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9545-1-1-JER-R

May 13, 2005

Ms. Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
Box 119,
Gjoa Haven, NU. X0B 1J0

Dear Ms. Beaulieu,

Re: Jericho Aquatic Effects Monitoring Plan (AEMP)

Thank you for providing INAC with an opportunity to review the above-mentioned plan submitted by Benachee Resources Inc. on March 22, 2005, as required by Part L, Item 10 of Water Licence NWB 1JER0410. This letter summarizes the comments provided by INAC's technical and scientific review team.

INAC's critique is provided in two parts: "General Comments", which provides a brief summary of INAC's overall impression of the plan, and "Specific Comments" which outlines our reviewer's observations related to specific sections of the AEMP.

General Comments

The March 2005 AEMP is comprehensive and reflects recent state-of-the-art methods for AEMPs in Canada and for diamond mines. As noted in the Jericho AEMP, it follows guidelines – where appropriate – described in Environment Canada's 2002 *Metal Mining Guidance Document for Aquatic Environmental Effects Monitoring* (MMEEM) and recommendations presented in reviews of other programs such as the Ekati Diamond Mine™ AEMP (Rescan 2003; Zajdlik 2004).

The AEMP incorporates a weight-of-evidence approach and embraces the concept of adaptive environmental management whereby monitoring is applied to detect unexpected impacts, potential causes from mine operations are determined, mitigation measures developed and further monitoring done to check the effectiveness of such measures. It monitors water quality, sediment quality, sediment deposition, dissolved oxygen, and aquatic biota from phytoplankton to fish for most of the pertinent variables, at reasonable frequencies and for the most part, at reasonable locations.

The following provides some general recommendations or suggestions regarding the AEMP:

1. There is no methodological approach provided for the collection of water quantity or flow data, although flow monitoring stations are illustrated. The quantification of water quantity is of importance particularly during spring break-up owing to the reliance of the PKCA discharge on natural dilution for safe disposal of wastewater from mine operations. If this methodology is not described elsewhere (for example, in the monitoring report) it is recommended that it be described in this AEMP.

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2. On page 11 of the Mine Plan in the "Materials and Water Management" Section, it is stated that all water from collection ponds will be directed to the PKCA unless it is shown that direct discharge can occur; i.e., it meets effluent quality criteria as shown in Part G, 6 a., of the water license. At the hearing, it was stated that a monitoring plan would be developed and implemented if it were found that direct discharge to Carat Lake from Ponds A, B, and C were acceptable.

   Generic details of this monitoring plan along the east shore of Carat lake should be provided in the AEMP to ensure that potential water chemistry, sediment chemistry and aquatic effects are monitored. Pre-operational baseline conditions in the area where such discharges may occur should be documented this year.

3. In addition, the AEMP would have benefitted from a brief discussion of how the AEMP relates to other monitoring programs at the mine, such as the SNP, Special Effects monitoring and day-to-day Operations monitoring. This may well be contained in the overall monitoring report which INAC's reviewers have not yet seen.

Specific Comments

Section 2.1.1., Table 2.1

There is no reference to the watershed which flows north and joins with the Jericho River below Jericho Lake and appears to drain lands adjacent to the airstrip and existing tank farm. The most southerly lake in this sub-watershed has the potential to receive dust and suspended solids via airborne and runoff modes of transport. The lake could potentially receive fuel-contaminated ground water as a result of potential fuel spillage at the tank farm. It is recommended that rationale be provided in the AEMP for the exclusion of this watershed.

Section 2.4.1, Page 8

There is reference to water quality stations being monitored monthly and additional water quality stations corresponding with benthos sites monitored once per annum. This is confusing and implies that the monthly monitoring sites may not be representative of overall lake quality. INAC would have expected that the monthly sampling program should suffice in determining cause & effect relationships between water chemistry and benthic communities present in a lake. If not, monthly replicates should be taken in areas of these lakes where benthic sampling will occur.

Section 3.2, Table 3.2

WQ4 (Lake C3 S Basin) is shown only as a water quality site. At the water licence hearing, this site was noted to be important with respect to timing of release of PKCA discharge to ensure that contaminants in the discharge are adequately diluted. It should therefore also be identified as a quantity site where flow is determined by a stage-discharge relationship.

Section 3.3, Table 3.3

The table does not cross-reference historical station numbers with the current station numbering system, used in Figure 3.1. Also, for Cigar and Carat Lakes and Jericho Lake outlet where multiple sites were sampled historically, it would be helpful to show which site corresponds with the planned AEMP site.

Section 3.3, Table 3.3 does not clearly identify whether historical sampling was completed to the same detection limits as the current AEMP specifies. If not, additional samples should be collected

prior to commencement of construction and analyzed at the current AEMP detection limits. This will provide a sound baseline data base against which to compare future potential changes in water chemistry.

Section 3.3, Table 3.4

The codes indicated in the "Water Chemistry" column of this table are not defined. For clarity to all readers, these codes should be defined, possibly as footnotes to the table.

