Case Study

SAFE MONITORING OF TAILINGS DAMS

2 October 2020: The catastrophic failure of a tailings dam in Brazil in January 2019 released a mudflow that advanced through the mine-owners' offices, staff amenities, houses, farms and roads downstream, with multiple fatalities in its wake.

In response to the disaster, the Global Industry Standard on Tailings Management was launched by the Global Tailings Review (GTR) on 5 August 2020. The GTR was co-convened by the United Nations Environment Programme (UNEP), the Principles for Responsible Investment (PRI) and the International Council on Mining and Metals (ICMM).

While failures of tailings dams are fairly uncommon, the consequences for downstream communities and the environment can be devastating if they do. Therefore the UNEP review aimed to establish a standard that would ensure mine operators apply best practice in planning, design, construction, operation, maintenance, monitoring, closure and post-closure of tailings facilities.

As an essential Australian-owned manufacturer and supplier to the mining industry, with over 120+ years combined experience, HMA Geotechnical provides monitoring equipment and services for the safe monitoring of tailings dams. HMA points to recent tailings dam pore water pressure monitoring projects successfully undertaken for mining clients in Queensland, Australia.

Here standpipe and vibrating wire piezometers on existing tailings dams had to be read manually.

Essentially, the manual readings were disrupted by inclement weather, site hazards, limited access and related staffing issues. The end result was intermittent readings taken over a 12-month period, which prompted the client to opt for a full standalone radio telemetry system linked back to its SCADA.

"Essentially the customer wanted to eliminate the interruptions of the readings and thereby achieve continuous real-time data that was reliable and accurate," explains **Craig Bruce**, Operations Manager, HMA Geotechnical. The immediate challenge was the expansive area that needed to be monitored, together with on-site civil construction taking place. Other factors that had to be taken into account were the extreme weather conditions, including heavy rain and extreme heat and humidity, and potential exposure to corrosive elements.

"Not only did our solutions have to address all of these issues, it also had to integrate seamlessly with the customer's existing SCADA and instrumentation, all while providing automated real-time site-monitoring capabilities from a remote location," elaborates Craig.

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The nodes can be deployed in a star or mesh topology from the Hub. The respective node data loggers have an antenna and are powered by a single lithium D cell or solar, which provides years of power. Most major sensor types can be accommodated. The Hub has its own data logger for collating and transferring data to the client's local system and is housed in a protective enclosure.

The Hub uses an omnidirectional antenna and is typically powered by a solar panel or AC power. Automated, reliable and accurate sensor data was sent in real-time to the user's desktop PC, allowing for quick decision-making and data analysis from the remote site. In addition, HMA Geotechnical provided direct support and service remotely and in the field.

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