Financial Assurance for Mine Closure and Reclamation

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A study prepared for the International Council on Mining and Metals

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A summary version of this report is available from the ICMM website at www.icmm.com. For a printed copy of the summary report contact ICMM at info@icmm.com or 19 Stratford Place, London, W1C 1BQ, UK.

The photographs on the front cover of the report are (clockwise from top left): Part of the Huntly Mine in south western Australia in 1980 (Alcoa); Community development programme at the Wetlands Langford Quarry – Tarmac Industrial Minerals (Anglo American); Reclamation of the indigenous vegetation with the aid of a shade cloth to protect young plants against the wind at Namakwa Sands (Anglo American); Reclamation of newly mined dunes at Richards Bay Minerals, KwaZulu Natal province, South Africa. The biodegradable windbreaks protect the young casuarina trees (Rio Tinto); Reclamation of an exploration drill site (Anglo American); The same view of the Huntly Mine in 2001 (Alcoa).
A key measure of the mining and metals industry’s ability to contribute meaningfully to sustainable development is its long-term environmental performance. This requires timely and comprehensive planning for closure and beyond. An important component of this planning is consideration of how closure measures will be funded.

The International Council on Mining and Metals’ sixth sustainable development principle, to “seek continual improvement of our environmental performance”, includes a commitment to the design and planning of all operations so that adequate resources are available to meet mine closure requirements. Environmental financial assurance measures help provide a guarantee to governments and communities that these resources will be available.

The need for financial assurance is clear. Yet choosing the best form of assurance requires careful consideration. Policies that meet environmental objectives can and should also be compatible with a healthy investment climate and financially efficient. Governments and industry both have a strong interest in ensuring that financial assurance policies meet these criteria.

This study presents a broad overview of the current status of financial assurance as applied to mine closure and reclamation in important mining jurisdictions around the globe. It is intended to aid governments and companies in their discussions on the application of effective policies in this area. A related study on metals operations is also currently being prepared.

By working together, stakeholders can help ensure that the right financial assurance tools are used and, ultimately, that the long-term environmental performance of mining and metals operations is enhanced. It is our hope that this report is another step in this direction.

Paul Mitchell
Secretary General
International Council on Mining and Metals
In recent years, government agencies in a number of jurisdictions have adopted policies of requiring mining companies to provide environmental financial assurance (EFA) to guarantee the costs of reclaiming lands affected by mining in order to prevent or repair environmental damage at the end of a mine’s life.

This study was commissioned by the International Council on Mining and Metals to clarify the degree to which EFA measures are currently used by mining jurisdictions, to reveal the range and extent of actual policies and practices in use and to discuss the issues that arise in the application of EFA policies.

The study is an update of the analysis put forth in a 1998 report by the same author for the International Council on Metals and the Environment. Much has changed in the intervening years, particularly in attitudes about EFA. The mining industry has embraced the concept of sustainable development and is generally supportive of providing financial assurance. Governments have also tended to impose stricter requirements on industry.

The assistance of ICMM member companies and of a number of other individuals who have provided information during this study is gratefully acknowledged.

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Executive Summary

Environmental financial assurance (EFA) measures are important tools to pursue environmental objectives. Today, their most common use is to ensure that funds will be available to guarantee effective mine closure and reclamation so that ongoing environmental problems are avoided. Also, effective EFA policies have the potential to reduce the scope for public criticism of industry practices. This report considers issues and policies in the use of financial assurance; analyses trends revealed through a survey of industry, governments and financial institutions; and speculates on future developments.

Issues and Policies in the Use of Financial Assurance

Governments and mining companies both have an interest in agreeing on realistic forms and amounts of EFA. It is generally accepted that these need to be effective in terms of environmental protection but should not unduly depress capital availability or damage the investment climate. This entails agreeing on the appropriate financial instruments and the expected standards of reclamation before a major mining project is committed. Indeed, these provisions should form part of the agreement under which mine development proceeds. Although the amount of assurance may need to be adjusted later, the process of adjustment should be well understood and also agreed in advance.

Financial assurance instruments may be chosen from a large number of options. Different instruments may be appropriate depending on the financial strength of the mining company, the amount of the potential environmental liability, the time frame over which the liability is to be extinguished and so on. For an individual operation, the EFA instrument used should meet two tests: it should be effective in assuring the government that the operator can take all necessary and reasonable measures to protect the environment (or that another party is enabled to do so if the operator fails) and it should be the least costly of all the effective instruments available.

It follows that the same financial assurance requirements will not suit all mining companies. It may be appropriate for a large, diversified, profitable company to have less demanding requirements than a smaller, less financially robust company.

The standards of reclamation required of operators will clearly affect the cost of the work and the amount of financial assurance required. A requirement to return the land to its pre-disturbance condition, or to a condition permitting resumption of its earlier use, is often unrealistic or even undesirable. Therefore, policy-makers are advised to develop other practical criteria for assessing the adequacy of reclamation efforts. In addition, there is a role for generally agreed industry standards of performance in designing and implementing closure plans and procedures in order to achieve reclamation goals.

It is reasonable that when operators have successfully completed reclamation and returned the site to the desired condition, they should be relieved of any further liability for that site. However, there is a quantitative difference between sites that can

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1 In this study, “closure” means the act or the moment of ceasing operations at a mine site. It does not imply any particular level of site clean-up after operations cease. “Reclamation” has been used to mean post-closure improvement of the site to a desired standard. It does not necessarily mean returning the site to the state in which it existed prior to mining. It is understood to be synonymous with “rehabilitation” and “restoration”.

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be successfully reclaimed at the end of the mine life and those that require long-term care. The latter require sufficient financial assurance to fund the costs of ongoing site care. The amounts can be substantial. In this case, legislation should provide that the operator can obtain an exit ticket by financing the site management activities for the required period.

Forecasting mine site reclamation costs is inexact, particularly when long-term care is required. There are many sources of uncertainty, including unexpected site conditions, the presence of acid drainage and actual rather than estimated costs of labour and equipment. Because of this, governments tend to build a safety factor into the amounts of EFA required. It is suggested that governments have a general policy of requiring EFA that is prudent in light of all reasonably foreseeable risks, but that they should not insist on protection against highly unlikely events.

The impacts of financial assurance requirements on existing operations also need to be considered. Governments should apply these requirements in such a way that they contribute to the goal of environmental protection but do not hobble existing operators and result in premature closure. The timing and nature of new requirements, as well as transition provisions, should be set accordingly.

Taxation arrangements should also be taken into account. A financial assurance requirement may be more or less onerous depending on the taxation arrangements between the operator and the government. At a minimum, the operator will expect to deduct from profits all the costs associated with the financial security. Some jurisdictions may be prepared to offer a net fiscal incentive in order to gain relief from environmental liability.

Finally, authorities should consider whether there are non-financial policy instruments that could be used to support environmental protection. The consideration of the track record of a company is an option. Accreditation or certification on either a voluntary or compulsory basis is another possibility. Accredited companies would expect from governments privileges not enjoyed by companies without accreditation.

Surveys of Current Practice

A survey of current practices on EFA has revealed trends and developments that could have an impact on the future of the global mining industry.

First, several jurisdictions have strengthened their legislation in recent years, including Botswana, Canada (the Yukon), Chile, Ghana, India, Peru, South Africa, Sweden, and the United States. This trend will undoubtedly continue.

Furthermore, a number of state or provincial governments (such as Nevada, Ontario and New South Wales) are requiring a high amount of financial assurance on the assumption that independent contractors will be called in if there is a default.

In addition, the virtual collapse of the U.S. surety market has disrupted pre-existing financial assurance arrangements. The availability of conventional sureties in this country will likely continue to be curtailed for the foreseeable future.

Finally, the standards of reclamation and the forms and amounts of financial assurance required vary among jurisdictions but are tending to cluster at the higher end. At one extreme, certain countries appear to require no financial guarantee as in Guinea, while in other countries such as Sweden hard forms of security are required.
(such as letter of credit, cash bonds or trust funds) and it appears virtually impossible to surrender mining lands under any practicable circumstances.

Conclusions and a Look to the Future

At the supra-national level, processes are in place to reinforce the trend towards higher standards of environmental management, including EFA, in mining. The European Community is developing an extractive industry waste directive that will require some European countries to amend existing requirements for mine reclamation and associated EFA. Another example is the Equator Principles, through which signatory international banks undertake not to finance any project over US$ 50 million unless it meets World Bank and International Finance Corporation environmental policies, standards and guidelines, which include a requirement for closure funding.

In light of this, industry and international associations should encourage research and innovation in the use of new tools to supplement or replace conventional EFA instruments. One possible area of research is the classification of EFA instruments into distinct groups and the development of policy guidelines for applying these EFA groups to the different risks encountered in individual cases.

In addition, industry and international associations should promote consistency and coherence among governments. The development of transparent systems of accreditation and certification to reinforce existing industry codes should be strongly supported. In parallel, governments should hold themselves open to suggestions for using new techniques and instruments of risk management.

In summary, financial assurance mechanisms are here to stay. The debate needs to be about making framework policies, and their application to specific EFAs and companies, as efficient as possible.
1. Introduction

This study was commissioned by the International Council on Mining and Metals (ICMM) to update a publication issued by the Council’s predecessor organization, the International Council on Metals and the Environment (ICME) in 1998. It provides a focus on the current status and trends related to financial assurance requirements for mine closure and reclamation.

The study evaluates industry experience in the use of performance bonds and other financial instruments, their strengths and weaknesses, and their effectiveness as a tool to provide assurance that funding for mine closure and reclamation will be available.

Background

Mining companies have long been required to post security with government to guarantee the performance of required activities for closure and reclamation of a mine site.

In recent years, however, some governments realized that existing security arrangements were inadequate and extended the concept of financial security much more broadly to include cradle-to-grave environmental performance. They have also specified various forms of financial assurance.

Environmental financial assurance instruments (abbreviated as EFA in this study) include sureties, for example, fidelity bonds, surety bonds, performance bonds and letters of credit. Sureties are guarantees issued by a bonding company, an insurance company, a bank, or another financial institution which agrees to hold itself liable for the acts or failures of a third party. The issuer of the surety is also, confusingly, called the “surety”.

Another form is a cash deposit with the responsible government agency. A new form, which has appeared since the 1998 report, is an insurance policy, used in conjunction with other measures. Several types of EFAs are described in the Appendix.

It is conceivable that a government could ask for a surety bond, a letter of credit, or some other financial assurance instrument to guarantee that a mining company would not exceed its effluent discharge limits. In practice, however, there are very few examples of this use of EFA for the control or guidance of mining at the operational phase.

Much more common today is the use of some type of EFA to guarantee environmental performance after closure. This provides confidence that the site will be stabilized and all necessary reclamation carried out so that ongoing environmental problems are avoided. The concept can apply to any instances of land disturbance, whether caused by exploration activities or mining operations.

Governments are increasingly interested in EFA instruments, realizing that, while traditional methods of regulation may be effective in controlling a mining company’s
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environmental performance during operations, they are essentially useless in guaranteeing site reclamation after operations cease.

Site abandonment creates issues for government(s), communities and the industry. There could be several causes: the company may fail outright; a fall in commodity prices may cause premature closure; or the company may have no financial reserves at the time of closure.

The remainder of this study will focus exclusively on the use of EFA to guarantee proper site closure and reclamation.

Governments and industry both have a strong interest in understanding the issues related to financial assurance for reclamation and site maintenance after closure. Governments wish to protect the environment for which they are responsible and avoid the costs of closing and reclaiming mine sites. At the same time, they need to maintain a friendly investment climate to attract mining capital. The majority of mining companies are responsible and financially sound. They stand to suffer embarrassment or worse if other companies leave orphaned mine sites that cause environmental problems. In our information age, public outrage over abandoned sites causes severe credibility problems for the world mining community and can lead to a policy backlash with long-term financial implications.

Structure of the report

This report contains 4 chapters and an appendix.

Chapter 2 provides background information on and extensive discussion of several issues that face government in the design of a system of EFA. The chapter also provides suggested guidelines for resolving these issues at the policy level. Finally, a set of negotiating principles or guidelines is given which governments and industry could use to develop a satisfactory system of EFA as applied to a specific project.

Chapter 3 contains the results of two industry surveys (six years apart) among ICME/ICMM members on their experience of the use of EFA. Eleven companies responded to the 1998 (ICME) survey, contributing a total of 40 individual case studies describing how EFA instruments were used at specific mines or exploration projects. The 2004 survey also attracted 11 responses (not all from the same companies that responded previously) detailing EFA requirements at 22 additional operations worldwide.

Also included in Chapter 3 is summary information on legal requirements in 25 national and sub-national jurisdictions, as well as the results of a limited international survey of opinion among mining executives and selected financial, government, and insurance and surety specialists.

Chapter 4 contains a review of several current issues and trends in financial assurance as they affect the world mining industry. It also provides an opportunity for a few concluding words and an attempt to speculate on the future development of practice regarding these instruments.

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A note on terminology

The 1998 report used the term “surety” to refer to all forms of assurance. However, as that term is properly used only to refer to third-party guarantees, the broader term “financial assurance” is used here.

The term ‘reclamation bond’ is often used for EFA required to guarantee environmental performance after closure. Bear in mind, however, that a so-called reclamation bond may be in any one (or more) of several technical forms such as a cash deposit, letter of credit, surety bond issued by an insurance company, performance bond, parent company guarantee, etc. Several common forms of EFA are described in the Appendix.

Usage differs from country to country in terms such as “reclamation”, “rehabilitation”, “site remediation” (to describe the work that is carried out) and “closure”, etc. In this study, “closure” means the act or the moment of ceasing operations at a mine site. It does not imply any particular level of site clean-up after operations cease. We have used only “reclamation” for the sake of consistency. In the present context, it means post-closure improvement of the site to a desired standard. It does not necessarily mean returning the site to the state in which it existed prior to mining. Chapter 2 deals with the issue of what standard of clean-up is expected.

The author appreciates that progressive reclamation is often undertaken while the mine is still operating. Still, the purpose of EFA as used in this study is to ensure that necessary reclamation and site management will still take place after closure, even if the company is unable to do the work. Therefore the emphasis is on post-closure conditions.
2. Issues and Policies in the Use of Financial Assurance

This chapter discusses several issues that arise in the development and use of policies requiring environmental financial assurance instruments (EFAs) and suggests a range of efficient EFA policies. The best results for both governments and mining project owners will be achieved if the parties engage in thorough and open discussions about the significance of each of the design issues and together consider the policy options and guidelines.

Issues to be considered in EFA design

**Required standard of reclamation**

The standards of reclamation which operators must meet will clearly affect the cost of the work and the consequent amount of the financial assurance required.

In former years some governments specified that the land should be returned to its pre-disturbance condition or to a condition permitting resumption of its earlier use (e.g., farming). This type of standard has a certain appeal, but most advanced exploration and mining operations almost inevitably leave permanent and visible alterations.

Nevertheless, remnants of earlier thinking still exist. For example, as part of its financial assurance process, Indonesia requires a cost estimate for backfilling an open pit mine. Estimating the cost is one thing. To actually insist that every pit be backfilled would essentially rule out any large mining developments today.

Generally applicable standards can be stated. The Whitehorse Mining Initiative (WMI) considered this matter in terms of the restoration of functioning ecosystems. This principle was agreed: on closure, mine sites and affected areas would be returned to viable and, wherever practicable, self-sustaining ecosystems compatible with a healthy environment and with human activities. This principle sets a responsible standard which is practical and portable across countries and regions. It also recognises that returning the land to its pre-disturbance condition is not desirable where the pre-mining land use was harmful to the environment.

In most cases, the operator and the government will find it possible to agree on a similar or equivalent standard of reclamation. In some cases, the land after reclamation may be of equal or higher economic value than it was prior to disturbance.

