

**CURRAGH INC.**

***D R A F T***

Inter-Office Memorandum

**TO:** Jim Hendry  
Vice-President, Operations  
Toronto Office

**FROM:** Gregg A. Jilson  
Vice-President, Exploration  
Whitehorse Office

**RE:** **Third Quarter Reserve Review**

**DATE: 12 18 1992**

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Enclosed is the third quarter minable reserve for Yukon operations along with a summary of ore production for the third quarter. This is in preparation for the start of '93 reserve and recommendations are provided to facilitate that report.

**Faro Division**

Total Faro division minable reserve decreased 604,000 tonnes to 44,314,000 tonnes despite having processed 984,000 tonnes during the quarter. The extra ore came from the Faro Underground (98,000 tonnes) and Vangorda Pit (248,000 tonnes). The extra ore in the underground area is due to the previous figures having been based on a mine plan which has been extended beyond its scheduled completion. The extension was possible since more ore than expected was found mainly at the periphery of the underground area. The extra ore in the Vangorda Pit is due to a conservative mine model which did not consider carbonaceous quartzite as ore and also incorporates a high dilution. Extra ore has also materialized due to a conservative interpretation on the southwest pit wall.

Minaible reserves are based on computer block models recalculated to reflect the

actual excavated surface at the end of the third quarter or other relevant manual methods. These reserves are not arrived at by backing out production during the quarter from earlier reserves.

The **Vangorda open pit** reserve is considered well known and conservative based on performance since production began in that pit. The dilution applied is probably excessive at this time but is retained since dilution will begin to increase as mining proceeds through the core of the deposit to its edges.

The **Grum open pit** reserve is based on an old mine model which has been verified by new work. The new mine plan and latest pit design is not reflected as this work has not yet been completed. The Champ zone is not included.

All the open pit reserves include material above a 3% Pb+Zn cutoff, some of this material is not economic at today's prices but is stockpiled, thus it is appropriate to retain it in the reserves.

The **Dy reserve** is based on a CMD study quoted in a 1989 long range plan and is based on Cyprus Anvil's mineral inventory. The allowance for dilution is low and should be reexamined.

#### Recommendation

By year end the Grum pit reserve should be updated to the new long range model (G9110) which is beginning to be shown to be reasonably accurate compared to production and is a substantial improvement on the 1987 calculation.

The Dy reserve should be updated so that it is consistent with the current mineral inventory and drilling data. This could be done by adopting a recent Fox Geological estimate (10.9 million tonnes averaging 12.2% Pb+Zn) or having

CMD complete their work on a revised mine plan. The latter is preferable as CMD will be involved further in the project and the Fox Geological work has been unduly influenced by assumptions from Faro underground.

When this work is done for the Grum and Dy deposits, the Probable and Possible, and where relevant, Proven quantities should be quantified separately.

With the exception of the Dy recommendation, all this work can be undertaken readily by the Faro Division site geologist.

#### **Sä Dena Hes**

The mineable reserve at end of third quarter was 2.49 million tonnes averaging 2.0% Pb and 11.2% Zn in Jewel Box Hill, Burnick and Attila.

The Burnick and Attila figures are derived from the 1990 Roscoe Postle "geological reserve" by reducing the "geological reserve" by 0.88 then applying a 0.1 dilution factor (10% dilution by zero grade) and 0.9 recovery factor (90% mining recovery). This applies arbitrary factors to a base inventory which already must be considered questionable. In order to deal with the difficulties encountered with the feasibility study tonnage the 0.88 factor has been introduced. This factor was in use in early 1991; based on current experience a factor of 0.77 might be more appropriate as this is the factor that will convert the feasibility study proven+probable "geological reserve" to the proven+probable start of mining mineral inventory for Jewel Box Hill based on current data.

The Jewel Box Hill reserve is simply the total ore in the remaining mine plan. It has not been possible to reconcile production and reserves.

