INDEPENDENT ENVIRONMENTAL MONITORING AGENCY
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May 5, 2006

Sarah Baines
Regulatory Officer
Wek'eezhi Land and Water Board
c/o Mackenzie Valley Land and Water Board
Box 2130
Yellowknife NT X1A 2P6

Dear Sarah

Re: Draft Revised Wastewater and Processed Kimberlite Management Plan

The Independent Environmental Monitoring Agency is pleased to submit the following preliminary comments on BHPB's revised Wastewater and Processed Kimberlite Management Plan (WPKMP) dated February 28, 2006.

While the Agency is prepared to submit some preliminary comments at this point, there are several outstanding information requirements that BHPB has committed to, and as required by the Wek'eezhii Land and Water Board in its April 11, 2006 letter to the company. Our view is that this information is required by the Board before there should be any final approval of the revised WPKMP or the permanent use of calcium chloride as an additive to the process effluent.

The Agency supports the Board's request for long-term water quality modeling and monitoring to ensure that the downstream receiving environment is protected. This will require the submission of the results of the Long Lake Water Quality Study and the Tier II risk assessment for chloride toxicity. These studies should shape the overall management of the Long Lake Containment Facility (LLCF) in the revised WPKMP. For example, we note from the BHPB presentation on April 13, 2006 of the preliminary LLCF Water Quality Study modeling predictions that groundwater inflows are increasing with depth, and chloride concentrations in Cell E may reach as high as 1100 ppm. This is well above the 150 ppm BC guideline, which the Agency believes to be appropriate. We expect that these two studies will be available for review and that the Board will solicit further comments on the issue at that point.

Preliminary General Comments

A major concern with the revised WPKMP is the very brief description of closure issues and concepts provided for the LLCF.

Section 3.7 of the WPKMP touches on closure concerns, but details are lacking. Closure options and remaining challenges are not well identified or described. Given the uncertainties identified previously about the long-term behaviour of the tailings, particularly the extra fine processed kimberlite (EFPK), it is far from demonstrated that closure options will be effective. In our view it is not sufficient to leave demonstration of closure viability to a subsequent time or to another document.

The new Plan relies mostly on the outcome of BHPB's 2005 Five Year Performance Review of the Long Lake Containment Facility. It is important to note that this review was conducted primarily to redesign the operational aspects of the Long Lake facility. While closure implications were qualitatively evaluated among the three options reviewed in the multiple accounts analysis used by BHPB, closure issues associated with the overall facility were not specifically addressed, nor evaluated with respect to the current operating situation.

While we understand that closure will properly be dealt with in the forthcoming Interim Closure and Reclamation Plan, it is very important that closure issues relating to reclamation and decommissioning of the LLCF be addressed in this version of the WPKMP to the point where viable closure concepts for each of the components are demonstrated. The Board, when it approves this operating plan, should have sufficient information at the time to understand how the LLCF can be effectively closed at the end of mine life. This reflects the great importance of designing for closure.

It is not clear if the small diamond recovery process will also result in the reprocessing of kimberlite rejects previously deposited in the waste rock dumps. Little information has been provided on the implications for the additional solids input and water levels in the LLCF, or for settling of additional extra-fine processed kimberlite (EFPK) that is expected from the processing of the coarse material.

Deposition into Cell D should be avoided. In our view Cell B should be made available for reclamation sooner than BHPB currently plans. A significant portion of Cell B should be completed as early as possible so that a major revegetation pilot project can be carried out, and so that progressive reclamation of this cell can be undertaken to determine how best to close the entire LLCF.

Specific Comments

- The WPKMP notes (pg. 2) that an 'up-to-date life of mine plan' is incorporated. The life of mine plan should be included and described.
- Of particular benefit would be a year-by year scheduling of tailings placement in Long Lake so that the targets dates for progressive reclamation of Cells A and B can be identified (there is some ambiguity as to when reclamation of these cells will be initiated).
- The WPKMP notes (pg. 3) that this version has been trimmed down to focus on objectives, methodologies and activities related to handling of water and processed kimberlite, and that other issues such as water quality and adaptive management

concerns are 'discussed in other documents.' We find that trimming for some topics has been excessive, and that more information is needed on issues such as water quality predictions and management during operations and post closure. At a minimum, such information should be provided and referenced so that the Board understands the consequences of approving this Plan.

