



IGF

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Sustainable Development

GUIDE TO FINANCIAL ASSURANCE FOR MINE CLOSURE IN ARGENTINA:

Toward responsible
mine closure



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Guide to Financial Assurance for Mine Closure in Argentina: Toward responsible mine closure

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FOREWORD

The purpose of this National Mine Closure Guide is to provide Argentina and the mining companies operating within it with the necessary guidance on best practice in mine closure and the establishment of applicable financial assurance within the life cycle of a mine. This guidance is expected to encourage proactive identification of risks along with progressive closure tasks and activities to address these in such a way that the financial burden is manageable when the time comes for closure. It details the benefits of financial assurance to stakeholders in government, the industry, taxpayers, and users in adjacent and downstream environments.

There were many—and varied—organizations and individuals who worked on drafting this guide. Golder Associates Ltd. outlined a proposal that was subsequently reviewed by Engineer Alejandro Vio Grossi. The law firm Fiorito, Murray & Díaz Cordero developed Appendix 1 on alternative forms of financial assurance under Argentinian law.

The guide has been revised in its entirety by the Mining Secretariat of the Ministry of the Productive Development of the Nation.



PREFACE

Mineral resources are limited, and every mine's production cycle eventually comes to an end. If the mine is properly managed throughout its life cycle—and bearing in mind the mineral resources that Argentina possesses—the country has the opportunity to obtain long-term economic benefits within a framework of protecting the environment and fostering the circular economy.

Given the finite nature of all mining, it is essential that responsibility is taken for all the liabilities that arise when a mine's productive life ends. The closure phase provides an opportunity to convert the space used by a mine into a stable environment conducive to the use of the land after closure. Worldwide, there is an increasing number of mines that provided extended economic benefits throughout their lives and then, thanks to responsible closure, were rehabilitated in a way that they became safe environments from both the physical and environmental standpoints.

Responsible mine closure requires comprehensive planning, involving the development of closure plans in the initial phases of the project and their constant updating through to execution.

One essential part of this process is planning that ensures the financing of mine closure activities. The costs involved in stabilizing and rehabilitating mined land arise at the time when mine ceases to generate income.

In order to ensure the availability of sufficient funds when the mine reaches the end of its life, many jurisdictions in different parts of the world require the establishment of financial bonds before any extractive work is done. This requirement is a way of ensuring that every mine will have the funds needed to address the tasks associated with its closure, regardless of the circumstances or date when this takes place. As part of the development and application of regulations of mining excellence that are transparent and consistent with best international practice, Argentina is preparing to establish requirements on the establishment of financial assurance to cover the closure of mining operations in its territory.

These requirements will build on the experience of multiple jurisdictions where the basic concepts of financial assurance have been applied for decades.

This guide focuses on the approaches that have proven effective in ensuring proper mine closure, taking into account Argentina's specific circumstances and the lessons learned from other jurisdictions in the region and worldwide.



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1.0 INTRODUCTION

Responsible mine closure is an integral component of sustainable development in the field of mineral resources. Appropriate closure activities—carried out while the mine is in production and after operations have ceased—are essential to ensure that the closed mine meets long-term physical and chemical stability objectives. As far as possible, the closure of a mine should form part of a general transition (progressive closure activities) in which the formerly mined land is rehabilitated, and neighbouring communities start to become involved in a long-term sustainable project.

The emphasis of this guide is on ensuring that all mines operating in Argentina generate the benefits that accrue from responsible closure plans. In this regard, it is essential to apply the concept of financial assurance to cover closure costs.

Financial assurance provides the government with an instrument for ensuring that the financial resources needed for responsible closure exist if the mining company is incapable, for whatever reason, of executing its closure plan. Similarly, financial assurance serves as a stimulus for companies to begin closure activities while the mine is still in operation (that is, "progressive closure" activities) that facilitate the transition from an active to a closed mine and allow reduced financial assurance amounts.

This guide sets out the best practice in respect of financial assurance for mine closure in Argentina that the sector and the government can adopt. It should be read in conjunction with the *Guía de recursos de buenas prácticas para el cierre de minas (Resource Guide to Good Practice for Mine Closure)* (Dirección Nacional de Producción Minera Sustentable [National Sustainable Mining Directorate], 2019) of the then Mining Policy Secretariat of the Nation (now the Mining Secretariat). *The Resource Guide to Good Practice for Mine Closure* is a compendium of the latest needs and expectations in respect of closure planning. It sets out in detail several of the concepts used as guidance during the drafting of this guide to responsible closure.



1.1 BACKGROUND

Argentina does not currently have a national law on the establishment of financial assurance for closure. Laws do exist at the provincial level,¹ and there are three laws that contain provisions for environmental remediation during operations.

- Under Article 23 of *National Law 24,196, of Mining Investment* (1993), mining companies are required to reserve funds to cover the costs of any environmental impact occurring during operations. While no minimum or maximum amount is set for these funds, their value (up to an amount equal to 5% of costs) can be deducted from taxes on profits. They will be used in the event of environmental damage that needs to be remediated during operations, and if they are not used during this time, they must be returned to the company.
- Article 22 of the *General Environment Law, Law No. 25,675* lays down that mining companies (and other entities or persons that could harm the environment) must take out insurance to cover the costs of remedying any environmental harm that takes place during their operations.
- Article 3 of the Supplementary Title, "*On environmental protection for mining, incorporated into the Mining Code under Law No. 24585*" includes the concept of liability for environmental damage, infractions under the concept of "remedying environmental damage" under Article 19 and also establishes that the regulatory scope covers closure as a phase in Article 4.

While the first two laws confer some degree of environmental protection during operations, they do not cover the closure or post-closure periods, which usually pose substantial environmental risks. In Argentina, moreover, mining activities come under the authority of the provinces, which is why various sets of mining regulations coexist in the country. Efforts have been made in recent years to erect a country-wide legal infrastructure with the goal of encouraging mining investment while at the same time protecting the environment. The 2019 *Resource Guide to Good Practice for Mine Closure* was the product of these efforts; it offers guidance on various aspects of mine closure. Financial assurance is a tool that is necessary and complementary to the *Resource Guide to Good Practice for Mine Closure*, which encourages the adoption of these best practices.

1.2 WHAT IS FINANCIAL ASSURANCE?

Financial assurance is a financial provision that the mining company grants to the enforcement authority. This financial provision guarantees the provision of funds whenever they are required for the closure of a mine at any stage of its life cycle. In general, these financial guarantees are calculated on the assumption that the enforcement authority will hire a third party to undertake the closure tasks for a specific mine in the event that the mining company responsible is unable or unwilling

¹ Resolution 396/16 of the Province of Catamarca, which includes a requirement for closure bonds, and Resolution 037/2020 of the Province of Jujuy, which indirectly imposes a guarantee requirement.



to do so itself (for example, if it files for bankruptcy or simply abandons the mine). The mining company cannot access the financial bond it established, but the sum is reduced and returned to the company in line with the progress of the reclamation work.

Financial assurance is an element of best practice according to international organizations such as the International Council on Mining and Metals (ICMM). Several of the world's major mining jurisdictions, such as Australia, Canada, Chile, and Peru, require companies to provide some form of financial assurance before the start of mining activities.

1.3 WHY IS FINANCIAL ASSURANCE NECESSARY?

A glance at the global history of mining reveals many examples of mines in different jurisdictions that did not properly undertake the tasks associated with closure. This practice caused environmental harm and risks to human health. States have been hit with millions of dollars in costs to remedy damages and rehabilitate abandoned mines. Financial assurance policies seek to prevent the proliferation of abandoned mines and avoid the state having to take responsibility for the costs arising from mine closures.

Rigorous financial assurance legislation is intended to ensure that potential closure costs are properly accounted for and that the funds will be available at a future date to carry out the work needed for reclamation, closure, and monitoring and to carry out long-term monitoring and maintenance if necessary. Adequate financial assurance policies help states avoid having to meet high costs for the implementation of closure plans.

In addition to preventing abandoned mines and the state's assumption of uncontrollable financial obligations, financial assurance provides other benefits for both companies and governments:

- **A more accurate determination of the economic viability of a project.** In recent decades, closure and reclamation activities have frequently come to form part of the activities expected of mining projects. Closure plans and closure cost estimates are necessary requirements for knowing the real total cost of a mining operation and accurately assessing its economic viability. Historically, mine closure costs have been underestimated, partly due to a lack of understanding of the complexity of the task. Closure planning and calculating the necessary financial assurance offer a more accurate understanding of the magnitude and implications of closure relative to the project as a whole.
- **Encouraging progressive closure.** Closure plans should be updated throughout active operation of the mine so that they align with mine plans, and an updated estimate should be made of closure costs upon which to base the financial assurance. In this way, closure activities carried out during operations are not reflected in closure costs, for which reason the corresponding amount can be deducted from the financial assurance amount. This reduction



in financial assurance promotes the conclusion of progressive closure work during mining operations whenever possible.

- **The possibility of achieving better closure outcomes, carrying out adaptive reuse, and promoting the circular economy.** Another benefit of closure planning in general and, especially, of progressive closure, is that it helps to optimize planning for the period after the cessation of mining and for the ultimate use of the land, thus achieving better outcomes. Early implementation of progressive closure activities provides an opportunity to adapt reclamation methods to suit outcomes observed during the life of the mine. This brings the additional result of achieving better design and performance of final closure tasks. If better reclamation outcomes are obtained at the time of closure, this will be a stimulus for the circular economy and sustainable development in Argentina since it will increase the chances of carrying out the adaptive reuse of the land once mining activity has ceased. As an example, in those cases in which the site can be remediated immediately after the closure of the mine with no environmental or human health risks, it can be used in a variety of ways in a shorter time, too, taking account of local communities. If these policies were to be implemented at the national level, they could generate considerable economic benefits in Argentina since they lay down a sound basis for increasing community acceptance of mining activities which could, in turn, attract investment in sustainable and environmentally responsible mining projects.

1.4 THE LIFESPAN OF A MINE AND PREPARATION OF THE CLOSURE PLAN

The lifespan of a mine is usually depicted as a flow or process chart (Figure 1) that starts with the planning of the mining project (exploration and pre-feasibility studies), continues with construction and operation, and ends with the closure and post-closure stages. After—or as part of—this last stage, it may be that another use is given to the place where the mine was. A brief description is given below of each stage in the life of a mine and of each stage's link with closure planning and financial assurance.

Exploration. This stage consists of prospecting and exploration, during which research is conducted to determine the presence of a mineral resource, and geostatistical evaluations are made to calculate reserves. Once these exploration results have been obtained, an economic evaluation of the deposit is carried out. In this stage, closure is limited to the rehabilitation of land affected by the exploration that would be of no future use to the company. It is possible that some form of insurance could be taken out to cover disturbances caused at this stage, though protection of this type does not normally fall within financial assurance in the sense in which it is understood in this guide.

Planning and feasibility studies. This stage consists of an economic, environmental, and social analysis of the mining project and its potential viability. Preliminary



mine planning is carried out during the feasibility study, including environmental assessments, socioeconomic evaluations, and economic viability studies for the project, using the data gathered during this research. Evaluation of the proposed closure plan and cost should be part of the project's general viability analysis. Authorities usually demand the presentation of a conceptual closure plan and an initial assessment of closure costs as part of the licensing procedure. The general project feasibility stage normally includes closure activities and the corresponding engineering designs, at a conceptual level (since most of these activities will begin long after the commencement of project development). The conceptual engineering designs for closure are carried out to find out the possible effects of results, along with logistical coordination and cost implications. However, to calculate closure costs, the engineering of the closure measures is adjusted to the fullest extent possible to align with the detailed engineering, in order to minimize uncertainty in respect of the financial assurance amount.

Construction and start-up of operations. This stage includes the detailed design and subsequent construction of the infrastructure, as well as the mine's initial short- and long-term plans. Closure and post-closure planning are carried out at the same time as that for the mining project, although a separate detailed closure plan is normally submitted to the regulatory body prior to the start of construction. This plan contains the closure works planned in accordance with the approved service life of the mine, in addition to closure costs. In good practice, part of financial assurance is granted to the competent authorities before generating any disturbance of the land to be built on. In general, good international practice recognizes that in this phase of the project, the amount of the financial guarantee is proportional to the magnitude of the disturbance anticipated in the early years of activity. This value can be calculated directly or represented as a percentage of the total mine closure cost.

Operations. It is in this stage that extraction of the mineral of interest and generation of mining waste begins. At this time, there are likely to be changes to operations and expansion of facilities, and progressive reclamation is undertaken whenever possible. During operation, the plan of the mine and its closure plan are periodically updated. It is considered good practice to update the closure plan and the estimate of the financial assurance (and funds) at least every 5 years (and possibly more frequently if significant changes occur to the plan of the mine). As the end of the mine's useful life approaches, there needs to be greater emphasis on the level of detail in the closure plan and the precision of the financial assurance estimate. The closure plan should be updated as the years pass in production in accordance with any different circumstances that have modified the original plan due to unforeseen events or factors external to the company.

Closure. Once operations have stopped, it is time to carry out all remaining closure activities that have not been implemented as part of progressive reclamation. These include resolving physical and chemical stability problems and converting the site into a long-term stable environment that can support the ultimate use of the land. In addition, completed reclamation works will be monitored to evaluate



their effectiveness. The corresponding proportion of the financial assurance can be released in line with the degree of completion of the closure works.

Post-closure stage. Once the closure work has been completed and sufficient time has elapsed for its effectiveness to be evaluated, the closure certification can be issued, and all or the remaining part of the financial guarantee provisions can be returned to the company. In many cases, the company will be subject to continuing obligations and risks to which it must respond by means of ongoing activities that it has to carry out, such as periodic dam safety inspections or the processing of water from the mine. It is usually necessary to retain part of the financial guarantee, which must be required in the post-closure calculation, in order to meet any obligation resulting from the post-closure stage.

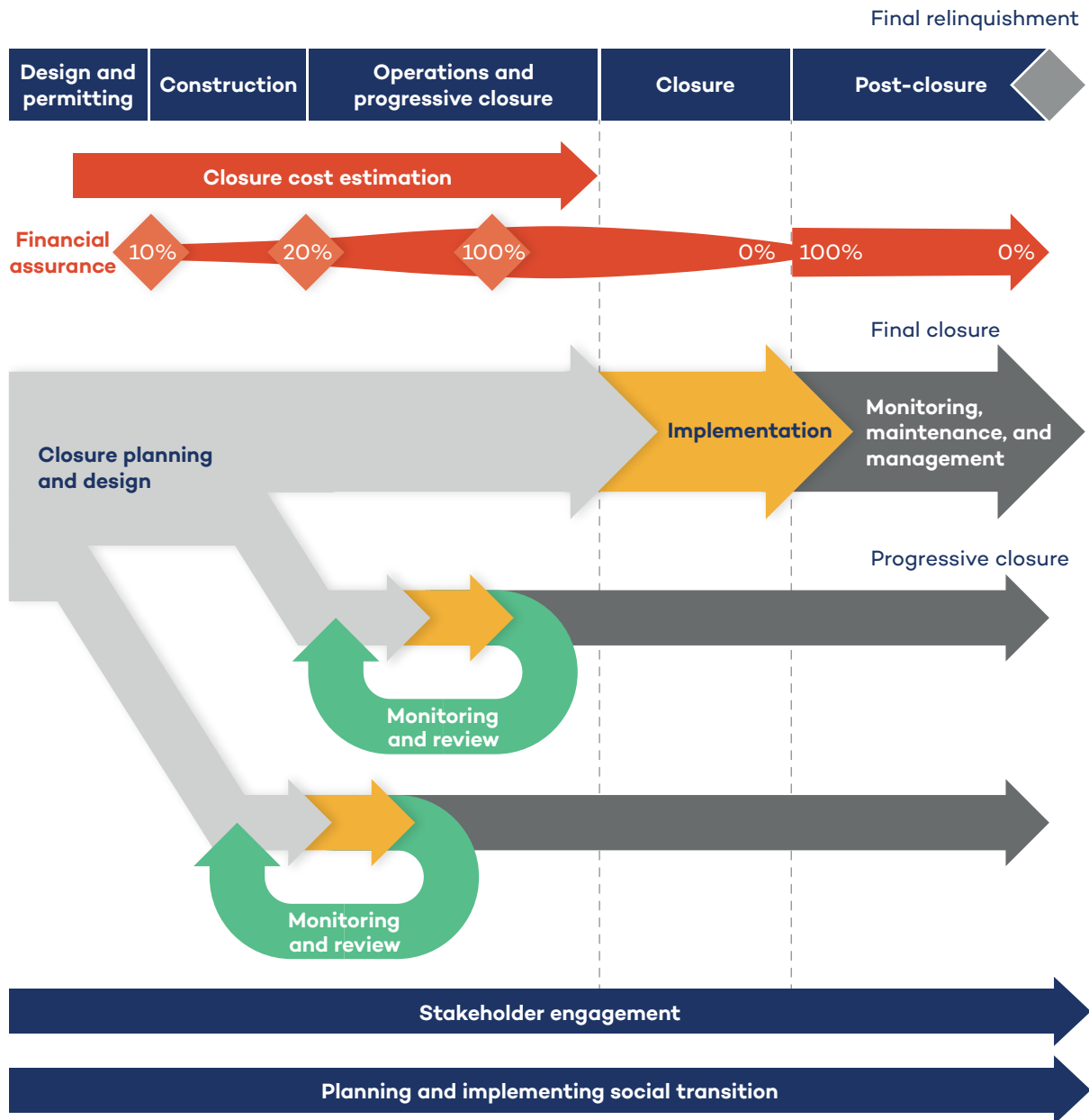
During each of the first four stages mentioned above, work is actively done on planning the mine closure. At the beginning of the mining project, the plan is more conceptual in nature—it gains detail and is progressively implemented in parallel with operations. Mine closure planning, therefore, goes hand in hand with design of the mining project; that is, the mine is designed in a way that facilitates progressive reclamation and final closure. Incorporating design features that facilitate final closure activities can reduce final closure costs and the financial guarantee required. This concept is aligned with the accepted principles of sustainable development.

