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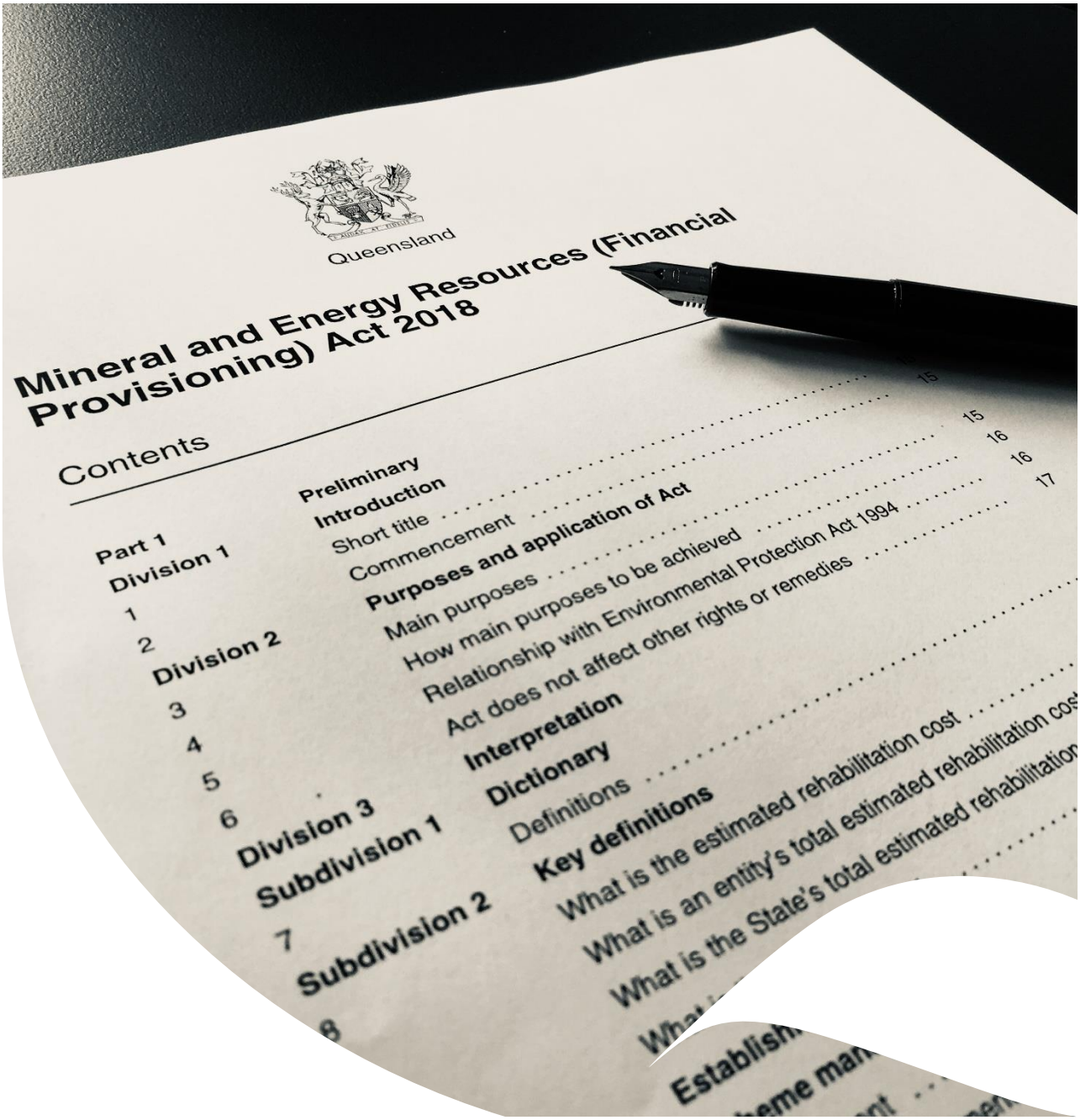
Social aspects of mine closure: governance & regulation



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Acknowledgements

This project report is part of a broader initiative, the Social Aspects of Mine Closure Research Consortium. Established in 2019, the consortium is a multi-party, industry-university research collaboration challenging accepted industry norms and practices around mine closure and demanding new approaches placing people at the centre of closure. Industry partners in the consortium include: Anglo American, BHP, MMG, Newcrest, Newmont, OceanaGold and Rio Tinto. The initiative falls under the SMI's Transforming Mine Lifecycles cross-cutting program.

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The University of Queensland

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Sustainable Minerals Institute

The Sustainable Minerals Institute (SMI) is a world-leading research institute[2] committed to developing knowledge-based solutions to the sustainability challenges of the global resource industry, and to training the next generation of industry and community leaders. The Institute is transdisciplinary, and our work is impartial and rigorous. Our research integrates the expertise of production, environmental and social science specialists to deliver responsible resource development.

Centre for Social Responsibility in Mining

The Centre for Social Responsibility in Mining (CSRM) focuses on the social, cultural, economic and political challenges that occur when change is brought about by mineral resource extraction. The Centre contributes to industry change through independent research, teaching and by convening and participating in multi-stakeholder dialogue processes. Our team consists of geographers, anthropologists, sociologists, political scientists, economists, development and natural resource specialists.

[1] QS World University Rankings and Performance Ranking of Scientific Papers for World Universities, 2018.
[2] The University of Queensland ranks first in the world for mining and mineral engineering, 2018 Shanghai Rankings by subject.

Executive Summary

Objectives and activities of this project

This project was an industry-funded study under the Social Aspects of Mine Closure Research Consortium. The objectives of the project were to (a) systematically collate and characterise global regulations on social aspects of mine closure; and (b) mobilise this knowledge base towards research on what makes for robust closure regulation with respect to social aspects.

The project team selected ten mining jurisdictions for study, in consultation with consortium partners:

- Brazil
- Chile
- New South Wales, Australia
- New Zealand
- Ontario, Canada
- Peru
- Philippines
- Queensland, Australia
- South Africa
- Western Australia, Australia

Regulatory instruments (Acts, regulations, policies, and guidelines) from each jurisdiction were collated, categorised, and reviewed. We tested whether, and to what extent, each jurisdiction had:

- Specific regulations on social aspects of mine closure
- General regulation on mine closure that include social aspects
- Policy and guidance on social aspects of mining (whether or not about closure)

Within these categories, we devised 11 indicators of what we would expect to see in a robust set of closure regulations. These included, for example, whether regulators are required by law to consider social aspects of closure, or whether companies are required to publicly disclose their mine closure plans. These indicators were applied across mining and environmental regulations across all ten jurisdictions.

Key findings

The primary objective of this project was to amass, sort, and categorise a repository of regulations that can be mobilised for future research. This report constitutes a synthesised database of those regulations.

Analytically, we sought to indicate the extent to which regulators were proactively seeking to govern the social aspects of closure. Generally, we found that regulators were not doing so. The majority of closure regulation we reviewed related to biophysical aspects of closure (i.e. environmental rehabilitation). No jurisdiction had regulations specific to social aspects of closure. Few articulate a clear procedural pathway to relinquishment, and none incorporate social aspects within that pathway. Policy and practical guidance on social performance generally is relatively plentiful – but we found no guidance documents relating to social aspects of closure.

How this project fits within a broader program of research

These findings are important because they confirm our starting expectation, that governance of social aspects of closure present a major challenge for regulators. In particular, we suggest that the difficulty lies in clarifying – through regulation or policy – the division of responsibility between the State and mining companies for ensuring that local communities develop self-sustaining futures after mining ceases.

We see this project as constituting an early step in a sequence of research. Building on the knowledge base collated in this project, the next step is to develop a conceptual design of a robust set of regulations for social aspects of closure, in collaboration with companies, regulators, and civil society. The final step of the research is to convert the conceptual design into model regulations that could be adopted by regulators (with adaptations to suit the local context). Having such a precedent would be of benefit to regulators – and also to companies, whose input throughout the design process would be critical to ensure the regulations are viable in the context of their businesses.

Contents

Tables

1. Introduction

1.1 About this report

This report relates to the project, *Closure governance and regulation*, an industry-funded project for the Social Aspects of Mine Closure Research Consortium. The project began in June 2019 and concluded in March 2020.

The project aims to build knowledge about the institutional arrangements of regulators in various jurisdictions around the world. This report documents the project's activities (section 2) and key findings (section 3).

1.2 Why research closure governance and regulation?

One of the key challenges in managing social aspects of closure is defining the division of responsibility between mining companies and the state.[3] To what extent, for example, is a company obliged to invest in the continuing economic development of a mining town once mining ceases? In many cases, a company's investments in community development are driven by a need to service its residential workforce in the town, and a desire to be a good corporate citizen within the local community. The relevance of both drivers diminishes once mining ceases and the company seeks to relinquish the site. At the same time, community-building, economic development, and the provision of services is generally the duty of the state. The central uncertainty is not *whether* companies and the state have obligations to manage the transition of the local community to a post-mining future, it is *what* specifically those obligations are and which parties bear them.

Recent work by CSRM indicates key gaps in Australian closure regulations.[4] In the absence of government-led policy and regulation, managing social aspects of closure tends to comprise ad-hoc negotiations between companies, governments, and mine-affected communities.[5] A gap or ambiguity in institutional arrangements or policy can undermine the functioning of the society and the economy. The Natural Resources Charter[6] and the Inter-Governmental Forum on Mining, Metals and Sustainable Development[7] endorse the importance of a strong policy framework.

This project represents a step towards addressing questions about the division of responsibility between companies and the state. The focus question underpinning the project is: how are regulators approaching the social aspects of mine closure?

As foundational research, the primary objective of this project is to systematically collate global regulations on the social aspects of mine closure. Regulations are a type of documentary evidence that requires research labour to amass, file, and characterise. This report constitutes a synthesised repository of data, and includes early analysis of the regulatory landscape around social aspects of closure. It is expected that this data can now be mobilised for further research.

Objectives of this project

- To systematically collate and characterise global regulations on social aspects of mine closure
- To mobilise this knowledge base towards research on what makes for robust closure regulation with respect to social aspects

[3] It is recognised that communities, civil society organisations, and other actors may take on responsibility with respect to mine closure. These third parties generally respond to company or regulatory decisions and initiatives about closure. They are not typically the direct subject of mine regulation. As such, they are not the focus of this research.

[4] Vivoda, V., D. Kemp, and J. Owen (2019) Regulating the social aspects of mine closure in three Australian states. *Journal of Energy & Natural Resources Law* 37(4): 405-424.

