



# MINERALS COUNCIL OF AUSTRALIA

## SUBMISSION TO SENATE ENVIRONMENT AND COMMUNICATIONS REFERENCE COMMITTEE INQUIRY INTO THE REHABILITATION OF MINING AND RESOURCES PROJECTS AS IT RELATES TO COMMONWEALTH RESPONSIBILITIES

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28 APRIL 2017

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## EXECUTIVE SUMMARY

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The Minerals Council of Australia and state minerals industry representative bodies welcome the opportunity to provide a submission to the Senate Environment and Communications Reference Committee Inquiry into 'rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities'.

The Australian minerals industry considers the existing jurisdictional systems sufficiently and comprehensively regulate the sector and safeguard governments and the community from post-mining liabilities. These regulatory frameworks continue to evolve in line with changing societal expectations, technology and leading industry practice. Mine rehabilitation and closure are a priority issue across Australian jurisdictions with a range of reviews of legislation, policy and processes currently underway. Outside of the legal framework the industry proactively undertakes a range of activities which are aimed at continuous improvement in rehabilitation practices.

The submission outlines the comprehensive regulatory regime in which the industry currently operates and the positive actions being undertaken by the minerals industry having regard to the terms of reference for the Senate Environment and Communications References Committee.

The minerals industry considers it important the committee recognises the regulatory context in which rehabilitation and environmental management is undertaken as well as the overall contribution the minerals industry delivers to the Australian economy and community.

### **Mine rehabilitation is comprehensively regulated**

Mining activities are sufficiently and comprehensively regulated under state-based mining, development and planning legislation. Existing state regulatory regimes provide comprehensive coverage of mine rehabilitation through assessment, approval, operation and closure.

Commonwealth legislation ensures federal matters are protected. Where mining and rehabilitation activities intersect with Commonwealth matters, assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are also required.

### **Financial assurance arrangements provide a necessary safeguard**

Financial assurance (security bonds) provides a monetary safeguard to protect government from incurring unfunded liabilities should a company be unable to meet its rehabilitation obligations.

Modern mining rehabilitation practice is highly regulated, better implemented and more accountable than ever before. Notwithstanding, there is a risk that a small number of operators may not be able to fulfil their rehabilitation obligation to the standards required. In these circumstances, financial assurance mechanisms provide government with access to sufficient funds to rehabilitate these sites to the standards required.

Security bonds are a safeguard of last resort – rehabilitation is not automatically left to state governments. The provision of a security bond does not remove a company's obligation to rehabilitate land. These bonds are drawn upon by governments only when a company cannot meet its obligations. Bonds are used only in exceptional circumstances should all other options fail to ensure rehabilitation is completed.

State-based security bonds are regularly reviewed and updated to reflect changing community and government expectations, industry practice and modern rehabilitation methods, and variations in service costs. The overall pool of funds held by government has increased substantially in recent years, reflecting these changes and significant industry expansion.

### **Mine rehabilitation is a priority for state governments**

The efficiency and effectiveness of mine rehabilitation and closure policy remains a high priority for state governments and the Northern Territory. These governments are continuing to audit, review and update mine rehabilitation policies, guidance and financial assurance mechanisms. Many

jurisdictions are currently undertaking reviews of relevant regulation, processes or supporting guidelines.

### **Sustained industry investment is paying off**

The industry's approach to mined land rehabilitation has continuously improved and significant advances have been made over recent decades. Rehabilitation methods continue to evolve – as does leading practice techniques proactively shared across the industry. This has been driven by sustained company investment in research to strengthen the science underpinning rehabilitation methods, industry experience, evolving corporate values, community expectations and government regulation.

Australian mining companies have significant in-house expertise in rehabilitation and closure planning. Where necessary, nationally and internationally recognised specialists are also engaged to review and provide input into rehabilitation and closure programs.

With consistent effort, investment in innovation and a focus on continuous improvement, the minerals industry is achieving positive rehabilitation outcomes and productive post-mining land uses – including cropping, grazing, recreation and nature conservation. These efforts ensure the community benefits extend beyond taxes, royalties, jobs and investment during operation to include a post-mining landscape that has ongoing social, economic or conservation values.

### **Collaboration and innovation have been central to improved practice**

Industry collaboration has been central to improved rehabilitation and closure practice. The industry has worked closely with government, universities and centres for cooperative research and centres of excellence, including the CSIRO and the University of Queensland's Sustainable Minerals Institute. National and international networks have been established to share knowledge to improve rehabilitation performance. Collectively-funded research, such as the coal industry research program (ACARP) and the contaminated land cooperative research centre (CRC CARE) have been critical to the leading practice journey.

### **Rehabilitation is only part of the environmental management story**

Mine rehabilitation is an important part of the industry's environmental performance. Rehabilitation is however only one way in which the potential impacts on environmental values including federal matters of National Environmental Significance (mNES) are managed.

To the extent possible, industry avoids, minimises and mitigates its impact on environmental values. If needed, companies will also 'offset' significant residual impacts on mNES. This may include the establishment of protected areas for conservation, developing new or improved habitat on degraded land and/or the control of threatening processes including feral animals and weeds.

Further to these requirements, companies may also undertake voluntary conservation initiatives to augment their social license to operate. These include species recovery programs, habitat restoration and the establishment of conservation reserves. These initiatives can have a significant positive effect on environmental and community values, including mNES.

As recognised by the CSIRO, the opportunities provided by responsible mining practices are significant:

Mining stands out from other major land uses in terms of the wealth it creates from the limited areas that it directly affects and the relatively short duration of the effect. This provides an opportunity for achieving high standards of environmental management, encompassing mitigation, ecosystem rehabilitation, and environmental offsets.<sup>1</sup>

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<sup>1</sup> CSIRO, [Biodiversity – Science and Solutions for Australia](#), CSIRO Publishing, Canberra, 2014, p. 178.

### **Abandoned mines require innovative solutions**

Like many industries, modern mining methods have substantially evolved beyond less environmentally-sound historic practices. Mining has been part of the Australian economy for around 200 years and many of these abandoned mines are many decades if not more than a century old. Most sites were developed before the modern era of environmental regulation when standards and community values were quite different from what they are today and scientific knowledge of the long-term impact of such practices was lacking.

The minerals industry has worked cooperatively with governments to improve the management of abandoned mines. Further opportunities exist to harness industry expertise in rehabilitation, closure and risk management. Innovative arrangements, including opportunities for exploration, mining of residual resources and industry led rehabilitation should be explored.

### **Opportunities for improvement – the states should have carriage, but the Commonwealth can assist**

State and territory governments should continue to have primacy in the regulation of mine rehabilitation, closure and financial assurance. Each jurisdiction already has in place a mature regulatory framework for managing these matters. Accordingly, state and territory governments are best placed to review and update regulation and policy in line with state priorities.

State approaches to mine rehabilitation could be improved through greater flexibility in financial assurance mechanisms, policy settings and processes to improve certainty regarding expectations rehabilitation and relinquishment – thus encouraging progressive rehabilitation – and streamlining of regulation.

The Australian Government could contribute to improved rehabilitation and policy outcomes nationally through a variety of approaches. These include facilitating dialogue between jurisdictions and industry to share knowledge, and the promotion of leading practice through the publication of relevant guidance.

## 1. INTRODUCTION

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Australia's mineral representative bodies welcome the opportunity to provide a submission to the Senate Environment and Communications Reference Committee inquiry into the rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities.

This submission has been jointly prepared by the MCA, New South Wales Minerals Council, Queensland Resources Council, Chamber of Minerals and Energy of Western Australia, the South Australian Chamber of Mines and Energy, Tasmanian Minerals and Energy Council, MCA Northern Territory Division and MCA Victorian Division.

The minerals industry considers it important the committee recognises the regulatory context in which rehabilitation and environmental management are undertaken as well as the overall contribution the minerals industry delivers to the Australian economy and community.

This submission outlines the complex and comprehensive regulatory regime in which the industry currently operates and the positive actions being undertaken by the minerals industry in relation to the terms of reference for the Senate Environment and Communications References Committee.

## 2. INDUSTRY CONTEXT

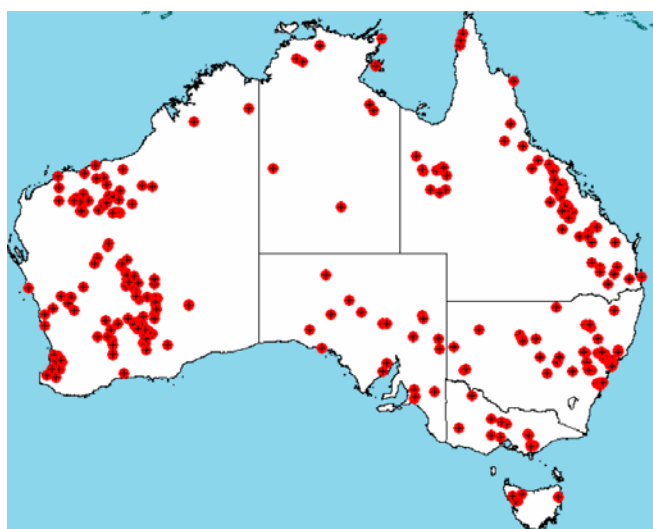
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### 2.1. Industry presence in the landscape

Mining is one of the nation's highest value land use activities. Despite the value of the industry, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) reports the industry's footprint is less than 0.02 per cent of Australia's land mass.<sup>2</sup>

The industry operates across Australia from regional to remote areas. Major mining regions include central and north-western Queensland, the Hunter Valley and central New South Wales and the Goldfields and Pilbara in Western Australia.

**Figure 1 – Operating mines across Australia**



Source: Geoscience Australia<sup>3</sup>

### 2.2. Regulatory setting

The minerals industry is subject to more regulatory requirements than most (if not all) other economic activities.<sup>4</sup> This regulation occurs across all three levels of government.

Mining activities are strictly regulated under mining, development and planning laws in addition to natural resource and environmental legislation. These regulatory processes vary across Australian jurisdictions, and the level of assessment required depends on the size and nature of the development proposed. While most regulatory approvals are at the state level, further approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is often required. Mining projects are comprehensively assessed as part of these approval processes.

In addition to major development approvals, mining developments typically require a range of other federal, state and local government authorisations. These may include Indigenous Land Use Agreements (ILUAs), agricultural land approvals, land access and compensation agreements, water licences and various other permits (e.g. road and rail).