As work advances on the mining project and planning its closure, so are the estimated financial assurance amounts updated. As the closure plan is conceptual in nature in the initial stages of the mine, the estimates of the amounts of financial guarantees will also be less precise at the start of the mine's working life. If uncertainty is high, the assurance amount must be greater than the calculated amount. As exploration and progress on operations provide more information, the closure plan will continually become more detailed, meaning that estimates of financial assurance amounts will also become more precise. Whenever the closure plan is updated, the estimated financial assurance amounts will be updated too. It is generally the case that the estimated cost of closure increases as knowledge increases of the true obligations arising from the project (Figure 2).

Many guides suggest that the financial assurance amount should be proportional to the disturbance (see, for example, ICM [2019]). The magnitude of the disturbance caused by a mine usually increases over its lifespan. At first, it may generate a relatively small footprint during construction, but this increases when operations begin, and it peaks at some point during the operations phase. While there is a need to calculate the total magnitude of the disturbance (and the final amount of the financial assurance) before moving on to the construction stage, the actual extent of the assurance established at the beginning of this stage should match the magnitude of disturbance expected in the early years of operation of the mine. It should be gradually increased up to the maximum in proportion to the mine's development.



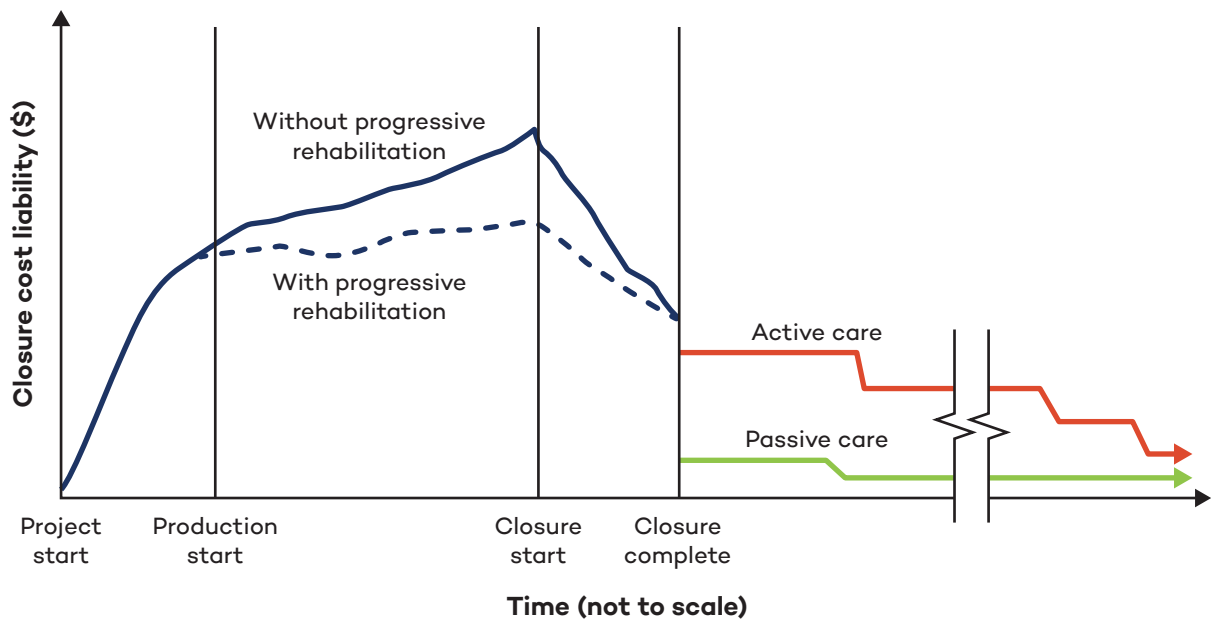
FIGURE 1. STAGES IN THE LIFE CYCLE OF A MINE AND MODEL ESTABLISHMENT OF FINANCIAL ASSURANCE



Source: Adapted from ICMM, 2019.



FIGURE 2. FINANCIAL OBLIGATION ASSOCIATED WITH MINE CLOSURE, WITH AND WITHOUT PROGRESSIVE RECLAMATION



Source: Bocking, 2010.



2.0 REGIONAL PRACTICES

Governments in Latin America have begun to move on from the position of simply waiting for mining companies to respect international best practices and have started to develop national legislation on mine closures to ensure that this step is properly planned and executed. In many countries in the region, legislative expectations in respect of mine closures are set by means of environmental and social impact assessments (ESIAs) in the case of new mining projects, either directly through legislation or through legally binding commitments made during the assessment process. While this does provide a legal framework for mining companies to establish and commit to implementing closure measures, this approach leaves several important shortcomings unresolved.

Historical precedents tell us that one of the most critical shortcomings is that legal commitments made under an ESIA process provide the state with no protection against the possibility of inheriting financial obligations resulting from the closure of the site in the event of bankruptcy or other situations whereby the company is unwilling or unable to take care of closure costs. The result is that a government that does not have a practical mechanism to force the company to pay closure costs will find itself under a significant obligation and possibly facing significant damage to the environment and harm to the health or safety of the public. As discussed in Section 1.0, financial assurance is a practical mechanism that is increasingly used to ensure that governments do not find themselves with unfunded obligations from mining operations.

In Latin America, Chile and Peru are two countries that have enacted national legislation on mine closures obliging mining companies to provide financial guarantees to cover closure costs. There are many important similarities in both countries' approaches, including:

- Clear and specific legislation on mine closures laying down requirements for financial assurance.



- The imposition of transparency around key aspects of how to calculate financial assurance amounts, including a definition of methodologies for setting discount rates.
- A requirement that calculations of closure costs are accompanied by a closure plan and that both undergo a suitability analysis by a national authority with powers to reject the plan or require that it be amended.
- A requirement that the closure plan and the calculation of the financial assurance amount are periodically updated.
- National guidelines that, although not legally binding, provide clear guidance regarding the content of closure plans, including expectations for a need to demonstrate adequate physical and chemical stability as part of closure activities.
- National guidelines indicating how to calculate, submit, and provide the financial assurance amount, with guidelines on acceptable financial instruments.

While there are many differences between Chile and Peru in respect of their guidelines and laws on mine closures, both countries broadly reflect the most important aspects of internationally accepted best practice, and both countries oversee mine closures at the national level. This makes it possible to exercise a uniform level of control and monitoring that promotes implementation of a national policy on mine closure. There are other noteworthy countries in the world where provincial or state authorities have jurisdiction over mining, which more closely resemble the situation in Argentina. Prominent among these countries are Australia, Canada, and, to a certain extent, the United States. The following sections provide a summary of financial assurance aspects of mine closure regulations in Chile and Peru.

2.1 CHILE

Chile is a unique case in the Latin American mining context since it has a higher proportion of large-scale mining projects than other countries such as Bolivia, Ecuador, and Peru, which have a higher percentage of artisanal or small-scale mining operations. In the case of mines with a monthly extraction capacity in excess of 5,000 tonnes, the establishment of financial assurance is required to cover:

- Closure and post-closure costs for each facility on the operating site
- Administrative costs of closure works
- Contingencies
- Post-closure monitoring costs
- Taxes applicable to closure works (value added tax).

Law 20,551 also lays down the types of sanctions to be applied if breaches of closure plans are detected. At the start of operations, the mining company must present



20% of the total estimated financial assurance amount. It must then constitute the full amount of the financial assurance and make it available to the government within the first two thirds of the estimated lifespan (if the lifespan is 20 years or less) or within 15 years from the start of operations (if the lifespan of the mine exceeds 20 years). The amount and form of the assurance are broken down so that it is gradually available throughout the lifespan of the mine.

The financial assurance amount is determined by estimating the present value of all costs and it must clearly specify the mechanism for establishing the discount rate used to calculate the present value. The discount rate is based on the rate of bonds issued by the Central Bank of Chile with a maturity date of at least 10 years (in the case of operations with a predicted remaining lifespan of between one and 15 years; for longer periods, the 20- or 30-year bond rates must be applied). Note that it is also important that the formula used to calculate the present value takes account not only of the year in which spending is expected to occur, but also the certified service life of the mine.

Financial assurance can be established in different forms. In general terms, these financial instruments are divided into three classes (instruments A1, A2 and A3). Eligible instruments are determined depending on the stage of the service life of the mine; in the final third, only the safest and most liquid instruments are allowed. These instruments (which are placed in category A1) include bank bonds, certificates of deposit, bank guarantee certifications, and standby letters of credit issued by a bank with a risk rating of at least A. While in theory, all companies can have A2 or A3 instruments depending on the mine's life cycle stage, in normal practice, the largest mining companies do not consider these appropriate. Under Law 21,169, which amended Law 20,551 and entered into force in June 2020, financial assurance may also be in the form of an insurance policy. This measure was included in order to ease the financial burden on medium- and small-scale mining companies, which find it harder to provide other eligible class A1 instruments.

2.2 PERU

Peru was the first Latin American country to enact a law on mine closures formally requiring the submission of financial assurance to cover closure costs. The financial assurance amount must be calculated and updated together with each detailed closure plan submitted every 5 years. The financial assurance amount must be equal to the total cost of implementing the mine closure plan, discounting progressive closure measures that have already been carried out. The bond has to be divided into equal amounts according to the remaining number of years of active operation. In the case of new or already-operating mining projects, active life is determined from estimates of annual production and total proven and probable reserves. In the case of exploration activities, it is considered that the timescale approved in the environmental certification represents the active life.

The criterion for increasing the amount of the financial assurance is practically linear over the entire service life of the mine; the underlying assumption is that the



assurance reflects the degree of disturbance generated by the mine as its activities advance. This supposition may or may not be realistic and representative.

Since the financial assurance is provided to ensure the implementation of closure measures in the event that the mine owner cannot carry them out, the estimate should be made on the assumption that a third party will be responsible for executing all closure works.

Peruvian law also has a provision requiring that a financial guarantee of a general overall amount be made every year if the company fails to submit a closure plan to the competent authority or if its closure plan is not approved. The progressive closure budget made prior to and contemporaneously with operations is required to include all progressive closure tasks, while the final closure budget (which has to be presented no more than 5 and no less than 2 years before the cessation of mining activities) has to include those costs related to final closure activities. The post-closure budget is required to include an estimate of all costs associated with the monitoring and maintenance carried out in this stage. Each cost estimate in the financial assurance must be accurate to +/- 20%.

Every year that the mine is in operation, the company is required to submit a renewal of the financial assurance in the form of an approved financial instrument. The operating licence may be revoked if the assurance is not kept up to date. Financial assurance must be provided in an approved form that, under the law, is required to have sufficient liquidity to be easily converted into cash for it to be available if necessary. Approved forms include letters of credit or other equivalent financial instruments issued by foreign or domestic first-class banks, insurance policies (bonds) issued by first-class firms, trust funds in cash or other approved instruments, property other than mining concessions, and financial securities not issued by the mining company. The competent area, the Ministry of Energy and Mines, may also add other types of financial assurance to the list of eligible instruments by means of a ministerial resolution.



3.0 ESTIMATES OF THE COSTS OF FINANCIAL ASSURANCE

3.1 WHEN IS ASSURANCE REQUIRED?

It is recommended that some form of financial assurance be required for every mining project and that no works that disturb the ground be carried out until sufficient financial assurance is provided to cover all necessary rehabilitation.

In practice, there are some variations in the application of this concept. In both Chile and Peru, a conscious decision was taken during the drafting of their mine closure laws to meet the needs of small-scale mining and artisanal miners, freeing them from the obligation to develop and finance independent closure plans. This was due to the fact that small-scale miners lack the technical capacity needed to develop closure plans and that the financial burden on them would be unsustainable if they had to provide the state with financial guarantees. In this context, application of closure requirements equal to those demanded of operations of all sizes might cause the disappearance of the small-scale mining sector or would drive small miners into operating illegally.

All mines generate disturbances, and all mines have to close at some point. If small-scale miners (generally, those operating mines with an extractive capacity of less than 5,000 tonnes per month) are exempted from the requirement to provide financial assurance, thought should be given to the possibility of introducing some form of collective guarantee based, for example, on the model used in Peru.

As for timing requirements, financial assurance should be made available before any disturbances are made to the ground. This means that the licensing documentation for new mining projects should include an estimate and evidence of approval of the financial assurance amount. Before construction begins, a calculation needs to be made of the financial assurance amount for the entire life of the mine as well as a determination of the assurance amount to cover the initial construction and operation period. This can be calculated as a percentage of the amount required for



the whole life of the mine or as an amount based on an estimate of the disturbance produced in the initial period such as, for example, the first 5 years from the start of construction. Both Chile and Peru calculate the initial financial assurance amount as a percentage of the total.

3.2 WHAT IS INCLUDED IN THE ESTIMATE OF THE FINANCIAL ASSURANCE AMOUNT?

Financial assurance estimates should include an amount for all the activities needed to achieve the physical and chemical stability and environmental rehabilitation of a mining site after the cessation of operations and to cover the costs of necessary monitoring and maintenance after the closure objectives have been met. In practice, this includes one element to perform a variety of works during the closure stage and another to cover monitoring and maintenance requirements in the post-closure stage. These two components may overlap, especially in terms of time, on complex and large sites. The activities carried out in the closure stage comprise a series of civil engineering works, such as demolition, construction of access control facilities, the placing of cover systems, the levelling and reforestation of surfaces and the construction of structures for surface-water management. If water needs to be treated, the construction of passive systems or treatment plants usually forms part of the work performed during the closure stage. The post-closure stage requires a monitoring program to confirm that all the closure work has been carried out as planned. There also needs to be a sum allocated to maintenance, such as minor repairs or levelling, which may become necessary as the closed site assumes a stable state. The post-closure stage can have a set duration, based on the closure plan. In some cases, such as when water treatment is required for an extended period or there are dams capable of retaining water for an indefinite period, the post-closure stage (and financial obligations entered into by virtue of these tasks) will continue into the foreseeable future.

Despite the current lack of consistent international practice, since the assurance is established on the basis of the closure plan, if the closure plan incorporates and budgets for social measures, the assurance amount could also cover the social measures included in the plan. For example, if the plan included budgeted measures for the preparation of mine workers for other professions (such as training, help with CV writing, or fostering the development of other productive activities to contribute to social transition), those costs included in the closure plan could be included in the assurance amount.

The financial assurance should include estimates of the costs that will be incurred during the closure and post-closure stages, along with the financial cost of employing a third party to carry out the closure procedure.