Recommendation

Burnick and Jewel Box reserves should be recalculated to reflect 9,000m of additional drilling since August 1. Work on the mineral inventory is already underway by the minesite staff for Jewel Box and Fox Geological for Burnick. There may be some difficulty reporting deeper material at Burnick. Attila will have to remain as per the 1989 reserve. A mineral inventory has already been calculated for Gribbler Ridge based on 1992 drill results. This should be the basis for a minable Gribbler reserve - some material was classified as Probable on Gribbler Ridge thus this area will be an addition to the minable reserve in previous years. Minesite engineering staff are prepared to turn the in place mineral inventory for Burnick and Jewel Box into a minable reserve during January so that reserves are ready for inclusion in Form 10K and for the protection ratio calculation. CMD should produce a minable reserve for Gribbler or provide the information to mine engineering to do the same.

**CURRAGH INC.**  
**FARO OPERATIONS**  
**Minable Ore Reserves – Sept 30/92**

|                                  |             | <b>%Pb+Zn<br/>Cutoff</b> | <b>Tonnes</b>     | <b>Zinc<br/>%</b> | <b>Lead<br/>%</b> | <b>Silver<br/>g/mt</b> | <b>Gold<br/>g/mt</b> | <b>SOURCE</b> |
|----------------------------------|-------------|--------------------------|-------------------|-------------------|-------------------|------------------------|----------------------|---------------|
| <b>PROVEN</b>                    |             |                          |                   |                   |                   |                        |                      |               |
| Faro                             | Underground | 9                        | 28,500            | 6.2               | 3.7               | n/a                    | n/a                  | 2             |
| Vangorda                         | Open Pit    | 3                        | 2,423,000         | 4.1               | 3.3               | 42                     | 0.74                 | 4             |
| <b>Stockpiles</b>                |             |                          |                   |                   |                   |                        |                      |               |
|                                  | High Grade  | 5                        | 343,000           | 5.3               | 3.9               | n/a                    | n/a                  | 3             |
|                                  | Low Grade   | 3-5                      | 2,458,804         | 2.8               | 1.8               | n/a                    | n/a                  | 3             |
| <b>PROVEN + PROBABLE</b>         |             |                          |                   |                   |                   |                        |                      |               |
| Faro                             | Open Pit*   | 3                        | 489,000           | 4.9               | 2.2               | n/a                    | n/a                  | 1             |
| Grum                             | Open Pit    | 3                        | 27,299,000        | 4.8               | 2.8               | 47                     | 0.79                 | 5             |
| <b>PROBABLE</b>                  |             |                          |                   |                   |                   |                        |                      |               |
| Dy                               | Underground | 9                        | 11,300,000        | 6.8               | 5.8               | 83                     | 0.94                 | 6             |
| <b>Total (Proven + Probable)</b> |             |                          | <b>44,341,304</b> | <b>5.2</b>        | <b>3.6</b>        | <b>n/a</b>             | <b>n/a</b>           |               |

**Sources**

1. Curragh Inc. – section polygonal calculation
2. Curragh Inc. – Scheduled shutdown of underground operations Oct. 15 due to encroachment of tailings into underground workings (production = 1900 tpd).
3. Curragh Inc. – General Manager's September Month End Report.
4. Curragh Inc. – V9009 calculation, geology composites, 20% dilution at "0" grade. *90% mining recovery*  
Remaining ore reserves below Sept/92 survey surface within VWEST Pit.
5. Curragh Inc. – G8705 calculation, 95% mining recovery, 15% dilution at "0" grade.  
Remaining ore reserves GIV Stage 3 pit (no Champ Zone).
6. Curragh Inc – (1989); S89 Alpha 2 mine plan (Initial Offering Prospectus)

\* Includes AY target zone only – does not include the "Zone I down dip area" which has a in-situ inventory of approximately 450,000 tonnes averaging 11.5% Pb+Zn of which approximately 33% is likely to be recoverable. This additional zone requires further quantification before a minable reserve can be given.

