Integrating Environmental, Rehabilitation, and Closure Workflows using an Intelligence System framework

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Mining companies must navigate increasingly strict rehabilitation and closure obligations and regulatory scrutiny through the life of mine, requiring robust systems to track obligations status, rehabilitation planning and record-keeping.

At an organisational level, mining companies are seeking to invest in technologies and tools to manage closure planning and implementation and develop governance frameworks to provide adequate oversight of sites’ closure planning status. In response to these challenges, IEMA has collaborated with mining companies to develop the Integrated Mining, Environmental, Rehabilitation, and Closure System (IMERCS). This advanced cloud-based platform integrates management plan obligations seamlessly with execution records, consolidating workflows and enhancing regulatory compliance. Leveraging spatial intelligence, automation, and artificial intelligence, IMERCS facilitates data-driven decision-making and operational transparency.

In collaboration with Whitehaven Coal’s Narrabri Coal Operations, located near Gunnedah, NSW, IEMA has developed thirteen specialised modules built in the IMERCS intelligence framework to streamline data management and operational workflows. Centralised Cloud Data Stores provide organisation-wide access to structured and secure data, supporting seamless collaboration across the organisation.

IMERCS adheres to the “Plan – Do- Check- Act” continuous improvement process. Tailored modules address diverse mine site obligations, embedding task planning, execution, record management, and quality assurance processes to ensure comprehensive compliance management. Customisable dashboards provide users within the organisation live information regarding the status of rehabilitation and closure planning metrics.

This paper describes the NCO IMERCS case study to demonstrate the value a structured and centralised spatial data store can deliver for mine site management. By combining innovative technologies into a mine site intelligence framework, including automations and AI, IMERCS can deliver enhanced rehabilitation and closure planning knowledge retention and verification evidence. Environmental, rehabilitation, and closure workflows significantly improve rehabilitation implementation practices, quality assurance and support compliance with regulatory obligations, as well as provide internal governance tools for the organisation.