**Required standard of certainty**

Forecasting mine site reclamation costs several years in the future is an inexact science. There are many sources of uncertainty. Site conditions may prove to be different from those assessed at the beginning of the project. Acid drainage may unexpectedly occur, raising the possibility that new funds may be required for long-term care. Actual costs of labour and equipment may be different from those estimated. As knowledge of the site grows with mine operation and as technology advances, mine plans are routinely updated.

In most cases, the amounts required to be set aside in EFA instruments are based on the projected costs of reclamation. Given the uncertainty in these costs, the amount of a specific EFA estimated at any time may fall short of, or exceed, the actual costs of the reclamation work. As long as the operating company is still in
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business at the time of closure, it will do the work and absorb the costs, whether they are more or less than the estimate. The government suffers no loss.

A different situation arises if the operator is no longer on the scene and the government becomes responsible for site reclamation, financing the work from the EFA. If the EFA is insufficient, the government is forced to pay the difference.

Most governments are risk-averse and will try to avoid all losses. In general there will be a tendency by governments to build a safety factor into the amounts of EFA demanded (often to provide for the extra costs associated with using third-party contractors). This ties up additional capital and imposes sometimes unnecessary costs on both large, stable, long-lived companies and on those which might be candidates for failure.

It is suggested that governments have a general policy of requiring EFA which is prudent in light of all reasonably foreseeable risks, but not insist on protection against highly unlikely events. Clearly, in negotiating specific arrangements, factors such as the operator’s financial condition, track record, and management systems will affect how much financial assurance the government will require to give it a feeling of reasonable certainty.

One-time reclamation vs. long-term care

All sites require some type of closure and reclamation. Some sites can be successfully reclaimed to a stable walk-away condition at the end of the mine life, but others require long-term care. Costs associated with long-term maintenance, such as that required for water management, can be substantial.

The need for and extent of financial assurance

Both governments and industry see value in financial assurance instruments as one means of financing or guaranteeing environmental protection following the closure of a mine or the completion of an exploration program. While most jurisdictions require that reclamation be carried out upon closure, sometimes the mining company may be unable to implement the requirement. In these circumstances, governments wish to be assured that they will not be left with unfunded environmental and financial liabilities.

By the same token, responsible companies recognize that an EFA provides governments and communities with future certainty that funds will be available for closure and reclamation, regardless of their current or projected financial stability. Thus, an effective EFA policy has the potential to reduce the scope for public criticism of industry practices.

However, it must be appreciated that the amount of capital tied up in assurance may be substantial. Some jurisdictions require security for the full reclamation liability at all times during operation. That liability may be reduced by intelligent prior site planning and progressive reclamation. But the amounts are still very significant on a global basis (see the discussion in Chapter 3).

Large mining companies may each carry environmental liabilities on their balance sheets amounting to hundreds of millions of dollars. For most of these companies, such liabilities will be covered by a mix of soft and hard assurances, ranging from balance sheet tests and financial reserves to letters of credit, bankers’ guarantees or cash trust funds. The harder forms involve out-of-pocket costs. The softer forms of
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assurance may not involve direct costs, but they still represent a significant burden in that they reduce the credit rating and borrowing ability of the firm.

The growing use of financial assurance instruments
Several governments have either introduced new, or strengthened existing EFA provisions in the past six years. The legislation and policies of 25 jurisdictions are briefly discussed and analysed in Chapter 3 and summarized in the Appendix.

The choice of financial assurance instrument
Financial instruments may be chosen from a large number of options. Each specific type of instrument may be appropriate in a given situation or set of circumstances, depending on the financial strength of the mining company, the amount of the potential environmental liability, the time frame over which the liability is to be extinguished, etc.

As has been demonstrated by our industry surveys (see Table 3), a wide variety of environmental financial assurance instruments has been used at various times and in various jurisdictions, including: irrevocable letter of credit; performance bond; cash trust fund (deposited with the government or a third-party trustee); balance sheet test; corporate guarantee or parent company guarantee. The specific characteristics of these instruments are described in detail in the Appendix. The views of industry as to their applicability to different situations are reviewed in Chapter 3.

There is therefore little need for additional discussion of the benefits or applicability of these well-understood instruments here. Later in this chapter, we will offer policy guidelines for the consideration of industry and government as to the optimum use of the instruments in future.

One particular type of financial instrument, insurance, does warrant further discussion because it has only recently been used. The Appendix makes extensive reference to insurance and outlines the main features of its operation. The possibility of using this type of vehicle has been discussed with insurance specialists in Canada and elsewhere for several years. Until recently, however, the potential of insurance to reduce the costs and risks associated with mine closure and reclamation had not been implemented in a practical fashion. One insurance company has recently introduced an insurance-based vehicle in the USA.

The timing of a requirement for financial assurance
Ideally, any requirement for financial assurance will be established early in the life cycle of a mine, and certainly before any substantial investment is incurred. Some jurisdictions require that assurance be lodged at the time mineral rights or tenement is granted. The amount may vary over the life of the project, increasing through the stages of exploration, advanced exploration and mine development, but decreasing as reclamation obligations are met.

Other countries normally require some form of financial assurance at the time of advanced exploration or whenever substantial land disturbance may occur. Still others take security up front to guarantee exploration work commitments.

It is of the utmost importance that the government and the operator reach agreement on the expected standards of reclamation and the amount of financial assurance before a major mining project is committed. These provisions should form part of the agreement or permit under which the mine development proceeds. The amount of assurance may be adjusted later as circumstances require, but the process of
adjustment must be well understood and agreed in advance so there will be no surprises.

**Small companies vs. large companies**
Mining companies clearly have an interest in ensuring that any financial assurance policies are properly structured so that valid environmental objectives are achieved at acceptable cost. Moreover, it should be recognized that not all mining companies are affected in the same way by financial assurance requirements. In several countries it may be appropriate for a large, diversified, profitable company to have less demanding requirements than smaller, less financially robust companies. This particularly applies where an established company operates a number of mines within one jurisdiction and has a good performance track record. In such cases it may be appropriate for the government to only require a “corporate guarantee” which might include access to parent company assets in the event of a failure, rather than a large number of individual bonds for each mine site. An incentive of this sort would encourage companies to establish strong records of good practice.

This distinction between small and large companies is often justified: the former may have shorter planning horizons than the latter. Smaller firms may be more inclined to walk away from a problem site, or may be forced to do so, through a shortage of resources. To the extent they do so, this damages the local economy, the environment, and the global reputation of the entire mining industry.

This unavoidable distinction works against smaller companies in that it raises their investment costs and hurdles.

**Application to existing operations: transition provisions**
When a jurisdiction decides to apply a requirement for substantial financial security, it must consider how it will affect both new and existing operations. The impact will be very different on each.

New operations have many more options for adapting to financial requirements than existing operations do. New investors may simply decide that the hurdle is too high and explore elsewhere. They can minimize the eventual liability, and the impact of the financial security, by careful site planning and mine design and may be able to plan for progressive reclamation, funded out of current cash flow.

An operator tied to an existing mine design and site plan does not possess these options. Moreover, if the mine is marginal or is approaching the end of its useful life, the remaining cash flow may be insufficient to support a drastic new financial requirement. A site may not be able to afford EFA depending on the type and how the amount is calculated, although actual closure costs may possibly be covered.

Governments need to consider options for the application of financial security requirements to existing operations which contribute to the goal of environmental protection, but which will not hobble existing operators and result in premature closure, with all the resulting financial, economic, environmental and social costs. Clearly, new requirements should be applied to existing operations in a phased manner over several years.

There are also options as to the nature of the security demanded. Experience in Canadian jurisdictions such as Ontario suggests that government authorities are sensitive to these issues. There is a tendency to take security of the kinds and in the amounts which allow mines to continue in operation while contributing to
environmental goals. The provision of non-cash securities such as pledge of assets and salvage value of plant and equipment, etc., can be creative solutions to the dilemma.

**Government supervision and oversight**
A requirement for financial security usually involves the calculation of the environmental liability followed by negotiation of the appropriate amount and form of the financial assurance between the operator and a government organization. In some cases, the government may have the capacity to review and approve the reclamation plan. In others, the government may lack that capacity, depending instead on the advice of the operator or of an independent expert.

In either case, there is a clear role for generally-agreed industry standards of performance in guiding companies in designing and implementing their closure and reclamation procedures. One option that industry may wish to consider is the development of agreed guidelines and standards which would provide both technical guidance and peace of mind. As indicated in the next chapter, the State of Nevada has begun to work with mining companies to standardize unit cost estimates and therefore simplify both the preparation and review of reclamation plans (note that this falls short of defining regional or global standards of performance for closure and reclamation activities).

**Taxation arrangements**
A financial assurance requirement may be more or less onerous, depending on the taxation arrangements between the operator and the government. As a minimum, the operator will expect to deduct from profits all the costs associated with the financial assurance. Some jurisdictions may actually be prepared to offer a net fiscal incentive in order to gain relief from environmental liability.

This study has established that most governments give tax relief for companies’ direct costs of providing financial security, but few if any offer incentives to do so. This is an option worth considering. There are some indications that cash accumulation through an insurance vehicle may be done on a pre-tax basis.

**Extinguishment of liability: the exit ticket**
Most fair-minded people would agree that when the operator has successfully completed reclamation and returned the site to the desired condition, he/she should be relieved of any further liability and financial responsibility associated with the site.

Such a provision would prove an attractive feature of a country’s investment climate. It may be necessary for the operator to continue to hold the site and monitor its chemical and physical stability for several years before knowing with certainty that the reclamation work was successful. But once such monitoring is completed and if no problems are apparent, operators should be able to expect their exit ticket in a reasonable time. This would include release of any funds or other assurance held by government.

For mines requiring long-term care, such as those involving acid drainage, the situation is more complex. In the absence of financial assurances, the operator could be held responsible for the site’s management for many years or decades. In this case, legislation should provide that operators can obtain their exit ticket by lodging sufficient cash to finance the site management activities for an indefinite period. Using these resources, the responsible government can then hire a contractor to take over the operator’s site management responsibilities and relieve the operator of
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further liability. In Japan this system is in place, with site management being performed by a designated custodial organization.

Alternatives to financial assurance
Are there non-financial policy instruments which could be employed by governments or by industry to support environmental protection? Respondents to the industry survey suggested a few such options. It is worthwhile to discuss these suggestions in the hope that other practical ideas may come forward.

Accreditation or certification
Various options could be considered under the general category of an accreditation or certification program. The program could be either voluntary or compulsory. It could be either privately-operated or operated by government(s). It could be either associated with a system of pooled risk or entirely free of pooling.

Whatever the design, accredited companies would expect from governments privileges not enjoyed by companies which lacked accreditation. For example, governments might make mineral rights and the access to mineral deposits contingent on accreditation. Alternatively governments might reduce the amount of financial assurance accredited companies need to lodge. In the latter case, the financial capacity of the company would be an important factor in accreditation.

Voluntary or compulsory? The international mining industry (possibly through ICMM) could operate a voluntary system of accreditation based on agreed standards and peer review. Alternatively, a voluntary system could rely mainly on ISO 14000 accreditation, adapted to the particular needs of the mineral industry. In either case, an independent accreditation secretariat would ensure that all governments have access to the current register of accredited companies. For the compulsory version, one government, or several, or an international intergovernmental organization (e.g., World Bank) could insist on dealing only with accredited companies.

Privately or publicly operated? The industry could be entirely responsible for operating its own accreditation system and registry. Alternatively, the system could be operated by a government or governments, or by an international institution.

Pool risk or not? Accreditation could be operated in tandem with an insurance system or other risk-pooling mechanism. While industry generally prefers user-pay reclamation funding, there are insurance schemes essentially operated on that basis in other fields. It is possible that pooling could reduce the frictional costs associated with many companies seeking financial assurance coverage in many countries and save financing and transaction costs. With proper risk management techniques enforced by company peers, it could also help to reduce the probability of unforeseen events such as tailings spills.

Track record
This proposal would hinge on the ability of a company to demonstrate its competence by pointing to a considerable history of good environmental performance. It may be difficult to persuade governments to accept it, however, for several reasons. It would have to satisfy a few tough questions, including whether past performance is any indicator of future financial viability.

Who is the judge? Without an accreditation system, who will give a qualified opinion on the company’s past performance and guarantee that it will be repeated in a new setting? Will the public accept a good track record as an indication of future
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performance? How is the performance to be measured? Is it more complicated than compliance record? What factors should be included?

Considerable scope exists for creative thinking in the industry about alternatives to financial assurance instruments. An organized effort to develop further options might yield worthwhile benefits.

Optimizing financial assurance policies

The minerals industry has always considered itself a global industry. The 1990s and the early years of the new millennium, however, have seen an unprecedented explosion of interest among countries on every continent in using their mineral resources as an engine of development. To do so requires attracting mining investment.

At the same time, companies, governments (developed and developing), and international institutions have become part of the environmental revolution. They wish to ensure that mining activities are carried out with due regard to protection of the environment.

Environmental financial assurance measures (EFAs) are important tools to pursue environmental objectives. The purpose of this section is to assist governments and industry to arrive at optimum arrangements through informed discussion.

Efficient policies defined

It is appropriate for all countries to maintain high standards of policy, legislation and regulation, and for all companies to use good environmental practice. However, it must be recognized that a country can pursue high standards of environmental protection by a wide range of policies.

Those policies which are effective in meeting environmental objectives and are at the same time compatible with a healthy investment climate can be termed efficient policies. In this sense, inefficient policies can impede mineral investment with little or no gain to the environment. An efficient environmental assurance policy would offer a range of options tailored to the characteristics of the individual company and the particular local situation.

In practice, this means making judgements about the financial strength and track record of specific mining companies and about site-specific conditions. While a consistent approach to the task of making these decisions is desirable, it is not appropriate to impose a uniform requirement on all companies and all projects. In this way, the optimum balance can be found between protection of the environment, protection of the government’s finances and political credibility, and maintenance of an attractive investment climate.

Two types of policy are associated with financial assurance for mine reclamation and closure. First, there are framework policies which define the general rules relating to the use of environmental assurance (Table 1). Second, there are decision rules governing the choice of particular assurance arrangements to be applied to particular companies and particular projects (Table 2). In the following sections policy guidelines relating to EFAs are suggested for the consideration of governments.

Specific justification is not given in this chapter for each proposed guideline. The suggestions are based on the general analysis of issues regarding legislation
2. Issues and Policies in the Use of Financial Assurance

contained in the first section of this chapter, as well as on the ideas derived from the survey of industry views (Chapter 3) and the author’s experience.

In addition to establishing framework policies, governments must consider how they will approach the task of negotiating specific EFA arrangements with specific companies in relation to a specific mine site. As has been pointed out in several places, no two companies have identical financial strengths or histories of performance, nor do any two sites have identical local conditions.

Therefore, in the interest of efficiency as we have defined it, government and the operator should work together to choose an EFA instrument that meets two tests: a) it is effective in assuring the government that the operator can and will take all necessary and reasonable measures to protect the environment (or that another party is enabled to do so if the operator fails); and b) it is the least costly of all the effective instruments available.

With respect to the first test, many factors (such as technical competence, financial structure, history of performance, corporate policy, management style, among others) will have a bearing on the company’s likely performance and the degree of additional certainty required by the government.

With respect to the second test, it should be remembered that an instrument which is least costly for one company may not be cheapest for another company. The particular circumstances of each firm will determine the effective cost of each type of instrument. For both reasons, the type and amount of assurance should be a subject of negotiations between the parties.