3.2.1 ACTIVITIES IN THE CLOSURE STAGE

The cost of the closure work to be carried out should be projected using standard engineering costing methods and should be accompanied by a detailed breakdown



of what is included in the estimate along with a clear record of all the major assumptions used for these. Documents should be of sufficient clarity for anyone to be able to analyze the costs and understand what is included in (and what is excluded from) the cost estimate.

The following is a list of the direct costs that are usually included in financial assurance estimates, as per ICMM (2019):

- The dismantling and demolition of structures and the cleanup of contaminated sites.
- Groundworks, comprising the reconstruction of slopes, channels or other waterways; or the expansion or installation of mechanisms to protect against erosion; the removal or transfer of materials; the construction of coverage systems; and the generation of extraction sources for filler material.
- Reclamation work, comprising the restoration of vegetation (sowing, planting, etc.), adding topsoil, fertilizing, and the maintenance and inspection of the vegetation that has been restored.
- Water management, including surface and groundwater (for example, the dismantling or maintenance of observation wells, as appropriate).
- Water treatment, comprising the construction, commissioning, and maintenance of water treatment plants.
- The removal or placement of surface coverings.
- The closure of mine entrances and underground access points, when appropriate.
- Signage of site access control.
- The cost of safe tipping or tipping site control.
- The costs related to the long-term management of the residual risk.
- Research into dismantling and closure planning in order to develop detailed closure designs when necessary.

Estimates of the financial assurance amounts to meet closure costs should also include the following indirect costs:

- The cost of contractors, consultants, and other services.
- The management of engineering works, procurement, and construction.
- Health and safety plans and the monitoring and quality control of construction.
- The costs of managing closure services, such as electricity, water, wastewater collection service, fuel, and supplies.

Lastly, closure plans usually include objectives and specific budgeted actions associated with meeting the social commitments made by the company.

The inclusion of these costs in the assurance estimate would contribute to



socioeconomic transition and budget planning. It also prioritizes social aspects of closure and ultimately contributes to efforts to mitigate the impacts of closure were the assurance to be called on.

While the above lists are not exhaustive, they do offer a general idea of direct and indirect costs and the types of items included. It is commonly found that in the early stages of a mine's activity, indirect costs are calculated on the basis of the manager's experience of closure estimates and planning and are expressed as a percentage of total direct costs. When the cost estimate is adjusted in the years closer to closure, indirect costs are calculated more accurately as a function of estimates of person-hours and materials and contain a detailed basis for the estimate.

3.2.2 MONITORING AND MAINTENANCE

Monitoring and maintenance requirements that need to be addressed once closure work has been completed can form a significant proportion of the financial assurance amount. Depending on the characteristics of the site, these activities can range from a relatively small percentage of the total assurance amount up to being the highest element of the costs.

A certain degree of monitoring is required on every site after the completion of closure activities to verify that everything is working as it should. Typically, this monitoring consists of periodic visual inspections and taking water, air and, sometimes, ground samples to show that the closure objectives are being met. Monitoring also usually includes the systematic collection of data from the geotechnical monitoring equipment to confirm that the site is physically stable at all times. The assurance amount for maintenance is set as a function of the types of closure works to be carried out. If, for example, closure operations include the planting of vegetation over extensive areas, a maintenance amount will be included to cover the obligation to return to the site and reforest any areas where initial reforestation works failed.

There is no single rule to estimating the period of time that the monitoring and maintenance stage needs to be continued, and so the correct period should be determined on the basis of the engineering work and the complexity of the site conditions. In practice, 5 years is the usual minimum period.

On some sites, monitoring and maintenance can be necessary for much longer than 5 years. Thus, for example, in current practice, a large dam with water-retention capacity that is left in place when the mine is closed cannot be abandoned. A structure of this type has to undergo some degree of constant monitoring for as long as it retains water: this is why it must have a provision for periodic maintenance in case any problems arise. Here, the financial assurance amount should include the present net value of the current annual cost for the structure's monitoring and maintenance.



The same applies when water treatment features in the closure plan. When water has to be treated because of problems caused by acid rock drainage, treatment plants usually have to be in operation for centuries or in perpetuity. Any logical determination of this cost should include an estimate of the current value of the associated costs, including the costs of treatment, of operating the treatment plant, of waste disposal, of the purchase of reagents, and of the maintenance or periodic replacement of the treatment plant and associated infrastructure, in accordance with its designed service life.

It should be noted that, when the costs of constant monitoring and maintenance have to be considered as being in or almost in perpetuity, the time value of the money should be calculated by means of the application of appropriate discount rates.

The company is usually required to set an evidence-based period for monitoring and control using specific studies able to give the authority a reasonable degree of certainty that the time estimate is correct. A calculation should also be made of the cost of periodic reviews of the closure including its maintenance, calculating the present value as being in perpetuity.

3.2.3 EXCLUSIONS

Financial assurance guarantees are provided to protect the interests of the state and society from the possibility that a mining company does not, for any reason, fulfill its responsibilities arising from the closure of a mine that has reached the end of its life. It is normally understood that the assurance will reflect the spending that the state would have to make to close the site safely.

As a general rule, the organized closure of a site by a mining company as part of the business cycle is more efficient than a closure by the state using external contractors; this latter possibility is incorporated in the approach used to calculate the financial assurance amount, the estimate of which includes the cost implications of using third parties.

However, mining companies that carry out closures responsibly will also incur spending that is not usually considered part of the financial assurance. One of these is the cost of reducing staff, ending contracts, and other business expenses that tend to take place in any cessation of operations. Although these are real costs that should be included in the company's internal accounting, they do not form part of the spending that the state would normally have to make in the event of the sudden or unforeseen mine closure (as might happen in the event of bankruptcy). This is why they should not be included in the closure costs and, therefore, the financial assurance.

One could, for example, draw an analogy with a company unconnected with mining that declared itself insolvent. If a major employer closed down, there would be consequences for the state and the community that would lead to job losses, damage to the tax base, and the destruction of social structures—and yet no one suggests that non-mining companies should post some kind of bond with the state



to cover the costs associated with these problems. This is why financial assurance in the mining sector should focus on the physical and environmental hazards specific to this particular sector.

Programs to help with the post-closure social transition could be added to the assurance, although it has not been international practice so far to do so. If they are included, it is recommended that they be well defined and have clearly expressed objectives, parameters, and executable actions, so as to avoid subsequent arbitrariness.

Interim care and maintenance costs, such as those that would ensue from the site going into a stage of temporary care and maintenance, are also excluded from the assurance amount. These interim costs are more akin to operating expenses, which would not fall to the state.

International practice in respect of financial assurance is geared toward closure costs that can be logically expected. While a risk-based approach is usually incorporated into the development of the closure plan and the selection of appropriate closure measures, the calculation of the financial assurance amount is deterministic. The provision of an additional amount in the financial assurance to deal with low-probability situations (such as catastrophic failures in mining waste facilities due to design defects) presents a series of conceptual difficulties; what is more, no clear and fair method has been devised in respect of assurance for situations of this type.

3.3 CALCULATION OF THE LIFE OF THE MINE TO DETERMINE THE SCHEDULE FOR THE POSTING OF THE ASSURANCE

3.3.1 LIFESPAN

The lifespan of a mine is the calculation of the number of years for which ore will be extracted, extrapolated based on the quantity of ore and the project's extraction rate.

The lifespan used is highly relevant for the calculation of the assurance amount and its posting schedule. Indeed, the lifespan, expressed in years, sets out the estimated moment when the closure plan approved by the competent authority should start to come into effect and defines the time frame within which the company must provide the competent authority with the duly approved assurance instrument or instruments.

The determination of the mine closure assurance amount is based on:

1. The sum of the costs of the closure measures for each of the facilities, with all their components, at the time when the plan is executed.
2. The funds necessary for implementation of the post-closure provisions contained in the closure plan.



To determine the total assurance amount, a calculation is made of the present value of the closure costs for each facility, taking the years in which each facility's closure takes place up to the lifespan or remaining lifespan of the mine. The longer the lifespan of the mine, the lower the calculated present value. Hence the importance of a competent authority determining or defining how a mine or mining project's lifespan is calculated.

3.3.2 CALCULATING THE AMOUNT OF MINERAL IN A DEPOSIT TO DETERMINE ITS LIFESPAN

MINERAL RESOURCE AND MINERAL RESERVE

The amount of mineral contained in a deposit is the mineral resource.²

There is also the “mineral reserve,” or “that portion of the measured mineral resource or indicated mineral resource that is economically extractable in a production, environmental, economic and financial scenario drawn from a mining plan.”

Assessment of the mineral reserve is carried out using pre-feasibility or feasibility studies.³

Mineral reserves can be placed in one of the two following two categories:

1. Probable mineral reserves.
2. Proven mineral reserves. Proven reserves have higher confidence levels.

Ore reserves, which are a modified subset of the Indicated and Measured Mineral Resources (shown within the yellow outline in Figure 3), require consideration of the Modifying Factors affecting extraction, and should in most instances be estimated with input from a range of disciplines (Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, 2012).

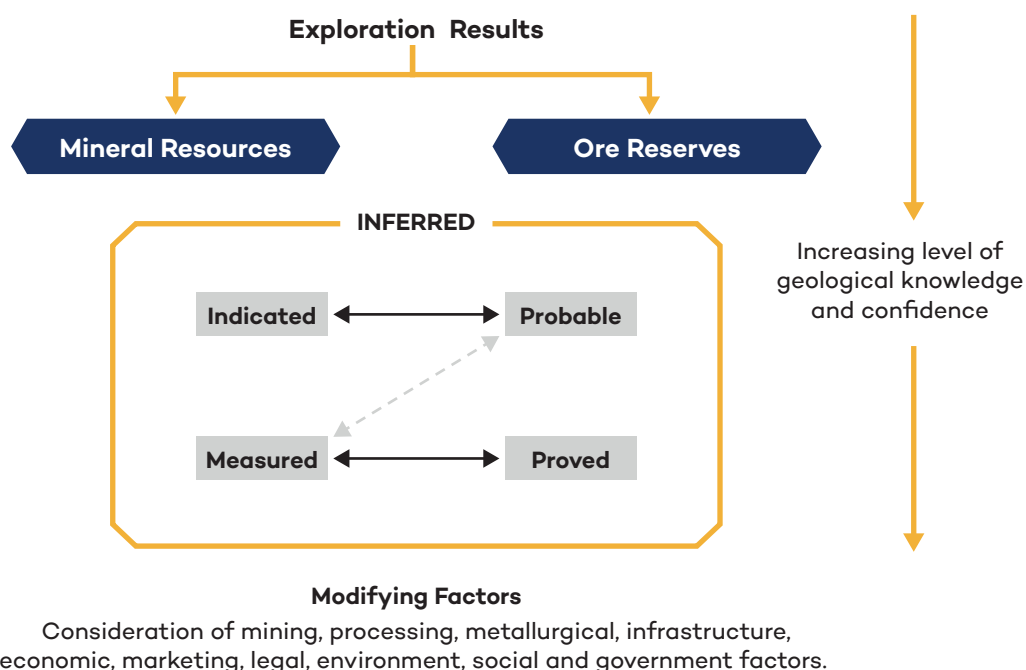
² Mineral resource is a concentration or occurrence of natural, terrestrial, solid, inorganic, or fossilized organic material in such a form, quantity, and quality that reasonable prospects exist of its possible economic extraction. The location, tonnage, content of elements or minerals of interest, geological characteristics, and degree of continuity of the mineralization are estimated, known or interpreted from specific geological, metallurgical, and technological evidence.

"The term 'mineral resource' covers mineralizations and natural materials of intrinsic economic interest and which have been identified and estimated by means of exploration, recognition and sampling activities. According to the degree of reliability, mineral resources are categorized into Inferred, Indicated and Measured" (Committee for the Qualification of Competences in Mining Resources and Reserves, 2015).

³ The mineral reserve is "that portion of the measured mineral resource or indicated mineral resource that is economically extractable in a production, environmental, economic and financial scenario drawn from a mining plan and the assessment of which has taken account of all modifying factors (mining, metallurgical, economic, financial, commercial, legal, environmental, infrastructure-related, social, and governmental). The mineral reserve includes losses and dilutions from foreign material that surrounds that portion of the mineral resource and contaminates it due to mining. Assessments of mineral reserves are carried out through pre-feasibility and feasibility studies, which need to be updated when the mineral reserves are reported" (Committee for the Qualification of Competences in Mining Resources and Reserves, 2015).



FIGURE 3. GENERAL RELATIONSHIP BETWEEN EXPLORATION RESULTS, MINERAL RESOURCES AND ORE RESERVES



Source: Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, 2012.

Mineral reserves are critical for determining the lifespans of mines. Mineral reserves must be taken into account in order to:

1. Define financial assurance amounts.
2. Determine the time when they should be lodged with the competent authority.

THE LIFESPANS OF MINES IN CHILE AND PERU

The Peruvian Closure Regulations lay down that a mine's lifespan shall be considered "according to its annual production and proven reserves as stated in the corresponding Annual Consolidated Declaration" (Ministry of Mining and the Environment Peru, 2012).

The Regulations of the Chilean Law of Closure of Mining Sites (Ministerio de Minería, 2012) lay down that the lifespan of a mining project is "that calculation that is made on the basis of reserves that are proven, proven more probable, certified by a Competent Person in Mineral Resources and Reserves pursuant to Law No. 20,235 (regulating the figure of competent persons) in relation to annual ore extraction levels."



International best practice dictates those mineral reserves should be carried out or guaranteed by a competent professional. The competent professional should be a professional registered in a body that certifies qualifying degrees or qualifications and should have knowledge of the techniques internationally recognized for determining a deposit's mineral resources and reserves.

ACCREDITATION OF COMPETENT PROFESSIONALS FOR DETERMINING MINERAL RESOURCES AND RESERVES

Chile created the Mining Commission (Comisión Minera) as its representative on the Committee for Mineral Reserves International Reporting Standards (CRIRSCO), an internationally recognized institution for the establishment of codes of mineral resources and reserves. CRIRSCO is made up of members representing the following countries: Australia, Brazil, Canada, Chile, Colombia, Europe, India, Indonesia, Kazakhstan, Mongolia, Russia, South Africa, Turkey, and the United States.

The Association of Economic Geologists of Argentina (Asociación de Geólogos Economistas de Argentina) is in the process of becoming a CRIRSCO member on behalf of Argentina and of validating its Code of Mineral Resources and Reserves. CRIRSCO can be the institution that defines the competent authority that accredits the “competent person.” The role of this competent person is to certify the lifespan of the mine for presentation of its closure plan for the approval of the authority.

3.3.3 DETERMINATION OF THE LIFESPANS OF MINES ACCORDING TO SCALE

In this respect, it is considered useful to divide mining into three categories, depending on the level of production: large-, medium- and small-scale.

1. Small-Scale Mining

Despite it being stipulated here that all mining companies should provide assurance, it is ineffective to ask small-scale mining operations to do this, as it is impossible for such operations to bear the financial cost of assurance.

It is common to exempt small-scale mining from the obligation to provide closure assurance, and there is, consequently, no demand for a determination of lifespan. The issue of closure is addressed by the mining authority from the perspective of training and technical support.

2. Medium-Scale Mining

Since medium-scale mining does not usually work with very long-term estimates of mining reserves (2 or 3 and up to approximately 6 years), the lifespans of mines are very short if they are only allowed to take account of proven mineral reserves. At the start of construction, they should be required to provide highly liquid financial assurance instruments, such as a unilateral on-demand guarantee, to force them to freeze all closure funds as soon as construction starts.



In Chile, mining projects extracting 10,000 to 500,000 gross tonnes of ore per month are permitted to calculate lifespan using measured, indicated, or inferred mineral resources, certified by a competent person as defined by law.

While Argentina does not have a significant amount of medium-scale metals mining, this could be important for non-metals mining. For the calculation of the assurance amount, therefore, it is recommended to divide mining companies into the three scales of large-scale mining, medium-scale mining, and small-scale mining, depending on their levels of production.



4.0 FINANCIAL ASSURANCE INSTRUMENTS USED WORLDWIDE

Among the various global mining jurisdictions, there are differences in the instruments accepted as financial assurance. It is possible to combine instruments, which is often more convenient for mining companies as it aims to achieve a balance between each instrument's advantages and disadvantages. The most common forms used worldwide are:

- Letters of credit
- Performance bonds
- Trust funds
- Insurance policies
- Cash deposits
- Pledges of assets
- Financial statements or balance sheets (there is currently no mechanism for the use of these in Argentina)

Those instruments in common use are described in the subsections below and in Table 1.

