



INDEPENDENT ENVIRONMENTAL MONITORING AGENCY

P.O. Box 1192, Yellowknife, NT X1A 2N8 ■ Phone (867) 669-9141 ■ Fax (867) 669-9145
Website: www.monitoringagency.net ■ Email: monitor1@yk.com

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Kathy Racher
Technical Director
Wek'eezhii Land and Water Board
#1-4905 48th Street
Yellowknife NT
X1A 3S3

Dear Kathy

Re: Conformity Check on the Wastewater and Processed Kimberlite Management Plan

As discussed with you and Ryan Fequet during our November Board meeting, the Agency is concerned with the approval of the most recent revised version of the Ekati Wastewater and Processed Kimberlite Management Plan (WPKMP).

On June 10, 2009 the WLWB requested that BHPB update its 2008 WPKMP. BHPB submitted a revised version on February 5, 2010 and the WLWB initiated a public comment period to review this document a couple of weeks later. The WPKMP was conditionally approved by the WLWB on June 28, 2010 based on BHPB addressing a number of deficiencies, including several issues raised by the Agency. BHPB submitted a further revision of the WPKMP on July 28, 2010. We were advised August 23, 2010 of the approval.

Agency comments on the February 5, 2010 WPKMP provided 23 recommendations for improvement, which the WLWB staff addressed in their instructions to BHPB. However, a conformity check conducted by us reveals a number of instances where there is a significant gap between what the WLWB requested and what BHPB provided. This raises questions about the WLWB process for approval of documents (see Appendix 1). For about half of the items, BHPB did not provide the information requested.

Related to this, we noted some ambiguity in the direction from the WLWB as to when revisions were to be submitted. For example, “in this version” or “in the revised version” compared to “in a revised version”. We assumed that all requested changes would come in the revised August 23, 2010 version, not in future versions of the plan. In the Agency’s view, timing directions provided to the company should be clear and explicit.



Notwithstanding the helpful direction provided in the Board's December 10, 2010, letter to BHPB with respect to, among other things, upgrading the content of Reclamation Research Plan #14, a particular concern in the most recent WPKMP is the lack of detail on key issues such as the long-term management of extra-fine processed kimberlite (EFPK). Information previously supplied in the WPKMP related to the management challenges posed by this material has been deleted, and reformulated as proposed research in the Reclamation Research Plans. It is worth noting that the critical review of both the operational and closure issues provided to BHPB by Robertson and Haley in 2004 is essentially unacknowledged in the current plan.¹

BHPB's reformatting and reorganization of this version of the WPKMP makes it difficult to compare to previous versions. The designation "Controlled Document" found in previous versions is now absent—some clarification should be sought from the company about the meaning of this. It would be very helpful to have BHPB adopt a standardized format and employ version numbers for its management plans.

Finally, the latest version contains significantly less quality and volume of information than previous versions. It may be necessary for the Board to develop guidelines for management plans to ensure greater clarity around content, including the kinds of information that should be included and criteria for determining when a plan is acceptable. The Agency would be pleased to assist in such an initiative.

We thank you for the opportunity to submit comments and we would be happy to discuss them with you and others at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "W.A. Ross". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Bill Ross
Chairperson

cc. Society Members
Bruce Hanna, Fisheries and Oceans
Anne Wilson, Environment Canada

¹ EKATI MINE PROCESSED KIMBERLITE CONTAINMENT FACILITY SUMMARY OF KEY LESSONS LEARNED FROM 5 YEAR PERFORMANCE REVIEW, A. MacG. Robertson and Don Hayley, October 2004.

Appendix 1. Detailed Analysis of Agency Comments in the 2010 Revised WPKMP

For the Agency's conformity check of the 2010 Revised WPKMP, we were guided by the following:

- did WLWB Board and staff address the Agency's concerns?
- did BHPB address the WLWB Board and staff directives?
- where information is deferred to another Plan, does it actually show up in that other Plan?
- what issues remain unresolved in the Agency's view?

