2024–25 Report

Queensland Mine Rehabilitation Commissioner

Queensland Government

The Office of the Queensland Mine Rehabilitation Commissioner acknowledges the Aboriginal and Torres Strait Islander peoples on whose lands the resources industry operates.

Purpose of this report

This report forms part of the Office of the Queensland Mine Rehabilitation Commissioner's corporate governance framework and fulfils the Commissioner's obligation under section 444O of the *Environmental Protection Act 1994* to provide the Minister (Minister for the Environment and Tourism and Minister for Science and Innovation) with an annual report about the operations of the Commissioner during the year, within four months of the end of the financial year.

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1 Introduction

This is the fourth report of the Queensland Mine Rehabilitation Commissioner (the Commissioner). The report describes our engagement on mine rehabilitation, summarises our leading practice rehabilitation research and analysis, and presents the performance and trends in progressive mine rehabilitation in Queensland.

1.1. The Commissioner's role

The Commissioner is an independent person, appointed under the *Environmental Protection Act 1994* (EP Act) to provide advice to the Minister responsible for mine rehabilitation management practices, outcomes and policies (the Minister). The Commissioner's role covers 'resource activities' in Queensland, including mining and petroleum activities.

The Commissioner also monitors and reports on rehabilitation practices and trends, raises awareness of rehabilitation management matters, and provides advice and reports on rehabilitation performance. The role of the Commissioner is independent and separate from the administering authority that regulates resource activities.

The Commissioner was appointed by the Governor in Council and reports directly to the Minister. The Commissioner and staff of the Office of the Commissioner (QMRC team) are dedicated to working collaboratively with all interested parties, including Aboriginal peoples, Torres Strait Islander peoples, the resources industry, environmental and scientific groups, communities and government. See Appendix A – Administration for details on the administration of the Commissioner's responsibilities.

Our approach

The vision of the Commissioner and QMRC team is to *lead Queensland to achieve best practice in mined land rehabilitation*. We do this through four key strategies:

Connect

- Consult with stakeholders to raise awareness on technical, scientific and engagement matters.
- Synthesise stakeholder perspectives and best practice mine rehabilitation to optimise environmental, social and economic outcomes.

Research

- Identify rehabilitation priorities for Queensland.
- Produce advice informed by global best practice.
- Undertake research in collaboration with stakeholders.
- Identify opportunities and challenges to achieving leading practice mine rehabilitation.

Advise

- Provide advice to the Minister on mine rehabilitation and management practices, outcomes and policies.
- Provide advice to the Minister on public interest evaluation processes and performance.

Report

- Report annually to the Minister and Parliament on leading practice mine rehabilitation.
- Publish advice, reports and guidance.
- Report on rehabilitation performance and trends in Queensland.

2 Stakeholder engagement

The Commissioner and QMRC team consulted with a broad range of stakeholders in 2024–25. We held 199 consultation meetings with First Nations organisations, academia, professional associations, peak bodies, conservation stakeholders, resource companies, local governments and government agencies. Our stakeholder engagement included visiting 23 resource sites and we wish to acknowledge the cooperation of the industry in affording access.

Stakeholders used these opportunities to express a wide range of views regarding progressive rehabilitation, closure planning and post-mining land uses. We will continue to engage with all parties to better understand aspirations and perspectives to inform our advice and publications.

2.1. Workshops and conferences

In June 2025, the QMRC team held a seminar on our technical paper ‘Applying erosion and landscape evolution models to assess post-mining landform stability’ in partnership with Dr Greg Hancock (Appendix B has a link to the paper on our website). Attendees had the opportunity to discuss the topic with experts in erosion and landscape evolution modelling. The online seminar was attended by over 180 people, including mine rehabilitation consultants, government representatives, mining company personnel and academics. It included participants from Queensland, New South Wales, Victoria, Western Australia, the Australian Capital Territory, New Zealand, Germany and India. Feedback from attendees was overwhelmingly positive.

In May 2025, we presented to the Southern Queensland Land Rehabilitation Group on the role of the Commissioner and QMRC team and provided an update on our research and reporting priorities.

