

Geological Reconciliations at Western Australian Iron Ore

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Geological Reconciliations form an integral part of the governance of BHP Billiton's Western Australian Iron Ore (WAIO) operations. This study gives an overview of Geological Reconciliations as currently practiced at WAIO.

The requirement to compare production tonnages and grades with the predictions made by the company's reserve and grade control models is internally mandated and influences all aspects of the mine geology function in our operations. Reconciliations provide assurance that our reserve models are accurate, that the mining process is correctly controlled, and that the business plan is based on valid information. They also assist our continuous improvement efforts in modelling, estimation and mining.

BHP Billiton requires all of its operations to report on three critical reconciliation factors, F1, F2, and F3. These factors are a ratio of a measurement divided by an equivalent "coupled" estimate expressed as a single number. The factors can be calculated for tonnes or grades. Factors greater than 1.00 indicate that the measurement is higher than the estimate and that more tonnes (or higher grades) have been delivered than predicted. Factors less than 1.00 indicate the opposite. The consistent use of these factors allows a rapid understanding of each site's performance and can quickly direct attention to areas of concern.

WAIO uses a customized version of a commercial, web-based reconciliation software package for all its reconciliation calculations and reporting. Every 24 hours the reconciliation system imports the required shipping, production and grade control data from a number of source systems. Each month, survey depletions from each operating pit are provided and tonnage and grade depletions from reserve models are calculated. Once the end of month process is complete the reconciliation system can then calculate factors for each of our operations. These results can then be 'rolled up' to calculate an F1, 2 and 3 for the whole of WAIO.

Recently we have increased our reconciliation system's capabilities to analyze geometallurgical predictions. F1, F2 and F3 can now be calculated for lump and fines product, tonnes and grade. This capability is providing important feedback to our geometallurgical team concerning the accuracy of their estimates and is assisting them in improving the algorithms they use for lump fines estimation.