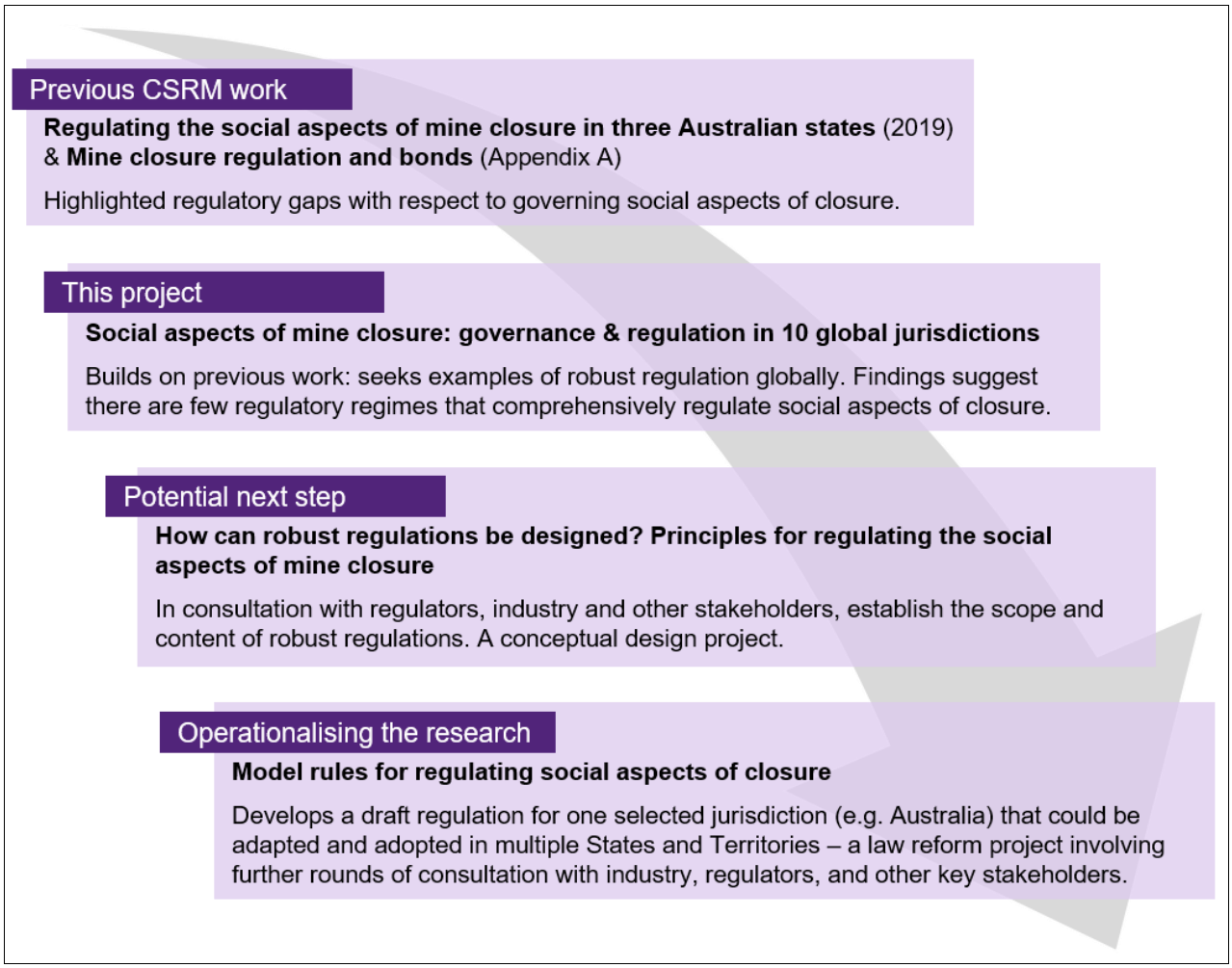
[5] Owen, J. and D. Kemp (2018) Mine closure and social performance: an industry discussion paper. Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland: Brisbane. https://www.csrm.uq.edu.au/publications/mine-closure-and-social-performance

[6] The Natural Resource Charter (2014) outlines 12 precepts for strong resource governance.

[7] The IGF Mining Policy Framework (2013) sets out best practices for exercising good governance of the mining sector. Half of the jurisdictions selected for study in this project are forum members.

Specifically, we envisage a sequence of research building towards identifying what robust regulation could look like (Figure 1). We suggest that the next step is a consultative research process to build a conceptual design of regulation for social aspects of closure, involving industry, regulators, and civil society. Ultimately, a set of model rules could be developed as a precedent resource for law- and policy-makers. From a regulator's perspective, this research would assist policy-making. From an industry perspective, the research would provide a platform for close engagement in the policy-making process, to ensure industry perspectives and realistic parameters are reflected in future regulation.

Figure 1 Sequence of research on regulating for social aspects of mine closure



2. Study method

2.1 Conceptualising 'good' regulation

Regulation is intended to serve the public interest,[8] in this case by facilitating an orderly mine closure, promoting sustainable development, and protecting society, the economy and the environment from risks. One purpose of regulatory frameworks (at least in liberal market economies) is to promote commercial activity by offering a range of incentives that establish an attractive investment environment. In mining, the state establishes incentive schemes to attract investment in resource development, such as tax holidays, profit repatriation, full ownership of assets, and exemptions from land tax. These incentives allow the state to take

[8] Noting considerable scope for debate as to what constitutes the public interest, and how it might be advanced.

advantage of mining companies' capital, technology and know-how, and to boost economic performance of the state. A second purpose of regulatory frameworks is to limit or manage certain activities. Aside from incentivising resource development, regulations also seek to safeguard society and the environment from the negative impacts of mining activities.

Effective administration of a mining sector is determined by how effectively a state is able to achieve an appropriate balance between the two purposes. Rules and regulations that are too restrictive tend to deter mining companies from investing in certain jurisdictions. On the other hand, over-emphasising incentives may undermine societal interests by allowing mining companies to operate in the absence of social and environmental safeguards.

Although both purposes are necessary and important in any regulatory framework, this project focuses primarily on the latter. As noted in section 1.2, the overarching question of this project is how to divide responsibility for social aspects of closure between companies and the state, which primarily falls within this second purpose. The first purpose of regulation can also be relevant (e.g. where closure obligations change the incentive for a company to invest, or where companies' eligibility to access incentives for one site depends on their performance closing previous sites) but are not the primary focus of this project.

2.2 Analytical framework for this project

A review of the literature suggests that there is no clear, extant framework for assessing what constitutes a robust regulatory regime for governing social aspects of closure.[9] In this project, we constructed *a priori* statements of what indicators we would expect to see in a set of robust regulations. All indicators fall under one of three categories, as shown in Figure 2. Each category (and their corresponding indicators) is explained in the following subsections. Taken together, these indicators constitute our analytical framework. These expectations are put forward not as a definitive statement of what *must* be part of a regulatory framework for it to be robust, but as a set of characteristics that we are testing here ahead of further research.

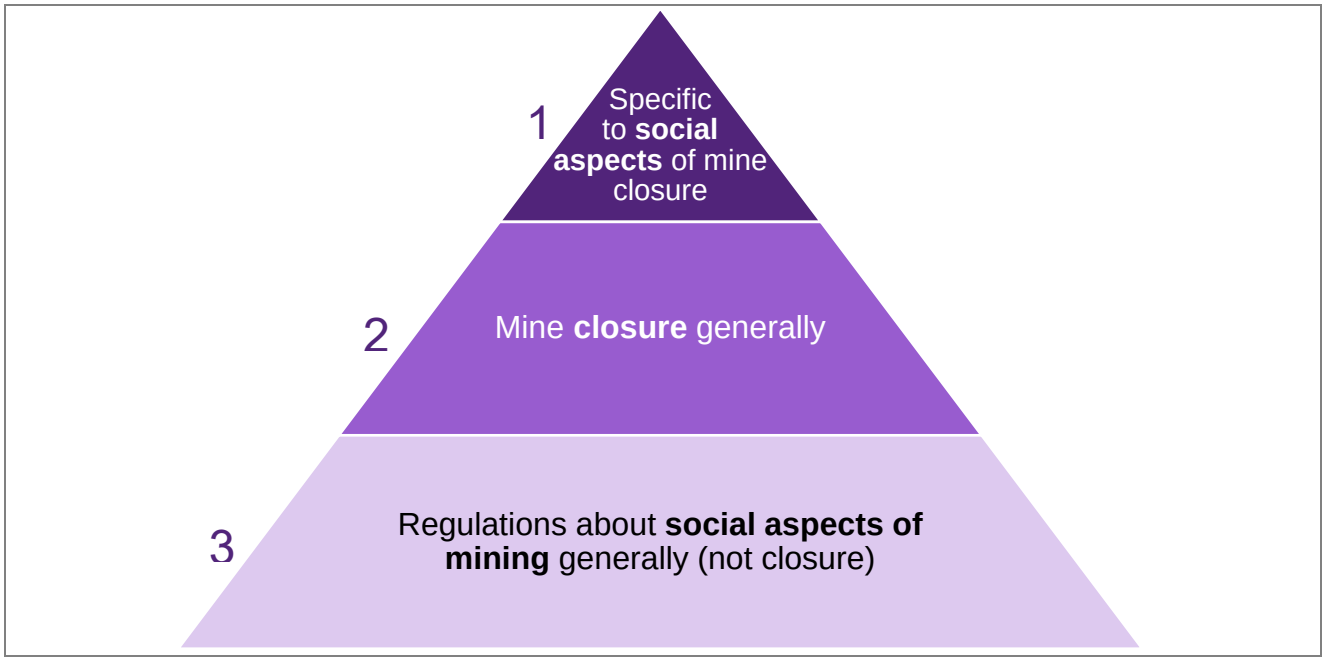


Figure 2 Categories of regulations constructed for this project

[9] Vivoda, V., D. Kemp, and J. Owen (2019) Regulating the social aspects of mine closure in three Australian states. *Journal of Energy & Natural Resources Law* 37(4): 405-424.

2.2.1 Specific regulation on social aspects of closure (Category 1)

The first category relates to whether social aspects of mine closure are specifically regulated. We would expect a robust set of closure regulations to specifically address the social aspects of mine closure. Doing so would acknowledge that mine closure gives rise to social risks and impacts that do not necessarily arise during other mine phases.

We would expect the following to indicate a robust regulatory framework for social aspects of closure:

1. Mine closure regulation exists.
2. Regulations require companies and/or public officials to consider social aspects of closure in closure planning (and other decisions related to closure).
3. Multiple agencies share responsibility for mine closure.

Table 1 presents these indicators, explains their relevance to a robust regulatory framework for closure, and states the query used in reviewing regulations from each of the target jurisdictions.

Table 1 Indicators of a robust regulatory framework for social aspects of closure – Category 1

#	Indicator	Explanation *(why does this expectation indicate a robust regulatory framework?)*	Query for this review
Are social aspects of mine closure specifically regulated?			
1	Mine closure regulation exists	Jurisdictions that regulate specifically for mine closure signal a recognition that closure requires careful, detailed and specific attention, driven by government law and policy.	1a. Is there legislation or regulation that exclusively focuses on mine closure? 1b. If not: is mine closure/rehabilitation covered in other, more general legislation?
2	Regulations require companies and/or public officials to consider social aspects of closure in closure planning (and other decisions related to closure)	Indicates regulatory attention to *social aspects* of mine *closure* (not only environmental rehabilitation and costs thereof). This indicator extends beyond requirements of public consultation.	Does mine closure legislation require companies and/or regulatory agencies to consider *social aspects* when planning for closure?
3	Multiple agencies share responsibility for mine closure	Recognition that closure affects multiple domains, and is therefore likely to span multiple governmental departments.	Is mine closure regulated by one or multiple authorities?

2.2.2 General regulation on mine closure (Category 2)

The second category relates to regulations that relate generally to mine closure, but may not explicitly cover the social aspects of closure. This category represents a more ad hoc and less policy-directed approach to governing social aspects of closure, because much of the planning is found in closure plans that would vary from site-to-site. In other words, jurisdictions that rely on general closure regulation to govern social aspects of closure could be considered to have taken a procedural approach, whereby legislation establishes procedures for managing closure generally that could be (but are not necessarily) adapted to managing social aspects of closure. Table 2 sets out indicators for robust regulation under this category.

Table 2 Indicators of a robust regulatory framework for social aspects of closure – Category 2

#	**Expectation**	**Explanation** *(why does this expectation indicate a robust regulatory framework?)*	**Query for this review**
What regulations about closure might involve social aspects of closure?			
4	Regulations set out a clear process to relinquishment	Provides procedural certainty to closure decision-making, including what decisions are to be made, who makes them, when, and under what circumstances.	Is a clear pathway to mine relinquishment specified in legislation?
5	Regulations obligate companies to prepare mine closure plans	Regulatory recognition that site-specific closure plans are necessary for orderly mine closure.	Is a mine closure/rehabilitation plan required by law?
6	Mine closure plans required to be updated	Acknowledges mine closure plans as a critical document in an orderly closure, affecting multiple stakeholders and containing substantive commitments (voluntary and/or mandatory) with respect to closure. Also acknowledges need for flexibility.	Are procedures for updating mine closure plans specified in legislation?
7	Mine closure plans are required to identify post-mining land use envisaged	Defining post-mining land use early in the life of mine encourages coordinated rehabilitation towards a specified land use outcome.	Is definition of the post-mining land use required?
8	Companies are required to publish mine operations plan, mine closure plan, and other related documents	Promotes transparency.	Is public disclosure of key documents mandatory by law?
9	Companies are required to make financial provisions for the cost of closure	Acknowledgement that closure costs are often considerable, yet incentives for companies to invest in closure diminishes as operations progress towards closure.	Is financial assurance required by legislation?

2.2.3 Regulations & guidance on social aspects of mining generally (Category 3)

The third category is the broadest, encompassing regulatory components that relate to social aspects of mining generally, but are not necessarily related to closure. Also included are documents issued as policy or guidance without having the force of law. Two indicators were formulated for this category, with sub-indicators shown in the right-most column of Table 3.

