

STATE OF MINE REHABILITATION

REPORT CARD

A snapshot of the rehabilitation performance across Queensland's mining sector.

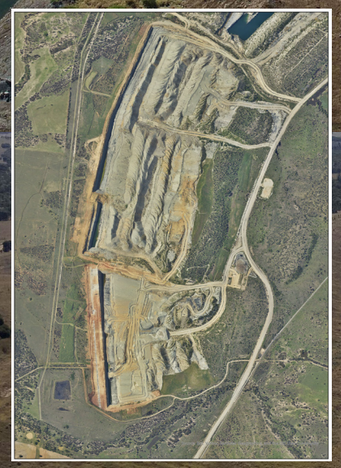
The Office of the Queensland Mine Rehabilitation Commissioner (QMRC) is responsible for engaging with stakeholders on mine rehabilitation matters and producing technical reports on leading practice rehabilitation. QMRC also provides advice to the Minister on mine rehabilitation practices and policies, and reports on mine rehabilitation performance and trends in Queensland.

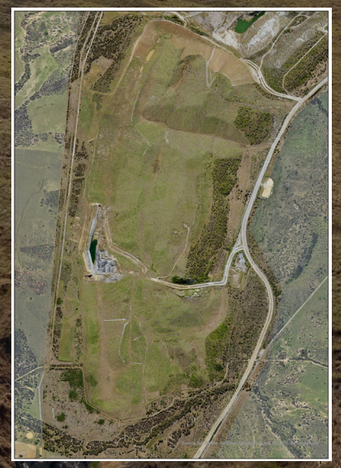
October 2026 marks five years from the establishment of QMRC and appointment of the Commissioner, this report card provides a snapshot of the rehabilitation performance of the State's major mines. This report card highlights key data findings and case studies of leading rehabilitation practices being undertaken across the State.

Queensland Government

Office of the **Queensland Mine Rehabilitation Commissioner**

Case Study 1: **Highwall Rehabilitation in Central Queensland**





Introduction

Steep open-cut coal mine highwalls have long presented one of the most challenging aspects of mine closure and rehabilitation in Central Queensland. Managing these landforms is critical to improving safety, reducing environmental risks and achieving sustainable post-mining land uses.

At Dawson Mine, near Moura, **innovative highwall reshaping techniques** have demonstrated how targeted rehabilitation can improve long-term landform stability, reduce closure liabilities and create opportunities for productive post-mining landscapes.

Challenge

If left in their original mined configuration, steep highwalls can present significant residual risks associated with community safety, structural stability, erosion and long-term water quality.

Landform evolution modeling undertaken at Dawson Mine identified potential **erosion rates exceeding 3,000 tonnes per hectare per year during the early post-closure period** if left as is. Without intervention, rilling and gullying could contribute to progressive highwall crest retreat and ongoing landform instability.

The residual voids also present challenges, including the potential accumulation of poor-quality water. Modeling indicates that declining water quality over time may limit opportunities for beneficial reuse without further treatment, resulting in areas being classified as Non-Use Management Areas (NUMAs).

These challenges highlight the need for rehabilitation approaches that reduce long-term environmental risks while supporting safe, stable and sustainable post-mining landforms.

Response

In response, mine owner Anglo American pioneered an approach to highwall rehabilitation using **cast blasting and dozer push reshaping** to improve environmental outcomes and minimise mine closure risks.

Trials undertaken at Dawson Mine in 2013 demonstrated that up to two-thirds of the required highwall reshaping could be safely achieved through cast blasting alone on slopes angled between 25–33%, substantially reducing reliance on dozer push methods.

This approach improved operational efficiency and contributed to a significant reduction in closure liability, supporting the adoption of highwall blasting and reshaping as an established rehabilitation methodology at the site.

Where highwall treatments have been implemented, erosion modeling indicates a significant reduction in long-term erosion risk, alongside improved conditions for vegetation establishment and the achievement of desired post-mining land uses.

Two residual voids where this has been implemented at Dawson Mine demonstrate positive outcomes, including:

- High levels of vegetative groundcover.
- Reduced extent of NUMAs.
- Improved recruitment of native bushland species.
- Greater potential for sustainable post-mining land uses.

With the NUMAs minimised, the remaining areas are currently designated for a **bushland post-mining land use**, with potential to support sustainable cattle grazing or alternative land uses in the future.

The outcomes demonstrate how innovative highwall rehabilitation techniques can reduce environmental and closure risks while improving opportunities for stable, productive and sustainable post-mining landforms.

