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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

File: NWB1NAN0208/TR/G14

August 22, 2003

By Email

Mr. Robert Carreau
Corporate Manager, Environmental Affairs
Breakwater Resources Limited
Suite 2000, 95 Wellington Street West
Toronto, ON M5J 2N7

**Subject: Licence NWB1NAN0208
Human Health Ecological Risk Assessment**

Dear Mr. Carreau

The Nunavut Water Board has completed its technical review of CanZinco Limited's ("CanZinco") Nanisivik Mine Human Health and Ecological Risk Assessment ("HHERA") submitted January 2003 and all submissions received from interested parties. The NWB has determined that the following issues are to be finally decided after a technical meeting, the details of which are discussed below:

1. Selection of Background Metal Concentrations in Soil

- a. The selection of 1985 soil sampling data as representative of the pre-mining conditions at the site.
- b. Correct methodologies for the calculations of SQROs vis-a-vis the effect that the background concentration may have on the calculated SQRO values.
- c. The use of Ontario Typical Range data to represent local background for the Nanisivik Mine.
- d. Alternate method for evaluation of background within the claim block.

2. Calculation of Background Exposures

- a. The consideration of supermarket foods as background exposures. Whether all other exposure pathways should be considered as site related and evaluated as such.
- b. Chemical screening and the use of receptor specific generic screening criteria for those metals for which background data is not available.
- c. Canadian data for the estimated daily intake for toddlers.

3. **SQROs Calculation Methodologies**

- a. Justifications for the parameters used in the calculations of the winter exposures to soil and dust, and in the calculations of the final HQ.
- b. Considerations should be given to simplifying the SQRO calculation process
- c. If the current method of calculating SQROs is retained, then the EDI used in the final calculations must be adjusted to account for the change in contributions that local soil and household dust make to the EDI.

The Nunavut Water Board believes issues 1 to 3 discussed above are those that need to be resolved prior to acceptance of the SQRO values for Nanisivik.

4. **Assessment of petroleum hydrocarbons** – Assuming that the intent is to remove and/or to encapsulate the petroleum hydrocarbons in the permafrost environment, whether there is a need to consider petroleum hydrocarbons in the assessment.
5. **Chemical screening** – Additional justification is needed to support/explain the selection of screening guidelines for both the human health and ecological risk assessments.
6. **Identification of Sensitive Receptors** – The appropriateness of current health status in the community, as well as potentially sensitive receptors for human health risk assessment.
7. **Risk Assessment** – The interpretation of the risk assessment as a community health assessment.

Issues 4-7 are those that were raised by the reviewers, and may or may not change the conclusions of the HHERA, i.e. their final SQRO values.

8. Additional issues that require clarification include the followings:
 - a. Designation of surface soil for the upper 10-15 cm.
 - b. Metals or elements that were excluded from the initial screening process.
 - c. Uptake factors or soil to plant bioaccumulation models for the ecological risk assessment.
 - d. Exclusion of terrestrial invertebrates in the exposure assessment for the ecological risk assessment.
 - e. Limited discussion and information about the unique characteristics of the Arctic ecosystems and the wildlife that inhabit them.
 - f. Effects of carcinogenic risk of some metals to human health risk assessment.
 - g. A requirement to cross check of all (100%) of the data by JWEL.
 - h. Discussion in regard to the marine environment, exclusion from the HHERA report.

Technical Meeting

The NWB has decided to host a *final* technical session in Ottawa (exact location to be determined) on September 22 and 23, 2003. The purpose of this meeting is to resolve methodologies and outstanding technical concerns regarding the above issues. Following this meeting, (which is a meeting of staff/technical experts not the Board), the NWB will issue a final decision and further directions as appropriate.

Questions and comments about the above-listed issues may be addressed to the undersigned.

Yours truly,

Original signed by:

Dionne Filiatrault
Senior Technical Advisor

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