Table 3 Indicators of a robust regulatory framework for social aspects of closure – Category 3

#	Indicators	Explanation *(why does this expectation indicate a robust regulatory framework?)*	Query for this review
What general mining regulations / guidance could relate to social aspects of closure?			
10	Regulations require companies and/or regulators to consider social aspects in mining generally	Minimum level of acknowledgement of need to manage social aspects of mining (not necessarily mine *closure*). Note: *whose* consideration also noted in findings.	Does legislation require companies and/or regulators to: a. Address social impacts generally b. Conduct community engagement c. Consider and plan for impacts on indigenous people
11	Regulators issue policy and practical guidelines	Guidelines influence the content of mine closure plans (as well as other operational plans). This review tested whether guidance exists for: (a) closure, (b) social impact assessment,[10] and (c) stakeholder engagement.	Has the relevant regulatory authority issued guidelines for: a. Mine closure/rehabilitation b. Social impact assessment c. Stakeholder engagement

2.3 Target jurisdictions

For this project, 10 jurisdictions of interest were identified for study:

- Brazil
- Chile
- New Zealand
- Ontario, Canada
- South Africa
- Peru
- Philippines
- New South Wales, Australia
- Queensland, Australia
- Western Australia, Australia

The jurisdictions were selected according to the criteria outlined in Table 4 and in consultation with Consortium partners.

Table 5 shows how the criteria applied to each of the jurisdictions selected.

[10] Including social baseline studies.

Table 4 Selection criteria for study jurisdictions

#	Criterion	Description	Rationale
C1	Consortium partners in jurisdiction	One (preferably more) Consortium partners having operations in the jurisdiction;	Ensure Consortium partners' interests in this project are accounted for. Every Consortium partner must operate in at least one.
C2	Where major mines are set to close / have recently closed	Determined using S&P dataset[11] of mines set to close in 5-10 years.	Ensure relevance of jurisdiction to mine closure. Regulators in these jurisdictions are likely to be interested in the work of the SAMCC.
C3	Recency of reform	The date of last major reform of mine closure regulation.	Recent reforms suggest fresher thinking on managing mine closure and regulator interest in this research. However, very recent reforms may not have had opportunity to be tested in practice. A balance is sought.
C4	Language	Availability of English language materials online (some Spanish materials ok)	A practical constraint for this study team.
C5	Mix of geographies and legal systems	A mix of different continents, and common and civil law systems.	Relates to breadth of study.

Table 5 Study jurisdictions against selection criteria

Jurisdiction	**Consortium partners**	**Mines nearing closure**	**Last reform** (prelim. scan only)	**English language?**	**Geography & legal system**
Brazil	Rio Tinto BHP Anglo American	No	2018	No – Portuguese	South America; civil law
Chile	Rio Tinto BHP Newmont Goldcorp Anglo American	Yes	2011	No – Spanish	South America; civil law
New Zealand	Oceana Gold	Yes	1991	Yes	Oceania; common law
Ontario	Rio Tinto Newmont Goldcorp Anglo American	Yes	2000	Yes	North America; common law
South Africa	Rio Tinto Anglo American	Yes	2002	Yes	Africa; mixed system
Peru	BHP Newmont Goldcorp	Yes	2003	No – Spanish	South America; civil law

[11] The S&P Global Market Intelligence Database is one of the key data sources used for the Consortium's UQ-seeded project, 'Data Landscape for Closure'

Jurisdiction	Consortium partners	Mines nearing closure	Last reform (prelim. scan only)	English language?	Geography & legal system
Philippines	Oceana Gold	No	1995	Yes	Asia; mixed system
NSW	BHP Newcrest	Yes	2013	Yes	Oceania; common law
Queensland	Rio Tinto BHP Newcrest Anglo American	Yes	2018	Yes	Oceania; common law
Western Australia	Rio Tinto BHP Newcrest Newmont Goldcorp	Yes	2015	Yes	Oceania; common law

The study involved a desktop review of each jurisdiction's regulatory instruments as relevant to mine closure, against the indicators listed in our analytical framework (section 2.2).For the purposes of this study, 'regulatory instruments' encompassed a range of legal instruments that impose compliance expectations on mining companies. These include statutes, regulations, policies, and ministerial orders, as well as less formal standards, guidelines and codes of conduct. Within a jurisdiction, the suite of regulatory instruments form a regulatory framework – that is, a government's network of organisations, rules, laws and sanctions, intended to control or govern behaviour in an orderly way, generally for public benefit.

A total of 44 regulatory instruments were reviewed (Table 6). Only instruments relating to natural resources, environment and/or extractive industries were considered. Aspects of labour law, welfare, social services, and other policy domains were excluded from the review. While these domains could be relevant to the social aspects of mine closure, they were unlikely to contain direct and specific obligations on companies with respect to mine closure. In this study, these aspects were noted where regulatory instruments directly mentioned them (or their corresponding government departments, such as finance, health, indigenous affairs, labour and employment, environment, social welfare, planning, and infrastructure), but they were not systematically recorded in the results.

Table 6 Regulatory instruments reviewed

Jurisdiction	Instrument	Year	Type	Authority
Brazil	Mining Code (Decree-Law 227/1967)	1967	Act	Ministério de Minas e Energia (Ministry of Mines and Energy)
	Mining Regulation (Decree 9.406/2018)	2018	Regulation	
Chile	Ley 20,551 that Regulates the Closure of Mining Sites and Facilities	2011	Act	Ministerio de Minería (Ministry of Mines)
	Ley 20,819 (amendments to Ley 20,551)	2015	Act	
	Ley 20,551 regulations	2012	Regulation	
New South Wales	Mining Act	1992	Act	Department of Planning and
	Mining Regulation	2016	Regulation	
	Environmental Planning and Assessment Act	1979	Act	

Jurisdiction	Instrument	Year	Type	Authority
	Environmental Planning and Assessment Regulation	2000	Regulation	Environment (DPE)
	Mining Operations Plan (MOP) Guidelines	2013	Guideline	
	Social Impact Assessment Guideline	2017	Guideline	
	Community and Stakeholder Engagement Guideline	2017	Guideline	
New Zealand	Resource Management Act	1991	Act	Ministry for the Environment
	An Everyday Guide to the Resource Management Act (RMA): Consultation for Resource Consent Applicants	2015	Guideline	
	Crown Minerals Act	1991	Act	New Zealand Petroleum and Minerals
	Minerals Programme for Minerals (Excluding Petroleum)	2013	Regulation	
Ontario	Mining Act	1990	Act	Ministry of Energy, Northern Development and Mines (MENDM)
	Mine Development and Closure under Part VII of the Act (O. Reg. 240/00)	2003	Regulation	
Peru	Ley 28,090 that Regulates Mine Closure	2003	Act	Ministerio de Energia y Minas (Ministry of Energy and Mines)
	Ley 28,507 (amendments to Ley 28,090)	2005	Act	
	Ley 28,090 regulations	2005	Regulation	
Philippines	Mining Act (Republic Act No. 7942)	1995	Act	Department of Environment and Natural Resources (DENR)
	Revised Implementing Rules and Regulations (DENR Administrative Order No. 96-40)	1996	Regulation	
Queensland	Mineral Resources Act	1989	Act	Department of Natural Resources, Mines and Energy (DNRME)
	Mineral Resources Regulation	2013	Regulation	
	Mineral and Energy Resources (Financial Provisioning) Act	2018	Act	
	Environmental Protection Act	1994	Act	Department of Environment and Science (DES)
	Environmental Protection Regulation	2008	Regulation	
	Rehabilitation Requirements for Mining Resource Activities Guideline	2014	Guideline	
	Strong and Sustainable Resource Communities Act	2017	Act	Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP)
	Social Impact Assessment Guideline	2018	Guideline	

Jurisdiction	Instrument	Year	Type	Authority
South Africa	Minerals and Petroleum Resources Development Act	2002	Act	Department of Mineral Resources (DMR)
	Mineral and Petroleum Resources Development Regulations	2004	Regulation	
	Guideline for Consultation with Communities and Interested and Affected Parties	2012	Guideline	
	Social and Labour Plan Guidelines	2010	Guideline	
	National Environmental Management Act	1998	Act	Department of Environmental Affairs (DEA)
Western Australia	Mining Act	1978	Act	Department of Mines, Industry Regulation and Safety (DMIRS)
	Mining Regulations	1981	Regulation	
	Mining Rehabilitation Fund Act	2012	Act	
	Mining Rehabilitation Fund Regulations	2013	Regulation	
	Environmental Protection Act	1986	Act	Environmental Protection Authority (EPA)
	Environmental Protection Regulations	1987	Regulation	
	Guidelines for Preparing Mine Closure Plans	2015	Guideline	DMIRS/EPA

3. Key findings

This section presents findings of the regulatory review. Results are organised by the three categories of indicators set out in the analytical framework (section 2.2). Within each indicator, results are presented in three ways:

- Key points for that indicator (shaded in gold)
- A table showing jurisdiction-by-jurisdiction results
- Detailed description from illustrative jurisdictions.

We emphasise that the results form foundational data for further research. They should not be taken as evaluative or determinative: a 'yes' result in any one indicator does not necessarily mean the jurisdiction's regulations are better than those scoring a 'no', but may point to fruitful avenues of subsequent research.

3.1 Specific regulation on social aspects of closure (Category 1)

3.1.1 Whether mine closure regulation exists

All jurisdictions regulated for mine closure. Three of the 10 reviewed (Ontario, Chile and Peru) had legislation or other regulation exclusively focusing on mine closure, while the remainder regulated for mine closure in other, more general legislation (typically mining or environmental legislation).

Enacting closure-specific regulations indicates a regulatory recognition that closure involves complex issues that are distinct from (although connected to) issues of permitting, construction, and operation. This indicator is not by itself determinative – it is possible for detailed mine closure regulations to exist without a standalone closure statute.

Table 7 Existence of mine closure regulation

Jurisdiction	1a. Is there legislation or regulation that exclusively focuses on mine closure?	1b. If not: is mine closure/rehabilitation covered in other, more general legislation?
New South Wales	N	Y
Queensland	N	Y
Western Australia	N	Y
Ontario	Y	-
Chile	Y	-
Peru	Y	-
Brazil	N	Y
South Africa	N	Y
New Zealand	N	Y
Philippines	N	Y

Further detail

Peru is the first country to have enacted legislation that specifically addresses mine closure. The Ley Nº 28090, *Ley que Regula el Cierre de Minas* (Law that Regulates the Closure of Mines), along with associated regulations, Decreto Supremo Nº 033-2005-EM, *Regalamento para el Cierre de Minas* (Mine Closure Regulations) were enacted in 2003 and 2005 respectively.

In Chile, Ley Nº 20551, *Ley de Cierre de Faenas e Instalaciones Mineras* (Law that Regulates the Closure of Mining Operations and Facilities), along with associated regulations, Decreto 41, *Regalamento de la Ley de Cierre de Faenas e Instalaciones Mineras* (Mine Closure Regulations), were enacted in 2011 and 2012, respectively.

In Ontario, the requirements for mine closure are set out in Part VII of the *Mining Act* and elaborated in *Ontario Regulation 240/00* (Amended to *Ontario Regulation 282/03*) – *Mine Development and Closure under Part VII of the Act*.

In other focus jurisdictions, mine closure and/or rehabilitations requirements are briefly covered either in general mining legislation and associated implementing regulations (Brazil, New South Wales, Philippines, Western Australia), or in environmental legislation (New Zealand, Queensland). In the case of South Africa (where there is a particularly complex regulatory regime with at least 15 Acts) both mining and environmental legislation are applicable.

3.1.2 Does closure regulation require consideration of social aspects?

The previous indicator established that all study jurisdictions have legislation administering mine closure – whether a standalone Act or embedded within general mining or environmental legislation. This indicator inquired into the content of those regulations. We tested whether the closure-specific provisions required either the regulator or the company to comply with any outcomes falling into typical social performance domains.

We did not find any such provision in any jurisdiction. Acknowledging that a review of this scope could not comprehensively review every possible provision, the fact that none was discovered in the course of this study suggests that social aspects of mine closure are not well regulated globally.

3.1.3 Is mine closure regulated by one or multiple authorities?

Having multiple agencies responsible for various aspects of mine closure would reflect the multi-faceted and multi-disciplinary nature of mine closure. We would expect to see multiple agencies have input into closure decisions. Typically, mining and environmental departments would carry primary responsibility for mine closure. A regulatory approach that encompasses the *social aspects* of mine closure would also be expected to include departments with oversight over social aspects such as town or regional planning, community development, or economic policy. Such is the case in Queensland – in addition to mining and environment departments, the Department of State Development, Manufacturing, Infrastructure and Planning is tasked with implementing the *Strong and Sustainable Resource Communities Act 2017* (SSRC Act).

