

Progressive Reduction of Liabilities and Recovery of Financial Sureties in Recognition of Successful Rehabilitation in Western Australia

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Abstract

Financial sureties are a requirement for all mining projects in Australia, as in many countries, giving Governments recourse to funds in the event that mining companies do not meet their environmental obligations. There has been a general move by governments in recent years to strengthen their requirements for mining financial sureties.

Staged reductions in financial sureties have been successfully negotiated at a number of sites in Western Australia in recognition of demonstrated rehabilitation success. The opportunity to achieve staged reductions in financial sureties is a powerful tool to promote innovative design, progressive rehabilitation, establishment of completion criteria and ongoing performance monitoring in the mining industry. Most Australian financial surety systems offer staged reductions.

The authors have been involved in calculating and negotiating a number of financial surety reductions for mines in Western Australia, using a variety of tools to demonstrate rehabilitation success, including Ecosystem Function Analysis.

One recent example comes from the Mt McClure project in Western Australia, owned and operated by View Resources Limited. The actual financial surety lodged for Mt McClure was balanced against a re-calculated surety, using the State Government guidelines provided. We estimated the recalculated surety was \$665,600 less than the surety that was in place, and through a process of negotiations with the State Government, View Resources were awarded a \$665,600 reduction in recognition of successful rehabilitation and robust rehabilitation design.

The Western Australian State mining regulator gave a clear demonstration that they will respond positively to mines that bring clear evidence, using quality monitoring tools, of rehabilitation criteria being met.

1 Introduction

Financial sureties are a requirement for all mining projects in Australia, as in many countries around the world, giving Governments recourse to funds in the event that mining companies do not meet their environmental obligations.

Staged reductions in financial sureties have been successfully negotiated at a number of sites in Western Australia, in recognition of demonstrated rehabilitation success. The opportunity to achieve staged reductions in sureties is one of the best tools available to promote innovative design, progressive rehabilitation, establishment of completion criteria and ongoing performance monitoring in the mining industry. A core component of achieving reductions in financial sureties is the ability to measure and demonstrate rehabilitation success.

The mining industry is an important contributor to local and national economies world wide and it will continue to underpin the economies of many countries in the future. Australia is one of the world's leading exploration and mining nations and the resources sector makes a significant economic and social contribution to the Australian economy. Mining is the nation's largest single

exporter earner, the continent is the world's largest exporter of coal, iron ore, lead, diamonds and zinc, and the second largest exporter of gold and uranium. A sustainable mining industry is considered vital for Australia's ongoing development.

The future of the mining industry is likely to become more and more dependant on its reputation and its ability to maintain a social licence to operate (Mackenzie et al, 2006). Amongst many other tasks the authors have been involved in applying for and negotiating a number of financial surety reductions, including a project involving View Resource's Mt McClure project located in the Goldfields of Western Australia. This case study is presented and discussed in detail.

2 Financial Sureties in Mining

2.1 Overview

Government agencies throughout the world have increasingly adopted policies that require mining companies to provide financial sureties to guarantee the costs of reclaiming lands affected by mining (ICMM, 2005). The United States, Canada (the Yukon), Chile, India, Peru, South Africa, Botswana, Ghana, and Sweden have all strengthened their requirements in recent years. The standards of reclamation, and the forms and amounts of surety required vary between countries but are tending to cluster at the higher end. Some countries require no financial surety (eg. New Guinea), while others require high levels of financial surety and it is virtually impossible to surrender mining lands (eg. Sweden) (ICMM, 2005).

Governments and mining companies both have an interest in agreeing on realistic forms and amounts of financial sureties. 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. Although the amount of a financial surety may need to be adjusted later, this process of adjustment should be well understood and also agreed in advance.

Financial sureties for exploration, mineral development and mining projects are a requirement in all states and territories of Australia. They ensure that funds are available should the mining company default on the environmental conditions of the mining tenements, or become bankrupt. The processes for managing sureties in the Australian states of Western Australia, Queensland, New South Wales and Tasmania are described below.

2.2 Western Australia

In Western Australia financial sureties for the mining industry are generally by way of unconditional performance bonds (UPB) which are administered by the Department of Industry and Resources (DoIR). A UPB is a contract between the Minister for Resources and a third party of financial standing acceptable to the Minister, providing for the third party to unconditionally pay an agreed sum following the failure of the tenement holder to comply with agreed environmental commitments (Cobby, 2006). UPB's are required for the "life of project" and are only retired when the lessee submits an audit of compliance with the mining lease conditions that is acceptable to the DoIR (Daddo, 2004). No mining operation is able to commence or expand until the DoIR holds a satisfactory UPB.

