, to the level of detail available, what is actually currently known regarding the spatial distribution and variation of hydrostratigraphic units throughout the LSA and beyond (including the entire potentially impacted groundwater flow regime), the nature and extent of interconnected fractures, and range of variability in hydraulic parameters. 2) Further, please provide an assessment of the level of uncertainty of this information and how it will effect the interpretations and assessment of hydrogeologic conditions, groundwater flow calculations and modeling, and the impacts analyses.

9.2.1.4 Groundwater Quality

Preamble: It appears that groundwater samples were collected from ports and seeps but no other sources. Also, the exact sampling locations, the presumed sampling depth, and the time when these samples were collected is not available in the report nor the referenced Appendix IX.1.

Request: 1) Please provide the rationale that justifies the use of the small number port and seep samples to be representative of groundwater as a whole in the study area. Please discuss in terms of the expected potential spatial and temporal variability in groundwater chemistry for all groundwater zones potentially impacted by the project. 2) Further, please provide plans for any future groundwater quality baseline assessment(s).

9.2.2.2.2 Water Quality Models

Request: In light of the request above regarding groundwater quality characterization and representativeness, please provide an explanation as to how the water quality modeling (i.e., GoldSim) and the impacts analysis is effected by the lack of groundwater quality data and the uncertainty in the groundwater quality characterization.

9.4 Water Quality

9.4.2.2.3 Impacts Analysis Methods, page 9-220

Preamble: It is stated that "concentrations of all parameters will slowly return to baseline conditions."

Request: Please explain the basis for this statement, the statement's level of assurance (in lieu of uncertainties in the water quality modeling), and the period of time that this will take place.

9.4.2.2.4 Impact Analysis Results, and Appendix IX.1, Mine Site Water Quality

Preamble: Significant changes to the water quality of Snap Lake and other water bodies will result from project activities. The results of the water quality analyses and modeling described in this section and in the associated appendix are dependent on data,

calculations and a number of assumptions described in many additional documents. Presently the adequacy of analyses and the conclusions so far reached cannot be thoroughly examined without this additional information.

Request: Please provide Appendices A-N, as listed in the Table of Contents of Appendix IX.1.

9.4.2.2.4 Impact Analysis Results, and Appendix IX.7, Water Quality Modeling

Preamble: Significant changes to the water quality of Snap Lake and other water bodies will result from project activities. Much of the residual impacts analysis is dependent on the results of water quality modeling, yet the results are not without uncertainty. Based on the modeling, the environmental consequences of residual impacts to the water quality of Snap Lake are deduced to be either low or negligible. Clearly, this conclusion is counter-intuitive, knowing that this relatively small lake (and associated small watershed) will be the sole source of dilution for >25 years.

Request: A more robust analysis and discussion of model assumptions and uncertainty is required. Please provide explanations for the following seven model issues:

1) It is stated that the RMA models assume depth-averaging. This assumption is not applied year round. The discussion on page 9-218 and 9-219, and Figure 9.4-10 attempt to describe this condition.
- 1a) How were temperature and density contrasts of the effluent and ambient lake water characterized during the ice-cover season (or majority of time)? and
- 1b) What is the sensitivity of the model conclusions to these assumptions?

2) The CORMIX model is used to simulate the mixing process in the near-field environment, and assumes steady-state conditions. It is not clear what were some of the underlying assumptions for applying the CORMIX model. It appears that because CORMIX was used for the near-field (i.e., diffuser), the model assumes that a steady-state and infinite supply of water for dilution is available. It is clear, however, that Snap Lake is a relatively small water body with many inlets and embayments and with a limited circulation.
- 2a) Please explain what is meant by steady-state and how this assumption is applicable to the year-round hydrodynamics at Snap Lake.
- 2b) Does this assumption apply to water quality as well as hydrodynamic conditions?
- 2c) How were the RMA models and CORMIX models integrated?

3) On page 9-219, it is stated that derived bulk dilution factors were 34:1 for the first seven years and 12:1 for the next 18 years.
- 3a) Please explain the logic in assigning only two constant dilution factors for only two time periods (i.e. reasoning for simplified variability), and
- 3b) explain what the limiting factors were in the derivation of these factors.

4) With respect to the RMA models:
- 4a) Please explain the operating assumptions for the RMA models and how they are applicable or not applicable to the modeling of the subarctic, limnological, biological and physiographical conditions found at Snap Lake (and any other water bodies simulated for this study).

