



Minimizing Mining Dilution, Ore Loss, and Misclassification by Accounting for Blast Movement in South American Porphyry-Skarn and Manto Copper Mines

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Introduction

- Blast movement is a major component of variability in reconciliation
- Optimal ore recovery must take movement in consideration to maximize revenue

Problem Statement

- Three South-American Copper mines do not adjust diglines post-blast
- Millions of dollars in value are lost due to ore loss and dilution

Mine A - PERU

- Porphyry-Skarn Copper-Molybdenum deposit

Mine B - PERU

- Porphyry-Skarn Copper-Gold-Zinc deposit

Mine C - CHILE

- Manto Copper-Silver deposit

Research Aim and Methods

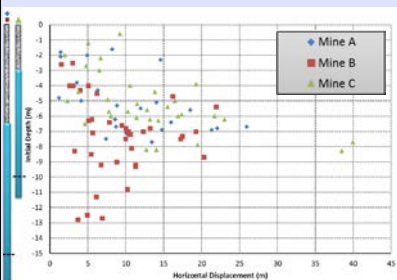
- Evaluate the impact of blast movement monitoring in ore loss, dilution and misclassification
- Monitor 3D rock displacement with the use of electronic sensors

Results

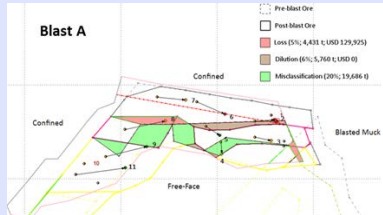
- Blast movement monitoring: 3D rock displacement calculated with highly variable results

Blast	A	B	C
Bench Height (m)	15	15	10
Hole Diam (mm)	311	311	270
Burden (m)	7.0	6.0	6.0
Spacing (m)	8.0	7.5	7.0
Powder Factor (kg/m ³)	1.6	1.34	1.1
Range of Horizontal Displacement (m)	6.3-26.0	2.6-21.9	7.8-21.7

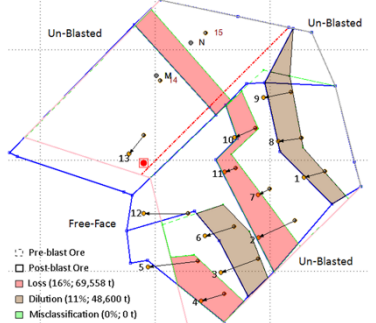
- Data distribution: Horizontal displacement is erratic and can't be modeled, higher at mid-bench elevation



➤ Blast pattern plan view and areas of loss, dilution and misclassification



Blast B



Blast C