Although UPB's do not reflect the estimated cost of rehabilitation, they are intended to encourage rehabilitation to a satisfactory standard (Cobby, 2006). UPB's cover all land that will require rehabilitation including waste rock landforms, tailings storage facilities, low-grade stockpiles, hardstand areas, plant sites, haul-roads, airstrips and campsites. Tailings storage facilities are often the most difficult, expensive and time-consuming to rehabilitate and as such are bonded at the highest rate.

The current guidelines for UPB's in Western Australia represent minimum rates that may be varied according to risk (Table 1) (DoIR, 2007).

Table 1 Western Australian Government guidelines for calculating UPB rates for disturbance types

Rate	Description	Surety Rate/ha
1	Tailings storage facilities, including in-pit disposal Heap / vat Leach Evaporation dams, turkey nest dams Waste dumps with high risk (sulphides, erodible, >25m high)	\$12,000
2	Waste dumps, ROM pads Low-grade oxide stockpiles Plant sites and workshops	\$10,000
3	Camp sites Strip mining (backfilled mining voids) Hypersaline pipelines (>15,000 TDS), causeways and haul roads	\$5,000
4	Roads and access tracks, 'fresh' water pipelines Laydown areas Borrow pits	\$3,000
5	Exploration – where clearing takes place Metal detecting, dry blowing Prospecting	\$2,000

Bonds are reviewed by the DoIR annually and can be varied according to the total disturbed area. Therefore, progressive mine rehabilitation is encouraged as bonds may be reduced if rehabilitation has been successfully completed. Bonds may be reduced as completion criteria for rehabilitation are met (Table 2) (DoIR, 2007).

Table 2 Western Australian Government guidelines for calculating reduced financial surety rates based on rehabilitation performance.

Stage	Action	Completion Criteria Met	Reduced Surety Rate / ha
1	Primary Earthworks - Reshaping - Drainage	Structure stable Erosion controlled Water run-off managed effectively	\$5,000
2	Finishing Earthworks - Topsoil spread - Deep ripping	Appropriate topsoil cover Adequate, contour ripping Demonstrated stability and control	\$3,000
3	Revegetation - Seeding - Planting	Vegetation established but not demonstrated to be self-sustaining Weed control program commenced Grazing control commenced	\$2,000
4	Relinquishment - All activity complete	All criteria met Where there are no criteria, there will need to be developed and agreed to before relinquishment can be achieved	\$0

The final stage of bond retirement and tenement relinquishment will occur when it can be satisfactorily demonstrated that the rehabilitated area is safe and stable, where erosion is comparable to the natural landscape and biological systems are sustainable under a range of seasonal conditions representative of the local climate (DoIR, 2007). Additionally, rehabilitation

must be shown to comply with all project-specific completion criteria in approval documents, annual environmental reports and closure plans. It may take up to 10 years or more after closure, before bonds are fully retired.

2.2 Queensland

In Queensland, the Environmental Protection Agency (EPA) requires financial surety for all exploration, mineral development and mining lease projects. The Department of Natural Resources and Mines may request an additional surety deposit to provide for a default in payment of rent and restoration of improvements (i.e. pre-existing structures) (QRC, 2004). Financial sureties can be in the form of cash, a bank guarantee or insurance bond, and must be lodged before any mining activities can commence.

Queensland has a two-tier financial surety system for exploration and mineral development projects:

- Standard projects (less than 10 hectares in size).
- Non-standard projects, including all projects located on a granted mining lease.

2.2.1 Standard Projects

The amount of financial surety required for ‘standard’ projects is specified in the Code of Environmental Compliance for Exploration and Mineral Development Projects (Table 3) and is based on the total area of significant disturbance and the risk associated with rehabilitation (EPA, 2003).

Table 3 Queensland EPA guidelines for calculating financial sureties for standard projects.

Total Area of Disturbance	Surety rate (\$ /ha)	
	Low Risk: Simple straight forward rehabilitation or, if successful rehabilitation of analogous sites has previously been achieved	High Risk: Difficult rehabilitation e.g. dispersive soils, steep topography, remoteness, sensitive areas etc.
Less than 1 hectare	\$2,500	\$5,000
1 to 4 hectares	\$10,000	\$20,000
4 to 10 hectares	\$20,000	\$40,000

2.2.2 Non-Standard Projects

Financial sureties for non-standard projects are calculated from estimates of total rehabilitation costs and include a performance discount system for those projects on granted mining leases. Estimates of total rehabilitation costs must (EPA, 2003):

- Be calculated on a project basis (i.e. may cover several tenements).
- Be based on estimates for the work to be completed by third party contractors.
- Be estimated using a schedule of disturbance and rehabilitation, which is a required component of the environmental management plan and the plan of operations.