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<sup>2</sup> Australian Bureau of Agricultural and Resource Economics and Sciences, [2010-11 summary statistics](#), *National scale land use version 5*, Department of Agriculture and Water Resources, Canberra, 2016.

<sup>3</sup> Geoscience Australia, [Australian mines atlas](#), Australian Government, Canberra, viewed 3 April 2017.

<sup>4</sup> URS, *Update of National Audit of Regulations Influencing Mining Exploration and Project Approval Processes* – Prepared for the Minerals Council of Australia, MCA, Canberra, 2013

### 2.3. Industry contribution to communities

The economic dividends derived from mining are shared across Australia. The industry's presence in regional and remote communities supports local business and provides local jobs. For example:

- In Queensland 2015-16 data indicate minerals companies purchased \$19.8 billion worth of goods and services with 20,200 local businesses and 914 community organisations across the state benefiting from this spend
- In Western Australia 2015-16 data indicate 46 minerals and energy companies supported 886 community groups and 6,924 Western Australian businesses, contributing nearly \$20 billion worth of business purchases and direct community contributions.<sup>5</sup>

The importance of mining to regional economies and local jobs has been highlighted in the initial report of Productivity Commission's study on the transition of regional economies following the resources boom:

Regions whose economic base is large-scale mining have generally had the highest rates of growth in employment (since 2005), notwithstanding the end of the investment boom. Overall, employment in mining remains higher now than it was prior to the boom.<sup>6</sup>

The mineral industry's approach to agreement-making with Traditional Owners is based on the principle that communities most impacted by mining operations should benefit most through leveraging of economic activity associated with mineral wealth to drive social and economic growth.<sup>7</sup>

In addition to training and employment, land use agreements with mining companies have provided unprecedented wealth creation for Indigenous people in regional and remote Australia.<sup>8</sup> For example, the total value of native title related payments in 2011-12 alone was estimated at \$3 billion, with assets in Indigenous trusts from mining activity valued at \$40 billion in total.<sup>9</sup>

### 2.4. Mining and the Australian economy

The mining industry is a key driver of the Australian economy, accounting for around 9 per cent of gross domestic product, 64 per cent of Australia's merchandise trade and 50 per cent of total exports.<sup>10</sup> In the decade to 2015-16, the industry paid \$177 billion in company tax and royalties.

The mining industry directly employs around 230,000 people – many in regional areas.<sup>11</sup> These are high-value, high-wage, high-skilled jobs, including engineers, environmental scientists, geologists, tradespeople and operators.

Australia's comparative advantage in minerals and energy exports is not simply a function of its natural endowment, important as it is. Rather, this has been achieved by firms that are prepared to bear the risks of investing, employing and innovating to derive value from mineral resources.

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<sup>5</sup> Queensland Resources Council, *Queensland resources sector: Economic contribution (2015-16)*, QRC, Brisbane, 2016, viewed 10 April 2017; and Chamber of Minerals and Energy of Western Australia, Resource Sector Operations Economic Contribution: Australia, CMEWA, 2017 <http://www.cmewa.com/images/files/maps/Australia.pdf>, viewed 6 April 2017.

<sup>6</sup> Productivity Commission, *Transitioning regional economies – initial report*, Canberra, 21 April 2017, p. 14

<sup>7</sup> Companies' negotiations with Traditional Owners for agreements on the access and use of their land including the protection of heritage on approved tenements. Agreements determine the conditions for which the land can be used, how it is managed and the payments for use.

<sup>8</sup> T Bauman & L Glick (eds), *The limits of change: Mabo and native title 20 years on*, AIATSIS, Canberra, 2012.

<sup>9</sup> Minerals Council of Australia, *MCA 2015-16 pre-Budget submission*, MCA, Canberra, 2015.

<sup>10</sup> Australian Bureau of Statistics Cat No. 5204, *Australian System of National Accounts and Department of Industry, Innovation and Science, Resources and Energy Quarterly – December 2016*.

<sup>11</sup> Australian Bureau of Statistics Cat No. 6291.0.55.003, *Labour Force, Australia, Detailed, Quarterly, November 2016*.



### 3. MINING AND ENVIRONMENTAL STEWARDSHIP

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MCA member companies are signatories to *Enduring Value – The Australian Minerals Industry Framework for Sustainable Development*. Enduring Value is based on the globally recognised *International Council on Mining and Metals 10 Principles for Sustainable Development*.<sup>12</sup>

Principle 6 of Enduring Value requires members to seek continual improvement in environmental performance. This includes the following elements:

- Element 6.3 – Rehabilitate land disturbed or occupied by operations in accordance with appropriate post-mining land uses
- Element 6.5 – Design and plan all operations so that adequate resources are available to meet the closure requirements of all operations.<sup>13</sup>

The commitment to sound closure outcomes is also articulated in the MCA's land stewardship policy.<sup>14</sup> A central tenet of the policy is that mining is a temporary use of land. In particular, it is the minerals industry's goal to ensure that this land is available for subsequent economic activities, conservation and/or community use. Relevant principles of the policy include:

- Mining activities will aim to minimise disturbance, and provide for ongoing progressive rehabilitation, directed at achieving an agreed post-mining land use that is both stable and self-sustaining
- The post-mining land use should be considered at the mine design stage and refined through an ongoing consultation process with regulators and relevant stakeholders
- Closure design should aim to facilitate beneficial post-mining land use; this may include future economic activity, conservation or community use.

Many mining companies have formal in-house policies that reflect the principles above.

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<sup>12</sup> International Council on Mining and Metals, [ICMM 10 Principles](#), ICMM, London May 2003

<sup>13</sup> Minerals Council of Australia, [Enduring Value – the Australian minerals industry framework for sustainable development](#), MCA, 2015

<sup>14</sup> Minerals Council of Australia, [Land stewardship policy](#), MCA, October 2012

## 4. INQUIRY TERMS OF REFERENCE (ToR)

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### 4.1. Scope of the inquiry – general comments

The committee seeks to inquire into the ‘rehabilitation of mining projects as it relates to Commonwealth responsibilities’ – however, the inquiry’s terms of reference (ToR) relate to a broad range of matters, many of which sit outside federal jurisdiction and are managed by the states or regulated under state law. Where the Commonwealth is involved, this tends to be at the periphery where specific matters intersect with discrete federal responsibilities (e.g. under federal environmental law, such as the EPBC Act).

The minerals industry agrees the scope of the inquiry should focus on those areas of federal jurisdiction. Any review of the operation of individual state law would require a detailed and comprehensive analysis of the regulatory framework in each jurisdiction, accounting for the specific state circumstances. Accordingly, this level of assessment is most appropriately undertaken at the state level.

### 4.2. Federal jurisdiction in mine rehabilitation and closure

Mine rehabilitation and closure conditions are principally set by state governments under relevant state environmental or mining legislation. Furthermore, each state and the Northern Territory have in place a range of supporting policies and mechanisms. These include mine rehabilitation and closure policies and mechanisms for financial assurance (security bond).

Federal jurisdiction over mine rehabilitation is generally restricted to its obligations under relevant Commonwealth legislation. These include:

- EPBC Act – mine rehabilitation is regulated where it intersects with Commonwealth mNES. This typically includes impacts on specific listed threatened species and habitats. It may also include national heritage in some circumstances.

General oversight of mine rehabilitation in relation to those specific mNES that consider broader environmental aspects, these include:

- Actions on Commonwealth lands
- Nuclear action (which includes uranium mines)
- *Environment Protection (Alligator Rivers Region) Act 1978* – the Act establishes the role of the supervising scientist. The supervising scientist is charged with a range of functions specifically related to the uranium mining operations in the Alligator Rivers Region of the Northern Territory. This includes the development and promotion of standards and practices in relation to mine rehabilitation.

## 5. ADEQUACY OF EXISTING REGULATION – ToR ITEM (B)

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### 5.1. Existing regulation is comprehensive

The minerals industry maintains that existing regulatory regimes provide adequate and comprehensive coverage of mine rehabilitation and closure.

Mine closure planning and rehabilitation are essential pre-requisites for state-based regulatory approvals and where relevant, federal approval under the EPBC Act.<sup>15</sup> As a condition of approval, companies are required to progressively rehabilitate mined land, where practical.

Rehabilitation requirements are specified in state (and occasionally Commonwealth) conditions of approval. This can include a requirement to submit a rehabilitation plan for each activity with potentially significant environmental impact. Where required, these plans often need to be approved prior to the commencement of the activity (e.g. construction and/or mining). Rehabilitation and closure plans often need both state and federal approval. Companies are also required to report on rehabilitation progress in line with their approval conditions.

### 5.2. A complex regulatory environment

The legislative frameworks for mine rehabilitation and closure in each state and territory are complex – there are around 8 to 15 pieces of legislation covering all aspects of mine closure in any given jurisdiction with Commonwealth oversight in many cases.

#### Commonwealth requirements

Commonwealth legislation that may intersect with mine rehabilitation and closure matters can include:

- *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Native Title Act 1993*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Environment Protection (Alligator Rivers Region) Act 1978*.

#### State-level requirements

State legislation provides comprehensive coverage of mine rehabilitation and closure which are conditioned under a range of environmental and planning laws. A mining operation is likely to be subject to assessment and/or approval under multiple legislative frameworks, each of which carries specific legal obligations. To illustrate this, examples from major mining jurisdictions are provided below.

#### Queensland

The minerals industry in Queensland must comply with 11 key pieces of environmental planning and management, safety and heritage legislation when carrying out rehabilitation and closure activities. These include:

- *Environmental Protection Act 1994*
- *Mineral Resources Act 1989*
- *State Development and Public Works Organisation Act 1971*
- *Sustainable Planning Act 2009, Land Act 1994, Water Act 2000*
- *Regional Planning Interests Act 2014*
- *Aboriginal Cultural Heritage Act 2003*

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<sup>15</sup> Examples include: *Environment Planning and Assessment Act 1979* (NSW), *Mining Act 1971* (SA), *Mining Act 1978* (WA), *Environment Protection Act 1994* (Qld), *Mining Management Act* (NT), *Mineral Resources (Sustainable Development) Act 1990* (Vic), *Minerals Resources Development Act 1995* (Tas)

- *Contaminated Land Act 1991*
- *Environmental Offsets Act 2004*
- *Nature Conservation Act 1992.*

Of the above, the *Environmental Protection Act 1994 (Qld)* (EP Act Qld) is the primary legislation driving and regulating rehabilitation and enforcing financial assurance during operations through to relinquishment.<sup>16</sup>

### **Statutory requirements**

The EP Act Qld not only affords a framework for rehabilitation and related matters, it also provides multi-faceted processes and requirements to guide appropriate rehabilitation practices. For example, an operator of a resource activity must hold and comply with an Environmental Authority (EA): a set of comprehensive conditions and criteria that govern environmental management and monitoring, including rehabilitation.

