



***Independent Environmental Monitoring Agency***

P.O. Box 1192, Yellowknife, NT X1A 2N8 ▪ Phone (867) 669 9141 ▪ Fax (867) 669 9145  
Website: [www.monitoringagency.net](http://www.monitoringagency.net) ▪ Email: [monitor1@yk.com](mailto:monitor1@yk.com)

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Zabey Nevitt  
Executive Director  
Wek'èezhii Land and Water Board  
1 - 4905 48 St.  
Yellowknife NT  
X1A 3S3

**Re: Agency Review of the  
Long Lake Containment Facility (LLCF) Water Quality Prediction Models**

Dear Mr. Nevitt

The two reports on LLCF Water Quality Prediction Models are a welcome arrival and should help in understanding the potential long term impacts of the LLCF on the downstream environment. Receipt of the Seasonal Water Quality Investigations for 2004-2005 and 2005-2006 was also appreciated as these studies are an integral part of achieving a better understanding of the current and future processes at work within the LLCF.

The Agency has some concern with the approach used in the Models. Using a mass balance model has some shortcomings: it can address the physical processes and thus provide good predictions for conservative elements, but, as it does not take into account chemical interactions occurring within the LLCF, it will likely be less successful in providing good predictions for non-conservative elements. That said, the modelling work is an important step forward.

Version 2.0 addressed a number of comments, concerns and questions that arose in the reading of Version 1. The technical refinements, and the modifications of key processes and flow pathways, appear to have improved the model. The comparison of observed chloride levels for 2005 to 2007 with the predictions for the same period, adds confidence in assessing the accuracy of the long term predictions for the period 2005 to 2030.

However, Version 2.0 concentrated on chloride and nitrate (for perfectly valid reasons) and did not attempt to address the full range of variables identified (in Version 1.0) as being important in managing the LLCF and its effluent in the long term. The full range of variables needs to be addressed in the near future.

Future work will need to link the uncertainties identified in the modelling work to the ICRP research plan. Some consideration will need to be given to understanding and predicting the magnitude of the chemical interactions occurring within the LLCF. This may be particularly important given the large volumes of extra-fine processed kimberlite and its potential impacts on the system. The extra fine material may adsorb or desorb trace elements and the trace elements may even interact with the clay minerals.

On a different note, the model appears to have provided some clarity around the increasing trend in molybdenum concentrations noted in recent year. It will be interesting to see if a reverse in the increasing trend begins, as predicted, in 2009.

In closing, the Agency appreciates the work that has gone into producing and refining the current model. We encourage BHPB to continue this work with the inclusion of all the variables of interest and all the data from the ongoing water quality investigations.

We would be happy to discuss these comments with you at your convenience.

Sincerely,

-Original Signed By-

Bill Ross  
Chairperson

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