In May 2025, the Commissioner was part of a panel discussion at the Global Coal Transitions Workshop, hosted by the Cooperative Research Centre for Transformations in Mining Economies (CRC TiME) at the Sustainable Minerals Institute, University of Queensland. The panel discussed the roles of regional communities and government and the importance of dialogue in coal transitions.

The QMRC team also attended the CRC TiME forum in Brisbane in August 2024. The Commissioner gave a presentation on the rights, obligations and interests of stakeholders in post-mining futures and our Principal Technical Advisor was part of a panel discussion on the challenges of preventing and managing acid and metalliferous drainage (AMD).

This year, we presented a paper at the Mine Closure Conference 2024 in Perth. The paper compared open cut coal mine rehabilitation practices in Queensland with that of Wyoming in the United States. It was jointly presented by our Principal Technical Advisor and a representative of the Wyoming Department of Environmental Quality (Appendix B has a link to the paper on our website).

In August 2024, our Program Manager presented at the Aging Assets and Plant Decommissioning Conference. The conference gathered energy industry leaders to discuss and share case studies on best practices in ageing asset integrity, decommissioning project management and site rehabilitation.

In August 2024, we also presented at the Central Queensland Mine Rehabilitation Group meeting held across two locations (Emerald and Brisbane). We provided an update on QMRC projects and sought feedback from the group on research priorities for leading practice development.

3 Research on leading practice

This year, our research priorities centred on final landforms. Landform design using erosion and landform evolution models was the subject of two technical papers and a seminar. In addition, we published three technical papers on the use of cover system trials to determine cover performance and better manage AMD. We also published interim advice on best practice management of residual voids as non-use management areas at coal mines.

The following sections provide a brief overview of our research. Links to our papers and further information on our partners and contract award dates are in Appendix B – Key QMRC research topics.

3.1. Final landforms

This year, we continued to develop leading practice advice on establishing stable post-mining landforms.

Modelling to predict long-term landform stability

Several erosion and landscape evolution models are commonly used in Queensland to predict the stability of mine waste landforms. When used in the landform design process, these models help optimise the final landform design by identifying erosion hotspots and the conditions under which they form. With our partner, Aquaterra International, we published a technical paper that introduces these models, discusses their application and considers model parameters and validation.

The paper also discusses factors relevant to the process used to design a post-mining landform. These include using a coordinated approach throughout mine operations, setting landform objectives, using predictive models and understanding the erosional processes associated with material type and climate.

Leading practices for reviewing landform design modelling

Mine operators are required to model the final landform design to demonstrate the long-term stability of the constructed landform. The appropriate application of data collected by erosion studies and the use of erosion models requires the services of technical experts with well-developed knowledge and skills. We engaged Landloch to develop leading practices on how to review landform design modelling reports and erosion studies used in mine rehabilitation planning.

Mine waste cover system research trials

Cover systems on mine waste structures are an important component of strategies used to reduce AMD into the environment. Field-scale trials test the performance and practicality of cover systems prior to full-scale deployment. In partnership with Environmental Geochemistry International, the QMRC team considered how trials can be tailored specifically for Queensland conditions.

Drawing on global experience of whole-of-mine-life AMD management, we undertook a literature review of trial methodologies, examined case studies on cover trials and cover performance monitoring, and developed a trial methodology for application in Queensland. We published three technical papers that introduce a leading practice approach to field-scale trials that are robust and cost-effective and avoid excessive or impractical requirements.

We also engaged Affinitas ODI to examine how the removal of certain administrative or regulatory processes may accelerate rehabilitation of mine waste structures, including the routine application of field-scale cover trials.

Managing coal mine voids as non-use management areas

In Queensland, classifying a mining area as a non-use management area (NUMA) requires the holder of the environmental authority to achieve ‘best practice management’ of the area and minimise risks to the environment. There is currently limited advice on how to achieve best practice management so the QMRC team has commenced a project to develop leading practice guidance. This year, we published interim, preliminary information in a practice note focused on open cut coal mine voids classified as NUMAs. It gives an overview of the key challenges associated with managing final voids and presents high-level management principles.