IEMA 2

Agency asked that exact arrangements for dealing with surface minewater be clarified, including water quality data from collection sumps and conditions under which water would be directed to Beartooth pit.

BHPB's response was that such decisions are operational ones and theirs to make as long as they are consistent with existing approvals.

The WLWB's response was to 'encourage' the company 'to include the decision criteria for which waste management method will be implemented when in a revised version of the WPKMP.'

For its finalized *WPKMP*, BHPB refers to s. 2.1.2 which states, "Ultimately, the use of Beartooth Pit for minewater retention is an option for contingency or adaptive management responses. As such, there are no pre-defined numerical criteria for its use in this manner."

Outstanding Agency Concern - The above text seems inconsistent with the concept of adaptive management as we know it - an approach that triggers management action at pre-defined thresholds or criteria. BHPB's approach is *ad hoc*, not adaptive management. See discussion under IEMA 17. BHPB also refers to s. 2.1.3 which provides exactly the same wording for an explanation about the use of flocculants for settling fine PK. BHPB also refers to s. 3.6 for its response, although no text in this section is relevant to IEMA 2.

IEMA 3

The Agency asked for Fox minewater data, the conditions when water treatment (flocculants) would be required for discharge to LLCF, and a description of the treatment.

BHPB responded that the addition of flocculants is at discretion of the company, has been approved by MVLWB, and that no flocculant is being used currently.

WLWB staff stated that information regarding how and when flocculant addition would be used should be in the revised Plan.

The finalized version adds 3 paragraphs on flocculants (Sec 2.1.3) but provides no information on when or how flocculants will be used. Instead, it repeats the quotation used above for Beartooth pit stating that there are no pre-defined criteria for its use of online flocculant plants.

Outstanding Agency Concern - The above text seems inconsistent with the concept of adaptive management as discussed in IEMA 2.

IEMA 4

The Agency asked that BHPB provide a description of the permafrost monitoring around the Beartooth Pit, including thresholds or triggers for corrective actions, and a contingency plan in the event of permafrost failure.

BHPB's response was that operational safety risks are monitored and managed by the company and are not appropriate for inclusion into the WPKMP.

WLWB's response was that this update of the WPKMP is intended to incorporate the Beartooth pit as a method of waste management on site and, as such, information regarding monitoring, triggers for action, and contingencies should be included in a revised version of the WPKMP.

The requested information could not be found in the revised Plan.

Outstanding Agency Concern – BHPB could easily report the results from the one ground thermistor cable between Beartooth and Panda in the AEMP or seepage survey where other ground temperature data are found. Although the issue of safety is BHPB's concern, other interested parties should know whether there is any melting taking place and what the contingency plans may be.

IEMA 5

The Agency noted that management objectives and operational details for the LLCFF are only vaguely described, and that detailed information present in previous versions of the Plan had been dropped. Objectives for management and closure were missing. We asked that BHPB reinstate the format used in previous versions of the Plan which provided rationale, objectives, and methodologies for the management of each wastewater component on the mine site.

BHPB's response stated that several sections of the WPKMP were reformatted and streamlined to increase clarity, and that the common operating objectives for the different types of minewater were consolidated rather than being repeated a number of times.

WLWB's response was that the company's response was appropriate.

Outstanding Agency Concern - A careful read of the 2010 Plan will show a significant loss of information and context that may lead to future problems if operators and regulators do not understand the rationale behind management practices. This information, we believe, should be included in the next versions in 2011.

IEMA 6

The Agency noted the serious loss of information about PK in the present Plan, noting that only 10 lines of content had been provided compared to six pages in the 2007 version. We asked that the company provide sufficient and current information about PK characterization and behaviour so that the Board can have a reasonable and reliable understanding of the operational and closure issues of the LLCF.