Although we expect to see multiple agencies collaborate to govern mine closure, we do not advocate for any particular institutional arrangement. Nor do we suggest that more agencies is necessarily better, as fragmented responsibilities pose challenges for achieving consistency and coordination.

Table 8 Institutional arrangements

Jurisdiction	3. How many agencies administer mine closure?	Notes – level of government responsible for closure
New South Wales	1	State / Province
Queensland	3	State / Province
Western Australia	2	State / Province
Ontario	1	State / Province
Chile	3	Federal / National
Peru	1	Federal / National
Brazil	1	Federal / National
South Africa	2	Federal / National
New Zealand	2	Local
Philippines	1	Federal / National

Further detail

As shown in Table 8, mine closure regulation is mainly the purview of a single authority in six of the ten jurisdictions reviewed. In New Zealand, Chile, South Africa and Western Australia, separate authorities regulate the mining and environmental aspects of mine closure.

Table 8 also notes the level of government responsible for closure. In the Australian and Canadian jurisdictions, mine closure is regulated at the state/provincial level. There are few federal laws specifically regulating mining. The Australian mining industry is regulated federally only where it intersects with Commonwealth matters of national environmental significance and obligations under international treaties. In the three South American jurisdictions, along with South Africa and the Philippines, mine closure is mainly regulated at the national/federal government level. This is not to say that lower level government units have no influence, but that it is secondary to national authorities. In Chile, in addition to the federal-level agencies (geological services, environment, and infrastructure and water), there are sectorial-level environmental permits that can include closure-specific commitments. In the Philippines, Local Government Units are tasked with ensuring compliance with relevant laws on public notice, public consultation and public participation. In New Zealand, the resource consent process is usually managed by local councils ('consent authorities'). Some resource consent applications are decided by a board of inquiry or the Environment Court instead of the local council.

3.2 General regulation on mine closure (Category 2)

Indicators in this category relate to regulations that are about mine closure, but not specifically the *social aspects* of mine closure. In general, these indicators relate to whether a jurisdiction has established clear procedures for managing mine closure, which could be adapted to include social aspects.

3.2.1 Is a clear pathway to mine relinquishment specified in legislation?

A clear procedural pathway to mine relinquishment would generally clarify what obligations companies and regulators must satisfy in order for the regulator to regain responsibility of the mining tenement. Few of the jurisdictions reviewed set up a clear pathway to relinquishment. In Australian jurisdictions, no pathway is mapped out, and criteria to demonstrate successful completion of the closure process are ill-defined. The same applies in Brazil, New Zealand, the Philippines and South Africa.

In Chile, Ontario and Peru closure criteria are covered in some detail in mine closure regulation. These three cases demonstrate an advantage of having stand-alone regulation of mine closure, which allows for detailed discussion of various procedural aspects. However, even in these jurisdictions, the regulatory focus is on achieving safe, stable, non-polluting and self-sustaining post-mining landscapes – i.e. environmental aspects of closure. Social aspects of mine closure are given little or no coverage.

Table 9 Clear pathway to relinquishment

Jurisdiction	4. Is a clear pathway to mine relinquishment specified in legislation?	If 'yes', what is the coverage of social aspects of closure?
New South Wales	No	-
Queensland	No	-
Western Australia	No	-
Ontario	Yes	Negligible
Chile	Yes	Negligible
Peru	Yes	Negligible
Brazil	No	-
South Africa	No	-
New Zealand	No	-
Philippines	No	-

3.2.2 Is a mine closure plan or rehabilitation plan required by law?

Companies are typically required to prepare a plan for closure. These plans are variously named, but will be referred to here as a mine closure plan. Although none of the jurisdictions studied prescribed social aspects to be included in closure plans, the requirement for such plans provides a mechanism for social aspects of closure to be identified, managed, assessed, and governed. All ten of the jurisdictions studied required a mine closure plan.

In Brazil, for example, mine closure plans do intersect with social aspects of closure, because the plans are required to align with other plans. More commonly, mine closure plans are required to intersect with environmental and not social aspects of closure. For example, in the Philippines, the Mining Act requires the mine closure plan (known as a Final Mine Rehabilitation and Decommissioning Plan) to be integrated in the Environmental Protection and Enhancement Programme of a mine.

Table 10 Whether mine closure plan or rehabilitation plan required by law

Jurisdiction	5. Is a clear pathway to mine relinquishment specified in legislation?
New South Wales	Yes
Queensland	Yes
Western Australia	Yes
Ontario	Yes
Chile	Yes
Peru	Yes
Brazil	Yes
South Africa	Yes
New Zealand	Yes
Philippines	Yes

Further detail

Brazil's *Mining Regulation* 2018 (Decree 9.406/2018) introduced mandatory submission of a mine closure plan. All mining and exploration activities in New South Wales require authorisation under the *Mining Act* 1992. Authorisations contain conditions requiring an approved Mining Operations Plan, complete with end of mining specifications, prior to the commencement of surface disturbing activities. In New Zealand, local council conditions of resource consent for mining activities often require the preparation and annual review of a Rehabilitation and Closure Plan. In Queensland, the *Mineral and Energy Resources (Financial Provisioning) Act* 2018 introduced a requirement for Progressive Rehabilitation and Closure Plans as part of the environmental authority process. In WA, the 2010 amendments to the *Mining Act* 1978 require a mine closure plan to be submitted to both mining and environmental regulators for assessment and approval as part of mining proposal applications, at the very outset of the mine life cycle.

3.2.3 Are procedures for updating mine closure plans specified in legislation?

The operating environment changes over the life of the mine. Mine closure should be updated periodically to reflect these changes. We examined each jurisdiction's regulations to ascertain what (if any) mandatory procedures existed, requiring companies and/or regulators to update closure plans. Of the jurisdictions surveyed, four (Brazil, South Africa, New Zealand, and the Philippines) did not specify requirements for updating the mine closure plan.

The level of detail about what triggers an update varied significantly across the jurisdictions. The *Ontario Regulation 282/03* was the most detailed. The proponent must submit an amendment to the Closure Plan any time the Closure Plan is materially deficient. The amendment may be required due to a change initiated by the proponent – for example, an expansion of operations (e.g. expansion of the size of a tailings disposal area), or a change in how operations are being undertaken or a change in the cost of planned rehabilitation activities. The amendment could also be required due to an order from the Ministry of Energy, Northern Development and Mines (MENDM), issued because a site inspection revealed a deficiency. The amendment is submitted to the MENDM for approval and is posted on the Environmental Registry as an information item. A public comment period is not required. While the MENDM does not have to wait for public comments to make a decision, in practice, it would consider any comments received.

Table 11 Regulatory procedures for updating mine closure plans

Jurisdiction	6. Are procedures for updating mine closure plans specified in legislation?
New South Wales	Yes
Queensland	Yes
Western Australia	Yes
Ontario	Yes
Chile	Yes
Peru	Yes
Brazil	No
South Africa	No
New Zealand	No
Philippines	No

Further detail

In New South Wales, a Mining Operations Plan (MOP) may be approved for a period of less than seven years at the request of the authorisation holder, or at the discretion of the Department. Where an activity is proposed that is not in accordance with an approved MOP, the holder must submit either a MOP Amendment or a new MOP. In Western Australia, all mine closure plans approved by the Department of Mines must be regularly reviewed over the life of a mine. The Mining Act requires these plans to be updated and submitted for approval every three years or such other time as specified in writing.

3.2.4 Is definition of the post-mining land use required?

This indicator relates to whether regulations require companies to define the post-mining land use in the mine closure plan. We acknowledge that the final land use is likely to be adjusted over the course of mine-life (or more narrowly in the course of closure planning). We consider such a requirement to indicate a robust regulatory regime for closure because it provides at least a concrete starting point for discussing post-mining futures. This requirement does not in itself guarantee a productive and participatory closure planning process – but conversely the absence of a proposed 'base case' (however mutable) makes it difficult to engage affected communities in discussions about what will happen at and after closure.

The jurisdictions that legislated for such a requirement were the same as those that required updates to the mine closure plan (Indicator 6, section 3.2.3). This likely points to generally less prescriptive regulations in Brazil, South Africa, New Zealand and the Philippines in relation to closure plans.

Table 12 Whether required to define post-mining land use

Jurisdiction	7. Is definition of the post-mining land use required?
New South Wales	Yes
Queensland	Yes
Western Australia	Yes
Ontario	Yes
Chile	Yes

Jurisdiction	7. Is definition of the post-mining land use required?
Peru	Yes
Brazil	No
South Africa	No
New Zealand	No
Philippines	No

Further detail

According to the New South Wales *Mining Operations Plan Guidelines*, 'the post mining land use needs to be defined early in the life of the mine to ensure that both mining and rehabilitation activities progress towards a post mining land use outcome which is sustainable and meets the requirements of key stakeholders.' The Mining Operations Plan should show the proposed post mining land use and landform at the completion of the project, i.e. at the end of mine life.

Ontario Regulation 282/03 requires mine closure plans to include 'a description of specified land uses for the site after the project is closed out including topography, water quality and quantity, plant and animal life.'

The Philippine *Revised Implementing Rules and Regulations* 1996 state that mining, as a temporary land use, should lead to 'an optimum land use in the post-mining stage' as a result of progressive and engineered mine rehabilitation work done in cycle with mining operations. Mine site decommissioning and rehabilitation shall aim to establish 'a land use capability that is functional and proximate to the land use prior to the disturbance of the mine area, unless other more beneficial land uses are predetermined and agreed in partnership with local communities and Local Government Units.'

Queensland's *Rehabilitation Requirements for Mining Resource Activities* recommends that post-mining land use be clearly specified with reference to grazing, cropping, forestry plantation, habitat, or return to native vegetation. Moreover, the prior land capability and use of the site, the existing uses of adjacent land and the views of landholders when selecting the future land use should be considered.

South Africa's *Mineral and Petroleum Resources Development Regulations* 2004 provide, inter alia, for the future land use objectives for the mining site to be described prior to the approval of the mine closure plan.

According to Western Australia's *Guidelines for Preparing Mine Closure Plans*, 'post-mining land uses should be identified and agreed upon through consultation before approval of new projects.' This should take into account the operational life span of the project, and should include consideration of opportunities to improve management outcomes of the wider environmental setting and landscape, and possibilities for multiple land uses. In Western Australia, the post-mining land use(s) must be: relevant to the environment in which the mine will operate or is operating; achievable in the context of post-mining land capability; acceptable to the key stakeholders; and ecologically sustainable in the context of the local and regional environment.

3.2.5 Is public disclosure of key documents mandatory by law?

Requiring public disclosure promotes transparency about mine closure planning, financing, and impact management. Greater transparency allows a broader set of parties to hold regulators and companies to account. In the context of governing for closure, we principally expect the mine closure plan to be disclosed – and at various draft stages to allow for public participation and community engagement in its development. We found that disclosure requirements varied significantly across the jurisdictions. As with other indicators relating to mine closure plans (indicators 6 and 7, see sections 3.2.3 and 3.2.4), Ontario had the most detailed procedures for public disclosure, in *Ontario Regulation 282/03*. The Australian jurisdictions reviewed (New South Wales, Queensland and Western Australia) also required public disclosure.

Table 13 Public disclosure of mine closure plans

Jurisdiction	8. Is public disclosure of key documents mandatory by law?
New South Wales	Yes
Queensland	Yes
Western Australia	Yes
Ontario	Yes
Chile	No
Peru	No
Brazil	No
South Africa	No
New Zealand	No
Philippines	No

Further detail

In Ontario, before starting (or restarting) advanced exploration or mine production, the mining company must publish a notice in a local newspaper and hold a public information session in the area where the project is located. The public notice includes a description of the project, indicating the nature, size and extent of related work to be carried out to complete the project. The company must address any questions raised by the public in the preparation of the final Closure Plan and provide the Director of Mine Rehabilitation with the names and comments from the public information session within 15 days of the event. The company must also report on any consultations carried out with Aboriginal peoples affected by the project, including a description of their comments and responses. A notice that the Director has received the Closure Plan is posted on the Ontario Environmental Registry. The notice is in the form of a proposal that is subject to a public comment period. The website posting includes a brief description of the mining project, the main components of the Closure Plan and information about where the Closure Plan is available for public review. There is a specified comment period, often 30 days. Any resident of Ontario who has an interest in a decision may seek leave to appeal the decision to approve or not approve the Closure Plan. The appeal must be made within 15 days of the decision being registered.