Geotechnical management of non-use management areas

Geotechnical stability is a significant aspect of best practice management of NUMAs. The QMRC team partnered with Henderson Geotech to describe leading practice principles for assessing the long-term geotechnical stability of mine void NUMAs. This project will provide guidance on geotechnical stability for both coal and mineral mines, expanding on information in Simmons J, Henderson S and Kennedy G (2024) ‘Guidelines for Assessment of Geotechnically Safe and Stable Post-Mining Landforms’ (Project Report C34028, Australian Coal Research Program). Our guidance will be provided as a practice note that summarises fundamental concepts and information essential to assessing long-term geotechnical stability.

Manufacturing growth media for mine revegetation

A suitable growth medium is key to the successful re-establishment of vegetation on disturbed land but lack of topsoil is a major constraint (a QMRC student report on the impact of topsoil deficit on mine rehabilitation is on our website). One solution is to utilise available material as a substitute growth medium. We engaged Verterra Ecological Engineering to develop a leading practice approach to manufacturing growth media for mine revegetation. This work is expected to be completed in 2025–26.

3.2. Biennial reviews of technical papers

The QMRC team undertakes biennial reviews of its publications to ensure our work remains current and continues to reflect leading practice advice. Authors were contracted to undertake reviews on:

- Water rights and licencing for mine rehabilitation in Queensland – practice note. Previously published as a ‘technical brief’, the practice note was updated with recently released government policy on managing water from longwall mining subsidence.
- Native ecosystems as a post-mining land use – three technical papers.
- Modelling residual mine voids for mine rehabilitation planning – three technical papers.

Updated versions of these papers have been published on the QMRC website with revision tables that describe changes.

3.3. Student placement

The QMRC team is committed to supporting the next generation of mine rehabilitation professionals and we host post-graduate students as part of their industry placement. This year’s student compared the regulatory requirements for mine closure and rehabilitation in Brazil and Chile with those in Queensland. Comparing mine rehabilitation practices with

other jurisdictions helps understand how Queensland varies from international practice and learn from the practices and experiences of others.

4 Rehabilitation performance and trends

This section describes rehabilitation performance and trends for all mines subject to a progressive rehabilitation and closure (PRC) plan in Queensland. Appendix C – Sectoral mine groupings explains the prioritisation and grouping of different sectors of the mining industry for the purpose of performance reporting in this document.

We used calendar year (CY) annual return data (provided by companies to the Department of the Environment, Tourism, Science and Innovation by 31 March each year) to analyse progressive rehabilitation and area of disturbance. Our analysis included land reported by companies in their annual return as ‘area disturbed’, ‘rehabilitation certified’ or ‘rehabilitation completed’. We excluded land reported as ‘rehabilitation commenced’ as the interpretation of this term differs widely across the industry. Our analysis relied on the accuracy of the data provided by companies in their annual returns.

Challenges to measuring rehabilitation performance

As stated in previous QMRC reports, establishing definitive performance measures and sector-wide trends in mine rehabilitation is challenging. Every operation has site-specific factors affecting the type and rate of rehabilitation, such as mining method, age, site configuration and spoil disposal method. The quality and durability of rehabilitation is also influenced by external factors, such as weather, availability of topsoil and economic conditions. Technology, commodity prices and other factors heavily influence the commercial viability of extracting resources, which can change rapidly.

Shallow strip mining and open cut highwall methods remain best suited to progressive rehabilitation—land becomes available for rehabilitation as the working face of the mine moves across the landscape. By contrast, deep open cut and underground metals mines are less suited to progressive rehabilitation and present a different set of challenges for assessing performance and trends.

Industry feedback highlighted the potential shortcomings of ‘rehabilitation against disturbance’ as a performance measure, given the challenges raised by the term ‘…as land becomes available…’ in section 126D of the EP Act. For example, an exhausted pit may need to remain open for years due to the sequencing of operations. However, the void may be used later for tailings disposal. In-pit disposal of waste materials is a leading practice but is not reflected in progressive rehabilitation reporting until the infill ceases and the landform is rehabilitated. New technologies, regulatory requirements and commercial and economic drivers influence rehabilitation decisions. Much fixed infrastructure is also required until the end of the mine’s operational life.