The amount of financial surety is calculated on the maximum total rehabilitation cost for rehabilitation of all disturbed areas during the life of the operation. The amount of financial surety may vary on an annual basis due to progressive rehabilitation (EPA, 2003).

Mining lease projects have an economic incentive to undertake progressive improvement of environmental performance and rehabilitation through a performance discount system. Discounts

are determined by evaluating the environmental performance of a company against the following criteria outlined in Table 4.

Table 4 Queensland EPA guidelines for calculating performance discount rates.

Category	% of total cost	Summary of criteria
5	100	Basic operational approvals in place
4	90	Demonstrated ability to comply with the environmental authority and plan of operations
3	65	Satisfactory performance for 2 years
2	40	Satisfactory operational environmental performance maintained
1	25	Validation of environmental management overview strategy commitments, and beyond compliance behaviour

The performance discount is applied to the highest total rehabilitation cost calculated for any year and is calculated using the formula (EPA, 2003):

Financial Assurance = Maximum Annual Rehabilitation Cost x Percentage Required

When applying for the surrender of tenure, the company is required to submit a rehabilitation report containing specific information about the status of rehabilitated areas, a statement from the landowner and details of any residual monitoring or management requirements where relevant (QRC, 2004).

The EPA will evaluate the submission and decide on the amount of financial surety to be retained to cover residual environmental risks. The surrender of tenure cannot be granted until the EPA has concluded that all environmental management conditions and commitments have been fulfilled (QRC, 2004).

2.3 New South Wales

The New South Wales (NSW) Department of Primary Industries (DPI) introduced a new financial surety policy in November 2005. This new policy aims to encourage progressive rehabilitation through the regular review of rehabilitation liabilities and progressive release of sureties where applicable (DPI NSW, 2006). Sureties are calculated from rehabilitation cost estimates and are required as either cash or a security certificate in a form approved by the Minister for Mineral Resources.

Titleholders must document all proposed site disturbance and rehabilitation requirements as part of their Mine Operations Plan (MOP), along with a rehabilitation cost estimate that fully addresses these rehabilitation requirements to the satisfaction of the DPI (DPI NSW, 2006). The DPI has implemented rehabilitation and completion criteria guidelines, with key consideration for rehabilitating to an agreed end land use.

Rehabilitation cost estimates must be based on likely cost to the DPI in the event that a third party contractor is required to rehabilitate the title. The following costs must be included in all rehabilitation cost estimates:

- Mobilisation costs.
- Project management costs (add 10%).
- Monitoring costs (add 5%).
- Contingency (add 10%).
- Indexation for inflation.

These costs are included in the DPI rehabilitation cost calculation tool (<http://www.dpi.nsw.gov.au/minerals/environment/pgf>).

Financial sureties will be released when the DPI is satisfied that the titleholder has demonstrated that rehabilitation and closure criteria have been met. DPI encourages progressive rehabilitation and titleholders may request a surety review to reflect a decrease in rehabilitation liabilities.

1.4 Tasmania

Under the Tasmanian system applicants must lodge financial sureties (bonds) in the form of cash, term deposit or bank guarantee with the Crown before the Minister can grant either an exploration licence, retention licence or a mining lease (DIER, 2006). Bonds are calculated on the basis of an estimate of disturbance and the likely costs of rehabilitation. Bonds are administered by Mineral Resources Tasmania, a division of the Department of Infrastructure, Energy and Resources and can be reviewed at any time. Generally bond amounts are assessed:

- When an application is made for an exploration licence, retention licence or a mining lease.
- On a regular basis to ensure that the bonds reflect the current level of disturbance and likely costs of remediation.
- As determined by the Minister for Infrastructure, Energy and Resources, in line with developmental phases of an operation.
- On renewal or transfer of a lease.

Bonds for small mines are calculated on the basis of risk and also reflect the cost of remediation. Additional sums will be added to the bond for mobilisation of equipment, and rehabilitation of complex features.