Table 1: Guidelines for framework policies

| Owner pays | Legislation should provide that the owner or operator is responsible for execution and completion of successful reclamation activities to an appropriate technical standard. Where long-term care is involved, the operator is responsible to provide it until relieved of liability. |
| Standard of reclamation | Reclamation should return the site to a safe and stable condition, free of safety hazards (such as unsafe buildings, equipment, open holes, etc.); return the mine site to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. There should be measures to address and prevent ongoing pollution from the site. There should not be a blanket requirement to return the site to its original condition or to a condition permitting particular land uses. |
2. Issues and Policies in the Use of Financial Assurance

**Table 1: Guidelines for framework policies**

| Standard of certainty | Closely related to the issue of standard of performance is the degree to which the government seeks assurance against all possibility of loss or damage to the environment. Just as unnecessary costs are imposed by a technical standard that is higher than it needs to be, so will unnecessary costs be imposed by a standard of future certainty that is higher than it needs to be. Governments need to be reasonably assured that the operator will carry out its obligations, or that approximately enough funding is available to carry out necessary work if the operator fails. If governments insist on being indemnified against all possible events, excessive costs will be imposed and investment incentive will be drastically reduced. Governments should have a general policy of requiring EFA which is prudent in light of all reasonably foreseeable risks, but they should not insist on protection against extremely unlikely events. Clearly, in negotiating specific arrangements, factors such as the operator’s track record and management systems will affect how much financial assurance the government will require to give it a feeling of reasonable certainty. |
| Timing of financial assurance requirement | Any requirement for EFA, or any change in the required standard of reclamation, should be identified as early as possible in discussions between company and government. Timely notice will allow the operator to plan the development of the site optimally and to assemble the necessary financial resources. Requirements which are imposed late in the mine life can lead to difficulties and disappointment for all parties. |
| Transition arrangements for existing mines | If it is necessary for a government to alter the required standard of reclamation, or to require a financial assurance instrument where none was required previously, the operator should be given a reasonable time to comply with the requirements. In some cases, particularly where the mine is only marginally profitable or is approaching the end of its life, a creative approach to the design of the EFA may be called for. Rather than requiring a cash deposit (which might hasten mine closure), for example, the government may wish to consider softer forms of EFA such as parent company guarantees or pledge of assets. |
2. Issues and Policies in the Use of Financial Assurance

Table 1: Guidelines for framework policies

| Taxation | All requirements for EFA impose some costs on the operator. In particular, hard forms of security (such as letter of credit, cash bonds or trust funds), impose two kinds of cost: direct carrying cost and loss of use of the funds for productive investment (or corresponding reduction in borrowing power). It is appropriate that the tax regime of the country recognize these costs and attempt to minimize their negative effects. It is therefore essential that the direct carrying cost of all EFA instruments be deductible for tax purposes. Moreover, in the case of deposits of cash or securities, the earnings from these funds should be sheltered from tax. |
| The exit ticket | The mining industry supports the concept of user pay. ICMM’s member companies are willing to accept the costs and liability for environmental protection of the site during operations and for reclaiming the site upon closure. Where conditions such as acid mine drainage exist, companies also accept the necessity of funding long-term care and management. However, government legislation should provide explicitly that at a certain moment the company can be relieved of future liabilities for the site. In most cases, this relief would be given as soon as site reclamation has been successfully completed. In the case of acid drainage, it would be given as soon as necessary funding arrangements have been established for long-term care. |
| Alternatives to financial assurance | To date, few practical alternatives to EFA have been fully developed or implemented. However, it is known that the insurance industry is now in a position to offer certain vehicles to supplement or replace existing EFA instruments. At the same time, international standards for environmental quality management, such as the ISO 14000 series, are becoming more widely practised and accepted. This raises the possibility that a practical certification or accreditation system may ensue, giving a government additional confidence in accredited companies. These and other potentially valuable options will undoubtedly come forward in future. Governments should ensure that they remain fully informed about these developments so that they will be fitted to judge new proposals on their merits. |

The guidelines in Table 2 suggest factors that should be taken into account by governments in determining the ultimate requirements that will apply to a specific project. Note that in practice the various factors are interrelated. The financial strength and other characteristics of the company, as well as the size and nature of the mining development, will all have a bearing on the appropriate form and amount of the EFA required.
2. Issues and Policies in the Use of Financial Assurance

**Table 2: Guidelines for specific negotiations**

| **History of performance or track record** | The government can assess how experienced the company is in developments of the same kind as the one proposed. How has the company managed other mine sites, both during operations and after closure? What is the company’s record of compliance with regulations at existing mines? Have there been accidents such as tailings spills or other unforeseen events? A company with a good track record may qualify for a softer form of assurance, or a lower amount, than one with a poor track record. |
| **Environmental management system** | Does the company have a fully-developed environmental management system? Does it practice public disclosure of its environmental performance? Does it have regular environmental audits by independent experts? Does it practice risk management techniques? Are managers formally judged on their environmental performance? Does the company subscribe to industry codes of practice? Does the company have ISO 14000 certification? A company with a strong and proven environmental management system is clearly less likely to suffer from unforeseen accidents and may offer a degree of certainty to the government with lower explicit financial assurances. |
| **Financial strength** | If the company is financially strong, and if the current project represents a relatively small financial drain, soft instruments such as a corporate guarantee and/or a balance sheet test may suffice. If the particular corporate vehicle is a subsidiary of a larger entity, a parent company guarantee may be appropriate. At the other extreme, if the company is small or if it is not diversified and the project represents a major potential drain, then the government may reasonably ask for hard assurances such as full coverage by letter of credit, bankers’ guarantee or cash deposit. |
| **Mine and site characteristics** | For a metal mine situated in a geological formation which is prone to acid drainage (AD), or where prediction testing has shown the likelihood of AD generation, the onus would be on the owner to show that AD can be controlled. Even so, larger or more rigorous financial security could be required, possibly extending to post-closure funding. Clearly also, the size and design of the mine (whether underground, open pit or strip mine) will affect the amount of assurance and possibly its form. In addition, the potential environmental effects will depend on site topography, geology, vegetation and climate. All these will affect the potential costs of closure and reclamation and hence the financial assurance requirements. It is suggested that governments and proponents work together to develop a detailed understanding of these factors through an environmental impact assessment and risk assessment as the basis for financial assurance discussions. |
2. Issues and Policies in the Use of Financial Assurance

Table 2: Guidelines for specific negotiations

| Amount and form of financial assurance | The final decision as to the optimum form and amount of security will depend on all the above factors. A company which rates highly in all respects may legitimately expect to provide less in the way of financial security because it is reducing the environmental risks and potential liabilities by other means. |
This chapter contains the results of surveys made to determine the status of, and recent developments in, countries' policies in the field of environmental financial assurance for mining. There are three sections in this chapter. The first section summarizes 62 individual case studies which reported on specific EFA requirements applying to mines located in 29 jurisdictions within 22 countries (Table 3). This table reveals a wide range of EFAs in practice. The second part discusses the results of two international surveys of industry opinion on financial assurance issues, six years apart. In addition to industry comments, the more recent survey also contains comments from outside industry: those of selected representatives of the financial sector, the governmental sector and the insurance/surety sector. The third section provides summary information on legal requirements regarding environmental financial assurance in 25 national and sub-national jurisdictions which host important mining industries.

Individual mine case studies

Table 3 (next page) contains the summary results of two industry surveys (six years apart) taken among ICME/ICMM members on their experience of the use of EFA.

Eleven companies responded to the 1998 (ICME) survey, contributing a total of 40 individual case studies describing how EFA instruments were used at specific mines or exploration projects. The 2004 survey again attracted 11 responses (not all from the same companies that responded previously) detailing EFA requirements at 22 additional operations worldwide.

The examples of financial assurance instruments in place vary widely, partly because of different requirements in different jurisdictions but also because of the mines' different dates of development. Different processes, facilities, ore types, etc., may also play a role.

In general, financial assurance requirements have increased dramatically over the past 15 years. The summary results demonstrate that requirements apply immediately to new mines, but for pre-existing mines there may be a phase-in period. Financial assurance measures can be applied at any stage of the mining cycle. In all cases studied, however, the financial assurance was required, not to regulate ongoing operations, but to guarantee restoration or reclamation of disturbed areas.

The total number of financial assurance instruments reported is greater than the total number of case studies, because in some cases more than one type of financial assurance was utilized for a single operation. Similar types of financial assurance have been grouped together, although the respondents identified them separately. It is possible that some duplication occurs in that a reported reclamation bond may in fact be a letter of credit or a cash bond.

The term “custodian” may be new to some readers. Guarantees of payment or behaviour involve three parties: the party from whom the guarantee is required...
(mining company), the guarantor (bank, insurance company, etc.) and the payee (government). The custodian of the security is the entity that holds the security until it is demanded. This may be any of the three primary parties or another party.

Table 3. Case studies of environmental financial assurance

<table>
<thead>
<tr>
<th>Stages of mining cycle where EFA applies (6 were identified)</th>
<th>Exploration; Development; Mining operations; Smelting; Closure; Reclamation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of instrument accepted (16 were identified)</td>
<td>Balance Sheet Test (5); Bank Account (in Trust) (1); Bank Guarantee or Bankers’ Undertaking (10); Cash Bond or Cash Deposit (3); Cash Trust Fund (4); Corporate Guarantee or Parent Company Guarantee (9); Deposit of Securities (1); Accounting or Financial Reserve, internal cash reserve, accounting accrual, self funding (5); Letter of Credit (15); Mining Reclamation Contract and Security Agreement (1); No Instrument (5); Performance Bond (7); Pledge of Assets (1); Reclamation Bond or Closure Bond (4); Self Bond (1); Surety Bond (2).</td>
</tr>
<tr>
<td>Custodians (8 were identified)</td>
<td>Bank; County Government or County Council; Independent Organization designated by the Japanese Government; Independent Trustee(s); Insurance Company; Internal to Company; National Government Department or Agency; State or Provincial Government Department or Agency.</td>
</tr>
<tr>
<td>Jurisdictions covered (22 countries, 29 sub-national divisions)</td>
<td>Australia (New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia, ); Belgium (Flemish region); Botswana (national); Canada (New Brunswick, Nova Scotia, Ontario, Quebec, Saskatchewan, and federal); Chile (national); Eritrea (national); Fiji (national); Ghana (national); Guinea (national); India (national); Indonesia (national); Ireland (national and county); Jamaica (national); Japan (national, MITI); New Zealand (national); Peru (national); Philippines (national); South Africa (national); Spain (national); Suriname (national); Sweden (national); USA (Arkansas, California, Colorado, Nevada, New Mexico, South Dakota, Texas, Utah, Wyoming, various counties, and federal).</td>
</tr>
</tbody>
</table>
Table 3. Case studies of environmental financial assurance

| Costs and tax treatment | Costs of third party security (letters of credit, performance and reclamation bonds, and bank guarantees) ranged from 0.37% to 1.5% of face value, usually deductible for tax purposes. Direct costs of softer assurances (balance sheet tests, corporate guarantees, covenants, etc.) are difficult to measure, as they largely reflect the amount of effort needed to satisfy administrative requirements. However, indirect costs may include a reduction of the company’s borrowing capacity and an increase in the cost of credit. In Canada and Japan, cash deposits to a trust fund are tax deductible but interest earned by the fund is taxable. However, trust funds’ earnings are tax deductible in South Africa. |

Industry’s and other views on financial assurance issues

In addition to contributing individual case studies detailing experience with specific EFAs, member companies were asked to give their views on the effectiveness of these instruments and on other qualitative issues connected with their use. In the 2004 survey, similar questions were posed to a limited number of persons external to the industry (representatives of government, financial institutions and the surety/insurance field). Respondents’ comments form the basis of the following discussion. Notable quotes are included.

How effective are financial assurance instruments in promoting or enforcing environmental protection?

Industry response

Companies accept that the major function of EFA is to protect the government and public if a mining company cannot meet its reclamation obligations. They are well aware that dropping prices and unforeseen technical difficulties can render the most promising project uneconomic. For a single-mine company with limited financial resources, the result can be catastrophic.

As large companies, however, most ICMM members felt they had financial resources and procedures in place to ensure ongoing environmental compliance, and were capable of fulfilling their environmental obligations without the additional discipline of a financial assurance mechanism. They agree that a financial assurance instrument does provide more certainty for the protection of the environment even if they do not necessarily promote its use. “They [EFAs] are double-edged. In some cases they may function as a real guarantee but in general they tend to remove financial resources from environmental protection activities”.

In the view of most companies, the terms and conditions of permits and licenses are more important in protecting the environment. If these are set at an appropriately high standard, major companies will respond accordingly. “For the smelting and refining sector they [EFAs] are not the most effective instrument. Indeed, compliance and permitting systems are much better adapted to those long-term, highly capital-intensive processes”.

www.icmm.com Financial Assurance for Mine Closure and Reclamation
Some respondents felt that financial assurance instruments for decommissioning should not be required for responsible operators. The deciding factor should be a corporation’s past performance or track record. “We have already established high standards against which we measure our performance”.

Financial assurance instruments undoubtedly have particular application for smaller, marginal, one-property operators. In this case, respondents would agree that these environmental financial assurance instruments are effective at enforcing environmental responsibility at closure: “In the case of some operators, they [EFAs] do result in getting their attention”. This issue is not only a question of will, but also of viability. “For smaller companies, financial assurance instruments may be more effective. It is more probable that [they] would be detrimentally impacted by changing economic conditions … they may not have the financial resources to reclaim sites [if they become] no longer viable”.

While some companies view the requirement for financial assurance as an administrative process of the government (a pure cost), all accept that government needs to demonstrate to the community that it has received sufficient financial protection from the holder of mineral rights to ensure effective reclamation. “Governments need to be able to assure the communities they represent that they will not be forced to bear the cost of poor financial or environmental management by land managers”. In no case did any respondent suggest that EFA instruments should be abolished for all operators.

Others’ responses
Representatives of the financial sector uniformly favoured effective EFA policies. Three different respondents agreed: “They focus the companies on the reclamation obligation and encourage a good track record and planning”. “Some governments have inadequate requirements for security”. “Some governments, mainly in the less developed countries do not ask enough”.

Representatives of government have mixed views on the effectiveness of current policies. In one Australian state, “Several medium-sized mining projects have ended suddenly because of financial difficulties. In some of these cases, the State has spent the available EFA, if any, and typically 10 to 100 times as much from State revenue”. An official of another Australian state feels that EFA “…has been effective as part of a ‘toolbox’ of strategies to ensure adequate environmental outcomes”. Other government officials in Canada, South Africa, and the USA find the current policies generally effective, though economic fluctuations can cause problems.

Respondents in the insurance/surety sector had few comments on this issue – one found existing policies generally effective.

**Have you found governments’ use of financial assurance instruments to be onerous or troublesome?**

Industry response
The degree to which financial assurance is regarded as onerous varies from company to company and country to country. In Ireland, one company considered financial assurance requirements to be troublesome, onerous, time-consuming, and costly. Problems are created by governments’ unfamiliarity with the use of financial assurance, and include delays and high legal costs. These problems are not limited to Ireland, however. An Australian company noted that “Governments [don’t] provide definitive guidelines…to objectively and consistently assess environmental risks…”
3. Surveys of Current Practice

The USA is another country in which financial assurance requirements are considered onerous, particularly if financial strength deteriorates so that the company cannot pass a financial test. In the USA, most past EFAs have been required under the Resource Conservation and Recovery Act (RCRA) and Superfund, usually based on estimated cost of closure/cleanup. Financial assurance may also be required against potential liability claims.

Companies take issue in the USA (and to some extent elsewhere) with the estimate of potential reclamation cost on which the required amount of financial assurance is based. Government estimates are based on high-cost inputs (a third-party contractor under the direction of a government agency, paying government-scale wage rates) whereas a company’s own costs would be much lower, some estimate by a factor of three to five. The required amount of financial assurance is inflated accordingly. Governments counter this argument by pointing out that if the mine fails, it will be government that has to do the reclamation.

Without reference to any particular jurisdiction, companies identified a number of problems. One is lack of consistency across both national and provincial/state governments. Within each government, inconsistency occurs across departments with respect to the choice of financial assurance instruments deemed acceptable in specific instances. Moreover, governments have few guidelines for applying the concept of discounting long term obligations (i.e., calculating the amount of security required). “There are two areas that become fairly problematic: 1) determination of the amount and 2) release of the assurance once reclamation has been achieved”.

Furthermore, problems are created by the unwillingness of government to recognize that a “softer” form of assurance may be appropriate in certain circumstances such as an investment-grade company. Additional problems relate to the lack of equitable tax treatment of funds when they are actually set aside.

