

To

W. N. Wallinger

Date

August 30, 1977

002554

From

R. B. Ferguson

Subject

Production and Metallurgy Forecast for 1978

A much more rigorous analysis of plant data over the period of operation of the expanded mill has produced a much more accurate model of tailings losses as a function of feed grades.

The result has been the abandonment of the fixed minimum attainable lead scavenger tail and replacement with a scavenger tail versus feed grade relation. This has resulted in a decrease in lead recovery.

Lead grade will be maintained at 1977 experience in order to maximize recovery. The program of plant improvements scheduled for 1978 as outlined in "Open Pit Mine Life Forecast, Metallurgy, Second Edition", R. B. Ferguson to W. N. Wallinger, February 21, 1977 is expected to be completed. As a result, lead concentrate grade is predicted to increase to 66.5% by the fourth quarter with no change in the recovery model.

A similar exercise on zinc has indicated that zinc recoveries tend to fall with rising grade. This becomes most evident when zinc feed grades are in excess of 5.0%. Data in the range 5.5% to 6.5% is weak and scattered but it is all that is available. Nevertheless, an increase in zinc recovery is expected. Grade will remain at 50.5%.

The mass flow loop and larger launders on the zinc cleaning circuit are expected to be operational by the fourth quarter of 1977. This will allow metal recovery to bulk to be reduced to 9.06% for lead and 8.83% for zinc or as close as feed grade ratios will allow.

Due to the dearth of data on silver, recent experience is extrapolated.

In general, this is expected to be the last year in which forecasts must be made by extrapolation of historical data with very limited data on feed. By the end of 1978 the detailed relogging and reassaying program should be complete allowing a computer modelled mine reserve to be constructed with all the pertinent variables available.

R. B. Ferguson
Chief Metallurgist
Enc.
/klc

cc: A. H. von Kursell
L. P. Taggart
D. Marr
G. Wight
J. C. Devitt

J. Mustard ✓
W. Muir
D. Garries
R. C. Smith
G. James

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APPENDIX

1. Throughput

10,000 short dry tons per calendar day. Lose 20,000 tons in February due to major scheduled work on No. 4 ball mill.

2. Lead Metallurgy

a) Recovery

Based on vigorous analysis of historical data. Details Appended.

First Quarter	82.8 + 9.3
Second Quarter	82.9 + 7.4
Third Quarter	84.0 + 6.7
Fourth Quarter	83.0 + 7.6

b) Grade

As the installation of proposed modifications and improvements progresses, expect grade to improve to 66.5% by year end.

First Quarter	65.0
Second Quarter	65.5
Third Quarter	66.0
Fourth Quarter	66.5

3. Zinc Metallurgy

a) Recovery

As per lead recovery, details appended.

First Quarter	80.4 + 8.9
Second Quarter	80.3 + 9.2
Third Quarter	80.3 + 9.2
Fourth Quarter	80.4 + 8.9

b) Grade

50.5%

4. Bulk Production

Will have mass flow loop and large launders on line.

Will achieve recoveries of 9.06% lead and 8.83% zinc to bulk or as near as feed grade ratios will allow.

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<u>Period</u>	<u>SDT Bulk</u>	<u>% Pb</u>	<u>% Zn</u>
First Quarter	13,559	18.0	29.8
Second Quarter	16,178	18.0	29.8
Third Quarter	16,207	18.0	29.8
Fourth Quarter	13,903	18.0	29.8
Total	59,847		

5. Silver

Mine model is undergoing major modifications. Absolutely no reliable data on silver in feed. Must assume recent experience will continue.

6. Iron

In selective zinc, 10.8%; in bulk, 15.8%.

7. Operating Time

95% for an operating rate of 440 SDT per hour.

8. Moistures

Lead Select 5.0%
Zinc Select 6.0%
Bulk 5.8%

CYPRUS ANVIL MINING CORPORATION
 METALLURGICAL FORECAST WORKSHEET
 LEAD, ZINC, SILVER RECOVERIES

1977

To Date 1974

TIME PERIOD	January	February	March	April	May	June	July	1977	to 1977
ORE SOURCE									
LEAD: Feed %	2.34	2.46	3.22	2.76	2.66	2.35	2.99		
Scavenger Tail %	0.49	0.47	0.55	/	0.49	0.49	0.48		
Arithmetic Rougher Recovery	79.06	80.89	82.92	/	81.58	79.15	83.95		
X Factor	1.0033	1.0077	1.0134	/	0.9990	0.9771	0.9820	0.9971	0.9962
= Total to Selective Plus Bulk	79.32	81.51	84.03	82.64	81.50	77.34	82.41	± 0.0145	± 0.0194
ZINC: Feed %	5.60	4.39	5.30	4.41	4.81	4.23	4.77		
Final Tail %	0.95	0.78	0.91	0.80	1.01	0.88	0.77		
Arithmetic Total Recovery	78.15	82.23	82.83	81.86	79.00	79.20	83.86		
X Factor	1.0592	0.9846	0.9773	0.9710	0.9870	0.9840	0.9726	0.9908	0.9833
= Total to Selective Plus Bulk	82.78	80.96	80.95	79.49	77.97	77.93	81.56	± 0.0308	± 0.0162
SILVER: Feed TrOz/Ton	0.34	0.42	0.67	0.56	0.54	0.46	0.67		
Lead in feed	2.34	2.46	3.22	2.76	2.66	2.35	2.99		
TrOz/Ton lead 'n feed	14.53	17.07	20.81	20.29	20.30	19.57	22.41		
X Factor	0.8321	0.6503	0.7780	0.9221	0.8059	0.8271	0.8835	0.8227	0.7511
= TrOz/Ton lead in selective	12.09	11.10	16.19	18.71	16.36	17.36	19.80	± 0.0911	0.1111
X lead selective grade	65.02	64.98	62.49	63.82	64.99	65.02	64.83		
= TrOz/Ton lead concentrate	7.86	7.21	10.12	11.94	10.63	11.29	12.84		
X Factor	0.8809	0.7118	0.7790	1.0202	0.9172	0.4824	0.6332	0.7750	0.8414
= TrOz/Ton lead in bulk	12.80	12.15	16.21	20.70	18.62	9.44	14.19	± 0.1832	± 0.1877
X lead bulk grade	19.38	18.76	18.24	20.77	16.76	22.57	23.26		
= TrOz/Ton bulk concentrate	2.48	2.28	2.96	4.30	3.11	2.13	3.30		

