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**'Financial Assurance for Mine Closure:
A Regulatory Perspective from the Argentine Context**

Santiago J. Dondo

Abstract

Mining countries include in their regulations the obligation of having a mine closure plan and financial guarantees to ensure that adequate funds are available in the event that companies are unable or unwilling to perform. While large scale mining is a relatively recent development in Argentina, the emerging regulation regarding mine closure and financial assurance requires further development. Analysing the issue from an international perspective, this article captures the experience of Queensland, Australia and highlights the technical and political complexity of the matter. Arising from this complexity and the Argentine factual and legal context, are relevant criteria to be considered when designing regulation related to mine closure and financial guarantees.

The main findings of this research include; the need for a technical approach to the issue of mine closure; the participation of stakeholders, including companies, in designing the guidelines; and assigning roles to third parties in underpinning independence and transparency of regulation, among others. This article suggests an adequate balance between the satisfactory level of assurance and the national interest in developing mineral resources needs to be achieved. In this respect, the cost of financially assuring mine closure should be measured and analysed in relation to the general tax burden to encourage much-needed mining investment and also allowing rational and efficient exploitation of mineral resources.

Key words: Argentina, Financial assurance, mine closure, regulatory proposal

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1. INTRODUCTION

'If you can't afford to close a mine you can't afford to open it'.¹

Mining is being closely scrutinised by governments and society regarding its capacity to contribute to the sustainable development. Mineral-rich countries are passing new regulations and companies are adopting new standards of practice to enhance the positive impacts of mining and to minimise and mitigate the negative impacts.² Given that closure is a matter of fact for any mine, one of the toughest questions faced by the mineral sector within this challenging scenario is what happens after the closure.

This paper examines mine closure from a policy-maker perspective, focusing on the financial schemes to ensure compliance with reclamation plans. The research objective is to identify the main considerations that should inform the scope and definitions of a financial assurance scheme within a mine closure policy, in the context of Argentina. This will be achieved by understanding the context of the jurisdiction under study, reviewing the international literature on the topic, focusing on the legal framework of Queensland, Australia, and finally analysing the findings from the perspective of Argentina to provide recommendations for a public policy.

As described in detail below that, metallic mining in Argentina is in its early development stage and the applicable legal framework does not require mine closure costs to be financially assured. Therefore, now is the proper time to discuss and promote a policy on this subject within Argentina's context, and this paper aims to contribute suggestions towards that end. From a practical viewpoint, this research may be useful to confirm, redress or enrich the national bill on mine closure, which was co-drafted by the author and submitted to the Argentine National Congress in 2011.³

The paper is structured as follows. The first section will briefly describe the notion of mine closure, its significance and the scope of this research. The second section will outline the context for the study: it will describe the basic facts of the mining industry and closure in Argentina, as well as the regulatory framework related to mine closure in the country. The third and core section of this paper will review the global trends on mine closure regulation with a twofold approach: first, aiming to identify the main issues and challenges related to financial schemes analysing them from different stakeholders' perspectives and, second, presenting the Queensland legal framework in more detail. The fourth section will provide concluding remarks for the paper, including preliminary suggestions for public policy design, by adapting the research findings to the specific context of Argentina.

2. MINE CLOSURE AND FINANCIAL ASSURANCE

Although there are different definitions of mine closure, however, for the purposes of this study the phenomenon is considered as those activities of reclamation and care that are required to return the

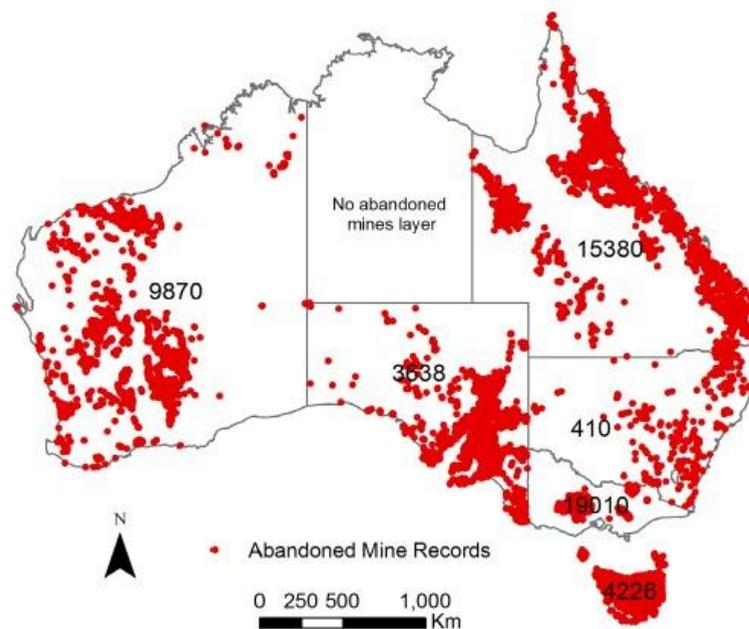
¹W. R Cowan, W O Mackasey and John G A Robertson, 'The Policy Framework in Canada for Mine Closure and Management of Long Term Liabilities' (Guidance document prepared for National Orphaned/Abandoned Mines Initiative of Canada, November 2010) 14.

² Ana Elizabeth Bastida, 'Mining Law in the Context of Development: An Overview' in Philip Andrews-Speed (ed), *International Competition for Resources: The Role of Law, the State and of Markets* (Dundee University Press, 2008) 101.

