

## CASE STUDY

# Optimising Ore Recovery using WebGen™

Glencore Ernest Henry Mine, Australia

### Site Profile

The Ernest Henry Mine (EHM) is a copper-gold mine located 38km north-east of Cloncurry in north-west Queensland, Australia. The mine produces 6.8Mtpa of ore from a chalcopryite-rich breccia pipe plunging at approximately 45 degrees using the sublevel cave (SLC) mining methodology. Production from the SLC was conventionally started from blind uphole rises at the end of slot drives. In 2020, EHM replaced slot drives with independent ore drives through the application of pre-charged rise widening blasting using WebGen™ (refer Minimising Development Using WebGen™ case study).

### The Situation

Investigations to replace these slot drives with independent ore drives identified that a significant portion of ore remained at the front of the ore drive (Figure 1). Ore recovery from this wedge was necessary to match the recovery of the previous slot drive methodology. Papers presented by industry participants at an Orica sponsored Drill and Blast Forum held in Mt Isa in November 2019 portrayed novel applications of WebGen™ that had been used to recover stranded ore. The EHM D&B Engineers investigated adapting these applications to recover this stranded ore at the end of the independent drives.

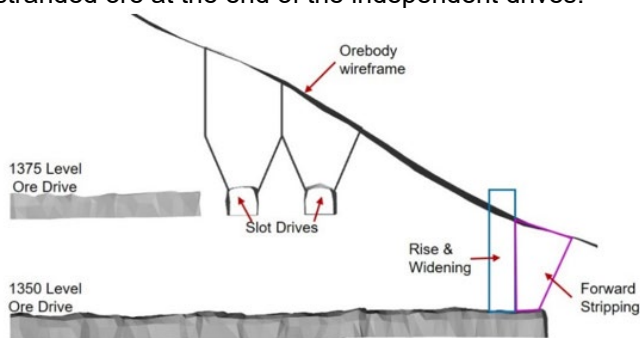


Figure 1 - Long section showing stranded ore when adopting rise widening methodology.

### Technical Solutions

The design concept was to drill out the wedge as a forward stripping blast and to pre-charge this with WebGen™ prior to firing the rise and slot widening shots. The blast was designed to cast the broken rock

from the wedge back into the previously fired rise and widening void.

### The Result

The first blast (Figure 2) performed very well with 99% of design tonnes recovered and a favourable cavity scan (CMS).

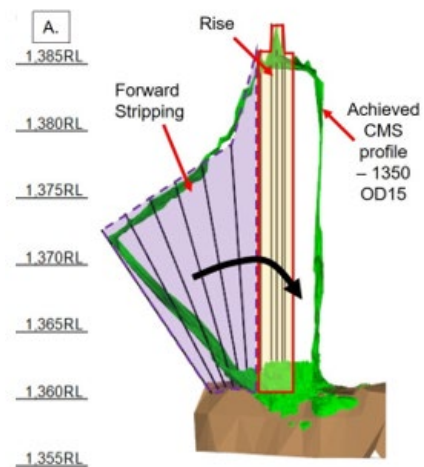


Figure 2 - Section showing design and CMS result of first forward stripping blast.

The design was incorporated into the rise and widening methodology and subsequent blasts continue to exhibit very good void and tonnage profiles. The ongoing success of the forward stripping also facilitates maximum ore extraction with minimal dilution particularly from the level below.

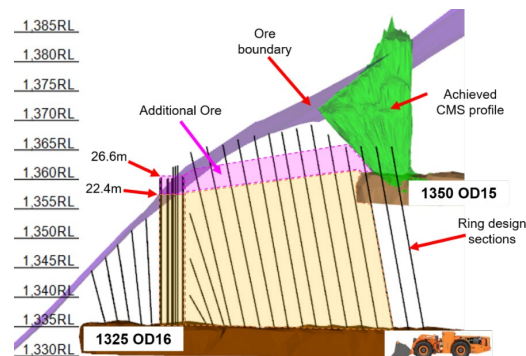


Figure 3 - Optimised drill sections for maximum ore recovery from the level below.



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Forward stripping combined with rise and slot widening blasting has demonstrated increased primary ore recovery from 75% of insitu design tonnes to 95%. This is equivalent to 75,000 tonnes per level.

Additional benefits include:

- Removal of blasting personnel from exposed brows
- Adapts easily to changing ore boundary geometries
- Allows rise location to be optimized to follow grade boundary
- Opens up the opportunity in the future to automate level ring design

Continued auditing through QA/QC, training and change management is necessary to aid ongoing success and to adapt designs to changing geological conditions.

The repetitive success of novel design applications enabled by WebGen™ wireless initiation has encouraged EHM to retain a continuous improvement focus to maximise the operational and economic benefits that this new technology can deliver. Future applications of design philosophy being considered include:

- Angled rises
- Increasing sublevel interval spacing
- Differential blasting for grade

### Testimonial

“By using WebGen on site, we have seen a significant safety improvement of operators not being involved in unsafe areas. The overall benefit for Ernest Henry is not only the reduced development and the financial reduction we have seen, it is also the de-risking of additional ore that we are also gaining with this trial. Working with Orica is a very rewarding experience to identify, execute and discover opportunities and continuous improvement value in the operation”.

Michael Hawtin – Lead Resource Engineer, Ernest Henry Mining.

### Acknowledgements

Orica wishes to thank Glenore Ernest Henry Mine for their support and permission to publish this case study.

### Reference:

Reduced Development through improved Rise and Widening Firings using Orica WebGen™ at Ernest Henry Mine. *M Hawtin, J Say, P Cann, and L Carlon*

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