Technical standards for reclamation clearly influence the degree to which financial assurances may be troublesome. For example, Indonesian law requires that open pits be back-filled. In practice this standard is effectively impossible to meet, and the government ignores it accordingly.

At the other extreme, some companies noted that despite delays and costs, no serious problems have occurred in the jurisdictions in which they operate. In particular, in the 1998 survey one company remarked that financial assurance requirements had not been onerous in South Africa or Canada.

It must be noted that the amount of capital tied up is substantial. In 1998, one international company reported that it currently had no fewer than 1056 financial assurance instruments in place in four countries, mainly in Australia. The total contingent liability associated with these sureties was well over A$20 million (by 2004, the amount reported by this respondent had risen to about A$60 million).

Another company had assurance mechanisms in place in 1998 totalling over US$100 million on 17 sites, plus more limited financial assurances which were required for a large number of exploration and mining activities. Almost all of these were in the USA. A third company also reported a total of over US$100 million, the bulk again in the USA.
3. Surveys of Current Practice

In the 2004 survey, a single company in the USA faced a total potential liability of US$170 million on two sites (a self-bonded amount, and subject to a strict test of financial capacity). The total liability of projects that contributed to this report was US$350 million (and, of course, reporting projects constitute only a fraction of the totality of projects).

A final comment on this subject: based on the tone and content of the submissions: it appears to the author that companies have gained a greater degree of acceptance of strict financial assurance measures in the past six years. Alternatively, companies may have recognized the value in demonstrating to their communities and governments a secure financial ability to close and reclaim a mining disturbance.

One respondent caught this mood with the following comment: “Ultimately, surety provides future certainty for communities that mine sites will be reclaimed.”

Others’ responses
The financial sector believes that strong policies are no bar to development of new projects: “In the context of a new project, the issue of financial assurance for reclamation is a minor one”. “Best practices and standards adopted in advanced countries have spread throughout the world thanks to the efforts of industry and international organizations including the international financial institutions”. “Policies requiring adequate financial security are needed to avoid defaults on environmental obligations”. In the negotiations for a new project in the less developed countries (LDCs), “Reclamation issues and associated financial arrangements are just one part of the mix. Fiscal and royalty issues dominate the negotiations and, in terms of importance to the developer, dwarf reclamation issues”.

Government responses generally indicated that the major troublesome aspect was the lack of adequately funded or adequately enforced assurance. This situation often arose where mining rights had been awarded under past legislation with weaker EFA provisions. “The relatively low EFA held against small mines [often lodged under previous regulatory systems] does not appear to be an effective incentive to ensure reclamation.” Again, “it is rather a question of enforcing and/or monitoring the adequacy thereof that poses problems.” In the USA, there have been cases where developers have walked away from a site, leaving the government to seek redress from bonders. In such cases, negotiated settlements generally resulted in incomplete cost recovery.

The insurance/surety sector representatives noted that sureties are extended with the expectation that they will be returned, not used for reclamation. As recent history shows, trouble arises when a mining company suffers reverses and cannot meet its reclamation obligations. The surety is called, sometimes with serious financial implications for the surety provider.

Please describe recent international trends in requirements for financial assurance by governments and the availability of these instruments in the marketplace. Are new instruments being developed (e.g., insurance?)

This question was new in the 2004 survey.

Industry response
One notable development which has affected mining companies, particularly in the United States, is a dramatic tightening of the traditional surety market.
Several industry respondents identified and reported on new policy initiatives strengthening the requirements for EFA in mining. Not a single jurisdiction was identified in which EFA requirements were relaxed.

These two trends, tightening of surety markets and stiffening of legislative requirements, are discussed in Chapter 4 under the title “Emerging issues, challenges and trends”.

**Others’ responses**
Finanical sector respondents stressed the growing need for mining companies to have strong balance sheets. “As lenders, bankers want to see companies make real cash contributions to a sinking fund for mine reclamation – not simply a paper account”. Leading banks also support the “Equator Principles”, under which funding is conditional on the mining project’s conformance with the World Bank project lending guidelines, including standards of reclamation. A banker pointed out that governments continually strengthen their requirements for reclamation security: because of public pressure “a corporate guarantee is no longer enough”.

One government respondent agreed, noting that some corporations avoid “provision of financial assurance as they believe their word and corporate status is irrefutable”. The State of Nevada has strengthened corporate guarantees to make them more secure. Another respondent noted that “We have done away with personal sureties as they are impossible to call in without legal action.” One questioned the worth of insurance schemes: “What happens if premiums are defaulted on?”

Representatives of the insurance and surety sector also reported.

The recent collapse of the surety market affected many mining companies, particularly in the USA, likely irreversibly. In many cases, as a surety came due, it was withdrawn and the client had to meet governments’ assurance requirements with harder, more expensive security. One surety provider accounts for the collapse of surety money this way: “Bonds were too freely written ten years ago. Many clients were not pre-qualified. Now surety issuers have become more realistic.”

According to the author’s conversations with U.S. surety providers, tight markets are likely to continue indefinitely. Only the most credit-worthy companies will qualify for sureties in the future. One leading surety provider offered this advice: “Build your balance sheet! Improve your credit profile! You will find it easier to get surety bonds.”

One entirely new development is the availability of an insurance vehicle for mine reclamation financing. This method could offer the mining industry an alternative to existing methods of providing required EFA. According to the author’s best information, this vehicle is offered by only one insurance company, AIG, the American Insurance Group. The main features are discussed in the Appendix.

**Which instruments best serve the needs of the industry? Which instruments best serve the needs of the government?**

**Industry response**
In the 1998 edition of this study there was a marked preference in industry for those financial assurances which can be issued at no cost to the company, called "soft" assurances. Examples included: financial strength (for instance where a company is rated as investment grade); self-funding of the obligation while retaining control of the funds; a financial test (such as a balance sheet test) which determines the grade of
the company; a corporate guarantee based on that grade; self-funding through financial reserves; parent company guarantees and pledge of assets.

In the 2004 survey the majority of respondents recognized that harder instruments, such as letters of credit, bank guarantees, deposit of securities, and cash trust funds, may best serve the industry, as they are required to satisfy public expectations. Two respondents gave no answer to the first part of the question; three called for soft undertakings such as internal funding or corporate guarantee. But the majority said that “hard” options best served the industry: one suggested insurance, one a bond, four a bank guarantee.

As to which instruments best serve the interests of governments, the 1998 report noted that they would be those that, while providing appropriate assurance to the public and the community that reclamation will take place after the mine is closed, still maintain the cost competitiveness of the industry. That report noted therefore that the goal is to determine the form of EFA in each case that best serves the mutual interests of the government and the company. This optimum is likely to be attained by constructive, well-informed and transparent negotiations between the parties.

In the current study, industry respondents suggested that governments’ needs would be best served by cash deposits, any liquid instrument, and bank guarantee. Most respondents referred to appropriate principles rather than specific forms of assurance.

In the case studies of actual projects, there are several interesting examples of mixed EFA. In these cases, the government and the company agreed that the total potential liability could be best covered by two instruments: a soft financial assurance (corporate guarantee) for 75% of the total and a hard instrument (letter of credit) for the remainder.

Others’ responses
Respondents external to the industry suggested the following instruments as best serving the needs of industry: financial sector suggestions (performance bond, sinking fund); government sector (bank guarantee, surety bond); insurance/surety sector (insurance).

To best meet the needs of government, financial sector representatives favoured a performance bond; the government sector favoured cash, bank guarantee, letter of credit, or security pool covering several companies; the insurance/surety sector (not surprisingly) favoured insurance.

Under what circumstances should the various types of EFA instruments be used?

Industry response
In the 1998 survey, industry suggested that governments specify an approved selection of financial assurance instruments and discuss with companies which instrument(s) are most appropriate to the specific reclamation situation. The choice of instrument should recognize the age and duration of the total obligation, what has been spent to date, the relative risk of default, etc.

Soft assurances (e.g., corporate guarantee) can be used where: the risk of default is low; the reclamation plan and cost estimate are independently confirmed (i.e., the
3. Surveys of Current Practice

Technical risk is low; the reclamation is of a short-term nature; and the company has appropriate financial strength to support the guarantee, such as an investment grade rating.

**Hard assurances** (e.g., letters of credit, trust funds) can be used where: risk of default is high; the timing of the reclamation is imminent; the reclamation must be continued over the very long term; the company does not have an investment grade rating.

In the 2004 survey, two respondents suggested that bank guarantees be used as a general rule. Deposit of funds (e.g., in trust funds) may apply where the mining company cannot provide a bank guarantee, or where it is necessary to supplement a bank guarantee in the longer term. One respondent suggested that EFA instruments apply mainly to activities that disturb the land and therefore should not apply to smelting/refining. One called for clear criteria that relate to the magnitude of the problem and the possible environmental impact, with the object of designing EFA measures that ensure that the potential environmental damage can be addressed even if the company is no longer viable.

A fifth opinion suggested that companies have little choice, as the requirement for EFA is dictated by statutory requirements. Relative cost may be a factor in the choice among permitted instruments. For this respondent, “financial assurance should only be used as a provision against non-compliance with statutory requirements.” Other industry respondents offered no answer to this question.

**Others’ responses**

One financial sector respondent noted that any of the instruments should be used when required by the relevant government. From another banker’s viewpoint, “We are generally indifferent as to the nature of the financial assurance instrument: lenders simply want to be assured that potential costs are covered”. A third banker wrote as follows: “The application of high standards of financial assurance to new mines can be managed. It is more difficult to apply them to existing mines. Over the years, as a progressively larger part of world metal production comes from more recent mines, the price of metals should incorporate any extra costs”.

Some government officials who responded to this question tended to list the options available in their respective jurisdictions or noted that the choice of instruments is left to the companies, as long as they meet the government’s requirements. However, one stated his belief that “as soon as you introduce too many options into the process it is open to manipulation and abuse, as well as making it more difficult to administer”. By way of contrast, another suggested that “A combination of instruments is usually beneficial when the proponent is unable to provide a suitable form in sufficient quantity”. This theme was followed up by another government official: “Smaller mines with low impact on the environment, usually the cash and bank guarantee option. Bigger mines, a combination of trust fund and bank guarantee”.

Respondents from the insurance/surety sector did not offer opinions on this topic.
3. Surveys of Current Practice

*Is it possible or desirable for industry to advocate a single best model of financial assurance? If so, which one?*

**Industry response**

For reasons cited earlier, industry recognizes that each reclamation situation is different. In the 1998 study only one, and in the 2004 study, only two respondents, put forward a proposal for a uniform model.

All other respondents were unanimous in concluding that no single best model of financial assurance would fit all cases. One respondent noted in 1998 that this issue has been debated for many years but no “single best” module for all levels of industry and for all site conditions has emerged.

To illustrate this point, consider the differences among companies. The cost of bank guarantees to the larger companies is cheaper because of their strong financial standing. However, such guarantees become very costly to the smaller companies and are virtually out of reach to many, such as the individual prospector or miner. These small players would have to self-fund a guarantee by lodging an equal amount of funds at the bank. Minor players may therefore prefer to lodge a cash amount with government provided it is interest-earning.

In both surveys, industry tended to favour a range of options that may be suitable to all industry players and a wide variety of local site situations. In other words, a toolkit approach is recommended, rather than a one-size-fits-all policy.

Respondents in the 2004 study made some useful generalizations. “It is possible to advocate a single ‘best’ model of financial assurance, but it is unlikely to be acceptable to all stakeholders.” “Circumstances may be specific for both applicant and project, requiring tailor-made instruments to optimise the cost and effectiveness of the surety”. A few respondents suggested that a single ideal set of principles could produce different, but appropriate, results in different cases: “the reputation, as well as the financial strength, of a company should be considered in both calculating the amount of security and the instrument by which security is provided. Some distinction clearly needs to be made between the large, responsible mining companies and the fringe, marginal one-mine operators”. “It would appear that a single model which could be applied consistently across large and small companies, as well as across various jurisdictions, would be worth considering”.

**Others’ responses**

Opinions varied among players in the financial sector. One banker suggested that there is such an ideal instrument – the bank guarantee! Another differed: “The chosen instrument depends on the specific situation and the legislation of the host country. It is a fallacy that some forms of security are cheaper than others. Any type…requires cash backing”.

Government officials tended to cite their respective legislative requirements as the ideal, though only one jurisdiction limits the choice to a single security: the bank guarantee. Another prefers the irrevocable letter of credit for its characteristics of security and simplicity. Several stated that there is no single best model.

One insurer (AIG) believes its product is the best solution yet. Another insurance expert, a consultant, believes insurance is effective but needs to be supplemented by particular skills involving project management and engineering, as well as actuarial and financial analysis.
3. Surveys of Current Practice

Should industry advocate wider use of financial assurance to help avoid future public controversy?

This question was prompted by the fact that several notorious cases involving abandoned mines have come to public attention in the last decade. The consequent negative publicity has reflected badly on the global mining industry, tainting the reputation of responsible operators and others alike.

Industry response
Respondents to the 1998 survey were not unanimous on this issue, but several common threads ran through their responses. One respondent opposed the use of EFAs, and one gave unqualified approval to their use. All other responses expressed various degrees of conditional approval for their use in particular situations.

The following sample quotations illustrate the spectrum of ideas that were expressed in 1998: “Industry should advocate EFA because it is essential to establish the principle of user pay.” “We believe that EFAs are effective in eliminating marginal operators from obtaining permits. This is a benefit to the industry as a whole.” “Industry should support a reasonable and rational use of financial sureties for environmental purposes. They should be recognized (and publicised) as a means to promote responsible mining activities and build the confidence of the public in the mining industry.” “Industry should advocate wider use of EFA, while maintaining greatest flexibility.” “Industry should advocate wider use of EFA only as a last resort. Rather, we should approach monitoring by the use of self and industry standards and clear regulatory requirements”.

In the current survey, while two respondents believed that good cooperation between operator and authority could obviate the need for EFAs, the majority accepted their inevitability and preferred to discuss implementation details. The single respondent advocating wider use added qualifications: “Yes, but the EFA should be based on objective assessment of risks.” Most respondents gave qualified acceptance to the continued existence of EFAs but not to their extension: “The use of sureties need not necessarily be wider, but existing mechanisms and regulations must be applied consistently by both government and industry.” “I believe there are some particular fields where we have to make use of financial security but I am not quite sure about extending the applications to wider industry sectors.” “Currently our experience would say no.”

Others’ responses
This question was not posed to groups outside industry.

What other options and better alternatives to the use of financial assurance instruments might be considered?

Industry response
In the 1998 study, industry members put forward several interesting options to replace or supplement the use of environmental financial assurance mechanisms. Several respondents identified strong, clear, practical regulatory requirements, among others, as the basis on which governments should build a policy to deal with mine closure and site reclamation. This would establish clear expectations and guidelines for operators to follow.
3. Surveys of Current Practice

Other suggestions offered various ways of identifying companies that would have the capacity and demonstrated ability to manage their own affairs without the need for EFA. Several respondents suggested that the deciding factor should be a corporation’s past performance or track record. Others specified the use of financial tests and ratios to make this distinction.

One suggested a system of accreditation. While details were not specified, an accreditation system could include industry standards and peer monitoring. It was suggested that accreditation be a precondition to holding mineral tenure or being involved in the industry, a far-reaching idea that opens a wide field of speculation.

In 2004, a variety of new mechanisms were suggested. One respondent noted that an institute at the University of Queensland is investigating the possibility of developing a third-party consortium to assume responsibility for mine closure subject to contractual arrangements with the mining company involved; the third party would arrange underwriting of costs by insurance carriers. Another possibility raised is that of pooled insurance schemes operated by industry segments. Also suggested are the ideas of: promoting and stimulating corporate governance, complementary to the use of financial instruments; creation of a government-controlled fund financed by levies on mineral sales; stimulation of public/private partnerships aimed at voluntary clean-up of polluted sites; creation of industry sector funds; insurance solutions; monitored internal funds accumulation together with transparency in company procedures; joint efforts to improve industry environmental practices; accreditation as a precondition to holding mineral tenure; self or parent company guarantee.