In New South Wales, approved Mining Operations Plans are made available to the public for viewing at the relevant regional office and may also be available on the department's website. In Queensland, the Progressive Rehabilitation and Closure Plan is subject to the same information request, public notification and decision-making process that applies to applications for an environmental authority under the *Environmental Protection Act* 1994. In Western Australia, the Department of Mines has the ability to make reviewed mine closure plans publicly available, where there is a regulation-making power enabling the release of information provided to the department.

In some jurisdictions (such as Chile), public disclosure is not mandatory, but a member of public may request access to certain key documents.

3.2.6 Is financial assurance required by legislation?

Financial assurance requires mining companies to set aside (or otherwise guarantee the availability of) funds to carry out closure activities. CSRM conducted a review of closure bond and other financial assurance mechanisms as part of the Social Aspects of Mine Closure Research Consortium – the file note is appended to this report as Appendix A.

Requiring financial assurance indicates that regulators are aware of both the potentially high costs of closure, and the risk of having companies default on their obligations to complete agreed closure activities. Of the jurisdictions reviewed for this study, all except Brazil required some type of financial assurance.

None of the jurisdictions reviewed included social performance obligations within the ambit of its financial assurance system. This finding indicates that regulators are not aware of, or have not yet devised satisfactory ways of addressing, the costs of managing social aspects of closure.

Table 14 Financial assurance

Jurisdiction	9. Is financial assurance required by legislation?
New South Wales	Yes
Queensland	Yes
Western Australia	Yes
Ontario	Yes
Chile	Yes
Peru	Yes
Brazil	No
South Africa	Yes
New Zealand	Yes
Philippines	Yes

Further detail

Of the financial assurance systems reviewed, the majority explicitly state that the purpose is to protect government and taxpayers from incurring financial liability for remediation if a mining operator fails to meet closure obligations. The majority of jurisdictions reviewed required financial assurance to be lodged as part of the approval processes and prior to the commencement of mining operations. Most jurisdictions allow flexibility in the financial instrument used. A bank guarantee or a letter of credit from a bank were common, as were trusts and cash deposits.

The bonded amount has historically secured performance at a specific site only, with the host state unable to apply those funds to another mine site. Pooled funds are an emerging structure, whereby companies contribute to a consolidated fund, and the host state may draw on that fund to cover the cost of closure at multiple sites, or to fund related activities. For example, Australian jurisdictions have relied on site-specific bonds, with non-refundable contributions to pooled funds recently introduced alongside bonds (in Queensland), or to replace bonds (in Western Australia). In some cases there is progressive adjustment of bonded amounts in line with the area of disturbed land. Though systems are widespread, recent initiatives to tighten regulation on this front in some jurisdictions suggest that there are challenges with enforcement, inconsistency of calculations and inadequacy of provisions.

3.3 Regulations & guidance on social aspects of mining generally (Category 3)

Indicators in this category relate to regulations that are about social aspects of mining generally, but not specifically of *mine closure*. In general, these indicators relate to whether a jurisdiction exhibits an awareness of the need to regulate social performance throughout the mine lifecycle, even if closure as a specific phase is not (yet) singled out as requiring particular attention.

3.3.1 Requirements to consider social aspects of mining generally

When reviewing regulations, we sought requirements relating to social impact assessment, community engagement or public participation, and indigenous peoples. As Table 15 shows, for most part, these aspects had regulatory coverage across the focus jurisdictions. These results suggest that regulators are aware (and have long been aware) of the need to manage social aspects of mining generally. The dearth of regulation that focuses on the social aspects *of closure* (see section 3.1.2) reinforces the finding that regulators have not yet successfully carved out closure as a particular social issue requiring leadership.

Table 15 Requirement to consider social aspects of mining generally

Jurisdiction	10a. Social impacts	10b. Community engagement	10c. Indigenous peoples
New South Wales	Yes	Yes	Yes
Queensland	Yes	Yes	Yes
Western Australia	Yes	Yes	Yes
Ontario	Yes	Yes	Yes
Chile	No	Yes	Yes
Peru	Yes	Yes	Yes
Brazil	No	No	Yes
South Africa	Yes	Yes	Yes
New Zealand	Yes	Yes	Yes
Philippines	Yes	Yes	Yes

Further detail – social impacts

In New South Wales, the objective of the *Environmental Planning and Assessment Act* 1979 is to encourage the proper management, development, and conservation of natural resources for the purpose of promoting the social and economic welfare of the community and a better environment. The Environmental Planning and Assessment Act Regulation 2000 requires proponents to 'take into account the environmental impact of an activity on a community'. These specific references provide the statutory basis upon which the state can hold proponents accountable in relation to development activities. This relates to the community's economic welfare and environmental impact on communities.

In the Philippines, *Mining Act* 1995 and its regulations exhibit socially sensitive requirements. It has specific provisions that require project proponents to take into consideration:

- Local government empowerment
- Respect and concern for the indigenous cultural communities
- Equitable sharing of benefits of natural wealth

- Economic demands of the present generation while providing the necessary foundation for future generations
- The effect of globalisation trends.

In Queensland, the *Strong and Sustainable Resource Communities Act* 2017 seeks to ensure that communities near large resource projects benefit from project development. The Act specifies that a social impact assessment (SIA) should consider the full project lifecycle and address the following key socio-economic aspects: community and stakeholder engagement; workforce management; housing and accommodation; local business and industry procurement; and health and community well-being. The SIA provisions of the Act work in conjunction with other provisions to achieve its stated objectives. Other provisions include 'prohibition on 100 per cent fly-in, fly-out workforce for large resource projects', and the prevention of discrimination against local people in recruitment.

In South Africa, *Mineral and Petroleum Resources Development Regulations* 2004 require that the mandatory social and labour plan must include a local economic development program and human resources development program which primarily specify activities during operations – some of which build resilience to closure transitions and have lasting effects. The regulations also require a program to manage retrenchment, associated with closure or downscaling, that includes plans to:

- Save jobs and avoid job losses and a decline in employment
- Provide alternative solutions and procedures for creating job security where job losses cannot be avoided
- Minimise the social and economic impact on individuals, regions and local economies where retrenchment and closure of the mine is certain.

Further detail – community engagement

Community engagement and/or stakeholder participation is mandated as part of development projects by legislation in the focus jurisdictions, with the exception of Brazil. This provides for all stakeholders to be engaged and have their interests considered.

In New South Wales, one of the objectives of the *Environmental Planning and Assessment Act* 1979 is to 'enable public involvement and participation in environmental planning and assessment', including the participation of vulnerable and marginalised groups. As well, the *Social Impact Assessment Guideline* encourages 'respectful, inclusive and meaningful engagement with potentially affected people and other interested parties'. Public involvement and participation in environmental planning and assessment includes vulnerable and marginalised groups. Similarly, Queensland's *Social Impact Assessment Guideline* requires project proponents to 'engage with potentially impacted communities and other stakeholders in a transparent and inclusive manner, throughout the project lifecycle'.

In New Zealand, the foundations and principles of consultation are stipulated in the *Resource Management Act* 1991. The *Ontario Regulation 282/03 – Mine Development and Closure under Part VII of the Mining Act*, provides detailed requirements for community input and public involvement as part of mine closure planning process, including consultation with Aboriginal communities. Queensland's *Financial Provisioning Act* 2018 stipulates that a proposed Progressive Rehabilitation and Closure Plan (PRCP) include 'details of the consultation undertaken by the applicant in developing the proposed PRCP', and 'details of how the applicant will undertake ongoing consultation in relation to the rehabilitation to be carried out under the plan'.

Further detail – indigenous issues

Consideration of Indigenous rights and interests is required by legislation in all focus jurisdictions. However, there are differences in whether the consultation is regarded as a duty of the state or the proponent and between those that require the 'consent' of Indigenous People and those only requiring 'consultation' with them and denying any right of veto. Generally, stipulations focus on the approvals stage and during operations rather than specifically addressing closure.

Brazil, Chile and Peru are among 22 countries that have signed and ratified the ILO Convention 169 (Indigenous and Tribal Peoples Convention). Under ILO Convention 169, Indigenous peoples have the right to be consulted on legislative or government matters that could affect them directly and can participate in the preparation, application and evaluation of development plans and programs. In Brazil, Chile and Peru, the ILO Convention 169 requires free, prior and informed consent (FPIC) in cases involving legislative or government matters (but not private company developments) that could affect them directly.

In Brazil, the Constitution recognises the need for special rules for mining in Indigenous lands. The Constitution acknowledges the Indigenous peoples as the first and natural owners of the land and guarantees them their right to land. Exploration and extraction of mineral wealth on Indigenous lands must be carried out solely with authorisation from the National Congress after listening to the communities involved, who must be guaranteed participation in the benefits of the mining activities. Eviction of Indigenous peoples from their lands is prohibited.

Chile signed and ratified the ILO 169 Convention in 2008. In order to fulfil its obligations under the ILO 169, Chile produced two separate laws acknowledging indigenous communities' right to consultation and right to FPIC. Chile's Supreme Decree 40 (2013) and Supreme Decree 66 (2014) contain provisions that specifically concern consultation with indigenous communities and regulate the consultation process. Significantly, both decrees stipulate that the responsibility for the consultation process lies with the state administration. Consultations must be performed in good faith, together with the affected Indigenous community's own representative institutions and aim to achieve an agreement or consent about the project.

The Peruvian Constitution (1993) provides that native and peasant communities are autonomous in their organization, communal work and in the use and free disposal of their lands, as well as in economic and administrative matters within the framework established by law. In 1994, Peru signed and ratified the ILO 169 Convention, which gave indigenous communities the right to participate in and be consulted on issues and activities that could affect their territories and ways of life. The government strengthened this protection with passing of a supreme decree that stipulates rules and regulations for prior commitment as a requirement for the development of mining activities (2003) and the Law of the Right to Prior Consultation to Indigenous or Native Peoples (2012).

In New Zealand, the *Treaty of Waitangi* (*Te Tiriti o Waitangi*), reflects the right to self-determination for *tangata whenua,* indigenous rights and property rights. It recognises Māori property interests in lands and other *taonga*, although not specifically minerals. The mining law, regulations and rules provide some recognition of Māori interests in minerals. The Minerals Programme for Minerals (Excluding Petroleum) 2013 provides that certain land that has been identified as being of particular importance to the *mana* of *iwi* or *hapū* must not be included in a permit. Moreover, the Minerals Programme specifies the matters on which *iwi* and *hapū* must be consulted, sets out principles and procedures for consulting with *iwi* and *hapū*, and specifies the matters of which *iwi* and hapū must be notified. Finally, it requires permit holders to report annually on their engagement with iwi and *hapū*, whose *rohe* includes parts of the permit area, or who otherwise may be directly affected by the permit. The *Resource Management Act* directs decision makers to consider Māori interests in achieving the purpose of sustainable management. Specifically, decision makers must recognise and provide for 'the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, *waahi tapu*, and other *taonga*'.

In Ontario, *Ontario Regulation 282/03* requires mine closure plans to report on any consultations carried out with Aboriginal peoples affected by the project, including a description of their comments and responses.

The Philippines' *Mining Act* and its regulations has specific provisions that take into consideration respect and concern for the indigenous cultural communities. The Act recognises the rights of indigenous peoples and indigenous cultural communities. The *Indigenous Peoples Rights Act* 1997 specifies that no mineral agreements and mining permits can be granted in ancestral lands/domains. Where written consent is granted by indigenous peoples, a royalty payment has to be negotiated which will amount to at least 1% of the gross output of the mining operations in the area. This royalty forms part of a trust fund for socioeconomic well-being of the indigenous cultural communities though it does not specify if it is just to 'last' during operations or beyond.

3.3.2 Policy and practical guidelines

This final indicator seeks to determine whether the focus jurisdictions have issued policy and practical guidelines, with respect to mine closure and rehabilitation; social impact assessment; and stakeholder engagement. Guidelines do not carry the force of law. A jurisdiction can be said to recognise an issue but has fallen short of providing policy- or regulatory leadership where there exists guidelines but not an accompanying regulation or Act.

