Environment Canada / Environnement Canada

Environmental Protection Branch
Qimugjuk Buidling
P.O. Box 1870
Iqaluit, NU
X0A 0H0

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Dionne Filiatrault
Technical Advisor
Nunavut Water Board
P.O. Box 119,
Gjoa Haven, NT X0B 1J0
By Facsimile: (867) 360-6369

By email: Dionne@polarnet.ca

RE: Review of Polaris Decommissioning and Reclamation plan.

Environment Canada has reviewed Cominco's Decommissioning and Reclamation Plan for Polaris Mine site and offer the following comments and recommendations for your consideration.

Cominco has conducted an extensive evaluation of surface contamination and assessment of disposal options for all installations and facilities of its Polaris mine site. In general EC has not identified any major concerns with the Plan with the exception of the approached proposed for Garrow Lake.

Garrow Lake

Final bathymetrics of the lake should be provided to indicate the bottom profile that exists following the removal of the tailings pipeline.

The lowering of Garrow Lake to its natural levels has been occurring over the last two years with its final release planned for 2002. This will lower the lake level by approximately 2.5 meters which results in a approximately 30% reduction to the thickness for the mixolimnion layer (surface layer). This will also expose a new wetted shoreline of Garrow Lake which could lead to the introduction of sediments to the surface waters. This could impact the water quality of Garrow Lake for future release.

It is also assumed in this plan that discharge from Garrow Lake will conform to the existing licence limits. Environment Canada recommends that, once "natural" discharge is allowed from Garrow Lake, the water quality should reflect, as near as possible, the natural background levels that existed before mining.

The Garrow Lake report (volume 2 supporting documentation), used a model to predict the stability of the halocline and expected metal concentrations in the mixollmlnion (surface layer). This model used data up to and including 1999, however it must be recognized that Garrow Lake is undergoing some immediate and large changes due to

draw down (since 2000). Since this model is being used to predict into the future, these changes must be taken into consideration. In addition, if the Garrow lake dam is taken apart before these predictions can be verified, it poses a concern for long term water quality and downstream impacts.

EC recommends that the dam remain in place and that Cominco be allowed to discharge (via siphons) from Garrow Lake in order to reach and maintain the original lake level. A new water licence could be established with set licence limits to reflect that mining has stopped and no effluent is being placed in the lake. In addition to this, an appropriate monitoring program must be established to verify the predictions of the model, as well as, the overall water quality within the lake in all layers. At a minimum, this program should operate for 5 years after the lake has returned to natural lake levels with an evaluation occurring each year, preferably during the open water season. A winter evaluation could be added to the monitoring program to allow for a better understanding of the dynamics of the lake. Following each year and at the end of the five years of monitoring, an assessment should be conducted to verify the lake's stability and whether or not it is conforming to the model predictions. The next steps for Garrow Lake would depend on this five year assessment.

No definitive information was provided within Polaris's Decommissioning plan that demonstrated the current health of the aquatic biota within the lake. EC recommends that an assessment/status of the biota for Garrow Lake specifically within the mixolimnion (surface layer) be carried out. Special attention should be paid to the *Myoxocephalus quadricornis* (Four Horned Sculpin) a listed species of concern with the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Further Comments:

Contaminated Soils
The disposal option for the underground storage of contaminated soils is an acceptable approach. However a detailed account of volumes, types of contaminated material, exact location/s and details regarding the geology of the placement area should be provided. The portals and other accesses to the mine will be sealed but there was no mention in the plan where the contaminated soils will be placed. EC recommends that the contaminated soils be sealed into place to further encapsulate the contaminated material. This would ensure that if, for any reason there is a change, such as climate change causing the loss of permafrost to this depth, the material would not have a direct route to the surface.

Fuel Tanks
For the incineration of tank sludges, waste oil and maybe glycol, no details were provided on the type of incinerator to be used. An approved two stage incinerator should be used.

Landfills
EC has no significant concerns with the design or cover materials chosen. However, as indicated in Polaris Landfill Closure Plan it is recommended that further durability tests should be undertaken to evaluate "shale" as a cover material. EC concurs that further

durability tests should be conducted in order to ensure long term stability of the cover materials from freeze/thaw degradation.

Marine Study
There were indications of contamination of the marine environment surrounding the current works at Polaris mine, however, no recommendations were provided as to how this might be addressed. Understanding that the remediation of contamination in the marine environment may cause more problems than it solves, EC recommends that further monitoring should occur to determine if there is continued contamination into the future. For example, the site in front of the operational landfill should be monitored.

Monitoring
Post Closure Monitoring Phase I and II provides a general understanding of what will be done. However, there is need to develop a more detailed monitoring plan including the location of stations, a list of parameters to be measured and frequency of sampling/observations for each station. This is important when confirmatory testing of remediated soils is being conducted during Phase I of the post closure monitoring program.

If you have any question or concerns please contact me at (867) 975 4639 or Email lawrence.ignace@ec.gc.ca

Sincerely

Lawrence Ignace
EPB, Iqaluit

cc. Stephen Harbicht, EPB, Yellowknife
Laura Johnston, EPB, Yellowknife