003272

To	D. Gregoire	cc R. Visagie	R. Buckley
From	R. Tolbert	D. Hogan	I. Hall
Date	September 12, 1984		

Subject: Comparison of F-4 Model Reserves with Dome Hand Calculated Reserves for Faro

Since the F-4 reserve modelling is only half complete (x-sections 124+22 to 134+47) it has not been possible to compare reserves in the F-3 model with those derived in the F-4 model.

It is possible, however, to compare the F-4 model and the Dome hand calculated reserves for x-sections 124+22 to 135+54.

The Minable Reserves outlined below are directly compariable taking into account their different interpolation methods.

To enable the Geological Reserves to be comparible, the Dome hand calculated reserves for x-sections 134+47 and 135+54 were added to the F-4 reserves covering x-sections 124+22 to 133+00.

Results

Geological Reserves (124+22 to 135+54)

Model	Tonnes	Pb %	Zn %	Ag g/mt
F4 + (D.H.C.)	13,768,695	3.2	5.0	41.9
Dome H.C.	12,746,023	3.18	5.12	42.1
*Variance %	-7.4	0	+2.4	0

Minable Reserves (124+22 to 133+00)

Model	Tonnes	Pb %	Zn %	Ag g/mt
F4	9,980,457	3.1	4.9	40.5
Dome H.C.	9,131,432	3.09	4.91	40.93
*Variance %	-8.5	0	0	+1

$$*\text{Variance \%} = \frac{\text{Dome H.C.} - \text{F4}}{\text{F4}} \times 100$$

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Re: Comparison of F-4 Model Reserves

The following is a comparison between the F3 model and the Dome hand calculated Minable Reserves for the same volume (118+00 to 133+00):

	Minable Reserves (118+00 to 133+00)			
Model	Tonnes (000,000)	Pb %	Zn %	Ag g/mt
F-3	26.4	2.9	4.3	36.0
Dome H.C.	22.7	3.17	4.87	40.8
**Variance %	-14	+9.3	+13	+13.4

$$**\text{Variance \%} = \frac{\text{Dome H.C.} - \text{F3}}{\text{F3}} \times 100$$

A comparison between the F3 and the F4 models within the NA, OA, and PA phases (R. Tolbert, October 1983) shows the following variances:

	Tonnes	Pb %	Zn %	Ag g/mt
***Variance %	-10	+ 5	+ 8	+ 1

$$***\text{Variance \%} = \frac{\text{F4} - \text{F3}}{\text{F3}} \times 100$$

A review of the Faro Zone 3 by Simpson et al. in May 1983 compared the reserves from the F3 model with their hand calculated reserves (unfortunately at 3% and 5% Pb + Zn cutoff) in the NA, OA, and PA phase volumes. Their results showed an increase in grade and a decrease in tonnage. The decrease in tonnage ranged from -27% (at 3% cutoff) to -8% (at 5% cutoff). It is estimated that the variance between the F3 model tonnage and the Exploration hand calculation would be in the same order of mangitude as the F3/Dome hand calculation, i.e. in the order of -14%.

Discussion

The Dome hand calculation and the F4 model show the closest correlation. The difference in tonnage can be explained due to the difference in interpolation method. One might expect, since there is more detail in the F-4 model, that it would be correct. If this is assumed to be the case then it is possible to derive an anticipated F-4 tonnage and grades for the whole deposit. This would be a tonnage 8.5% higher than the Dome hand calculation with grades the same as the Dome hand calculation as follows:

	Tonnes	Pb %	Zn %	Ag g/mt
F-4 (anticipated)	24.6	3.18	5.12	42.1

Examining the total metal content the following variance between Dome H.C. and F3 and between F4 (anticipated) and F3 can be made as follows:

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Re: Comparison of F-4 Model Reserves

Model	Tonnes (000,000)	Pb Tonnes	Zn Tonnes	Ag Tonnes
F3	26.4	765,600	1,135,200	950.4
Dome H.C.	22.7	719,600	1,105,500	926.2
F4 (anticipated)	24.6	779.800	1,198,000	1003.7
Variance %: $\frac{\text{Dome H.C. - F3 x 100}}{\text{F3}}$	-14%	- 6.4%	- 2.3%	- 2.5%
Variance %: $\frac{\text{F4 (ant) - F3 x 100}}{\text{F3}}$	- 6.8%	+ 1.9%	+ 5.5%	+ 5.6%

The value of the above total metal content (in the ground) for silver, lead and zinc only is as follows:

Model	Value * (C$ Billion)	Variance to F3	Difference to F3* (C$ 000,000)
F3	2.219	-	-
F4 (anticipated)	2.328	+4.9%	+ 109
Dome H.C.	2.148	-3.2%	- 71

*Silver U.S. $10/oz
Lead U.S. $0.25/lb.
Zinc U.S. $0.40/lb.
C$1.00 = U.S. $0.76

It is pointed out here that the above discussion is simply an indicator of the possible discrepancy that may be anticipated between the F3 model and the F4 model once it is completed.

Since:
1. there may be differences, in the unmodelled volume remaining (x-sections 118+00 to 123+00), between the Dome hand calculated reserve and the to be completed F4 model that are not readily apparent:
2. new 1984 drill assay results have to be included in the new F4 model;

the above discussion should be viewed with due discretion.

Clearly if the above F4 (anticipated) reserve were to be real then the effect, if the same ore tonnage throughput to the mill were maintained as in the F3 based plans, would be to deplete the reserves sooner. This would require sooner start up in the Vangorda Plateau.

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Re: Comparison of F-4 Model Reserves

If the same concentrate tonnage output were to be maintained, as in the F3 based plans, then since the F4 (anticipated) grades are higher the ore tonnage throughput to the mill would have to be reduced.

Summary

1. Comparing the F4 model with the Dome hand calculation for half of the Faro deposit shows excellent correlation between grades and a reasonable correlation between tonnages of the two methods in both the Geological and Minable Reserves.

2. Comparing the F3 model with the Dome hand calculation of the Minable Reserve for all the Faro deposit shows a decrease in tonnage from the F3 to the Dome hand calculation and an increase in grade.

3. Various other comparisons also suggest that the F3 model overestimated the tonnage and underestimated the grades.

4. An anticipated reserve from the F4 model may contain less ore but at a higher grade.

5. If the F4 (anticipated) reserve were valid then this would affect milling and mining rates as well as start up dates on the Vangorda Plateau.

Recommendations

1. Once the 1984 drill logs and assays have been entered to the database an updated revision of the Dome hand calculated reserve should be carried out.

2. The F4 modelling should be completed as soon as possible, on schedule. To this end it is imperative that the computer handling (be it Mintec or a 'standalone') system be available by the end of December 1984.

Robin S. Tolbert

RST/DBC