Others’ responses
Respondents from the financial and insurance/ surety sectors did not suggest any new options.

Government respondents made reference to the following options: a system of incentives or regulation that stimulates progressive reclamation; levies to fund reclamation of abandoned mines; unique agreements between mine operator and government, as practiced in Western Australia, under which the government accepts site liability; and finally, certification as a “good company”.

What position should industry take on financial assurance for environmental purposes?

Industry response
The answers to previous questions illustrate the range of positions favoured by industry respondents and it is not necessary to repeat them here. In this connection, however, two further points were made in 1998: “Wider use of EFAs should be self-imposed, for example through accounting standards, not imposed by governments”; “Industry should advocate that the types of EFAs be clearly defined at different points in the mineral cycle and that the requirements be consistently applied.”

In 2004, ICMM members made the following suggestions: “[EFAs] may be necessary for some types of operations/operators, [industry should] work to reduce the number in both categories.” “Accept that financial surety is a community requirement to guarantee that industries will conduct their activities in a responsible manner and contribute to a sustainable future.” “The degree to which financial security for environmental purposes is required should depend also on the corporate governance structure of the company, the track record in reclamation and the financial strength of the balance sheet.” “[Industry should be] negative in general or [insist on] very
restrictive and careful use only in cases where other alternatives are not available.” “Surety is an important piece in the overall puzzle of sustainable development and social responsibility. If industry is to take a position it should include: consideration of a company’s reputation and financial strength; calculation of surety amounts based on articulation of what closure ‘success’ means and a clearly defined mechanism for the release of surety.” “We should show that we are responsible for the remediation of mine sites and that we have the ability to do this. However, the remediation does not mean that we have to return the land completely back to the original state and what we have the responsibility to do is to keep the land as environmentally safe on the basis of sound science.”

Others’ responses
This question was not posed to groups outside industry.

Financial, government and insurance/surety specialists

The following questions were designed to probe the availability and characteristics of various types of financial assurance mechanisms in different mining countries and their potential suitability to the mining industry.

**In your experience, how is the amount of financial assurance calculated or established? Is the amount demanded by government different from the amount needed as calculated by the company?**

The financial institutions surveyed are heavily involved in arranging financings for new mines rather than providing financial assurance for operations. Their responses to our questions are coloured accordingly. They reported the following procedures in determining the type and amount of financial assurance for major new projects: “The amount is calculated by government on a formulaic basis with regard to type of mining, reclamation plan and track record.” “In some cases the amount is specified under legislation. In others, the amount of security required is estimated as a percentage of capital cost. In many countries, however, the amount of security required is negotiated, based on the feasibility study. This negotiation usually takes place in the context of the discussion of the Environmental Impact Statement. The amount demanded may be greater or less than the amount indicated in the feasibility study. Some governments, mainly the LDCs, do not ask enough.” “Generally [EFAs are] established by negotiation between government and mining company.” “A bonding or financial assurance market similar to that in the USA does not exist for [large mining projects in developing countries]. Therefore the reclamation requirements and associated financial guarantees are made to order for the project and the circumstances.”

Government representatives in selected jurisdictions (sampled from those in which mining is a major industry) described the establishment of EFA amounts in their respective jurisdictions as follows.

In Queensland, “The current system calculates liability on the basis of the expected maximum disturbance within the next planning period (1 to 5 years) as detailed in a Plan of Operations and unit costs for each type of disturbance (e.g., waste piles, tailings dams, tracks, infrastructure, open pits). A discount is allowed based on previous environmental performance as set out in different criteria for small and larger mines. Someone in authority or a consultant to the company must certify that the calculations are correct.”
3. Surveys of Current Practice

In **Western Australia**, “We have a fixed starting rate that can be varied according to the situation on any specific site. These amounts do not represent the true cost of the work to reclaim an operation. However, it is our belief that the figures are sufficiently large to encourage operators to undertake the work in their own right and not leave it to the government to call in the bonds and do it themselves. The potential for outcry and implementation of more reactive bond policy is too great. Also, I imagine any financial institution would not be keen to provide guarantees to an operator who defaults and loses the bond.”

In **Ontario**, “Costs should be estimated and certified by bona fide third parties and based upon work to be completed by external contractors. Financial assurance is premised on the reality that the owner will be unable or unwilling to do the work.”

In **South Africa**, “[The amount is] calculated annually by the mine itself or with help of a competent person. Submitted to the Department for approval and reviewed annually. The quantum required is based on the assumption that a mine could close down prematurely – normally the amount required by government is higher as government would have to invite tenders to reclaim on the mine’s behalf, thus supervision fees, P&G’s as well as VAT [value added tax] is added.”

In the **USA** the federal Bureau of Land Management (BLM) is charged with the administration of mining and other activities on federal lands (Indian lands, national forests, etc.). State governments are responsible for mining within their boundaries on non-federal lands.

The Bureau of Land Management describes its system of determining the amount of EFAs as follows: “The mining company submits detailed calculations of reclamation costs. We review these calculations and approve the figures. To streamline the process we are working with the State of Nevada to establish standard rates and unit costs for common construction processes (e.g., earthmoving) to be used in reclamation costing. Because we insist costs are calculated on the basis of using third party contractors and Department of Labour rates, the coverage demanded by government is higher than it would be if the work was done by the mining company.”

The **State of Nevada** uses the following process: “The operator calculates the third party cost of reclamation (i.e., if done by an independent contractor under government contract). Once reviewed and accepted by government, this is the basis of the financial security. The company could likely carry out the work for much less cost. The federal Bureau of Land Management and industry are working together with us to develop standardized unit costs wherever possible.”

One **insurance provider** offered a detailed account of its method of estimating the amount of security needed. These details are included in the Appendix.

**Please describe the market for financial assurance instruments. Is there a local market or is it primarily international? How does it work? Is there a choice for the borrower, competition among financial institutions? Is insurance an option?**

One financial institution noted that: “The collapse of the surety market affected mainly U.S. mining companies. These instruments are less widely used in other developed countries, where other, usually harder, vehicles are used (letters of credit, bank guarantees, etc.). Such instruments are generally available from local banks.”
Another suggested that there is “Plenty of competition and companies have the option of lodging [funds] directly with Government.” With respect to new mines, “For major projects, financing is often international in nature, involving 4 to 5 lead banks, each of which may pick up $200M to $300M initially. These amounts may then be syndicated through involvement of a larger number of smaller banks. Countries’ government-supported export banks may also have a significant role.” Regarding traditional forms of assurance, “The traditional surety market has tightened dramatically, partly as a result of major defaults such as Enron. This has placed mining companies under serious stress.”

Respondents from the government sector also commented. In Queensland, “Most of the major local banks will provide bank guarantees that meet [requirements]. There are no insurance bonds lodged at present although some major mining companies are exploring this option.” In Western Australia, “banks have different deals with their clients depending on their level of security, size of their operation and corporate history. These can range from not charging for the service to demanding a cash backing to the guarantee.” For Ontario mines, “Letter of credit: good market, good competition amongst financial institutions. Surety bond: limited market, minimal or no competition. Insurance: currently not an option in Ontario until favourable terms can be developed.”

No comments were forthcoming from the insurance or surety sectors.  

Please describe the availability of insurance vehicles to provide necessary assurance. Are there examples of the use of insurance vehicles?

Among financial institutions, one Australian bank reported a disappointing experience with insurance: “We used an insurance vehicle to support indemnity guarantees [effectively identical to bank guarantees] for Anaconda. They disappeared when the going got tough.” The US branch of an international bank noted that “Aside from known insurers working in the field (e.g., AIG), there have been efforts to develop joint insurance schemes covering several companies or mines. Marsh Maclennan was involved in this effort.”

Within governments, Queensland reported that “There are no insurance bonds lodged at present although some major mining companies are exploring this option.” Western Australia has “...looked at insurance schemes but they usually cost just as much as a bank guarantee and are complex to draw up.” The Ontario representative sounded a warning note; “Different insurance companies continue to struggle to find a good instrument which has reasonable premiums. The question of what happens if premiums are defaulted on is usually troublesome.” In the State of Nevada, “Several insurance-based assurances are in place. AIG is the only insurer so far.”

AIG’s offerings have already been mentioned under the section on recent international trends in requirements for financial assurance by governments. Details of the mechanism are set out in the Appendix. While some respondents said that other insurers were active in the reclamation market, the author was unable to verify these leads when the named companies were contacted. All other respondents were unaware of the use of insurance in connection with mine reclamation.
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Please identify leading financial institutions (banks, insurance companies, etc.) which are involved in the market for EFAs.

This question was asked of all non-industry groups in order to gain an understanding of the breadth of the financial market serving the needs of the mining industry in various countries. The names of financial institutions offering some form of financial assurance are too numerous to mention here. It is notable, however, that they are largely confined to developed countries. In countries such as the United States, Canada, Australia, etc., mining officials and companies may choose from a range of both forms of EFAs and institutions offering them. In countries such as Botswana or Suriname, by contrast, there may effectively be no market for such instruments.

Summary of EFA requirements in 25 jurisdictions

The Appendix includes an extensive table of information on the principal features of the current requirements for financial assurance that have been established by the governments of 25 important mineral-producing jurisdictions around the world.

Some observations are listed below:

- There is considerable variation among the financial instruments specified by different jurisdictions, ranging from none (Guinea and Suriname) to straight cash (Japan);
- In some jurisdictions, the formal criteria for relinquishing site responsibility are spelled out in some detail. In others, the legislation may say only that the criteria will be established on a case-by-case basis. The most common approach is to make reference to criteria such as physical and chemical stability and self-sustaining ecosystems;
- The amount of required assurance may be quite small in relation to the potential liability (Ghana requires only 5%-10% of the ultimate costs; Quebec normally requires no more than 70%). In some cases, the required amount may exceed the company’s estimate of closure costs by a significant margin to provide for the cost of using third-party services (New South Wales, Ontario, Nevada). Assurance amounts may also vary with the company’s financial strength or track record (Ontario, Queensland, Northern Territory);
- In some cases, the procedures to satisfy the authorities that closure criteria have been met allow specifically for the case where perpetual care may be required.

This concludes the discussion of our survey findings. The next chapter attempts to draw conclusions from all this information. It also contains an analysis of ongoing issues that remain to be resolved in the area of financial assurance for mine reclamation and closure.
4. Conclusions and a Look to the Future

This concluding chapter has two purposes: to identify emerging issues, and to suggest possible next steps for the further evolution of efficient EFA mechanisms and their alternatives.

Emerging issues, challenges and trends

This survey has revealed a number of new trends that could have an impact on the future of the mining industry. It may be useful to enumerate and comment on them briefly. While the author does not suggest that any of these emerging issues necessarily spells trouble, it is clear that continued efforts will be required to work for balanced laws and to surmount any remaining challenges. Among these notable trends, issues and challenges are the following:

Several jurisdictions have strengthened their legislation in recent years and this trend will undoubtedly continue.

In 1999, Botswana issued a new Mines and Minerals Act which includes provision for mine closure stating that mining companies must make “adequate ongoing financial provision” for reclamation but the criteria and procedures are left to the discretion of the Director of Mines.

While Chile has no provision in its mining legislation for EFA, the environmental law of 1994 allows a project proponent to submit with the EIS an insurance policy covering environmental risk, enabling it to obtain provisional authorization to initiate the project.

In Ghana, the Environmental Assessment regulations of 1999 require financial assurances to ensure that the cost of reclamation is borne by the company rather than by the public.

In India, recent amendments to the 1988 Mineral Development rules require a company to furnish a financial assurance for mine closure.

Peru revised its mining law in 2003 to strengthen requirements for reclamation planning and the provision of financial assurance.

South Africa issued a new Mineral and Petroleum Resources Development Act in 2002 which tightened the requirements for financial provision.

In Sweden, financial assurance has been an issue since the 1980s, but concrete measures were introduced with the new Environmental Code in 1999, requiring the provision of financial assurance, the amount being decided by the Environmental Court.

The United States Bureau of Land Management (responsible for mining on federal lands) no longer accepts corporate guarantees as EFA and is phasing out existing ones, forcing companies to find harder security.

In northern Canada, the Yukon is reviewing its mining law and will undoubtedly call for provisions equivalent to those common in other Canadian jurisdictions.
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There is every reason to believe that this trend of strengthening financial assurance provisions will continue. Even if those countries with high standards today do not go further, there is undoubtedly an upwards trend among those jurisdictions that currently have softer standards.

The standards of reclamation and the forms and amounts of financial assurance required vary among jurisdictions but are tending to cluster at the higher end.

At one extreme, certain countries appear to require no financial guarantee (e.g., Guinea) or they leave the standard of reclamation entirely to the discretion of the government on a case-by-case basis (e.g., Indonesia, Jamaica, Suriname). At the other extreme, in Sweden it appears a virtual impossibility to surrender mining lands under any practicable circumstances.

In Chile, the law is in process of change but, for the time being, the government offers an incentive (fast track authorization to initiate a project) if a security is voluntarily deposited.

Ghana requires reasonably effective reclamation standards, but the required deposit may be only 5% to 10% of the total money required to complete the closure plan.

In virtually all the other jurisdictions studied, adequate technical standards and some hard form of security are formally required. Even then, there are differences in approach. Some jurisdictions, while preferring hard security, will consider the track record or financial strength of the company in setting the amount (e.g., Australia’s Northern Territory, Queensland, and Canada’s Ontario, Quebec). In many cases, the list of acceptable forms of security ends with the phrase, “or any other method/form approved by the government/Minister.”

Another important variable in calculating the amount of security demanded is the issue of “who will do the reclamation work?” Mining companies rightly feel that they can carry out the necessary work most economically, using their own equipment and manpower. But a number of governments (e.g., Nevada, Ontario, New South Wales) require a higher amount on the theory that, in the event of a default caused by business failure, the company will not be in a position to do the work and independent contractors will be called in.

More complete descriptions of the ways in which selected jurisdictions (Queensland, Western Australia, Ontario, South Africa, U.S. Federal Government, and Nevada) establish the amount of financial assurance are described in an earlier section.

The virtual collapse of the conventional U.S. surety market (i.e., those sureties offered by insurance companies) has disrupted pre-existing financial assurance arrangements. The availability of conventional sureties will likely continue to be curtailed for the foreseeable future.

As a result of declining returns over a few years prior to September 2001 and heavy insurance losses following the New York disaster of September 11, 2001, U.S. insurers (including surety providers) undertook reviews of their risk portfolios. During the same time period, one U.S. surety provider failed and its obligations had to be covered by other insurers and re-insurers.
4. Conclusions and a Look to the Future

Even as the liquidity of the surety industry was suffering, some surety providers found themselves having to cover defaults by insolvent mining company clients. Sureties have traditionally been priced at a small fraction of their face value on the understanding that they will not be called. When the client unexpectedly defaults on its obligations the surety provider must pay up. This drastically alters the economics of the deal. If, as the scenario plays out, the amounts are large enough, the cash drain can bankrupt the provider. Following this experience, the surety industry took a hard look at its mining risks and either withdrew from the mining industry market or demanded liquid back-up security (such as a letter of credit) and at the same time charged much higher premiums.

The direct result of the surety providers’ change in policy was that governments were forced to demand other forms of security to replace the vanished sureties. This increased the cash demand on mining companies, as well as tying up substantial amounts of borrowing power. The impacts were substantial, so much so that the U.S. Congress scheduled hearings on the matter in July 2002. One mining company testified that it was forced to purchase over US$300 million of US treasury bonds to satisfy its financial assurance requirements.

During the hearings, the U.S. mining industry suggested several possible remedies. One was that state and federal authorities should accept other forms of security such as self-bonding, letters of credit, other forms of collateral, and combinations of these. To date, however, there is no evidence that the responsible government agencies have adopted such measures.