To facilitate consistency across operations, the Queensland Government in consultation with the minerals industry, established outcomes-focused model mining conditions to guide the development of EA's. These conditions require operators to progressively rehabilitate the site in compliance with a plan of operations; a statutory document required under the EP Act Qld and designed for the purpose of scheduling operations to accommodate a rehabilitation program for land disturbed or proposed to be disturbed for the period. This is one measure demonstrating government's expectation and the minerals industry's commitment in Queensland to ensure rehabilitation is not something that commences only towards the end of the operation, but rather a process that begins in the planning phase and continues throughout the life of the mine.

In direct correlation with the plan of operations, operators are required to provide financial assurance as calculated in accordance with a government-endorsed calculator. Financial assurance systems, as implemented across the states and territories, are discussed more broadly in Section 6.

To ensure the burden to the state and community continues to be minimised in a modern regulatory environment, the Queensland Government is currently undertaking a review of financial assurance mechanisms and related considerations of the rehabilitation framework. The minerals industry is working cooperatively and collaboratively with the Queensland Government and its consultants to implement a financial assurance system that offers confidence in operator performance yet at a reasonable cost to industry.

In addition to progressive rehabilitation requirements under an EA, operators are also required to consider the government's *Rehabilitation requirements for mining resource activities guideline* along with modern industry-accepted practices.

### **Progressive certification**

Queensland has a pathway that allows for government to sign off (formally certify) an area prior to relinquishment. Government must be confident that relevant EA conditions and criteria have been complied with and rehabilitation has been completed satisfactorily. This is integral to encouraging ongoing positive rehabilitation action and gives the minerals industry certainty with regards to achieving rehabilitation goals considered to be current leading practice (see also Section 9 for further context). However, it is important to note that operators continue to remain responsible for the upkeep of certified areas until relinquishment.

The minerals industry is currently working with the Queensland Government to test the existing process under the EP Act Qld for the application, assessment and certification of nominated

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<sup>16</sup> Relevant Queensland legislation includes: *Environmental Protection Act 1994*, *Mineral Resources Act 1989*, *State Development and Public Works Organisation Act 1971*, *Sustainable Planning Act 2009*, *Land Act 1994*, *Water Act 2000*, *Regional Planning Interests Act 2014*, *Aboriginal Cultural Heritage Act 2003*, *Contaminated Land Act 1991*, *Environmental Offsets Act 2004*, *Nature Conservation Act 1992*

progressive rehabilitation. As improvements to the existing system are recognised, both industry and Government will be seeking amendments to legislation and supporting documents.

### ***Closure planning and residual risk at relinquishment***

Upon approach and at the time of closure, the priority for the minerals industry in Queensland is to minimise long-term significant residual environmental impacts from operations and provide a safe, stable and non-polluting rehabilitated area that is available for future economic activity, conservation and/or community use.

Relinquishment or surrender of an EA and related tenement is granted only once the government is satisfied that all environmental requirements, in particular rehabilitation, have been achieved. Only at this stage can the ownership and management responsibilities, including residual risk, of the land be transferred to the next user, where capable, or to the state.

The Queensland Government and its consultants are currently working with the minerals industry to establish a residual risk determination and payment method at relinquishment based on a tested approach adopted in New Zealand. While operators' provide for mine closure (e.g. rehabilitation, monitoring, decommissioning etc.), this project will further refine the mine closure planning approach and requirements in Queensland with the end-process to be transparent to both government and operators, generic, non-negotiable and reportable.

#### **Case study: Mine rehabilitation and closure approval conditions for a Queensland mine**

Mine rehabilitation and closure related conditions for approval for a mine established in Queensland within the past five years:

##### **EPBC Act approval**

- Eight major conditions relating to mine rehabilitation, including:
  - Development of a mine rehabilitation strategy, specifically addressing mNES
  - Separate federal minister approval of the mine rehabilitation plan
  - Specified targets for progressive rehabilitation including timeframes for commencement
  - Implementation of the rehabilitation strategy including reporting and performance requirements.

##### **State approval**

- Six major conditions and 19 subordinate conditions relating to all aspects of mine rehabilitation and closure
- Development of a detailed interim rehabilitation management plan for approval by the regulator
- The development and implementation of a final rehabilitation management plan that includes:
  - Detailed landform and geotechnical design
  - Specific revegetation and soil remediation methods
  - Water and geochemical design
  - Rehabilitation objectives, indicators and measurable completion criteria for each post-mining land use
  - Experimental revegetation and rehabilitation trial design
  - Detailed research and monitoring programs with specified milestones
  - Maintenance programs.
- Agreement with the landholder and regulator on post-mining land and infrastructure use
- The development of a detailed post closure management plan for government approval.

## New South Wales

For a detailed overview of the regulation of mine rehabilitation and closure in New South Wales please refer to the submission of the New South Wales Minerals Council, however an overview is provided below.

In New South Wales, mining activities are tightly regulated under mining, development and planning laws. The mining lease, together with other statutory approvals, such as environmental protection licences under the *Protection of the Environment Operations Act 1997* and planning approvals under the *Environmental Planning and Assessment Act 1979* (EP&A Act), regulate the impact of mining on the environment. Key legislation that guide mining rehabilitation at state level is listed below, however many other acts, guidelines and planning instruments apply to approval and management of the whole end-to-end mining process:

- *Mining Act 1992 (Mining Act)*
- *Environmental Planning and Assessment Act 1979 (EP&A Act)*
- *Protection of the Environment Operations Act 1997 (POEO Act)*
- *Contaminated Land Management Act 1997 (CLM Act)*.

### **Case Study: Mine rehabilitation and closure approval conditions for a New South Wales coal mine**

Mine rehabilitation and closure related conditions for approval for a recent coal mine in New South Wales:

#### **EPBC Act approval**

- Six major conditions and nine subordinate conditions relating to mine rehabilitation and closure, including:
  - Development of a comprehensive, mine rehabilitation plan as it relates to significantly impacted mNES
  - The plan is to be independently peer reviewed with approved by the federal minister.

#### **State approval**

- Six major conditions and 19 subordinate conditions relating to all aspects of mine rehabilitation and closure
- Specific objectives for environmental (e.g. landforms) and community (e.g. minimising adverse socio-economic effects) aspects
- The development of a comprehensive rehabilitation plan – for approval by government – which includes nine sub-conditions including:
  - Measures to address all aspects of mine rehabilitation
  - Environmental management and intersection with biodiversity management objectives
  - Detailed performance monitoring and evaluation criteria
  - Progressive rehabilitation requirements.
- The provision of a final void and mine closure plan – for approval by government – including but not limited to the following requirements:
  - Peer review and verification by and independent expert, approved by the regulator
  - Detailed consideration of all aspects of mine closure, including cumulative impacts, long-term site stability and void management.

## Western Australia

For a detailed overview of Western Australian regulation of mine rehabilitation and closure, please refer to the submission of the Chamber of Minerals and Energy of Western Australia.

Mine rehabilitation and closure is comprehensively managed in Western Australia under a range of different legislation, policies and guidelines (e.g. Western Australia - mine closure guidelines). Mine rehabilitation and closure obligations may intersect with the following legislation:

- *Environmental Protection Act 1986*
- *Mining Act 1978*
- *Mining Rehabilitation Fund 2012*
- *Contaminated Sites Act 2003*
- *Conservation and Land Management Act 1984*
- *Rights in Water and Irrigation Act 1914*
- *Biodiversity Conservation Act 2016*
- *Aboriginal Heritage Act 1972*
- *Aboriginal Affairs Planning Authority Act 1994*
- *Mine Safety and Inspection Regulations 1995*
- *Occupiers Liability Act 1985.*

**Case Study: Mine rehabilitation and closure approval conditions for a Western Australian iron ore mine**

Mine rehabilitation and closure related conditions for the approval for a long-operating iron ore mine in Western Australia include:

- EPBC Act conditions for rehabilitation and monitoring related to mNES
- State approval which includes 17 major conditions relating to rehabilitation, planning and environmental management for closure
- The development of a comprehensive decommissioning and rehabilitation plan for Ministerial approval with 11 sub conditions, including:
  - Comprehensive understanding of baseline conditions of pre-existing ecosystems.
  - Management of water systems and open cut pit.
  - Progressive rehabilitation of all disturbed areas to a standard suitable for the agreed land use using best practice rehabilitation techniques.
  - Development of completion criteria and monitoring of rehabilitation performance.
  - Reporting requirements for rehabilitation performance.
  - Waste management and avoiding pollution through the application of national standards.
  - Management and decommissioning of infrastructure
  - The plan is to be reviewed and updated at least every three years.
- Other conditions related to vegetation management and lease relinquishment.

## South Australia

South Australia's comprehensive mine rehabilitation framework is monitored and reviewed to promote continual improvement. The South Australian Mining Act is currently undergoing a comprehensive review.<sup>17</sup> Given this, specific details have not been provided in this submission as they may soon be redundant and therefore not contribute meaningfully to the inquiry.

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<sup>17</sup> Department of State Development, [Leading practice review of South Australia's mining laws](#), Government of South Australia, viewed 28 March, 2017.

## 6. FINANCIAL ASSURANCE (SECURITY BOND) MECHANISMS – ToR ITEM (C)

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### 6.1. Financial assurance arrangements

Financial assurance (security bonds) provides a monetary safeguard to protect government from incurring unfunded liabilities should a company be unable to meet its rehabilitation obligations.

Security bonds are a safeguard of last resort – their existence does not mean rehabilitation is automatically left to state governments. The provision of a security bond does not remove a company's obligation to rehabilitate land. These bonds are drawn upon by governments only when a company cannot meet its obligations. Bonds are in place to be used only in exceptional circumstances if all other options fail to enable rehabilitation to be completed.

There are a range of financial assurance mechanisms across Australia. Common features of these mechanisms include:

- The bond must be lodged with government prior to the commencement of mining (and often in advance of final approval)
- The form of bond typically includes cash or a bank guarantee. It cannot be accessed by the company
- The bond is intended to cover the forward liabilities for a mine over a defined period, usually aligned with the mine plan or operations.
- The bond amount is periodically reviewed and updated in line with changes to the mine plan and evolving rehabilitation methods
- In some cases, a bond can be discounted based on an operator's good environmental performance or other social and economic factors
- Bonds are returned to the company only once the regulator is satisfied rehabilitation targets have been achieved.