Our approach

For this report, we allocated the 206 Queensland mines subject to PRC plan requirements (as at 30 June 2025) into sectoral groupings:

- metallurgical and thermal coal
- large-scale strip mining other than coal (for example, bauxite, phosphate, silica and mineral sand)
- base and precious metals
- smaller strip operations (for example, monument stone and clays).

These groupings are the same as in previous QMRC reports (see Appendix C – Sectoral mine groupings for details and section 4.7 for the status of PRC plans as at 30 June 2025).

The primary focus of this report remains large scale mining operations that are required to prepare PRC plans. Such operations have been identified as the highest priority for reporting on trends and performance in progressive rehabilitation. Other mining activities have a smaller land disturbance footprint and present a much lower potential environmental impact. As such, smaller strip operations, small mining claims, seismic lines and other exploration activities are not a priority for evaluation in this report. However, the Minister has requested that the Commissioner investigate issues pertaining to estimated rehabilitation costs and administrative procedures for small resource operators. More detail on this request is included in Appendix A – Administration.

While we continue to include large scale metals mines in this report, our analysis of progressive rehabilitation continues to be limited compared with large scale strip mines. This is due to the nature of metal mining operations and their limited ability to undertake progressive rehabilitation. The 29 sites described as ‘other resource activities’ subject to PRC plan requirements are included in the total rehabilitation analysis (Figure 2) but not presented as a separate grouping.

The sub-sections below present the areas of land ‘disturbed’ and ‘rehabilitated’ for each sectoral grouping. Our analysis is presented in a series of ‘waterfall’ graphs. Historical disturbance and completed rehabilitation up to the end of CY2019 was used as the starting point, calculated as the total remaining disturbance and completed rehabilitation reported by companies up to the end of CY2019. Annual data for disturbance and rehabilitation is then presented for each calendar year to the end of CY2024.

We also present the area of completed rehabilitation against the area of disturbance as a percentage. This provides a measure of rehabilitation performance for each sectoral grouping and is referred to as the ‘rate of progressive rehabilitation’. It includes historical and recent disturbance and rehabilitation.

We continued to identify a small number of discrepancies in annual reporting and referred anomalies to the regulator for checking with the reporting entities. The number of mines subject to PRC plan requirements also changes year-on-year, as new mines commence and other mines fall out of the PRC plan framework. The rectification of reporting discrepancies and changes to the number of mines subject to PRC plan requirements in this report have resulted in small changes to the historical disturbance and rehabilitation figures appearing in previous reports.

4.1. Rehabilitation liability

We analysed the 206 mines across the sector subject to PRC plan requirements. The most recent data shows continued growth across the mining sector in outstanding rehabilitation liability.

Figure 1 shows the trend of increasing estimated rehabilitation cost (ERC) for all resource activities since ERC requirements came into effect in 2019. The calculated ERC at the end of each year is derived from the annual report of the Financial Provisioning Scheme manager.

Several factors explain the change in ERC:

- Area of disturbance—the area of land disturbed by mining yet to be rehabilitated has increased year-on-year (see Figure 2).

- Number and type of mine waste structures—more complex waste structures, such as metalliferous tailings storage facilities, carry a greater ERC than more benign mine-affected lands.
- Area of rehabilitated land—certified rehabilitation of mined land removes areas from the ERC calculation.
- Schedule of rates—the cost of rehabilitation is subject to market forces and inflation.
- Change in liability calculators—the sector's transition from the previous financial assurance system to one based on ERC in 2019 removed the discount system, introduced a contingency provision and updated unit costings.

