

A tailored solution to determine plant capacity using strategic analysis.

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ABSTRACT

There are significant opportunities to improve a project's outcomes by conducting strategic mine planning to assist in making key decisions such as processing plant capacity. It is important that the study team defines the objectives for the strategic mine planning at the beginning of the study to understand what type of decisions will need to be made. Specialist software skills and experience will be needed to meet these objectives and are often required to achieve the best outcomes.

This paper discusses the benefits of completing strategic mine planning to identify project configuration options to assist in the selection of the processing plant throughput rate (Capacity Study) for a large greenfield open pit gold mine. The processes described in this paper allowed for the basis of design to then be set for subsequent studies at a risk profile acceptable to the owner.

The relationship between the orebody, processing plant, mine, market and other constraints can be assessed holistically to rank options based on a range of metrics, rather than considering the processing plant as a standalone entity, thus enabling the plant size decision to be tailored to the project and corporate objectives.

As part of the Capacity Study, multiple strategic life-of-mine schedules were developed that allowed the effect of varying multiple parameters to be quantified and incorporated into the plant capacity decision. The key parameters that were assessed included: mining bench height and selective mining unit (SMU) size, associated mining dilution and ore loss, cut-off grade, mining equipment, pit staging and final pit stage selection, stockpiling strategy, vertical rates of advance in the pit, preproduction mining duration, and mining and processing rates and ramp-ups. The Capacity Study also considered both the inclusion and exclusion of Inferred Mineral Resources to understand the risk associated with current resource uncertainty and its impact on the plant capacity decision.

Identifying and selecting the plant capacity is a key decision to be made for all projects. Not only does it have a material effect on the project's upfront capital cost, but also a long-felt effect on future cashflows. It can change the way in which a mine is operated, and ultimately the overall project value. Understanding the physical and financial risk associated with plant capacity is essential for the informed stakeholder.

Adopting the described approach to determine plant capacity ensures key decisions are given adequate consideration and are underpinned by a systematic approach with defensible outputs, rather than it being a decision based on inadequate analysis.