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FAX COVER PAGE

DATE: JAN 5, 1989

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OUR REF. NO: GT 4057

ATTENTION: Doug Read FAX 403-250-8265
BARRINGER Magenta LABS

FROM: Doug Bartlett
G.Y.M.L.

NO. OF PAGES TO FOLLOW: 2 (Excluding This Cover Page)

COMMENTS OR INSTRUCTIONS:

P.O. Attached for analytical work discussed. Reference
attached from Randol "Gold Bible" on fulvic acid.
Tailings solids samples for Inorganic carbon
remain to be shipped.
Regards
DM

If there is a problem with this transmission, or if you wish to contact us, following are our numbers:

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NATURE OF THE GANGUE

The nature of the gangue affects leaching kinetics and recovery efficiency in several ways. Those that come to mind immediately are:

- permeability of the ore grains
- preg-robbing species
- precipitation effects
- adsorption effects on clays, etc.

Fulvic
Acid

Permeability of Ore Particles

The permeability of the ore can be affected by the degree of silicification, i.e. silica encapsulation of the precious metal particles or simply the nature of the gangue and the distribution of metal values in it. Those ores where gold and silver values were distributed in "boxwork" fractures without being encapsulated by silica or manganese would be expected to be particularly leachable by cyanide solutions.

The permeability or accessibility of the gold and silver particles depends on the nature of the gangue and determines the degree of fineness to which the ore must be ground to expose the gold and silver. This characteristic of the ore is best determined in an empirical way through a series of grind-leach tests although here again a good process mineralogist and microprobe analyst will be able to provide a good idea of what to expect.

Although nothing was found on the subject in the literature, RANDOL believes that clogging of pores and fractures in sulfide mineral grains, possibly by elemental sulfur, may reduce the permeability of such particles and that this may make them sometimes appear more refractory than they really are.

Preg-robbing Species

Preg-robbing of gold and silver from cyanide pulps may occur as a result of various not yet completely defined naturally occurring species in the ore or as a result of extraneously introduced materials.

Naturally occurring preg-robbing species in gold and silver ores include activated carbons, certain types of pyrite and possibly clay minerals impregnated with humic or fulvic acids which can all adsorb gold and silver from pulp during leaching with cyanide. The preg-robbing properties of the so-called "graphite" or carbonaceous content that exists in certain ores in Nevada, California, Montana, Columbia, West Africa and Western Australia was shown by DORR and BOSQUI (1950) to have been a source of difficulty for many years.

It was GUAY (1980) who first pointed out that certain types of framboidal pyrite clusters, and not only activated carbon, results in preg-robbing from cyanide pulps and solutions.

This phenomenon is particularly prevalent in the Western United States. Processes for the recovery of gold from some of these ores have been proposed by GUAY (1973, 1980) and GUAY and GROSS (1981), RADTKE and SCHEINER (1970), SCHEINER et al (1971, 1972) and WELLS and MULLENS (1973). Natural preg-robbing species have also been reported by STILLWELL and EDWARDS (1946) in Fiji and described by FEATHER and KOEN (1975) as well as in Colombia by WILSON and DARNELL (1942) and by DORR and BOSQUI (1950).

BOYLE et al (1975) described an experiment with humic material in water: