DOME

INTERNAL CORRESPONDENCE

DATE 84 03 16 (YEAR MONTH DAY)

To J. H. McKIBBON, R. LOPASCHUK, D. GREGOIRE, G. JILSON

FROM H. M. Visagie

Business Development (DEPARTMENT OR FIELD OFFICE)

COST CENTRE OR AFE No. FILE No. CCF 11

SUBJECT

Re: GRUM PIT

In the latter part of 1982, CAMC geologists hand calculated the reserves of the Grum pit based on sections and together with engineering help, designed a preliminary, efficient pit (low stripping ratio) which they called the Olk pit. The Olk pit had a volume of 52,000,000 BCM and undiluted reserves of 17,400,000 of 9.27 of a combined lead and zinc grade. By increasing the volume of the Olk pit by 75 percent to 90,000,000 BCM to include the reserves contained in the upright panel, the Champ Zone and other reserves in the Olk pit wall and by lowering the cutoff grade to 3%, the Grum undiluted reserves in the extended pit became 28,000,000 tonnes of 8.8% combined lead and zinc grade (Exhibit 1).

In the MAPR 84/85-30 plans, Grum mineable reserves are based on the Kerr Addison computer mode and with 5% dilution are calculated at 15,583,000 tonnes of a combined grade of 7.7 percent. The extended pit at a 10% reduction in grade for dilution is calculated to have a mineable reserve of 28,000,000 tonnes with a combined grade of 7.9 percent (Exhibit 2). The extended pit has a life of 7 years compared to 4 year life of the pit used in the MAPR 84/85-30 plan (Exhibit 3).

Comments

- o A mining plan has not been worked out but it is thought that the economics of a detailed mining plan will be more favorable than what is currently forecasted since the higher grades can be mined first.

- o Detailed planning may be able to design a more optimum mining configuration for the extended pit and hence reduce the waste removal.

- o A ramp allowance of 10,000,000 BCM was assumed for the extended pit. This allowance may be reduced if in-pit crushing is used to move ore and waste. In-pit crushing allows the ramps to be used for service rather than haulage and hence ramp size can be reduced.

- o If future metal prices are low, the extended pit may have to be decreased since the stripping ratio increases rapidly for the outer ore.

Recommendation

- o More detailed engineering on the extended pit is recommenced. This

... /2

engineering should include not only pit design but a close look at mining methods (truck/shovel operation vs. an in-pit crushing system).

- o Rationalization of the discrepancies between the sectional reserves and the computer reserves is needed as soon as possible. Once a computer model which reflects the Grum Deposit has been designed and has management confidence, mining sequences can be worked out. Front end loading of the mining grades should improve the economics.

- o Work should be conducted to determine what should be a reasonable dilution for the Grum pit. A reduction in dilution will increase grade and result in more favorable economics.

- o The economics for open pit and underground mining must be worked out to determine the Grum pit boundaries.

- o Until better data is available, the extended pit should be considered the base for the long term plan.

HMV/rdp
Attach.

