

Flambeau Mining Company
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Kennecott
Minerals

Larry Lynch
Wisconsin Department of Natural Resources
101 S Webster
Madison, WI 53707

Dear Mr. Lynch:

During the course of the backfilling operation of 1997, it is the intention of Flambeau Mining Company (Flambeau) to recover certain quantities of ore contained in the benches of the open pit as they become accessible from the refilled pit floor. The areas in question will be evaluated on a case by case basis taking into account time availability and backfill schedules. Backfilling progress, with a view to completing all rock relocation during 1997, will be the overriding priority in all decisions. Additionally, only those sections of ore that lie within the original permitted pit design will be considered for recovery.

During early mine activities, it became apparent that the rock strength of the hangingwall and footwall formations was not as good as anticipated. To ensure optimum safe working conditions during the development of the pit, bench geometry was refined, resulting in a flatter final pit wall slope angle (45 versus 50 degrees). As a result, a quantity of ore was left in the west, south and north walls-ore that is now being considered for extraction during backfill operations.

As backfilling proceeds, the original concerns of bench stability and worker safety at depth are substantially reduced, leaving the recovery of the remnant pockets of ore as a viable option-one that is also important to ensure the optimum beneficial use of the resource. The extraction of the ore will follow the general methodology employed over the life of the mine, although horizontal drilling (as outlined briefly in the meeting of February 6th, with the exception that the uppermost lift from 1040 to 1080, **will not now be recovered**) and "hammer" techniques may be employed.

With specific reference to the ore contained in the mining benches of the west end of the mine, it is now the intent to drill each bench vertically using ramps established on the hangingwall side to gain access to each bench. The concerns in this area, as identified by DNR and Flambeau management are the following:

- I. backfill quality in the ramps established for access
- II. hydrology of the river pillar adjacent to the mine
- III. integrity of monitoring wells

Each of these items is explored in more detail as follows.

Backfill Ramps

All waste rock will be limestone amended. All access ramps built up to the drilling level will be constructed in the standard 3 ft lifts using tuck and dozer combinations and additional compaction from the compactor unit when truck traffic becomes untenable.

Where backfill material has to be removed to allow access to the broken ore for haulage to the stockpile, this material will be respread and compacted in 3 ft lifts in other active areas of the pit. The methodology will ensure all material is laid in 3 ft lifts and compacted.

Hydrology

The impact of the recovery of very minor quantities of ore adjacent to the river pillar needs to be viewed in the context of the hydrological picture that has developed over the life of the mine. During that time, as blasting of successive benches has increased the height of the pillar wall from 80 to 180 ft, there has been no significant change in the inflow of water to the west end of the mine. The data can be summarized as follows:

<u>Study Date</u>	<u>Pit Elev.</u>	<u>West Wall (gpm)</u>	<u>West End Floor (gpm)</u>	<u>Total (gpm)</u>
Sept. 10, '94	1020	56.3	142.6	198.9
Dec. 1, '94	1010	50.0	160.1	210.1
Nov. 6, '96	920	155.9	59.3	215.2

The implication of this data is that blasting operations have had no adverse impact on the hydraulic conductivity of the pillar.

In terms of the incremental blasting proposed (~15 ft) per bench, all drill holes will lie inside the original pit design and be planned with a maximum explosive charge of 50 lb. per delay, which typically limits rock breakage to within 10 ft of the charge (Hoek and Bray, "Rock Slope Engineering"). This is substantially less than was the practice during normal mining, when explosives charges approached 100 lb. per delay. In other words we see the impact from the ore scavenging operation as being substantially less than during normal mining operations, in which the hydraulic flow conditions appear to have been stable over time.

The drill and blast procedures will be subject to on-going review and amendment as necessary. Observations will be made during and following all blasts. Rock fragmentation, ore pile disposition and rock-face conditions will be assessed in order to modify, if necessary, any of the blasting parameters prior to the following blast. In addition, prior to any blast, all weep holes and piezometers in the mining face will be abandoned per the proposed methodology outlined in the Flambeau letter of October 15, 1996, Murphy to Lynch, and piezometers in adjacent benches read to ensure no adverse condition, in terms of hydraulic pore pressure, are developing.

Monitoring Wells

The monitoring wells 1010P and 1000P-R located in the river pillar will remain 86 ft and 64 ft respectively from the nearest point of blasting on the 1010 and 1040 benches. As demonstrated above there can be no damage to the wells over these distances.

In conclusion, the planned works lie within the boundaries of the permitted pit design and do not represent a significant change. The data records for the river pillar hydrology show that there has been little or no impact due to mining to date and furthermore, the blasting methodology proposed is not anticipated to impact this situation given the overall structural dimension of the pillar.

We would be pleased to review the hydrological data with you at the mine site should you so desire.

Sincerely,


Tom Myatt
General Manager

cc: Al Christianson, City of Ladysmith
Jeff Earnshaw, Flambeau
Jim Hutchison, Foth & Van Dyke
Ken Markart, WDNR
Jana Murphy, Flambeau
Thure Osuldsen, Rusk County Chair
Tom Riegel, Town of Grant
Melvin Spencer, Rusk County Zoning