Overall, the coverage is patchy over the ten focus jurisdictions, as shown in Table 16. Even where a 'yes' is recorded, we note that there are few guidelines for social impact assessment and stakeholder engagement that address mine closure. Of the focus jurisdictions, only New South Wales's social impact assessment guideline emphasised the importance of assessing social impacts through to post-closure.

All three indicators 11a, 11b and 11c do receive coverage at the regulatory level (see especially sections 3.1.1 and 3.3.1). The lack of policy and practical guidance suggests an opportunity for regulators to provide greater support to companies in these areas, both generally and with respect to social aspects of closure.

Table 16 Policy and practical guidelines

Jurisdiction	11a. Mine closure/rehabilitation	11b. Social impact assessment	11c. Stakeholder engagement
New South Wales	Yes	Yes	Yes
Queensland	Yes	Yes	No
Western Australia	Yes	No	No
Ontario	No	No	No
Chile	No	No	No
Peru	No	No	No
Brazil	No	No	No
South Africa	No	Yes	Yes
New Zealand	No	No	Yes
Philippines	No	No	No

Further detail – mine closure / rehabilitation guidelines

Internationally, there is guidance for evaluating mine closure and rehabilitation provisions in environmental impacts assessments (EIAs), usually at approvals stage.[12] The three Australian jurisdictions that are included in this study have a range of supporting guidelines that address mine closure planning requirements:

- In New South Wales, the *Mining Operations Plan (MOP) Guidelines* 2013 detail the process for monitoring and managing progress towards mine closure, ensuring that mineral resources development is 'environmentally and socially sustainable'. The MOP Guidelines approach mine closure as a process that is broader than mine rehabilitation that encompasses, for example, optimisation of land use for socio-economic outcomes. Specifically, the guidelines require that closure objectives describe the requirements for achieving positive social and economic outcomes.
- In Queensland, guidance on rehabilitation is outlined in the *Rehabilitation Requirements for Mining Resource Activities Guideline* 2014. The guideline states that mine closure 'provides opportunities for land disturbed by mining to be rehabilitated to one or more sustainable post-mining land uses'. The guideline

[12] Environmental Law Alliance Worldwide, 2010 Guidebook for evaluating mining project EIAs says an EIA 'must include a guide to deactivate, stabilise and perform long-term surveillance of waste management' (p.96)

suggests that 'completion criteria should be developed in consultation with stakeholders (e.g. landowners, local government, Indigenous peoples, community groups and various state departments)'.

- In Western Australia, mine closure plans must be prepared in accordance with the *Guidelines for Preparing Mine Closure Plans* 2015. While the guidelines 'focus on the ecological aspects of mine closure planning', proponents are encouraged 'to consider socio-economic aspects of closure planning, in particular, impacts of mine closure on local communities'.

Further detail – social impact assessment guidelines

Three of the jurisdictions have issued supporting guidelines that address social impact assessment and mitigation requirements.

- In New South Wales, the *Social Impact Assessment Guideline* 2017 provides direction on assessing positive and negative social impacts in the context of the impact assessment process.
- In Queensland, the *Social Impact Assessment Guideline* 2018 applies to all projects (mining and otherwise) that require environmental and social impact assessment. Closure is not mentioned.
- In South Africa, as part of an application for mining rights the applicant is required to submit a social and labour plan (SLP) to the mining regulator. While not guidance on social impact assessment per se, the *Social and Labour Plan Guidelines* 2010 does recommend designing programs for managing downscaling and retrenchment (not only at closure but at other stages of mine life). The programs detailed in the SLP must be budgeted for and included in the financial provision for the site.

Further detail – stakeholder/community engagement guidelines

Three focus jurisdictions have issued supporting guidelines that address stakeholder or community engagement expectations and requirements for project proponents. Importantly, these are not specific to closure and do not require consultation about closure except in general terms such as 'throughout the project lifecycle'. For example, none of the following mention closure:

- New South Wales's *Community and Stakeholder Engagement Guideline* 2017 describes how the government expects proponents to engage with the community and other stakeholders during the environmental impact assessment process. However, mining is not mentioned – and nor is closure.
- New Zealand's *An Everyday Guide to the Resource Management Act (RMA): Consultation for Resource Consent Applicants* 2015, provides information on the consultation process if project proponents are applying for a resource consent and explains the foundations and principles of consultation under the Act. While a useful resource for the general public (rather than mining companies), the focus of this guidance is on challenges to approvals. Closure is not mentioned.
- South Africa's *Guideline for Consultation with Communities and Interested and Affected Parties* 2012 provides detailed guidance on the implementation of the sections of the *Mineral and Petroleum Resources Development Act* 2002 require notification and consultation with communities. Closure is not mentioned.

4. Conclusions

The primary objective of this project was to systematically collate global regulations on the social aspects of mine closure. This report constitutes a synthesised repository of the regulations gathered and characterised.

The characterisation process offered some insights into the state of governance with respect to the social aspects of closure. When developing the study method, we looked for governance measures applicable not just to closure, but to all phases of mine life. We found that most regulators and regulations focus on attracting investments and the early phases. Closure was noticeably less well covered in regulations than permitting. Rhetoric about sustainability and 'triple bottom line' outcomes of mine closure largely have not been translated into policies, legislation and guidance. A few jurisdictions provide leadership about ways for governance and regulation of mine closure to address social aspects and ensure the ambition that mining will contribute to an enduring positive legacy. But most still treat the management of mine closure as a biophysical challenge, notwithstanding growing discourse around the importance of social performance in mining.

Figure 3 synthesises this observation into a graphic: although socioeconomic aspects of mining are 'trending' within the industry (and we contend rightly so), only leading jurisdictions translate this discourse into regulation. The fact that so few jurisdictions have done so perhaps indicates the central difficulty articulated in the introduction of this report – namely, that there is an unresolved tension between the State's and the company's responsibilities for social aspects of closure.

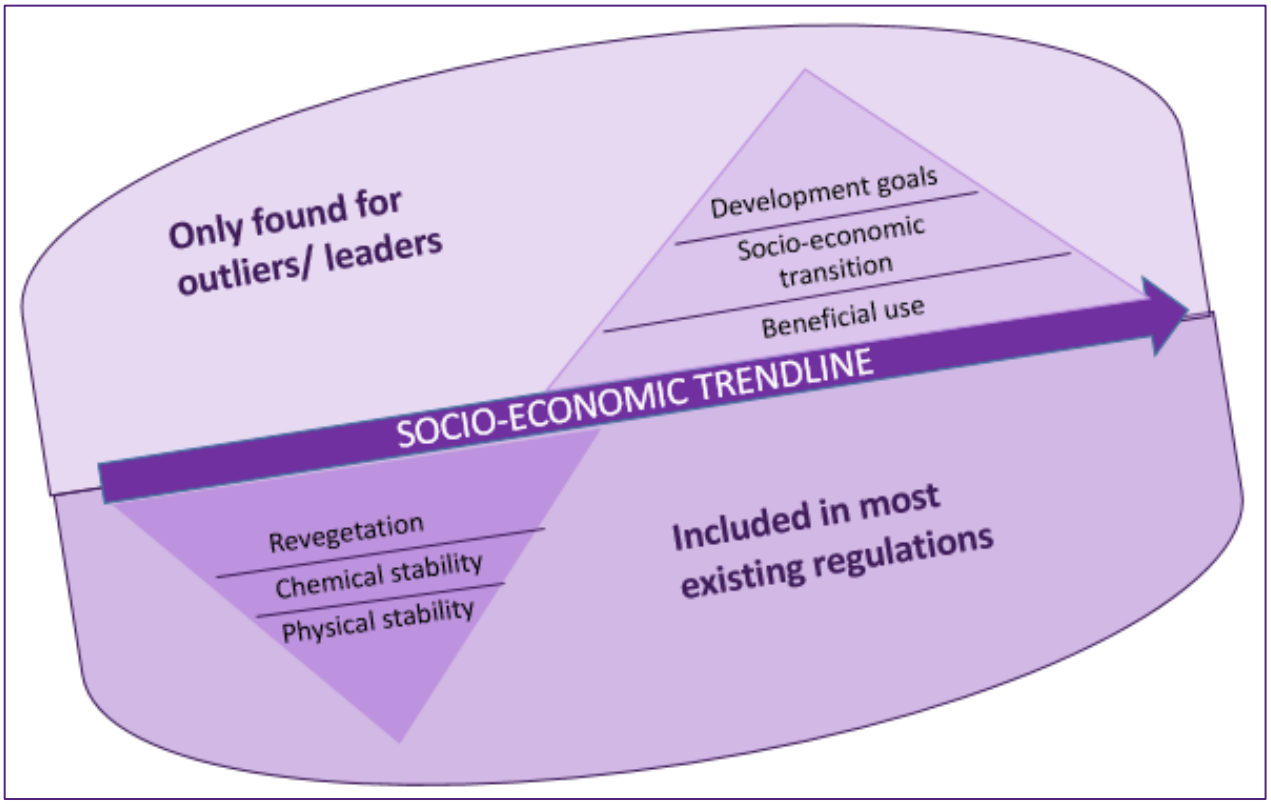


Figure 3 Closure regulations tend to relate to biophysical aspects

This project has been an early step towards developing robust regulations for closure, which provide regulatory leadership in relation to social aspects, as well as improving operational viability for companies (see section 1.2 for a discussion on subsequent research). Some ideas for such a set of regulations arose in the course of this study, and are captured in Table 17. This table summarises key observations from this project, and extrapolates them into expectations for what a robust set of closure regulations would encompass.

Table 17 Observations about mine closure governance & expectations for regulatory regimes

#	Observation	Expectation
1	Most jurisdictions endorse or require stakeholder engagement but few have guidelines, measures, monitoring or sanctions to back that up. In most cases, engagement is concentrated at approvals stage with little subsequent follow up by regulators at least.	That stakeholder engagement should be required and should influence closure transition proposals and actions. Both companies and regulators should approach mine closure decisions in consultation with those affected.
2	All focus jurisdictions required consideration of Indigenous rights and interests though legislation sometimes concentrated on rights to be consulted, land rights or cultural heritage rights rather than specifically mandating FPIC.	That regulators require the FPIC of Indigenous People with respect to closure plans.
3	Few jurisdictions have a clear policy about where expectations of operators ends and the state assumes responsibility, especially with respect to the post-closure period. The range across jurisdictions is from the state clearly assuming responsibility, to places with contaminated land provisions and very few with 'chain of responsibility' laws.	That there should be clear delineation of the respective roles of state and proponent with the state acting as a check and balance.
4	Early preparation of mine closure plans is generally required and regular updating is specified, though specific names vary. However, the amount of detail stipulated varies considerably and few require any social considerations.	That the regulator will require advance preparation of a mine closure plan with procedures for adjustments, public input and mention of potential socio-economic impacts and mitigations.
5	Biophysical issues predominate and no jurisdiction pays direct attention to social aspects, or has social closure criteria though a few address post-closure land use and stakeholder engagement.	That there should be a mechanism to address more than the biophysical ramifications of the mine closure transition.
6	No jurisdiction indicates that any social considerations influence these decisions and few suggest parallel incentives and performance mechanisms suitable to social issues.	That the role of social considerations in conditions for relinquishment, and release of financial assurance should be clearly specified.
7	Those countries with closure-specific laws or regulation did not include socio-economic considerations. Those jurisdictions with greatest requirement for social conditions applied their stipulations to whole of project-life rather than specifically mentioning closure.	That jurisdictions that have introduced specific mine closure regulations might deal more comprehensively and holistically with the closure challenges.

Appendix A – Mine closure regulations & closure bonds

This file note has been prepared as part of the Social Aspects of Mine Closure Consortium, a research consortium convened by the Centre for Social Responsibility (CSRM). The Consortium is jointly funded by mining industry partners and The University of Queensland Sustainable Minerals Institute (UQ-SMI). This file note was funded by UQ-SMI (UQ-SMI Seeded Project 2).

