

Does Gravity Gold Recovery Make a Difference in the Profitability of a Low-Grade Orebody?

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ABSTRACT

A common misconception is that only high-grade gold orebodies contain a significant component of gravity recoverable gold (GRG). As a result, the impact of gravity recovery on project profitability of low-grade deposits is often not considered. The facts though, as shown in the case study of the Karlawinda Gold Project, is that low-grade orebodies can contain significant GRG. In this case study, the impact of GRG recovery on the project's cashflow is in the order of \$40 million dollars over the life-of-mine.

The Karlawinda Gold Project, located in the Pilbara region of Western Australia, is 100%-owned by Capricorn Metals. Its Bibra orebody, is a typical low grade, high tonnage deposit, with a current reserve of 28 million tonnes at 1.0 g/t gold. The feasibility study confirmed up to 69 % of the gold in the deposit is amenable to recovery by gravity.

Detailed testwork undertaken during the study characterised the GRG in terms of its particle size, and its impact on cyanidation and gold recoveries. It was identified that a significant proportion of the GRG in the Bibra deposit is moderate to coarse in size. On average 20 % of the GRG is greater than 150 µm in size, and 50 % is greater than 80 µm. This moderate to coarse gold component was found to be slow leaching, impacting on leach residue grades. Removal of the GRG component prior to cyanide leaching was also found to significantly reduce sodium cyanide consumption.

Modelling of the GRG data, using the AMIRA P420 Gravity Model, was used to assist in the design of the gravity circuit to ensure optimum gravity effort was applied for maximising GRG recovery and minimising leach residue grades. By applying a high gravity effort, treating 50 % of the bleed stream to gravity, it is estimated that leach residue grades will be reduced by 0.02 to 0.03 g/t. This equates to approximately \$32 million dollars in additional revenue, and savings of approximately \$8 million dollars in sodium cyanide consumption over the life-of-mine.

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