

Redesigning Stopes for Improved Recovery of Ore



Project Summary

\$1 MILLION OF UNRECOVERABLE ORE

This underground nickel mine in the Midwest United States is relatively young with only a few years of production blasting. The operation is employing a sublevel stope mining technique. The operator purchases Dyno TITAN® RU emulsion and electronic detonators for blasting.

The customer was experiencing poor blast results over a substantial period of time. When the customer first contacted DynoConsult® for assistance, the concern was the under-breaking of the ore which left valuable material along the ribs. At that time the mine engineers were looking for guidance on the delay times they should be using to improve the recovery of ore

During the site visit by DynoConsult, it was also discovered that there were a few instances of benches and bridges being left in the stope after mucking. In one stope it was estimated that over \$1 million worth of ore was left unrecoverable in the stope.

It was also revealed during the site visit that there were issues related to tight digging of the muckpile even though the fragmentation was adequate.

Technology Used

LACK OF RELIEF FOR STOPE BLASTS WAS DETERMINED TO BE THE MAIN ISSUE

A site visit was conducted by DynoConsult to investigate the situation at the mine. A top to bottom review of the blast design and practices was carried out with the mine engineers. In addition, an underground tour of the mine gave DynoConsult a first-hand account of the situation and current results experienced.

Although the customer had initially assumed the issues they were experiencing could be resolved with different delay times, the investigation on site quickly revealed that the issue was related to lack of relief for the stope blasts.

The void into which the rock from the stopes was designed to expand was far too little to allow for proper rock breakage. DynoConsult's representative informed the



mining engineers at that time that most, if not all, of their blasting issues could be resolved by redesigning their stope panels to incorporate a greater void for relief.

Results

PROPER VOID FOR PROPER ROCK EXPANSION

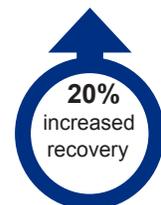
After the investigation, the DynoConsult representative sat down with the mining engineers and worked out a new stope development plan that would produce the proper amount of void in the panel for proper rock expansion.

Two test blasts were conducted. Scans of the panels after the mucking of the test blasts indicated that the recovery in the panels had improved from 70-80% to over 90%.

Next Steps

EVOLVING BLAST DESIGNS

Refinements on the stope blast designs continue to evolve through discussions with the mining engineers at this operation and will lead to continued improvements in the blasting program at this operation.



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