

Drilling plan generation based on uncertainty models. Definition of uncertainty thresholds, error for a determined volume at Escondida Mine.

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ABSTRACT

In the mining industry drilling is the main activity that support the incorporation of new data (samples) for 3D models. For this reason, the generation of the drilling plan is a key activity to quantify the required data (number of meters) for a determined level of confidence in a known volume. There are different methodologies to define drilling plans, some of them take in consideration grids or space between holes and other only a visual review to add holes in areas with 'poor' data. Normally this practices are based on the level of experience of the team or professional in charge, and are not necessarily considering the deposit variability. Additionally the use of these approach doesn't take in consideration a verification process to evaluate if the plan will address the objective of collect data where required (i.e 5 year plan) providing the priorities of the plan.

Drilling activities represent more than 80% of the geology budget in mining companies. This is the reason why requirements of diminishing and optimising the budget affects directly drilling plans. The effect is always the same, cutting down or delaying drilling meters for a determined period of time, with the expectation to drill more in the future. According to this common situation, can we cut down the expected drill plan without provide a clear understanding of the effect of this decision? Can we quantitative support the requirements of our plan?

This paper describes the use of uncertainty models to support drilling plan generation at Escondida deposit, uncertainty models takes in consideration the confidence obtained from simulation of geology and grades. The definition of error limits for determined volumes allows the understanding of drilling meters vs error acceptance.

Finally some examples of the impact of cutting down drilling and the impact in the resource confidence is also included.