

Comment Table – ICRP WORKING GROUP #4

Received From – Indian and Northern Affairs Canada (INAC)

Tacking Number	ICRP SECTION	TOPIC	COMMENT	STATUS	ACTION ITEM
9	8.0	General	<p>In general there is a lack of detailed information. The chapters are basic summaries and often simply refer to references, which are not available or difficult to track down.</p> <p>A preferred solution is to provide more detail in the ICRP and make the references available (i.e. On CD).</p>	Resolved	I will put together a list of references to be provided by BHP.
10	8.2	Figure 78 – Water Balance	<p>Using the numbers provided in Figure 78 there appears to be approximately 2.84 million m<sup>3</sup> of water being removed from the LLCF into Leslie Lake.</p> <p>Using the number provided in Figure 78 the following calculations (approximations) were made:</p> <p>Inputs (Cells A, B, C) ----- 6.5 Mm3            Withdrawn for Processing Plant-- <u>5.14 Mm3</u>            Surplus----- 1.36 Mm3</p> <p>Discharge to Leslie Lk----- 4.2 Mm3.</p> <p>Therefore there is an excess of approximately 2.84 Mm3 (4.2 – 1.36) of water being removed annually from the LLCF.</p> <ul style="list-style-type: none"> <li>- Can you explain what this means to the water balance of the LLCF?</li> <li>- Is it due to volume of solids, or precipitation?</li> <li>- How is ice entrainment being considered in this schematic?</li> </ul>	Resolved	Marc Wen (RESCAN) agreed to look into it and provide an explanation.

11	8.3	Table 84	<p>-The vast majority of the described effects are listed as being negligible or minor. Considering that some of these parameters are not well known and are still being researched, it would appear premature to claim that the effects will be negligible or minor. More information is required to make these claims</p> <p>-For LLCF water quality the contingency is water treatment during the reclamation period. INAC-WRD requests more information be included in the ICRP regarding the type of Water Treatment System or methods which BHPB intends to use as a contingency if water treatment is determined to be required during the reclamation period.</p>	Resolved	BHP will update Section 8.6 with more information about water treatment plant or contingency plans in advance of any reclamation work to be required during the reclamation period.
12	8.4	Pit Lake Load Balance Models	BHP states at the start of this section that it is only a summary and a pit lake report will be forthcoming. Considering the importance of this document, can BHP confirm that the pit lake studies and the final report will be completed by December 31 <sup>st</sup> , 2008 or earlier?	Resolved	
13	8.4.2 and 8.4.3	Pit Lake WQ & Stability	INAC-WRD would like to thank BHPB for organizing the presentation on the issues surrounding pit lake water quality and stability, they were very informative and helpful. They did however highlight the complexity of these systems and the difficulty in modeling and prediction. This only emphasises the need to implement a pit lake study sooner rather than later so some of these variables can be answered before closure.	Resolved	
14	8.4.4	Source Lake Extraction Rates	INAC-WRD is concerned that average values are used to determine the drawdown of the source lakes and prediction of downstream effects. Table 19 (p-115) indicates that Ursula Lake will be used as a source lake for 14 years. Considering the extended time frame, there are certain to be years of low water.	Resolved	With the condition that 'unacceptable effects of drawdown' will be defined before pumping and more detailed plans will be forthcoming as we progress through the life of mine .

