

Gangue Rejection Responses for a Variety of Gold Ores

T D H McGrath¹, A R Bax², J J Eksteen³ and J L McGrath

1.

Research Fellow, Curtin University (WA School of Mines: Minerals, Energy and Chemical Engineering), MAusIMM, Perth, WA 6152. Email: teresa.mcgrath@curtin.edu.au

2.

Senior Research Associate, Curtin University (WA School of Mines: Minerals, Energy and Chemical Engineering), MAusIMM (CP), Perth, WA 6152. Email: alan.bax@ozmet.com.au

3.

Chair Extractive Metallurgy, Curtin University (WA School of Mines: Minerals, Energy and Chemical Engineering), Perth, WA 6152. Email: jacques.eksteen@curtin.edu.au

4.

Metallurgical Coordinator, Curtin University (WA School of Mines: Minerals, Energy and Chemical Engineering), Perth, WA 6152. Email: jeff.mcgrath@curtin.edu.au

ABSTRACT

Rejection of gangue, resulting in an increased plant feed grade at a higher net throughput (or, alternatively, a smaller plant footprint), and the creation of dual products, eg high grade and low grade, for alternative processing streams are two treatment options being investigated to turn otherwise uneconomic ores into reserves by means of gravity based separations. Eleven gold ores have now been assessed for their potential for rejection of gangue using the gangue rejection amenability test (GRAT). The samples represent a variety of gold ore types, from several continents and many different gold producers. In addition to the basic GRAT, two ores have been processed using four different crushing modes to characterise the influence of crush-type on liberation. The resulting GRAT responses have been collated in database for benchmarking and can also be interrogated to determine the optimal gold loss vs mass rejected (analogous to the more popular interpretation of gold recovery vs mass yield) response for each ore given the influence of elemental deportment as a function of size and density based separation. A coarse particle gangue rejection model has also been developed which allows for predictions of recovery based the GRAT response and the selected plant parameters.