Regarding their specific application in the Argentine market, the financial instruments that could be used for financial assurance are detailed in Appendix 1.

To provide greater flexibility, the possibility should be stipulated of evaluating alternative forms of assurance presented by those proposing mining projects in exceptional circumstances, without the state being under any obligation to accept any form that does not match or exceed the liquidity and safety of the instruments mentioned above.

Regardless of the instrument chosen, once the mining licence has been granted there should never be a period in which there is no financial assurance in force and



available. The following sections describe common instruments used internationally for financial assurance. Table 1 summarizes the advantages and disadvantages of each.

TABLE 1. ADVANTAGES AND DISADVANTAGES OF FINANCIAL ASSURANCE INSTRUMENTS

INSTRUMENT	ADVANTAGES	DISADVANTAGES
Letters of credit	<ul style="list-style-type: none"> • Low initial cost. • Negotiable rates. • In general, costs associated with opening are deductible. • Require minimal administration once issued • Funds are easily accessed. • Governments can reserve the right to approve the bank. • No need for governments to administer funds directly. 	<ul style="list-style-type: none"> • Can be limited to large companies and/or companies with good credit ratings. • A commission has to be paid to the banking institution for the service, regardless of whether the funds are called upon or not. • An individual mining company (that is not a subsidiary) cannot apply for this, unless it deposits the nominal value of the letter of credit in the bank first. • Could reduce the company's borrowing capacity. • Annual renewal may be required.
Performance bonds (bonds of faithful compliance with the contract)	<ul style="list-style-type: none"> • Low initial cost. • In general, costs associated with opening are deductible. • Require minimal administration once issued. • Capital is available for the company's use. 	<ul style="list-style-type: none"> • Costlier than a letter of credit. • Availability may be restricted, depending on the company's credit rating. • Rates are based on the company's credit rating. • Not available to simplified joint stock companies, unless they deposit the nominal value of the letter of credit in the bank first. There must be a guarantee of solvency.
Trust funds	<ul style="list-style-type: none"> • Low establishment cost. • The mining company does not relinquish control of its funds, since the surplus from excess contributions or high revenues are returned to it after periodic audit or proper execution of the closure works. • Society has a better understanding of these, and they are, therefore, considered to be more transparent. 	<ul style="list-style-type: none"> • Given that closure costs are high in most cases, the establishment and constitution of an adequate trust fund can take the mining company a long time. • A high initial deposit may be required. • Funds may depreciate. • Administration and management may require considerable work.



INSTRUMENT	ADVANTAGES	DISADVANTAGES
Insurance policies	<ul style="list-style-type: none"> • These may have a lower upfront cost than other options (such as cash deposits or trust funds). • Premiums may be deductible. • Require minimal administration once issued. 	<ul style="list-style-type: none"> • Premiums can be costly for some customers, depending on their credit rating. • May involve other expenses, such as taxes and brokerage fees. • Surpluses accumulated over the term of the policy are not refunded to the mining company.
Cash deposits	<ul style="list-style-type: none"> • Require minimal administration once issued. • Society may possibly understand these better and they may, therefore, be considered to be more transparent. 	<ul style="list-style-type: none"> • A high initial deposit may be required. • Involve a large amount of capital to which the mining company has no access, as it hands over control of its funds. • Could reduce the company's borrowing capacity. • Susceptible to loss due to fraud or theft; represent an administrative burden for the entity responsible for the deposit.
Pledges of assets	<ul style="list-style-type: none"> • Require upfront expenditure. 	<ul style="list-style-type: none"> • Access to assets can be hampered if a company becomes insolvent; illiquid • Requires periodic evaluation of assets. • Little likelihood that the collateral assets in the country for the pledge of assets cover all closure costs.
Financial statements/	<ul style="list-style-type: none"> • There is a long tradition of their use in the sector; common practice for some governments. 	<ul style="list-style-type: none"> • The company must have a long track record of financial stability. • Access to assets can be hampered if the company becomes insolvent; does not necessarily comply with the concept of financial assurance. • Low public acceptability.

Source: ICMM, 2005; Lima et al., 2003.



4.1 LETTERS OF CREDIT

A letter of credit is an agreement between a company and a bank according to which a banking institution issues a letter to a beneficiary third party (in this case, a government) guaranteeing that the bank will pay the beneficiary third party in cash in accordance with a series of terms and conditions. The bank has to comply with the letter of credit if the terms and conditions are met. An irrevocable letter of credit may contain terms to be determined before it is issued. If there is a desire at any time to change the terms of this irrevocable letter of credit, the three entities (the mining company, the bank, and the government) must agree the terms. The terms and conditions cover specific hypothetical situations in which the government could draw down the funds, such as the closure plan agreed between the mining company and the government and which is covered by the funds (ICCM, 2005).

In general, letters of credit used as financial assurance for closure and reclamation undergo analysis and are renewed sufficiently before their expiry dates so there is no period in which the financial assurance is unavailable. If a bank declines to renew a letter of credit, the government or beneficiary third party must be notified.

4.2 PERFORMANCE BONDS

Performance bonds, or bonds for faithful compliance with the contract, possess several of the characteristics of letters of credit, except that the issuer is an insurance company rather than a bank. As with letters of credit, the mining company and the insurance company make an agreement under which the insurer assumes responsibility for closure and reclamation costs under the mine closure plan approved by the government, pursuant to a set of agreed terms. The government is the beneficiary of the bond, and any changes made to its terms and conditions must be agreed between the three parties: the mining company, the insurer, and the government. In practice, this is a contract between three parties.

The performance bond is issued for a specific time and is renewed before it expires based on an analysis of the company's credit rating and the estimated costs of implementing the approved closure plan.

4.3 TRUST FUNDS

It is the mining company that establishes the trust fund, control over which is exercised by an external manager, and its management is undertaken by an investment manager responsible for managing the funds in accordance with a predetermined investment policy. Contributions are made to the trust fund over a certain period, and only the government can make withdrawals under the fund's terms and conditions (e.g., to cover costs of reclamation and closure when it has to implement the approved closure plan). As with the performance bond and letter of credit, the amount is based on the cost of implementing the closure plan. Instead of having a defined renewal date, the trust fund is subject to periodic audits, after which there may be amendments to the terms and conditions. If the government is satisfied



with implementation of the closure plan as approved, the trust fund or what remains of it can be returned to the mining company. It is recommended that the revenue generated by the fund be free of tax until withdrawn (ICMM, 2005).

4.4 INSURANCE POLICIES

Insurance policies are a fairly recent addition (since the early 2000s) to the financial assurance options used internationally, especially in the United States: for this reason it might not be possible to use this type of instrument in Argentina. These policies work in a similar fashion to personal insurance, in that the mining company pays a premium that will cover a determined amount. Since it is unlikely that an insurance policy would cover the full cost of implementing a closure plan, this option tends to be used in combination with other financial assurance instruments. Insurance policies are based on projections of the cost of implementing the closure plan, the creditworthiness of the mining company, and the market value of the mining assets (ICMM, 2005).

4.5 CASH DEPOSIT

Cash deposits are made to the government in order to cover part of the estimated cost of implementation of the approved closure plan. This option involves little periodic administration for the mining company, although it does entail high upfront costs that may be beyond the means of smaller companies. Periodic updates to the closure plan and the corresponding cost estimate should be reflected in the amount of cash deposited and the disbursement plan. It is recommended that the government or a third party administer and monitor the funds to ensure proper management and that they are sufficient to cover projected closure costs. If it is the government that manages the funds, there will probably be a need to establish a mechanism to segregate them from regular public revenues and to ensure that they are intact at the time of closure. A range of legal and structural challenges could arise in respect of the safe, fair, and transparent management of cash deposits, which is why this method is not widely used.

4.6 PLEDGES OF ASSETS

Pledges of assets are provided to the government for it to sell them, or, by way of contrast, use the income arising from them to cover part of the costs of implementing the approved closure plan. This option is only open to mining companies that have assets that can be pledged. It requires the involvement of an external auditor to value the financial assurance at the outset and then to periodically reassess it.

4.7 FINANCIAL STATEMENTS

It is likely that financial statements, which have traditionally been used in some jurisdictions, could not be used in Argentina. Financial statements (or balance



sheets) are used to demonstrate that the mining company or its parent company, if necessary, will have sufficient assets and, therefore, the capacity to meet the costs arising from implementation of the approved closure plan. This type of instrument is susceptible to the effects of rapid changes in market conditions, which may affect the companies' capitalizations and financial statements. This would lead to the mine closure also being subject to the ravages of the market. This option is typically offered only to mining companies that are large or have large parent organizations (often based in the country in which the mining operation is located), since companies are required to demonstrate historical financial stability through an evaluation conducted by an accredited accountancy firm. For the financial statement to be accepted, a range of requirements routinely have to be met that vary from government to government. These include evidence that minimums for one or more of the following requirements have been met or exceeded:

- The relationship between current assets and current liabilities
- Tangible net worth
- The proportion of total assets in the country of the government in question to which the financial statement is presented
- Total assets minus total liabilities
- Net income plus depreciation, impairment, and amortization, minus total liabilities
- Bond rating as of the company's latest bond issue

Regardless of the method employed to obtain an accounting statement, the final result must demonstrate whether the company has sufficient assets to meet the costs of implementation of the closure plan. The same method of calculation must be applied to all the mines in a given jurisdiction. The financial calculations used to create the accounting statement should conform to generally accepted accounting principles and, furthermore, this task should be performed by an accredited accountancy firm (ICCM, 2005).



5.0 CLASSIFICATION OF FINANCIAL INSTRUMENTS FOR MINE CLOSURE GUARANTEES

Based on the list in Appendix 1 of assurance instruments available in Argentina, the assurance instruments recommended for use to assure mine closures can be classified as follows:

1. Readily realizable
2. Moderately realizable
3. Realizable with restrictions

The classification of financial instruments based on their liquidity and security makes it possible to authorize mining companies to use more than one financial instrument, depending on the life-cycle stage of the mine in question. This reduces financial costs in the early stages of construction and operation. The Central Bank of Argentina could also be approached to find out whether any particular categorization has already been established.

A proposed classification of the financial instrument mentioned above (could vary depending on the last table in Appendix 1) follows:

TABLE 2. CLASSIFICATION OF FINANCIAL INSTRUMENTS

READILY REALIZABLE	MODERATELY REALIZABLE	REALIZABLE WITH RESTRICTIONS
Unilateral on-demand guarantee Pledge of balances on deposit Surety insurance (only if claimable without litigation)	Guarantee trust	Security deposit Pledging of assets and mortgages on properties



6.0 MANAGEMENT OF FINANCIAL ASSURANCE

In cases where the financial assurance entails the retention of funds by the government (such as when a letter of credit is drawn down after an act of insolvency or when a government receives the assurance in cash), the funds corresponding to the financial assurance need to be kept securely apart from other operating accounts, including other funds that mines deposit as guarantees.

When financial assurance is provided in liquid form (such as cash deposits or cash trust funds), these funds or accounts must be under the control of an external independent trustee, and their management must be by an investment manager under a specific investment policy. Such funds or accounts must have terms and conditions governing their operation, and they should be regularly audited to verify their integrity. It is recommended that the revenues from any financial assurance constituted in liquid form be free of tax until funds are withdrawn. The ICMM lays down the following criteria for the efficient administration and constitution of a financial assurance fund or account (ICCM, 2005):

- **Monitoring legislation.** Funds must be monitored to (a) evaluate whether their performance is as expected and (b) ensure compliance with investment policies and the corresponding terms and conditions. Legislation governing the monitoring of funds or accounts tends to be similar to that governing pension funds.
- **Fund income sheltered from tax.** All income generated by a financial assurance fund or account should be tax sheltered until withdrawn.
- **Investment management fees.** Investment management is a service that involves fees that should be covered from the proceeds of the fund or account.
- **Fund trustee.** The fund trustee should be an independent trust company or external third party.
- **Sole government control.** Governments should not exercise sole control over the management of financial assurance accounts or funds.



7.0 FINANCIAL ASSURANCE DURING THE COURSE OF THE LIFE OF THE MINE

As discussed in previous sections, assurance must exist in one form or another throughout the lifespan of the mining project, and no ground should be disturbed until the total financial assurance amount for its reclamation has been gathered. As the disturbance increases in line with the progress of mining operations, so too should the financial assurance amount increase in proportion to the disturbance. This rule is in line with global best practices.

While the financial assurance amount would ideally precisely match the disturbance at all times, the burden of making the corresponding calculations and assessments is disproportionate. Therefore, the following formula could be used in Argentina:

1. Calculate the estimated closure cost for the disturbance based on the approved lifespan of the mine.
2. Prior to the start of construction, provide a financial assurance amount equivalent to 10% of the total closure cost.
3. Before beginning production, require the financial assurance amount to represent 20% of the total cost of closing.
4. From the time when operations begin, gradually and proportionally increase the financial assurance amount over time until it reaches 100% within the first two thirds of the estimated life of the mine (if the lifespan is 20 years or less) or within 15 years from the start of operations (if the lifespan of the mine exceeds 20 years).

The reason why the financial assurance lodged should cover 100% of the closure costs within a maximum of 15 years from the start of operations is that in projects with lengthy lifespans, the gradual increase in disturbance after this period tends to be less significant than the changes made during the first 15 years of activity. If the total financial assurance amount for closure is provided, taking account of



the stage after the first 15 years of operation, it is unlikely to arrive at a significant overestimate of closure costs.

During the active life of the mine, the actual total financial assurance amount will be adjusted so as to reflect changes to the mining plan, the greater detail in closure designs, and the corresponding cost estimates. The financial assurance amount should be based on the relevant percentage of the latest approved estimate of the real closure cost.

The following table shows, using the approach adopted by Chile, what type of closure assurance companies would be permitted to have, depending on the life-cycle stage, the lifespan of the mine, and the end date by which 100% of closure costs need to be covered by financial assurance.

TABLE 3. CLOSURE ASSURANCE INSTRUMENTS PERMITTED DEPENDING ON THE LIFE-CYCLE STAGE, THE LIFESPAN OF THE MINE, AND THE END DATE

TYPE OF INSTRUMENT	1/3	2/3	3/3
1 (at least)	40%	60%	100%
2 (maximum)	40%	40%	0
3 (maximum)	20%	0	0

References: Types of instruments:

1. Certificate of on-demand deposit, bank guarantee certifications, certificates of deposit of less than 360 days, standby letters of credit issued by a bank whose risk rating is at least A or equivalent, and on-demand guarantee policies issued by domestic insurance companies and meeting the conditions set out in Law 21,169. The general conditions accepted will be approved by the authority in accordance with Supreme Decree No. 6 of 2020, amending the regulation of Law 20,551.

2. Financial instruments in representation of funding or debt pursuant to Article 45 of Decree-Law 3500 of 1980 of the Republic of Chile, with a risk rating of at least class A or its international equivalent.

3. Other instruments such as: assignment of a contract of sale made with the National Mining Company of the Republic of Chile or other purchasing authority, pledge on export return, joint and several guarantee by a controlling partner with a Chilean domestic risk rating of at least A or its international equivalent and certified annually.

Source: National Geology and Mining Service (SERNAGEOMIN), 2020.

During the early planning stages of the mining project, it is possible that estimates of the costs of financial assurance may be represented by order-of-magnitude estimates. Once disturbances have occurred on the ground, closure planning and the presentation of financial information will be carried out in more detail—in light of new knowledge gained—in order to provide greater precision. This improved precision, which goes hand in hand with increasing detail in the engineering designs of the major closure activities, must be evaluated in accordance with a professional standard for cost estimates.