³ Bill on Mining Works Closure, submitted to the Argentine National Congress under File No 5614-D-2011 <<http://www1.hcdn.gov.ar/proyxml/expediente.asp?fundamentos=si&numexp=5614-D-2011>>

affected area to a state compatible with a healthy environment and human activity, while precluding further environmental damage.⁴

At present, governments and companies worldwide are aware of the need to develop a plan for mine closure.⁵ Unfortunately, this practice can be partially explained as a reaction to a heavy legacy of historical carelessness. In fact, how to manage the so-called orphaned or abandoned mines remains a major challenge for jurisdictions with long mining traditions. For instance, Australia has recorded more than 50,000 abandoned mine works (see Map 1 below);⁶ while more than 10,000 are registered across Canada.⁷ The United States is also home to thousands of abandoned mines, which cause between 20 and 30 fatalities per year due to safety accidents.⁸ The environmental legacy of the coalfields in the United States' Appalachian region is also well-known and illustrates the high risks posed by ownerless mines.⁹



Map 1: - Abandoned Australian Mines Records as of July 2011¹⁰

⁴ Allen L Clark and Jennifer Cook Clark, 'An International Overview of Legal Frameworks for Mine Closure' (2005) *Environmental Law Alliance Worldwide* 67 <<http://www.elaw.org/node/3715>> 67.

⁵ James M Otto, 'Global Trends in Mine Reclamation and Closure Regulation' in Jeremy P. Richards (ed), *Mining, Society and a Sustainable World* (Springer-Verlag Berlin Heidelberg, 2009) 251.

⁶ C Unger et al, 'Mapping and Prioritising Rehabilitation of Abandoned Mines in Australia' (2012) *Proceedings Life-of-Mine* 259. See also Ministerial Council on Mineral and Petroleum Resources and the Minerals Council of Australia, 'Strategic Framework for Managing Abandoned Mines in the Minerals Industry' (Publication report, 2010).

⁷ National Abandoned/Orphaned Mines Initiative, 'Orphaned and Abandoned Mines in Canada' (Performance Report 2002-2008, Canada, 2009) <<http://www.abandoned-mines.org/pdfs/NOAMIPerformanceReport2002-2008-e.pdf>> 5.

⁸ Hobart King, *Abandoned Mine and Quarry Accidents Claim 20 to 30 Lives per Year*, Geoscience News and Information <<http://geology.com/articles/abandoned-mines.shtml>>

⁹ Alan T Herlihy et al, 'Regional Estimates of Acid Mine Drainage Impact on Streams in the Mid-Atlantic and Southeastern United States' (1990) 50 *Water, Air and Soil Pollution* 91. See also Michael Hendryx, 'Mortality from Heart, Respiratory, and Kidney Disease in Coal Mining Areas of Appalachia' (2009) 82 (2) *International Archives of Occupational and Environmental Health* 243.

¹⁰ Unger et al, above n 6, 262.

The risks associated with a failure in closure planning can be classified as environmental (often related to acid mine drainage or tailings),¹¹ health and safety (including dangerous high-walls and impoundments, and underground mine openings), community and social, land degradation, legal and financial and technical risks.¹² Consequently, mine closure appears extremely relevant to all stakeholders, though for different reasons and perspectives. Landowners will expect their lands to be rehabilitated for end use; communities will be concerned about environmental and socio-economic impacts, as well as health and safety issues; companies will seek to extinguish liability while avoiding damage to their reputation; and, finally, governments must look after all of these aspects, balancing them with the best national and public interest.¹³

The global trend in the past decades shows that governments from mineral-rich countries mandate companies to develop a timely mine closure and reclamation plan.¹⁴ Within these regulations, companies are also generally required to establish financial assurance.¹⁵ Financial assurance, as this paper refers to it, aims to ensure funds will be available for the government to conduct the approved closure plan, in case the company is unable or unwilling to do so. Furthermore, the 'post-closure' stage, which was not commonly included in the mine closure frameworks,¹⁶ is now receiving greater attention as a component of closure plans.¹⁷ This stage includes the monitoring, maintenance and, if required, remediation of any unanticipated adverse incidents after closure.¹⁸ Financial assurance of this long-term liability is widely recognised as a major challenge, as the associated contingencies are sometimes timeless and hard to estimate,¹⁹ but regulatory authorities are developing tools to address this issue.²⁰

The need for financial assurance is justified by three main reasons:

1. Closure means that no more revenue will come from the mine;
2. Unforeseen variation on mineral prices or other circumstances can result in a premature closure, or in the mining company going bankrupt or becoming insolvent;
3. And, unplanned events may affect the environment even far-after reclamation is duly completed.²¹

¹¹ David Laurence, 'Establishing a Sustainable Mining Operation: An Overview' (2011) 19 (2) *Journal of Cleaner Production* 278, 280.

¹² D Laurence, 'Classification of Risk Factors Associated With Mine Closure' (2001) 10 (3) *Mineral Resources Engineering* 315.

¹³ Otto, above n 5, 253.

¹⁴ Otto, above n 5, 256.

¹⁵ Cowan, Mackasey and Robertson, above n 1, 22.

¹⁶ Otto, above n 5, 266 [5.5].

¹⁷ World Bank, 'Towards Sustainable Decommissioning and Closure of Oil Fields and Mines: A Toolkit to Assist Government Agencies' (Report, World Bank, March 2010) [3.6].

¹⁸ William Gorton III, 'Understanding the Reclamation Surety Relationship Before and After Operator Default' (Paper presented at Rocky Mountain Mineral Law Foundation, Special Institute on Mine Closure, Financial Assurance and Final Reclamation, Westminster, Colorado, November 2009) 11-14. See also Michael Orlando, 'Financial Assurance for Environmental Protection: Trends and Opportunities' (2012) *PERC Research Paper* 12.

¹⁹ For example, in Australia, BHP Billiton was required, as a condition to expand the Olympic Dam project, to assess the risks that tailings and rock storage facilities may pose to safety and environment from closure to in the order of 10,000 years. See *Buzzacott v Minister For Sustainability, Environment, Water, Population and Communities* [2012] FCA 314, 330.

²⁰ See, among others, Gorton, above n 18, 12-13; Cowan, Mackasey and Robertson, above n 1, 23.

