



## ESG-focused edition



Environmental, social, and governance (ESG) considerations have become increasingly important in the business world and contribute to long-term sustainability and responsible corporate behaviour. An ESG-driven strategy is not only a responsible approach to business but also an imperative for long-term success. It can contribute to risk mitigation, enhance reputation, attract capital, foster innovation, and engender social license to operate, making it an enduring competitive advantage. Despite varied acceptance and interpretation, ESG considerations are crucial for addressing environmental and social challenges and ensuring sustainable development of the mineral industry.

The role of the Southern African Institute of Mining and Metallurgy (SAIMM), in the promotion of ESG, is based on the premise that sustainability, and the contribution of the mining and minerals industry to society, is dependent on the professional and ethical conduct of minerals industry professionals – our members.

This journal edition is a wide-ranging collation of environmental, social, and governance sustainability topics intended to broaden perspective on the penetration of ESG sustainability considerations across the minerals industry.

The paper by Nxumalo and Field describes an approach to improve understanding of mine closure planning at Tshikondeni coal mine and identifies closure processes that achieve post-mining land use that aligns with a post-closure strategy to transition from a mining to an eco-tourism economy that can preserve livelihoods and self-reliant communities.

Masir et al. present a framework to optimise the utilisation of critical infrastructure and minimise operational disturbances to coal longwall mining operations, whilst introducing a system resilience index to optimise equipment use and longevity.

The opportunities and challenges associated with the nature of artisanal and small-scale mining are explored by Rembulwani and Dikio-Makia.

Maswanganyi et al. explore gaps and opportunities in sustainable development initiatives within the South African mining industry.

Bioleaching of metals is not new technology, however the paper by Eze et al. highlights the presence and application of indigenous ore-hosted microbes with bioleaching and beneficiation potentials that can be exploited to upgrade an iron ore resource with phosphorus and sulphur content.

Khan and Magweregwe explore circular opportunities in the mining sector and conclude that the most implementable circular economy opportunities are those aligned with the second principle of keeping materials in use. High impact opportunities are aligned with the first principle of designing out waste and pollution, whilst application of the third principle of regenerating natural systems, is more difficult to implement owing to large investment requirements.

A comparative consideration of environmental law in South Africa and Australia by Agyemang and Ashukem results in a conclusion that an approach based on a managed financial provision would be appropriate for effective rehabilitation of legacy mining operations. However, the approaches differ between countries in that South Africa, guided by the Mineral and Petroleum Resources Development Act of 2002, depends on state budget allocations, leading to funding inconsistencies and slow progress. Whilst, in contrast, the Western Australia's Mine Rehabilitation Fund Act of 2012 relies on a levy-based system, ensuring continuous financial support for mine rehabilitation.

The study by Gumede on blast induced noise and ground vibration on mud house homes identified gaps in current regulatory instruments and established that current safe limit criteria focus on general structural damage with little regard to human impact and response. A new approach is proposed, based on relating limits to the structural and human response.

The diversity of these topics and the associated insights highlight the inherent complexity of effectively dealing with ESG sustainability matters. However, whilst effectively addressing ESG matters involves investment, it will create long-term value for all stakeholders, build resilience, and position mining companies for success in an increasingly sustainability-conscious world.

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