BHPB references the *2007 Geochemical Characterization and Metal Leaching Management Plan* for a characterization of PK. Appendix B, s. 3.6 of the current Plan describes FPK discharge into the LLCF. The company notes it has been 'gathering information and modeling FPK and EFPK deposition patterns.' There is discussion of FPK and EFPK in s. 3.3.1 pg 3-4 and in s. 3.3.4.

The WLWB directs that the WPKMP should explicitly reference other documents that contain relevant material relating to PK management and that, if there is relevant or new information about PK that affects operations, it should be mentioned in the Plan. BHPB is to make these changes in the revised Plan.

BHPB's response comprises the following:

- adds approximately three pages of information to s. 3.1 most of which is old information relating to the results of the 2005 LLCF review exercise. None of this adds forward-looking information relevant to PK and EFPK management;
- adds approximately one page of information to s. 3.3.1 which adds old (but useful) information about storage volumes in the various cells for PK and EFPK; and
- adds Figure 12 depicting operational water levels in the cells.

The *2007 Geochemical Characterization and Metal Leaching Management Plan* does not provide a physical or chemical characterization of PK. Section 3.6 of Appendix B in that plan discusses thickening of PK in the process plant, but provides no information about management of the material in LLCF.

Outstanding Agency Concern - The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision on the WPKMP in 2011.

IEMA 7

The Agency asked that BHPB provide current information on EFPK characterization and behaviour in the LLCF in the next revision of the Plan, including timing and content of ongoing studies to address remaining issues.

BHPB's responded that it has been gathering information and modeling FPK and EFPK deposition patterns. There is discussion of FPK and EFPK in s. 3.3.1 and in s. 3.3.4. Longer-term concerns regarding EFPK are, appropriately, addressed in the ICRP.

WLWB refers back to its comment for IEMA 6.

BHPB's revised Plan does not contain the requested information. The referenced sections in BHPB's previous response do not provide updated information on EFPK behaviour and management issues. No new information has been provided from the studies that BHPB says it is conducting. Issues raised in older versions of the Plan relating to EFPK management are no longer identified or discussed.

Outstanding Agency Concern - Little additional information has been provided. The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision in 2011.

IEMA 8

Related to the previous issue, the Agency asked more specifically that the EFPK studies identified in the 2007 WPKMP as on-going not be dropped from the revised Plan, but rather the investigations should be described, results provided, and a schedule for research tasks established in the WPKMP.

BHPB's response and the WLWB's response, was to refer to their responses for IEMA 7.

Outstanding Agency Concern - The Agency believes the information requirements identified in the WLWB staff response need to be incorporated into the next revision in 2011. If this is to be covered in the ICRP, then appropriate cross-referencing should be furnished.

IEMA 9

The Agency asked that instead of dropping the detailed deposition plans present in previous versions, these should be kept and updated in each new updated WPKMP.

BHPB's response was that nothing about the deposition plans has changed from the 5-Year LLCF.

The WLWB agreed with the Agency, that with each updated Plan critical information should not be removed, and requested BHPB to include information from previous Plans in a revised version.

The revised WPKMP contains additional information taken from the 2007 version. There are now nine pages describing LLCF operations compared to 17 in the 2007 Plan, but the content changes are difficult to determine, since headings have changed, the formatting is different, and much cutting and pasting is evident. Given the 2007 version was twice the length and

contained no extraneous material, our conclusion is that the content of the new Plan is deficient.

Outstanding Agency Concern - Little additional information has been provided. The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision in 2011.

IEMA 12

The Agency recommended that sufficient information was needed to demonstrate that reclamation in cell B is viable, that there are effective measures available to prevent erosion of FPK surfaces, that the beaches can provide a stable reclamation surface, and that reclamation (or reclamation research) will be initiated by a specific date.

BHPB responded that this closure-related information is described in the Reclamation Research Plan, and that future versions of the *WPKMP* will make the reference more clear. BHPB also states that 'a related operational function' is described in s. 3.3.1 and 3.3.2

WLWB stated that BHPB should reference the specific *Reclamation Research Plans* (RRPs) that address the issues surrounding FPK within a revised version of the *WPKMP*. BHPB should also revise the relevant RRs if necessary.

