

Subject: Ekati Expansion -- NRCan's Comments on Draft ToR and Project Description

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Hi Louie

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As requested, NRCan has reviewed the Environmental Assessment Terms of Reference (ToR) for the BHP Diamonds Inc. Beartooth, Pigeon and Sable Kimberlite Pit Mine Extension issued by the MVEIRB (Draft dated November 8, 1999), and the Project Description: Proposed Development of Sable, Pigeon and Beartooth Kimberlite Pipes, October 1999, Revision 3.

Terms of Reference

The ToR are in general, comprehensive. We have a few specific comments and recommendations, as set out below:

* Section 3.1.2: Description of Existing Environment: Lake sediments should be included as "environmental components" for baseline characterization (quantity, geochemistry) because they are to be stockpiled in surface dumps (after lake dewatering) and may be dispersed by runoff.

* Section 6: Definitions: Impacts of earthquake or other accidental effects are intended to be covered (see line 698) but do not seem to get much attention under section 2.6.3 other than "natural disasters" on line 148. We suggest an additional item "earthquakes" to cover low probability hazard from nearby earthquakes including dike failure under earthquake loads. Key points under a new line item for earthquakes would be:
"low probability hazard from nearby earthquakes
dike/containment structure failure under earthquake loads"

* Section 3.1.2 Description of the Physical Environment: Line 213 should be expanded as follows: "water quality and quantity (surface and ground waters)"; and

* Section 3.1.2 Description of the Physical Environment: Line 217 should be expanded to: "terrain, surficial geology, bedrock geology, seismicity, geological hazards, permafrost and soils".

Project Description

The Project Description provides sparse information on the geochemical characterization methodology. However, it is understood that that information will be provided in the EA (ref. pages 4-12 and 4-31).

The proposed Waste Rock Runoff Management Plan (page 4-31) introduces the utilization of permafrost formation to impede seepage from the toe berm of the prospective waste rock storage pile and saturate the voids of the rockfill with ice. While the concept is appealing in principle, the Project Description does not contain sufficient design details (e.g., dimensions of the toe berm and rock piles, placement schedule, grain-size distribution of the waste rock, etc.) to allow an evaluation of how practical the proposed scheme will be. Such details should be included in the EA.

Two facts of particular interest in the application of permafrost to incapsulate reactive rocks and relevant in the present case are:

- 1) depending on the ionic strength, films of water adhered to clay particles often remain unfrozen even at -2 deg.C; and
- 2) ice lens formation is not desirable for the physical stability of waste rock stockpiles especially if extreme fluctuation in climatic conditions occurs.

The proponent may have to furnish evidence in the EA document that neither situation will occur or propose steps to prevent the occurrence of such phenomena.

Environmental Assessment

Much of what is needed for an assessment by NRCAN is more likely to come in the EA. Some issues that we expect to be further covered in the EA are:

* Relevant to Section 3.2.4 Water Quality and Quantity and Section 3.4 Impacts of the Environment on the Proposed Development : - the cumulative effect of nitrate levels (from explosives residues in sump water) in the Processed Kimberlite Containment area and other new potential containment areas (eg. waste water/sediment containment at Sable), as a result of additional waste water from the new pits being added to the project

* Relevant to Section 3.2.4. - design and rationale of a pervious dike for waste water containment at Sable, in particular, pervious rather than impervious dike.

* Relevant to Section 3.2.2, item XXI. - a geotechnical report for the proposed granular resources and guidelines for extraction procedures, if resources are obtained from Exeter, Ursula or another esker

If you have any questions concerning the foregoing, I would be pleased to discuss them with you.

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