			Therefore, a range of possible scenarios would be more appropriate. For example use a series of possibilities ranging from high to low flow years. You can then use these ranges to provide details describing at what flow or drawdown level mitigation (i.e. reduce or stop pumping) will be required.		
15	8.6.1	Physical Configuration of LLCF	This section states that 'A relatively small volume of Kimberlite will also have been discharged into Cell D during the final years of operations, creating a beach in the northwest corner of the cell'. This is a change of plans from restricting PK to Cells A, B, and C and possibly using the pits for the remainder. Furthermore considering that this will be deposited towards the end of mine life, the impact at closure will be greater. How will these potential impacts be mitigated?	Resolved	
16	8.6.2	Model Set up	The effect of subsurface porewater expulsion should be considered in the model.	Unresolved	Refer to tracking # 201
36	9.2	Progressive Reclamation Planning	INAC-WRD-WRD is unclear how the BHP is planning for the closure of large mine components prior to 2020. The following statement is confusing, "Closure of large mine components scheduled for reclamation prior to 2020 will entail planning and plans, to a small degree of the main EKATI mine closure, from conceptual through to execution." Can BHP explain their plan more clearly? BHP states that over the next 3 years, many of the mine components will be in the pre-feasibility stage of closure planning. What will be done for those mine components that are scheduled to be closed prior to 2011 (e.g. Phase 1 Pond, Panda/Koala/Beartooth WRSA, Beartooth pit, etc.)?	Resolved	Clarification is needed as to whether any future reports will be subject to approval.

38	Appendix F	General	<p>-The Research Objectives and Planned Research headings are not clearly connected to closure criteria or objectives. Considering that this is a Reclamation Research Summary Table, the research should be more clearly linked to closure criteria and/or objectives.</p> <p>-The research summaries are far too vague and do not provide enough information to determine if the work being done is adequate. In order to help resolve this problem, a greater level of detail is required in the research summaries and the reference material cited should be made available (i.e. On CD or website)</p> <p>-The research tables do not reference timelines or deadlines for the research. There are no timeframes for research results, so it is difficult to determine if they are aligned with the closure dates established in the mine plan.</p>	Resolved	
59	Appendix F Table 43	Land 1	<p>The vegetation section was informative, particularly the seed collection, storage and propagation program. What areas of the mine will be reclaimed using local seed sources. The use of local seed sources is encouraged and preferred over native cultivars. Will the references for this section be made available?</p>	Resolved	
80	Appendix F Table 43	Water 1	<p>Similar to comments made in tracking number 6, INAC-WRD is concerned that a reduction in outflow of 21.5% for Ursula Lake and 18.1% for Upper Exeter may result in downstream impacts. This is particularly true considering that the values are based on average precipitation values and do not consider impacts and mitigation of a low flow year.</p>	Resolved	Refer to tracking number 14.
101	Appendix F Table 43	Water 2 and 3	<p>INAC-WRD is confused regarding the difference between "research on pit lake final elevations" and</p>	Resolved	

			the “estimated final lake level elevations for pit lakes”. It seems that final pit lake elevations are available. Will BHP provide both the predicted levels for pit lake with and without plugs?		
108	Appendix F Table 43	Water 4	INAC-WRD stresses that these pit lake studies and the pending report is crucial to the review and assessment of BHP’s Interim Closure and Reclamation Plan.	Resolved	
124	Appendix F Table 43	Wildlife 1	INAC-WRD supports DFO’s position that fish barriers should be designed in such a way that they are easily removed if and when water quality criteria are met and DFO and others are satisfied the pits are safe for fish.	Resolved	
128	Appendix F Table 43	Wildlife 2	INAC-WRD has questions about the perimeter pit berms being proposed by BHP. Can BHP further explain the rationale for perimeter berms and expected design life of the berms? Are there any other options to restrict/mitigate wildlife accessing to the pits?	Resolved	
155	Appendix F Table 43	Operations 3	BHP has conducted some initial research on directing Processed Kimberlite (PK) into the pits to reduce the overall depth and pumping requirements. INAC-WRD notes that directing PK into the pits is not brought forward as an option in the ICRP but BHP will continue to research this as an option. When will this research begin and how long will it take? We note as per the mine plan as early as 2010 a pit will become available for closure?	Resolved	-Conditional on reclamation research for backfilling PK be provided well before backfilling begins.
158	Appendix F Table 43	Operations 4	BHP has indicated that research on engineered plugs in the UG mines is ongoing but has not been completed. When will the research be completed and what type of research other than feasibility will be conducted?	Resolved	