Section 3.3, Table 3.4

Indicates that preconstruction water chemistry data will not be collected at JER-WQ2 (PKCA discharge) or at JER-WQ16 in Lynne Lake. It will be important to collect pre-construction data at these locations. Long Lake, the future tailings pond, will have to be de-watered and suitability of water for discharge into Lake C3 should be known, particularly for dissolved oxygen at depth. Lynne Lake will support winter road access to the site and will be representative of water chemistry entering Contwoyto Lake. It could potentially be affected by acid rock drainage from proposed waste rock piles near its watershed divide. It is therefore recommended that pre-construction water chemistry data be collected at JER-WQ2 and JER-WQ16.

Section 3.6, Page 22

The before-after-control-impact (BACI) approach is not mentioned as the basic statistical analytical design for water chemistry. This is mentioned in Section 2.4.2, Page 8 (Analytical Methods) and is normally applied in AEMPs.

Tables 4.2 & 4.3, Page 24

There is no plan identified for any of the Lynne Lake group of lakes to be sampled and analyzed for sediment chemistry. Owing to the possibility of drainage from nearby waste rock piles, at least one lake (Lynne Lake) should be included in the sampling program to detect possible metals from acid rock drainage, in the event of rock pile encroachment on the Lynne Lake group, which drains to Contwoyto Lake.

Section 4.3, Page 26

It is mentioned that five (5) replicates sediment samples will be collected at each station because power analysis conducted in 2004 suggested this. This is important to ensure that a sound baseline data base is available to statistically detect future changes.

- Were the historical samples taken as 5 replicates?
- Will baseline sampling results represent 5 replicates?

Section 4.6, Page 27

Mercury should be added as a key parameter to the sediment chemistry data analysis. High mercury results were found in lake trout tissue from one of the downstream lakes, which demonstrated a possible high natural source of mercury. Mercury should therefore be monitored to ensure fish are safe for human consumption.

Section 5.2, Table 5.1

Consideration should be given to adding Long Lake and Lynne Lake for dissolved oxygen (DO) monitoring owing to possible nitrate and ammonia impacts on both lakes. This could be caused by the discharge of mine water with blasting residue to the Long Lake tailings facility and from possible leaking of ammonia and/or nitrate from waste rock piles and the emulsion plant and ammonium nitrate storage pad close to the Lynne Lake sub-watershed divide. Ammonia can reduce available oxygen as it oxidizes to nitrate; both act as fertilizers to trigger algae growth which can deplete oxygen dissolved in water, particularly during the winter, under snow-covered ice.

Section 6.2, Table 6.1

The lake south east of the airstrip should be included in the sediment deposition monitoring owing to potential air-borne sediment and dust disturbed during frequent takeoffs and landings.

Section 7.1, Table 7.1

There is no indication of gut content identification for fish. This easily-acquired data should be collected to help determine possible aquatic biota interrelationships and indirect effects. Should one critical species – in terms of its importance as fish food – of the zooplankton or bottom fauna community be reduced or eliminated from a lake by mining activities, fish health and condition could be negatively affected. Linking gut content with sudden reductions in zooplankton or benthic invertebrate abundance can "flag" possible unanticipated problems not revealed by other water quality variables.

Section 7.2, Table 7.3

Owing to Inuit water rights associated with waters running by, through or downstream of Inuit-owned Lands, of which part of Benachee's property occupies, consideration should be given to monitoring lake trout and round whitefish in Jericho Lake.

Section 7.2, Figures 7.1 and 7.2

These figures are confusing in that station locations are different yet numbered the same, for example, JER-AB10 and JER-AB11 for sampling sedentary and non-sedentary biota. The reason seems to be that the sedentary animals of Figure 4.1 will be sampled in shallower water whereas non-sedentary will be sampled in deeper waters. It is recommended that this be clarified and the distinction be made clear on the figures.

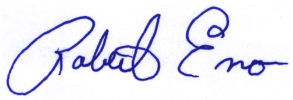
Section 7.3, Table 7.4

In the footnotes of this table it is stated that background samples of lake trout and whitefish for Cigar Lake in 1996 and 1999 were taken from a *"...water body immediately adjacent to Cigar Lake"*. Similarly, slimy sculpin samples reported for Cigar Lake in 2004 were collected from a "*... tributary to Wallingham Lake"*. INAC recommends that Benachee repeat baseline sampling in 2005 for lake trout/whitefish and for slimy sculpins ensuring that fish testing is done on fish from Cigar Lake itself to truly reflect environmental conditions in Cigar Lake rather than from those nearby which may represent far different geologic and limnological conditions.

Section 7.3, Page 43

It is stated that "*...parameters used to describe community characteristics are measured using fish sacrificed for metal contamination analysis*" and that fish sacrificed for tissue analysis are kept to a minimum. This could be interpreted to mean that fish community characteristics will only be determined through the tissue contaminants monitoring program. If this interpretation is correct, INAC agrees with the objective of minimizing the impact on fish populations, however, INAC wonders how representative this approach alone will be in determining fish community characteristics. It is recommended that this approach be reviewed carefully with DFO fisheries impact biologists to ensure that critical fish community data will not be lost and to determine if alternative means may be available to acquire it.

This concludes INAC's comments. Should the NWB or Benachee Resources Inc. have any questions or require clarification on any of the comments in this review, do not hesitate to contact the undersigned.



Robert Eno
Water Resources Coordinator

c. Greg Missal - Tahera Diamond Corporation