

JKTech Mining Consulting

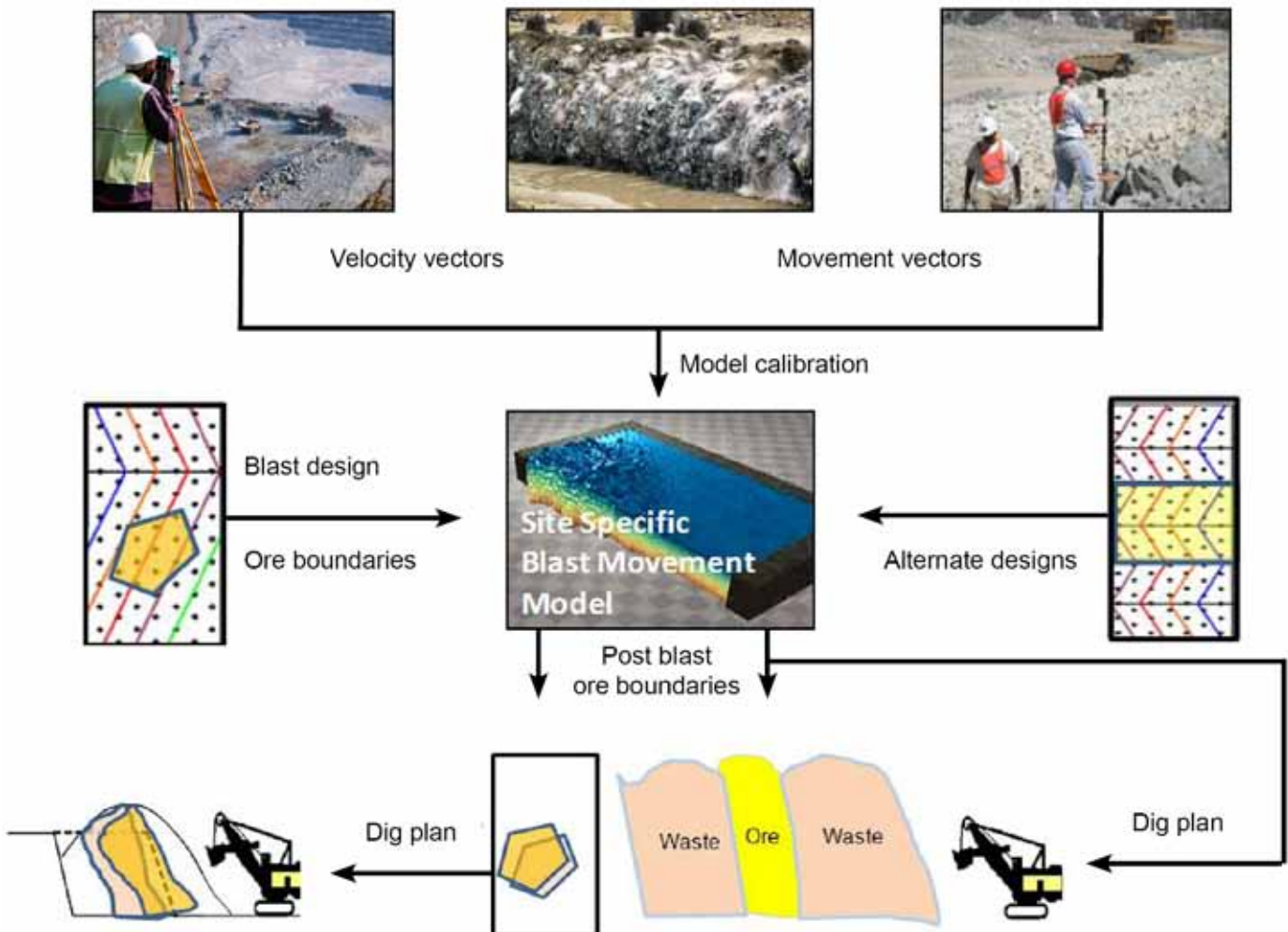
Ore Loss and Dilution Management



JKTech offers innovative solutions to control Ore loss and Dilution and provide significant improvements in ore recovery and mine profitability.

During a blast the ore blocks within the blast volume are fractured and moved for efficient loading and subsequent downstream comminution processes. A lack of understanding of ore block movements within a blast increases the risk of ore loss and dilution.

The JKTech, W H Bryan Research Centre (BRC) and Julius Kruttschnitt Mineral Research Centre (JKMRC) have been conducting research over the last fifteen years to understand the impact of blast movement on ore loss and dilution and developed tools to measure and model blast movement. Using the state of art tools developed from this research JKTech has developed a scientific methodology to minimise ore loss and dilution in open pit mines.



Measurement

JKTech engineers monitor the blasts with high speed videos and blast movement techniques to determine the velocity and movement vectors in different part of a blast. These measurement techniques have been validated at a number of mining operations.

Modelling

JKTech uses a combination of state-of-the-art blast movement models to predict the extent of movement within a blast and to simulate the displacement of the rock mass under specified blasting conditions. These models take into account particle interactions and allows for various blast energies and tie-up configurations to be simulated. Velocity and movement vectors measured from the blast movement monitoring are used to calibrate the models to site-specific blasting conditions.

Simulation

Calibrated blast movement models are used to understand the displacement trends for a given blast design and various 'what if' scenarios. The trends of displacement vectors from the simulations are used to determine the optimum blast design, grade control and excavation procedures to minimise ore loss and dilution. Risk analysis will be conducted for each proposed change and suitable controls will be recommended to mitigate them.

Optimisation

The recommended changes in blast design, grade control and excavation process will be implemented in a systematic manner to minimise the ore loss and dilution. This approach eliminates the high risk and cost of the trial and error approach commonly used by operations. A cost benefit analysis is conducted to demonstrate the benefits.

Sustain

The modified drill and blast, grade control and excavation processes will be incorporated in the standard procedures of the operations. Key personnel in each process will be trained by the JKTech engineers to implement the modified practices in a sustainable and safe manner.



JKTech Offers

1. Benchmarking and auditing of current blasting practices and quantification of the economic impact of ore loss and dilution.
2. Recommendation and implementation of alternative blast designs, grade control and excavation procedures to minimise ore loss and dilution.
3. Training to all key site personnel the findings and recommendations.

JKTech Services

- Consulting (comminution, flotation, mineralogy, mining & geometallurgy)
- Process Mineralogy and In-House Instrument Analysis
- Specialist Software (JKSimMet, JKSimFloat, JKMultiBal, JKSimBlast)
- Specialist Equipment (ore breakage characterisation, flotation characterisation)
- Metallurgical Laboratory Services
- SMI Knowledge Transfer

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