Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Water Resources Division
3rd Floor Bellanca Building
PO Box 1500
Yellowknife, NT

File: MV2003L2-0013
MV2001L2-0008
BHP Billiton Diamond Inc.

March 19, 2007

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

Re: Interim Closure and Reclamation Plan for BHP Billiton Diamond Inc. EKATI - Comments

Dear Ms. Baines:

Indian and Northern Affairs Canada (INAC) has conducted a review of Section 1 which includes Chapters 1 through 5 as well as Appendix A and C of BHP Billiton Diamond Inc.'s Interim Closure and Reclamation Plan 2007 (herein referred to as the ICRP). Section 1 of the ICRP is mainly background and general in nature, more detailed comments will be expanded in due course. Water Resources retained consultant John Brodie to review the Appendix C; his review is attached. Overall we are encouraged by the effort to follow the Terms of Reference (TOR), which allowed for easy comparison and analysis. Unfortunately, past issues raised by INAC concerning the lack of detail of the closure objectives and criteria have not been appropriately addressed. The lack of clear measurable closure criteria greatly limits our ability to comment on the validity of the ICRP.

Comments provided by INAC in the November 6, 2006 letter entitled Comments on Closure Objectives for the BHP Billiton Ekati Diamond Mine Interim Closure and Reclamation Plan, clearly stated that 'closure criteria should describe a precise measure of when the objective has been satisfied.' and '…we [INAC] are requesting a greater level of detail than is presented in your letter, and/or details pertaining to information required to develop the closure criteria at this stage.'. Unfortunately, these issues have not been addressed in the proposed ICRP.

Our comments have been organized in sequential order from Section 1 (Chapters 1 to 5), Appendix A, and Appendix C.

Section 1:

Pump Flooding: The stated pumping rates of 0.2 m^3/s to 0.4 m^3/s do not initially appear to pose a threat to the water balance within the Lac de Gras (LDG) watershed. However, there are several concerns with the pump flooding approach.

- The life of mine (LOM) timeline shows the pump flooding of the first pit to begin in 2010 and continue until 2046. The concern is that there are no guaranties that the pump rates will remain at 0.4 m^3/s, as stated in Table 16 p-112.
- In addition, according to the numbers presented on page 21; a minimum of two pits will be drawing water from LDG from 2020 to 2025. This will increase the volume of water taken from LDG to 0.8 m^3/s over the 5 year period. How will the pump rates be assessed to minimize potential effects to the water balance or water levels in LDG?
- It is important to note that the EKATI mine is not working in isolation within the LDG watershed. Diavik is also looking to fill its open pits with water from LDG. Future modelling is required and must take this into account.

Beartooth Pit: The Closure and Reclamation Guidelines 2007 (p-4) states that a interim CRP should place emphasis on 'Detailed reporting on progressive reclamation activities'. The Beartooth pit is to begin pump flooding in 2010. Greater detail of the closure plans, specific to Beartooth pit, are needed in order to determine if the closure criteria and measurement endpoints are acceptable to achieve successful closure, as this is a final closure component.

Waste Rock Storage Areas (WRSA): Section 1.6.3. page 23 states that 'Seepage from the WRSA will be negligible and will be monitored for signs of adverse trends in seepage quality for a period after closure.' Greater detail is needed in terms of what constitutes an adverse trend and what will be done about it? The duration and procedure for the WRSA monitoring requires clarification.

Processed Kimberlite Containment Facilities: Section 1.6.4 states that water quality discharge in the receiving environment will be monitored. It is not clear how long this monitoring will continue and whether any monitoring was done before hand to provide a baseline.

Buildings and Infrastructure: Section 1.6.2 page 22 states that remaining equipment with salvage value will be removed. Clarification is needed to define what is salvageable equipment, and conversely, what is to remain. An

explanation of what effect the remaining equipment may have on ground water and water quality would be of value.

Environmental Assessment:
Section 1.12 page 29 states that "opportunities to optimize the pump flooding strategies as well as minimize any potential effects on source lakes and the downstream receiving environment will be investigated with continuing research studies". Greater detail on the continuing research would be useful in order to determine what is being measured and why.

Statements made in regards to the negligible effects of global warming on the WRSA as it pertains to permafrost should be supported by the appropriate evidence.

Closure Timeline: There is a discrepancy in the timeline from Table 2 on page 21 which indicates the pump flooding will be completed in 2046, with the additional 10 year monitoring period this would mean overall closure would be in 2056. However, Section 1.13 states that the overall closure will occur in 2054.

Closure Objectives: The closure objectives listed in Section 2.1 are vague and ill defined. Much greater detail is required before effective comments can be made. Additional comments regarding closure goals and objects are attached in John Brodie's review.