ENGINEERING DESIGN LEVELS IN RELATION TO MINE CLOSURE

While the exact nomenclature used varies between mining companies, engineering design levels are usually classified as conceptual, pre-feasibility, feasibility, and detailed. In reference to mine closures, the following definitions are typically used:

- **Conceptual design:** A normal stage in closure design used in the overall process of the approval and environmental assessment of a mining project before construction begins. This includes the design concepts for all the closure work to be implemented on the mining site. It customarily shows several different design concepts for the closure of certain areas of the mine, which in turn leads to the financial assurance amount being based on the method that will yield the best results. It is usually the case in the course of the life of a mine that the studies or engineering works needed to select from a range of options are carried out to then guide the design stages.
- **Pre-feasibility design:** This is generally developed for closure works 5 to 10 years ahead of the mine finishing its production cycle. Most of the design concepts indicated in the conceptual design will be more thoroughly designed during this stage, which will help to gain a more accurate cost estimate.
- **Feasibility design:** At this stage, a more advanced model of the engineering design is presented, all the important design concepts are confirmed, and cost estimates are made with a higher degree of precision.
- **Detailed design:** Detailed design, which is usually developed during the phase immediately preceding the end of the mine's productive life, takes the engineering design forward, since all the designs are finished and ready to proceed to construction and often contain the procurement packages that are prepared as part of the design.

The above illustrates a typical process. Not all designs will necessarily follow all these steps, or there may be, by way of contrast, other intermediate steps depending on the needs of the project or corporate policies. Each step involves significant work on coordination between disciplines, although it allows for greater accuracy in the calculation of closure costs.

It is important not to confuse the engineering design levels of the project with those of the closure plan. The mining project reaches the stage of applying for approval for its closure plan before construction begins, or in other words, its feasibility engineering must be fully completed.

When mine closure plans and financial assurance are updated in line with a periodic cycle (such as the typical 5-year cycle), these updates may reflect advances in the engineering stage. Nevertheless, this does not necessarily mean that each update will incorporate a radical change in the design level. Especially in the early years of a mine with a long lifespan, updates are likely to represent amendments to the conceptual design rather than real advances in the design engineering.

Although it may, in theory, be tempting to have a more detailed closure design in the earlier stages of a mine's life, this is not desirable in practice, as mines go through many changes in their plans in the course of their lives. This means that if, say,



the detailed design is prepared at too early a point in the life of the mine, various technical plans will be generated that may or may not be useful or relevant when the time comes to build the closure works. In addition, doing this can imbue the design with a false sensation of precision.

One exception to this is formed by those sites that operate progressive closure, since their design of the progressive closure works will align with the design stages mentioned above up to the point of detailed design before their implementation during the active life of the mine.

Engineering Levels Required for Closure Measures

The engineering level used for closure and post-closure measures will have an impact on the greater or lesser variability of the determination of the closure and post-closure costs, which is why there should be a requirement to increase the amount of the cost by a certain percentage for contingencies. Commonly, when engineering is at the feasibility stage, uncertainty is between 10% and 20%.

In Chile, the contingency estimate is:

- 10% to 15% if the engineering is at the detailed level
- 15% to 20% if the engineering is basic
- 20% to 30% if the engineering is conceptual
- Over 30% to 100% if it is scoping engineering

In Peru, the engineering has to be at the feasibility level.

It is important to define the nomenclature used for the classification of the engineering levels. For example, the JORC Code, the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves states:

- A **scoping study** is an order-of-magnitude technical and economic study of the potential viability of mineral resources. It includes appropriate assessments of realistically assumed modifying factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a pre-feasibility study can be reasonably justified.
- A **preliminary feasibility study** (pre-feasibility study) is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions regarding the modifying factors and the evaluation of any other relevant factors that are sufficient for a competent person, acting reasonably, to determine if all or part of the mineral resources may be converted to an ore reserve at the time of reporting. A pre-feasibility study is at a lower confidence level than a feasibility study.



- A **feasibility study** is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable modifying factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically minable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with or finance the development of the project. The confidence level of the study will be higher than that of a pre-feasibility study.

The competent authority must specifically define what is understood by the engineering levels, regardless of the classification used. It must adopt a known one or its own, but it must be explicitly defined. It is reasonable that the competent authority should require companies to provide a minimum level of engineering to support the feasibility study for a closure plan.

7.1 CLOSURE AND POST-CLOSURE

The operations stage in a mine's life cycle is followed by the closure and post-closure stages. While closure activities should commence while production is still under way whenever possible, most closure activities will take place after the cessation of production. In the closure stage, the goal is to implement the closure plan to avoid any risks to human health or the environment.

The implementation of closure activities is a major financial commitment for the mining company, and construction can take several years. During this period, the competent authority normally retains the full financial assurance amount (except for any credit in the company's favour for progressive closure work already undertaken before starting final closure). If the deadline approved for execution of closure work is too long (over 3 years), the regulator may consider the possibility of updating the financial assurance amount, while applying the corresponding reductions for the value of closure work that is being completed. This applies more to closure activities for which conclusive evidence can be made available to demonstrate their conclusion and that they require very little or no monitoring. Most demolition work would fall into this category.

At the start of the post-closure stage, the competent authority retains a sufficient part of the financial assurance amount to ensure the implementation of monitoring and maintenance activities. When the mining company ends post-closure monitoring—and through that monitoring demonstrates that the closure activities achieved their objectives—the corresponding part of the financial assurance will be returned to the mining company. In less-complex sites, able to be fully transferred, it is expected that after post-closure monitoring and maintenance, the mining company will be able to prove that the site has been fully restored and is a stable and secure environment. The full amount of the financial guarantee can be released at that time.



As discussed in Section 3.1, there are mines whose full and final transfer is not an option due to the need to conduct constant work at the site for a long time. It falls to the mining company to conduct this ongoing work, for which reason the corresponding financial assurance amount should be retained. This financial guarantee is necessary to ensure the availability of funds to continue these activities if the company cannot, for any reason, continue to carry them out. In this event, the financial assurance amount must be periodically updated during the post-closure stage at intervals not exceeding 5 years. Updates should include real data for the preceding 5-year period on monitoring and maintenance costs and updates to the applicable discount rates.

In some cases, it may be possible or desirable to transfer the constant-care obligations to a third party. This can happen as part of the conversion of a closed mining site or on the transfer of mining assets. Such transfers of obligations should be evaluated on a case-by-case basis, with the competent authority reserving the right to accept or reject the transfer.

7.2 TEMPORARY CLOSURE

Temporary closure is the suspension of mining activities for a brief period. It is also called a "care and maintenance phase" on account of the activities carried out during it. Temporary closures can take place for a range of reasons, such as a fall in the price of minerals, adverse climatic, social, or political conditions, or unforeseen events. Mining and processing are halted during this time. The site is maintained so that it remains safe, stable, and ready to resume operations.

Since it is likely that the temporary closure will have an impact on the mining plan and the timescales for its active life and closure, it must be accompanied by a newly submitted update to the closure plan and estimate of the financial assurance amount. Regardless of the duration of the temporary closure, the timescale for submission of the plan and closure planning (that is, the recurring 5-year cycle for submission of documentation and updates). The financial assurance amount must continue to be properly constituted, and no renewals must be omitted. It is possible that progressive closure activities continue during a temporary closure, and these should be reflected in any updates to the financial assurance amount.

During the temporary closure, the site's environmental management and infrastructure maintenance are similar to those carried out during normal activities since the site will still have to comply with all environmental and safety requirements until such time as mining and processing can be resumed.



TEMPORARY CLOSURES DUE TO THE COVID-19 PANDEMIC

The events of 2020–2021 due to the COVID-19 pandemic illustrate the possible consequences for active mines, including temporary closures, of unforeseen events. Although many mines decided to continue operations during the first wave of the pandemic in early 2020, others opted for temporary closure in order to safeguard local and remote populations and to keep their own staff safe. Other sites closed temporarily due to the fall in demand for their products during the pandemic. Temporary closures have usually been short-lived and sites kept in a stable, safe state through the work of small teams so that staff were able to return to work once the risks associated with the pandemic decreased. Some temporary closures, however, were extended for longer periods. An excessive drop in diamond prices, for example, has led to extensions in the length of care and maintenance periods in some mines around the world.

Temporary closures must be time-limited since a temporary closure plan is designed for a certain time and the closure measures set out in a risk analysis may not be suitable for permanent closure. One example is that of the dumps that can produce acidic water. Temporary closures are conceived with the view that at some defined time, the mine will go back into production, but permanent closure is planned on the basis that the mine will not go back into operation.

TEMPORARY CLOSURES IN CHILE AND PERU

In Chile, temporary closure is for 2 years, extendible to 3 years if there are sufficient grounds. In exceptional cases laid down by the law and its regulations, they can be extended for longer, upon presentation of a temporary closure plan, but never longer than the lifespan of the mine.

In Peru, the Mine Closure Law states that temporary closures may be for no longer than 3 years.

For Argentina, it is recommended that an initial period of authorization of temporary closure of 3 years be established, subject to submission of a temporary closure plan, it being possible to extend this period for a further 3 years if sufficient grounds exist. The permanent closure plan must be implemented once these periods have come to an end.



7.3 SUDDEN OR UNPLANNED CLOSURE

Sudden or unplanned closure occurs when a mine closes without notice and, contrary to the mining plan, the mining company stops mining. This is different from temporary closure since it is a decision to put a definitive stop to operations. In some cases, a production stoppage that started as a temporary closure can become a permanent closure. Cases such as these are frequent, particularly when a temporary downturn in the market harms mines that were inherently insignificant or were reaching the end of their lives. When the COVID-19 pandemic broke out in 2020, a number of mines suddenly closed around the world, and there are others that are currently temporarily closed but that could become permanently closed in the future.

When a sudden or unplanned closure takes place (including leading on from a temporary closure), the mining company has to develop and present its updated closure plan. Where appropriate, work with the regulator will be needed to verify that closure plans are concluded within appropriate time frames, that the relevant approvals are obtained, and that the closure activities are carried out in an acceptable time frame. If the mining company is incapable of implementing the closure works, the competent authority shall make use of the financial assurance to complete the outstanding closure plan and activities.

In the event of a sudden or unplanned closure, the mining company may have to move rapidly forward with work on its closure designs and work on the detailed design (in order to proceed to implementation). During this step, there may be changes to plans when the arrangement of the site is different from that provided for in respect of closure. Closure timescales and cost estimates will need to be updated and designs refined and finished in light of the information available at the time of closure. These modifications can lead to changes in estimates of closure costs and can consequently have an impact on the financial assurance amount. Work must be done from the outset with the competent authority to analyze possible changes to the financial assurance amount and update it if necessary.

Sudden or unplanned closures have always occurred throughout the history of mining, hence the emphasis on the importance of always having financial assurance in place.

In no circumstances must any administrative negligence occur that allows a mine to operate, at any time, without having provided sufficient financial assurance. For example, if a letter of credit has to be renewed, there must never be a period in which there is no such letter of credit available.



8.0 APPLICATION

This guide offers an overview of current best practices in financial assurance from different parts of the world that are considered appropriate for conditions in Argentina. In particular, the guide has carefully considered approaches successfully used in other jurisdictions of Latin America.

An overview of the suggested application of this guide, according to the different types of mining taking place in Argentina, follows below.

8.1 SIZE OF MINING OPERATION

It is advisable that the obligation to provide financial assurance apply to all mines regardless of size. In theory, the disturbance and possible environmental impacts resulting from a mine are proportional to its size, which is why in this respect, **the owners of smaller operations should be required to provide smaller financial assurance amounts.**

In practice, this is not so simple. The owners of small operations do not have the economies of scale that larger companies have to cover the costs of closure studies and develop impact estimates. It is also possible not to know what a mine's lifespan will be, or it may be indefinite because the extraction rate in that sector is relatively low. Lastly, it is possible that the financial burden from an imposition of closure plans and financial assurance would simply be unsustainable for small-scale miners, leading to the disappearance of the sector or an increase in illegal mining.

Both Chile and Peru have opted to limit the application of financial assurance to large-scale mining projects. **Argentina should consider an approach similar to that of Peru and require financial assurance in accordance with this guide, for mines with a monthly extraction capacity of more than 5,000 tonnes of ore.**

For smaller operations, some form of collective assurance could be considered.

In Malaysia, the "common reclamation fund" is an example of this type of assurance. Through it, every small-scale mining permit holder makes an annual contribution



to the fund in the form of a small percentage of the previous calendar year's gross sales or pays a set annual amount corresponding to the cleanup costs for the year's activities. This option of paying as one extracts the ore enables companies with little capital to continue mining and make regular contributions to the reclamation fund. The government then uses the funds to reclaim the site (Termidi et al., 2009).

8.2 MINES IN OPERATION AND NEW MINING PROJECTS

The approach to financial assurance proposed in this guide is applicable to all new mining projects, and it should be straightforward to incorporate these requirements into the planning of new projects in the same way as is done in other mining jurisdictions of the world.

In respect of mines already in operation, there is a need for caution with the gradual introduction of assurance requirements, for this to be done fairly, for mining companies to have time to take action and incorporate the new requirements in their planning, for the local market in relevant financial instruments to have time to develop, and for there to be the environmental protection to ensure that financial assurance is granted without inappropriate delays.

Section 4.0 of the *Mine Closure Checklist for Governments* (APEC, 2018, consulted in its Spanish version: *Lista de Verificación para los Gobiernos sobre el Cierre de Faena Minera del APEC*) offers general guidance on the incorporation of new regulations on mine closures and their application to active mines. Specifically, with regard to financial assurance, the APEC publication states (p. 84):

If financial assurance has never been required previously in the jurisdiction, or major changes are planned, a transition period is advisable. Mines that are currently operating without financial assurance should have a period to adapt to the new regime and not have a significant financial burden implemented from one year to another. The experience in Chile offers one example of how to implement an orderly transition from no bonding requirement to full bonding.



THE CHILEAN TRANSITIONAL REGIME FOR REQUIRING FINANCIAL ASSURANCE

While the experience of Chile in respect of transitional regimes is an excellent example of the incorporation of new regulations for closure, it should be recognized that there are noteworthy differences between mine closure practice in Chile in 2012, when the transitional arrangements came into force, and current practice in Argentina. In Chile, before 2012, the Safety Regulations contained provisions to the effect that all mining sites should have a closure plan approved by the national mining authority, SERNAGEOMIN. During the transitional regime, mining companies were required to review their approved closure plans and calculate how much it would cost to implement them. If approved by SERNAGEOMIN, this cost estimate was then analyzed and used as a basis for determining the assurance amount in 2014; 2014 also marked the start of the gradual constitution of the assurance over time until the full amount was in place. When the transitional regulatory regime came to an end, and the new closure law came into full effect, mining companies had an opportunity to update or amend their planned closure activities whenever, from then on, they updated their closure plans (in general, after 2014), in which they had to amend the previously-approved closure measures to better align them with the new provisions regulating physical and chemical stability.

In Argentina, the introduction of a transitional period would be significantly different from that of Chile since Argentina currently has no national register of approved closure plans for all the mines operating in the country, and Argentina's province-based regulation of mining differs from Chile's fully national approach. One of the main lessons learned from the Chilean experience is the need to set a reasonable timescale for mining companies to adapt to new obligations in respect of closure planning. In practical terms, it is possible that an active large mine with no well-developed closure plan would have to devote between 1 and 2 years to the preparation of such a plan, and consideration should also be given to the time needed for the approval process.

Another of the lessons learned from the Chilean experience that could be applied directly to an Argentinian version of a transitional regime is that consideration needs to be given to the number of applications that the authority responsible for reviewing closure plans would receive. In Chile, the date of entry into force of the transitional arrangements and stipulated deadlines led to most of the closure plans for all the mines in the country being submitted to the regulator a few months after the start of the transitional arrangements and, in general, within 2 years. This amounted to a huge burden for the regulators, as they had to review many plans and decide on their acceptability within a very short time. (This problem was compounded by the fact that regulators set a very tight deadline for reviewing the plans they received). When the process is put into effect in Argentina, a detailed analysis should be undertaken of which body will have the technical competence to review the closure plans and corresponding cost estimates, how much time will be needed to review these properly, and how to schedule this work.



The most important aspects to bear in mind in respect of Argentinian transitional arrangements are:

- Allow mining companies sufficient time to develop closure plans and cost estimates.
- Offer a reasonable length of time for mining companies to put their financial assurance together.
- Identify resources with the appropriate technical capacity to evaluate the technical adequacy of closure plans against relevant criteria (such as aspects relating to health and safety, the environment, and transition).
- Create a mechanism for organizing the review process so that there is time to secure the necessary resources with the capacity to carry this task out.

8.3 EARLY-STAGE MINE CLOSURES

This guide is oriented toward mines that follow the traditional life pattern, as shown in Figure 1. They have an initial exploration and construction stage, they spend a certain period of time in operation (which may or may not be interrupted by temporary closures), they carry out progressive closure works while in operation, and they perform closure activities when they cease production and move toward the post-closure stage.