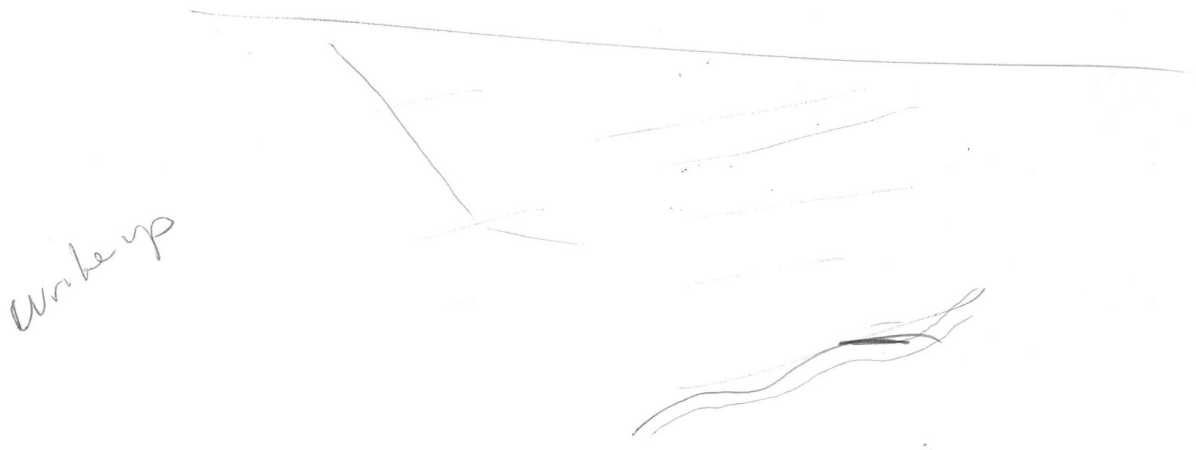

EXHIBIT 1

GRUM PIT

GRUM - PRELIMINARY PIT ESTIMATES

	Olk Pit	Expanded Pits			
		Pit 1 (4%) No Ramps	Pit 1 (4%) Ramps	Pit 1 (3%) Ramps	Extended Pit
Volume (MMBCM)					
Pit	52.0	74.7	84.7	84.7	90.7
O/B	12.0	13.2	14.9	14.9	16.7
Waste	34.4	54.6	62.9	62.2	65.8
Ore	5.6	6.9	6.9	7.6	8.2
Weight (MM Tonnes)					
Pit	133.2	197.5	223.1	223.1	238.3
O/B	21.7	23.8	26.8	26.8	30.0
Waste	94.1	149.7	172.3	170.3	180.3
Pit	17.4	24.0	24.0	26.0	28.0

Notes:

1. Pit 1 was calculated without ramp design. Allowance for ramps was calculated assuming a 100 ft. width plus 10% grade and the allowance is estimated at 10 MM BCM. Since pit volume increases 13%, 13% increase in O/B is estimated.

2. Factor Champ Zone as 3 BCM per tonne. Allocate 30% of stripping to be overburden.

3. Extended pit includes an allowance for ramps and the Champ Zone.

HMV/rdp
84-03-13

EXHIBIT 2 GRUM PIT

GRUM PIT TONNAGES

A. PIT RESERVES	Pit Composition (MM)					Ore Grade		
	Overburden	Waste	Ore	Ore	Cutoff	PB	ZN	AG
1. Sectional Method	BCM	BCM	BCM	Tonnes	%	%	%	gm/T
- Olk Pit	12.0	34.4	15.6	17.4	4	3.40	5.87	58
- Alternative Pit	13.2	62.9	6.9	24.0	4	3.49	5.84	60
	13.3	62.2	7.6	26.0	3	3.33	5.55	57
- Extended Pit	16.7	65.8	8.2	28.0	3	3.34	5.46	56
2. Computer Model								
- KA	9.0	38.0	3.9	15.6	4	3.10	5.00	47
- CAMC	9.0	38.0	3.9	16.9	4	3.00	4.90	47
B. MINEABLE								
Extended Pit								
- 5% dilution	16.7	65.8	8.2	28.0	3	3.17	5.19	53.2
- 10% dilution	16.7	65.8	8.2	28.0	3	3.00	4.90	50.4
KA Model								
- 5% dilution	9.0	38	3.9	15.6	4	2.95	4.75	45.46

Notes:

1. The sectional pits include the Gnomes cap and the results of CAMC's infill drilling whereas the Kerr Addison (KA) and CAMC computer models do not.

2. Both computer models are very rough models and will require a lot of work to make them compatible with the complexities of the Grum deposit.

3. No dilution is included in the sectional calculations.

HMV/rdp
84-03-15

EXHIBIT 3 GRUM PIT

COMPARISON OF MINING PLANS

A. CURRENT MINE PLAN

	Volume (MM BCM)			Ore	Metal Content				
Year	O/B	Waste	Ore	Tonnes	Pb	Zn	Ag	Au	Cu
-3	1.0								
-2	4.0								
-1	4.0								
1		9.4	.9	3.6	3.20	5.40	49.3	.7	.15
2		9.6	1.0	4.1	3.00	4.68	46.2	.7	.15
3		9.6	1.0	4.1	2.85	4.50	43.3	.7	.15
4		9.4	.9	3.8	2.76	4.47	43.3	.7	.15
Total	9.0	38.0	3.8	15.6	2.95	4.75	45.5	.7	

B. PROPOSED PLAN

Year									
-2	8.35								
-1	8.35								
1		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
2		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
3		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
4		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
5		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
6		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
7		9.40	1.17	4.0	3.0	4.9	50.0	.7	.15
	16.70	65.80	8.19	28.0	3.0	4.9	50.0	.7	

Notes:

- o Current plan is based on Noranda's computer model and small pit.
- o Proposed plan is based on large pit including Champ zone. Grades have been reduced 10% from sectional model for dilution (no reduction in volume).
- o Copper and gold averages not been worked out in detail.

HMV/rdp
84-03-15