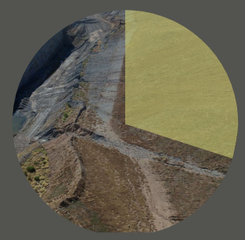
Rehabilitation Performance

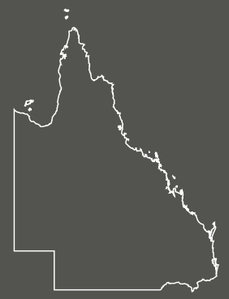
Rehabilitation status for Queensland major mines from 2021-2025

At the end of 2025, the **200 largest mines** in the State *had disturbed 325,000 hectares* of land, **30%**

of which has been rehabilitated.

While the average rate of progressive rehabilitation is 30%, that rate varies widely between companies.

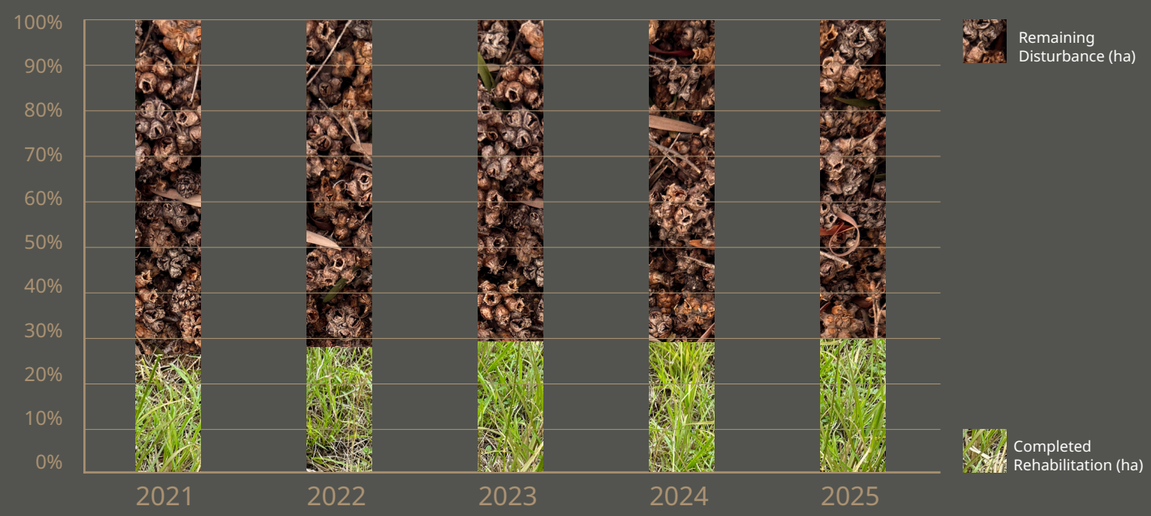




Current rate of progressive rehabilitation

Comparing the area of completed rehabilitation against the area of disturbance as a percentage provides a measure of rehabilitation performance referred to as 'rate of progressive rehabilitation'[1]. Although this measure is not all encompassing, it is useful to demonstrate performance trends across the industry. More information about the source data and its limitations can be found in the Commissioner's annual reports.

1 The data that underpins this analysis is provided by mining companies through their annual returns and is externally available.



Change in rate of progressive rehabilitation

The industry has demonstrated a year-on-year increase in the rate of progressive rehabilitation between 2021-2025, from 26% to 30%.

Case Study 2: **Coastal Dune Rehabilitation in Cape York Peninsula**

Introduction

Operating since the 1960s, the Cape Flattery silica mine (CFSM) on the remote eastern coast of Cape York Peninsula has developed and refined its approach to rehabilitating sensitive coastal dune ecosystems over several decades.

The Cape Flattery landscape is home to some of the most unique and best developed sand dune systems in the world. It is also one of the most remote and pristine environments of any mine in Queensland. This setting has shaped CFSM's commitment to restoring mined landscapes to a **conservation-focused post-mining land use**, with 119.97 ha of approved progressively certified rehabilitation, with some dating back 30 years.



Challenge

Rehabilitating the coastal dune ecosystem requires careful reconstruction of complex landforms and the **restoration of rare and significant native vegetation** communities.

At Cape Flattery, the challenge extends beyond establishing vegetation to recreating the pre-mining landscape, preserving its ecological characteristics and supporting the long-term recovery of native ecosystems.

CFSM has established clear rehabilitation objectives, including:

- Delivering a scheduled annual program of progressive rehabilitation.
- Ensuring no net loss of rare and significant dune and ridge landforms.
- Restoring the native flora of pre-mining ecosystems.

The site's remote location and unique ecological conditions also present challenges in sourcing and propagating suitable native plant material. Disease outbreaks, extreme weather events and potential disruptions to nursery production can affect the availability of seeds and plants required for rehabilitation.

