

# Polymetallic mine improves reconciliation and adds US\$320,000 of value in one blast

## CASE STUDY

Commodity	Ore Grades	Geology	Powder Factor	Location
Polymetallic	Low - high	Ultramafic layered intrusion	1.4 kg/m <sup>3</sup>	Northern Europe

This Arctic open-pit operation mines nickel, copper and gold.

- Mineralisation is contained in hard Mafic rocks, which require a high powder factor to achieve optimum fragmentation
- Benches are 12 metres and mined in a single pass
- The site contains low and high ore grades

### Challenges

Poor reconciliation between the reserve model, recovered tonnes and mill grades

- Ore loss, dilution and misclassification resulting from the blast energy, generated by the high powder factors, moving the ore boundaries 10 – 20 m (32 – 65ft)
- The mine had experienced poor reconciliation against forecast grades
- Visual ore control is not possible

### Results

Improved recovered tonnes and mill grade reconciliation  
Recovered US\$320,000 in one blast

Accounting for blast movement improved reconciliation variance:

- **Recovered tonnes variance** improved from 3<sup>1</sup>% to 1%
- **Mill grade variance** improved from 13 – 16% to 2 – 5%

In an example blast, the mine minimised ore loss and misclassification. Significant movement occurs within all blasts. Variation of ±50% from the mean horizontal movement is common and occurs at this mine. In this blast:

- Measured horizontal movement ranged from 10 to 20 m (32 – 65ft) and heave of up to 3 m (10ft)

Accurately accounting for blast movement in this blast:

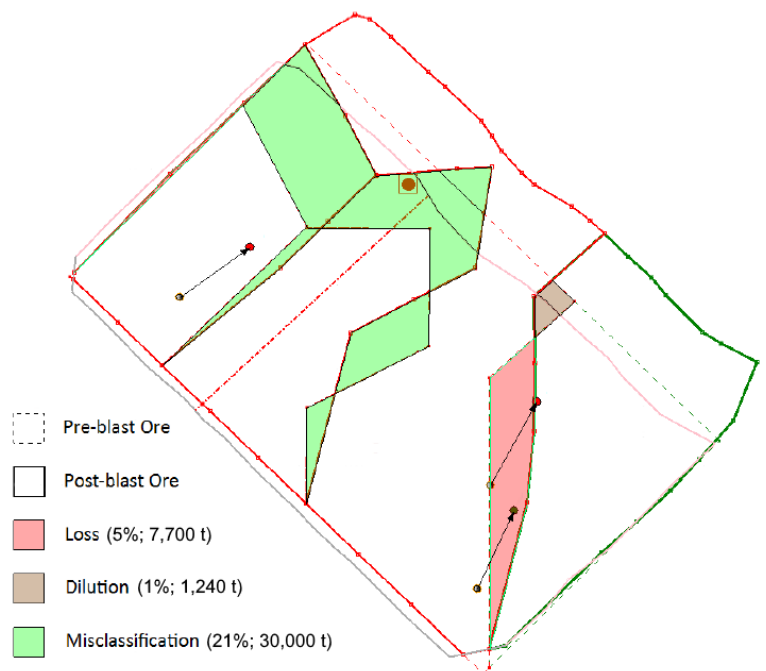
- Maximized ore yield—an additional **7,700<sup>2</sup> tonnes of Ni ore** valued at **US\$320,000<sup>3</sup>** was recovered (avoided 5% ore loss)
- Prevented misclassification of 30,000 tonnes (21%) of ore

### Solution

BMM System accurately translated post-blast dig lines

- Blast movement monitors (BMMs) are installed in monitoring holes throughout the shot
- Blast is fired and movement measured
- BMM Explorer software calculates new dig lines, and areas of ore loss and dilution that would have occurred without monitoring

Accounting for blast movement added US\$320,000 value—in one blast



1. Company-supplied data  
2. Numbers are rounded  
3. Calculated at a commodity price of US\$11,000/t Ni

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