The bond calculations are as follows:

- \$200 per hectare for lease area if on Crown Land.
- \$5,000 per hectare for quarries which have good access.
- \$10,000 per hectare for more remote or larger sites.
- \$20,000 per hectare for contaminated sites (e.g. pyritic tailings) and sensitive environments.

Bonds for large and complex sites are determined by costing various components of remediation required to address current levels of disturbance.

Many of the larger mines in Tasmania include areas of historic disturbance. Acid mine drainage is a legacy from some historical workings. The bonds on most large mines are insufficient to cover the cost of the current liabilities, in terms of both current disturbance and historical legacies. It is estimated that liabilities at some sites may amount to \$20-30 million, while the bonds which are held are in the order of \$2-3 million. In these circumstances steps are taken to ensure future rehabilitation, including the implementation of closure plans, acknowledgement that current bonds do not cover current liabilities and efforts to match bonds with liabilities through either reducing liabilities via progressive rehabilitation or payment of additional bonds.

Tailings dams are recognised for their long-term maintenance requirements by retaining a portion of the bond to provide for future surveillance and maintenance.

3 Using Surety Reductions to Encourage Progressive Rehabilitation

Staged reductions in financial sureties are a powerful tool to encourage progressive rehabilitation and monitoring of rehabilitation performance. In Western Australia mining companies are actively encouraged to undertake progressive rehabilitation via government guidelines and by other more direct means such as mining lease conditions. As detailed earlier, most Australian financial surety systems encourage innovative planning, progressive rehabilitation and on-going performance monitoring, by offering staged reductions in financial sureties.

In brief, the benefits of progressive rehabilitation for mining companies include:

- Reduction of on-going environmental liabilities.
- Distribution of rehabilitation and closure costs during the productive phase of mining rather than deferral to the end of the project.
- Increased efficiency through reduction of double handling of waste rock and rehabilitation materials.
- Ongoing feedback, through monitoring, of the effectiveness of rehabilitation designs.
- Lower risk of regulatory non-compliances and less regulatory interest.
- Improved access to land resources from governments.
- Greater acceptance by key stakeholders.
- Reduced period of post-closure monitoring and maintenance, for areas rehabilitated earlier during the life of mine.

In Western Australia UPB reductions have been successfully negotiated in cases where the DoIR agree that the risks associated with a landform (for example), have been reduced significantly and that the State Government is sufficiently covered with the current UPB. Conversely, UPB's have been increased in cases where the State Government is exposed to unacceptable risks, where the current UPB does not adequately cover the risk to the State. In most cases the company has been given the opportunity to develop an adequate strategy for, and a commitment to, rehabilitating the area to avoid the proposed UPB increase (Mackenzie *et al*, 2006).

4 Measuring and Demonstrating Rehabilitation Success in Western Australia

There are a number of monitoring tools for rehabilitation that are recognised by the Western Australian DoIR as being appropriate to support an application for a reduction in UPB's. Given that the initial stages of UPB reduction focus principally on earthworks, and that many Western Australian mines are remote, then a guided 'virtual tour' using photography and aerial images is useful. However, a site-visit to jointly assess and negotiate the proposed stage of rehabilitation for each landform is an essential component of the process.

After vegetation has been established, monitoring data becomes critical as supporting evidence for bond reductions. The focus of monitoring will vary, depending on the nature of the ecosystem, and the planned final land use. Objectives for rehabilitation have been set out by the Western Australian Environmental Protection Authority (EPA, 2006), and can be summarised as follows:

- Safe, stable and resilient landforms and soils.
- Appropriate hydrology.
- Providing visual amenity, retaining heritage values and suitable for agreed land uses.
- Resilient and self-sustaining vegetation comprised of local provenance species.
- Reaching agreed numeric targets for vegetation recovery.
- Comprising habitats capable of supporting all types of biodiversity.

As set out in these objectives, establishing an appropriate abiotic environment, is a critical first step in the overall restoration process. In addition to geotechnical and surface stability, we consider that the physical and chemical fertility of the soils are also important. Defining appropriate soil parameters depends in turn on an understanding of the requirements of the vegetation communities that are proposed to be established. Typically this should involve investigation and characterization of local soils that support these communities

Once vegetation is established, then monitoring is critical for all stakeholders to assess progress in relation to the overall objectives. In most Australian environments, water is a critical resource for vegetation productivity and ecosystem function. Therefore, the restored ecosystem should not only be made up of the target plant community, but should also retain resources, such as water and

nutrients, locally. Therefore, monitoring should focus on both of these aspects, and techniques such as Ecosystem Function Analysis (EFA) (Tongway and Ludwig, 1995) are suitable. We have used EFA to provide this supporting data across a number of sites. At sites such as nature reserves, where restoration of the plant community may be particularly critical in achieving the end land use, then it may be appropriate to compliment EFA with targeted botanical monitoring.