Western Australia has also introduced a centralised pooled (levy payment) model – the Mining Rehabilitation Fund (MRF). Eligible companies make annual non-refundable contributions to the MRF proportionate to a company's total rehabilitation liability estimate (levied at 1 per cent per annum).<sup>18</sup>

### 6.2. Size of financial assurance held

In calculating the amount of financial assurance required for a particular operation, companies are typically required to use a standard state government calculator or other method deemed acceptable to government. These funds are intended to cover the full cost of rehabilitating mine sites by third parties post-production, however, it may be less costly for the company to rehabilitate land during and post operation (where resources and plant machinery are already available).

Financial assurance calculators are periodically updated to reflect changing expectations, modern rehabilitation methods, and changes to service costs. The overall pool of funds held by government has increased substantially in recent years, reflecting both this and significant industry expansion. For example, in 2016, the Queensland government held \$5.92 billion in financial assurance for mining, which is four times the amount held a decade before.<sup>19</sup>

### 6.3. Mines cannot be sold without adequate security in place

There are strict financial assurance requirements on companies buying or selling a mine. State regulators usually require a matching security bond to be lodged by the purchaser of the mine before they can proceed and the previous owner released from their obligations. When a lease is transferred

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<sup>18</sup> Department of Mines and Petroleum, [What is the MRF?](#), Government of Western Australia, viewed 23 March 2017.

<sup>19</sup> The Hon. Stephen Miles – Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef, [Resource Sector must provide for mine site rehabilitation](#), Media statement, 22 July 2016.



from one operator to another, a bond may be increased or decreased based on government assessment of risk, which may include the capability of the new owner.

#### **6.4. Business implications of financial assurance**

While the industry supports an appropriate mechanism to safeguard governments from incurring financial liability, it is important these mechanisms be efficient, incentivise good performance and come at least cost to industry.

The provision of large cash-based security bonds can impact a company's borrowing capacity and unnecessarily tie up company cash resources that would otherwise be available for growth, rehabilitation work and other improvements.

Financial assurance provided as a bank guarantee is not cost-free for companies. Bank guarantees, while generally having relatively low servicing costs – a percentage of the principal – can cost companies tens of millions of dollars each year to maintain.

We consider greater flexibility is needed to reduce the opportunity cost of financial assurance, while providing appropriate protection for government. More can also be done to incentivise improved performance. This is discussed further in Section 13 – opportunities for improvement.

## 7. STATE AND TERRITORY REVIEWS – ToR ITEMS (B & C)

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Mine rehabilitation and closure policy is a high priority for state governments and the Northern Territory. These governments are continuing to audit, review and update mine rehabilitation policies, guidance and financial assurance mechanisms.

Several jurisdictions have initiated detailed reviews of relevant regulation, processes or supporting guidelines. These include:

- **Victoria** – Review of financial assurance policy for coal mines.<sup>20</sup>
- **South Australia** – Comprehensive review of mining laws commenced in 2016 and is ongoing.<sup>21</sup>
- **Queensland** – Review of financial assurance mechanisms and related considerations of the rehabilitation framework.<sup>22</sup>
- **New South Wales** – Audit of the adequacy of mining rehabilitation security deposits.<sup>23</sup>
- **Northern Territory** – Development of mine closure guidelines (pending).
- **Western Australia** – Regulatory impact review of the implementation of the Mining Rehabilitation Fund.<sup>24</sup>

As evidenced by the above reviews, state regulation and policy for rehabilitation and closure continues to evolve and it is understood that the effectiveness of these systems is important to the community.

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<sup>20</sup> Earth resources, [Latrobe Valley coal mines' bonds](#), Government of Victoria, viewed 5 April 2017.

<sup>21</sup> Department of State Development, [Leading practice review of South Australia's mining laws](#), Government of South Australia, viewed 28 March, 2017.

<sup>22</sup> Queensland Budget Papers 2016-17, Budget Measures (Budget Paper 4), Government of Queensland, viewed 10 April 2017.

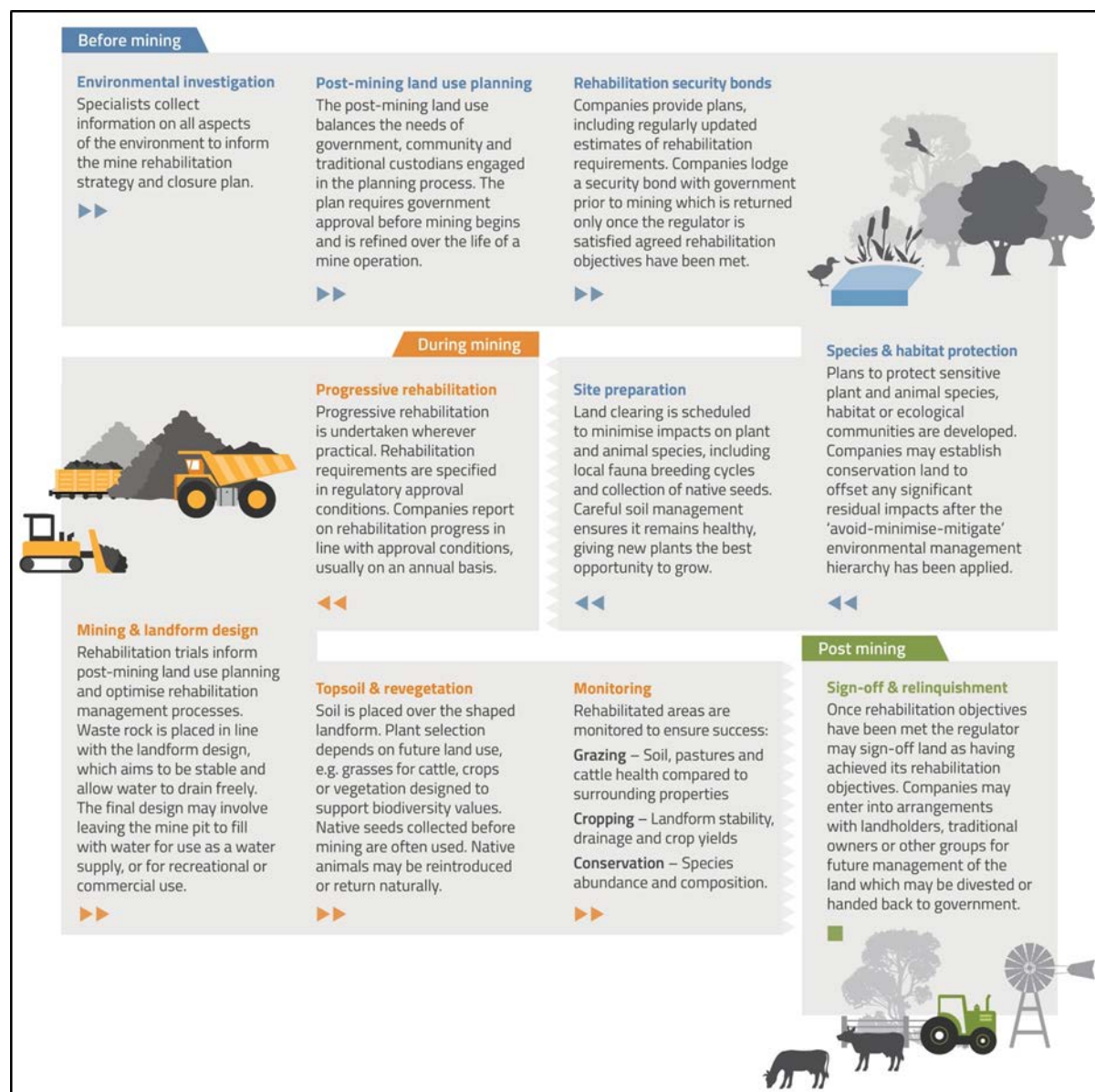
<sup>23</sup> Audit Office of New South Wales, [Performance Audit Program 2016-17 to 2018-19](#), Government of New South Wales, viewed 29 March 2017.

<sup>24</sup> Pers comms, Sarah Bellamy, Department of Mines and Petroleum

## 8. PROGRESSIVE REHABILITATION OVER THE MINE LIFE – ToR ITEM (D)

Rehabilitation and mine closure are planned and considered across all stages of modern mine development and operation, from design to closure. A simplified outline of this process is provided in the figure below.

Figure 2 – Rehabilitation over the mine life



### 8.1. Post-mining land use

Land use following mining may be different to the pre-mining land use. For example, a mined area previously used for cattle grazing may be rehabilitated and used for nature conservation, recreation or industrial purposes.

In determining the most appropriate post-mining land use, a range of social, economic and environmental factors are considered. Community consultation is an essential part of this process.

## 8.2. Progressive rehabilitation (during mining)

Mine rehabilitation is not necessarily a linear process. Progressive rehabilitation is undertaken in line with the mine plan and varies based on operational needs. Land can be rehabilitated only when it becomes available (i.e. the area is no longer operational and is not needed for future operations). For example, areas of a hard rock mine such as the pit, ramps, roads, tailings storage and processing areas are required for the entire operating life of a mine, but waste rock dumps may be available for progressive rehabilitation. Accordingly, rehabilitation for an individual mine site can vary substantially from year to year.

Mining operations can span from several years to many decades. Closure and therefore rehabilitation planning may be refined periodically based on new information and changes to the operation. Significant changes often require further government approvals.

For demonstration purposes, an example of progressive rehabilitation has been provided in Figure 3. It is important to note this is an example of a low-strip ratio coal mine. Direct parallels should not be drawn between this and other deeper or more complex coal mines.

## 8.3. Rehabilitation for closure (post-mining)

Rehabilitation is undertaken progressively wherever possible during the operational life of a mine, with remaining areas rehabilitated in the post-closure phase. At closure, any further requirements for remaining land forms are completed and site infrastructure is removed (or left as a community asset), making land available for rehabilitation works and readying the site for an agreed post-mining land use.

For a modern mine, planning commences during the assessment and approvals phases for a proposed mining project, well before mining commences. It includes consideration of not only health, safety and environmental aspects but social and economic factors. Accordingly, community input is an essential step in developing post-mining land use objectives.

