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PROJECT CASE STUDY: Tailings Storage Facility Closure and Rehabilitation Investigation Including a Field Scale Cover Trial

SGM Environmental Pty Limited (SGME) has done an investigation into the closure and rehabilitation of a potentially acid forming tailings storage facility (TSF) over a period of three years including field scale cover trials.

Site description: The mine is an underground operation located in central New South Wales that produces lead, silver and zinc concentrate.

The problem: Rehabilitation of the potentially acid forming TSF requires careful site-specific planning to make sure the potential for acid mine drainage (AMD) is limited.

What SGME did: The investigation was done in three phases. Phase 1 examined the TSF water balance and conceptual cover design for the TSF using Vadose/W; Phase 2 built on phase 1 by testing three conceptual cover designs (from phase 1) as cover column trials. The best performing cover was 0.65 metre (m) thick and this preferred cover was taken into phase 3.

In Phase 3 the 0.65 m cover was constructed as a large field scale cover trial on a section of the TSF. The trial was instrumented with volumetric water content and matric suction sensors to measure how rainfall infiltrated, was stored and percolates through the cover. The objective was to provide the company with a yearly report that interprets field scale trial data on the cover's performance.

The mine has been actively investigating the rehabilitation strategy for the closure of the TSF at the end of the mine life. The results from the first year of field trial monitoring indicated that the cover will limit the potential for rainfall to percolate into the underlying tailings. Field trials are useful to optimise and confirm potential rehabilitation strategies for successful closure.