In some cases, new mining developments may close even before reaching peak production. Before the commencement of mining, they may perform some work (small excavations or exploration shafts) during the exploration phase, or they may cause significant disturbance if they start mining development and then stop before the site even starts production. This can happen if there is a significant change in market conditions while the mine is being developed or unforeseen circumstances arise that make the project unprofitable.

In every case, the general concepts of good mine closure practice should be applied. Disturbances to the ground must be remediated. In the case of disturbances caused during mine development, the amount constituted as initial assurance before commencement of the construction phase should be sufficient to repair these disturbances. This approach is consistent with the principle that, at every moment in the working life of the mine, the financial assurance amount available must be equal to or greater than the estimated costs of closure and reclamation. In practical terms, this could be enacted through a provision under which the initial financial assurance amount should be a certain percentage of the obligations arising from final closure, allowing for the fact that this percentage should be sufficient to cover the costs of repairing the disturbance caused in the early years of operation. Chilean mine closure legislation, for example, provides that this percentage be set at 20% of the current value of all estimated closure obligations.

If less disturbance should take place than that caused by exploration, the suggested financial assurance mechanism should not be applied. Current environmental



legislation in Argentina provides sufficient protection to address the limited disturbances generated during this stage.

8.4 METALLIFEROUS AND NON-METALLIFEROUS MINES

In some jurisdictions, there are significant differences between the ways that metalliferous and non-metalliferous (such as aggregates production plants) mines are treated. This practice stems from the fact that non-metalliferous mines usually have less environmental impact, as they do not require the processes typically required to separate the ore from mining waste and generally produce less waste. In addition, non-metalliferous mines tend to have very long or indefinite lives, which can make closure planning difficult.

Although these differences are important, non-metalliferous mines do affect the environment, and large-scale projects can have a significant impact on the land.

Therefore, it is recommended that the approach set out in this financial assurance guide should be applied equally to both metalliferous and non-metalliferous mining operations.

8.5 OPEN-CAST AND UNDERGROUND MINING

Generally speaking, most mining operations can be classified as open cast, underground or mixed (a combination of open cast and underground). It is quite common for the mining strategy to evolve as the project progresses. For example, underground mining could be added to open-cast, often in a late stage of the project, as a way of extending the life of the mine.

With regard to the considerations and technical aspects of mine closures, there are significant differences between the closures of underground and open-cast mines (Table 2). The costs of closing open-cast mines tend to be higher, as there is a bigger change to the mining footprint and greater amounts of waste are generated. Nonetheless, every site is different, and this is only a general trend with several exceptions. Each mine's closure cost must be assessed in light of its specific characteristics.

In respect of the way in which the financial assurance policy is structured, there is no difference between open-cast, underground, and mixed mines, inasmuch as all recommended financial assurance practices maintain the same relevance. The assurance amounts and corresponding periods need to be calculated on the basis of specific site characteristics.



TABLE 4. COMMON DIFFERENCES BETWEEN THE CLOSURES OF UNDERGROUND AND OPEN-CAST MINES WITH SIMILAR PRODUCTION CAPACITIES

CONSIDERATIONS IN RESPECT OF CLOSURE	OPEN-CAST/SURFACE MINE	UNDERGROUND MINE
Area of land disturbed that will require reclamation	Greater	Lesser
Volume of waste to be treated	Greater	Lesser
Opportunity for progressive closure	Greater	Lesser
Socioeconomic impact of closure	Potentially high	
Closure cost	Greater	Lesser
Financial assurance	Calculated on the basis of implementation of the approved closure plan	
Need for post-closure monitoring	Yes	Yes

Source: Prepared by authors.



9.0 JURISDICTIONAL CONSIDERATIONS

The application of financial assurance requirements is greatly facilitated by centralized management. This gives the regulator the opportunity to gain greater expertise in the review and evaluation of financial assurance and to apply a more uniform approach throughout the country. The benefits are clear: as can be seen by contrasting the unified approaches used in countries with a centralized review process (such as Chile and Peru) with the sometimes-dramatic inconsistencies in policies and implementation observed in countries with provincial- or state-level administration of financial assurance (such as Australia and Canada). In Canada, for example, mine closure is mainly regulated at the provincial or territorial level, with the consequence that all financial assurance is administered at the same level. The result of this is that the administration of financial assurance varies considerably from one province to another. In the province of Saskatchewan, legislation provides for a clearly defined procedure for the eventual relinquishment of closed mining sites. While this procedure has been successfully implemented in a number of closures, other provinces lack legislative clarity and similar mechanisms. Some provinces require closure plans to be submitted to a mandatory public review, while others have no such mechanism. Financial assurance amounts may be public or confidential, depending on jurisdiction. In some provinces and territories, financial assurance amounts are calculated using predefined worksheets (British Columbia and the Northwest Territories use worksheets, albeit different from one another). Historically, the level of technical sophistication applied to the review of cost estimates also varies from province to province, partly reflecting the importance of mining in each province's economy (the provinces in which mining plays a less-important economic role tend to have smaller and less-developed mining regulators).

In Argentina, Article 124 of the Constitution grants its provinces original ownership of natural resources in their territory. This means that the procedures and administration of any financial assurance policy fall under provincial jurisdiction. While this presents challenges, the general approach adopted by Argentina could minimize the problems that other countries have faced in which mining belongs to provincial jurisdictions. Specifically, working as a team to achieve a common policy with the full



participation of every province involved should result in a single policy that respects and incorporates the differences between provinces and meets the needs of every province.

If legally, administratively, and politically feasible, **consideration should be given to creating a centralized system, possibly with representation from every province, for the review and management of financial assurance.** It could possibly be a system similar to that used in Canada to respond to the need for centralized strategies on environmental issues, in a national context in which environmental responsibility is a province-level matter. The Canadian Council of Ministers of the Environment (CCME) is an intergovernmental forum for collective action on environmental issues of national and international interest. It is made up of representatives of every province and the federal government. The CCME provides a space for Canada's jurisdictions to work together to achieve effective results. It recently published a guidance document on the assessment of ecological risks at contaminated sites located within the provinces but remaining under federal jurisdiction (CCME, 2010). This document provides a methodology for systematically conducting such assessments (with definitions of terms, calculations and steps for the characterization of hazards). These assessments are normally required to be subject to rigorous professional judgement, which is when inconsistencies between jurisdictions often arise. The positive results achieved so far thanks to the document are due to its offering a methodology and a common basis on which to work, and to its not giving specific indications, which could lead to exceptions.

Regardless of the mechanism chosen, it will be beneficial if the financial assurance policy is as practical and uniform as possible between provinces, to avoid discrepancies such as those found in countries like Australia and Canada. Consideration should also be given to the possibility of trialling a financial assurance policy in one province in order to learn from its implementation and use this experience to guide its progressive incorporation in other provinces.

9.1 METHOD OF CALCULATION

Every province should use the same method to calculate the financial assurance amount. While mines' closure costs depend on the specific conditions of each site, there has to be a consistent framework and a method that can be replicated. For this, it can be made a requirement that financial assurance calculations be audited by an independent third party with an understanding of the mining operation and site conditions.

It is suggested that each competent provincial authority have its own estimate of mine closure costs that reflects the reality of the province, to compare this with the closure costs presented by companies and to take more evidence-based decisions.



10.0 MANAGING FUTURE RISKS

There is a well-documented record of the hazards that mining projects face during operations and when they close. Decisions are taken at every stage of the life cycle of a mine on the basis of assessments of risks and opportunities, taking account of environmental, economic, technical, and health and safety factors. Events that could pose risks during the closure and post-closure phases of a mine's life could be related to such factors as climate change, future social and political conditions, seismic events, floods, and slope failures.

Logically, neither the mining project proponent nor regulator can predict the future with respect to certain occurrences. Future changes may affect closure plans and final land use in ways that cannot be predicted from the perspective of today, and there may be difficulties in achieving general policy objectives for mine closures and, particularly, in respect of financial assurance. The following sections focus on three areas in which changes are expected to occur, even though their exact nature cannot be predicted.

10.1 CLIMATE CHANGE

The scientific evidence for climate change is clear. There are, nonetheless, a number of confounding variables that restrict the capacity of current models to predict the magnitude, timing, and nature of climate change, in addition to the uncertainty around the extent and nature of the corrective actions that will have to be taken to slow its pace. Current climate change models seek to shed light on these uncertainties, by modelling alternative future scenarios. While this methodology can be useful in many types of planning, currently accepted climate change models are limited to time horizons on the order of 100 years. Mine closure planning usually has to cover significantly longer periods. As discussed in this guide, long-term management may be needed in perpetuity.

The recommended approach to dealing with the uncertainty enveloping climate change by means of financial assurance is as follows:



- In closure planning, identify those elements of the closure that may be susceptible to the effects of climate change.
- Using current models to the greatest extent possible, assess the effect of the possible scenarios that climate change could bring about.
- If necessary, adjust designs to generate a degree of resilience or risk control to help address foreseen conditions and calculate financial assurance amounts on the basis of the best understanding available of design needs.
- Review and update climate change predictions as part of updates to closure plans and corresponding financial assurance amounts.

It is difficult to measure and justify the application of an adjustment for contingencies or other reasons to the financial assurance amounts in order to cover future climate risks, which is why this should be avoided.

10.2 SOCIAL TRANSITION

The closure of a mine can have a profound effect on the nearby community. Current best practice guidelines (such as the ICMM 2019 publication) emphasize the importance of taking account in closure planning of the social transition that will take place after closure. Regulators are increasingly tending to include requirements relating to community participation in the preparation of closure plans and planning for social transition. Many mining companies invest in programs such as retraining for new careers so that their employees can earn their livings in a post-mining economic setting.

In the case of mines with a long lifespan, it may be difficult to predict all the needs that will arise during social transition. The changes that mining may bring to the socioeconomic composition of the areas affected are not always predictable. During the lifetime of a mine, there may be transformations in stakeholders, whose needs and aspirations may also vary over time due to intergenerational change or other factors. Mining companies need to be flexible to respond to these processes.

While they incur closure-related costs for the management of social impacts and social transition, these are not normally included in financial assurance amounts. This is because, historically, financial assurance has been adopted to respond purely to the environmental impacts and physical closures of mines. It is also because the costs of managing social transition are not as clear or predictable as those of the civil engineering carried out for physical closures.

Nevertheless, account should be taken of the fact that management of social impacts at every stage of the life cycle of a mining project (in general, and not especially for the closure stage) is a requirement in many countries of the world, including Argentina.⁴ Furthermore, policies and legislation do not yet consider the relevance of socioeconomic transition in managing the impacts of mine closures,

⁴ See Kung et al. (2020) Table 15 - Requirement to consider social aspects in mining generally.



even though guides to closure and international best practice do cover this area (Kung et al., 2020).

It is important to advance the incorporation of management of its social aspects into closure planning and, especially in regulatory aspects, that this planning be comprehensive. As regards the incorporation of financial assurance, it should be borne in mind that many aspects understood as social are already regulated by legislation, especially in respect of staff redundancies. Even so, closure plans incorporate commitments and efforts to mitigate the effects of closure or contribute to social transition. While these additional commitments have explicitly defined and budgeted objectives and scope, guaranteeing their implementation through their incorporation into corresponding instruments is a way of guaranteeing a contribution to the sustainability of the territory and community regardless of the situation of the company.



11.0 FINAL RELINQUISHMENT OF THE MINING CONCESSION

As discussed in Section 3.4.1, it may be possible to relinquish some mining sites, after which the location of the former mine can be put to a new use. Possible end uses of the land include sports facilities, agriculture, wildlife conservation, conservation as mining heritage and tourism, renewable energy production, and many others. Relinquishment is generally understood to have taken place once the post-closure stage has been completed, that is, when the worked-out mine site no longer requires monitoring or maintenance and the mining company has no further responsibilities under the closure plan.

While relinquishment can involve difficulties, it can also be beneficial. When a positive future for the land can be glimpsed after completion of the post-closure stage and the transition toward a new use has begun, a circular economy situation can arise since mining makes a temporary and productive use of the land that lays the foundations to give it another productive purpose. The macroeconomic benefits of the closure derive from possible job opportunities and a greater distribution of mining-related funds (such as the involvement of specialist demolition, revegetation, regional planning, etc. companies, as well as the mine owner).

The challenges around final relinquishment tend to be related to risk management. Once closure has been completed, some residual risks may remain, with the consequence that to secure favourable results from any closure process, there is a need to weigh these against the benefits arising from new opportunities to use the land. In this situation, **it is important to have a degree of flexibility in the rules on relinquishment to achieve positive outcomes**. This may include ensuring financial assurance has the flexibility to subdivide the mining site into several parts and liquidating the financial assurance amounts according to different timescales for each part. This flexibility recognizes that an area of land that had just one purpose while mining was ongoing may, once mining has ceased, be turned into a space for different—and even possibly overlapping—uses.



A financial assurance policy that facilitates relinquishment and prepares the ground for the circular economy should also include mechanisms to regulate the transfer of obligations from the mining company to the new owner of the land. The competent authority will need to carefully review these transfers, assessing the residual risks emanating from the site, to ensure that whoever inherits the obligations has capacity equal to or greater than that of the mining company to assume responsibility for them. The lack of such a mechanism could lead to the unwanted effect of preventing the repurposing of former mining sites. **Mining companies should be asked to ensure that the closure plans they submit to the competent authority include an assessment of alternatives for other, non-mining, uses of the land and infrastructure.** There may be no alternative uses for the land and infrastructure, but this should be learned from conducting a formal analysis.



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APPENDIX 1. OPTIONS FOR GUARANTEES OF FULFILLMENT OF OBLIGATIONS IN RESPECT OF MINE CLOSURES

1. PRELIMINARY REMARKS

The analysis contained in this report (the "report") has been made on the basis of current legislation in force in Argentina. Unless expressly stated otherwise or an express reference is made to foreign law, it should be understood that the conclusions, recommendations, and any opinions contained in this report are based solely and exclusively on the law applicable in Argentina.

2. PRELIMINARY CONSIDERATIONS ON GUARANTEES TO ASSURE THE FINANCIAL COSTS ASSOCIATED WITH THE CLOSURE OF MINES

Mining is a complex activity that, as such, consists of several stages, each of which has defined sub-stages that can be summarized as follows:

1. Dimensioning the deposit and its resources stage
 - i. Prospection
 - ii. Exploration
2. Mine planning stage
 - i. Engineering
3. Mine operations stage
 - i. Construction
 - ii. Operation
4. Mine closure stage
 - i. Closure
 - ii. Post-closure monitoring and control

The closure stage of a mine requires prior planning of the work that will be required to close the mine, in light of the particular characteristics of the mine and its setting, in order to ensure care for the environment and the neighbouring community.

As there is an absence in Argentina at national level and in most of the provinces⁵ of specific legislation on activities or protocols for the closure of mines, one of the main problems facing the regulation of the mining industry is that of ensuring that at the end of the active life of the mine there are sufficient funds available to finance

⁵The provinces of Catamarca, through its Resolution 396/2016 and Jujuy, through Resolution 037/2020, are noteworthy. These impose, directly and indirectly respectively, an obligation to provide financial assurance for mine closure.



its closure works, regardless of the will or solvency of the company holding the concession in a mining area at the time that closure takes place.

In this way, the problem caused by the full, partial, or defective closure of a mine could be solved by setting up a guarantee to ensure the existence of sufficient funds to cover the financial costs of the closure, so that a third party could carry it out without the state having to absorb the costs that such work entails.

Further to the above, a requirement to establish financial assurance to cover the work associated with mine closure becomes fundamental for protecting both the environment and communities, in clear alignment with the principles of sustainable development that ultimately make it possible to reuse the former mining area for new developments.

However, given the inherent complexity of mining, there is a need to determine the principles, parameters, or criteria for guarantees, which can be used as a basis for the analysis of the assurance instruments available, to determine which one or more of them is/are most appropriate to be required by the state as financial assurance for mine closures.