FARO DIVISION  
THIRD QUARTER SUMMARY OF PRODUCTION FROM MINES

ORE MOVED FROM MINES

| Hauled                 | July    |      |      | August  |      |      | September |      |      | TOTAL   |      |      |
|------------------------|---------|------|------|---------|------|------|-----------|------|------|---------|------|------|
|                        | Tonnes  | %Pb  | %Zn  | Tonnes  | %Pb  | %Zn  | Tonnes    | %Pb  | %Zn  | Tonnes  | %Pb  | %Zn  |
| To Vangorda LG         | 48,473  | 2.39 | 3.04 | 14,074  | 2.02 | 2.33 | 37,737    | 1.79 | 2.43 | 100,284 | 2.11 | 2.71 |
| To Vangorda HG refract | 9,547   | 3.93 | 5.28 | 0       | 0.00 | 0.00 | 0         | 0.00 | 0.00 | 9,547   | 3.93 | 5.28 |
| To Vangorda HG carbon  | 64,853  | 2.98 | 4.46 | 0       | 0.00 | 0.00 | 21,540    | 2.67 | 4.14 | 86,393  | 2.90 | 4.38 |
| To Vangorda HG baritic | 265,114 | 4.34 | 5.28 | 74,959  | 3.78 | 3.85 | 254,130   | 3.97 | 4.89 | 594,203 | 4.11 | 4.93 |
| To U/G HG              | 72,944  | 3.97 | 6.60 | 63,436  | 3.94 | 6.43 | 67,357    | 4.38 | 6.90 | 203,737 | 4.10 | 6.65 |
| Total Pits             | 387,987 | 3.86 | 4.86 | 89,033  | 3.50 | 3.61 | 313,407   | 3.62 | 4.54 | 790,427 | 3.72 | 4.59 |
| Total U/G              | 72,944  | 3.97 | 6.60 | 63,436  | 3.94 | 6.43 | 67,357    | 4.38 | 6.90 | 203,737 | 4.10 | 6.65 |
| TOTAL                  | 460,931 | 3.88 | 5.14 | 152,469 | 3.68 | 4.78 | 380,764   | 3.75 | 4.96 | 994,164 | 3.80 | 5.02 |

ORE FED TO MILL FROM MINE RECORDS

| Hauled                    | July    |      |      | August  |      |      | September |      |      | TOTAL   |      |      |
|---------------------------|---------|------|------|---------|------|------|-----------|------|------|---------|------|------|
|                           | Tonnes  | %Pb  | %Zn  | Tonnes  | %Pb  | %Zn  | Tonnes    | %Pb  | %Zn  | Tonnes  | %Pb  | %Zn  |
| From Faro L.G.            | 83,383  | 1.83 | 2.67 | 19,395  | 1.92 | 2.73 | 34,661    | 1.69 | 2.58 | 137,439 | 1.81 | 2.66 |
| From Vangorda Mill stock  | 285,202 | 4.05 | 5.03 | 151,690 | 3.82 | 4.44 | 252,272   | 3.92 | 4.92 | 689,164 | 3.95 | 4.86 |
| From U/G + 6%             | 41,165  | 3.97 | 6.60 | 27,121  | 3.96 | 6.83 | 62,885    | 4.16 | 6.96 | 131,171 | 4.06 | 6.82 |
| From Coarse               | 21,750  | 3.46 | 4.62 | 0       | 0.00 | 0.00 | 5,026     | 3.56 | 5.33 | 26,776  | 3.48 | 4.75 |
| To Coarse                 | 200     | 3.58 | 4.69 | 0       | 0.00 | 0.00 | 0         | 0.00 | 0.00 | 200     | 3.58 | 4.69 |
| Total mill feed from mine | 431,300 | 3.58 | 4.70 | 198,206 | 3.65 | 4.60 | 354,844   | 3.74 | 5.06 | 984,350 | 3.65 | 4.81 |
| Millfeed from met. bal.   | 431,301 | 3.27 | 4.54 | 198,206 | 3.38 | 4.41 | 354,844   | 3.51 | 4.64 | 984,351 | 3.38 | 4.55 |

