

Indicator Kriging Saves the Day: Improving Reconciliation

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ABSTRACT

An estimation geologist has many tools in their kit and using the correct one for the job is vital for creating a useful model. Reconciliation is a key step to monitor the performance of a resource model and to ensure the correct tools have been selected and appropriate parameters are set. This paper presents an example of refining the estimation methodology for a Channel Iron Deposit (CID), resulting in an improved model.

Rio Tinto Iron Ore (RTIO) CIDs are unique iron ore deposits located in the Pilbara region of Western Australia and contribute a significant volume to the worlds seaborne iron ore market. A problematic feature of these deposits is the irregular dispersion of clay pods that cannot be delineated with confidence within the resolution of the exploration drilling.

Resource to grade control reconciliation showed an over-prediction of high-grade material in the resource model. A fresh approach was required to improve grade and tonnage predictions.

Historically, clay pods were delineated using traditional wireframing techniques and estimated using ordinary kriging with hard boundaries. The new method utilised indicator kriging to estimate the probability of clay. Probabilities generated from the indicator kriging estimate were used as an additional weighting following the ordinary kriging of grades.

Results showed indicator kriging improved global high-grade tonnes reconciliation, however, as expected, it did not improve the spatial prediction of clay. Based on improved reconciliation results indicator kriging has now been adopted as a suitable alternative for analogous CIDs at RTIO. These improvements benefit the mine planning process, but do not replace grade control models.