²¹ See, among others, Otto, above n 5, 267.

3. MINE CLOSURE IN ARGENTINA: FACTUAL CONTEXT AND LEGAL FRAMEWORK

This section describes the facts of mineral development in Argentina with a focus on large-scale metallic mining, as these deposits have the greatest economic potential and also mining activity faces increasing social resistance.²² Secondly, the section will critically describe the regulatory framework related to mine closure, revealing that it is to general and does not require financial assurance.

3.1 FACTUAL CONTEXT

Although Argentina is well-known for its geological potential,²³ however, metallic mining represented less than 10% of the national mining production until the early nineties.²⁴ Argentina's economy has been heavily driven by agribusiness and its mineral resources were historically forgotten about and neglected by the national authorities.²⁵

In 1993, the federal government and all provinces jointly established a regulatory framework aiming to attract foreign mining investments.²⁶ As a result, metallic mining experienced significant growth, but the sector remains relatively new. In the last 15 years, the only metallic mining project closed was Mina Angela, a gold and silver deposit in the province of Chubut, which was closed in 1999.²⁷ However, depletion of some metallic mines is now occurring and will continue in the forthcoming years. For example, the Alumbreira project in the province of Catamarca, the largest operating mine in the country, will be depleted within the next four years. In addition, Martha project, silver mine located in the province of Santa Cruz, ceased production in September 2012, but has not yet proceeded to closure due to ongoing negotiations on reopening.

On the other hand, the conflict and resistance with respect to mining activity has increased in vehemence, content and geographic scope during the past decade.²⁸ As a political reaction to this conflict, nine Argentine provinces have approved laws prohibiting certain extraction techniques or mining processes.²⁹

²² Diana Mutti et al, 'Corporate Social Responsibility in the Mining Industry: Perspectives from Stakeholder Groups in Argentina' (2012) 37 (2) *Resources Policy* 212.

²³ 'Argentina: Land of Opportunities', *Mining Journal* (online), 10 August 2012, states that Argentina is 'potentially home to vast undiscovered mineral deposits to match its neighbour and mining giant, Chile, with which it shares the Andean mountain range.

²⁴ Oscar A. Prado, 'Situación y Perspectivas de la Minería Metálica en Argentina' [Situation and Perspectives of the Metallic Mining in Argentina] (Document No 91, United Nations Economic Commission for Latin America and the Caribbean, Division of Natural Resources and Infrastructure, May 2005) 20. See also María Virginia de Moori K, 'Reformas Económicas y la Inversión en el Sector Minero Argentino' [Economic Reforms and the Investment in the Argentine Mineral Sector] (Paper prepared for a Netherlands' Government Project, December 1999).

²⁵ Eddy Lavandaio and Edmundo Catalano (eds), *Historia de la Minería Argentina* [History of the Argentine Mining] (Editorial RN, Buenos Aires, 2004).

²⁶ The main pieces of legislation are *National Law No 24,228* (Argentina) of 1993, which ratified the Federal Mining Agreement; and *National Law No 24,196* (Argentina) of 1993, which established tax benefits and 30 year fiscal stability to promote mining investments.

²⁷ Rafael Anello, 'Un Caso de Cierre y Remediación Final de una Operación Minera' [A Case of Closure and Final Rehabilitation of a Mining Operation] (Company Report, 2000) <<http://www.ceads.org.ar/casos/2000/Garova%20Un%20caso%20de%20cierre.pdf>>

²⁸ See, for example, Carlos Reboratti, 'Socio-environmental Conflicts in Latin America' (2012) 11(2) *Journal of Latin American Geography*, 1.

²⁹ *Provincial Law No 5,001* (Chubut, Argentina) dated 8 May 2003; *Provincial Law No 3,981* (Río Negro, Argentina) dated 22 July 2005; *Provincial Law No 7,722* (Mendoza, Argentina) dated 21 June 2007; *Provincial Law No 2,349* (La Pampa, Argentina) dated 16 August 2007; *Provincial Law No 7,879* (Tucumán, Argentina) dated 17 April 2007;

3.2 LEGAL FRAMEWORK

With respect to competences in environmental matters, the 'Argentine National Constitution' grants the federal government the right to enact laws on minimum standards for environmental protection, while the provinces may approve the necessary laws and regulations to complement these.³⁰

The 'National Law of Environmental Protection for Mining', approved in 1995 and applicable to all provinces,³¹ set forth the obligation to submit an Environmental Impact Assessment (EIA), which must be approved prior to the commencement of any mining activity.³² The law expressly includes '*all activities aimed at mine closure*' as activities that require an EIA.³³ Additionally, it establishes that every EIA must describe the expected impacts on the environment and on the sociocultural system, as well as the proposed prevention, mitigation or restoration measures.³⁴

In 1996, complementary rules to further specify the content and scope of the required EIAs were approved.³⁵ These rules included annexes referring to EIAs for the prospecting, exploration and exploitation phases, as well as parameters for water, soil and air quality. Regarding closure, however, it stated only that companies must submit a plan indicating projected measures for mitigation and rehabilitation, including timing and methods for compliance.³⁶ It did not include any further requirements on content or scope for the EIA regarding closure activities.

In summary, the current legal provisions on mine closure are too general and there is no requirement of a formal and comprehensive reclamation plan. In addition, the framework in place does not specify any practices, standards or methods to be applied.³⁷

Regarding enforcement of this obligation to obtain an approved EIA for closure activities, the law and its complementary rules provide administrative, civil and criminal sanctions. Administrative sanctions may be imposed on the company upon failure to submit the EIA or comply with it once approved, and may range from fines to suspension or cancellation of mining operations.³⁸ Civil remedies consist of the restoration of environmental damages. Noticeably, if a company abandons its operations unclosed and without submitting an EIA as required, sanctions of suspending or cancelling operations will not be applicable. It is important to note here that, at a provincial level, there are no laws or regulations that specifically and comprehensively address mine closure.