- The WPKMP cautions readers (pg. 3) about the variable nature and behaviour of the kimberlite tailings, and the uncertainty about the plan's effectiveness arising from the assumptions made by managers. The resulting variability in the wastewater means that 'on-going monitoring is required during mine and process operation to verify that the assumptions are correct'. The assumptions referred to are not explicitly identified in the WPKMP, and should be. In addition, the on-going investigations or monitoring being done to verify the assumptions should be explicitly described.
- The WPKMP notes (pg. 22-23) that 'there are numerous uncertainties currently with the processing of Fox ore and with the discharge of underground saline water. A number of studies are currently in progress regarding these issues…'. The uncertainties should be clearly identified, and their relevance to operational and closure issues described. The studies that are being done to resolve these uncertainties should also be described.
- The WPKMP states (pg. 41) that 'reclamation objectives and closure criteria for LLCF are provided in the updated Interim Closure and Reclamation Plan.' The document referred to has not been developed yet, so preliminary reclamation objectives and criteria should be included in the WPKMP.
- The WPKMP does not explain how the interface shorelines will be reclaimed. The 5-year review exercise noted that the 'constructability' of these areas was not certain, and that the high degree of erodibility of the materials in this zone raised challenges for both waste rock cover placement and revegetation. Their long-term stability has not been demonstrated. The WPKMP does not identify or discuss these unresolved issues—it states that 'erosion of FPK will also be reduced by a stable surface cover (vegetation and/or rock), short drainage channels within the facility and peripheral channels to redirect tundra surface runoff' (pg. 43). Given the uncertainties about behaviour of these materials, much more explanation is required in the WPKMP or in an attached document.
- The WPKMP should provide evidence to show that maintaining a one metre layer of clean water over the EFPK will keep the material permanently in place.
- The currently approved WPKMP did not envision the internal dykes as water-retaining structures at the end of the mine life. The revised WPKMP proposes that some internal dykes will be converted to dams. The implications for closure (perpetual care?) should be explained.
- The WPKMP states (pg. 42) that, 'permafrost distribution created by the revised deposition plan will be more predictable and will produce substantial improvements in the long term stability of the landscape.' Given the increased complexity of deposition through the construction of jetties into the cells, this statement requires an analysis to support it.
- The WPKMP states that the final water level of Cell E will 'be lowered to approximately elevation 450 m'. This is inconsistent with Figs. 9-11 that shows Cell E level at 447 m through mine life.

- The sources of all water into LLCF are not properly characterized, nor is the geochemistry of the pooled tailings pond water characterized. Monitoring of the water quality of water streams to the impoundment is being done, but results are not reported here. The WPKMP states (pg. 37) that the results are used to 'develop models for predicting future water quality trends. These trends are used to plan and implement water quality management.' No details of emerging water quality issues are provided. The WPKMP should provide this information so that water quality issues during operation and at closure are properly identified and discussed.
- Uncertainties relating to water quality were identified two years ago during the review of Long Lake operations. These included characterization of tailings porewater and tailings solids geochemistry and mineralogy. In our view, proper geochemical characterization of the wastes to be permanently stored in Long Lake is required for long-term water quality predictions, and should form a component of the WPKMP. The revised WPKMP does not identify tailings and porewater geochemistry as an outstanding information deficiency.
- A design objective for the LLCF facility is identified (pg. 24) so as to 'provide every practical opportunity to maximize progressive reclamation…'. The revised WPKMP does not include the previous opportunities identified for early reclamation of Cell B beaches. The WPKMP should explain how design for closure was carried out.
- The WPKMP notes that studies of the long-term characteristics, behaviour, management and operational requirements for the EFPK are on-going. Requirements for closure are not explicitly identified as part of the needed investigations. The WPKMP should more fully identify the information requirements needed by managers of the facility for both operations and closure, especially for management of the EFPK.
- The WPKMP notes (pg. 38) that investigations into the properties of processed kimberlite are being conducted, particularly in regard to the Fox pipe ores. These studies 'are at this time not adequately advanced to enable revised design or operation criteria to be established for the LLCF.' This, in combination with the other information gaps previously identified, indicates that approval of the proposed Plan should be for a short-term, until the results of the completed investigations can be properly understood and incorporated as necessary into a revised plan.

In the Agency's view there are sufficient information uncertainties, and lack of clarity on closure issues that it would be premature to approve the Plan in its current form. Aside from the specific issues listed above, the following concerns should be addressed in a plan suitable for approval:

- a detailed description of the outstanding information uncertainties and their management implications relating to the operation and closure of the LLCF;
- descriptions of studies, monitoring, or other analyses being undertaken to resolve the information deficiencies, along with completion dates;
- identification and description of conceptually viable proposals for closing the LLCF, particularly the interface shorelines;

- evidence that extra-fine processed kimberlite (EFPK) can be held secure within a closed LLCF by a thin layer of clean water;
- a schedule of annual tailings deposition in each cell including:
    - a schedule for progressive reclamation of the beaches;
    - an early completion date for Cell B so that revegetation tests and progressive reclamation can be done;
    - removal of Cell D from deposition schedule; and,
    - use of Beartooth or some other pit for tailings deposition or relocation of EFPK from LLCF or to better manage chlorides.
- geochemical and mineralogical characterization of tailings solids and porewater, including predictions of water quality at closure.

Given the significant amount of information yet to be obtained, it would be prudent to require an update to any approved Plan in relatively short timeframe (two years?) that incorporates the results of the studies and investigations currently being undertaken by BHPB.

We trust that our comments are constructive and helpful. We look forward to an opportunity to review the additional information that BHPB submits and to consider its implications for a revised WPKMP.

Sincerely,

-ORIGINAL SIGNED BY-

William A. Ross
Chairperson

cc. David Scott, Manager Technical Services, BHPB Diamonds
Society Members