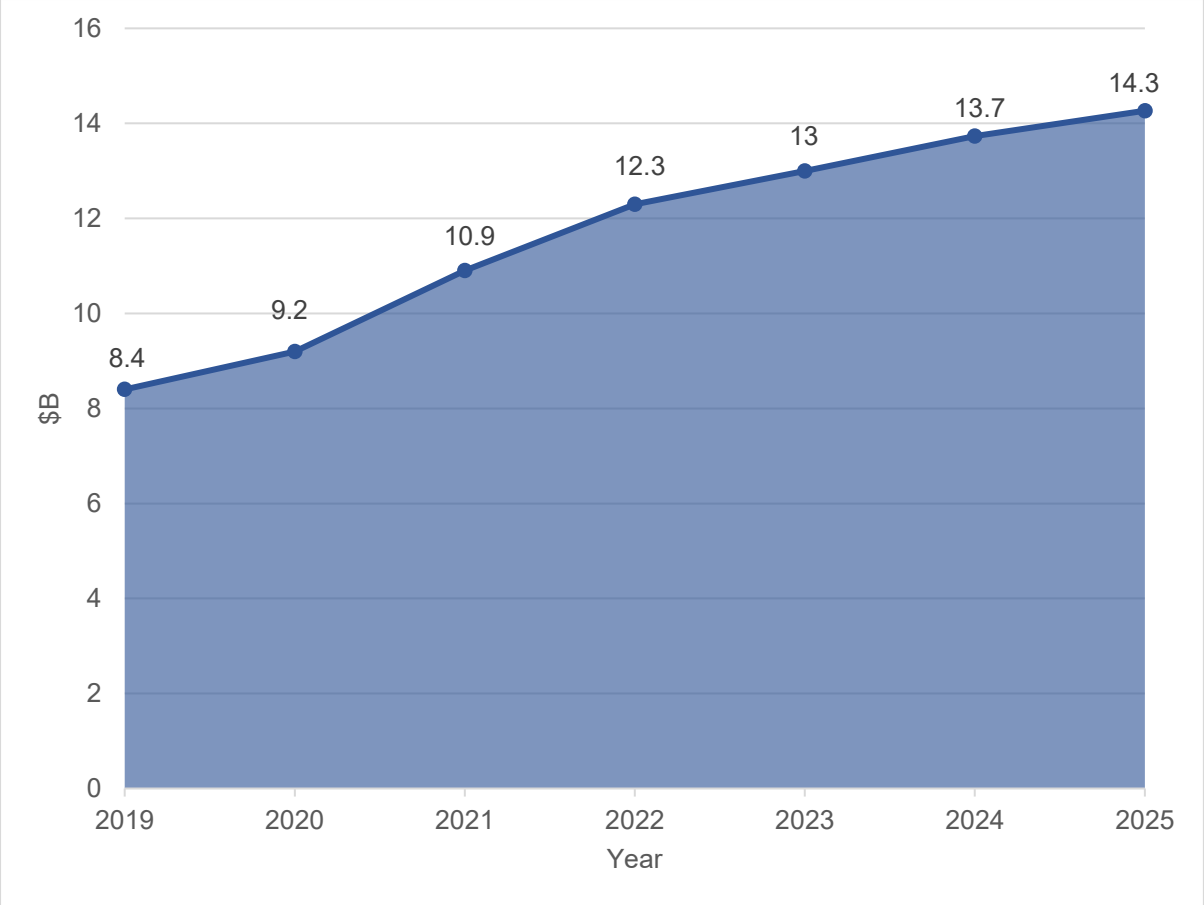

Figure 1. Industry wide ERC liability in Queensland 2019–2025

4.2. Mining industry-wide

Figure 2 shows the cumulative areas of disturbance and rehabilitation for the 206 mines subject to PRC plan requirements to the end of CY2024, from data provided by companies in their annual returns.