Finally, it is worth mentioning two legal instruments that may be considered indirectly related to mine closure, and should ideally interact with an eventual mine closure framework. First, the National Law for the Promotion of Mining Investments provides that companies shall establish an especial provision in

Provincial Law No 8,137 (La Rioja, Argentina) dated 8 March 2007; *Provincial Law No IX-0634/08* (San Luis, Argentina) dated 15 October 2008; *Provincial Law No 9,526* (Córdoba, Argentina) dated 9 September 2008; and *Provincial Law No 853* (Tierra del Fuego, Argentina) dated 25 August 2011.

³⁰ *National Constitution* (Argentina), art. 41, incorporated by the reform of 1994.

³¹ *National Law No 24,585* (Argentina) of 1995, incorporated as a Complementary Section to the Mining Code.

³² *National Law No 24,585* (Argentina) of 1995, art. 6.

³³ *National Law No 24,585* (Argentina) of 1995, art. 4.

³⁴ *National Law No 24,585* (Argentina) of 1995, art. 17, subsections (c) and (d).

³⁵ Consejo Federal de Minería [Federal Mining Council], '*Acta de San Carlos de Bariloche*' [San Carlos de Bariloche Agreement], dated 16 August 1996. Although this agreement was not legally binding in itself, the majority of the provinces adopted it by means of local legislation.

³⁶ *Ibid* arts. 26 and 27.

³⁷ Elizabeth Bastida and Tony Sanford, 'Mine Closure in Latin America: A Review of Recent Developments in Argentina, Bolivia, Chile and Peru' (Paper commissioned by ECUS and MDS, 2004) [4.1]. Typical examples of more specific standards prescribed in other jurisdictions refer to management of acid mine drainage and tailings.

³⁸ *Ibid*.

order to prevent or cure any environmental alterations that could be caused by mining activity.³⁹ The amount of this provision may be freely determined by the company, but will be deductible from income tax only up to a sum equivalent of 5% of the operational extraction and benefit costs. In case this provision is unused by the end of the production cycle, it shall be returned to the taxation balance. The latter makes clear that this provision is not intended to cover costs of closure and post-closure stages, but rather respond to environmental contingencies during the operation of the mine.

Secondly, the National Law on Environment, approved in 2002, provides that all companies carrying out activities dangerous to the environment, which includes mining, shall have an insurance duly covering the remediation of any damage it may cause.⁴⁰ Although exceeding the confines of this study, it is noted that the implementation of this legal requirement faced tremendous challenges and difficulties, and its scope and enforcement remains uncertain.⁴¹ This environmental insurance primarily seeks to cover risks of environmental damage that may occur during operations,⁴² but is not meant to financially ensure compliance with a designed and approved plan to reclaim the mine site. Nevertheless, it could be related to the post-closure contingencies component of closure plans.

In summary, there is no financial assurance required to enforce compliance with activities included in the required EIA for closure. In addition, the law does not require an EIA on closure to be submitted in the early stages of construction or commencement of production, but only sometime prior to performing the activity (i.e., closure).

4. FINANCIAL ASSURANCE SCHEMES: ISSUES AND APPROACHES

This section will first outline the main issues related to financial schemes for mine closure regulations, drawing from international literature. The competing interests from stakeholders are referred to and preliminary suggestions on best practices are provided. Secondly, it describes the regulatory approach adopted by the State of Queensland, Australia, to illustrate how these issues may be addressed, from the example of a jurisdiction with a long-standing and successful mining history.

4.1 MAIN ISSUES AND CHALLENGES

4.1.1 Financial Assurance: Timing and Amount

There are some widely-accepted, basic definitions of good practice in relation to timing and amount of financial assurance:

1. The company shall secure and provide financial assurance as early as possible, ideally at the exploration stage, and certainly before commencing construction or disbursing major investments;⁴³
2. The amount of assurance is to be determined by costing closure;⁴⁴ and

³⁹ *National Law No 24,196 (Argentina)* of 1993, art. 23.

⁴⁰ *National Law on Environment No 25,675 (Argentina)* of 2002, art. 22.

⁴¹ For a comprehensive analysis on this environmental insurance requirement and the challenges of its implementation, see Gabriela Pesce, Hernán Vigier and Regina Durán, 'Análisis Teórico y Empírico de los Seguros Ambientales en Argentina' [Theoretical and Empirical Analysis of Environmental Insurance in Argentina] (2012) 11 *Rev. de Economía Política de Bs. As.* 81. See also María Gabriela Rossi and Javier García Fronti, 'Gestión Empresarial del Riesgo Medioambiental en la Argentina: Regulación y Práctica' [Corporate Management of Environmental Risk in Argentina: Regulations and Practice] (2010) *Facultad de Economía UBA* 87.

⁴² See, for example, *Presidential Decree No 1638/2012 (Argentina)*, art 7.

⁴³ C George Miller, 'Financial Assurance for Mine Closure and Reclamation' (Report, International Mining and Metals Council, London, February 2005) 12. See also Cowan, Mackasey and Robertson, above n 1, 15.

⁴⁴ There are some exceptions to this general rule. For example, in Queensland, Australia, when it refers to mining claims, exploration permits or mineral development licenses (i.e., works prior to construction and exploitation), the

3. The cost estimate needs to be periodically reviewed, including field inspections, in order to refine its accuracy when addressing changing circumstances.⁴⁵ Changes may include new technologies impacting the calculated costs, economic variations, possible partial releases of assurance due to progressive closures carried out during operations and unforeseen environmental incidents that may affect the scope of closure works. However, the exercise of estimating the cost of closure is riddled with questions and tensions that need to be addressed by regulatory authorities.