These challenges demand a specialised, long-term approach to landform reconstruction, native species propagation and ecosystem monitoring.

Response

In response, CFSM has developed an integrated rehabilitation program combining **precision landform reconstruction, on-site native plant propagation and long-term ecological monitoring**.

Before mining, drone surveys capture detailed topographic information and map native species distribution, establishing a baseline against which rehabilitation outcomes can be measured.

Reconstructed landforms are required to match pre-mining topography within a **1%** **margin of error,** supporting the accurate restoration of the site's distinctive dune and ridge systems.

The mine also monitors ecosystem development across rehabilitation areas established up to 30 years ago. These long-term observations provide valuable insights into vegetation recovery and help inform rehabilitation practices in newer areas.

A central component of this approach is CFSM's dedicated on-site nursery, developed over more than 40 years to provide a reliable supply of locally sourced native seeds and plants.

The Nursery

Seeds are collected from eight designated seed collection areas within natural vegetation communities on-site, representing the target native species. Through decades of research and practical experience, the rehabilitation team has refined propagation techniques to meet the specific requirements of these species.

Recent nursery expansion has increased annual production capacity to approximately:

50kg native seeds

100kg grass seed

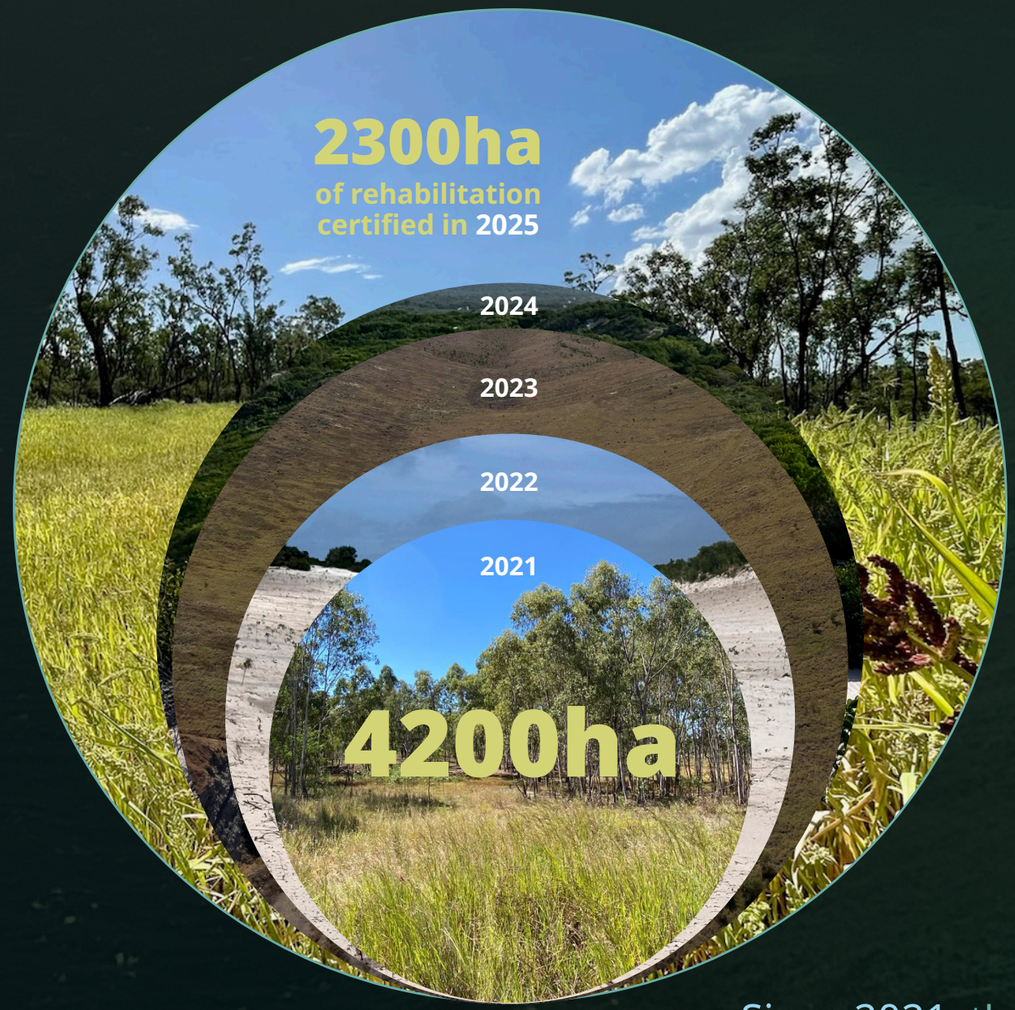
84000 stems of tube stock

To protect this critical supply, the nursery employs strict hygiene protocols, segregated production processes, quarantine measures and a dedicated backup generator. Tube stock production provides an additional safeguard against seed loss while supporting the volume of native vegetation required for progressive rehabilitation.