A number of jurisdictions have developed or are in the process of developing specific guidelines to be used in mine closure planning, for example, the Western Australian 'guidelines for preparing mine closure plans' updated in May 2015.<sup>25</sup>

The closure plan is often reviewed and refined over the life of a mine consistent with closure planning guidelines or other requirements. Ongoing engagement with landholders, local communities and other stakeholders is critical to the development, implementation and review of mine closure and rehabilitation strategies.

## 8.4. Post-closure monitoring and future management

Once rehabilitation work has been completed, environmental specialists monitor rehabilitated areas until success against agreed closure criteria can be demonstrated. This can take many years. Rehabilitation areas must be 'signed off' by regulators before land can be relinquished. Depending on underlying tenure and agreed post-mining land use, the site may be returned to government, landholders/leaseholders, owners or Indigenous communities.

Dependent on the agreed post-mining land use, the performance of rehabilitated areas may be compared with unmined 'analogue' sites in the surrounding region relevant to the target post-mining land use (e.g. suitability for cattle grazing, cropping, conservation or other uses). Performance is measured to show similar trends in coping with environmental factors such as weather and fire impacts. Companies often employ sophisticated techniques (e.g. specialist tools developed by the CSIRO) to monitor and determine rehabilitation success.<sup>26</sup>

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<sup>25</sup> Department of Mines and Petroleum and Environmental Protection Authority, [Guidelines for preparing mine closure plans](#), Government of Western Australia, Perth, May 2015.

<sup>26</sup> Minerals Council of Australia, [Mine rehabilitation in the Australian minerals industry](#) – Commodore mine case study, MCA, Canberra, p.16.

During the monitoring periods, companies may undertake additional remedial work to address issues that may arise to ensure a safe, stable and non-polluting landform is achieved. Post relinquishment, companies may enter into commercial arrangements with landholders, community groups or traditional owners for future management of rehabilitated areas to fund any remedial works, should these be required in the future.

In some instances, companies may enter into commercial arrangements with landholders, community groups or traditional owners for ongoing monitoring and management of rehabilitated areas.

### **8.5. Performance reporting**

State regulators require reporting of rehabilitation performance as per the conditions of approval. A number of companies also report on rehabilitation as part of environmental and social performance in line with national and international benchmarks, including the Global Reporting Initiative (GRI).<sup>27</sup> Through these reports, company-wide rehabilitation performance is provided for investor and public information. Rehabilitation performance can also be found in company sustainability reports.

### **8.6. Company disclosure**

Mining companies are required to make provision for rehabilitation and closure liabilities in accordance with Australian Accounting Standards Board Standard (AASB) 137 titled Provisions, Contingent Liabilities and Contingent Assets which aligns with the International Accounting Standard (IAS) 37 and where material these will be disclosed in the companies audited financial statements. The provision will be updated on an annual basis or more frequently dependant on internal company requirements.

Australian Accounting Standards apply to:

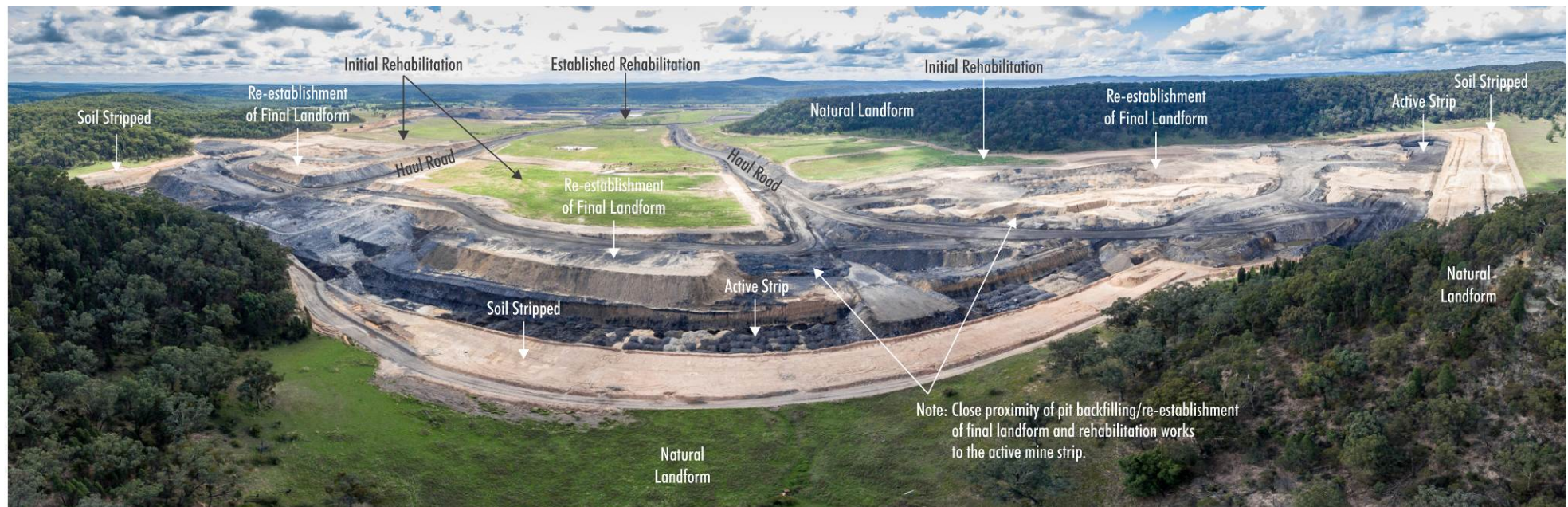
- Entities required by the Corporations Act 2001 to prepare financial reports.
- Entities in the private or public for-profit or not-for-profit sectors that are reporting entities (as defined by Australian Accounting Standards) or that prepare general purpose financial statements.

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<sup>27</sup> Global Reporting Initiative, [Sustainability reporting](#), GRI, viewed 29 March 2017.



**Figure 3 – Progressive rehabilitation at the Wilpinjong mine in the Upper Hunter Valley, New South Wales (Source: Peabody Energy)**



Note: The Wilpinjong mine is a low strip ratio mine. Deeper or more complex coal operations will have different characteristics, dependent on the operational need.

## 8.7. Care and maintenance

In some cases, mining companies may choose to place a mine into care and maintenance. The decision to move a site into care and maintenance is a major decision for a mining company with all potential impacts carefully evaluated. One factor influencing this decision may be low commodity prices – which are often cyclical. Under these circumstances, a company may choose to manage the site until economic conditions are favourable to recommence operations.

Care and maintenance should not be confused with premature closure of a mine. Periods of care and maintenance may last several years. However, in both care and maintenance and premature closure, the ongoing liability for the site remains with the mining lease holder – it is not relinquished until government requirements have been met. Care and maintenance should also not be confused with abandonment, which is safe-guarded by financial assurance mechanisms.

### **Case study: Engaging traditional owners in mine rehabilitation**

#### **Weipa seed collection programme – Rio Tinto**

Rio Tinto Weipa's community seed collection programme has been running for a number of years and supports Traditional Owners to have a leading role in the land rehabilitation process.

Since 2010 Rio Tinto has engaged a local Indigenous business to facilitate the community programme and engagement, which sees Traditional Owners register as pickers to collect native under storey seed required for land revegetation.

Seed collected through the programme is sourced ethically and safely. Registered pickers participate in an awareness programme to make sure the collection remains sustainable and does not cause damage or harm to the vegetation bearing the seed.

The programme continues to grow year on year, with 51 active pickers in 2010 growing to 100 in 2014 and 121 pickers in 2015. The number of seed collected has also grown significantly from 273 kilograms collected in 2010, to 760 kilograms in 2014 and over 1,000 kilograms in 2015.

Not only has the number of pickers grown to support local employment but Rio Tinto's land rehabilitation efforts have thrived ensuring the vegetation meets the future needs of stakeholders. When the programme commenced in 2010, around 28 species of trees and shrub seeds were collected through the programme, and this has also grown with now more than 43 species included in the dynamic mix of seed.

In addition to the direct income returned to communities, there are other benefits for Traditional Owners including the opportunity to collect seed on country and greater understanding of the rehabilitation process used on an area after mining has finished.

## 9. INDUSTRY PERFORMANCE - EFFECTIVENESS OF MINE REHABILITATION – ToR ITEM (D & F)

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### 9.1. Rehabilitation performance – the evolution of practice

The industry's approach to mined land rehabilitation has continuously improved and significant advances have been made. This has been driven by sustained company investment in research to strengthen the science underpinning rehabilitation methods, experience with past practices, evolving corporate values, community expectations and government regulation.

Mining companies value their social licence to operate and work to ensure a positive legacy from mining. Rehabilitation methods continue to evolve – as does leading practice techniques which are shared across industry. Companies take their responsibilities seriously, and where rehabilitation fails to meet expectations make all efforts to rectify issues that arise

While some previously mined areas are rehabilitated to pre-existing condition or better, other mined areas result in transformation of the landscape and alternate post mining uses. At a minimum, companies are required to rehabilitate land to ensure it is safe, stable and non-polluting. However, it is the industry's goal to move beyond minimum regulation to ensure previously mined land is available for subsequent environmental, social or economic uses.

Like any industry, capability and resources will vary from company to company based on a range of factors. There will always be different levels of performance across what is a broad range of mining companies. Notwithstanding this, regulation specifies the minimum requirements all companies must meet.

Modern mining rehabilitation practice is highly regulated, better implemented and more accountable than ever before. Notwithstanding, there is a risk that a small number of operators may not be able to fulfil their rehabilitation obligations to the standards required. In these circumstances, financial assurance mechanisms provide government with access to sufficient funds to rehabilitate these sites to the standards required if needed (see Section 6).

### 9.2. Leading practice corporate governance

Modern corporate governance of rehabilitation and closure has been central to improved industry rehabilitation performance. The integration of rehabilitation and closure into the mine planning processes has been as important to improved practice to on-ground technical solutions.

The Australian minerals industry is a leader in the development of innovative and sophisticated approaches to integrated closure planning. Australian-based mining companies have developed a range of in-house and public tools and processes to optimise rehabilitation and closure performance while reducing costs for industry.