We therefore understand that a guarantee intended to assure the existence of sufficient funds to perform or complete closure works should be:

- **Easy to execute:** The importance of the environment and the need to reclaim the mining area for it to continue in use through the development of new purposes for the land or facilities leads to a recommendation that the assurance required should be executable as simply and quickly as possible, minimizing the scope for interventions by third parties that may hinder or delay execution of the assurance, including by bringing proceedings that need to be resolved by some authority or court prior to execution of the assurance taking place.
- **Easy to administer:** Ideally, the assurance to be constituted should be easy to administer, that is, its implementation should not involve a need to create contractual or corporate instruments in addition to the economic structure used for operation of the mine.
- **Economically reasonable, necessarily, and sufficiently for implementation of all closure measures:** The funds should be sufficient to meet, in a full and timely manner, the costs of the actions and measures involved in closure and post closure. Accordingly, when choosing the type of assurance, its cost (either direct or in terms of the opportunity cost of resources) should be reasonable.
- **Capable of being progressively enlarged and repaid:** Considering that the risk associated with the mine and the cost of its eventual closure will increase in line with progress on its construction and operation, it would be inappropriate for the concession holder to have to provide the assurance in full from the outset. It will, for this reason, be of significant value that the assurance can be increased over time, in line with the pace of construction and operation



of the mine. It will be equally of value that the assurance is capable of being gradually returned to the concession holder in proportion to the cost of mine closure at every point during the term of the concession contract, as partial or progressive closure works are completed that have an influence on the total amount assured by the guarantee that has been partially released.

3. ALTERNATIVE FORMS OF FINAL ASSURANCE FOR MINE CLOSURE

There follows below an analysis of the nature, characteristics, and legal advantages and disadvantages of each of the most important instruments available under Argentinian law that could be used as financial assurance for mine closures. For each type of instrument, we shall give an indication of the degree of correspondence it has with the principles identified below, which we consider essential for any financial assurance for mine closure. Table A1, at the end of this Appendix, contains a summary comparison of the different forms of financial assurance discussed below.

3.1 UNILATERAL ON-DEMAND GUARANTEES

3.1.1 NATURE AND MAIN FEATURES

Unilateral on-demand guarantees are regulated by Articles 1810⁶ to 1814 of the Civil and Commercial Code of the Nation. They consist of a unilateral declaration of will through which the issuer will guarantee fulfillment of the obligations of the concession holder and places itself under an obligation to fulfill them in cash or another benefit in favour of a beneficiary, if an event occurs that authorizes the beneficiary to demand execution of the guarantee, all subject to the specific conditions laid down in the unilateral declaration.

What is relevant to this report is that the unilateral on-demand guarantee may be issued by (i) public entities; (ii) private legal entities the members of which do not have unlimited liability; (iii) financial entities authorized to operate in Argentina by the Central Bank of the Argentine Republic; and (iv) insurance companies authorized to operate in Argentina by the Insurance Oversight Body of the Nation. We understand that a proposed legislative reform allowing a broader range of subjects to be authorized to issue this type of guarantee could simplify its use as a means of guaranteeing obligations arising from mine closures. To that end, Article 1811 of the Civil and Commercial Code should be amended to remove the restrictions on the entities able to issue guarantees of this type.

⁶ Article 1810 of the Civil and Commercial Code defines them in these terms:

Constituting a unilateral declaration of will and being governed by the provisions of this Chapter are the so-called “performance guarantees at first demand,” “at first demand,” and those that in any other way lay down that the issuer guarantees fulfillment of the obligations of another and commits to pay them, or pay a sum of money or other determined benefit, regardless of exceptions or defences that the payer may have, although it retains the right of recourse against the beneficiary, the payer or both. Payment authorizes the bringing of corresponding recourse activities. In the event of manifest fraud or abuse by the beneficiary arising from this instrument or other instrument of easy and rapid examination, the guarantor or payer may ask the judge to set an appropriate surety that the beneficiary must satisfy before payment is made.



Implementation of this type of demand guarantee is through the demand guarantor issuing a written unilateral declaration placing itself under a personal obligation for up to a set amount, to disburse the funds if the concession holder fails to meet its obligations in respect of mine closures.

The issuer of the unilateral declaration must honour fulfillment of the guarantee granted irrespective of any exceptions or defences that the concession holder may have, although it maintains the right of recourse against the competent authority, the concession holder, or both.

It should also be noted that a guarantee granted by unilateral declaration is irrevocable unless expressly stated otherwise. This means that the issuer of the guarantee cannot revoke its commitment during its term without the prior consent of the competent authority.

The content of the unilateral guarantee should reflect the terms and conditions of the agreement reached between the holder of a concession for a mining area in Argentina and the Mining Secretariat of the Nation—or competent authority—regarding a specific mine operation and closure plan. It should also lay down the particular conditions under which the funds should be disbursed to the competent authority on its sole demand.

Regarding the operation of the unilateral guarantee as a financial assurance instrument to ensure mine closure, it is noteworthy that, given that the funding of a mine closure operation is a commitment that extends over time into the later stages of mining extraction and operation, usual practice is for these unilateral guarantees to be issued for a term of validity shorter than that necessary to make the guarantee operational, its renewals usually being conditional upon a review, conducted by the guarantor at each renewal, of the financial situation of the concession holder. This review should be completed prudently in advance of the expiry date of the guarantee. If, after the financial review, the issuer decides not to extend the unilateral guarantee, the competent authority will be notified and will have the option of demanding disbursement of the funds guaranteed.

3.1.2 ADVANTAGES AND DISADVANTAGES

The main advantages of the unilateral on-demand guarantee are the following:

- To the advantage of the competent authority, it is very simple to execute since all that is needed is the written order of the competent authority for the guarantee amounts to be released to it. This is due to the fact that it is only in cases of manifest fraud or abuse on the part of the competent authority that release of the funds to it can be delayed. This would apply were the authority in question to claim the receivable from the concession holder and then demand it from the guarantor, for example, and the guarantor had express, sufficient, and categorical proof of such fraud. Similarly, a situation such as this would not prevent collection of the funds, but rather empowers the guarantor or concession holder to ask a judge to set an appropriate surety



that the competent authority had to meet before it was able to access the funds. Notwithstanding the foregoing, for the guarantee to truly be an on-demand guarantee, it would make sense to amend Article 1810 of the Civil and Commercial Code to the effect that the grantor of the on-demand guarantee should make the corresponding disbursement in all circumstances, regardless of whatever situations may arise.

- It could be an attractive option for concession holders, since the cost of setting up a unilateral on-demand guarantee usually includes only grant and maintenance costs. Moreover, considering that the subjects empowered to issue guarantees of this type include those holding stocks in companies whose shareholders do not have unlimited liability, if a concession holder had shareholders of proven solvency, the guarantee could even be granted at very convenient cost, or even at no cost to the concession holder.⁷
- If issued by a financial institution or insurance company, the guarantee would have the backing of an entity whose solvency is subject to verification by credit rating agencies or official bodies that oversee the solvency of financial institutions or insurance companies. Under this, they give the competent authority a high degree of security in respect of the solvency of the issuer—regardless of the solvency of the concession holder—since certain solvency criteria are required of the former associated with their credit rating.
- To the benefit of the enforcement authority, its condition of being irrevocable guarantees that there can be no unilateral withdrawal of the guarantee by its issuer during its period of validity, for which reason the competent authority would have control over the guarantee unless it consents to its being revoked.
- This type of guarantee offers flexibility to both parties since, if changes occur in the mine's operation and closure plan, the terms and conditions of the unilateral guarantee can be amended accordingly in order to align them with the new circumstances, such that the guarantee will parallel the particularities of operation and type of closure that it is intended to cover. This will require the prior consent of the issuer of the guarantee and written confirmation of this commitment.
- This guarantee has a simple implementation method for the concession holder, since once they have been set up, unilateral guarantees require minimal administration, and there is no need to create contractual or corporate vehicles, as would apply in the case of a guarantee trust, or to register the guarantee in any public record.
- Another attraction for the concession holder is that renewal of the unilateral guarantee can at all times go hand in hand with development of the mine operation and closure plan, so the amount assured at each renewal of the guarantee matches the assured amount updated in line with the terms agreed

⁷ In the case of guarantees issued free of charge for controlled entities, justification must be provided of the benefit to shareholders from granting this guarantee in a way that its validity could not be challenged in the event of the bankruptcy of the guarantor shareholder, in Argentina or abroad.



in the concession contract, making it possible to gradually reduce its cost, to the benefit of the concession holder.

Turning now to the disadvantages of the unilateral on-demand guarantee, the following are noteworthy:

- One disadvantage for both parties is that the availability of a unilateral guarantee may be restricted or conditioned by (i) the credit rating of the originator concession holder; and (ii) the fact, if applicable, that the originator concession holder is not the parent company itself or a subsidiary of the parent company—in other words, that it does not have an over-arching corporate structure to guarantee repayment of the funds in the event that the guarantor has to provide them if the unilateral guarantee is executed.
- One aspect that may potentially deter concession holders could be that the issuer may require them to support the guarantee through a counter-guarantee, with the costs that this would imply for the concession holder or the freezing of assets that it could entail. Nevertheless, it should be noted that this requirement is not mandatory for the originator concession holder, and so the guarantor has the legal right to recourse against the originator for the sums paid to the competent authority.

3.2 PLEDGE OF BALANCES ON DEPOSIT

3.2.1 NATURE AND FEATURES

The pledging of balances on deposit consists of a collateral right constituted by a pledgor—in this case, the concession holder—in favour of a pledgee—in this case the enforcement authority—on a cash deposit in a bank account designated for that purpose. The balances underlying the pledge are frozen by the bank in which they are deposited with the effect that while they are in an account open in the name of the concession holder, their administration is severely restricted due to the account being frozen.

The amount of the deposit should be sufficient to cover the total costs of the mine closure operation, in order for them to be available to the government for application in the event that the concession holder refuses to carry out the mine closure works.

3.2.2 ADVANTAGES AND DISADVANTAGES

The main advantages of pledges of balances on deposit are the following:

- To the benefit of the competent authority, as this is a collateral right, it grants it a preferential right of claim of its guaranteed credit over other third-party creditors without a guarantee of equal or better rank. It should also be noted that the preferential right of claim extends to the competent authority even in the case of the reorganization or bankruptcy of the concession holder, as a special privilege pursuant to Law No. 24,522, of Bankruptcy (“LCQ”).



- A benefit for both the concession holder and the competent authority is that the pledged balance on deposit can be renewed whenever the mine operation and closure plan is developed, so that the amount pledged on deposit is always equivalent with each renewal to the updated financial assurance amount in accordance with the agreement in the concession contract, making it possible to adjust the amounts required for the guarantee in line with advances in the operations of the mine and partial closure works that may be carried out from time to time.

In respect of the disadvantages of pledges of balances on deposit, the following are noteworthy:

- This assurance instrument is mainly oriented toward guaranteeing short-term operations. As the operation of closing a mine is a major and long-term undertaking, the amount deposited can be extremely high, and the concession holder could find significant funds immobilized during the period of mining operation, with the consequent financial cost.
- A drawback for the competent authority is the method of execution of this guarantee, since in order to claim a pledged balance on deposit, this must be executed in accordance with a specific procedure applicable to the enforcement of pledges of this nature, which involves the assistance of the custodian of the pledged balance.
- This guarantee entails a high financial cost to the concession holder, which could act as a disincentive, since depositing the full nominal value of the guarantee amount involves the immobilization of that liquid asset for the entire period of operation of the mine.
- As a general disadvantage, balances placed on deposit are subject to the vicissitudes of the local financial market and could be affected by the adoption of measures identical or similar to or having similar consequences to certain measures taken in the past during public emergencies.

3.3 SURETY INSURANCE

3.3.1 NATURE AND FEATURES

Surety insurance, as an assurance instrument, is a type of insurance contract under which an insurance company guarantees to indemnify a third-party beneficiary—here, the enforcement authority—from the harm it may suffer if the principal—here, the concession holder—fails to meet its obligations to the competent authority under a contractual relationship pre-dating the surety and to which the surety is attached. Thus, the insurance company will take responsibility for the liability to the enforcement authority for breach imputable to the concession holder of its obligations to the competent authority, but only to the extent of the insurance as stated in the surety policy and the terms agreed therein.

The general conditions for surety insurance are not defined in Argentinian law, but even so, the Insurance Oversight Body of the Nation has in the past approved



particular surety insurance policies for certain specific contracts, such as public–private contracts, public works contracts, and rental contracts. Notwithstanding the above, it should be noted that insurance companies are authorized to issue surety policies whether or not such policies are pre-approved by the Insurance Oversight Body of the Nation, on condition that such policies are consistent with the insurance regulations in force in Argentina.

Surety insurance must be issued by an insurance company authorized to operate in Argentina by the Insurance Oversight Body of the Nation. It may eventually be reinsured by a foreign insurance company with a proven reputation and financial solvency under the terms to be defined in the relevant legislation.

3.3.2 ADVANTAGES AND DISADVANTAGES

The main advantages of surety insurance include the following:

- It enables the principal—that is, the concession holder—to avoid assigning physical or liquid assets when assuring the mine's closure operations other than payment of the corresponding premium, which results in a clear benefit and incentive for it, bearing in mind the lengthy period of operation that precedes the mine closure process.
- One benefit for the competent authority is the incorporation of a third party—the insurance company—as guarantor of the concession holder's obligations. It is presumed to be solvent as it comes under the comptrollership of an official body, the Insurance Oversight Body of the Nation. This amounts to a double guarantee for the enforcement authority, as it will not depend solely on the financial and asset position of the concession holder at all times. In turn, the fact that the insurance company must be authorized to operate by the Insurance Oversight Body of the Nation is an additional element that increases the robustness of the guarantee, as it sets it within a precise and concrete regulatory framework.
- This type of guarantee has a simple execution procedure, which is an advantage for the competent authority. If an agreement is made to waive the benefit of excussion,⁸ execution of the policy and payment of the sum insured once the claimable event (that is, the concession holder's breach of its obligations) has been reported, execution is immediate, meaning that the insurance company will have a fixed, defined time within which to disburse the sum insured to the competent authority with no requirement for any other prior procedure.
- One attraction for the concession holder is that the cost of setting up this type of guarantee is relatively low in comparison with other alternatives of a similar nature, such as a bank guarantee, a bond, or a guarantee trust, since it only requires payment of the premium and successive premiums at the time of

⁸ The benefit of excussion is a right granted to the guarantor under which the creditor must exhaust legal remedies against the principal's assets before executing the guarantee and execute the guarantee for the outstanding amount after exhausting such remedies.



taking the insurance policy. In addition, it requires minimal administration once it has been obtained.

- Another benefit for the concession holder is that renewal of the surety insurance can at all times go hand in hand with development of the mine operation and closure plan, so the amount assured at each renewal matches the amount assured, updated in accordance with the terms agreed in the concession agreement, creating the possibility of making partial withdrawals of the guarantee and gradually reducing its cost, both of which work to the benefit of the concession holder.

Turning now to the main disadvantages of surety insurance, the following are worthy of mention:

- One disincentive to the concession holder is that, although this type of instrument is less costly than alternatives, it can still be an expensive option for some operators.
- A disadvantage to the competent authority is that, unlike the on-demand guarantee, in the event of a dispute between the parties over whether or not the obligations guaranteed by the surety insurance have been fulfilled, the insurance company issuing the guarantee could avoid disbursement of any money at all until there has been effective determination of the breach.

3.4 GUARANTEE TRUST

3.4.1 NATURE AND FEATURES

The guarantee trust is a multilateral agreement regulated under the terms of Article 1680 and concordant articles of the Civil and Commercial Code of the Nation made between (i) the concession holder as trustor, (ii) the enforcement authority as beneficiary, and (iii) an entity that manages the trust fund as a trustee, for the sole purpose of the guarantee.

Within this contract, the concession holder transfers to the trustee fiduciary control over assets it owns to form the assets in trust. These are administered by the trustee in accordance with the instructions provided in the trust contract to the benefit of the competent authority. For this, the trustee may apply said assets to the payment of secured claims by the competent authority, be this through the disbursement of cash held in the trust account or through the disposal of assets through mechanisms that seek to obtain the best possible value for them.

The assets whose fiduciary control has been transferred to the trust may consist of cash, movable and immovable property, securities, or the total or partial flow of funds from contracts for the sale of minerals or similar made by the concession holder with third parties. In the particular case of securities, special consideration must be paid to the risk of fluctuations in their market prices, for which reason protective mechanisms must be provided in the grant agreement as indicated in §4.2.1.



