Addressing the environmental impacts of Australian mining's past and future

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Australia's mining sector urgently need to address its legacy and ongoing environmental impacts. This will require prioritising and remediating high-risk abandoned sites, developing and applying advanced environmental risk management practices, implementing transparent reporting mechanisms, and building community trust.

The vision

ATSE envisages Australia's minerals sector becoming the world leader in managing its environmental and socio-economic impacts across both commodity and mining life cycles. Industry and government would proactively address the sector's legacy of abandoned mines by developing and implementing strategies to prioritise and fund mine rehabilitation projects. The application of low-cost environmental monitoring and analysis tools, and the demonstration of innovative research and engineering solutions to environmental challenges would support effective environmental risk assessment and management practices. Enhanced community engagement and transparent reporting and regulation of the sector would increase public trust in the sector's operations and governance.

The challenge

Mining poses a variety of environmental risks, including potential impacts on ground and surface water quantity and quality, air quality, biodiversity, landscape stability and climate change. Australia's mining sector has the skill, technology and motivation necessary to manage and mitigate these risks. However, examples of significant environmental impact still occur and, irrespective of fault, these detract from the reputation of the industry as a whole. A 2014 study suggested that while the Australian public understands the importance of Australia's mineral resources sector, its overall level of trust in the mining industry and its confidence in regulation is low. Communities see negative impacts of mining on the environment, on land and water use including the agricultural sector, and on the health and cost of living of communities. They increasingly lack faith that governments, legislation and regulation can ensure that mining companies do the right thing.

The environmental and socio-economic impacts of incomplete remediation and Australia's growing number of abandoned mine sites also pose a significant threat to the mineral sector's social licence to operate. By some reports, Australia has more than 50,000 abandoned mines, most of which are decades old and may not meet modern rehabilitation and closure standards. These sites range in size from individual shafts to large open cut mines; however, there are significant liabilities in each jurisdiction. Managing the environmental, social, safety and financial risks that these sites pose is a major challenge for both industry and government.

Addressing Australia's mining legacy

Addressing Australia's abandoned mine challenge presents an opportunity for the mineral resources sector to develop innovative, cost-effective and permanent solutions to the challenges of rehabilitation and closure. Funding the remediation of abandoned mines is an outstanding issue but some jurisdictions have now implemented a levy or a pooled mining rehabilitation fund. Once these programs gain momentum they have potential to provide significant regional employment and support practical research and demonstration of innovative solutions to remediation challenges. This will increase Australia's remediation and closure expertise with flow-on benefits to the sector's ability to undertake effective closure of current mines. Developing cost-effective remediation and closure techniques and enabling economic resource recovery and safe disposal of tailings and other waste streams will help Australia to address its mining legacy.

Improving environmental risk management

There is currently a lack of accessible, integrated data available to support informed decision making about environmental and ecological risks. Enhanced data collection and analysis is necessary to fill in critical gaps in ecological and hydrological knowledge at regional and national levels, enabling a robust scientific assessment of environmental risks at a whole-of-ecosystem scale. The continued development and deployment of enabling technologies, such as cost-effective sensors, information and communications technology systems, and geographical information systems for low-cost monitoring and analysis, will support evidence-based environmental impact assessment and management.

Environmental impact assessments predominantly rely on data collected within the boundaries of the proposed mining lease and nearby critical ecosystems, but rarely do they systematically consider and review the cumulative impacts of multiple operations in close proximity – partially due to poor data-sharing arrangements. Maintaining integrated, open and user-friendly geographical information systems will support the sector's capability to assess and monitor environmental impacts.

Leading-practice environmental management processes should be required for new developments. Research and development into improved technologies and processes can enhance efficiencies, minimise energy and water consumption, reduce waste and carbon emissions, and mitigate the environmental and health impacts of mining. Developing these technologies is an important opportunity for the Australian mining, equipment, technology and services industry.

Engaging communities and building trust

Transparent and effective environmental risk assessment and management for mine operation, remediation, and closure, supported by genuine community engagement will be essential to build trust in the mining sector and governments. By embracing accessible environmental reporting and open data practices, governments and industry will also provide a wealth of data that, with effective management, could help improve our understanding of environmental risk management.

Genuine community engagement is vital to build public support and trust. Robust and ongoing consultation processes are essential to define successful outcomes for environmental management plans and closure planning. It is important to implement engagement and consultation frameworks that consider environmental objectives alongside the needs of all stakeholders, including indigenous communities, to optimise the ecological, social and economic outcomes for Australia. Successful stakeholder engagement processes will help to build the capacity of all stakeholders to understand the evolving technical, environmental and social challenges and their management.

The way forward

ATSE recommends the following key actions for government and industry:

1. Proactively address Australia's legacy mine challenge, and put in place measures to ensure that current and future mine operators are held accountable for mine site remediation and closure

> Ensure national leadership and coordination to update the Strategic Framework for Managing Abandoned Mines in the Minerals Industry (2010) and legislation such as the Environmental Protection and Biodiversity Conservation Act (1999) to reflect international best practice and ensure that all jurisdictions commit to implementing its principles for legacy sites.

> Establish a national abandoned mine initiative tasked with reviewing barriers to remediation of legacy sites, identifying priority areas for research, and supporting the states and territories to:
  • Implement policies and mechanisms to incentivise progressive rehabilitation and timely closure of current and future mines, and accumulate sufficient funding for remediation of abandoned mines; and

• Develop a national inventory of abandoned mines, which identifies the environmental, safety and health risks posed by abandoned mines to prioritise remediation activities.

> Support collaborative research and demonstration of innovative technologies and techniques for remediation, including options to enable economic resource recovery from tailings and other waste streams.

2. Improve the effectiveness of environmental risk assessment and management

> Ensure that environmental impact assessments meaningfully investigate cumulative impacts within appropriate ecosystem boundaries, collect and incorporate appropriate baseline data, and consider the full life cycle of the activity (including the post closure condition of environmental systems) from the outset.

> Undertake regular audits of environmental impact statements to assess the shortcomings of current assessment standards and environmental management practices and invest in targeted research that supports efficient and effective cumulative environmental impact assessments.

> Build the capacity of regulators to enable them to apply leading practice scientific and technical knowledge to the development and enforcement of environmental management, remediation and closure policies and regulations.

3. Earn the public's trust through transparency and engagement

> Ensure that all jurisdictions require environmental reporting and data collections to be made publicly available through centralised and accessible open data services.

> Improve the accountability of environmental management, remediation and closure through real-time reporting of planned activities, regulatory compliance and actions to deal with and fix non-compliance.

> Develop and deploy enhanced communication tools such as report cards that synthesise complex information from multiple sources and provide an easily understood snapshot of progress towards specific environmental protection goals.