Examples of these leading practice approaches/standards include:

- Anglo American – mine closure toolbox
- Newmont – closure and reclamation standard.<sup>28</sup>

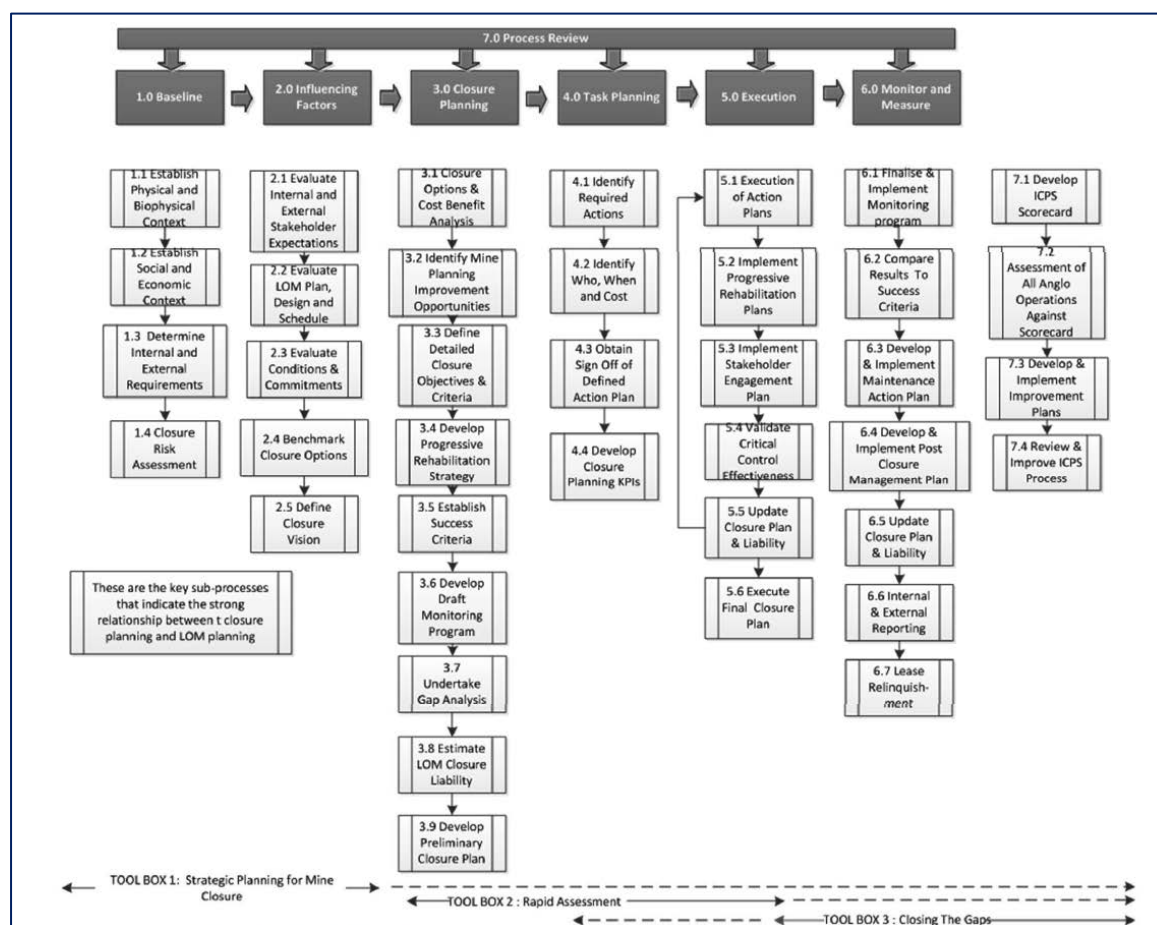
The sophistication of industry management is illustrated in the following example (Figure 3).

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<sup>28</sup> Anglo American, [Mine Closure Toolbox – Version 2](#), August 2013 – made publicly available in 2013; and Newmont, [Closure and reclamation management standard](#), 4 April 2016.



**Figure 3 – Anglo American – Integrated Closure Planning System involving seven processes and 39 sub-processes<sup>29</sup>**



### 9.3. Industry investment and expertise in rehabilitation and closure planning

Australian mining companies have significant in-house expertise in rehabilitation and closure planning. While much of this expertise is in environmental fields (mining is the third-biggest employer of environmental scientists, employing more than 13,600 directly and indirectly), it also involves financial experts, engineers, mine planners and many others.<sup>30</sup>

Some companies have corporate managers dedicated solely to the implementation of mine rehabilitation and closure standards. This is in addition to significant numbers of business unit and operations (on-site) personnel responsible for the management and implementation of on-ground rehabilitation work, often as part of general site operations.

Where necessary, nationally and internationally recognised specialists are engaged to review and provide input into rehabilitation and closure programs. Companies have entered into partnerships with scientific and research bodies, including the CSIRO and universities in the development of new techniques to improve rehabilitation outcomes, and for peer review of existing methods and planning.

<sup>29</sup> Grant C D and Lacy H W B, *Developing Anglo American's integrated closure planning system; requires people, process and technology working together*, Mine Closure 2016, Perth, 2016.

<sup>30</sup> Department of Employment, *Job Outlook 2014*; MCA calculations. NB these figures are estimates of the total number of workers directly and indirectly employed by the resources sector.

#### 9.4. Rehabilitation outcomes – achieving value on post-mining land

With consistent effort, investment in innovation and a focus on continuous improvement, the minerals industry is achieving positive rehabilitation outcomes and productive post-mining land uses. The industry has demonstrated a range of post-mining land uses can be successfully achieved. These include cropping, grazing and nature conservation.

These efforts ensure the community benefits not only from taxes, royalties, jobs and investment during operation but from a post-mining landscape that has ongoing social, economic and/or conservation values.

##### ***Rehabilitation case studies***

To illustrate industry achievements, examples of successful/leading practice mine rehabilitation are provided below:

##### **Case study: Beenup Mine, south-west Western Australia**

BHP Billiton's hectare Beenup mineral sands mine located in south-west Western Australia was closed in 1999. The restoration of the site presented unique challenges due to an agreement, after extensive government and community consultation, to re-establish 140 hectares of endemic vegetation communities, including some rare species, each with particular soil, hydrological and topographical requirements.

A master planning process was initiated at the start of the project to develop end use options for the site. The primary vision was 'wetlands and adjacent rehabilitated areas providing an end-use of significant ecological, landscape and recreational value'. The complex aspects of the natural landscape presented opportunities to not only restore the mine-affected landscape but also to enhance the ecological landscape values and integrate the post-mining environment with the adjacent areas.

Now, 13 years after closure, over 85 per cent of the site has achieved floristic completion criteria requirements. The site currently supports a diverse mix of vegetation types, wetland and upland habitats, open parkland and associated faunal assemblages. The project is now visited by a variety of stakeholders (government, mining, community) as an example of the level of restoration that can be achieved with sound science and a prescriptive restoration planning approach.



Site at closure (1999)



Rehabilitated site (2015)

### Case study: Alluvial land rehabilitation – Upper Hunter Valley, New South Wales<sup>31</sup>

Coal & Allied's rehabilitation in New South Wales' Hunter Valley has demonstrated that alluvial land used for mining can be rehabilitated to match the crop production of nearby farms.

In July 2013 a crop of Triticale, a hybrid of wheat and rye, was planted on the land, the first commercial crop since the productivity trial ended in 2007. After three years of consecutive production, hay yields were above the district average.

The Coal & Allied experience has provided new knowledge on the rehabilitation of higher value agricultural land. The land will continue to be farmed and monitored and will ultimately be a valuable asset to relinquish at the end of the mine life.



During operation



Rehabilitated site

### Case study: Cattle grazing on rehabilitated land, Liddell Coal Operations – Upper Hunter Valley, New South Wales<sup>32</sup>

Glencore's Liddell open-cut coal mine has achieved high quality rehabilitation of grazing pasture, demonstrating mined land can be returned to productive and sustainable farming.

Successful grazing trials revealed cattle on the rehabilitated land grew faster and averaged an extra 79 kilograms over cattle on neighbouring pasture. At the abattoir, the extra weight and condition of the cattle grazed on rehabilitated land returned approximately 25 per cent higher price, or \$220 per head.

While the trial has not yet concluded, indications are the grazing of cattle on rehabilitated land at the Liddell coal mine is commercially viable and may provide superior pasture compared to surrounding unmined paddocks.



Operational areas



Grazing on rehabilitated site

<sup>31</sup> Minerals Council of Australia, [Mine rehabilitation in the Australian minerals industry](#), Canberra, February 2016, pp. 6 – 9.

<sup>32</sup> Minerals Council of Australia, [Mine rehabilitation in the Australian minerals industry](#), Canberra, February 2016, pp. 24 – 27.



### Case study: Jarrah forest ecosystem restoration, Western Australia<sup>33</sup>

Alcoa mines and rehabilitates approximately 600 hectares each year at its Huntly and Willowdale bauxite mining operations in the Darling Range in Western Australia.

A key objective of Alcoa's rehabilitation program is to restore 100 per cent of the plant species that existed in the pre-mined jarrah forest and to accomplish this within 15 months after rehabilitation is complete, an objective well above government requirements.

Alcoa has established its own nursery and has worked in collaboration with local universities, government agencies and private researchers to understand the forest ecosystem. Long term monitoring has shown that most fauna species return to rehabilitated areas once the habitat has re-established.



During operation



Rehabilitated site

A selection of other examples of successful/leading practice rehabilitation include:

- Native species re-established – Ginkgo Mineral Sands (Cristal Mining), Mildura New South Wales
- Rehabilitation to pastoral land – Wilkie Creek Coal Mine (Peabody Energy) Dalby, Queensland
- Establishment of pasture – Commodore Mine (Intergen/Downer) Darling Downs, Queensland
- Rehabilitation to woodland/mixed woodland and pasture – Wilpinjong Coal Mine Ltd (Peabody Energy), Mudgee New South Wales
- Natural landform rehabilitation – Mangoola Mine (Glencore) Hunter Valley New South Wales
- Progressive rehabilitation in the Gunnedah Basin – Boggabri Coal Mine (Idemitsu Australia Resources) Gunnedah New South Wales
- Rehabilitation in a highly urbanised environment – Westside Open Cut Coal Mine (Glencore) Lake Macquarie New South Wales
- Emplacement rehabilitation in the Illawarra (South 32 Illawarra Coal) Illawarra, New South Wales
- Wetlands established on tailings dams – Renison Bell tin mine (Bluestone Mines) Tasmania
- Cropping as a post-mining land-use – Northparkes Mine (CMOC) Parkes New South Wales
- Sustainability and Profitability of Grazing on Mine Rehabilitated Land in the Upper Hunter - (Rio Tinto Coal & Allied Mine) Upper Hunter Valley New South Wales
- Pilbara seed atlas – iron ore mines (BHP Billiton) Pilbara Western Australia.