The first issue refers to which party shall carry out the estimate. Because companies tend to underestimate in order to minimise costs,⁴⁶ and many regulations delegate the estimating to an independent third party or request an auditor to review the company's calculation before granting the approval,⁴⁷ an approach that increases the cost for the company. Another related issue, sometimes overseen, is the need to prepare the estimate under the assumption that closure and reclamation will be conducted by a third party, which normally results in higher costs for hiring contractors.

Second, closure costs vary throughout the life of the mine. The cost of a premature closure at year three is less than reclaiming a 25-year operating and depleted mine. Watchdog NGOs advocate for the final closure cost to be fully assured (ironclad guarantee) from day one,⁴⁸ while companies may prefer to constantly adjust the assured amount to match closure cost at any given time. Regulatory authorities, on the other hand, try to find a balanced scheme that accommodates assurance requirements to estimate costs at different times (for example, annually or periodically every five years), while avoiding the high administrative costs of constantly reviewing and adjusting estimates.

A third key question affecting cost estimates relates to the level of reclamation or standard legally required. The spectrum of alternatives range from a conservative approach requiring the land to be returned to its pre-disturbance condition, to a cosmetic landscaping focused on visual impact remediation. Regulators should abstain from imposing unrealistic conditions, such as the Indonesian requirement to backfill open pits,⁴⁹ but ensure that reclamation is rigorous and fulfils good practice standards. A feasible approach is to set general standards and allow some flexibility to work on a case-by-case basis, aiming at rehabilitating the land up to a pre-agreed end-use goal.⁵⁰

The fourth issue refers to possible discounts to be deducted from the calculated amount. Large mining companies advocate for the adoption of regulatory tools to classify companies according to their financial strength or environmental practices and, based on that, alleviate the financial burden on the 'good guys'. This may be achieved by;

amount is calculated by a tariff table on the surface of the disturbed land. See Department of Environment and Heritage Protection, 'Financial Assurance under the Environmental Protection Act 1994' (Guideline, 31 May 2013) <<http://www.ehp.qld.gov.au/management/non-mining/documents/fa-guideline.pdf>>.

⁴⁵ Western Australia Government, Department of Mines and Petroleum, 'Guidelines for Preparing Mine Closure Plans' (Guideline, Environmental Protection Authority, June 2011) 27. See also Cowan, Mackasey and Robertson, above n 1, 15.

⁴⁶ Centre for Science in Public Participation, 'Putting a Price on Pollution: Financial Assurance for Mine Reclamation and Closure' (Report prepared for the Mineral Policy Center, 2003) 4. See also Otto, above n 5, 272.

⁴⁷ Hugo van Zyl et al, 'Financial Provisions for Rehabilitation and Closure in South African Mining: Discussion Document on Challenges and Recommended Improvements' (Report for the World Wide Fund for Nature, Cape Town South Africa, August 2012) 27 [5.4.2]. See also Cowan, Mackasey and Robertson, above n 1, 14, 18.

⁴⁸ See Centre for Science in Public Participation, above n 46, 4.

⁴⁹ Miller, above n 43, 10.

⁵⁰ John Briggs, 'Managing for Mine Closure' (2006) *AMPLA Yearbook* 464, 470.

1. 'Balance sheet test', which means periodically verifying compliance with pre-defined targets of financial health;⁵¹ or
2. Accreditation programs to assess and certify the companies' environmental track record or corporate practices, through an *ad-hoc* or existing independent system, such as ISO standards.⁵²

4.1.2 Administration of Assurance

Regarding administration of the funds or the financial assurance, two main questions stand out:

1. Should the funds or the financial instrument be held and managed by the government or a third party?
2. And, should the funds or assurance be held in a separate account for each specific operation or in a pooled general account for mining closures across the country?

With regards to the first posed question, governments may plead for managing the funds or instruments, while other stakeholders (companies, communities, NGOs) may support the idea of delegating this to a third party, for reasons of technical capacity, but primarily to ensure transparency and to avoid misapplication.⁵³

With respect to the second question, mining companies generally prefer 'user-pay reclamation funding',⁵⁴ but creating a general account may be financially advisable and provide further assurance for the government and larger society. A suggested mixed approach is to establish site-specific funds for assuring compliance with the approved reclamation plan, but create a 'general account for emergency issues in the jurisdiction', related to long-term liabilities.⁵⁵ Regarding post-closure liabilities, regulations usually prescribe a period of time after which the company's liability shall be extinguished.⁵⁶

4.1.3 Types of Financial Assurance Mechanisms

The decision on the type of assurance mechanism to be used causes great tension between governments and companies. There are several types, ranging from the hard, most secure and costly types, including cash deposits or certificates of deposits, and trust or reclamation funds; to the soft, inexpensive but riskier 'self-assurance'. In the middle are other typical mechanisms, such as:⁵⁷

1. Surety or performance bond (the most commonly used);
2. Letter of credit;
3. Insurance policy (quite rare and untested),⁵⁸
4. Third party guarantee, including parent company; or
5. Any other mechanism acceptable for the regulator.

⁵¹ This is provided, for example, in Ontario, Canada. See Matthew Hawkins, 'Rest Assured. A Critical Assessment of Ontario's Mine Closure Financial Assurance Scheme' (2008) 26 *J. Energy Nat. Resources L* 499, 524-525.

⁵² Miller, above n 43, 15-16.

⁵³ For a further analysis of the role of financial institutions regarding environmental assurances in developing countries, see Eric Twum, 'Legislative Regulation and Financial Institutions in Environmental Assurance in Developing Countries: Case Study of Mining in Ghana' (2013) 7(4) *African Journal of Political Science and International Relations* 200, 205-207.

⁵⁴ Miller, above n 43, 15.

⁵⁵ See Cowan, Mackasey and Robertson, above n 1, 17-18; and see also Gorton, above n 18, 12-13.