165	Appendix F Table 44	Water 1	<p>-INAC-WRD notes that the results from earlier research states that the Ion exchange mechanisms have been suggested as a possible cause. An SRK report confirmed that ion exchange is the likely cause of the low pH and elevated aluminum. Since the cause of the pH depression is understood, what mitigation measures are going to be implemented to stop the aluminum non-compliance of Seep-018B/019?</p> <p>-INAC-WRD has raised concerns about SEEP-018/019 for the past years as total aluminum is higher than discharge criteria. Is BHP conducting research as to why the toe berms are not working in this area? What options are being considered to deal with this seepage (i.e. containment, pumping to the LLCF, etc.)?</p> <p>-BHP indicates that increasing trends in underground inflow rates since 2003 with large temporary inflows of groundwater. Also, current trends indicate that the salinity of mine water from the UG workings will increase in the future. Has BHP done any hydrogeological modelling of groundwater inflows given these noted increases above? Have they made any predictions on how the groundwater may influence the WQ of the LLCF with time? What are the expected groundwater inflow rates once UG operations are near complete (i.e. maximum amount of inflow)?</p>	Resolved	Conditional on the 2005 Klohn Crippen report being provided
175	Appendix F Table 45	Land 2	<p>INAC-WRD is concerned that BHP does not have a % success rate component as part of the revegetation studies/research. This would be both useful and necessary if BHP wishes to use revegetation percentage as measurable closure criteria for the site.</p>	Resolved	

193	Appendix F Table 45	Wildlife 1	Why isn't BHP utilizing both the recent and potential ongoing opportunities to monitor and research caribou use of the haul ramp, particularly as this is a proposed closure option for the Waste Rock Piles?	Resolved	
201	Appendix F Table 46	Land 1	<p>- Research Completed b) states that field measurements including temperature and water samples at depth were initiated in 2001 . When will the available information be provided as the need for this information was highlighted in the Section 3 working group meeting and BHP committed to provide this as soon as they could.</p> <p>-Research Completed c) refers to a doctoral thesis that was originally designed to study the LLCF, but was subsequently changed to study the effect of climate, snow cover, and vegetation on peatlands across the Slave Province. It is unclear how a peatland study is relevant to the closure of the LLCF given the very different substrate properties.</p> <p>-This topic was raised at the Section 3 working group meeting and BHP stated that work is currently being done on the LLCF by Carleton University (refer to Section 3 transcript pages 45 and 46). This is clearly not the case.</p> <p>- Research Reference iii) notes a Thesis Proposal – Permafrost Aggradation and Pore-water Expulsion in Saturated Fine Tailings. The associated description refers to the peatland studies being conducted across the Slave Province. It is clear that the description does not match the reference. This should be clarified.</p> <p>-BHP's response to Tracking Number 27 for Section 3 refers to Table 46 and how it will be updated. The most recent copy of Table 46 provides only a summary of the work conducted and does not</p>	Unresolved	<p>INAC and BHP have agreed to meet in the near future to discuss and resolve this issue.</p> <p>BHP has committed to provide the following references/ information:</p> <p>-EBA, 2002. Processed Kimberlite Deposition Investigation, Long Lake Containment Facility.</p> <p>-EBA, 2005. Report that was cited during the Section 4 meeting.</p> <p>-Reports produced (including his thesis) by Andrew Rollo.</p> <p>-Pooling all of the related information collected at the LLCF into a report . This was discussed at the Section 3 working group meeting.</p>

