**Integrating Circular Economy Principles into Mine Closure Planning**

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# ABSTRACT

The integration of circular economy principles into mine closure planning provides the mining sector with a transformative opportunity to align with global sustainability standards, such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD). Traditionally focused on compliance and rehabilitation, mine closure strategies can be enhanced by embedding circular economy concepts to deliver long-term environmental, social, and economic benefits.

This paper explores how circular economy business models and principles, from material reuse to landscape repurposing to regenerate nature, can reshape mine closure planning. Reimagining waste streams as resources allows mining companies to reduce closure costs, generate new economic opportunities, enhance sustainability and secure the challenging ‘social licence to close’ in resource regions. For example, repurposing mine tailings for construction or soil rehabilitation supports local economies while promoting biodiversity restoration, aligning with GRI’s environmental impact objectives.

The potential of circular economy integration is further illustrated through examples from construction, manufacturing, and agriculture. These sectors demonstrate the effectiveness of circular principles in driving resource efficiency and waste reduction. Lessons from the reuse of by-products in construction can inform approaches to mine waste reprocessing, while regenerative agriculture offers guidance on restoring post-mining landscapes to improve soil health and biodiversity.

Case studies from mining regions – from Lusatia to the Hunter Valley - highlight the potential of circular economy approaches to foster sustainable post-mining livelihoods, reduce environmental risks, and achieve community benefit-sharing outcomes. Collaborative efforts – which are integral to many circular economy strategies – can involve mining companies, regulators, local communities and other partners in designing closure plans that transform environmental, economic and social licence liabilities into assets.

By adopting circular economy principles and learning from other industries, the mining sector can create resilient, regenerative post-mining landscapes that deliver lasting benefits for people, ecosystems, and the industry.