EFA provides an index of soil stability, nutrient cycling, infiltration and plant cover, density and diversity, we complement this with a measure of erosion and habitat complexity. A critical component of justifying bond reductions is to compare site EFA data with data from regional natural reference sites and other rehabilitated sites (see case study below). This provides a direct local comparison with undisturbed sites that are experiencing the same climatic conditions as the rehabilitated sites of interest. As an additional step, we integrate the EFA indices into a single easily-interpreted spreadsheet that also displays previous monitoring outcomes. This allows all stakeholders to quickly assess the relative attributes or deficiencies of the rehabilitated areas.

5 Case Study – Calculating and Negotiating a Surety Reduction at the Mt McClure Gold Project, Western Australia

5.1 Overview

The authors have been involved in calculating and negotiating a number of financial surety reductions for mines in Western Australia, using a variety of tools to demonstrate rehabilitation success. In Western Australia, reductions are negotiated according to the 2003 DoIR guideline in which a number of broad criteria that need to be achieved to demonstrate the particular stage of rehabilitation.

One recent example comes from the Mt McClure project, owned and operated by View Resources Limited. The actual financial surety lodged for Mt McClure was balanced against a re-calculated surety, using the guidelines provided. We estimated the recalculated surety was \$665,600 less than the surety that was in place, and through a process of negotiations with the State Government, View Resources were awarded a \$665,600 reduction in UPB due to recognition by DoIR of successful rehabilitation and robust rehabilitation design.

5.2 Location and Background

The Mt McClure goldmine is located approximately 700km north-east of Perth, in the East Murchison Mineral Field of Western Australia. Mt McClure comprised seven open pit mines, two underground mines, a processing plant site, two tailings storage facilities and a number of waste rock landforms. By 2004 all mines and associated infrastructure were decommissioned and rehabilitated by Newmont Australia. Rehabilitation incorporated innovative designs including concave slopes, use of lateritic rock armour, and fencing to limit grazing pressure. The rehabilitation and closure effort was awarded Western Australia's highest mining environmental award, a "Golden Gecko" in recognition of co-operative partnerships in planning and execution of decommissioning and rehabilitation.

Mt McClure is currently under a program of post closure monitoring and reporting, although View Resources have revitalised the mines and have reopened some of the open pit and underground resources.

5.3 Balance of actual versus re-estimated financial sureties

In 2006 the financial sureties for Mt McClure were re-estimated in an effort to identify if a reduction could be achieved. The first step involved calculating the footprint of all disturbed areas from recent aerial photography. Each disturbance area was attributed a land use category and an associated bond in accordance with the Western Australian guidelines (see Section 2.2).

The second step involved determining which stage of rehabilitation had been achieved at each area, so that a reduced rate, if warranted, could be applied. The rehabilitation status of each area was determined using the following tools:

- Site visit and visual assessment.

- Annual EFA rehabilitation monitoring data.

5.3.1 Site Visit and Visual Assessment

A site visit was undertaken to visually assess rehabilitation performance at each area. Photographs were taken from various locations and general observations on performance were recorded. These photographs and observations were compiled into a “surety reduction application” to provide supporting evidence and allow a virtual tour of the remote site for the assessing officers, who were situated 7-15 hours drive from the minesite.

5.3.2 Review of available monitoring data

EFA data from three years of rehabilitation monitoring (2004 to 2006) were available for all sites, together with associated photographic records. Soil surface stability and erosion data were compared to a regional data set and photographs over the three year period were reviewed in concert with the monitoring data (Figure 1). This information was also compiled and presented in the “surety reduction application”.

5.4 Outcome

The “surety reduction application” was submitted for review, and a site visit was then arranged to negotiate and agree upon the rehabilitation status of each area. It was agreed that most rehabilitated areas had achieved Stage 2 and that some areas had achieved Stage 3 criteria according to the State Government guidelines (Table 2), and that reduced surety rates could be applied to each area.

The reduced rates were applied to each rehabilitated area and a final “surety reduction application” was submitted. The State Government adjusted the surety rates accordingly and View Resources were awarded a reduction of \$665,600 from a total of \$2,314,100 leaving a residual surety of \$1,648,500.