The Mine Site Reclamation Guidelines for the Northwest Territories-INAC 2007 (p-4) describe what components an effective ICRP should have. The following components do not appear to have been properly addressed in the BHPB ICRP 2007.

- Detailed description of contingency plans
- Detailed report on progressive reclamation activities
- Updated reclamation research plan
- Increasingly convincing evidence that the reclamation objectives can be achieved by the described activities
- Site specific closure criteria
- Updated post-closure monitoring requirements and responsibilities
- Renewed or updated descriptions of the likely post-reclamation risks to human and wildlife health and the environment relevant to the information available (Risk Assessments)

Appendix A

Appendix A is a glossary of terms which has been translated into three Aboriginal languages. Overall this section is very helpful and we commend BHPB for the

effort. The glossary will allow community members to more easily interpret the report and provide valuable comments.

The term bioaccumulation has in our view been improperly defined, as the definition provides a more accurate description of biomagnification. Bioaccumulation refers to the accumulation of a chemical in the tissues of an animal or population. Biomagnification refers to the accumulation of a chemical as you go up the food chain (trophic level). The definitions should be amended accordingly.

Appendix C

Appendix C is the Closure Goal, Objectives and Criteria report. The layout of Tables 21 to 26 is useful as a way to summarise and present the objectives and criteria. However, the objectives and criteria themselves need to be much more specific.

The closure goal is 'to return the EKATI mine site to a viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities'. To achieve this, properly defined closure objectives must be in place, which specifically relate to the major components of the mine closure. These closure objectives should clearly relate to the closure criteria and assessment endpoints which can be measured and analysed. Without specific closure criteria there is no way to conclude that the mine site has reached its closure objectives or the overall closure goal.

The definition of closure criteria provided on page 112 of Appendix C is "closure criteria are a set of measurable performance based standards that provide the ability to measure the actual performance of closure activities in successfully reaching the closure objectives. They are also used to determine when reclamation and monitoring programs have been completed". The closure criteria in Tables 21 to 26 do not have specified measurable endpoints. In the tables the closure criteria should be a measurable parameter that once a specified value or endpoint is reached it will indicate successful closure. In Figure 2, traditional knowledge (TK) is listed as a closure criterion. However, TK is a set of knowledge or data that should be used throughout the development of the project from planning to decision making and not a criterion per se. Closure criteria should be something like, 'sustainable/acceptable future land use for a traditional lifestyle'. Focus should be placed on the use of traditional knowledge throughout the process.

It is important to remain open to discussion on all potential closure activities that may be desirable to stakeholders/interested parties. For example, the statement that backfilling of open pits cannot achieve the objective of environmental

protection is not well supported. Backfilling may not be the least costly; however, it is feasible and could achieve the objective of environmental protection. This option, and any other, should not be discounted without adequate justification.

INAC hopes that the above comments are useful to the WLWB.

Sincerely,

-original signed by-

Dr. Kathleen Racher
Manager
Water Resources Division

BRODIE CONSULTING

MEMORANDUM

DATE: March 18, 2007

TO: Nathen Richea, INAC Water Resources

FROM: John Brodie, P. Eng.

SUBJECT: Ekati Mine, ICRP Section 1 Comments

Review of the Ekati Mine ICRP is divided into 4 groups. This memo relates to Section 1 only. Specifically, only Appendix C – Closure Goal, Objectives and Criteria have been reviewed. My comments are as follow:

Section 3.3

The Reclamation Goal, as stated by BHPB is reasonable, however it could be improved. There is no mention of factors such as the duration of time to achieve self-sustaining ecosystems or the need to ensure that physical and chemical stability will continue to be met in the long-term.

Reviewers and stakeholders should note that BHPB has included "wherever practicable" in the Reclamation Goal. This places the onus on the company to do all that is reasonable to satisfy the goal.

A list of 8 closure objectives are presented. Many of these are not truly closure objectives. They are in fact corporate objectives and considerations that relate to mine closure activities.

It is surprising that there is no cross-reference in this section to the mine plan. The scope and type of closure activities are directly affected by the mine activities. Merging of the mine plan and closure plan would yield the lowest practical level of closure activities, for example by reducing the magnitude of the reclamation liability by disposing of tailings in one or more of the open pits (reducing the land area inundated by tailings and subsequent creation of a boulder field cover). Further to this point is that some post-closure options may be rendered "impracticable"

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because of inadequate consideration of the closure implications during the mine planning stage. One such example is the burial of overburden in the waste rock piles, thus precluding its use in waste dump reclamation.

Four types of closure criteria are listed (physical stability, chemical stability, biological stability, and, sustainability and traditional knowledge). It is not clear that sustainability and traditional knowledge are really closure criteria. These seem more like moderating factors to be considered in setting the physical, chemical and biological criteria.