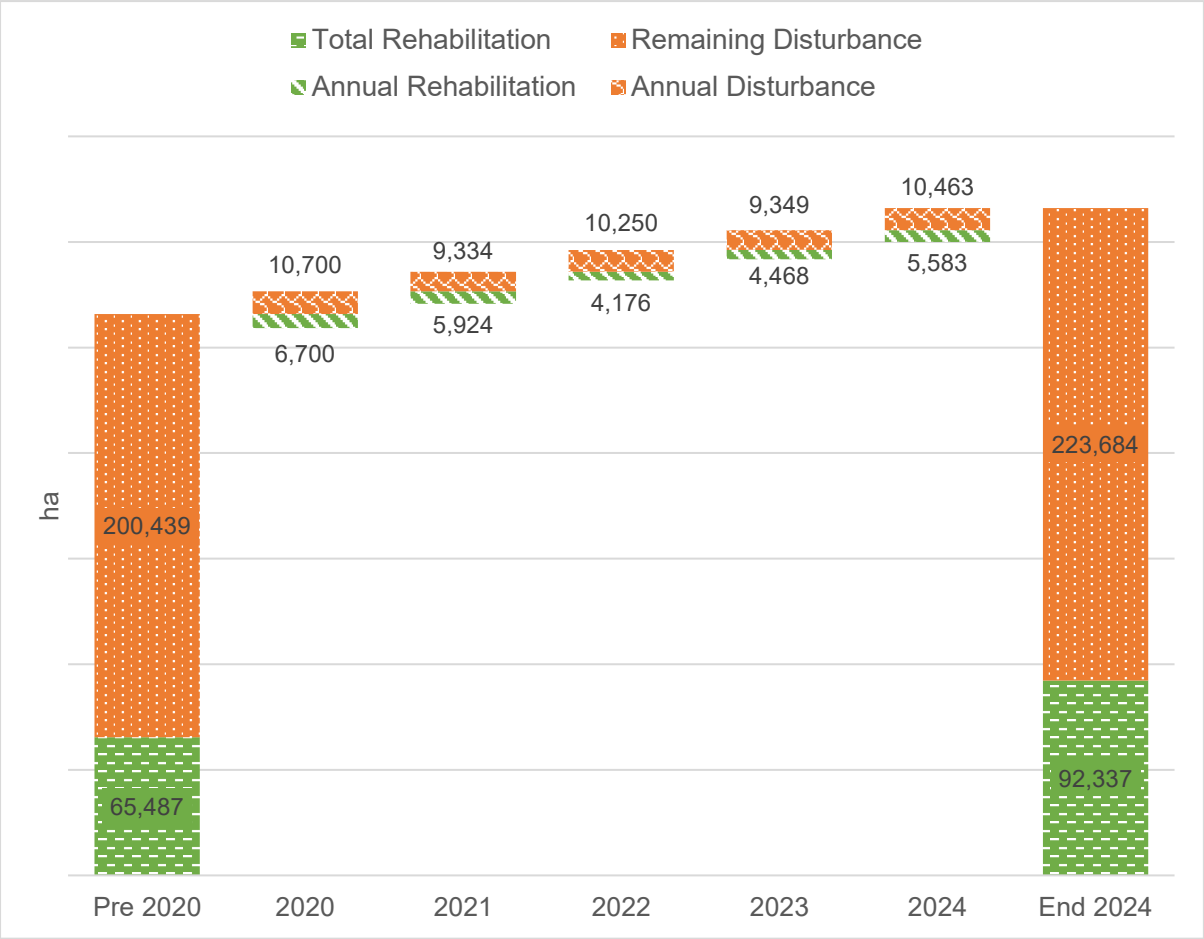

Figure 2. Progressive rehabilitation for all mines required to prepare a PRC plan to end CY2024

Figure 2 shows that the total net disturbance remaining after rehabilitation was 223,684 hectares at the end of CY2024. This is an increase of 23,245 hectares (12 percent) since the end of CY2019 and an increase of 4,880 hectares (2 percent) since the end of CY2023. The rate of progressive rehabilitation (historical to end CY2024) is 29 percent (compared to 25 percent at the end of CY2019 and 28 percent at the end of CY2023).

Figure 3 shows the change in the total area of completed rehabilitation, including certified and not certified rehabilitation.