This substantial reduction resulted in an immediate boost to cash flow for View Resources, which in the opinion of the Managing Director was critical for the planning and re-development of the mine. Moreover the State mining regulator (DoIR) provided the company and the broader industry with a clear demonstration that they will respond positively to mines that bring clear evidence, using quality monitoring tools, of criteria being met. The regulator responded by rewarding a mine where progressive, well-planned and robust rehabilitation had been undertaken.

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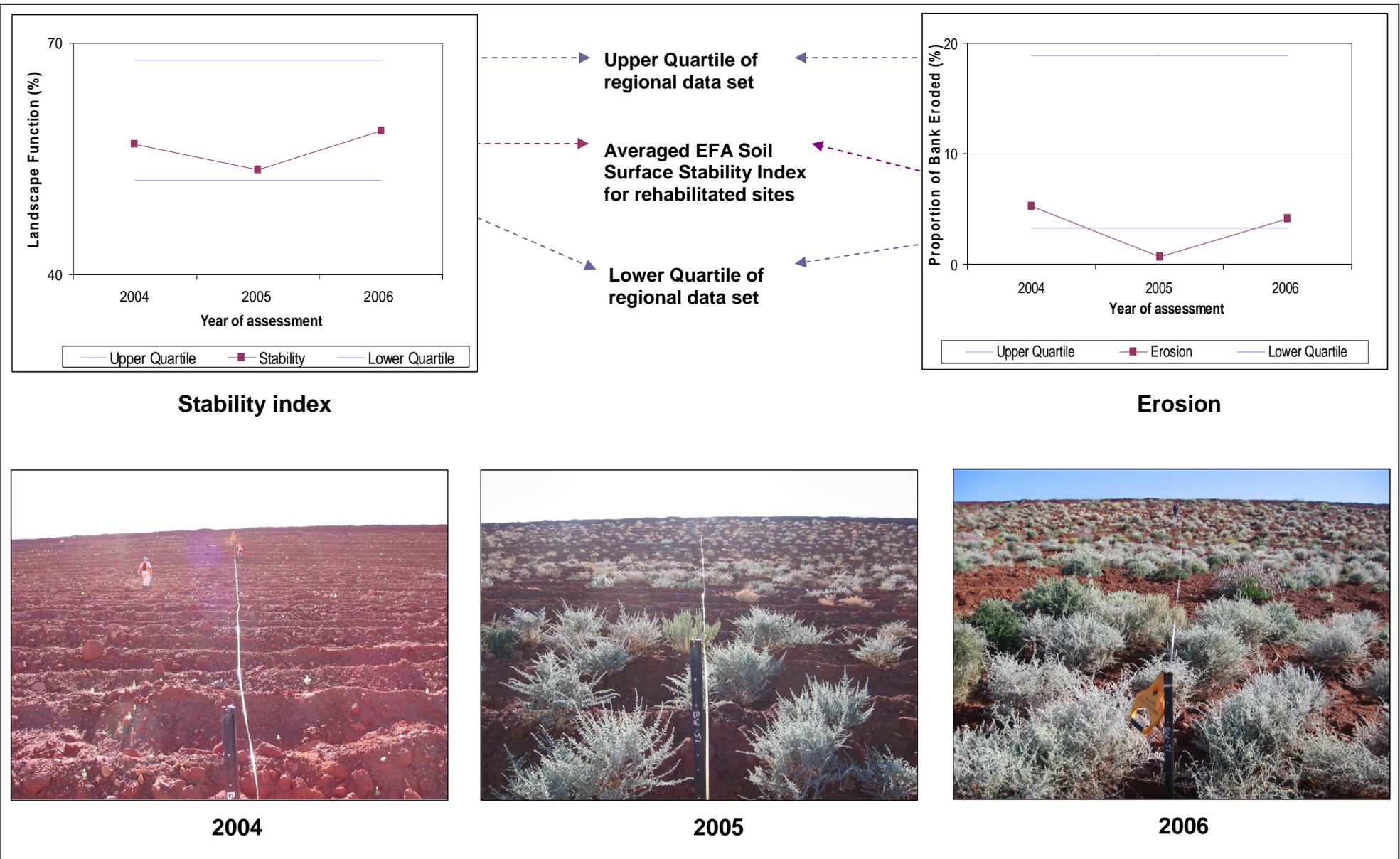


Figure 1 Mt McClure Tailings Storage Facility soil surface stability and erosion data compared to regional data set and photographs over the three year period.

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