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TONNAGE AND GRADE MODELS

THE GRADE/FACIES APPROACH

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ASSAY SECTIONS AND RECALCULATED ORE RESERVES

Current low metal prices, combined with shortfalls in stripping on the Faro deposit, serve to highlight the limitations of the existing mine model and mining methods. The Faro No. 3 orebody has a highly variable distribution of facies and ore grades and a complex internal structure. To optimize the mining operation, it is essential to have a flexible mining model and method based on the anatomy of the deposit. Previous partial comparisons of some recalculated mine phase reserves with the revised F3 model indicated that the F3 model includes large amounts of sub-grade and marginal grade material and is not sufficiently discriminating to flow through to a flexible mining model. A mine plan based on facies-grade distribution, with stockpiling of lower-grade material, would provide a mechanism for better grade control in response to price fluctuations, while reducing costs and maintaining metal output.

Assay Sections

To achieve the best understanding of grade-facies distribution, a series of assay cross sections was compiled (Sections 124-134 inclusive). Grade facies composite assays were selected by observation from all available downhole assay data and entered into the computer. These were plotted on corrected borehole projection sections showing Pb, Zn, Ag values over intercept. Like grade-facies composites were interpolated, using the revised geological base as an underlay, to provide grade-facies panels on the

section. The panels were color coded for 2% increases in combined lead-zinc grade, i.e. less than 2%, 2-4%, 4-6%, etc., with a facies code overprint (e.g. 2E4, etc.). The resulting sections show the 2-4% element to be significant in terms of relationship to facies. Almost all graphitic 2A and siliceous 2C elements are below or within the 2-4% range and are marginally economic. Removal of the minus 4% material from the model reduces overall volume but enhances grade considerably.

Ore Reserve Calculations

The following procedures were used to calculate reserves from the assay cross sections:

1. Working on each vertical cross section assay plot (for Sections 124+22 through 133+00), each assay/facies block was assigned an identification number.
2. The planimetered area (in square meters) for each assay block was measured.
3. The weighted average assay for lead, zinc and silver was calculated for each assay block.
4. The weighted average S.G. for each block was calculated. For this purpose, the pulp S.G.'s reported on the assay computer printouts were reduced by 5%.
5. For each section, a tabulation was made of assay block number, weighted average assay for lead, zinc and silver, weighted average S.G., combined lead plus zinc weighted average assay, and the facies designation.
6. Blocks with combined lead and zinc assays of 5% plus were designated as ore, 3-5% blocks as stockpile material, and with less than 3% as waste.
7. Ultimate pit limits for each mining phase (NA, OA, PA, UB, WA, YA) were drafted on to each assay/facies cross section.
8. For each section and for each mining phase, the in-situ tonnage and grade ore reserves were calculated, using one-half the distance to adjacent sections as the applicable strike length. Reserves were calculated using two mining cut-off grades of 3% and 5% combined lead plus zinc.

9. Total reserves for each mining phase within the limits of Sections 124+22 through 133+00 were calculated and tabulated.
10. For mining phases entirely within the limits of Sections 124+22 through 133+00 (i.e. phases NA, OA and PA), tonnage and grade results were tabulated in comparison with revised Faro Model F3 tonnage and grades, as provided by R. S. Tolbert by memo of April 22, 1983. Percentage variances with revised Model F3 were calculated.

Conclusions

From the reserve calculation comparisons and direct observation of the assay sections, the sub-grade and marginal grade material is clearly defined in sufficiently large blocks to be selectively mined, without jeopardizing costs. An indicated mine/mill cost reduction of 10-20% should be achievable with no decrease in metal output, using more selective mining methods based on a revised grade-facies model.

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FARO ORE RESERVES

Comparison of Revised Model F3 and
Exploration Department April/83 In Situ Reserve Estimates

	<u>3% CUT-OFF</u>			<u>5% CUT-OFF</u>		
	<u>Revised Model F3</u>	<u>Expl. Apr./83</u>	<u>% Variance Ex.vs.F3</u>	<u>Revised Model F3</u>	<u>Expl. Apr./83</u>	<u>% Variance Ex.vs.F3</u>
<u>NA</u>						
Tonnes (000's)	1,827	1,308	-28	1,306	1,253	- 4
Pb - %	2.45	3.11	+27	2.84	3.18	+12
Zn - %	3.81	5.02	+32	4.35	5.11	+18
Ag - G/MT	37	48	+30	40	49	+22
<u>OA</u>						
Tonnes (000's)	1,330	1,087	-18	900	938	+ 4
Pb - %	2.35	3.01	+28	2.59	3.26	+26
Zn - %	3.40	4.68	+38	3.98	4.97	+25
Ag - G/MT	32	39	+24	33	42	+27
<u>PA</u>						
Tonnes (000's)	1,320	887	-33	966	737	-24
Pb - %	2.60	3.78	+45	2.98	4.17	+40
Zn - %	4.22	6.31	+49	4.88	7.11	+46
Ag - G/MT	32	44	+37	35	47	+34

FARO ORE RESERVESComparison of Pounds Metal, Exploration Model and Mintec Model

	<u>Tonnes</u>	<u>% Pb</u>	<u>Tonnes Pb</u>	<u>% Zn</u>	<u>Tonnes Zn</u>	<u>Ag-G/MT</u>	<u>Gms-Ag</u>
<u>3% CUT-OFF</u>							
NA - Mintec	1,827	2.45	44.8	3.81	69.6	37	67,599
Expln.	1,308	3.11	40.7	5.02	65.7	48	62,784
Variance (%)	-28	+27	- 9	+32	- 6	+30	- 7
OA - Mintec	1,330	2.35	31.2	3.40	45.2	32	42,560
Expln.	1,087	3.01	32.7	4.68	50.9	39	42,393
Variance (%)	-18	+28	+ 5	+38	+13	+24	Nil
PA - Mintec	1,320	2.60	34.3	4.22	55.7	32	42,240
Expln.	887	3.78	33.5	6.31	54.1	44	39,028
Variance (%)	-33	+45	- 2	+49	- 3	+37	- 8
<u>5% CUT-OFF</u>							
NA - Mintec	1,306	2.84	37.1	4.35	56.8	40	52,240
Expln.	1,253	3.18	39.8	5.11	64.0	49	61,397
Variance (%)	- 4	+12	+ 7	+18	+13	+22	+18
OA - Mintec	900	2.59	23.3	3.98	35.8	33	29,700
Expln.	938	3.26	30.6	4.97	46.6	42	39,396
Variance (%)	+ 4	+26	+31	+25	+30	+27	+33
PA - Mintec	966	2.98	28.8	4.88	47.1	35	33,810
Expln.	737	4.17	30.7	7.11	52.4	47	34,639
Variance (%)	-24	+40	+ 7	+46	+11	+34	+ 2
<u>3% CUT-OFF OA, PA, NA PHASES</u>							
Total Mintec	4,477	2.46	110.3	3.81	170.5	34	152,399
Total Expln.	3,282	3.26	106.9	5.20	170.7	44	144,205
Variance (%)	-27	+33	- 3	+36	Nil	+29	- 5
<u>5% CUT-OFF OA, PA, NA PHASES</u>							
Total Mintec	3,172	2.81	89.2	4.40	139.7	36	115,750
Total Expln.	2,928	3.45	101.1	5.57	163.0	46	135,432
Variance (%)	- 8	+23	+13	+27	+17	+28	+17