

Application of GeoMet to Iron Ore Mine Geology and Planning at BHP Billiton Iron Ore

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BHP Billiton Iron Ore conducts an extensive geometallurgy (GeoMet) program for its iron ore deposits in the Pilbara. The geometallurgy program was initially focused on providing samples to allow design optimization for new iron ore-processing facilities. The GeoMet program was then extended to incorporate geometallurgical predictions of lump and fines ratios and grade splits to long-term resource models and strategic mine planning.

This paper discusses the next phase of the application of GeoMet (based on drill core or operational data) to mine geology, grade control, and production planning, and the challenges faced so far. Prior to the current version of GeoMet, individual mines applied their own version of GeoMet (lump and fines grade splits) based on historical performance. However, this method was becoming increasingly prone to error as new mines were opened without historical information and the requirements to produce the lump and fines grade to target (rather than just head grade) due to the introduction of a blended lump product. To meet the challenge, geometallurgical predictions were then incorporated into mine geology grade control models and short-term geology models. Having GeoMet in these models enabled improved short-term production planning, which has supported operational efficiencies. To increase the accuracy of predictions in operational deposits, new techniques are being applied, including advanced domaining, metallurgical pit sampling, and utilizing blast-hole drilling information to test and improve the GeoMet predictions. Reconciliation processes and systems have been developed to provide an important feedback loop for measuring the ongoing performance of these predictions.