3.4.2 ADVANTAGES AND DISADVANTAGES

The main advantages of guarantee trusts include the following:

- An advantage for the competent authority is that the guarantee trust is a so-called self-liquidating guarantee, which means that legal proceedings are not required to execute it. As all that is required is the instruction to the trustee to release all or part of the assets assigned to the trust to the competent authority, this enables it to comply with the principle of simplicity of liquidation of the guarantee.
- Another attraction to the competent authority is that from the time that the trust guarantee is set up and the fiduciary assignment accepted by the appointed trustee, the assets in trust form a body of assets that are separate from and independent of the concession holder's assets, with the result that they are safeguarded from any possible claims by creditors of the concession holder.
- An advantage for both parties is that if the assets in trust are made up of cash, flows of funds from contracts made by the concession holder, or government securities, the application of said assets to the payment of the sums guaranteed becomes relatively simple, due to the total or high liquidity of the assets making up the trust. This makes it possible to invest them in secure instruments with a high degree of liquidity in order to maintain the value over time of the assets pledged as assurance, saving the concession holder the cost of having funds frozen over extended periods of time.

In respect of the main disadvantages of guarantee trusts, the following are noteworthy:

- One possible disincentive for the concession holder is that the establishment of a guarantee trust involves the formation of a contractual vehicle additional to the underlying structure for mining operation, since it involves negotiating and making a specific contract to set the trust up and includes a third party to be the trustee of the guarantee trust.
- Another disadvantage to the concession holder is the additional cost of the third party appointed as trustee of the trust, as this will accrue fees for its work as administrator of the assets in trust.
- Once constituted, the guarantee trust requires active management for its entire term, including, among other matters, obtaining a Unique Tax Identification Code (CUIT) for the trust, registering it for the corresponding taxes and opening a bank account for it. In addition, the trust is required to submit affidavits, pay taxes, and keep accounts separate from those of the trustee itself. All this implies a higher administrative burden than other assurance instruments mentioned above which, despite falling to the trustee, entails additional time and costs amounting to another difficulty for the concession holder.



- As a general disadvantage, if the assets in trust are made up of movable and immovable property, application of such assets to payment of the sums guaranteed is complicated by the low liquidity of the assets, since the trustee will have to carry out the process of liquidating them, with the ensuing costs and time.

3.5 BONDS

3.5.1 NATURE AND FEATURES

The bond is a bilateral contract governed by Articles 1574 et seq. of the Civil and Commercial Code of the Nation. It is made between (i) a creditor—in this case the Mining Secretariat or corresponding government body—and (ii) a third party, which could be a natural or legal person, as guarantor. The contract provides that the guarantor undertakes to pay a benefit to the creditor if the concession holder defaults, as main obligor of the bond.

Depending on whether the bond is formed as being joint and several or not between the guarantor and the concession holder, the competent authority has different options for requiring payment of the sum due. In the case of the joint and several bond—expressly formed as such or in which the guarantor has waived the benefit of excussion—the competent authority may address its claim for the entire amount guaranteed to both the concession holder and the guarantor.

In the contrary case of the non-joint and several bond, the creditor is required to address its claim firstly against the concession holder and only if it, the principal debtor, breaches its obligations to the enforcement authority or does not have sufficient assets to meet the full cost of the mine closure. The Mining Secretariat may then redirect its claim to the guarantor.

Normal practice in Argentina is for guarantors to be formed jointly and severally, which coincides with the recommendation that we would make to the enforcement authority.

3.5.2 ADVANTAGES AND DISADVANTAGES

The main advantages of the bond include the following:

- One advantage for the concession holder is that, while a bond contract is a bilateral contract between the competent authority and the guarantor, it could be incorporated through a contractual clause in the concession contract itself, with the guarantor's participation in the contract for the purposes of placing itself under an obligation under the terms of the bond. This would avoid the creation of additional contractual and corporate vehicles for implementation of the bond, making it a flexible way of providing assurance.
- Another possible attraction to the concession holder is that the cost of establishment is irrelevant, since there is no requirement to register the bond, nor for the payment of fees or duties to implement the guarantee, although there could be a financial cost associated with payment of a fee to the guarantor for granting the guarantee.



- To the benefit of the competent authority, as this is a guarantee of the personal type, the guarantor is liable to the full extent of its assets for any breach of obligations on the part of the concession holder, rather than to one or more determined items of its assets.
- In favour of the concession holder, bonds do not entail any particular administrative burden once they have been established.

Turning to the main disadvantages of the bond, the following are noteworthy:

- They are complex to execute. This is a disadvantage for the competent authority, since the guarantor is authorized by law to oppose the competent authority using all defences and objections to both it and the concession holder paying the debt to the competent authority. The use of these defences and exceptions could lead to an adversarial process between the parties requiring a resolution by a competent authority or court, with the concomitant undesired costs and time.
- Another disincentive to the competent authority could be that its assurance depends on the solvency of the concession holder and guarantor, whose assets are subject to any vicissitude that arises against them during the term of the concession contract. This is because, in principle, no privilege is created to the benefit of the competent authority over any of the assets of the guarantor in respect of claims from other third parties. In other words, the competent authority has no guarantee of the creditworthiness of the obligors, since unforeseen events in the course of their business could generate capital impairment that might affect their ability to pay in the event of an occurrence that triggers execution of the guarantee. Similarly, the bond gives the competent authority no powers of preference and pursuit over any specific part of the concession holder's or guarantor's assets, with the result that it is not in a privileged position with respect to their respective creditors. On this basis, and in the absence of credit ratings from credit rating agencies, the terms of the bond should include obligations to maintain certain solvency-related ratios, to be appropriately analyzed in order for the grant of the bond to be accepted. Notwithstanding the foregoing, an alternative for legislative reform exclusively applicable to bonds to guarantee mine closures would be an amendment of Article 246 of the LCQ, to establish that the obligations of the guarantors of this type of bond enjoy a general privilege over the guarantor's unsecured obligations.

3.6 PLEDGING OF ASSETS AND MORTGAGES ON PROPERTIES

3.6.1 NATURE AND FEATURES

Both pledges and mortgages are collateral rights on the property of a third party and are established to assure fulfillment of a determined obligation. They are regulated in Chapters II and IV respectively of Title XII of Book IV of the Civil and Commercial Code of the Nation.



A pledge can be of movable assets—such as machinery, inventory of goods for use or other assets—or of documentarily established receivables. Pledges can be with or without registration. Unregistered pledges involve the delivery by the pledgor—in this case the concession holder—to the pledgee—in this case the enforcement authority—or to a third party designated by the parties, of the asset pledged. Registered pledges, on the other hand, are established of assets that must remain in the power of the pledgor that has pledged them as collateral for their obligations to the pledgee. The pledge agreement, of whichever type, may be made by public instrument—a notarized deed—or private instrument with a certain date to ensure effectiveness against third parties.

Mortgages can only be of immovable assets owned by the mortgagor—in this case the concession holder—and that belong to it under a real right of ownership, co-ownership, horizontal property, real estate complexes, or surface. Unlike the pledge, mortgages must be formalized by a public instrument under penalty of nullity.

3.6.2 ADVANTAGES AND DISADVANTAGES

The main advantages of pledges and mortgages include the following:

- To the benefit of the competent authority, as they are collateral rights, they grant it, in the event of breach by the concession holder, powers of pursuit and preference over the asset that is the subject of the guarantee to recover the sum guaranteed by the proceeds of execution. This being so, preferential recovery over the proceeds of sale of the asset that is the subject of the guarantee extends to the competent authority even in the event of the reorganization or bankruptcy of the concession holder, as a special privilege under the terms of the LCQ.
- Another advantage to the enforcement authority is that they have *erga omnes* efficacy, that is, efficacy before all, meaning that the competent authority can pursue collection of the sum owed by means of disposal of the asset that is the object of the guarantee, against any holder of it, regardless of whether or not said holder is the concession holder itself.

In respect of the main disadvantages of pledges and mortgages, the following should be noted:

- Notwithstanding the comments made in the first of the paragraphs above on advantages, it should be noted that a potential disadvantage for the competent authority could be the provision of the LCQ that states that if a pledge or mortgage is made to guarantee an obligation that is not yet due and that did not have such guarantee at the time of its establishment, it can be declared ineffective with respect to other creditors of the concession holder, when the pledge or mortgage was made during the suspect period—the period of up to 2 years counting back from the date of filing for reorganization or of bankruptcy being pronounced. Such a declaration of ineffectiveness would have to be resolved within the limitation period provided for this purpose in the LCQ.



- Both guarantees are complex to execute, which would be a disadvantage for the enforcement authority, since the assets comprising the guarantee would have to be disposed of by private or judicial auction, with the associated costs and time involved therein. This, therefore, means that these are both low-liquidity forms of assurance compared with other alternatives such as surety insurance and the unilateral on-demand guarantee.
- Although they do provide the competent authority with robust assurance, one disadvantage for the concession holder is that it is more expensive to establish them than other alternatives available in the market, such as surety insurance, bonds, or unilateral on-demand guarantees. In particular, the cost of a mortgage could be high when account is taken of the amount that would need to be guaranteed by it, consistent with the works for mine closure since, as it needs to be formalized by means of a notarized instrument, its formation is subject to the payment of fees for notaries, registration fees, and legal stamps, which increases the cost to the concession holder of the guarantee.
- In the case of unregistered pledges, the fact that the concession holder has to deliver the asset to the competent authority would act as a clear disincentive to the concession holder, which would not be able to have its own assets, since it would need to use them to carry out mining activity.
- In respect of mortgages, as a general disadvantage, we have no records of these having been used either domestically or internationally, as they are a form of assurance whose structure, establishment, and execution does not align with the particularities of projects of this nature which, as stated in Chapter 3 of this report, require guarantees with principles dissimilar to those upon which mortgages and pledges are based.
- In the case of the pledge, it becomes difficult, if not impossible, to gradually repay the guarantee since whenever it is desired to make a part refund of the guarantee, a new pledge will have to be made of a lower-value asset than previously, with the administrative and technical difficulties that such a process entails. In the case of the mortgage, while its partial and progressive refund is possible through decreasing the amount guaranteed by it, the fact of the matter is that it requires a formal amendment to the original mortgage deed by the grant of a new notarized instrument, with the consequent undesirable notarial and registration fees. Above all, bearing in mind that as indeterminate receivables, as these are, the formative instrument must state the maximum amount guaranteed in every respect, which can be difficult to determine and lead to a need for the amount guaranteed to have a capacity that would make the granting of the guarantee excessively costly.

3.7 CONTRIBUTIONS TO THE ENVIRONMENTAL COMPENSATION FUND

The General Environment Law, Law No. 25,675, established the Environmental Compensation Fund (the “Fund”) that, pursuant to Article 34 of said law is “intended to guarantee the quality of the environment, the prevention and mitigation of harmful or dangerous effects on the environment, the response to environmental



emergencies; and also, the protection, preservation, conservation or compensation of ecological systems and the environment.”

An alternative form of assurance could consist of an obligation on the part of the concession holder to contribute to the Fund, for the contributions to be applied to the financing of closures of the concession holder's mines if the concession holder should breach its obligations in this respect.

3.7.1 ADVANTAGES AND DISADVANTAGES

The main advantages of the obligation to contribute to the Fund include:

- One advantage for the competent authority is the liquidity of the guarantee, since it is made up of cash contributions that the concession holder would make to the authority responsible for administering the Fund. This would, therefore, make the execution process extremely simple, in accordance with the guidelines agreed between the authority responsible for administering the Fund and the enforcement authority.
- To the benefit of the concession holder, as this is a regular contribution, it could be aligned with the development of the mining operation and mine closure plan at all times, so that its amount could be graduated and updated on the basis of the agreement made in the concession contract, making it possible to gradually reduce its cost.

The disadvantages of the obligation to contribute to the Fund would include:

- If the amount of the contribution was agreed in Argentine pesos, the value of the guarantee could be reduced in line with any reduction in the value of the peso over time.
- As a potential disadvantage for the competent authority, concession holders (especially those that had submitted their feasibility studies before the date of entry into force of any future mine closure law) could challenge the validity of the obligation to make contributions to the Fund, arguing that this could be a specifically earmarked tax and, as such, a violation of Article 8 of the Mining Investment Law, No. 24,196, which provides the fiscal stability of mining projects covered by it for a period of 30 years from the date of submission of their feasibility studies.

4. RECOMMENDATIONS FOR LEGISLATIVE POLICY ON FINANCIAL ASSURANCE FOR MINE CLOSURES

In line with the explanations throughout this report, we consider it advisable that legislation on mine closures should provide for certain principles in respect of the eligibility of the various alternatives for financial assurance, including the following:

- **Liquidity:** The main attribute to be pursued in relation to forms of financial assurance for mine closures would be that of liquidity, which translates into ease of liquidation and execution.



- **Exclusivity:** One of the desirable attributes of guarantees for the obligations in relation to mine closures is that of exclusivity, so that the guarantee is used exclusively to assure the obligations of mine closures and exclude other current or contingent obligations on the part of the concession holder. Similarly, exclusivity also relates to the beneficiary (the state), object, and destination.
- **Flexibility:** We understand that it would be good legislative policy to establish a principle of breadth of eligible guarantees so that, within the parameters legally required for eligibility, the concession holder had a range of possible options for providing assurance. This would be to ensure that the legislative provision be adaptable to the different types of mining projects (in terms of size, nature, environmental complexity, and other distinguishing factors) that it is designed to regulate and to the possibilities and wishes of the different concession holders, when said wishes are proven to make no difference in terms of the effectiveness of the guarantee.
- **Correspondence with factual circumstances:** The nature of the guarantee required should correlate with any special and particular circumstances that take account of the characteristics of both the concession holder and the mining project that is the subject of the concession, such as the following: (i) the historical performance of the concession holder both in Argentina and abroad, in respect of meeting its environmental obligations and those toward Argentinian and foreign public authorities, within the framework of mining projects or other projects subject to government concession agreements; (ii) the financial health of the concession holder, mainly revealed by the use of solvency indices and its financing structure; and (iii) the degree or level of harm that the project could cause to the environment or public health.
- **Adaptability:** Mine closure legislation should clearly provide for the situation of mining projects that are already under way at the time that it is enacted, to establish clear rules and guidelines for adaptation to the new arrangements on the part of mining concession holders currently working under legislation that has no specific regulations on financial assurance for mine closures.
- **Efficiency:** Considering the extended period over which the assurance provision would have to be maintained, it would be appropriate that the type of guarantee chosen had a simple mechanism to enable the competent authority to periodically monitor its validity, effectiveness, and solvency, guaranteeing its efficacy for the full length of the obligation.
- **Precision and clarity:** Lastly, it should be noted that a key point in implementing guarantees for the financial assurance of the costs of mine closures relates to the calculation and determination of the amount assured at any particular moment in the life of a concession contract. While this does not have any direct impact on the assurance alternative used, it is worth noting that the criterion used for the calculation of the cost of closure of a mine must be established clearly and precisely, since an unclear or imprecise criterion could lead to legal disputes between the contracting entity and the concession



holder related to the determination of the amount assured and, until the amount is defined, this could lead to a delay either in the commencement of activity under the concession contract or in the establishment of the guarantee.

TABLE A1. COMPARATIVE TABLE OF FINANCIAL ASSURANCE VEHICLES FOR MINE CLOSURE

	Unilateral on-demand guarantee	Pledge of balances on deposit	Surety insurance	Guarantee trust	Bond	Pledge of movable assets or mortgage of immovable assets	Contributions to the Environmental Compensation Fund
Simplicity of establishment and administration	✓	✓	✓	✗	✓	✗	✓
Liquidity and ease of execution	✓	✗	✓	✓	✗	✗	✓
Efficiency and monitoring	✓	✓	✓	✓	✓	✓	✓
Flexibility	✓	✓	✓	✓	✓	✗	✓
Costs	—	✗	—	✗	✓	✗	—
Grants privilege over specific assets	✗	✓	✗	✓	✗	✓	✗
Potential for dispute	✗	✗	✗	✗	✗	✗	✓

Note: The comparative table above is not intended to be and does not constitute an exhaustive comparison of each and every characteristic of each type of vehicle for the financial assurance of mine closures. It has been prepared for and accompanies this report for the sole purpose of illustration, for which reason it must not be read or interpreted in isolation, but taking account of the nuances and specific characteristics of each alternative.

Source: Prepared by authors



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