⁵⁶ See, for example, Decree Peru, art. 31

⁵⁷ For further details on each mechanism, and a comparative analysis on advantages, disadvantages and different costs, see Otto, above n 5, 272-285.

⁵⁸ Often the insurance policies are, in fact, disguised surety bonds. Insurance products are being developed in the US and South Africa, but remain of little application. See van Zyl et al, above n 47, 33 [6.2.3]

The governments tend towards a straightforward, nil-risk approach, while companies struggle to demonstrate to governments the financial complexities and other factors that, they believe, should be considered. This includes opportunity costs (net present value of money), the impact of costing in the project's feasibility, how it affects the company's credit rating or borrowing capacity, practical limitations due to conditions imposed by sureties or flaws in the financial and insurance markets⁵⁹ and technical or engineering differences between mining projects.

In general, jurisdictions allow companies to choose from a list of pre-approved mechanisms, and some even allow companies to propose the evaluation method.⁶⁰ In addition, financial calculations and other circumstances may advise the combined use of different mechanisms to assure the same closure plan.⁶¹

Two suggestions may be highlighted here from a regulatory perspective. First, governments may be flexible regarding acceptable mechanisms, thus allowing companies to accommodate specific circumstances and use the most cost-effective tools, but at the same time prescribe guidelines or templates to ensure each mechanism complies with minimum conditions. Secondly, and regardless of the selected mechanism, the regulator should ensure that the assurance will be enforceable and effective in the scenario of insolvency or bankruptcy, both from a theoretical and 'down-to-earth' standpoint.⁶²

4.1.4 A Difficult Balance in Difficult Times

In summary, this section evidences that regulating on financial assurance for mine closure entails numerous and complex issues. It is about assessing, through financial technicalities, a difficult balance between comfortable levels of environmental protection, while not preventing mineral resources development.⁶³

The recent global financial crisis complicated this balance even further. On one side, companies claim that financial assurance became too costly, often hindering the projects' feasibility. On the other hand, after witnessing the failure of some top-rated, global financial institutions, governments may feel cash is the only 'safe home'.⁶⁴ Forecasting costs, a cornerstone of financial assurance schemes, has always been inexact science;⁶⁵ however, the recent economic and financial turmoils have made this statement truer than ever.

4.2 FINANCIAL ASSURANCE FOR MINE CLOSURE IN QUEENSLAND, AUSTRALIA

In the next section, financial assurance legislation from Queensland, Australia, is analysed to identify its approach regarding the issues raised in this paper.

Pursuant to the *Environmental Protection Act 1994* (Qld), the holder of a mining lease shall, after obtaining the environmental authority but before carrying out any activity, propose an amount to financially assure the total potential cost of rehabilitating the disturbed land, in compliance with the

⁵⁹ Hawkins, above n 51, 513-514.

⁶⁰ Otto, above n 5, 272.

⁶¹ See Cowan, Mackasey and Robertson, above n 1, 18.

⁶² Gorton, above n 18, states the importance of this precaution and analyses some challenges that a bankruptcy scenario may pose to the enforcement and forfeiture of financial assurance mechanisms. For a more practical analysis, see van Zyl et al, above n 47, 35[6.4].

⁶³ This balance is, like many others, a specimen within the 'sustainable development' principle, incorporated to the Argentine National Constitution in 1994, which requires the *equilibrium* to '(...) satisfy the current needs without compromising those of the future generations'. See *Constitución Nacional* [National Constitution] (Argentina) art 41. See also Cowan, Mackasey and Robertson, above n 1, 15.

⁶⁴ Orlando, above n 18, 10-11.

⁶⁵ Michael Delosa, 'Managing for Mine Closures. A Comment' (2006) *AMPLA Yearbook* 496. See also Miller, above n 43, 10.

approved rehabilitation program.⁶⁶ The Act also includes general provisions on financial assurance, specifically dealing with the amount and form, claiming or realising, amending or discharging and replenishing.⁶⁷ In addition, the *Environmental Protection Regulation 2008* (Qld) prescribed⁶⁸ the application of a guideline prepared by the State Department of Environment and Heritage Protection (Authority) and regulates financial assurance in further detail (FA Guideline).⁶⁹ Finally, the FA Guideline refers to various other guidelines, templates and documents produced by the Authority.⁷⁰

4.2.1 Timing

The Queensland legal framework requires financial assurance to be lodged before any mining activity is carried out, including exploration, mineral development, construction and exploitation.⁷¹ Logically, the scope and extent of the rehabilitation program will differ depending on the stage, as will the amount of financial assurance required.

4.2.2 Rules to Determine the Amount

The amount shall be proposed by the company based on rehabilitation costs for the year where maximum liability is to be incurred, within a 'nominated disturbance period' (generally not more than five years).⁷² Costs shall be supported by qualified third party quotes, detailed and based on the true costs to the government for commissioning the works.⁷³ Rehabilitation costs shall include:⁷⁴

1. Termination, decommission and removal of all infrastructure and services;
2. Constituent tasks or activities required for rehabilitation;
3. Project management from government (10% recommended);
4. Maintenance and monitoring (5 % is recommended);
5. 3 % adjustment for inflation;
6. Cost of final inspection to verify conditions have been met.

In calculating the amount, the company shall not assume that the value of infrastructure or other assets can be offset or deducted from the estimate costs.⁷⁵

The mining companies can reduce the amount of financial assurance by applying for an offered discount (up to 30%), that may be granted by the Authority upon demonstration of a good environmental track record, level of compliance and financial health for a two year period.⁷⁶

⁶⁶ *Environmental Protection Act 1994* (Qld) ss 286(a)(i), 287, 288(1)(c)(iii), 288(2). For processes and activities other than mining leases, financial assurance may or may not be required by the administering authority as a condition to the respective environmental authority. According to the FA Guideline, mining claims, exploration permits and mineral development licenses generally require financial assurance.