In response, BHPB states specific references to the RRs have not been made because any subsequent changes to the numbering of RRs would necessitate a change to this Plan. It also refers to s. 3.6, but no new information is provided here.

Outstanding Agency Concern - BHPB has not addressed the staff direction in this version. Section 3.3.1 does not address "Accessibility onto EFPK" and s. 3.3.2 addresses "Accessibility onto FPK", not EFPK. The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision in 2011.

IEMA 14

Similarly to item 10 (now considered largely resolved), the Agency asked for a schedule of deposition for LLCf, with particular details about the predictions for use of cell D.

BHPB's response was that the use of cell D would depend upon a number of factors and that it would let the inspector know when use of cell D was imminent.

The WLWB referred back to item 10 - i.e., a schedule of deposition was needed in a revised version.

Outstanding Agency Concern - Figure 11 provides an end point, not a schedule. Additional information is also available in s. 3.3.3 (pgs. 3-9) but we suggest this matter be addressed in the next version in 2011.

IEMA 15

The Agency asked for updated information from the deposition monitoring being undertaken in LLCF.

BHPB's response essentially was that there is no need to address this as nothing has changed.

The WLWB stated the relevant monitoring results should be included and that they should be in the revised version.

The revised document does not supply any results. In particular, the key information we noted about the mineralogical, geochemical and geotechnical properties of the deposited FPK has not been provided. BHPB continues to state that all this monitoring is being conducted, but does not provide any results.

The absence of information on deposited FPK properties is a long-standing issue. On March 26, 2004, we wrote to the MVLWB about the *2004 WPKMP*:

Second, BHPB is continuing to investigate behaviour of deposited tailings in Long Lake. A revised WPKM Plan is expected next year, and may propose substantial modifications to the operation of the facility. On July 29, 2002, we sent comments to the Board on the company's tailing behaviour studies carried out as a requirement under Part H(1) of licence N7L2-1616. At that time we noted that the work carried out did not meet any of the original management questions identified in the water licence. It is our view that these questions are still critical to the effective management of Long Lake facility, and should be addressed. At the March 19, 2004, technical workshop held by MVLWB on the revised WPKM Plan, we asked BHPB to supply terms of reference for the current fieldwork so that we can assess whether the outstanding information is being addressed. BHPB has agreed to do this. Once these are available, we recommend that the Board review these against the requirements spelled out in the existing water licence, and take the necessary steps to secure from the licensee any missing information the Board feels is necessary. In our view, if gaps between the field work and the original licence requirements still exist, this could be rectified by reinserting the necessary conditions in the new licence, along with an approval mechanism to ensure that the study objectives are achieved.

In relation to on-going geochemical studies in LLCF, BHPB stated in July 2006 that it "will present more as it becomes available from several special studies currently being conducted at the instigation of BHP Billiton." [BHPB Response to Comments on 2006 WPKMP Jul06]

In short, BHPB has not reported on the results of this work and indicated how it is being used to better manage the EFPK.

Outstanding Agency Concern - The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision in 2011.

IEMA 17

The Agency asked BHPB to provide a risk-based contingency plan for the LLCF operations.

BHPB responded that ‘adaptive management responses should not be pre-defined.’

The WLWB is satisfied with BHPB’s response, and believes the company has described the risks and addressed contingencies appropriately.

In the final version, a new s. 3.5.1 states BHPB’s understanding of contingency planning:

The very nature of these uncertainties precludes a pre-determined contingency plan because one does not know what the risk is until it is identified. Instead, the ongoing cycle of monitoring and review of information is used to identify trends and to then develop the most appropriate response plan based on the circumstances at hand.

Immediately following this paragraph is another which seems to confuse contingency planning with adaptive management:

The current adaptive management response to nitrate in the LLCF water is an example of this approach. Monitoring and review work identified nitrate as a potential risk to water quality downstream of the LLCF. An adaptive management response was then developed from the available “toolbox” of contingency measures, some of which were purposely built into the LLCF management plan for this purpose.