- 4b) Please provide the manual that describes for example the model derivation, assumptions, calibration routines, and input and output, etc. for these models.

5) The RMA models are two-dimensional (i.e., assume depth averaging). It is not clear what the sensitivity of the results is to this assumption. Similarly, it does not appear as if the degree of uncertainty was considered during subsequent analyses (i.e., residual effects).
- 5a) Please provide an uncertainty analysis that addresses the sensitivity of each parameter (i.e., temperature, density, etc.) to changes or un-modeled scenarios, and other plausible hydrodynamic and water quality conditions that were not (i.e., stratified conditions) or could not be modeled.

6a) During the ice-cover season, aside from reducing wind shear to zero, were there any other model assumptions or considerations that were different than the ice-free season?
6b) For example, was ambient lake temperature and density assumed to be constant throughout the ice-cover season?
6c) Were density plumes considered?
6d) Also, please explain how these assumptions varied during freeze-up and break-up of the lake ice.

7a) Were all inflows portioned to specific areas of the lake (i.e., the sub-watersheds) or were they assumed to occur uniformly over a fully-mixed water body?
7b) Please provide the map that shows the sub-watershed delineations, and explain how this map was derived and utilized within the model framework.

9.5.1 Baseline

Preamble: The purpose and selection of streams and lakes used for baseline sampling appears to lack consistency and is without rationale.

In the introduction (Subsection 9.5.1.1), it is stated that an initial reference lake (i.e., north lake) was identified and then data collected from it in 1998. This reference lake was eliminated and another was chosen after north lake's "physical features proved to be different". In the impact analysis, it appears that "north lake" could have potential impacts from the Project. Several other lakes and streams were sampled within and outside the Snap Lake drainage, including Mace Lake, which is a considerable distance from the Project area. It is stated that the new reference lake will not have any effect from the Project, although its headwaters are on the Snap Lake watershed boundary and about 80 meters from the foot print of the Project.

Under the Fisheries Sampling subsection (9.5.1.2.4), it is stated that "the fisheries baseline study was to characterize baseline environmental conditions of the Snap Lake area that may be affected by the Snap Lake Diamond Project". In Appendix IX.9 subsection 1.5 it is further explained that "this information will be used as a baseline for comparison with monitoring data collected should the project reach the operational phase".

Requests: 1) Please provide a concise objective and rational for baseline data collection of aquatic organisms and habitat on a regional and local scale. 2) Include the method and reasoning for selecting stream and lake sampling locations. 3) If there are criteria

developed or a statistical basis for the selection of lakes and streams, please provide that information. 4) Provide this information with respect to geographic scale (regional and local) and temporal considerations. 5) Include a discussion concerning the inclusion on reference sampling locations, criteria for selection of reference sites, and the purpose of the reference data. 6) Please include a brief summary of the north lake data, the reason it was rejected as a reference site, and provide information on the location of the north lake location. 7) Provide an explanation as to the planned future use of the north lake location, as it appears that this location could be impacted.

9.5.1 Baseline

Preamble: If baseline data are to be used to monitor or estimate potential impacts in the future, there appears to be a problem in the consistency and robustness of baseline data. This is particularly true when attempting to relate test (Project) baseline data to reference data.

Phytoplankton and zooplankton samples were collected to assess nutrients and community structure during 1999. Samples were taken from both Snap Lake and the reference lake at several locations. There is no description in subsection 9.5.1.2.2 or Appendix IX.9 of why or how these sample sites were chosen. There is no explanation of how representative they are and if the samples collected (number and location) are statistically robust enough to account for annual, diurnal, habitat, and spatial variability of these organisms. Benthic invertebrate communities can fluctuate significantly in community structure and abundance in a similar manner to plankton. Appendix IX.9 provides a description of benthic invertebrates collected from three shallow and one eastern location in Snap Lake, and three water quality reference stations and one shallow station in the reference lake. It is not clear how the benthic invertebrate sample locations are comparable between the test and reference locations.

Table 9.5-1 provides a summary of the 1999 and 2001 fisheries survey. In general, baseline conditions in Snap Lake appear to be well documented through data on habitat, bathymetry, fish tissue, a fish inventory, and rearing and spawning habitat assessments. Data types collected from other areas, however, appear to be rather random in nature. In terms of lake reference data, it appears that fish tissue was collected from the reference lake and MacKay Lake. The reference lake also had fish sampling in rearing habitat areas. In addition, bathymetry and shoreline habitat was collected from nine inland lakes (within the Snap Lake watershed) and a fish inventory was completed on four north lakes. Fish use and fish habitat data were collected in inlet and outlet tributaries to Snap Lake, although there appears to be no reference area data.