The ICRP goes on to describe the four types of closure criteria and then moves on to specifics of each as they apply to the various mine components. There is no indication that these must be met on a site-wide basis as well as on an individual component basis. For example, even if individual components met criteria for release of metals or TSS, the aggregate down-stream effect from the entire site could be unacceptable. Another example concerns replacement or re-establishment of high value terrestrial habitat which may have to occur in different parts of the mine site than the areas where it was lost.

None of the closure goal, objectives and criteria make any reference to the time period for meeting the goals and objectives.

Physical Stability

This section does not mention that physical stability must continue to be met in the long-term (although one might infer it from objective 7). Physical stability should address extreme events (floods and earthquakes) as well as erosion and decay. These are not expressly stated. Physical stability criteria should also recognize the need for closure measures to be resistant/tolerant of changes that may arise due to climate warming.

Chemical Stability

The second paragraph of this section includes the statement “The success of physical reclamation at the Ekati mine site will influence both the chemical and physical stability.” A stronger and

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clearer statement of this concept is “Mine closure cannot be successful if physical stability is not achieved.”

This section of the ICRP makes reference to a “risk based approach”. No further information is provided on this. Key questions are: Who participated in the risk evaluations? When was this done? What risk ranking system was used? What risk factors (definitions of likelihood and consequences) were applied? Are we certain that all risks were identified (i.e. none over-looked) and were the risks rated in such a way that all stakeholders would substantially agree on the rating?

Section 3.4

It is stated here that the closure criteria must “remain flexible”. This may be acceptable so long as it applies to technology and experience gained at the mine. It would not be acceptable if this is allows a reduction in the criteria because of cost considerations or upsets in the mine plan.

Tables 21 to 26 – General Comments

This group of tables presents closure objectives and criteria for open pits, underground workings, waste rock piles, kimberlite storage area, dams etc., and buildings and infrastructure.

Objective 1 is essentially the same for each component. Surprisingly, there is no mention of the NWT mine reclamation policy or the NWT mine closure guidelines.

Many of the criteria, particularly in objective 2 are adjectives which are subject to interpretation. The words, “significant”, “encourage”, “negligible”, “routine” and many others occur through out these tables. There are no definitions provided to clarify what each of these mean. In this regard they are not “measurable performance based standards” as suggested in the 3rd bullet of Section 3.2.

Table 21 – Open Pits

Physical criteria refer to “geotechnically stable” pit slopes. This should be defined – does it refer to large scale failure involving the entire slope? What about raveling? What about instability of any overburden slopes?

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The physical stability section makes no reference to hydraulic criteria for inflow and outflow channels.

The biological criteria refers to pit berms outside the "zone of instability". Phrased as such, this conflicts with the physical stability criteria. Also in this column is "risk assessment" as an action item. What does this mean?

Objective 7 physical stability refers to the 1:100 year storm event for engineered structures. This is not an acceptable standard for closure. Even low risk structures should be constructed for a higher standard than this. The current mine closure guideline does not include the design criteria tables, however the earlier versions recommended that the minimum hydraulic standard for low risk structures would be the 1:200 year storm event, moderate risk structures would be the 1:500 year event and high risk structures based upon the PMF (probable maximum flood). *Note that this comment applies to all of the Tables 21 – 26.*

Table 23 – Waste Rock

Objective 4, Biological stability refers to "wildlife use of WRSA has been demonstrated". What does this mean? Use is demonstrated if one animal goes there occasionally. Would this be acceptable to stakeholders? There should also be a need to demonstrate that any such use did not have any negative effects such as enhanced predation or damaged hooves.

Overburden piles are not mentioned in this section.

Objective 4 refers to maintaining dump lift heights at 20 m. maximum. How is this a closure criteria and what benefit does it provide?

Table 24 – PKCF

This section makes no reference to critical closure criteria for tailings impoundments, namely static and seismic stability of dams, and hydraulic capacity of ditches and spillways. *Note that this comment also applies to Table 25.*

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Objective 4 – biological – actions, refers to progression towards achieving a certain % cover. What is the percentage?

Table 26 – Buildings & Infrastructure

This section makes no reference to industrial waste disposal and landfilling, or to the management of hydrocarbon contaminated soil.

Summary

In my opinion, Appendix C of the ICRP is severely deficient in many aspects. It proposes inadequate closure criteria or fails to provide specific criteria. The document is very wordy and seems to avoid committing the company to any particular (acceptable) closure criteria. It leaves open for discussion nearly every aspect of the closure plan as to whether or not the measures will be acceptable.

Should Appendix C be accepted in its present form as the definition of closure criteria for the Ekati mine, then problems will arise in the future concerning the adequacy of purportedly completed closure work and the associated release of reclamation security. This should be a concern to both the company and the government, particularly INAC.

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