

Northern Division
Environmental Protection Branch
Prairie and Northern Region
#301 - 5204 - 50th Ave
Yellowknife, NT X1A 1E2
Ph, (867) 669-4700

March 30, 2001

Our File: 4705 037 CULL

Gladys Joudrey
Environmental Assessment Officer
Nunavut Impact Review Board
P.O. Box 2379
Cambridge Bay, NT X0E 0C0

By Facsimile: (867) 983-2594

Dionne Filiatrault
Technical Advisor
Nunavut Water Board
P.O. Box 119,
Gjoa Haven, NT X0B 1J0

By Facsimile: (867) 360-6369

**Re: Homestake Canada Inc. - Water Licence Amendment - NWB1CUL9902 NIRB File
01WA027 - Disposal of Waste Rock into Shear Lake (Cullaton Lake Project)**

I have reviewed the above amendment application on behalf of Environment Canada (EC), and offer the following comments for your consideration.

Homestake has identified the onset of acid rock drainage originating from the waste rock pile located adjacent to Shear Lake. Associated effects noted include depressed pH and elevated sulphate in surface waters, as well as localized damage to vegetation. The application outlines options to address the ongoing generation of acidic drainage from the waste rock pile, and identifies the option of subaqueous disposal as best isolating the rock from oxidation. Shear Lake is proposed for this, and based on a 1984 fish-out the proponent has identified this lake as not supporting fish.

EC agrees that subaqueous disposal is a feasible means of minimizing the generation of acidic leachate. However, there are some potential concerns with the proposal as outlined. It is not clear from the maps provided where the outflow from Shear Lake goes to the next small lake, but presumably it is to the south and ultimately ends up in Kognak River. It has not been established whether the downstream lakes support fish (there was the suggestion in the 1984 report that grayling made seasonal use of the system).

Past work in Shear Lake identified a mud bottom which would be expected to generate increases in suspended sediments in the water column when rock is placed in the lake. If the flows out from Shear Lake enter downstream waters which may support fish, measures would be needed to prevent the transport of sediments into such waters. EC supports the proposed monitoring at the outflow of Shear Lake, and suggests that the parameters monitored include TSS and field measurements of turbidity.

The pH in Shear Creek was measured at 4.2, and it was suggested that this is related to acidic leachate directly entering the creek (unfortunately diagrams weren't provided which show the proximity and elevations). There is some possibility that this low pH is related to natural processes or conditions, and it is recommended that the proponent take field pH measurements of similar outflows from small lakes to try and narrow down the cause. That will help with interpreting results of future monitoring of Shear Creek, in that changes in pH may or may not be seen once the waste rock has been submerged.

The application proposes to monitor pH in Shear Lake against the event that a pulse of soluble acidity and metals enters the lake with the deposition of the waste rock, with the contingency plan to mix hydrated lime with the waste rock as needed to neutralize acidity and precipitate metals. Generally this is acceptable, with the caution that this system is adapted to more acidic conditions, and amounts used must be carefully monitored to ensure fluctuations in pH are avoided. While the lake and outflow stream may not support fish, protection should none-the-less be provided for aquatic plants and invertebrates that provide food sources for migratory birds.

With removal of the waste rock pile there will inevitably be some surface disturbance (no estimate of total area involved was provided) which will need to be stabilized to prevent erosion. With respect to timing, EC notes on Figure 3 that the completion of the waste rock relocation is slated for mid-September, while final grading would have been completed before the end of August. The proponent will need to ensure that there is minimal disturbance of the tundra surface beyond what is necessary to substantially remove the waste rock, and to stabilize the area prior to final inspection and demobilization.

Please do not hesitate to contact me at (867) 669-4735 with any questions or comments regarding the foregoing.

Yours truly,

Anne Wilson
Water Pollution Specialist

cc: Steve Harbicht (Head, Assessment & Monitoring, EPB)
Mark Mallory (CWS Iqaluit)
Lawrence Ignace (EPB Iqaluit)