Requests: 1) Please provide a concise objective and rational for baseline data collection of aquatic organisms and habitat within the test and reference locations selected. 2) Include the method and reasoning for selecting the type and amount of data collected in both stream and lake sampling locations. 3) If there are criteria developed or a statistical basis for the data collection, please provide that information. 4) Include a discussion concerning the value or use of reference sampling data and how this data set should be used (or not used) to assess impact. 5) What are the plans for future baseline data collection? 6) Please describe how the uncertainty associated with the current program was considered in during the residual effects evaluation.

Subsection 9.5.1.5

Preamble: This section, including Table 9.5-15, appears to focus on lake habitat in terms of overwintering habitat and small bodied fish. It seems that there would be potential for other species and life stages to use these habitats, at least on a seasonal basis.

Request: Please provide more information of potential fish use in stream and lake habitats of the project area. This should include all fish species and life stages, including potential use in migration rearing, spawning, etc.

Subsection 9.5.2.2 – Key Question F-1 – Impacts to quality and quantity of non-fish aquatic organisms.

Preamble: It appears the conclusion that there are negligible or no impacts to the Snap Lake ecosystem from this project are not based on the use of all available data or criteria.

Subsection 9.5.2.2.5 states that there is a high level of certainty in the residual impact assessment. Subsection 9.5.2.2.4 states that Snap Lake Construction and Operations residual impacts will be negligible, although the zooplankton community will be impacted through elevated calcium concentrations and phytoplankton, zooplankton and benthos through increased hexavalent chromium, and total dissolved solids (TDS). Existing TDS criteria for aquatic life are not mentioned and temperature changes are not addressed. Physical changes in habitat through changes in components like substrate and hydrology are not addressed. In describing post closure, the residual impacts are described as negligible and as no impact. Intuitively and notwithstanding the results from water quality modeling, it seems that the highest concentration of chemicals associated with mining are accumulated during operation would occur at the end of operations or the beginning of post closure.

Requests: 1) Please provide additional information on the effects of chemical discharges, taking into consideration, TDS criteria, temperature, and more importantly the potential changes in plankton and benthic organisms from a community and ecosystem perspective. 2) Include an analysis of the physical parameters that are likely to change with project construction, operation and closure. 3) Include a more complete analysis of the accumulation of chemicals in relation to aquatic habitat, especially at the point of release and areas where accumulation will occur. 4) Please use any case study information that is available under similar situations to describe potential impacts.

Subsections 9.5.2.2, 9.5.2.3, 9.5.2.4 and 9.5.2.5 (Key Questions and impacts)

Preamble: An attempt is made to describe impacts in relation to the key questions in North Lake and to a much lesser degree to Northeast Lake. Generally, there are no baseline data collected or presented for aquatic resources in these areas. It seems apparent that (relative to other areas near the Project) there are important and significant potential impacts to aquatic resources. It is apparent that the impact assessment for this area is invalid at this time.

Requests: 1) Please provide baseline data and an impact assessment for the aquatic habitats that are potentially impacted by the Project, including those outside of the Snap Lake watershed. 2) Include local and regional components as described in the TOR.

Include information that, if appropriate, provides the rationale to eliminate aquatic resources in adjacent watersheds from impact consideration.

Subsection 9.5.2.3 Key Question F-2 (Impacts to Fish Habitat)

Preamble: There appears to be several assumptions in the basic linkage analysis, and impacts analysis that produces an over simplified examination of potential effects resulting in a bias result.

For example, construction and removal of instream structures will disturb over 1,500 square meters of existing aquatic habitat. A HEP analysis was used to demonstrate that there would be an increase in habitat value associated with this magnitude of construction and removal of the water intake and water mine outlet. The simple calculation of replacing one habitat with another that is "more valuable" (through weighting of species use by humans) does not provide a true impact analysis.