Nor is it likely, in the author’s opinion, that they will do so. Despite the significant financial implications of the surety collapse for U.S. mining companies, the responsible government agencies have followed the trend to strengthen their financial assurance requirements. As a result, U.S. mining companies have faced new and unexpected demands on their financial resources – diverting them from other, more productive uses.

The impact of the changes described here has been felt mainly in the USA. This is primarily due to the extensive use of surety bonds in that country. While the surety bond is known elsewhere (e.g., in Canada), governments have tended to require other forms of security from mining companies operating in their jurisdictions.

The conditions that caused the collapse of the surety market have not been reversed. Surety providers interviewed in this study gave no indication that they were anxious to build up their mining industry clientele in the near term. Rather, they offered advice to build the financial strength of mining companies (including internal reserves adequate to handle reclamation requirements).

At the supra-national level, processes are in place to reinforce the trend towards higher standards of environmental management, including financial assurance for closure and reclamation, in mining.

Evidence for this assertion will be drawn from a number of recent occurrences.

European Community Mine Waste Directive
Since its inception, the European Community (EC) has worked to harmonize regulation within its boundaries. A current initiative of this kind is the proposed Directive on the management of waste from the extractive industry (also called the...
4. Conclusions and a Look to the Future

Mine Waste Directive) already well along in its development. Once the Directive is finalized, European countries would be required to amend any existing requirements for mine reclamation and associated financial assurance to agree with its terms.

For the future development of mines in European countries it is important that the new Directive represent the appropriate degree of integration of environment and economy.

The draft Directive was given first reading by the European Parliament at the end of March 2004 and the Council reached a political agreement on the proposal in October of the same year. Article 14 deals with financial guarantees for future mines. Its provisions require the responsible authority to demand a guarantee (e.g., financial deposit or equivalent) before operations commence. The amount of the guarantee must be sufficient to cover all permit obligations and ensure that sufficient funds are available at any time for reclamation of the land. It must also reflect the likely environmental impact and is based on the assumption that an independent third party will perform the reclamation work. It must be adjusted periodically in accordance with the work needed to reclaim the site. When final closure is achieved and approved, the competent authority shall give the operator a release from the financial obligations except for those relating to the post-closure phase. These measures are generally consistent with the provisions and standards found in leading mining jurisdictions in other developed countries.

Article 22 of the Directive deals with transition measures for existing mines. It requires such mines to conform to the provisions of Article 14 within a period of six years from its in-force date. This portion of the directive could well be troublesome. The experience of other jurisdictions strongly suggests that the transition to new rules for existing mines must be carefully handled so as not to jeopardise the survival of the affected enterprises. This is in order to avoid creating social problems and additional harm to the environment. Every case is different. Within broad limits, discretion should be left to local authorities to adapt the transition rule to local realities.

To cite only one example, when Ontario introduced its new financial assurance measures it chose to accept softer assurances from marginally-profitable existing mines in order to avoid forcing them into premature closure. At the same time, the Province required the operator to develop a valid reclamation plan and begin funding it from current revenue. By allowing continued operation, the Province obtained continued employment and revenue, while ensuring progress toward complete reclamation. Moreover, the imposition of strict financial assurance measures, leading to premature closing, would have left the Province with an unwelcome legacy, several mines requiring reclamation at public expense.

Accordingly, the author would urge the EC to leave a great deal of discretion to member states in dealing with transition measures for existing mines.

World Bank / IFC Initiatives
Since 1998, the World Bank has included in its “Pollution Prevention and Abatement Handbook” provisions to ensure that any project financed by the Bank or the International Finance Corporation (IFC) anywhere in the world includes appropriate standards of mine closure and reclamation, including the nature and amount of financial assurance. These requirements are currently stated in general
4. Conclusions and a Look to the Future

terms. If a country does not have corresponding requirements, then the World Bank/IFC measures govern.

In the Handbook’s chapter on base metal and iron ore mining the requirement is phrased as follows:

“Money should be reserved over the life of the mine to cover the costs associated with mine closure. The amount of money and the type of financing required will depend on a number of factors such as the projected life of the mine, the nature of the operations, the complexity of environmental issues, the financial and environmental management capacity of the borrower or project sponsor, and the jurisdiction in which the mine is located. The mine reclamation and closure plan, the timing of its submission, and financing of activities under the plan should be discussed and agreed on with the borrower or sponsor as early as possible.”

Virtually identical wording applies to coal mines financed by the World Bank Group. In the chapters dealing with base metal smelters there are no corresponding financial assurance provisions.

The existing provisions, cited above, do not in themselves surpass the normal standards of design and operation among ICMM member companies. However, they are offered as an example of one of the mechanisms by which standards can be progressively raised by the actions of international organizations.

It is understood that IFC is preparing new guidelines. While the proposed text is not available for comment, it is expected that IFC will put forward a requirement for fully funding a mine’s closure plan by appropriate instruments so that the cost of closure can be covered at any stage in the mine life, including premature and unforeseen closure.

If this speculation proves to be accurate, at first glance the provision seems to be in line with practices already followed in most developed countries. But a careful reading of the examples given in Table 2 from chapter 2 shows that many governments, including a number of those in developed countries, provide a certain amount of discretion in setting the amount and nature of the required financial assurance.

Several factors may be taken into account in this decision. Any absolute definition of the required financial assurance runs counter to this practice.

The reader may be tempted to object: “But surely the IFC guidelines do not apply to mines in developed countries!” Not so. See the next section.

Equator Principles
Equator Principles provide a framework for financial institutions to manage environmental and social issues in project financing. An international group of banks noted for their involvement in the financing of development projects, including mining, have endorsed the Equator Principles. Adherents to these principles have undertaken not to finance any project anywhere in the world unless the project meets World Bank/IFC environmental guidelines.

The history of the Principles is a short one but their impact could be substantial. Note the following quotes from their web site. “4 June 2004 -- The Equator Principles were first adopted by 10 banks a year ago today, and their reach now
extends to 25 financial institutions located in 14 countries”. “London-based Dealogic, which produces statistics and analysis of the project finance market, has calculated that the 23 banks among the 25 financial institutions which have adopted the Equator Principles arranged $55.1 billion of project loans in 2003, representing 75% of $73.5 billion project loan market volume in 2002.”

One perhaps unforeseen side effect of these undertakings could be to frustrate the deliberate policies of responsible jurisdictions in developed countries.

As one example, the Province of Quebec normally requires a financial assurance amounting to only 70% of the projected reclamation cost. This is a deliberate, calculated policy designed to attract mining to the Province. If a project developer finds that it cannot get financing from the Canadian Imperial Bank of Commerce or the Royal Bank of Canada (the two Canadian signatories to Equator Principles to date) without posting 100% security, the Province’s policy may be nullified.

This is not necessarily an isolated example. The legislation of many jurisdictions in developed countries gives the responsible minister some discretion in setting the nature and amount of required financial assurance. The ultimate impact of the Equator Principles cannot be predicted at this time. Nevertheless, the industry should monitor future developments closely.

International Cyanide Management Code
Under the auspices of the United Nations Environment Programme (UNEP) and ICME, a multi-stakeholder committee was established to develop a voluntary cyanide management code for application to the gold mining industry. The Code was developed by a body of stakeholders, with broad representation from the mining industry, suppliers and manufacturers of cyanide, as well as governmental and non-governmental bodies. The objective of the Code is to ensure very high standards for safety, environmental and quality aspects worldwide in the use of cyanide in gold mining.

The Code, published in May 2002, includes a detailed code of practice for the manufacture, transport and use of cyanide in the production of gold.

Principle 5.2 of the Code reads as follows: “Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.” The purpose of this principle is to ensure that facilities such as heap-leaching pads are reclaimed in such a way as to present no residual threat to human health, wildlife, or the environment.

This information on the Cyanide Code is not presented here as a problem. Rather, it is cited as another illustration of the tendency for international initiatives to lead to higher standards.

Enduring issues

Amount of capital sequestered is significant

This report quotes certain estimates of the extent of mining environmental liabilities in various countries. While little exact significance can be attributed to these estimates, due to varying assumptions and calculations, it is clear that the
global amount of potential liability is very great, certainly in the tens of billions of dollars.

If governments demanded hard security (e.g., cash deposits) at the beginning of every mining project to cover the ultimate cost of site reclamation, the drain on capital available for mining investment would be substantial.

Even soft forms of security (such as a corporate guarantee based on a balance sheet test) decrease capital availability by diminishing the company’s credit rating and borrowing power. Moreover, a country which demands unrealistically high EFA standards will find that its investment climate suffers relative to other countries.

**Suggestion:** It is in the interests of governments and mining companies to agree on forms and amounts of EFA which are realistically determined and which do not unduly depress capital availability or damage the investment climate.

**The concept of efficiency for environmental financial assurance**

In this study efficient environmental financial assurance policies and instruments are defined as those which provide effective protection of the environment at minimum economic cost. The concept of effective protection should take into account realistic estimates of the risk of environmental problems in relation to the site characteristics and the company’s environmental management system, financial strength, track record, etc.

The word “effective” is used in this context rather than “maximum”. To provide perfect protection would impose infinite economic cost. The concept of economic cost includes the loss of opportunities for economic development through the sequestration of overly large amounts of capital in financial assurance instruments.

**Suggestion:** Governments are urged to use policies which are simultaneously effective in terms of environmental protection and efficient in their demands on economic resources.

**Are financial assurance mechanisms necessary?**

The research reported in Chapter 3 shows that officials of large multinational companies are divided on the question of whether financial assurance mechanisms add anything to environmental protection. No doubt the large, solvent, well-managed, responsible companies which are typically members of ICMM would be prepared to provide the necessary resources without being compelled to give financial bonds and guarantees.

On the other hand, it must be remembered that not all companies are large, nor are all large companies equally solvent at all times. Environmental management practices vary from company to company within the industry. The thousands of small junior companies have little financial and managerial depth but can and do have the capability to create significant environmental problems.

**Suggestion:** Financial assurance mechanisms are here to stay. Discussion about the need for them is sterile. The debate should be focused around issues of
4. Conclusions and a Look to the Future

making framework policies, and their application to specific instruments and specific companies, as efficient as possible.

**EFA practices differ widely: a case for consistency**

Some countries or states/provinces do not demand any EFA, whereas others have quite strict requirements, even for small projects operated by large, solvent companies. For the stricter jurisdictions, there would be economic benefits, and no loss to the environment, in having more efficient policies and a more discriminating approach to the application of requirements to specific companies and in specific cases.

However, lack of any EFA requirements is an equally problematic situation. The following scenario can be postulated within some jurisdictions that do not currently require EFA. First, there will be a dramatic environmental occurrence or accident. This will create global negative public reaction and may force the country in question into hasty or ill-conceived punitive action or into the creation of unduly harsh policies. Application of these new policies to existing operations will create transition difficulties and hardship for all.

**Suggestion:** It is appropriate for companies, associations, and international institutions to assist countries to work towards the orderly development of efficient and effective EFA policies and practices. The current efforts of the United Nations and the European Community to harmonize requirements could contribute to this goal, provided they subscribe to the principles set out in this report.

**Wide variety of EFA in use: clarification is needed**

Table 3 (Chapter 3) lists a great variety of EFA instruments by name. There are two potentially beneficial areas for further work: a) clarifying their differences and similarities and grouping them into distinguishable classes of instruments, and b) developing graduated and consistent guidelines for the application of the different classes of instrument to specific cases.

With further research into the specific terms of these instruments, it is possible that the list might be shortened by grouping essentially identical instruments together. For example, letter of credit, bank guarantee and banker’s undertaking seem to represent essentially similar instruments.

Similarly, reclamation bonds and performance bonds are likely to be different names for a common type of surety bond. All parties may benefit from a more in-depth study of the characteristics of the instruments and their classification into truly distinct and distinguishable groups.

The second stage of the work would seek to develop for international institutions and for governments a set of uniform policy guidelines for the application of the different classes of EFA instrument, so that similar risks would be treated more consistently across jurisdictions and across time.

**Suggestion:** Industry and international institutions may wish to consider undertaking research which would classify EFA instruments into distinct groups and develop uniform policy guidelines for applying the different EFA classes to the different risks encountered in individual cases.
4. Conclusions and a Look to the Future

*Framework policies are as important as specific financial assurance mechanisms*

Chapter 2 shows that the effectiveness, the cost, and the efficiency of EFA instruments in practice depend on a large number of issues and policies which underlie the choice of form and amount of the financial assurance applied to a given case. These factors include: technical standard of reclamation demanded, standard of probability used in assessing risks, the timing of application to a project, etc. The global efficiency of EFA policies and practices could be improved by a wider understanding of the influence of these factors and an effort to assist governments to move towards a set of consistent and coherent principles underlying framework policies.

**Suggestion:** Industry and international institutions may wish to consider studying and promoting consistency and coherence among governments in terms of the principles on which their framework policies affecting EFA are based.

*Alternatives and supplements should be pursued*

Just as technology continues to advance in science and engineering, so too does innovation continue in financial institutions and practices. Concepts of risk management continue to evolve. The instruments available today to provide coverage for environmental liabilities may well be superseded or supplemented in future by other or additional types of EFA instrument.

The concept of using insurance policies to replace or support existing EFA tools was discussed in Chapter 2. Similarly, the accreditation or certification of mining companies could provide governments with another tool to assess and control risks, possibly resulting in reduced incidence or cost of financial assurance instruments.

Those innovations which are successful will result in efficiency gains (as we have defined efficiency) with benefits to all parties and to the environment.

**Suggestion:** Industry associations and international institutions should encourage research and innovation in the use of new tools to supplement or replace conventional EFA instruments. In particular, they should strongly support the development of transparent systems of accreditation and certification to reinforce existing industry codes. There is also an argument to be made for using approved independent assessors. Governments should hold themselves open to suggestions for using new techniques and instruments of risk management.
A summary version of the report on Financial Assurance for Mine Closure Reclamation is available:

From the ICMM website
www.icmm.com

For a printed copy, please contact ICMM at
19 Stratford Place
London, W1C 1BQ
United Kingdom

info@icmm.com
The greater part of this explanation of selected financial assurance instruments is adapted from a discussion paper entitled Financial Assurance for Mine Reclamation, Decommissioning and Post-Closure Obligations, prepared in April 1991 by The Mining Association of Canada (MAC). This material is used here with the kind permission of Mr. Gordon Peeling, MAC President. There have been some modifications in the section relating to insurance, which has been redrafted in light of recent developments. The last section was supplied by ASARCO Incorporated.

In its original form, the paper served two purposes: to inform the reader about the nature of several types of instruments that could be used as environmental financial assurance; and to convey industry views on how one particular form of EFA (the cash trust fund) should be structured. Recognizing that thinking in both industry and government has progressed in the years since 1991, the author nevertheless felt it would be useful to non-specialist readers if the original work were reproduced largely intact.

Irrevocable letter of credit

Description
An irrevocable letter of credit is an agreement between a banking institution and a company whereby the bank will provide cash funds to a third party (the beneficiary, which in this case would be the government), under specific terms contained in the letter of credit.

The letter of credit is irrevocable. Therefore, the issuing bank must honour all legitimate claims i.e. those in compliance with the terms of the letter of credit presented by the beneficiary.

In addition, any changes to the terms of the letter of credit must be agreed to by all parties to the transaction. The normal term for a letter of credit is one year, although under certain circumstances the terms may be longer.

Operation
Since reclamation funding is a long-term commitment, the normal practice is to issue a letter of credit in the amount of the estimated cost of reclamation, with a one year term which is then automatically extended each year, based on an annual financial review of the company by the bank. This review is usually completed sixty days prior to the current expiry date. Should the bank decide not to extend the letter of credit then the equivalent of a default situation has occurred and the beneficiary is notified and has the option of drawing down the full value of the letter of credit.

Characteristics
The characteristics, i.e. the content of the letter of credit, will reflect the terms and conditions of the agreement between a company and the government with respect
to a specific decommissioning plan. It will also outline the specific conditions under which funds may be drawn down by the beneficiary. These may include, for example, failure to perform certain work as outlined in the decommissioning plan, failure to meet certain quality standards or failure to extend the term of the letter of credit.

