

Flambeau Mining Company
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Kennecott
Minerals

July 3, 1996

Mr. Larry J. Lynch
Mine Reclamation Unit
Bureau of Solid and Hazardous Waste Management
Wisconsin Department of Natural Resources
101 South Webster Street
Madison, WI 53707-7921

Dear Mr. Lynch:

Re: Pit Backfilling Plan
Flambeau Project, Ladysmith, Wisconsin
Reference No. 2720-2

This pit backfilling plan is being provided to the Wisconsin Department of Natural Resources (WDNR) to provide additional details regarding pit backfilling and to address issues presented by WDNR staff during discussions in May of this year in reference to pit backfilling at the Flambeau Mine. The Flambeau Mining Company (Flambeau) submitted a letter dated April 8, 1996 to the WDNR describing engineering refinements to the general pit backfilling plan contained in the Mine Permit Application (MPA) for the project. The WDNR acknowledged these refinements in a letter dated June 13, 1996 (reference 2720-2).

The refinements included the amount and type of alkaline material (limestone) to be mixed with the waste rock, the timing of the start of backfilling, the sequence of filling certain areas of the pit, and the equipment anticipated to be used during the backfilling process.

In order to determine the most efficient and effective method of compaction of the pit backfill (for Type II material), a field test was performed by Flambeau on top of the Type II stockpile area during the week of June 17, 1996. Three compaction techniques were studied, namely, static roller, dynamic (vibratory) roller, and loaded dump truck with dozer. Two materials types, weathered Type II material, and recently excavated Type II material, were compacted at two moisture contents (in situ and wet of optimum). The results indicate that compaction by any of the three methods was appropriate, when two passes of compaction are performed.

Pit Backfilling Procedure (Type II Material)

Type II material will be backfilled into the pit first, followed by Type I waste rock, saprolite, sandstone, and till material. It is anticipated that Type II material backfilling will continue through

mid-1997. Initially, the backfill material consists of both freshly-excavated Type II material as well as stockpiled Type II material, placed into dump trucks and deposited in the east end of the pit. A dozer will spread the material evenly across the fill area in approximately 3-ft loose lifts, then compacted by previously described methods. Crushed limestone will be spread across the compacted 3-ft thick lifts by typical agricultural spreaders.

Lift Thickness Preparation

Prior to each lift installation, the area to receive fill will be surveyed on 150-ft grid. A height of 3-ft above the top of the existing surface will be marked with lath or other methods. The fill material will be filled to the appropriate depth prior to compaction. Immediately after compaction, the lift area will be surveyed to determine the elevation of the lift on a 150-ft grid. The elevation will be documented. Upon verification of the lift thickness and proper compaction crushed limestone will be added.

Crushed Limestone Application

Crushed limestone will be added to the Type II backfill at every three feet of elevation across the entire backfill area. When areas achieve sufficient compaction limestone will be applied. The rate of application will be a minimum of 3 pounds per ton of backfill material. The limestone will be placed by conventional agricultural spreaders or other methods approved by the engineer. The application of excess liming material may be performed by other methods. The quantity of excess liming material, if and when applied, will be determined and documented by Flambeau at the time of application. A visual observation will be performed immediately after limestone application to document that a generally even application of crushed limestone has been applied. The amount (by weight) of limestone added per application will be determined and documented. Only when it is observed that the minimum amount of limestone has been placed generally evenly across an area, will the area become accepted and approved for further filling.

If you have any questions concerning this backfilling plan, please contact Jana Murphy or me at Flambeau, (715) 532-6690, or Jim Hutchison at Foth & Van Dyke, (414) 497-2500.

Sincerely,



Tom Myatt
General Manager

cc: Jana Murphy, Flambeau
Jim Hutchison, F & VD
Ken Markart, WDNR
Thure Osuldsen, Rusk Co.
Tom Riegel, Town of Grant
Melvin Spencer, Rusk Co. Zoning
Al Christianson, City of Ladysmith
Tom Portle, WDNR