

Case Study

Future Proofing Tailings in the Andes

Open Pit Copper Mine
Huayllay District, Pasco, Peru

> Background

The open pit copper mine is located in southeastern Peru at elevations of 4,000 m to 4,500 m above sea level. Okane assessed the potential extent of sulfide oxidation due to oxygen ingress for a proposed tailings management facility (TMF) embankment expansion and examined the potential for rock strength degradation within the embankement.

> Approach

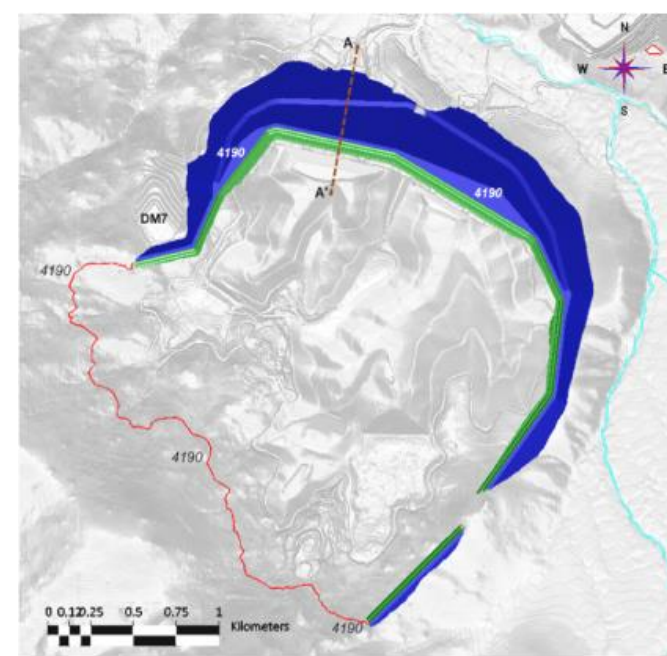
The assessment was accomplished through use of the GeoStudio suite of software to model two-dimensional coupling TEMP/W, AIR/W, SEEP/W and CTRAN. It was observed that the original design did not mitigate the advective transport of oxygen into the system. Models demonstrated that sulfide oxidation of potentially acid generating (PAG) material during construction resulted in the formation of temperature gradients, which led to a steady advective flow of oxygen and thus sulfide oxidation within the expansion. Zones of reduced oxygen developed confirming the active consumption of oxygen. The models also found that low degrees of material saturation allowed air permeabilities to be maintained at near maximal rates regardless of season.

> Client Benefit

Okane's work demonstrated that the original design would not inhibit sulfide oxidation, and would likely result in acidity generation. A sensitivity analysis showed that placement of finer-textured material could restrict air permeability to reduce advective gas transport thus providing the client with an effective design that decreased closure liability and AMD treatment cost.

Decreasing AMD treatment costs and closure liabilities through effective modeling and design.

Integrated Mine Closure
and Relinquishment Solutions



Open Pit Copper Mine, Pasco, Peru