			provide any details. INAC-WRD was also asked to refer to report EKATI Diamond Mine Quality of Pore Water Extracted from Cell B. As we have stated in the past (refer to Section 3 working group transcript page 31) this report refers only to porewater quality within the active layer and therefore does not address the question of sub-surface porewater quality.		
210	Appendix F Table 46	Land 2	Is BHP continuing research on weathering processes on PK over time? Will they be investigating the potential concerns brought forward regarding vegetation growth, erosion, wind dispersion and downstream sediment loads in the long term? When will this research take place and what is its completion date?	Resolved	
213	Appendix F Table 46	Land 3	When will BHP be commencing research on rock placement on tailings as part of closure? How long will the research take? Will the research be completed prior to the Phase 1 Pond closure?	Resolved	
216	Appendix F Table 46	Land 4	When will BHP complete this research (pilot study) on revegetation of the LLCF? What is the expected duration of the pilot study? What is the alternative if the results of the pilot study are not favourable?	Resolved	References will be provided
221	Appendix F Table 46	Land 5	-Again, when will BHP complete this research (pilot study) on revegetation of the LLCF? What is the expected duration of the pilot study? What is the alternative if the results of the pilot study are not favourable? -Results from completed research states that native grass cultivars can be successfully established in the mid-slope portion of the LLCF. The possibility of the cultivars escaping into the surrounding environment should be considered.	Resolved	-BHP will check to ensure that the risk of cultivars escaping is/will be addressed.
223	Appendix F	Land 6	When will research on grazing impacts on the LLCF	Resolved	



	Table 46		take place? How long will they take place and when will the results be known? Is this expected to be part of the pilot study mentioned above? Wouldn't the contaminant uptake by the plants and the potential transfer of contaminants to the grazers be part of this study?		
250	Appendix F Table 46	Water 1 and 2	What are the timelines established for the additional modeling of Water Quality and Extra Fine Processed Kimberlite in the LLCF?	Resolved	Condition that the ongoing research with be provided upon completion and not 2020.
251	Appendix F Table 46	Water 3	INAC-WRD is uncertain as to why the LLCF dyke weir locations are a research objective but there is not application of the results of the research? Is this only a monitoring requirement? If not, how will the weir locations be determined at closure?	Resolved	
260	Appendix F Table 46	Wildlife 1	When will BHP complete this research on revegetation of the LLCF? Will it be part of the planned pilot study? What is the expected duration of the pilot study? What is the alternative if the results of the pilot study are not favourable?	Resolved	
266	Appendix F Table 46	Wildlife 2	When will the results of RESCAN's Risk Assessment on metals uptake by wildlife be completed? Are there any plans for additional research on this matter?	Resolved	
267	Appendix F Table 46	Wildlife 3	INAC-WRD supports DFO's position that fish barriers should be designed in such a way that they are easily removed if and when water quality criteria are met and DFO and others are satisfied the pits are safe for fish.	Resolved	
272	Appendix F Table 46	Operations 1	Why hasn't BHP conducted any research on the "Design internal drainage channels"? What is the associated timeline for this research? How will these internal channels effect pit lake stability and mixing? When does BHP expect the results of this research?	Resolved	
282	Appendix F	Water 1	When will BHP conduct the research on sediment	Resolved	

	<b>Table 47</b>		<b>materials characteristics and the water quality of the King Pond Settling Facility? When will the research be completed? Will this research be expedited if no further work is planned for the Misery site?</b>		
<b>286</b>	<b>Appendix F Table 47</b>	<b>Wildlife 1</b>	<b>When will BHP conduct the over-wintering fish habitat research for the King Pond Settling Facility? Will this research be expedited if no further work is planned for the Misery site?</b>	<b>Resolved</b>	
<b>296</b>	<b>Appendix F Table 48</b>	<b>Operations 1</b>	<b>When will BHP conduct the research on demolition and encapsulation of material either in the WRSA, UG or Open Pits? INAC-WRD notes that most WRSAs are currently close to final elevations and that the effects of placing demolition material in the UG or in Open Pits on water quality are not known at this time. If this is to be truly considered as part of final closure the research, planning and scheduling of operations is extremely critical to the success of this option.</b>	<b>Resolved</b>	