First, it does not seem logical that one can disturb this amount of habitat on two occasions and not have an impact on existing habitat and organisms. At a minimum, a huge area is being buried and disturbed largely resulting in the loss of that habitat and the organisms occupying that community. Secondly, the replacement habitat does not come with established communities. Recovery and colonization of habitat, especially in sub-arctic environments, can be extremely difficult, long-term and very unpredictable. Third, the HEP analysis appears to assume that the replacement habitat is in fact limiting the production of target species. It is possible that the existing habitat is limiting the target species through variables like food production and therefore decreasing that habitat would be detrimental. Fourth, habitat is not just the physical environment that is created through substrate and depth. For example, the zone where mine water will be discharged will likely not be an improved habitat from a chemical perspective. It seems reasonable to assume that concentrations of thermal or chemical pollutants is greatest in the area, and by providing "preferred physical habitat" in conjunction with a detrimental chemical environment may create an attractive nuisance and amplify impacts rather than mitigate impacts.

Requests: 1) Please provide a complete and ecological based approach to impacts analysis for the water intake and discharge. 2) Include temporal (i.e. recovery rates), practical (i.e. value of constructed habitats), biological (chemical and physical habitats), and ecological (i.e. limiting factors) components.

Subsection 9.5.2.3 Key Question F-2 (Impacts to Fish Habitat)

Preamble: There appears to be several assumptions in the basic linkage analysis, and impacts analysis that produces an over simplified examination of potential effects resulting in a bias result.

Stream crossings were considered not to have a linkage because the potential for impacts was restricted to direct disturbance, alteration, or loss of productive habitats and downstream deposition of fine sediments. Seepage and runoff ponds are viewed as not having a linkage to impacts for the same reason and it is stated that there is no direct connection to waterbodies with fish habitat. It is not clear that because there is a waterbody between the altered pond (seepage/runoff) and a fish rich lake like Snap Lake, that there is no impact to aquatic resources. From an ecological perspective, it

seems that because a waterbody does not have obvious or direct habitat connection to fish that it does not have a value in supporting populations. There is little information on the basic biology and life history of the species using these areas and the contribution of resources that do not provide direct habitat for fish species.

Requests: 1) Please provide information on the basic biology and life history of the species using these areas including the seasonal use of areas for life phases such as migration and rearing. 2) Relate this information to the potential Project impacts in similar water bodies. 3) Include the potential ecological benefits of smaller water bodies such as buffering effects of the physical environment and biological contributions unrelated to direct fish habitat.

Subsection 9.5.2.3 Key Question F-2 (Impacts to Fish Habitat)

Preamble: There appears to be several assumptions in the basic linkage analysis, and impacts analysis that produces an over-simplified examination of potential effects resulting in a bias result.

The 'Change to Hydrology' portion of the assessment clearly states that water withdrawals and water releases in Snap Lake during construction and operations have a potential to contribute to changes in lake water levels (page 9-330). Further, the connection is made that a change of water levels could cause a loss of near-shore spawning, rearing, foraging, or refuge areas for a number of fish species, including habitats at depth just due to changes in depth. The linkage between lake levels and fish habitat in Snap Lake is then declared invalid because in the hydrology analysis the environmental consequences are considered negligible. A "negligible" effect in the physical environment, however, does not preclude a drastic effects in the biological environment.

Request: 1) Please provide a complete evaluation of the potential for impacts due to changes in hydrology to Snap Lake. 2) Provide a clear and concise relationship between the changes in the physical environment and the biological environment. 3) Please evaluate the potential to integrate this with the HEP analysis and relate to habitat lost or gained by instream activities.

9.5.2.5n Key Question F-4 (Fish Abundance)

Preamble: As described in comments on previous Key questions 1-3, the linkage determination and impact analysis is in question. Since much of Key Question – F4 analysis is correlated directly to these previous analyses, it is invalid. From a practical perspective, changes in fish abundance is perhaps the most important end result and therefore must be a complete and inclusive analysis for prediction of the impact. It is basically the culmination of all the physical and ecological affects from the Project. Rather than looking at all of the potential impacts and attempting to determine a resulting impact on fish populations, the analysis here is the opposite. The direction in this section is to eliminate all of the small or "negligible impacts" from the analysis. Worse yet, it appears that overall fish abundance changes are only considered if two or more individual impacts are present. This makes no sense from a biological or practical perspective.

Requests: 1) Provide a practical and scientific based approach to predict changes in fish populations. 2) From these results, reassess residual impacts and corresponding mitigation.

Subsection 9.5.2.5.5 Monitoring

Preamble: The text explains that detailed baseline information will be required for the north lake, northeast lake, NL5, NL6 and the outlet stream of the north lake.