A-1 Introduction to this file note

Developers are generally expected to make financial provisions for closure costs, which can reach hundreds of millions of dollars. There are occurrences of major mining companies divesting near-exhausted and/or non-economic assets to smaller companies, which transfers closure liabilities to companies less able to bear the cost.[13] In some jurisdictions, host governments require companies to provide a form of financial security against the cost of closure. Financial security (or financial assurance) mechanisms ensure that the host government has access to pre-arranged funds in the event that a company is unable or unwilling to meet their closure obligations. The aim of these arrangements is to reduce the financial risk borne by host governments. Various forms of security have been adopted, such as the payment of a surety bond, provision of a bank guarantee, and purchase of an insurance policy.[14]

A-1-1 Objective

The objective of this note is to summarise how financial security mechanisms work in jurisdictions around the world. Regulations from 62 jurisdictions were accessed, of which 46 had a closure bond system. Of these, 27 common-law jurisdictions (both national and state/provincial) were reviewed. This note is intended to provide a foundational knowledge base for further research by CSRM. In particular, an industry-funded project for the Social Aspects of Mine Closure Consortium will identify what institutional capabilities regulators require to manage social aspects of closure. This project will build on the regulatory review recorded in this note, and in other CSRM work.[15]

Our interest in closure bonds is linked to increasing attention on the costs of closure from regulators, industry associations and civil society. The ICMM's recent guidance, 'Financial concepts for mine closure'[16] indicates the emerging prominence of closure costs as an industry issue. In the Australian mining context, recent inquiries and regulatory reforms have focused on mine rehabilitation and closure, with close attention to financial liability. In other words, closure bonds are being discussed in debates about regulatory reform.

A-1-2 Terminology and working definition

There is no single definition of 'closure bond'. In this note, the term 'closure bond' is used as a catch-all term for financial security mechanisms. Our working definition describes 'closure bonds' as a financial arrangement through which a mining company makes funds available to the host state for closure costs in the event that the company defaults on closure obligations.

Generally, the term 'bond' connotes a sum of money set aside to provide security against obligations. This is similar to a tenancy bond, where funds are held as security against obligations to pay rent and maintain the property. Some financial security mechanisms used in mine closure are not bonds in this strict sense. For example, the purchase of an insurance policy involves payments of a premium rather than a lump sum set aside. Such a policy nonetheless makes funds available for the host state in the event of the company's default; it is considered a species of closure bond for the purposes of this note.

[13] Some of these occurrences are highlighted in Vivoda, V., Kemp, D. and Owen, J. (2019) Regulating the social aspects of mine closure in three Australian states. *Journal of Energy & Natural Resources Law* DOI 10.1080/02646811.2019.1608030.

[14] See Cheng, L. and Skousen. J.G. (2017) Comparison of international mine reclamation bonding systems with recommendations for China. *International Journal of Coal Science & Technology* 4(2): 67–79.

[15] Notably Vivoda, Kemp and Owen (2019) – cited in footnote 13.

[16] ICMM (2019) Financial Concepts for Mine Closure. ICMM Closure Working Group. International Council on Mining and Metals. www.icmm.com/website/publications/pdfs/closure/190205_icmm_financial-concepts-for-mine-closure.pdf.

A-1-3 Situating closure bonds in broader issues of closure

We recognise that closure bonds are a part of a much broader set of issues about managing social aspects of closure. We situate closure bonds as being connected to three issues in particular:

- **Post-closure vision:** Reaching, defining, and revising a post-closure vision that includes social aspects
- **Costs:** Calculating the cost of implementing a post-closure vision (especially the social aspects), and determining who pays for the costs
- **Securing costs:** Designing ways to secure and redeem companies' contribution to closure costs.

These issues are summarised briefly in Table 18. Closure bonds are chiefly a subset of the last group of issues ('securing costs'). To some extent, these issues are sequential: defining a post-closure vision is a precursor to estimating costs; designing ways to secure costs requires an understanding of what those costs are. Closure bonds are one part of multiple, broader issues associated with the social aspects of closure.

Table 18 Issues relating to closure bonds

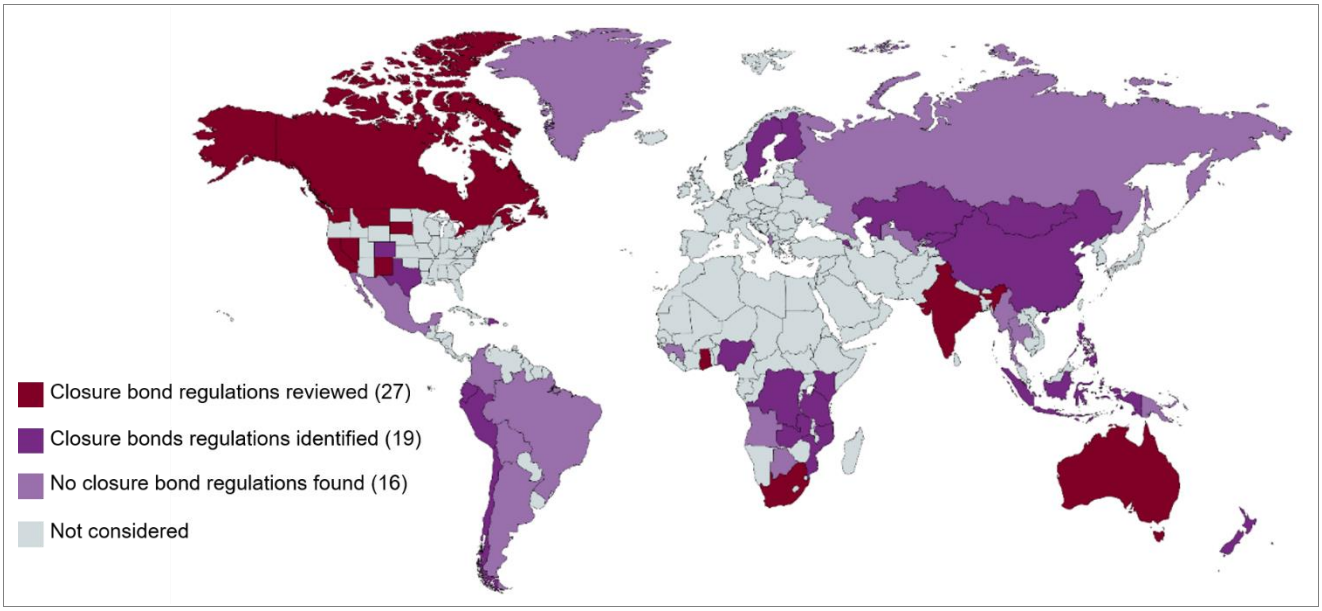
Category	Key questions
A. Post-closure vision	• What post-closure vision is acceptable to all stakeholders? • How can this vision be reached? • To what extent can social aspects be included in the vision? • When is it reached? • When and how can it be refined?
B. Costs	• What is the basis for calculating the cost of carrying out this vision? • Are there any methods for costing social elements of the vision? • Who bears the cost of implementing this vision? Where does a company's responsibility end, and the State's (or taxpayers') responsibility begin? • How can responsibilities for costs be negotiated among stakeholders?
C. Securing contribution to costs	• How can the company's contribution to costs be secured? • When during mine life is the contribution secured? • When and how should the contribution be reviewed, as social circumstances change and closure costs become more certain? • When and for what purpose can cost be allocated/ redeemed

A-1-4 Scope and approach

This note focuses on characterising and classifying how bond mechanisms work. It is descriptive in intent, and does not set out to undertake a critical inquiry into the appropriateness of bonds as a mechanism for securing social performance for closure.

An initial scan of mining jurisdictions sought to identify which jurisdictions had established a closure or rehabilitation financial security system. This scan involved accessing closure regulations of 62 national and sub-national jurisdictions worldwide (see Figure 1).

Figure 1 Mining jurisdictions reviewed as part of this study



Of these 62 jurisdictions, 16 did not appear to have regulations establishing closure bonds. Of the remaining 46 jurisdictions, a more in-depth review was conducted of 27 jurisdictions. These 27 jurisdictions are all common law systems. They were selected to enable comparison across geographies and within a type of law-making approach. The 27 jurisdictions reviewed for this note are:

- Australia (7): New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia
- Canada (10): Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Quebec, Saskatchewan, Yukon
- United States (7): Alaska, California, Montana, Nevada, New Mexico, South Dakota, Washington
- Ghana (1)
- India (1)
- South Africa (1)

The review aimed to identify how the closure bond systems worked in each of these jurisdictions, in order to synthesise key design components.

A-2 Key findings

Our objective was to summarise how financial security mechanisms work in jurisdictions around the world. We identified six design variables in the bond systems reviewed. Together, these variables comprise a framework for understanding how a bond system has been designed (or could be designed). The six variables are summarised in Table 19. Each is discussed in turn in this section.

Table 19 Key design variables of closure bond systems

Design variable	Relevance	Examples
Stated purpose of bond system	Indicates intended objective of bond system (and whether it includes social aspects)	• Funding incomplete/unsatisfactory (environmental) rehabilitation • Closure and de-commissioning • Residual environmental risks • Post closure contingency for monitoring and management • Legacy mines • Re-purposing the site
When and how is payment is made (financial instrument)	Influences financial outlay required, potentially affecting attractiveness of host state as a jurisdiction for investment	• **Company pays entirely or mostly up front** (e.g. cash deposit into government account or third-party trust account; certified cheque or letter of credit where issuing bank is paid in full at the outset) • **Company pays incrementally** (e.g. insurance policy; bank guarantee where company pays bank an ongoing fee in exchange for the bank providing the guarantee; contributions to government account over time) • **Other / none** (e.g. company self-guarantee; security over physical assets rather than monetary payments – e.g. by way of lien or charge)
Site-specific or pooled	Indicates State's powers to apply funds to other sites (e.g. orphan mines)	• **Site–specific**: bonded amounts can only be used for a particular site • **Pooled**: host government may use bonded amounts for other sites, including abandoned mines
Basis for calculating bond amount	Demonstrates granularity with which bonded amount reflects actual anticipated cost of closure	• Site area • Ratio of disturbance to rehabilitated area • Third party assessment (of remediation costs) • Expected project life • Assessment of environmental risk • Miner's assets/ability to pay • Regulator formula and standardised costings
Circumstances in which bond is returned / forfeited	Relates to conditions of relinquishment without further liability	Bond is wholly or partially returned in recognition of compliance with closure criteria, with bond forfeited where: • Company defaults on closure agreement or licence conditions • Regulator holds reasonable expectation of default
Circumstances in which bond conditions are reviewed / amended	Shows balance of flexibility and stability in security arrangements	• Achieving progressive rehabilitation milestones • Annual review • Compliance with completion criteria/permit conditions • Satisfactory compliance and closure audit

A-2-1 Stated purpose of bond system

Of the bond systems reviewed, the majority explicitly state that the purpose is to protect government and taxpayers from incurring financial liability if a mining operator fails to meet closure obligations. Such obligations tend to relate to biophysical aspects of mine closure. For example, in South Australia, the bond is entered to secure 'the rehabilitation of land disturbed by mining operations'.[17] In Alaska, 'reclamation' is the term used (i.e. closure bonds were required to secure performance as indicated in the mine's reclamation plan) – this formulation similarly refers to environmental rehabilitation.

No jurisdiction specifically included social performance obligations within the ambit of its bond system. While some jurisdictions do provide for public participation in administering bonds (see Box 1), the bonded amounts are not set aside for social impacts arising from mine closure. Some social impacts arise as a consequence of environmental impacts (e.g. water quality affecting agriculture or human health). These would be covered by the bond as part of environmental rehabilitation.

Other social impacts are not directly related to environmental impacts. An example is outward-migration from a mining town upon closure, leaving the town with too few people to function. Costs associated with managing this impact include redundancy payments, retraining programs, support for new businesses and business sectors (e.g. tourism), improved social services (health, education, justice, etc.), and investment in infrastructure (roads, airstrips, etc.). Closure bonds in the jurisdictions reviewed do not provide security for the costs of managing this type of social impact.[18]

Box 1 Participation in various bond systems

Alaska

The detailed evaluations used to set a bond amount are not confidential. The final draft reclamation security calculations are available for public comment prior to final approval by the agencies.

Montana

A bond filed for an operating mining permit may not be released or decreased until the public has been provided an opportunity for a hearing.

Nevada

The final draft Reclamation Cost Estimate calculation (from which the bond amount is derived) is available for public comment prior to final approval by the agencies.