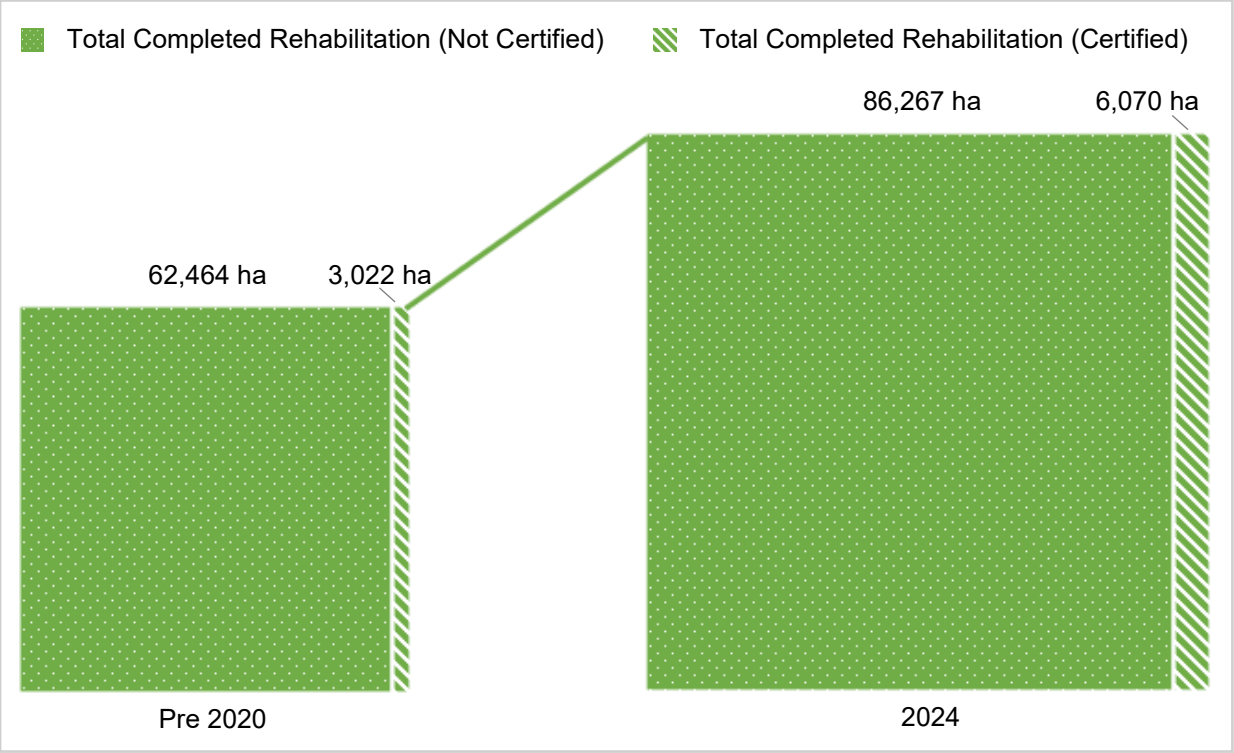

Figure 3. Change in completed rehabilitation for all mines required to prepare a PRC plan from end CY2019 to end CY2024

Figure 3 shows that, historically to the end of CY2024, the total area of completed rehabilitation is 92,337 hectares, including 6,070 hectares certified (7 percent) and 86,267 hectares not certified (93 percent). Figure 3 also shows that the total area of completed rehabilitation has increased by 26,851 hectares (41 percent) since the end of CY2019.

Between CY2019 and CY2024, the area of completed rehabilitation that has been certified has doubled. In the same period, the proportion of total completed rehabilitation that has been certified has increased from 5 percent to 7 percent. Completed rehabilitation that is certified remains less than 2 percent of all land disturbed.

Our analysis of the areas of land reported as ‘disturbed’ and ‘rehabilitated’ revealed that 67 of the 206 mines have either not commenced operations or have not undertaken additional disturbance or rehabilitation from CY2019 to CY2024. Of these 67 mines, 40 mines have reported no disturbance or rehabilitation to the end of CY2024, while 27 mines reported historical disturbance and rehabilitation but no additional works from CY2020 to CY2024.

4.3. Metallurgical and thermal coal

We analysed the 90 mines and related infrastructure that extract metallurgical and thermal coal and are subject to PRC plan requirements. Of these 90 facilities, 59 mines primarily extract metallurgical coal and 31 mines primarily extract thermal coal. Mines that extract both types of coal were grouped according to the predominant coal type extracted.