Request: 1) Please describe the future baseline monitoring program and the rationale and methodology for data collection. 2) Please include this in a complete monitoring plan for the entire Project.

10. Terrestrial Resources

10.1.4 Regional Study Area

Preamble: The text explains that the RSA is defined as the area within a 31 km radius of the centre of the active mine site.

Request: 1) Please explain the rationale behind assigning a rather arbitrary value for defining a study area. 2) Please explain how this definition was based on biological and/or physical processes or mechanisms that are relative to fully understanding impacts.

10.3 ELC (Ecological Land Classification) and Biodiversity

Preamble: Areas of exposed bedrock such as rock outcrops and cliff faces may have a low or moderate biodiversity rating, but may also provide habitat for raptors.

Request: Please explain whether these areas were considered for raptor habitats, and how this would affect the biodiversity rating.

10.3.2.4 Key Question ELC-3: What Indirect Impacts Will Air Emissions from the Snap Lake Diamond Project Have on Vegetation (ELC Unit) Health?

Preamble: "Elevated dust levels on plants can have a variety of physiological and chemical effects." (p. 10-105). "A study initiated in July 2001, was undertaken to measure the level of metal accumulation in plant tissues under baseline conditions. The results of this study are presented in Environmental Health (Section 11.3.1)." (p. 10-107).

Request: 1) Explain whether the results of any previous studies conducted to indicate that dust from mining activities contain elevated levels of heavy metals, nitrates, or hydrocarbons in similar (e.g., arctic and subarctic) environments were integrated into this analysis. 2) What mitigation is proposed to reduce any deleterious effects from fugitive dust on wildlife?

10.4 Terrestrial Resources

10.4.1.3.4 Wolverines

General Comment: We concur with the Government of the Northwest Territories Information Request No 1 (April 15, 2002) 1.4.7 that "There are several limitations in using snow track counts to index relative abundance of wolverines"; and also that "BHP (2001 Wildlife Effects Monitoring Program) has recently acknowledged that with the removal or destruction of 16 wolverines from the Lac de Gras area since 1998, this impact does in fact constitute a cumulative effect on the local wolverine population," along with the information requests that followed. The cumulative effect of the loss of 16 wolverines in the Lac de Gras area since 1998 is acknowledged in the Snap Lake EA in section 12.7.4.3.6; however, we agree with GNWT that it is not adequately addressed in the report.

10.4.1.3.6 Raptors

Preamble: "An intensive survey of all suitable nesting habitat within the entire RSA for gyrfalcon and peregrine falcon nest sites has not occurred. Instead, raptor surveys were conducted during aerial surveys of eskers within the RSA for carnivore dens in 1999."

Request: 1) Please explain the rationale for conducting raptor studies more or less fortuitously or coincidentally with the aerial surveys for carnivore dens, whereas upland breeding bird and waterfowl studies were the subject of what appears to be more rigorous and systematic studies. 2) Regarding raptors, explain any future baseline studies, and the rationale, methodology and schedule that are planned for these studies.

10.4.2 Impact Assessment

Preamble: "Species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2001) as 'Endangered', 'Threatened' or of 'Special Concern' were given special consideration throughout the EA for wildlife and wildlife habitat. VECs listed as 'Species of Special Concern' included the grizzly bear, wolverine, and peregrine falcon."

Request: 1) If COSEWIC-listed VECs were given special consideration throughout the EA for wildlife and wildlife habitat, why does it appear that the study methods for grizzly bear, wolverine and peregrine falcon were relatively cursory compared to other species such as upland breeding birds and waterfowl? Please explain this apparent discrepancy. 2) More intensive surveys are necessary to adequately characterize species abundance and habitat conditions for grizzly bear, wolverine and peregrine falcon. The EA acknowledges that "An intensive search of this area would likely reveal more nest sites" (p. 10-72). Describe any further and more intensive searches that are planned.

Wildlife-Human Interactions (p. 10-185)

Preamble: "Relocation of wildlife tends to be expensive, as it requires considerable effort." This should not preclude relocation as an option. Numerous animals have been relocated at the Ekati Mine. But is has been difficult to address the success of these

relocation efforts. The limited success of this program may indicate that the relocated animals are not being removed far enough from areas of human activity, given that they have large home ranges.