A-2-2 When and how payment is made

Security bonds represent significant financial outlays. Host states seek to balance security against non-performance at closure, and a favourable regulatory and financial environment for investment. How bond payments are structured can impact both sides of the scale. Six financial structures are commonly used:[19]

- Deposit of cash (or other liquid assets) into a government-controlled account
- Insurance policy (paid for by the company as premiums) that covers closure costs
- Payment of funds into a trust, payable to the regulator in the event of non-performance of closure obligations

[17] *Mining Act 1971* (SA), s 62.

[18] While not within the scope of this note, the likely reason is that there is an unresolved debate as to the extent to which companies are liable for building functional post-mining communities, as opposed to this being a State responsibility. See Owen, J. and Kemp, D. (2018) Mine closure and social performance: an industry discussion paper. Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland: Brisbane.

[19] Cheng, L. and Skousen. J.G. (2017) Comparison of international mine reclamation bonding systems with recommendations for China. *International Journal of Coal Science & Technology* 4(2): 67–79.

- Surety bond – a contractual relationship whereby a third-party surety (typically a bank or surety bond company)[20] guarantees the mining company's performance of closure obligations, and provides additional funds in the event of default
- Provision of a corporate guarantee (self-bonded)
- Payment of fees into a bond pool with other companies.

We observed that these variations were independent of the financial mechanism adopted – for example, a trust is one mechanism for 'storing' security payments, but a company could be required to pay into that trust all at once, or incrementally over life of mine. The financial structure adopted does not generally affect the core consideration of host states articulated above – namely, how to balance securing closure costs against encouraging mining investment. We constructed a way of categorising payment structures based on when and how security payments are made. Three variations were identified, as shown in Table 20.

Table 20 When and how security payments are made – variations

Arrangement	Discussion	Illustrative examples
Company pays entirely or mostly up-front	Payment of the full security at the start of mine life might provide the greatest security to the host state, but represents a significant outlay for companies that coincides with other costly activities (such as feasibility studies or construction).	90% per of bond amount paid into a bank account or a trust, with remaining 10% paid upon operations commencing.
Company pays incrementally	Allowing companies to pay incrementally would spread the expenditure over a greater number of years. The host state's risk would be increasingly secured over time, and companies can avoid large sums of money being 'tied up' at once.	Company pays monthly insurance premiums for a policy that covers the host state as a beneficiary, in the event of non-performance of closure obligations. A bank (or other surety company) guarantees the cost of closure (to an agreed amount), whereby non-performance of closure obligations entitles the regulator to call on the bank's guarantee. The company arrangement with the bank may involve incremental payment of fees, or some other commercial agreement.
Company does not pay	The company might seek not to part with monies, but provide security another way. These methods generally impart greater risks to the host state, particularly where the company is relatively small or new.	Self-guarantee: company promises to cover the costs of closure, relying on its strong financial position to provide security. Lien or charge over property: security is granted not by payment of monies into a fund, but by assigning proprietary rights (to land, shares, or other collateral.) to the host state, in the event that the company does not carry out its closure obligations.

The majority of jurisdictions reviewed required the bond to be lodged as part of the approval processes and prior to the commencement of mining operations (i.e. payment up-front). The rationale is to secure the company's 'cradle-to-grave' environmental performance, not just performance at closure.

Many of the jurisdictions allow flexibility in the financial instrument used. A bank guarantee or a letter of credit from a bank were common, as were trusts and cash deposits. Some jurisdictions also allow for the use of

[20] For a discussion on the surety bond industry, see Kirschner, L.A. and Grandy, E.B. (2003) 'Mining and the Vanishing Surety Bond Market. *Natural Resources & Environment* 17: 152–189.

corporate (or self) guarantees.[21] Self-guarantees rely on the company retaining a sufficiently strong financial position (potentially across multiple sites, long time periods and multiple owners) to cover the cost of closure at a particular site.

A-2-3 Site-specific or pooled

The bonded amount has historically secured performance at a specific site only, with the host state unable to apply those funds to another mine site. Pooled funding (or bond pools) are an emerging structure, whereby companies contribute to a consolidated fund, and the host state may draw on that fund to cover the cost of closure at multiple sites, or to fund related activities.[22] For example, Australian jurisdictions have relied on site-specific bonds, with pooled funds recently introduced alongside bonds (in Queensland), or to replace bonds (in Western Australia).

The Western Australian arrangement, called the Mining Rehabilitation Fund, was introduced in 2012. This arrangement requires active tenements with estimated rehabilitation liability of greater than AU$50,000 to contribute a levy into the fund.[23] The host state can use fund monies to rehabilitate legacy / abandoned mines in Western Australia. Notwithstanding payment of the levy, a company remains responsible for 'rehabilitation works' on their tenements, and may be held liable in court for failure to do so.[24]

Six states of the USA provide for a bond pool system, where companies post both site-specific bonds and pay into a pooled fund. The site-specific bond is *less* than the total estimated cost of land reclamation, to account for expenditures into the pooled fund.

A pooled fund system is not a bond in the strict sense described in section A-1-2, because the company cannot recover the levied amount. Nonetheless, such a system provides security to the host state, because it sets aside funds to pay for companies' non-performance of closure obligations.

A-2-4 Basis for calculating bond amount

The basis for calculating the bond amount reflects not only the purpose for which the bond system is created, but also the balance that regulation must strike between an administratively workable system and the provision of security to the state. For example, to provide full security to the state, the bonded amount should equal or exceed the cost of closure. But predicting closure costs is a difficult technical exercise – including for social aspects.[25] One solution is *not* to attempt to predict closure costs precisely, but to apply a relatively easier basis for calculation, such as a dollar-amount per hectare disturbed by mining. This basis would be more administratively workable, but the host state bears the risk of the actual cost of rehabilitation above the bonded amount.

In the jurisdictions reviewed, there were a variety of bases for calculating the bond amount. Some require highly detailed formulae and supporting documentation; others reflect a more negotiated outcome whereby the company proposes a quantum. In Nova Scotia, for example, the security required represents the sum of:

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21 Nineteen US states allow self-bonding: Alabama, Alaska, Arkansas, Colorado, Illinois, Indiana, Iowa, Louisiana, Mississippi, Missouri, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia and Wyoming.

22 For example, in Queensland, funds may be used for research on land rehabilitation: see *Mineral and Energy Resources (Financial Provisioning) Act 2018* (Qld), s 3.

23 Some mining projects are subject to a State Agreement, a contract between the Western Australian Government and the company. These projects are exempt from the Mining Rehabilitation Fund levy. See DMIRS (2018) 'Mining Rehabilitation Fund (MRF) Frequently Asked Questions'. Department of Mines, Industry Regulation and Safety, Government of Western Australia. Last accessed 10 June 2019 at www.dmp.wa.gov.au/Documents/Environment/ENV-MEB-380.pdf.

24 Liability through the judiciary is specifically emphasised by the WA Department of Mines, Industry Regulation and Safety: 'The introduction of the MRF does not absolve tenement holders/operators of their legal obligation to carry out rehabilitation works on a tenement. The MRF Act allows for monies owed for rehabilitation work on abandoned sites to be recovered through the Courts from those responsible': DMIRS (undated) 'About the MRF'. Department of Mines, Industry Regulation and Safety, Government of Western Australia. Last accessed 10 June 2019 at www.dmp.wa.gov.au/Environment/What-is-the-MRF-19522.aspx.

25 See footnote 18**Error! Reference source not found.**.

- Estimated cost of labour, equipment, supplies and services for reclamation, rehabilitation or restoration (usually costed assuming the state procured goods and services from a third-party commercial provider)
- The cost of post-reclamation monitoring
- A contingency amount equal to 30% of the above two items.

The vast majority of jurisdictions reviewed mirrored this formula, with other regulations that did not specify a formula, but instead stated that the security amount is to cover the cost of carrying out rehabilitation works specified in a site's closure plan.

Some jurisdictions added more prescriptive elements. For example, in Montana USA, the security amount must at least equal the estimated cost of rehabilitation, but in any event must be no less than $200 per acre of disturbed land. In India, the security amount is determined by hectare of mining lease area, with a minimum amount depending on the category of mine.[26]

All jurisdictions focussed on securing costs of environmental rehabilitation. None of the 27 jurisdictions reviewed specifies socio-economic considerations that should be included in calculations.

A-2-5 Return and forfeiture of bond

This component relates to the circumstances in which the host state will reimburse a company's financial security (*return* of bonded funds), and conversely the circumstances in which the company will forfeit the bond. In the 27 jurisdictions reviewed, all required the regulator (e.g. responsible Minister) to be satisfied that the company had fulfilled its obligations before the bond can be returned. In jurisdictions requiring a closure plan (or reclamation / rehabilitation plan), a bond can generally only be returned once the regulator is satisfied that the plan has been carried out. This arrangement relies on the robustness of the closure plan and conditions of the environmental authority – it assumes that compliance with the closure plan means no latent liabilities or residual risk of environmental harm later. Most jurisdictions also allow for partial return of the bond during life-of-mine, if the company undertakes progressive rehabilitation to agreed standards.

If a mining company defaults on its remediation obligations (e.g. due to insolvency), the regulatory agency can then draw on the bond to defray the costs incurred in carrying out remediation work. In most cases, if the rehabilitation obligations have not been met, then part or all of the security deposit is forfeited. These funds are then used by the government to meet the rehabilitation requirements.

An issue that regulations do not address clearly is *how long* the host state can retain the bond. This issue relates to the funding of monitoring, maintenance and long-term care of the site. Once the company ostensibly carries out the actions contained in the closure plan, how long can the regulator wait to see if any latent risks become manifest? It was not clear that the bond is discharged on lease relinquishment. Regulations in the jurisdictions reviewed were ambiguous, creating a point of uncertainty for companies and host states alike.

A-2-6 Review and amendment of bond

The purpose of a security payment (such as a bond) is that it offers a measure of financial stability to the host state. This purpose can be undermined where the bond amount, or its conditions for return and forfeiture, are susceptible to change. However, bond arrangements also need to maintain a degree of flexibility, recognising that mine lifecycles can be decades long, that mine sites can change corporate hands multiple times (with vary degrees of risk to the state), and environmental and societal expectations about the post-mining future can also shift.

Of the 27 jurisdictions reviewed, most allow for bond arrangements to be reviewed and amended on a periodic and regular basis. The timing of this review varies from one to ten years, depending on the size of the project, the life span and the liability risk.

[26] Category A mines are generally fully mechanised mines and/or mines exceeding a particular workforce threshold. Category B mines are smaller operations. Category A mines require higher amounts of security to be posted.

There are some common 'trigger points' for review and amendment. The majority of jurisdictions require the bond to be reviewed and adjusted when:

- The mining title is renewed
- There is a change in the operating plan
- There is a transfer of assets
- Progressive rehabilitation is undertaken
- The regulatory authority has due reason to request a review

A-3 Conclusions and next steps

The intention of this note was to summarise how financial security mechanisms work in jurisdictions around the world. Regulations from 62 jurisdictions were accessed, of which 46 had a closure bond system. Of these, 27 jurisdictions (national and state/provincial) with common law, parliamentary systems were reviewed.

This note puts forward a six-component framework for understanding how bond systems are designed (and could be designed). The components are:

- Stated purpose of bond system
- When and how is payment is made
- Site-specific or pooled funds
- Basis for calculating bond amount
- Circumstances in which bond is returned / forfeited
- Circumstances in which bond conditions are reviewed / amended

Our review suggests that there are design choices involved in each of these components, with pros and cons for every choice.

A key issue identified in this note is that no bond system in our sample covered social aspects of mine closure. Financial security mechanisms are designed with environmental rehabilitation in mind. Such mechanisms might not be readily adapted to address social responsibilities, especially given the difficulty of designing and costing social mitigation measures. Consequently, host states are exposed to financial risk where a company is unable or unwilling to manage the social impacts of closure.

This note set out to describe how bond mechanisms work. Subsequent questions would include:

- How do bonds work in jurisdictions other than those with a common law, parliamentary basis?
- How can state and companies negotiate responsibilities for social aspects of closure, and on what basis?
- Given this division of responsibility, how can we predict, account for, and provide for the management of social risks and impacts of closure?
- What options are there for ensuring social aspects of closure are fully understood and appropriately provided for throughout a mine's life?
- Looking beyond regulation, what institutional capabilities, roles and responsibilities are required for host states to manage closure (and particularly social aspects thereof)?

The last-listed suggestion has been proposed as an industry-funded project for the Social Aspects of Mine Closure Consortium, and represents the immediate next step for this line of inquiry.

A-4 File note references

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