⁶⁷ *Environmental Protection Act* Part 12, div 2.

⁶⁸ *Environmental Protection Regulation 2008* (Qld) s 17B.

⁶⁹ Department of Environment and Heritage Protection, above n 44, condenses advices that were previously spread across nine documents.

⁷⁰ Importantly, financial assurance is being revised under the EPA and a revised guideline shall be released in May 2014, with expected changes on the approved methodology, form of financial assurance and discount system. See Department of Environment and Heritage Protection, 'Guideline on Financial Assurance under the Environmental Protection Act 1994' (Consultation report, July 2013) <<http://www.ehp.qld.gov.au/era/financial-assurance-guideline-consultation-report.pdf>>.

⁷¹ See comment in above n 66.

⁷² Department of Environment and Heritage Protection, above n 44, 7, 22.

⁷³ This refers only to mining leases. Previous stages (including exploration) also require financial assurance, but are calculated as a fixed amount per surface of disturbed land. See Department of Environment and Heritage Protection, above n 44, 19, 22, and comment in above n 66.

⁷⁴ Department of Environment and Heritage Protection, above n 44, 22.

⁷⁵ Department of Environment and Heritage Protection, above n 44, 23.

The Authority shall then decide the amount, applying a set of criteria outlined by the FA Guideline,⁷⁷ with a special focus on ensuring the amount relates to conditions from the granted environmental authority. The amount cannot be higher than the total potential liability.⁷⁸

4.2.3 Assurance Form and Administration

The Authority shall decide the form of assurance. The FA Guideline does not provide a list of pre-approved forms,⁷⁹ however, the Authority provides a pro-forma template to be used when financial assurance is proposed as a bank guarantee in the form of a bond, which suggests that this is the most used and habitual form of assurance mechanism.⁸⁰ On the other hand, the FA Guideline requires the assurance mechanism to be ‘unconditional, irrevocable, immediately payable on demand and without reference to another person and available until all obligations have been performed’.⁸¹ Cash may be accepted in limited circumstances.

The assurance is to be undertaken by a financial institution, upon the instructions and decisions of the Authority who can claim or realise the assurance at any time. Finally, the assurance is administered in a separate account attached to the approved rehabilitation program for a specific project.

4.2.4 Review and Adjustments

The company may apply to amend the amount or form of financial assurance or the Authority may require the amount or form to be amended, at any time. Reasons for these adjustments may include changes in circumstances or in the designated disturbance period, observations raised through onsite inspections, changes in the environmental authority or progressive rehabilitation certification.⁸² ‘Progressive rehabilitation’ refers to the act of restoring affected areas simultaneous to the mining activity.⁸³ Once the progressive rehabilitation is certified by the Authority, the amount of financial assurance can be reduced, although a residual risk payment may apply.

4.2.5 Residual Risk Payment for Post-Closure

The law in Queensland provides that; [T]he administering authority may require the applicant to pay it a stated amount for the residual risks of the proposed certified rehabilitated area.⁸⁴ This is called a ‘residual risk payment’,⁸⁵ which is determined by the Authority, who may require it when rehabilitation is complied with and certified. It is designed to cover long-term liabilities, including;

1. [R]einstate rehabilitation that fails to establish a safe, stable and self-sustaining ecosystem;
2. [R]estore the environment because of environmental harm resulting from the resource project, despite the rehabilitation; or

⁷⁶ For further detail on the necessary criteria to receive this discount, see Department of Environment and Heritage Protection, above n 44, Appendix C.

⁷⁷ Department of Environment and Heritage Protection, above n 44, 8.

⁷⁸ *Environmental Protection Act* s 295(1), 295(4), 295(5).

⁷⁹ *Environmental Protection Act* s 295. See also Department of Environment and Heritage Protection, above n 44, 8.

⁸⁰ Department of Environment and Heritage Protection, ‘Financial Institution’s Undertaking in respect of Environmentally Relevant Activities’ (Pro-Forma Template) <<http://www.business.qld.gov.au/business/running/environment>>

⁸¹ Department of Environment and Heritage Protection, above n 44, 8, 23.

⁸² *Environmental Protection Act* s 299-306. See also Department of Environment and Heritage Protection, above n 44, 10-15

⁸³ *Environmental Protection Act* s 318Z-318ZJ.

⁸⁴ *Environmental Protection Act* s 318ZL.

⁸⁵ For further details on residual risk payment, see Briggs, above n 50, 474-475.

3. [M]aintain environmental management processes needed to protect the environment.⁸⁶

5. CONCLUDING REMARKS AND POLICY SUGGESTIONS

Argentina's legislation on mine closure is remarkably out-dated. Almost all mineral-rich countries, including Peru⁸⁷ and more recently Chile,⁸⁸ have adopted thorough frameworks for mine closure and required financial assurance. It is probable that the relatively short history of abandoned mines⁸⁹ and the remoteness in time from closure of large mines means the authorities are unconcerned about this issue. However, as closure needs to be planned well in advance, regulating the issue is more urgent than it appears. As noted by Clark, requesting a financial assurance 'is particularly important in the [developing] countries [...] where, quite often, other forms of ensuring compliance are weak or non-existent'.⁹⁰ Being a relatively new metallic mining industry may be an advantage, as the country is not carrying such a heavy legacy and has the opportunity to develop minerals within a sustainable framework. A regulation on mine closure is a key element within this goal. In addition, companies have already adopted closure practices, either voluntary or because of lending covenants,⁹¹ so they would most likely support the idea of adequate closure regulations.⁹²

Based on the findings of this research, this final section provides the concluding remarks, in the form of preliminary suggestions for the necessary criteria to design and adopt a financial assurance scheme for mine closure in Argentina.⁹³ Firstly, general comments on issues when designing policy will be considered and, secondly, a few more specific suggestions on the content of the regulation will be provided.