**Advantages**
The initial cost is inexpensive. Fees are generally negotiable and are a function of the credit-worthiness of the company. In most cases, the cost would be less than 1% per annum of the face value, i.e. the size of the required fund, for a good credit risk. However, letters of credit will be backed by an indemnity or a guarantee from the company and in this respect the company will bear a further cost. The costs associated with opening a letter of credit are expensed as a tax deductible item. Once in place, only a minimal amount of administration is required.

**Disadvantages**
The availability of a letter of credit may be restricted by a company's credit. Under these circumstances, a company may be required to place the full face value of the letter of credit on deposit with the bank to ensure that funds are available if drawn by the beneficiary. Even if the company’s credit rating is adequate to obtain the letter of credit, the borrowing power of the company is correspondingly reduced.

A letter of credit could not be obtained by a single-mine company closing down its operations unless: a) it was a subsidiary of a parent company, in which case the parent company could give a guarantee; or b) the company places the full face value of the letter of credit on deposit with the bank.

**Performance bond**

**Description**
Although a performance bond may be a special form of a letter of credit, thereby exhibiting all of the attributes of a letter of credit, it is most often found in the form of a surety bond issued by an insurance company.

Under the performance bond agreement, the insurer agrees to act as surety for the company and makes a commitment to be financially responsible for all claims and expenses arising out of the decommissioning plan up to a certain limit. The government is the beneficiary under the bond and any changes to the bond would have to be agreed to by all three parties to the transaction.

**Operation**
The operation of a performance bond is similar to that of a letter of credit. The performance bond is issued for a specific time period in the face amount of the cost of carrying out the reclamation work under the decommissioning plan and is renewed for a further time period based on a credit review of the company. If the performance bond is not renewed, then the government has the option of drawing the full amount.

**Characteristics**
The characteristics are similar to those of a letter of credit.
Appendix

Explanation of Selected Financial Assurance Instruments

**Advantages**
The initial cost of getting a performance bond is relatively inexpensive, although performance bonds are generally more expensive than letters of credit. The costs associated with putting a performance bond in place are expensed as a tax deductible item. Once the performance bond is set up, only a minimal amount of administration is required.

**Disadvantages**
The availability of a performance bond may be restricted by a company's credit rating. Under these circumstances, a company may be required to place the full face value of the performance bond on deposit with the insurance company to ensure that funds are available if drawn by the beneficiary.

A performance bond could not be obtained by a single mine company, closing down its operations, unless: a) it was a subsidiary of a parent company, in which case the parent company could give a guarantee; or b) the company places the full face value of the performance bond on deposit with the insurance company.

**Cash trust fund**

**Description**
A trust fund is a fund set up by a company in an amount that is determined to be sufficient to cover specific reclamation costs which are contained in the decommissioning plan. The fund amount will be a function of the expected annual reclamation costs, investment policy and expected real rates of return.

**Operation**
The fund would operate in a manner similar to a pension fund, i.e. it should be under the control of a third party trustee and have an investment manager who would be responsible for managing the funds in accordance with a defined investment policy. Contributions to the fund would normally be structured as a series of payments over a specific time period. Withdrawals could only be made from the fund to cover reclamation costs outlined in the decommissioning plan. The operation of the fund would be subject to a periodic audit review. Upon periodic review or satisfactory completion of the decommissioning plan, any surplus funds remaining would be returned to the company.

**Characteristics**
The fund must be structured in such a way as to give the government "reasonable assurance" that sufficient funds will be available to meet expected reclamation costs. The fund will also be set up to cover reclamation costs relating to one specific operation, although companies with more than one mine may wish to "pool" the cash funds required for individual operations into a single cash trust fund.

The specific terms and conditions governing the operation of the fund will be contained in a trust agreement administered by the trustee. It is highly desirable that income earned by the fund be tax sheltered until it is withdrawn.

A government-approved decommissioning plan would normally be the basis for setting up a mine reclamation fund.
Advantages
The company does not give up total control over its funds, since any surpluses created in the fund either through over-contributions or exceptional earnings should be returned to the company either after one of the periodic reviews or after the successful completion of the decommissioning plan. In addition, the company will have the incentive to ensure sound management of the fund.

Both the government and the public may feel more confident that funds will be available to meet expected reclamation costs, since cash trust funds are more visible and often better understood than other alternatives.

Disadvantages
In view of the long time frames involved, greater uncertainty exists about the values assigned to the parameters that will determine the size of the cash fund, even though the same problems must be dealt with for each of the other funding mechanisms. If large amounts of cash are required to establish a fund, a transition period will be necessary to allow time for the company to build up the financial assurance required.

It is desirable that a Fund should be structured, managed and operated in a manner that is fair both to the mining company and the government. Accordingly, the mining industry suggests that the following principles should govern the design and operation of a fund (Tables A1 and A2).

Table A1: Criteria for the efficient design of a fund

<table>
<thead>
<tr>
<th>Site-specific basis for fund</th>
<th>Each mine should be assessed individually and the security required should reflect the costs and risks associated with reclaiming that site.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis for cost estimates</td>
<td>Estimated costs should be based on careful engineering and technical studies accompanied by formal risk assessments to take into account the probabilities and consequences of alternative scenarios.</td>
</tr>
<tr>
<td>Responsible management of reclamation</td>
<td>The design of the fund should encourage mining companies to manage their reclamation programs in an active and responsible manner, in order to control costs and to develop innovative technical solutions to reclamation challenges.</td>
</tr>
<tr>
<td>Similarity to pension fund</td>
<td>The principles for setting up a fund should be similar to those used to establish a pension fund.</td>
</tr>
<tr>
<td>Investment policy</td>
<td>Investment policy should permit investments that optimize the risk-return ratio, bearing in mind that the fund is a long-term investment.</td>
</tr>
<tr>
<td>Investment manager</td>
<td>The fund should be managed by an investment manager selected by the company. The company should at the same time have the option of managing the fund internally with reasonable guidelines, as with a pension fund.</td>
</tr>
</tbody>
</table>
Table A1: Criteria for the efficient design of a fund

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring legislation</td>
<td>Legislation modelled on pension statutes or other similar legislation can be used to monitor performance of the fund and to ensure compliance with investment policy.</td>
</tr>
<tr>
<td>Choice of financing mechanism</td>
<td>As justified by the circumstances, a company should have the option to determine which government-authorized financing mechanism (or combination of mechanisms) represents efficient use of the company's capital.</td>
</tr>
<tr>
<td>Expenses deductible for tax</td>
<td>Where a government-mandated mine reclamation fund is required, payments into the fund should be allowed as a deductible expense at the time they are made for purposes of income tax and mining taxes.</td>
</tr>
<tr>
<td>Fund income sheltered from tax</td>
<td>Income generated by a fund should be tax-sheltered until withdrawn.</td>
</tr>
<tr>
<td>Investment management fees</td>
<td>All investment management costs should be financed from the proceeds of the fund.</td>
</tr>
<tr>
<td>Fund Trustee</td>
<td>An independent third party, such as a trust company, is an acceptable trustee of a fund.</td>
</tr>
<tr>
<td>Sole government control</td>
<td>The mining industry is opposed to the government having sole control over the management of investments in a fund.</td>
</tr>
</tbody>
</table>

Review of and audit process for a fund
The mining industry suggests a number of guidelines for the periodic review of a fund and for the audit process. The integrity of the review and audit is particularly important in view of the industry's recommendation that any surplus funds should be returned, net of appropriate tax adjustments, to the company. See Table A2.

Table A2: Guidelines for the review and audit of a fund

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site-specific basis for fund</td>
<td>Each mine should be assessed individually and the security required should reflect the costs and risks associated with reclaiming that site.</td>
</tr>
<tr>
<td>Basis for cost estimates</td>
<td>Estimated costs should be based on careful engineering and technical studies accompanied by formal risk assessments to take into account the probabilities and consequences of alternative scenarios.</td>
</tr>
</tbody>
</table>
Appendix

Explanation of Selected Financial Assurance Instruments

Table A2: Guidelines for the review and audit of a fund

<table>
<thead>
<tr>
<th>Periodic review or audit</th>
<th>A periodic review or audit of activities of a fund is necessary to ensure appropriate disbursement and use of funds pursuant to the approved decommissioning plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope of audit</td>
<td>An audit would include the preparation of financial statements and a technical review of work performed. It should also include, where applicable, a reassessment of reclamation requirements and funding contributions.</td>
</tr>
<tr>
<td>Conduct of audit</td>
<td>An appropriate panel should be engaged to undertake the review and audit, using technical, engineering, legal and actuarial expertise.</td>
</tr>
<tr>
<td>Frequency</td>
<td>A review should be held with a stated frequency, which could be from three to five years, or more frequently if deemed desirable by the government or the company.</td>
</tr>
<tr>
<td>Disposition of surplus funds</td>
<td>Any surplus funds determined by a review should be returned, net of appropriate tax adjustments, to the company.</td>
</tr>
</tbody>
</table>

Insurance options

Insurance Policy

Until recently, there have been no insurance policies to cover long-term reclamation costs. While for several years the insurance industry showed some interest in this area and appeared willing to consider “custom designing” an insurance instrument to meet the criteria of government authorities, it was not until around 2003 that a product was available. The collapse of the U.S. surety market no doubt hastened its development.

A representative of the company offering the product, the American Insurance Group (AIG), described experience with this system as follows. “AIG has insured a dozen or more projects to date.” While the median coverage is around US$10 million, the largest project is said by AIG to be “in the hundreds of millions of dollars”.

Advantages claimed by AIG for the insurance solution are as follows: The current system of depositing reclamation bonds through cash letter of credit, etc., has two drawbacks: a) it ties up capital in the statutory deposit while the company spends actual cash on physical reclamation and b) reclamation bonds are not released until the work is completed. All this effectively results in double payment for several years. The AIG combination of cash and insurance avoids these disadvantages. The author also notes that insurance premiums are normally tax-deductible, whereas in many jurisdictions deposits to a reclamation fund are not deductible.

One project in which insurance was used to facilitate a change of ownership (while satisfying government authorities that pre-existing environmental liabilities would be covered) is the Jerritt Canyon Mine in Nevada. According to releases by the
new owner, Queenstake Resources, the insurance coverage totals over US$30 million.

The important features of the insurance coverage are described below.

**Description**
The package is a combination of three main components: a conventional surety bond, accumulation of cash within the policy, and insurance protection for overruns and for changing requirements. The insurance company works with the operator’s best estimate of reclamation cost (normally lower than the amount of security regulators would want). In addition, the insurer “optimizes the approach by a combination of pre-funding and credit evaluation.”

**Operation**
Each year’s reclamation cost is estimated, taking inflation into account. A discount is applied, depending on the operator’s credit rating. The adjusted net present value (NPV) is the basis for the annual payment. AIG guarantees the reclamation. From the funds deposited, AIG issues the required security bonds to government. And AIG pays the actual reclamation costs. At the end of the project, if there is a surplus in the account, it goes back to the operator. If a deficit, AIG pays. Term of the policy is for 15-30 years (30 maximum). After the fifth year the operator can commute the fund and withdraw if there are better options.

Does the accumulation and insurance guarantee get the reclamation liability off the balance sheet? No, but the positive balance in the corporation’s insurance account is an offsetting asset for the balance sheet. In addition, overruns in cost are eliminated.

AIG describes its approach as follows: “The AIG Environmental® Mine Reclamation Policy is unique in the industry and is based in part on: Reclamation plans and projected costs; The environmental risk profile of the closure and reclamation; The credit worthiness of the company; The market value of the mine(s) assets. This assessment allows further flexibility in constructing a policy that meets financial assurance guidelines while also meeting the cash flow needs of the mining operation. The policies may be transferable (based on an analysis of the credit worthiness of the buyer) and [the package] offers self-insured retentions on the policy when financially appropriate. Equipped with the necessary operational analysis expertise, combined with the backing of a triple-A rated insurer – [the package] is uniquely positioned to provide leadership, flexibility and responsiveness for the financial assurance needs of today’s mining operations”.

**Advantages**
This funding mechanism may require smaller up-front dollar commitments, in terms of premiums, than a cash trust fund. Less administration is required after it is set up than with a cash trust fund. In addition, as noted earlier, premiums may be a tax-deductible expense whereas contributions to a reclamation fund are not.

**Disadvantages**
This type of funding mechanism may prove to be expensive for some clients. For example, the initial premiums may be very high to ensure that the bond has substance. Moreover, in addition to the premium amounts there could be taxes and insurance brokerage fees. This funding mechanism is so far untested in other countries and may require extensive work with the appropriate government.
authorities before they give their approval. Any surpluses built up in the fund and ultimately not paid out, are not returned to the company.

**Captive insurance company**

A Captive Insurance Company ("Captive") is a funding vehicle that can aid in the administration and formalization of risk retention within the risk management function. It is an insurance company owned by the insured or an affiliate of the insured and is typically formed to insure the owner's risks.

As such it is important to realize that there is no transfer of risk outside the corporate family. The Captive would represent, in simple terms, a vehicle for formally segregating the owner's retained risks. Although funds would be formally segregated, associated with this formalization are certain costs which must be weighed against the benefits derived.

Since the Captive is an incorporated entity it must be capitalized sufficiently to retain the risks assumed and to meet minimum statutory requirements to the Captive domicile. In general, premiums must be adequate to cover projected losses plus expenses less investment income.

Long-term commitment to the Captive and corporate responsibility for its operation are essential ingredients for its success.

As a result of the limited capitalization of a Captive, it usually participates in the primary layers where losses are large in number but predictable and normally purchases stop loss cover to limit its exposure.

Quota share participation in excess layers is normally not viable due to the high risk involved and the relatively small premium levels associated with those layers. A commercial insurer pools risks and is capitalized to such extent that these excess layers can comfortably be assumed.

Captive Programs can be represented either by direct or fronted policies. When a policy is written with an insurer unlicensed in the country of operation (which a direct policy would be) federal excise tax (as a percentage of the gross premium) could be levied.

A fronted program can be structured in one of two ways. Structure A requires that the Captive take on significant levels of risk and purchase excess and stop loss insurance (normally arranged by parent company brokers).

In Structure B the fronting company arranges a net line cede to the Captive and purchases the stop loss and excess cover directly from re-insurers. Structure B is generally less costly to administer as the Captive does not deal directly with reinsurers, but it does not allow the same flexibility with respect to the reinsurance market. Each set of corporate circumstances dictates which structure is more appropriate.

**Advantages**

The benefits afforded by a Captive are: to provide certificate issuance; to meet statutory coverage requirements through the fronting arrangement; to access reinsurance markets; to formalize the risk management function through administration and co-ordination of a consolidated program, accountability, and
optimization of deductibility levels; to develop negotiating leverage with commercial markets; and to provide tax advantages.

The extent of each of these benefits would need to be examined in detail. It can be a viable alternative.

**Balance sheet test**

The following passage reproduces the legal text of a balance sheet test commonly used today by agencies of the U.S. government. It was supplied by Mr. W.O. Hart, Associate General Counsel, ASARCO Incorporated, New York. According to Mr. Hart, this version is a mix of present tests required under various laws and it has been accepted and used by the U.S. Government in several locations. It assumes that the mine operator (MiningCo) has undertaken or is required to provide a suitable EFA under a consent decree.

Subpart (4), plus two of the other three numbered requirements, must be satisfied to comply with the financial assurance requirements of Paragraph 71(e) of the MiningCo Consent Decree:

1. Either of the following two alternatives (a) or (b):
   (a) Either of the following two alternative ratios:
      i. Total assets less total liabilities shall be not less than $500 million. The definitions for these terms are set forth at 40 C.F.R. ' 264.141, and total liabilities" shall include all of MiningCo's environmental liabilities for which assurance is given using a financial test, including liabilities arising out of CERCLA, RCRA subtitle C, Class I hazardous waste underground storage tanks, PCB commercial storage facilities, and related state and local government liabilities. See Note (If MiningCo has relied on a similar financial test to assure other potential liabilities, it must notify the applicable offices (federal and state) of this new liability.); Or
      ii. Net income plus depreciation, depletion, and amortization minus $10 million / total liabilities (as defined in 40 C.F.R. ' 264.141 and in subparagraph above) is greater than 0.10.
   (b) A current bond rating for the company's most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, or Baa as issued by Moody's. This bond must be issued in the name of MiningCo and not a corporate parent or other affiliate.

