

CURRAGH INC.

Inter-Office Memorandum

TO: Jim Hendry
Vice-President, Engineering
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FROM: Gregg A. Jilson
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cc: ~~C.V. Reed~~
~~Chief Geologist~~
~~Faro Operations~~

RE: Dy Issues

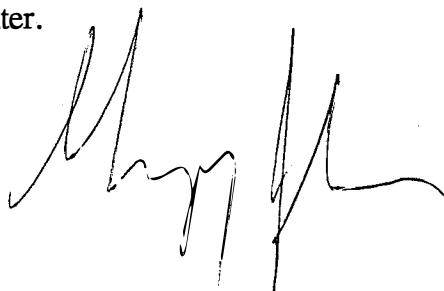
DATE: 09 17 1992

I am enclosing a copy of a memo to Colin which summarized several concerns about the Dy work program as envisioned many months ago. Most aspects of the program are now changed but the fundamental issues remain.

One area I did not touch on when emphasizing the importance of avoiding direct assumptions about Dy based on Faro underground was the assumption that all massive sulphide must be mined as a unit. Fox has made this assumption when recompositing drillhole assays. This is applicable at Faro underground but cannot be followed at Dy since there are large quantities of barren massive or nearly massive sulphide. Assay limits will be a fact of life in parts of the Dy mine. Visual control of this material will be difficult but recognizing underground faces which need more rapid sample results or testing by x-ray type technology should be no problem.

As we discussed, I believe that geological support for Dy should be in house and part of the Faro operations sooner rather than later. It is strongly recommended that we retain a geological consultant with a few "grey hairs" in the shaft sinking business to advise us in that unfamiliar area at the outset and occasionally during the project.

I will discuss a drilling strategy for the shaft site with Cam Reed and get back to you later.



*P.S. I've also attached a writing on tonnes per metre as you
have said interest to Cam*

APPENDIX XI

A Discussion of Drilling Intensity in Anvil District Stratiform Pb+Zn Deposits

A measure of drilling density that can be used to quantitatively compare intensity of drilling between deposits is the number of tonnes of ore at a given cutoff grade inferred from a metre of drilling in mineralized rock.

The measure is far from perfect since some deposits have an unusually large proportion of low grade sulphides and drillhole orientations vary but none the less the measure provides some useful insights. In the cases quoted below the total length of drill core assayed is compared to the geological reserve at a 4% or a 9% Pb+Zn cutoff grade.

Comparison of various deposits shows that, for a 4% cutoff grade, once drill density has reached a point where approximately 1,500 to 2,000 tonnes is inferred from one metre of drilling in sulphides then there is considerable certainty in geological interpretation and confidence in reserves in both a global and local basis. These are essentially proven to very firm probable reserves. At 4,000 to 5,000 tonnes per metre there is a good understanding of the deposit structure and a reliable global ore reserve. Decisions made on the global reserve can be made confidently at this point. This is a solid probable reserve.

At 15,000 tonnes above 4% Pb+Zn per metre of drilling in sulphides a basic understanding of deposit extent and gross structure is possible and global reserves can be stated with moderate confidence. At this level of drill density comfort in the reserves should be (and historically has been in this district) sufficient to commit to major additional expenditures for advanced exploration and deposit definition. Reserves drilled to this density can be considered marginally probable to probable on a global basis.

The following paragraphs provide some historic background of various deposits in light of this parameter. This is all in retrospect as the parameter has not been used previously.

Faro

Zone 3 at Faro was considered sufficiently well drilled to commence expenditures preparatory to open pit mining of the deposit in the early to mid-1970's when 15,000 tonnes at a 4% Pb+Zn cutoff was inferred from a metre of drilling in sulphides. Zone 3 was committed to production (start of significant pre-production stripping) at a drill intensity of approximately 5,000 tonnes per metre. When Curragh Resources Inc. purchases Faro the Zone 3 drill intensity was at approximately 3,500 tonnes/m. After a short time it was judged necessary to increase the drill density to avoid production uncertainties. Empirically it was observed that Zone 3 became predictable on a local basis when the drill control was sufficiently dense that approximately 2,000 tonnes relied on a metre of drilling in sulphides. From an open pit perspective this is functionally proven ore.

Reserves for the Faro underground mine have only been calculated on the basis of a 9% cutoff. At that cutoff there was approximately 4,000 tonnes inferred from a metre of drilling in sulphides (this may extrapolate to approximately 6,000 to 7,000 tonnes/m at a 4% cutoff) at the time the deposit was committed to production. This was an unusual circumstance where the continuity and structural style of the orebody was well established by adjacent open pit operations. It was also clear from the structural style in the open pit that reasonable levels of additional drilling would not resolve local structural details. Since the cost to access the ore and drift in it to define ore was less than the cost of detail drilling from surface the decision to go ahead at this low intensity of drilling was logical.

In retrospect the Faro underground operation has lived up to its global reserve projection but, as expected, there has been considerable local variance due to local difficulties with faults. The limit of ore in plan view was particularly difficult to define by surface drilling and more ore than expected was encountered at the deposit periphery. The lesson of that deposit was that stepout drilling should continue if any massive sulphides were encountered even if they did not meet cutoff grade/thickness criteria.

Vangorda

Vangorda was committed to production based on drilling up to 1986. At that time 2,300 tonnes of ore above 4% Pb+Zn was inferred from a metre of drilling in sulphides. Based on Faro experience drill density was increased for production by additional drilling between 1986 and 1991. This work reduced the measure to 1,300 tonnes per metre and though having no material impact on global reserves the additional drilling significantly clarified local structural detail and local predictability. The reserves calculated from this dense drill pattern have been reliable and there have been no significant structural surprises during mining in the open pit.

Grum

Kerr Addison's decision to proceed with advanced underground exploration of the Grum deposit was made in 1975 at a time when drill density was sufficient that approximately 13,500 tonnes above 4% Pb+Zn was inferred from a metre of drilling in sulphides. After the underground program this measure had dropped to approximately 2,200 tonnes/metre but the global reserves had not changed dramatically although the structural picture had changed significantly (actually had increased 15% at a 4% cutoff due to extra tonnage found in fold hinges). Grum now is at approximately 1,600 tonnes above 4% inferred from a metre of drilling in sulphides due to additional drilling by CAMC and CRI from 1980 to 1991.

Dy

Dy, like Faro underground, has not been estimated at a 4% Pb+Zn cutoff. At a 9% cutoff grade there is approximately 7,400 tonnes inferred from a metre of drilling in sulphides. This compares to 4,000 for Faro underground. At a 6% cutoff the measure is at 14,500 tonnes/metre. Extrapolating to a 4% cutoff should result in something like 17,000 to 19,000 tonnes/metre.

This placed Dy at a level of drill intensity significantly less than Faro underground when committed to production and slightly less than Grum when underground exploration commenced.