

APR 12 1977

April 11, 1977

MEMO TO: Mr. J. Carrington ✓

cc: M.D. Rowswell  
B.P. Wallace  
K.V. Konigsmann

FROM: R. L. Coleman

SUBJECT: Grum Estimates

Any estimate we may give you at this time has to be considered VERY PRELIMINARY and as such must not be used for design purposes. The response of the various types of ore is so drastically different to all our previous tests on the "B" ore and we have done tests on only 3 or 4 of the new materials that the future predictions may be appreciably different. Hopefully, when the metallurgical testing is more complete and the estimates are refined, some more encouraging figures may be forecast. All the individual ores should have been tested by mid-May and composites reported on by June 30, 1977.

Parameters upon which these estimates are based are as follows:

Open pit ore  
5,000 metric tons/day  
60 mil electric power  
Tailing Dam - Downstream from Mill - Reasonable Terrain.

Assumptions we have had to make:

Mine will use 10 yard loaders and 100 ton trucks  
Mine will work 3 shifts per day, 5 days per week  
Head analysis will be up to 5% Pb and 10% Zn  
Large motors may be 4400 Volt, 60 cy.

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Major Equipment Requirements will be:

- 1 - 42 in. gyratory crusher x 350 HP motor - AC Type
- 1 - 7 ft. Standard Crusher x 350 HP motor - Nordberg
- 2 - 7 ft. Short Head Crushers x 350 HP Ea. - Nordberg
- 3 - 8' x 20' Screens - DD - AC Type
- 1 - Coarse Ore Stockpile - 15,000 Tons Live
- 1 - Fine ore bin - provision for second - 5,000 Tons Ea.
- 1 - Rod Mill - 13½' x 18' x 1600 HP motor
- 2 - Ball Mills - 13½' x 23' x 2300 HP motors Ea.
- 2 - Regrind Mills - 9½' x 14' x 600 HP motors Ea.
- 21 - 300 Cu. Ft. Pb roughers - Agitair Type
  - Pb cleaners - 3000 Cu. ft. - Denver Type
- 21 - 300 Cu. ft. Zn Roughers
  - Zn cleaners - 3000 Cu. ft.
- 1 - Pb Filter - 8'-6" x 8 Disc.
- 1 - Pb Thickener - 60 ft. Diam.
- 1 - Pb Dryer - 100 ins. x 60 ft.
- 2 - Zn Filters - 8'-6" x 8 Disc.
- 2 - Zn Thickeners - 60 ft. Diameter
- 1 - Zn Dryer - 120 ins. x 60 ft.
- 1 - Tailing Dam
- 1 - On-Stream Analyser.

Layout Might be:

Primary - Secondary - Tertiary Crushing Plant

Similar to 1967 G.C.M.L. Crushing Plant But perhaps modified for closed circuit provision, or perhaps as per Mattabi system combined into one plant. Coarse ore stockpile - as per 1967 G.C.M.L.

Concentrator - Grinding - Flotation - Dewatering

As per Mattabi but with provision for second Rod Mill and inclusion of two regrind mills.

Metallurgy Projected

SUBJECT TO REVISION

	<u>Assay</u>			<u>Recovery</u>		
	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>
Mill Heads	4 to 5%	8 to 10%				
Pb Conc.	60%	8%	20 OPT	80%		67%
Zn Conc.	2%	55%			85%	
Tailing	0.5%	1.2%				

Tailing is ACID generating - Treatment of effluent will be necessary.

Milling will require at least 4,000,000 gallons of water per day - Fresh or recycle or combination.

Manpower estimate - including assay office and Maintenance

Up to 50 Hourly rated and

20 Staff

Subject to refinement!

Operating Cost Estimate - Calculated on short ton basis

Power	\$3.25
Reagents	1.25
Liners	0.15
Grinding Media	0.75
Fuel (Dryers)	0.15
Tailings	0.20
Op Materials	0.25
Maint. Materials	0.35
Labour	<u>0.90</u>
Total	\$7.25/short ton
Conversion to Metric	<u>0.75</u>
Total	\$8.00/metric ton

As will be noted, the four major items are:

Power, reagents, grinding media and labour for a total of \$6.15. As the metallurgy and layouts are developed, there may be some improvements which we cannot incorporate at the moment.

Power and grinding media are high because of 95% minus 325 mesh grind and 60 mil power.

Reagents are extrapolated because landed costs are not known and the types have not been finalized.

Labour is guessed at at \$10.00/hour for hourly and \$15.00/hour for staff, all inclusive costs except for housing and unusual costs such as northern allowance. These could be low.

RLC/dhg