5.1 GENERAL CRITERIA IN DESIGNING POLICY

A key finding is the need to recognise financial assurance as a technical and complex issue, which is influenced by many financial considerations and is subject to permanent changes. These features have several implications for policy-makers in the Argentine context. First, the issue needs to be addressed with a deep technical approach, thus authorities must ensure there is a minimum consensus not to play politics on the matter before putting it in the public agenda.⁹⁴ Second, it is crucial to engage stakeholders in the policy-making, including mining companies, to ensure a feasible and experience-based approach in the wording of the particular provisions (*e.g.*, methods to estimate the amount, types of assurance and means to enforce compliance in bankruptcy scenarios, among others). Third, due to Argentina's short mining history and considering that mine closure will be enforced by the different provinces, the capacity for designing and implementing such a complex issue appears as a major challenge.⁹⁵ Alternatives to overcoming this limitation may include outsourcing to third parties, forming a close relationship with

⁸⁶ *Environmental Protection Act* s 318ZM(b).

⁸⁷ *Law No 28,090 on Mine Closure 2003* (Peru), and *Supreme Decree No 033 of 2005* (Peru), ruling the preceding law.

⁸⁸ *Law No 20,551 on Closure for Mining Works and Operations 2012* (Chile), and *Decree No 41 of Mining Ministry* (Chile), dated as of 22 November 2012, ruling the preceding law.

⁸⁹ This is not to say that there are no environmental damages from past mining practices, but its impact and extent is very limited compared to mining countries.

⁹⁰ Clark and Cook Clark, above n 4, 74.

⁹¹ Otto, above n 5, [4.3].

⁹² Miller, above n 43, 2, expressly states 'the need of financial assurance is clear'.

⁹³ This will not discuss the issue of national or provincial competences to regulate this matter, as this exceeds the confines of this study.

⁹⁴ Provincial laws mentioned in section 3.1 above are evidence of this politicised climate in Argentina.

⁹⁵ Regarding the importance of capacity and experience-based approach, see the report on South Africa in van Zyl, above n 47.

other experienced areas of government⁹⁶ and interaction with agencies from countries in the region, such as Chile or Peru.

The second general consideration refers to the conundrum of finding the right balance between the stakeholders' interests, as explained in section 4.1.4 above. In doing so, policy-makers should not set aside the broader national interest to develop mineral resources. In particular, the cost of the required financial assurance would need to be assessed in light of the overall tax burden for mining investments. Internalising costs in the companies will reduce the tax base and thus the state revenues; but also may affect the country's ability to attract investments. Finally, regulator shall be also aware of the relation between higher costs and resource efficiency, since raising capital cost can elevate the *cut-off* grade of the projects, resulting in shorter life or smaller mines, or leaving some projects unfeasible.⁹⁷ Ideally, policy-makers should evaluate promoting a regional integration in terms of some mineral policies with other Latin American countries, to avoid the so-called 'career to the bottom'.

5.2 SUGGESTIONS ON THE CONTENT

Outlined below are the suggestions for some specific issues related to the financial assurance regulation in context of Argentina:

Financial assurance is built on the environmental principle of 'polluter-pays'. However, it is important to make sure that mining companies do not rely on this assurance and, consequently, neglect the environmental management during operations. The proposed regulation should certainly secure closure, but also encourage and ensure best environmental practices, as to prevent damages.⁹⁸ Setting up a staged planning for closure, linking concurrent rehabilitation with reduction of financial assurance and offering a discount to responsible companies, all features adopted by Queensland, are directed toward this goal and thus should also be embraced by Argentina.

Secondly, policy should assign independent third parties a role in relation to costing closure, administering the funds or assurance and undertaking the closure works. Along with addressing the scarce of technical capacity, this is particularly important to improve transparency and ensure proper use of funds; two conditions essentially need to be addressed in a scenario of increasing socio-environmental conflict.⁹⁹

Although assurance for closure should be administered through an individual account attached to the respective project, however, it is suggested that the equivalent to the 'residual risk payment' from Queensland should be credited in a pooled long-term trust to be used for unexpected incidents across the country. In the long term, a general trust fund may reduce the risk of falling short to fully cover restoration costs of unforeseen environmental incidents, while hopefully allowing reducing the amount of residual risk payments for projects in the future.

Regarding the reclamation standard to be required, which in turn affects the amount of the assurance, the proposed regulation may encourage consultation with landowners and nearby communities.

⁹⁶ The difficulties mentioned in part III(B) above, regarding implementation and enforcement of the required environmental insurance in Argentina, has involved a lot of study and discussion within the National Secretary of Environment and Sustainable Development and, hence, may be helpful to engage responsible officers from this agency to further develop the regulation herein proposed.

⁹⁷ For analysis on these relations, see Phillip Peck and Knud Sinding, 'Financial Assurance and Mine Closure: Stakeholder Expectations and Effects on Operating Decisions', (2009) 34 *Resources Policy* 227. See also Laurence, above n 11.

⁹⁸ Van Zyl, above n 47, 26 [5.4.1.4]. See also Peck and Sinding, above n 97, 232.

⁹⁹ World Bank, above n 17, [3.6]

Engaging stakeholders in the planning stage, particularly to agree on the post-closure land use, improves the legitimacy of the plan and allows a more accurate estimate of costs.¹⁰⁰

Finally, the proposed regulation shall be articulated and cross referenced with any other existing and indirectly related legal tool, particularly with those identified above in section 3.2.

¹⁰⁰ See A D Rawa et al, 'Working with Stakeholders to Develop a Toolkit to Guide Planning and Implementation of Decommissioning and Closure Schemes in Resource-Rich Countries' (Paper presented at SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production, Rio de Janeiro, Brazil, 12-14 April 2010).

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