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ABSTRACT

Barrier cover trials at Rosebery mine



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The MMG Rosebery mine (the Mine) is located on the West coast of Tasmania approximately (~) 125 km south of Burnie and ~ 300 km northwest of Hobart. The Mine is an underground polymetallic mine (zinc, lead, copper, gold and silver) with some small-scale open cut workings. The Bobadil tailings storage facility (TSF) contains mine tailings that are potentially acid forming (PAF).

The rehabilitation of a PAF TSF, to minimise environmental contamination is site specific; being a function, among other factors, of TSF construction method, the tailings deposition, and climate.

Due to the region, the primary design objective of the Bobadil TSF cover is to limit rainfall infiltration (seepage) with a secondary objective to limit the potential for oxygen ingress into the underlying PAF tailings.

Two experimental barrier covers have been constructed at the Bobadil TSF in preparation of determining a suitable cover. Both covers include a layer of Moorland peat (150 mm) above a layer of glacial till (450 mm) above the tailings. One of the covers also incorporates a geosynthetic clay liner (GCL) at the interface between the tailings and the glacial till.

The Moorland peat provides a perched phreatic zone that is largely anoxic and limits the potential for deep-rooted trees to establish, that may potentially damage the GCL.

Further, the peat provides the preferred environmental conditions for shallow-rooted native grasses that will enhance water transpiration from the cover and create an ecological community that is sympathetic to the surrounding landscape.

The purpose of this paper is two-fold. Firstly, it describes the method and results for two large field trials that show the effectiveness of each cover. Secondly, it describes the cover model (for each cover) that was built using the field trial results and their predicted future performance.