

Opportunities for improving the planning process



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OVER THE YEARS, Whittle Consulting has had considerable success in establishing its concept of Global Optimisation, the methodology for simultaneously optimising the life-of-mine mining schedule, cut-off grade, blending, stockpiling, processing configuration and production plan. This involves bringing together information from across the functions of geology, mining, processing and marketing.

Thus, according to Whittle Consulting, Global Optimisation serves as an umbrella under which all major divisional and departmental improvement projects can be evaluated and supported.

In practice, the data used by a resource company is handed across a chain of functional specialists, each with their own area of focus and expertise, but unfortunately often with only a limited appreciation of the roles and issues of others in the chain.

"Information invariably has to serve more than one purpose," says Gerald Whittle, managing director, Whittle Consulting, "and if all of these are not clearly understood along the way, then actions are often taken that suit one purpose but negatively affect another."

A basic example is the geologist making a distinction between what is economic ore and what is waste, based on the current view of long-term metal prices, costs and recoveries. It is common practice to zero out the grades of waste, or make them negative 1, as a way of flagging that the material is not considered as economic in the long run. This may be sound practice for resource estimation or reserve statements, and arguably as a basis for pit optimisation, but it causes havoc when trying to perform strategic schedule optimisation.

"With current high metal prices, we are often engaged to review mining rates, cut-off grades and stockpiling strategies in the light of the market opportunities that prevail at this stage of the economic cycle. We go to the block model with the intention of revaluing the mineralised material that was previously regarded as uneconomic – and the data is not there!" explains Gerald Whittle. "This means backtracking through the process, involving a larger number of individuals, and either losing valuable time or failing to achieve the analysis we are seeking. It would be a simple procedure to flag mineralised blocks as economic or not, with a long-term mind set, and not censor the original data.

"Although there is room for improvement in communication between geology and mine planning, we observe even bigger gaps between mining and processing. Many resource companies are still mining to deliver a constant head grade, with constant ore characteristics over time based on the average characteristics of the resource. As soon as we see constant delivery, we know there is opportunity of value enhancement via optimisation."

This discussion does not relate to the day-to-day variability of feed that can destabilise sensitive mineral processing. It does mean having a changing target over time that reflects a balanced consideration of what is available from the ore body, and the "value-in-use" that different material characteristics can produce within the plant.

"In a single element metalliferous operation, the 'dynamic head-grade' discussion is driven mostly by cut-off grade optimisation considerations (as per Ken Lane methodology). In a multi-element environment with deleterious elements it is a combination of cut-off grade, blending considerations and plant sensitivity," says Gerald Whittle.