Pilbara Minerals' Pilgangoora Lithium-Tantalum mine reduces misclassification and ore loss: Adding up to A$335,000 of value in one blast

CASE STUDY

Commodity	Ore Grades	Geology	Powder Factor	Flitches	Location
Lithium-Tantalum	High – Low	Intrusive LCT Pegmatite	1.05 kg/m^3	2	Australia

Pilbara Minerals' Pilgangoora Lithium-Tantalum Project, located in Western Australia, is one of the world's largest hard-rock lithium-tantalum deposits.

- Lithium and tantalum are hosted in pegmatite
- Blasts are fired in 5-metre benches, which are mined in 2.5m flitches
- The site contains high, medium, low and sub grade ores

Challenges

Misclassification: incorrectly stockpiled ore negatively affects the mill blending strategy

- The Pilgangoora deposit contains four ore classifications: high (HG), medium (MG), low (LG) and sub grade (SG). Subgrade ore is stockpiled separately, not in run-of-mine
- Without accounting for blast movement, HG, MG and LG may be misclassified as SG or vice versa, resulting in ore loss, dilution and lower recovered tonnes

Solution

BMM System accurately translated post-blast dig lines

- Blast movement monitors (BMMs) are installed in monitoring holes throughout the shot
- Installation and detection as per site standard operating procedures
- BMM Explorer software calculates new dig lines for each flitch, and areas of ore loss and dilution that would have occurred without monitoring

Results

Less misclassification and ore loss
Pilbara Minerals saves A$335,416 in one blast

An example blast (shown right) demonstrates the value Pilbara Minerals generated from monitoring blast movement.

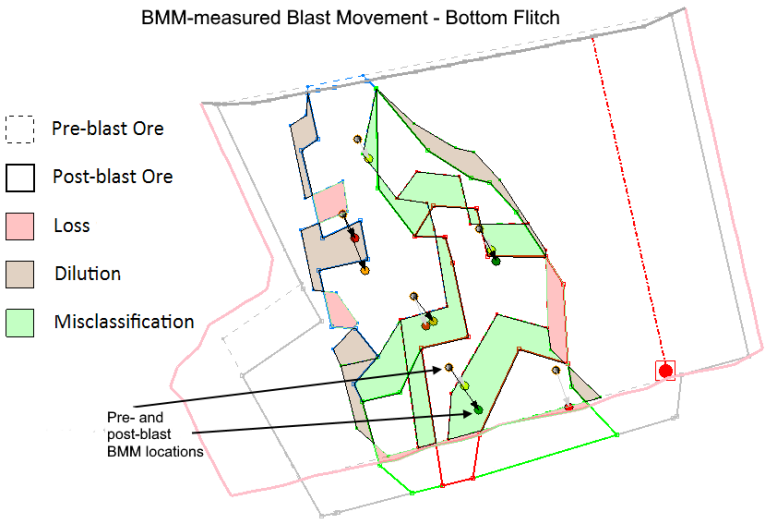
Significant movement occurs within all blasts. Variation of ±50% from the mean horizontal movement is common and occurred in this blast:

- Measured horizontal movement ranged from 4.1m – 7.4m in the top flitch and 6.7m – 11.3 m[1] in the bottom flitch
- Vertical movement was up to 1.9 m[1]

As a result of accurately accounting for blast movement, Pilgangoora mine:

- Prevented 20% misclassification of 6,517[1] tonnes
- Avoided 11% dilution—3,364[1] tonnes of sub grade ore were diverted from MG and LG ROM, saving A$87,000 in milling costs
- **Increased ore yield by 7%**—recovered an additional 2,109 tonnes of **Lithium ore valued at A$335,416**[2]

1. BMM System-measured blast movement, misclassification and dilution
2. Calculated at a Lithium price of A$792 p/tonne. (Spodumene Concentrate - SC6.0 specification)



This blast map indicates areas of loss, dilution and misclassification in the bottom flitch, where blast movement varied from 6 – 11m. For two flitches, Pilgangoora mine avoided misclassification of over 6,500 t, dilution of over 3,300 t and ore loss of 2,109 t.

Lost revenue would have exceeded A$335,416 if blast movement was not accounted for.

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