Request: 1) What is the estimated cost of relocating a wolverine or a grizzly bear? 2) Please describe what plans, if any, there are for relocating "problem" animals, particularly grizzly bears and wolverines, away from the project area. 3) In view of the general sensitivity of wolverines to human activities, their status as a species at risk, and their low reproduction rates and ecological resilience, what further efforts, other than those provided in the EA, can be made to minimize wolverine mortality?

Subsection 12.6.5 Fish and Fish Habitat (Cumulative Assessment)

Preamble: This subsection provides a linkage between activities associated with the Projects and cumulative effects on aquatic organisms and habitat. The analysis is restricted to fugitive dust and increased access to fishing. These are not cumulative impact assessments. They are more like a reiteration of these two potential impacts for the Project.

Request: Please provide a cumulative impacts assessment. This should be provided at two levels.

1) The first level is a local level. It should include all of the phases of the Project including construction, operation and abandonment. It should include all activities associated with the project including the mine, roads, spoil piles, sedimentation and treatment ponds, borrow pits, airstrips, buildings, water treatment, water withdrawal, water discharge, fuel storage, and any other structure or activity related to the project. The analysis must look at these activities as a whole, not separately as with the existing impact analysis. It must be linked to all species and life stages potentially affected. It should look at a watershed(s) scale as well as individual environments.

2) The second level is a regional level. This should include an analysis of how this proposed Project fits into other Projects or activities on a regional perspective. For example, how do the immediate and future project activities of the region affect aquatic resources?

12.7 Cumulative Effects Assessment - Wildlife

12.7.4.3.6 Cumulative Impact Analysis For Snap Lake Diamond Project – Change in Abundance to 12.7.4.5 – Discussion

Preamble: "Since January 1998, 16 wolverines from the Lac de Gras area (including EKATI™, Misery, Diavik, and Nuna camps) have been relocated or destroyed (R. Mulders, pers. comm., RWED), and is likely having a cumulative effect on local population abundance." (p. 12-128).

"Given the low population density and low reproductive potential of grizzly bears and wolverines relative to caribou and wolves, the sensitivity of the loss of an individual from the population is anticipated to be higher for bears and wolverines. In addition, the loss of even one grizzly bear or wolverine from the local population may be considered a low

to moderate impact given their status as "species of special concern" (COSEWIC 2001)." (p. 12-128).

"Given that the footprint of the proposed Snap Lake Diamond Project is substantially smaller than that of the EKATĮsite, it is predicted that the cumulative incremental change in movement and behaviour of grizzly bears, wolves and wolverines due to the Snap Lake Diamond Project will be above baseline conditions, but within range of natural variation." (p. 12-130).

Request: 1) In the context of the quoted statement, please describe what is meant by baseline conditions and natural variation, and 2) also explain how baseline conditions can be increased without affecting natural variation. 3) Also, please explain what baseline data will be used to evaluate changes to wolverine, grizzly bear and wolf popluations.

Preamble: "There is a large amount of confidence in predicting the likelihood of an incremental cumulative effect from an individual project on caribou, grizzly bears, wolves and wolverines. However, there is a high degree of uncertainty in predicting the magnitude or strength of the incremental effects from the Snap Lake Diamond Project on a population over space and time." (p. 12-136)

Residual Impact Classifications for Cumulative Effects for Direct Habitat Loss, Fugitive Dust, Change in Abundance, and Change in Movement and Behavior assign uniformly low environmental consequences for caribou, wolves, wolverine and grizzly bear. However, such evaluations are of little use when there is such a high degree of uncertainty. The fact that ecosystems are highly complex and sensitive to initial conditions, and regardless of the theory proposed by Landis and McLaughlin (2000) that "ecological systems are complex, non-equilibrium systems and that our assumption that ecosystems can be 'managed' in order to preserve or return to some pre-stressed state is spurious" (p. 12-138), suggest that every effort to ensure that impacts are minimized must be attempted.

Requests: 1) Please explain in detail the data and information and rationale, in view of the admitted high degree of uncertainty in the analysis, used to support the assignment of the above low consequence rating. 2) Please describe the measures and methods that could be proposed to lower the uncertainty in predicting the magnitude of cumulative effects on wildlife VEC's (i.e., to improve the accuracy and sensitivity of the measurement criteria). 3) Please describe DeBeer's plans to study and monitor cumulative effects for the above-referenced wildlife and habitat, and any collaborative studies or approaches that DeBeers is considering to undertake with the Dogrib, other aboriginal groups, RWED, Diavik, BHP-Billiton or any other association to address these concerns.