<sup>33</sup> Minerals Council of Australia, [Mine rehabilitation in the Australian minerals industry](#), Canberra, February 2016, pp. 28 – 33.

Further examples of successful mine rehabilitation outcomes, including additional information on the above case studies are provided in **Appendix A** of this submission. Others are included in state industry association and company submissions to the inquiry.

### **9.5. Why closure requirements can differ from operation to operation**

Those unfamiliar with the industry may question why different mines appear to be rehabilitated to different closure criteria. The long-lived nature of mines across changes to regulation, scientific understanding and industry practice is one reason this occurs.

At a minimum, mining companies rehabilitate land consistent with their legal obligations. These obligations are specified in the conditions of approval which are set prior to the commencement of mining. Specific criteria for mine rehabilitation and agreed post-mining land use are included in a range of approved documents including closure plans in Western Australia, mine management plans in the Northern Territory, plans of operation in Queensland and mining operation plans in New South Wales. Agreed closure criteria will specify the post-mining land-form which may include leaving a void and associated management requirements.

A mine life can span many decades with long lived operations lasting more than 50 years. Over such a long time, community expectations and environmental standards may change and these will be reflected in the changes in approval conditions and subordinate documentation for a new mine.

It is appropriate to expect modern mining operations to meet contemporary criteria; however it is inappropriate to apply these criteria retrospectively to sites that have been previously approved and are working in good faith to meet the legal obligations associated with those approvals

There will always be improvement from older to new areas of a mine site – reflecting changes in practice. However it would be both impractical and cost-prohibitive to continuously upgrade previously rehabilitated areas or the agreed land-form to meet contemporary rehabilitation criteria, unless needed to ensure the post mining land form is safe, stable and non-polluting. Furthermore, these criteria may again change before mining finishes, although, an operator may voluntarily choose to revisit mine rehabilitation and closure planning for an individual site, if viable.

Moving goal posts that define rehabilitation ‘success’ provides certainty for neither government or the mine operator, making it difficult to progressively rehabilitate land, generating perverse outcomes and making it impossible to relinquish or divest land.

### **9.6. Management of mine voids (open cut pits)**

A rehabilitation issue that is often raised with the industry is the question of whether it is appropriate to leave final voids after mine closure.

The ability to employ open cut mining techniques is essential to the economic viability of many mining operations across Australia. Depending on the nature of the resource, sites may operate one or a number of pits. Certain types of mining, such as coal mining, may be suitable for strip mining where the pit moves across the landscape and backfilled behind the operation, leaving a smaller void at the ‘end’ of the cut at the cessation of the mining (see Figure 4 below).

The decision to backfill a void – partially or fully – is undertaken on a case-by-case basis using a risk-based approach. It may be easier to undertake backfilling where there are multiple voids available during operation (e.g. mining from one pit and depositing in another close by) and more difficult and costly to backfill a single void (post-closure).

The management of mine voids, including the decision whether or not to back fill is neither a simple nor a ‘one-size-fits-all’ proposition. Backfilling a mine void can be extremely costly, affecting the viability of a mining operation. Furthermore, backfilling may not necessarily lead to an optimal environmental or social outcome and, in some instances be physically impossible (e.g. when tailings or overburden have expanded significantly in volume when disturbed).

Given these complexities, there are a range of important issues to consider. These include:

- Environmental benefit – what are the risks and opportunities presented by the void management option under consideration. Will there be a commensurate environmental benefit?
- Resource sterilisation – backfilling will remove the future opportunity that changes in technology will allow further economic extraction of resources.
- Perverse outcomes – backfilling may lead to unintended environmental consequences including further land clearing (to obtain 'fill' material), water quality impacts, emissions and energy impacts.
- Geochemical stability – the interaction of waste rock and other material with groundwater may present increased environmental risks.
- Community and conservation perspectives – a pit or a pit lake may have future uses, including social (e.g. recreation), conservation (e.g. wetlands) or environmental and economic (e.g. Woodlawn bioreactor near New South Wales).<sup>34</sup> There are many examples worldwide of mine voids being used beneficially.<sup>35</sup>

Major capital investment decisions need regulatory certainty. Any retrospective requirement to backfill voids would create significant regulatory risk for the minerals industry, rendering many projects unviable. Furthermore, should the requirement to backfill voids have been in place at the time the investment decision was made it is likely a significant number of mining projects would not have commenced.

### **9.7. Are operators avoiding their rehabilitation responsibilities? (ToR Item F)**

As provided earlier (see Section 2) the modern Australian minerals industry is committed to fulfilling its rehabilitation obligations. Mine rehabilitation is highly regulated, better implemented and more accountable than ever before.

Each jurisdiction has in place regulatory safeguards (e.g. the provision of financial assurance and transfer of liability requirements) designed to mitigate the risk of operators avoiding their rehabilitation obligations (see Section 6). These safeguards are subject to periodic review (see Section 7).

#### **On-selling of a mine**

There are legitimate reasons why companies may sell sites to other companies that may be able to realise the potential of the resource under a different cost structure. This brings a number of advantages including:

- Extension of the mine life with ongoing additional benefits for neighbouring communities, including employment and local businesses
- Maximum use of an economic resource to the benefit of the state – the resources would otherwise be sterilised through rehabilitation for mine closure
- Encouraging innovative operators in the recovery of remaining resources.

Performance safeguards are in place to ensure rehabilitation obligations are fulfilled. As provided in section 6, in the event a mine is sold, state regulators typically require a matching security bond to be lodged by the purchaser of the mine before they can proceed and the previous owner released from their obligations.

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<sup>34</sup> Veolia Australia and New Zealand, [Woodlawn Bioreactor](#), viewed 25 March 2017.

<sup>35</sup> Pearman G, *101 Things to do with a hole in the ground*, Post-mining alliance, St Austell, Cornwall 2009

## 9.8. International practice – how does Australian industry compare?

Australia is a leading jurisdiction in sustainable mining practices, including rehabilitation and closure. The industry has over many years worked closely with government and research institutions to develop and share improved practices (see industry research in Section 10).

Recent examples of this collaboration include the recently published ‘mine rehabilitation’ and ‘mine closure’ handbooks for the Australian Government’s ‘Leading Practice Sustainable Development Program for the Mining Industry’.<sup>36</sup> The handbooks illustrate contemporary Australian approaches to mine rehabilitation, supported by industry case studies. The handbooks are internationally recognised and have been translated into eight different languages for use in a range of developing countries.

Australian practice is also exported through centres of excellence or similar institutions. These include the CSIRO, the University of Queensland’s Sustainable Minerals Institute (SMI) and international training through various development initiatives including the former International Mining for Development Centre involving the Department of Foreign Affairs and Trade, SMI and the University of Western Australia’s Energy and Minerals Institute.<sup>37</sup>

In 2002, the MCA and the Australian and New Zealand Minerals Council developed a strategic framework for mine closure.<sup>38</sup> The document provides an overarching framework for mine closure across Australian jurisdictions.

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<sup>36</sup> Department of Industry, Innovation and Science, [Leading practice sustainable development program for the mining industry](#), Australian Government, Canberra, September 2016.

<sup>37</sup> International Mining for Development Centre, [IM4DC](#), viewed 18 April 2017.

<sup>38</sup> Australian and New Zealand Minerals and Energy Council and the Minerals Council of Australia, *Strategic framework for mine closure*, Canberra, 2002.

## 10. INDUSTRY COLLABORATION AND RESEARCH – ToR ITEM (D)

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Industry collaboration has been central to the significant improvement and innovation in rehabilitation and closure practice. The industry has a range of voluntary forums in which dedicated industry practitioners come together and share learnings on a regular basis. Examples of these are the Central Queensland Mine Rehabilitation Group and the Goldfields Environmental Management Group in Western Australia, both of which have been running for more than 20 years.<sup>39</sup>

State mining associations and the MCA run regular workshops that frequently include knowledge sharing of mine rehabilitation practice. Examples of these include the 2016 MCA Environment and Communities Workshop and the recent University of Newcastle's Tom Farrell Institute – Mine Rehabilitation Conference 2017 which is supported by the New South Wales Minerals Council and government agencies.<sup>40</sup>

### **MCA mine closure dialogue**

The MCA has established an industry mine closure dialogue. The dialogue, which consists of state mining associations and key industry representatives, will explore opportunities for a collective industry response to improve rehabilitation and closure policy outcomes. A central focus is to reduce risk and improve certainty in mine closure processes for both industry and government.

As part of its work, the dialogue will review both national and international industry initiatives and policy settings.

### **CRC CARE – Industry working group on closure**

Established in 2015, the Contaminated Land Cooperative Research Centre - CRC CARE (part of the University of Newcastle) industry working group comprises a range of company representatives. The group meets regularly to discuss rehabilitation and closure matters.

### **Collective industry research**

#### ***Australian Coal Research Program (ACARP)***

The ACARP program is an example of collective industry effort to improve rehabilitation performance through innovative research. Over the ten years between 2007 and 2016 ACARP spent around \$10 million on rehabilitation related research. The research program, while funded by the industry, is undertaken by independent researchers from government (CSIRO), universities (e.g. the University of Queensland, Central Queensland University) and private sector specialists.<sup>41</sup>

### **International networks**

In addition to national networks, Australian industry collaborates internationally on rehabilitation and closure matters. Two notable examples are provided below.

#### ***International Council on Mining and Metals (ICMM)***

The MCA and a number of our member companies are members of the ICMM. The ICMM has a global program reviewing issues associated with rehabilitation and mine closure to facilitate improved performance. One example of these initiatives is the ICMM 'Planning for integrated mine closure: Toolkit,' developed as a practical guide for companies.<sup>42</sup>

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<sup>39</sup> Central Queensland Mine Rehabilitation Group, [About the CQMRG](#), viewed 27 March 2017 and Goldfields Environmental Management Group, [website](#), viewed 18 April 2017.

<sup>40</sup> The Tom Farrell Institute, [Mine Rehabilitation Conference 2017](#), University of Newcastle, viewed 27 March 2017.