2. A ratio of current assets to current liabilities that equals 1.25 or greater

3. Tangible net worth (as defined in 40 C.F.R. ' 264.141) greater than the sum of the response cost estimate and other obligations covered by a financial test plus $10 million. Obligations covered by a financial test include all of MiningCo's environmental liabilities for which assurance is given using a financial test, as detailed in subparagraph (i) above.

4. Assets located in the United States amounting to at least ninety percent (90%) of total assets or at least six times the sum of the current cost estimate of work to be performed and any obligations covered by the financial test, as detailed in subparagraph (i) above.
Financial calculations used in the preceding paragraphs shall be calculated in accordance with generally accepted accounting principles on a consolidated basis, except that LIFO inventories shall be included in current assets at their replacement cost.

Note: The phrase "environmental liabilities for which assurance is given using a financial test does not include demonstrations of financial responsibility for bodily injury and property damage to third parties such as set forth in 40 C.F.R. ' 264.141 and ' 264.151 or corresponding state requirements."
Appendix

Government Requirements for Financial Assurance in Mine Reclamation and Closure

The table below provides information on the principal features of the current requirements for financial assurance that have been established by the governments of 25 important mineral-producing jurisdictions around the world.

The first column contains the name of the jurisdiction (whether national or sub-national in nature) and a listing of the acceptable types of financial assurance which is specified by the relevant legislation or regulations. The second column describes the technical or environmental criteria that must be met before the responsible authority will allow the mining company to relinquish mineral title and site responsibility. The third column provides detail on the way in which the amount of required assurance is specified or calculated. The final column outlines the procedures that must be followed in order to satisfy the competent authorities that closure criteria have been met.

Table A3. Government requirements for EFA in mine reclamation and closure

<table>
<thead>
<tr>
<th>Jurisdiction / Acceptable Types</th>
<th>Closure Criteria</th>
<th>How Assurance Amount Is Calculated</th>
<th>Procedures to Surrender Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia: New South Wales Cash, bank guarantee.</td>
<td>Safe, stable and non-polluting, suitable for agreed post mining land use. Maintenance requirements commensurate with similar non-mined land uses.</td>
<td>Cost of reclamation if leaseholder defaults and DMR has to complete reclamation.</td>
<td>When site demonstrated to be stable etc. This is unlikely to be less than seven years after completion of reclamation.</td>
</tr>
<tr>
<td>Australia: Northern Territory Cash or unconditional bank guarantee.</td>
<td>Criteria are site specific. General criteria include: public safety, stable self-sustaining landform, not causing erosion, not releasing contaminants to environment.</td>
<td>Established process based on full cost of reclamation. Issues that can be taken into consideration include financial position, past and current performance record.</td>
<td>NT Mining Management Act section 46.</td>
</tr>
</tbody>
</table>
# Appendix

Government Requirements for Financial Assurance in Mine Reclamation and Closure

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<th>How Assurance Amount Is Calculated</th>
<th>Procedures to Surrender Site</th>
</tr>
</thead>
</table>
| Australia: Queensland  
Cash, bank guarantee  
(unconditional, irrevocable, on demand); insurance bond  
(unconditional, irrevocable, etc). | Currently these criteria have been negotiated on a site by site basis and documented in the Environmental Management Overview Strategy. A major review of the closure criteria has recently commenced. | The company proposes an amount based on area of disturbance and unit rates of reclamation costs for different types of disturbance. A discount may be applicable based on past environmental performance. | Conditions of the environmental authority have been met or the reclamation has been satisfactory or there is either an environmental management program or a site management plan in place to complete the reclamation or manage land contamination. |
| Australia: South Australia  
Cash, irrevocable bank guarantee or letter of credit. | No commercial exploitation likely. | An assessment of the risk to the Government following non-performance of company obligations under legislation. | Independent consultants report showing future risks have been managed to a level satisfactory to the Minister. |
| Australia: Tasmania  
Cash deposit, bank guarantee, term deposit or another format at Minister’s discretion or any other security the Minister may determine. | Unless a post mining land use is identified, return of the land in a condition compatible with the surrounding land form. | Department estimates the cost of reclamation. Bonds are staged to provide for development and reflect progress of reclamation. | A decommissioning and reclamation plan is negotiated with the lessee. This will include reclamation specifications and validation criteria. |
| Australia: Victoria  
Cash, irrevocable bank guarantee or letter of credit. | No commercial exploitation likely. | An assessment of the risk to the Government following non-performance of company obligations under legislation. The amount of “security” is determined by the Minister at his discretion. | Independent consultant’s report showing future risks have been managed to a level satisfactory to the Minister. |
## Appendix

### Government Requirements for Financial Assurance in Mine Reclamation and Closure

#### Table A3. Government requirements for EFA in mine reclamation and closure

<table>
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<td><strong>Australia: Western Australia</strong>&lt;br&gt; Unconditional guarantee from a bank or financial institution.</td>
<td>The site has to be safe from both a public risk and environmental perspective; stable in both the short and long term; must meet all the standards agreed to at approval and/or to through the operating life of the site.</td>
<td>Calculations are based on a guideline, which provides for a minimum amount. The final amount is then calculated according to any additional risk factors associated with the particular project</td>
<td>The operator applies to DoIR when they believe they can demonstrate that they have met the agreed standards. Final surrender or sign off will depend on whether the department considers they have adequately met these standards, at which time time bonds will be retired and conditions removed.</td>
</tr>
<tr>
<td><strong>Botswana</strong>&lt;br&gt; The law merely states that companies must make financial provision.</td>
<td>Concession area is reclaimed from time to time and ultimately reclaimed in so far as is practicable in a manner acceptable to the Director of Mines.</td>
<td>Holder of a mineral concession shall make adequate ongoing financial provision for compliance with his obligations under this section.</td>
<td>Procedure not specified – left to the discretion of the Director of Mines.</td>
</tr>
<tr>
<td><strong>Canada: Ontario</strong>&lt;br&gt; Cash; letter of credit; bond of an approved guarantee company; mining reclamation trust; Compliance with a corporate financial test in the prescribed manner; Any other form of security or any other guarantee or protection, that is acceptable to the Director.</td>
<td>Financial assurance is premised on the reality that the owner will be unable or unwilling to do the work. Therefore, the amount required by government is the same amount calculated by the company using third party costs.</td>
<td>Costs should be estimated and certified by bona fide third parties and based upon work to be completed by external contractors.</td>
<td>Minister may accept a surrender by agreement of a closed out site if: the site is closed out in accordance with a closure plan or with prescribed standards; perpetual care funding is in place in a special purpose account if required for a site closed out in accordance with a closure plan; a risk premium is provided.</td>
</tr>
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## Appendix

### Government Requirements for Financial Assurance in Mine Reclamation and Closure

#### Table A3. Government requirements for EFA in mine reclamation and closure

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<td>Canada: Quebec</td>
<td>There are some specific criteria and requirements included in our Reclamation guidelines. The site must be restored to a satisfactory condition by: eliminating unacceptable health hazards and ensuring public safety; limiting the production and circulation of substances that could damage the receiving environment and, in the long-term, trying to eliminate maintenance and monitoring; restoring the site to a condition in which it is visually acceptable to the community; reclaiming the areas where infrastructure is located (excluding the accumulation areas) for future use.</td>
<td>Based on the estimate cost of the reclamation and restoration of affected areas, the guarantee corresponds to 70% of the anticipated cost, in dollars. The guarantee must be deposited according to the projected schedule of annual payments or costs. The amount required by the government can be higher. If so, there is a process of negotiation to reach an agreement. The company must follow the schedule of payments of the guarantee. The Minister may request before approval, the payment of part of the totality of the guarantee (70%). The Minister may also request the total payment of the guarantee (70%) if he considered that the finances of the company are risky.</td>
<td>In accordance with section 232.10 of the Act, the Minister may release any person from his obligation under sections 232.1 to 232.7 and issue to him a certificate to that effect where: he agrees to letting a third person assume the obligations; the reclamation and restoration work has been carried out in accordance with the reclamation and restoration plan approved by him and no sum of money is due to him with respect to the performance of the work; and, where there are tailings, they no longer present any risk of acid mine drainage.</td>
</tr>
<tr>
<td>Canada: New Brunswick</td>
<td>A site must be returned to its previous or better use and must be environmentally and physically stable in the long term.</td>
<td>Security amount is based on actual cost to perform the maximum outstanding reclamation work expected during mine life.</td>
<td>The company must give ninety days notice to the Minister prior to closing or abandoning a mine. All reclamation must then be completed according to the approved reclamation plan and to the satisfaction of the Minister.</td>
</tr>
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<td><strong>Chile</strong></td>
<td>Obligation to submit a closing plan, but does not refer to specific requirements in terms of committed action and insurance policies involved.</td>
<td>The insured amount or sum will be equal to the value of the natural and artificial elements of the environment in financial terms, obtained through use of the most appropriate methodology (unspecified).</td>
<td>Recent changes to regulations on Mining Safety specify a list of actions to be undertaken – such as closing mine accesses, withdrawal of machinery, etc.</td>
</tr>
<tr>
<td>No mandatory deposit, but project may submit together with the EIS an insurance policy covering the risk for environmental damage, and enabling it to obtain provisional authority to initiate the project.</td>
<td></td>
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</tr>
<tr>
<td><strong>Ghana</strong></td>
<td>The existing regulations stipulate: establishment of slopes and structures that are demonstrably safe and stable in regard to physical and chemical characteristics; consistent achievement of acceptable quality of surface waters, springs, and groundwater; achievement of permanent and self-sustaining vegetation cover in accordance with decommissioning and reclamation plan objectives; etc.</td>
<td>The amount is a percentage usually in the range of 5 to 10% of the total money needed to complete the closure/reclamation plan. The actual percentage is usually negotiated between the company and the EPA once the closure plan is approved.</td>
<td>Acceptance of the reclamation plan. The real specifics of the criteria will be negotiated during the reclamation plan approval process.</td>
</tr>
<tr>
<td>Each mine’s final bonding agreement is on a case-by-case basis. The bond always includes a form of cash deposit with the remainder of the financial assurance provided by various options such as a bank guarantee, trust fund, insurance, etc.</td>
<td></td>
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<tr>
<td><strong>Guinea</strong></td>
<td>The mining agreement provides that mined lands will be reclaimed to generally accepted standards.</td>
<td>No financial assurance is required by the government of Guinea.</td>
<td></td>
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<td>None.</td>
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<td>India</td>
<td>Letter of credit; bond; trust fund based on expected sum required for abandonment of mine; or any other form of security or any other guarantees acceptable to the authority.</td>
<td>The financial assurance for mine closure is Rs. 25,000/- per hectare for A category mines and Rs. 15,000/- per hectare for B category mines. However the minimum amount of financial assurance to be furnished should be Rs. 2,000,000/- for A category mines and Rs. 1,000,000/- for B category mines.</td>
<td>The duration of company responsibility in terms of ongoing environmental management in the post-mining phase is up to the Director General.</td>
</tr>
<tr>
<td>Indonesia: Nusa Tengarra Barat</td>
<td>A reclamation guarantee may take the form of a term deposit, accounting reserve or third party guarantee.</td>
<td>A closure plan to be submitted at least one year prior to the end of mining operations. This stipulates the environmental impacts to be managed in the post-closure phase and the performance criteria for environmental management.</td>
<td>The Commissioner upon being satisfied that requirements have been complied with shall issue to the lessee a certificate to that effect.</td>
</tr>
<tr>
<td>Jamaica</td>
<td>The Mining Act (13th October 1947) with Regulations outlines the financial requirements that will be charged to the mining Lessee.</td>
<td>As soon as practicable after mining operations are concluded the lessee of a mining lease must restore all land mined as nearly as practicable to the pre-existing level of agricultural or pastoral productivity by a list of specified procedures.</td>
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<td><strong>Japan</strong></td>
<td>Cash deposit to guarantee reclamation at closure, and potential contributions to government for ongoing wastewater treatment.</td>
<td>These measures apply to metal mines exhibiting acid drainage problems.</td>
<td>Water Treatment contributions are made over 6 years totalling 20X annual treatment cost.</td>
</tr>
<tr>
<td><strong>Peru</strong></td>
<td>Not known at this time. Regulations are still being established.</td>
<td>Unknown at this time. Regulations are still being established.</td>
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<td><strong>South Africa</strong></td>
<td>Trust fund, cash deposit, letter of guarantee from a bank, or any other method approved by the government.</td>
<td>Criteria for other aspects are in place except for potential water quality impacts which is delaying the walk away scenario.</td>
<td>The amount is determined from the information the company provided in the Environmental Management Programme Report. The methodology of determining the amount is currently under review.</td>
</tr>
<tr>
<td><strong>Suriname</strong></td>
<td>No financial assurance required by the government</td>
<td>The present law states that land must be returned in a state, as measured to the satisfaction of the Minister of Natural Resources, with regards to safety of the public, conservation of the deposit, re-use of the area and protection of the environment. There are no other criteria established by the government.</td>
<td>Mine reclamation is an on-going expense that is calculated/budgeted based on experience</td>
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<td>Sweden Bank guarantee, letters of credit, cash bonds.</td>
<td>In principle, the legislation precludes the possibility of exit. At the same time authorities understand that companies have finite lives. This has led to rather extreme discussions about closure strategies that can be guaranteed to be efficient in a thousand-year perspective</td>
<td>The amount is decided by the Environmental Court as part of the permitting procedure. There is a complete lack of guidance on how the amount should be calculated, so far it has been built upon closure cost calculated by the operator</td>
<td>In practice, the closure plan for a site is reviewed and approved by the environmental court. After closure the company proposes a monitoring program that will run for a certain period, say five years. After this period the monitoring program is reviewed and runs for another period. And so on …</td>
</tr>
<tr>
<td>United States: Arkansas Surety bonds; letter of credit.</td>
<td>None specified in general terms; technical standards for landfills include no standing water, no erosion, good vegetative cover consisting of permanent species, no sloughing of slopes, etc. For mined-over lands 3:1 slopes, permanent vegetative cover, no rills or gullies greater than four inches deep, standing water pH 6-9.</td>
<td>Calculated/anticipated cost of completing tasks.</td>
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<td>United States: Nevada (Bonds, letters of credit, trust fund, corporate guarantee or insurance.)</td>
<td>Completion of work described in the reclamation plan, demonstration of successful re-vegetation of reclaimed earth, and demonstration of chemical stability following at least five years of monitoring. No ongoing water management.</td>
<td>Based on an estimate using quantification of physical activities required such as earth moving, building demolition, water disposal etc. based on a detailed reclamation plan; Rental cost for equipment to perform such work; Prevailing federally mandated wages; and administrative overhead that totals approximately 40%.</td>
<td>The bonds are released for the entire permit area or for incremental areas if the governmental regulatory agency is satisfied that the reclamation (or a phase of reclamation) has been accomplished in accordance with the approved reclamation plan. Bonds are released in phases as the reclamation work proceeds. After all surface mining and reclamation activities have been completed, the remaining portion of the bond is released.</td>
</tr>
<tr>
<td>United States: Texas (Surety bonds, letters of credit, collateral bonds, escrow bonding, self-bonding, combined surety/escrow bonding.)</td>
<td>The amount of bond required depends upon the reclamation requirements of the approved permit, and the amount reflects the probable difficulty of reclamation giving consideration to such factors as topography, geology of the site, hydrology, and revegetation potential. The amount of bond is primarily based upon (but not limited to) a reclamation cost estimate submitted by the company.</td>
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