Cyprus Anvil Mining Corporation — Interoffice Correspondence

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Subject GRUM OREBODY - CONCEPTUAL UNDERGROUND STUDIES

New Grum orebody cross-sections have been completed, based on recent drilling, reassaying of Kerr-Addison drilling, and the most recent structural interpretations. This information was used by T.J. Adamson to calculate ore estimates, both for a possible ultimate open pit and for underground mining potential. The preliminary estimated tonnage and grade figures are as follows:

	Tonnes	Pb	Zn	Ag	Remarks
Open Pit Reserve	15,518,000	3.55	6.06	61	@4% cutoff-undiluted
Underground Reserve	10,231,000	4.60	7.84	78	@8% cutoff-undiluted

Of this Underground reserve, 4,910,000 tonnes @ 4.72% Pb, 8.62% Zn, and 81 gms/tonne Ag are contained within the limits of the Open Pit Reserve.

The concept of an underground mine producing 2,500 tonnes per day of mill feed (875,000 tonnes/year), or 3,500 tonnes per day on a five day week mining schedule was used for this study. This is the same production parameter that was used in the study done by Canadian Mine Services for Kerr-Addison in a report dated May 10, 1977. Operating and capital costs were prepared using a combination of updated costs from the CMS study and the recent preliminary DY underground study, as well as information on recent district development plans. A mining schedule was prepared for Grum underground ore, which featured higher grades in the first two years of mining.

The first idea tried was to incorporate this underground ore into the Production Plan (407B) as soon as possible in order to increase the mill feed grade during the period of lower grade ore from Faro. This plan showed no economic benefit based on comparative discounted net operating cash. The principal reason for this was that most of the ore from Grum was being introduced into the schedule at a time that Faro ore grades were increasing and costs were decreasing, so higher grade, less costly Faro ore was being displaced and deferred by higher cost Grum ore, and the difference in grade did not compensate for the higher cost.

The other concept that was tried was to introduce the Grum underground ore into the Development Plan (P04B) at a time when mill feed grades were past their high point from Faro and were decreasing. Specifically underground ore was introduced in 1987. Just considering the two orebodies, Faro and Grum U/G, and the time frame until Faro ore is exhausted, an increase in discounted net operating cash is effected by the addition of this underground ore.

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The result of this study is not to suggest that a combined Development Plan/Grum Underground operation is established as a viable option at this time, but to indicate that further study could well be justified. The specific items that would be a part of this further study would include:

- The effect of underground mining extraction on the viability of a Grum open pit. If roughly 50% of the underground extraction is within the open pit, the open pit tonnage and grade are reduced and the stripping ratio is increased. If the open pit is not viable, then that tonnage is lost as far as the reserves in the District are concerned. This would affect the ore transportation system plans, and bring the viability of Vangorda and possibly DY into question.

- A more detailed underground mining plan and more refined capital and operating costs.

- A more complete financial evaluation of possible alternatives.

- Study the possibility of some minimal underground development to mine a certain amount of a high grade "plum" contained within the underground reserve. The indicated tonnage and grade of this "plum" is 2,351,000 tonnes of 5.7% Pb, 10.8% Zn, and 98 gms/tonne Ag.

It is recommended that, as part of the district development scenarios that are to be studied, a Grum underground option be included. It is recognized that this may require a complete reassessment of the district development philosophy, but this option should be tested.

JFO/mw

J.F. Olk

GRUM STUDY II - ASSUMPTIONS

- Case P04B used as the Base Case

- Grum U/G ore to come in @ 3500 TPD mining rate - 5 days/week (875,000 TPY) in 1987.

- Metallurgy as per Case P04B for Faro and per AFE for Grum

- Metal Prices - Same as Grum Analysis by L.P.T.
  Pb - 35¢ U.S.
  Zn - 49.9¢ U.S. Exchange 1.23
  Ag - $12.00 U.S.
  Au - $475 U.S.

- Operating Costs - Same as Grum analysis by L.P.T.

Grum Mining (Ind. development)		$25/T
Ore Transport		$ 4/T
Faro Mining		$5.20/$M^3$
Faro Milling		$9.80/T
Power - Per case P04B		
Conc. Transport - to T.W. and Skwy	Cdn	$60/WMT
Ocean	Cdn	$17.30/WMT
Product Moistures		6.5%
Treatment Charges - Pb	U.S.	$186/DMT
- Zn	U.S.	$176.74/DMT

- Capital Costs - Per Grum Analysis by L.P.T.

- Total Reserve of +8% combined Pb/Zn ore in Grum estimated by T.A.
  10,231,560 tonnes 4.6 Pb 7.84 Zn 78 g/T Ag.
  Assume that 60% of this is recoverable by U/G, then U/G reserve is 6,000,000 tonnes, assume same grade.

  Total mined in this study - 4,370,000 tonnes, ∴ 1,630,000 tonnes remain after 1991, or 2 years life.