<sup>41</sup> Australian Coal Association Research Program, [Research Funding](#), ACARP, viewed 20 March 2017

<sup>42</sup> International Council on Mining and Metals, [Planning for integrated mine closure: Toolkit](#), ICMM, London



### ***International Network for Acid Prevention (INAP)***

A number of Australian companies are members of INAP. INAP is an international collaboration of companies aimed at addressing technical issues associated with acid rock drainage (ARD) and to avoid creating legacy mine impacts. A key initiative of INAP was the development of the global acid rock drainage (GARD) guide in 2009. The GARD guide is a state-of-the-art summary of best practices and technologies to mitigate and address ARD issues.<sup>43</sup>

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<sup>43</sup> International Network for Acid Prevention, [GARD Guide](#), 2009

## 11. REHABILITATION AND ENVIRONMENTAL VALUES – ToR ITEMS (G & H)

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### 11.1. The potential social, economic and environmental impacts on mNES of inadequate mine rehabilitation – ToR Item (G)

Mine rehabilitation is an important part of industry performance and where relevant, federal approval conditions; however rehabilitation is only one way in which the potential impacts on mNES and other environmental values are managed.

The minerals industry employs the environmental risk management hierarchy (avoid – minimise – mitigate) to protect significant environmental values, including state and Commonwealth matters. Under the hierarchy, companies first ‘avoid’ impacts on identified environmental values. Where this is not possible – often due to the nature of the mineral resource – mining companies seek to ‘minimise’ impacts wherever possible, then ‘mitigate’ impacts through rehabilitation or other environmental management measures.<sup>44</sup>

To further safeguard mNES, and as a condition of approval, companies may secure environmental offsets for significant residual impacts on mNES.<sup>45</sup> Typical environmental offsets include the establishment of protected areas for conservation (often many times larger than the affected area), developing new or improved habitat on degraded land and/or the control of threatening processes including feral animals and weeds.

Further to these requirements, companies may also undertake voluntary conservation initiatives to augment their social licence to operate. These include species recovery programs, habitat restoration and the establishment of conservation reserves. These voluntary initiatives can have a significant positive effect on environmental and community values, including mNES. Examples of these programs include:

- The northern hairy nose wombat recovery project in Queensland – Glencore
- The river red gum restoration initiative in New South Wales - Anglo American
- Partnership to protect turtle breeding on Raine Island - Great Barrier Reef, Queensland – BHP Billiton
- Project to investigate feral predator impacts to Northern Quoll – Pilbara Western Australia – Rio Tinto.<sup>46</sup>

Social and economic factors are taken into account in the assessment and approval of a new mine, including federal approval under the EPBC Act. As provided in section 2, in addition to the significant regional investment, the industry provides employment and business opportunities for local communities throughout mining, rehabilitation, post closure monitoring and maintenance phases.

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<sup>44</sup> For example, Rio Tinto, [Our approach to environmental management](#), viewed 5 April 2017.

<sup>45</sup> Department of Environment and Energy, [EPBC Act environmental offsets policy](#), Australian Government, Canberra, 2012.

<sup>46</sup> Queensland Government, 2014; [Northern Hairy Nosed Wombat Recovery Project](#), Department of Environment and Heritage Protection, 2 April 2014.; Anglo American, [Biodiversity](#), Anglo American (Australia), April 2014.; BHP Billiton, [New \\$7 million partnership to help protect the Great Barrier Reef](#), 21 May 2015.; and Threatened Species Recovery Hub, [Will baiting benefit northern quolls in the Pilbara?](#), National Environmental Science Program, 1 August 2016 – Program supported by Rio Tinto

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As recognised by the CSIRO, the opportunities provided by responsible mining practices are significant:

Mining stands out from other major land uses in terms of the wealth it creates from the limited areas that it directly affects and the relatively short duration of the effect. This provides an opportunity for achieving high standards of environmental management, encompassing mitigation, ecosystem rehabilitation, and environmental offsets.<sup>47</sup>

#### **11.2. The potential social, economic and environmental benefits of adequate rehabilitation, including job opportunities in communities affected by job losses – ToR Item (H)**

There are no mass employment opportunities in rehabilitation that follow the mining phase. Rehabilitation, including the development of a post-mining land form is integrated into the operation of a mine. Mine planning allows the workforce responsible for mining to also undertake work essential for rehabilitation. In most cases there is no single separate workforce that undertakes on-ground rehabilitation and closure activities.

In addition to operational staff, companies employ a range of mine planners, engineers and environmental specialists – all of whom contribute to rehabilitation and closure planning and management. Further to direct employment, mine operators often engage specialist consultants or contractors, depending on the needs of the company. Importantly, workforce size will fluctuate in line with normal business cycles and dependent on the intensity of rehabilitation required at different stages in the mine life cycle. At times this may include further opportunities for local employment and businesses which may include major post-closure rehabilitation work.

In some instances, mining companies may engage or partner with specialist companies to complete rehabilitation work. A mine may also be purchased by companies (with all appropriate safeguards in place) that specialise in creating on-going value through innovative approaches to resource recovery and rehabilitation (see Section 9.7).<sup>48</sup>

Both during operation and post-closure, mines may enter into agreements with local communities, landholders or Indigenous groups to monitor rehabilitation or manage rehabilitated areas and the broader post-mining landscape (e.g. for conservation purposes).

Mining is a temporary use of land – the resource will eventually be depleted and the mine will close. Given this reality, companies work closely with communities to plan for and minimise the impact of mine closure and to the extent practical, facilitate the transition of the local economy, while leveraging industry investment over the mine life.

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<sup>47</sup> CSIRO, [Biodiversity – Science and Solutions for Australia](#), CSIRO Publishing, Canberra, 2014, p. 178.

<sup>48</sup> For example, Australian Financial Review, [Big miners court the Raging Bull of rehab](#), AFR, 19 April 2017.

## 12. ABANDONED MINES – ToR ITEM (E)

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### 12.1. Historic mines and modern practice

The minerals industry recognises historic mining practices and absence of adequate regulation has resulted in abandoned mines that have not been appropriately rehabilitated, the presence of which can undermine public confidence in the ability of the modern industry to manage its long-term environmental impacts.

While recognising the concerns about historic mines, it is important not to conflate historic practices with contemporary mining and regulation. The Australian minerals industry is committed to ensuring current mines meet their rehabilitation requirements. As provided previously, modern mining practice and regulatory standards provide sufficient safeguards to avoid this occurring.

### 12.2. The importance of context and risk for abandoned mines

Mining has been part of the Australian economy for around 200 years. Historic examples of poor environmental practice in the absence of regulation can be found in several parts of Australia including the notable examples of the Mount Morgan Mine in Central Queensland (1882-1981) and the Mount Lyell Mine in Tasmania (1886-1993).

Context is needed in the discussion of abandoned mines. For example, while it is estimated there are more than 50,000 abandoned mines across the country, most are historic, single mine features including individual shafts, tunnels or mine workings (e.g. gold-rush era features around Gympie in Queensland, Kalgoorlie-Boulder in Western Australia and central Victoria) with few having material on-going environmental impacts. Only a handful of these mines are the very large sites commonly pictured in discussions (such as Mount Morgan and Mount Lyell). Most of these sites were developed long before modern mining regulation.

This does not reduce the importance of addressing the abandoned mine issue. We recommend government efforts be pragmatic and focus on those sites that present the highest risks to community health and safety and the environment.

### 12.3. Industry collaboration on abandoned mines

The minerals industry has been an active contributor on the issue of addressing abandoned mines. The MCA was a co-sponsor of the 2010 Strategic Framework for Managing Abandoned Mines in the Minerals Industry with the then Ministerial Council on Mineral and Petroleum Resources (MCMPR).<sup>49</sup>

The MCA, along with relevant state mining associations continue to engage with the Council of Australian Governments (COAG) Energy Council's Land Access Working Group program on abandoned mines. Furthermore, in recent years the MCA has sponsored and participated in key national forums on abandoned mines (e.g. the University of Newcastle and NSW government sponsored 'Dealing with derelict mines summit', held in December 2016).<sup>50</sup>

### 12.4. Opportunities to leverage industry capability

The minerals industry wants to continue working cooperatively with governments to manage or minimise the environmental, social and economic impacts of abandoned mines.

Opportunities exist to harness industry expertise in rehabilitation, closure and risk management. These arrangements, agreed to on a case by case basis, could include:

- Industry and government knowledge sharing and the use of industry expertise to advise on rehabilitation techniques

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<sup>49</sup> Ministerial Council on Mineral and Petroleum Resources and the Minerals Council of Australia, [Strategic Framework for Managing Abandoned Mines in the Minerals Industry](#), Department of Industry, Innovation and Science, Canberra 2010.

<sup>50</sup> CRC CARE, [Dealing with derelict mines summit – 2016](#), 6-7 December 2016.

- Providing options for companies to link the rehabilitation of abandoned mines within a mining lease to offset requirements
- Bundling of rehabilitation into existing earthmoving contracts to reduce costs
- Local partnerships between industry and government on rehabilitation as part of enhancing social licence to operate
- Practical partnerships between industry, government and the community) for regional training and education.

Commercial solutions should also be considered. Issues of legal liability could be addressed to open up potential exploration, mining and industry led rehabilitation of abandoned mines (including models that enable access to residual resources). Furthermore, innovative approaches to use abandoned mines for economic or community purposes should also be encouraged.

### 13. OPPORTUNITIES TO IMPROVE POLICY SETTINGS – ToR ITEM (J)

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The MCA and state minerals representative bodies consider state and territory governments should continue to have primacy in the regulation of mine rehabilitation, closure and financial assurance. Each jurisdiction already has in place a mature regulatory framework for managing these matters. Accordingly, state and territory governments are best placed to review and update regulation and policy in line with state priorities.

We consider state and territory approaches to mine rehabilitation could be further improved through greater focus on the following matters:

- **Greater flexibility** in the structure of and types of financial assurance mechanisms permitted – policy settings should allow for innovative approaches that encourage investment, reduce unnecessary financial burden on industry while addressing the risk of incomplete mine rehabilitation to the community
- **Improved certainty** – policy settings to provide certainty on requirements for rehabilitation sign-off and relinquishment and encourage progressive rehabilitation
- **Minimising regulatory burden** – Commonwealth requirements for rehabilitation should be streamlined through better coordination or rationalisation with state conditions, including monitoring and compliance. We strongly support the government's policy to streamline state and federal environmental approvals.

There are ways however the Commonwealth government could contribute to improved rehabilitation and policy outcomes nationally. These include:

- Facilitating dialogue between jurisdictions (e.g. through the COAG Energy Council's Land Access Working Group forum) and industry to share knowledge and improve practice
- Continuing to promote leading practice approaches (e.g. through the publication of relevant guidance, including the leading practice sustainable development in mining handbooks).

## 14. FURTHER INFORMATION

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