With permanent rehabilitation personnel working year-round on landform reconstruction and nursery operations, CFSM has established a sustained approach to ecosystem restoration.

The program demonstrates how **long-term investment in ecological knowledge, specialised propagation and precision rehabilitation techniques** can support the progressive recovery of sensitive coastal environments and conservation-focused post-mining landscapes.

Rehabilitation Performance



The rate of certified rehabilitation between 2021-2025

In Queensland, one of the key measures of quality of completed rehabilitation is the amount of land certified by the Department of the Environment, Tourism, Science and Innovation (DETSI).

Since 2021, the area of **certified rehabilitation** *across the State's major mines has* increased from **4200ha** to **8500ha** in 2025

Case Study 3: **Grazing as a Post-Mining Land Use – New Acland**

Introduction

New Acland Coal's (NAC) progressive rehabilitation program demonstrates how mined land can be returned to a stable, productive grazing landscape, consistent with the surrounding Darling Downs environment.

Since 2005, NAC has progressively **rehabilitated 698 hectares of disturbed land, with 349 hectares formally certified by DETSI**. This approach integrates rehabilitation with ongoing mining operations, supporting long-term land productivity and future lease surrender.

Challenge

Restoring mined land to productive grazing requires careful **management of soil resources, landform stability and pasture establishment**.

At NAC, particular challenges include preserving the structure of self-mulching clay soils during handling, managing weed and pest infestations, and controlling the natural establishment of pasture species that are less preferred by cattle.

Maintaining soil quality is critical to rehabilitation success. Unnecessary soil handling and stockpiling can compromise soil structure, while effective ground preparation and pasture establishment are essential to supporting long-term grazing productivity.

These challenges highlight the importance of integrating soil preservation, practical agronomic management and ongoing monitoring throughout the rehabilitation process.



Response

In response, NAC has established a progressive rehabilitation program focused on **soil resource preservation, landform stability, pasture productivity and continuous improvement**.

Topsoil and subsoil are selectively stripped and managed to minimise handling and preserve soil structure before being returned to recreate functional soil profiles suitable for grazing. Practical agronomic input guides ground preparation, soil amelioration and low-disturbance seeding to support consistent pasture establishment.

More recently, NAC has introduced vegetation mulching ahead of mining, allowing organic material to be recovered with the soil. This approach aims to retain carbon and organic matter, supporting nutrient cycling when soils are reused for rehabilitation.

The effectiveness of NAC's rehabilitation has been independently assessed through a **five-year cattle grazing trial**, involving livestock consultants and researchers from the University of Southern Queensland. Results indicated that rehabilitated soils had comparable properties to local unmined soils, supported pasture growth and demonstrated no identified constraints to long-term sustainable pasture production during the assessment.[1]

Ongoing monitoring of soils, vegetation, erosion and landform stability informs continuous improvements to rehabilitation practices.

Following progressive certification, rehabilitated land transitions to Acland Pastoral Company, an adjacent farming, grazing and land management enterprise. Grazing contributes to the rehabilitation cycle by returning organic matter and nutrients to the soil, stimulating biological activity and supporting the development of productive, self-sustaining pasture ecosystems.

The program demonstrates how **integrated soil management, evidence-based rehabilitation and ongoing agricultural use** can successfully return mined landscapes to sustainable grazing land while supporting progressive certification and mine closure objectives.

Reference
[1] McL Bennett J, Melland AR, Eberhard J, Paton C, Clewett JF, Newsome T and Baillie C (2021) 'Rehabilitating open-cut coal mine spoil for a pasture system in South East Queensland, Australia: abiotic soil properties compared with unmined land through time', Geoderma Regional, 25. https://doi.org/10.1016/j.geodrs.2021.e00364

Looking **Forward**

The challenges for successful progressive rehabilitation and transitions to sustainable post-mining land uses continue.

QMRC is committed to a strong forward work program, expanding its leading practice guidance and ensuring it remains current as scientific understanding and technologies evolve. Emerging technologies, including artificial intelligence (AI) and increasingly detailed remote sensing at ever-finer levels of granularity, are creating new opportunities to inform rehabilitation strategies, improve monitoring and support decision-making.

While our focus remains on advancing leading practice in the technical aspects of mine rehabilitation, we recognise that successful rehabilitation must also deliver enduring value for local communities and the environment.

Our work into the future will have increasing focus on the relationship between environmental, economic, social and cultural values with mine rehabilitation and post-mining land use transitions to support sustainable outcomes for Queensland's mining landscapes and communities.



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