STOCKPILE STATUS

|                       | Opening Stockpile (July) |      |      | Closing Stockpile (September) |      |      | Increase or (decrease) |       |       |
|-----------------------|--------------------------|------|------|-------------------------------|------|------|------------------------|-------|-------|
|                       | Tonnes                   | %Pb  | %Zn  | Tonnes                        | %Pb  | %Zn  | Tonnes                 | %Pb   | %Zn   |
| Faro L.G.             | 2,168,744                | 1.68 | 2.72 | 2,019,284                     | 1.67 | 2.73 | (149,460)              | 1.82  | 2.58  |
| Vangorda L.G.         | 315,998                  | 2.48 | 3.08 | 439,520                       | 2.40 | 3.00 | 123,522                | 2.20  | 2.80  |
| Vangorda H.G. refract | 85,706                   | 4.11 | 4.89 | 83,753                        | 4.09 | 4.93 | (1,953)                | 4.97  | 3.17  |
| Vangorda H.G. carbon  | 78,086                   | 3.47 | 4.74 | 64,445                        | 3.27 | 4.61 | (13,641)               | 4.41  | 5.35  |
| Vangorda H.G. baritic | 3,200                    | 3.57 | 4.02 | 33,474                        | 3.98 | 4.92 | 30,274                 | 4.02  | 5.02  |
| Vangorda Mill Stock   | 96,612                   | 4.31 | 5.50 | 88,154                        | 3.99 | 5.12 | (8,458)                | 7.65  | 9.46  |
| U/G 6%                | 33,253                   | 3.95 | 6.95 | 66,787                        | 4.10 | 6.64 | 33,534                 | 4.25  | 6.33  |
| Coarse Ore            | 38,480                   | 3.51 | 4.94 | 5,904                         | 3.59 | 5.36 | (32,576)               | 3.50  | 4.86  |
| Total L.G.            | 2,484,742                | 1.78 | 2.77 | 2,458,804                     | 1.80 | 2.78 | (25,938)               | 0.00  | 1.58  |
| Total H.G.            | 335,337                  | 3.93 | 5.23 | 342,517                       | 3.89 | 5.26 | 7,180                  | 2.20  | 6.47  |
| Total Stockpiles      | 2,820,079                | 2.04 | 3.06 | 2,801,321                     | 2.06 | 3.08 | (18,758)               | -0.84 | -0.29 |

**CURRAGH INC.**  
**SA DENA HES MINE**  
**Minable Ore Reserves – Sept 30/92**

| <b>Zone</b>              | <b>Class</b> | <b>%Pb+Zn<br/>Cutoff</b> | <b>Tonnes</b>    | <b>Zinc<br/>%</b> | <b>Lead<br/>%</b> | <b>Silver<br/>g/mt</b> | <b>SOURCE</b> |
|--------------------------|--------------|--------------------------|------------------|-------------------|-------------------|------------------------|---------------|
| <b>PROVEN + PROBABLE</b> |              |                          |                  |                   |                   |                        |               |
| Jewel Box Hill           | Undefined    | 8                        | 425,900          | 6.2               | 10.3              | n/a                    | 1             |
| Burnick                  | Probable     | 8                        | 1,713,650        | 0.8               | 11.4              | 43                     | 2             |
| Attila                   | Probable     | 8                        | 353,707          | 3.1               | 11.2              | 56                     | 2             |
| <b>Total</b>             |              |                          | <b>2,493,257</b> | <b>2.0</b>        | <b>11.2</b>       | <b>n/a</b>             |               |

**Sources**

1. Remainder of 1992 production schedule from SDH Mine engineering and 1993 mine plan by CMD quoted by R.V. Crossley. Classes of ore not separated are mainly probable, some proven and other material is included.
2. April 1992 minable reserve from spreadsheet applying 0.1 dilution factor and 0.9 recovery factor to 0.88 of the in-situ geological reserve reported by Roscoe Postel in 1990.