Outstanding Agency Concern - The Agency is concerned that the company’s approach is to monitor trends and respond to situations on an *ad hoc* basis when they arise, using tools from an ‘available toolbox’. Proper adaptive management and contingency planning requires a more systematic approach that we will expect to see in the next version in 2011.

IEMA 18

The Agency asked that the closure planning section be updated to include the most recent information on closure issues. This version provides less information on these issues than previous versions.

BHPB argues that there is a ‘strong risk of confusion between documents and so all discussion of risks, options and effects for closure are provided in the ICRP.’

The WLWB found this response ‘appropriate’, and then stated that the approach and rationale should be provided within a revised version of the WPKMP.

The final version simply adds the previous response to the text:

BHP Billiton believes that it is relevant for a performance-based Management Plan such as this Plan to provide a broad description of the plan for reclamation of the facility. This enables operators and reviewers to quickly understand the ultimate goals for the facility. However there is a strong risk of duplication and confusion between documents and so all discussion of risks, options and effects for closure are provided only in the *Interim Closure and Reclamation Plan*, which is the purpose of that document.

Outstanding Agency Concern - In the Agency's view, there is a serious diminution of information related to reclamation issues in LLCF from previous WPKMPs, and there is nothing in the ICRP except 'research yet to be done'. It now remains to be seen if this issue is adequately addressed within the ICRP. The Agency also believes that the principle of "planning and operating for closure" requires closer integration of operating plans (such as the WPKMP) and the closure plan. This integration would, in our view, be better served with a greater level of duplication, so that operators using the operating plans would be more able to operate for closure.

IEMA 19

The Agency asked that Appendix A be completed. It is labelled 'summary of specific requirements for WPKMP'. All that is provided under this heading is "Under **Part G.1a** of Water Licence W2009-L2-0001, which also covers the Sable, Pigeon, and Beartooth developments, the following information is quoted and is specified for inclusion within the Plan..."

BHPB responded that the above is complete.

WLWB stated that no response was necessary.

Outstanding Agency Concerns - Appendix A provides the complete Water Licence condition. However, it does not provide all the *information* required in Part G.1a). We wish to reiterate our request in terms of the need to meet the *information* requirements in Appendix A, rather than the completeness of the Appendix itself.

IEMA 22

The Agency asked that the important unresolved issues about the Fox ores and the generation of EFPK raised in earlier versions should be tracked in revised WPKMPs.

BHPB states that there have been 'no negative operational effects relating to the processing of Fox ore, and none anticipated.' BHPB says that its separate studies on various issues and occasional reporting are more effective and timely approaches to dealing with this kind of information rather than repeated revisions of the WPKMP.

The WLWB states that a discussion of the uncertainties related to wastewater and PK is crucial to understanding how these will be addressed at closure, and that BHPB should incorporate 'uncertainties' into a revised version.

BHPB responds by adding s. 3.5.1 on 'uncertainties'. See discussion under IEMA 17.

Outstanding Agency Concern - Section 3.5.1 partially addresses this issue. The Agency believes the information requirements identified in the WLWB staff response should be incorporated into the next revision in 2011.

IEMA 23

The Agency referenced previous versions of the Plan which had been formatted as 'controlled documents' meeting ISO 14000 standards. We asked BHPB to explain why the format had been changed, since it clearly resulted in less substance.

BHPB's response was that the re-formatting had been done to improve clarity and to consolidate some items.

The WLWB replied that all future versions should include a brief summary of the changes, plus designating each 'version' to distinguish it.

Outstanding Agency Concern - There has been an increasing tendency to shorter, less substantive management plans in terms of both quantity and quality of information, and uncertainty issues are falling by the wayside. This may be part of the larger discussion on management plan content and purpose, and the need for better overall policy and guidance.