Figure 4 shows the cumulative areas of disturbance and rehabilitation to the end of CY2024, from data provided by companies in their annual returns. Open cut and underground operations are included together, as some mines have a combination of methods operating under the same environmental authority.

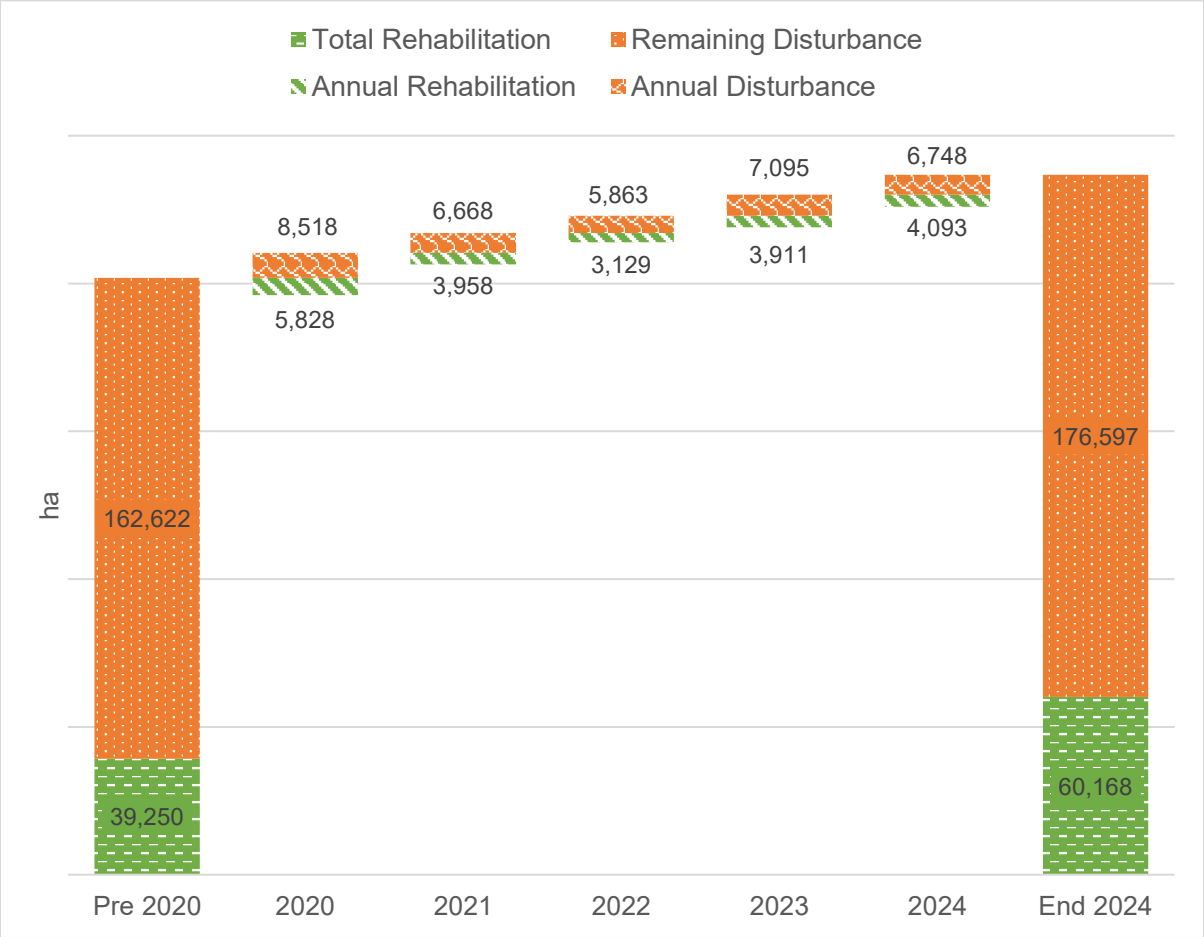

Figure 4. Progressive rehabilitation for metallurgical and thermal coal mines to end CY2024

Figure 4 shows that net disturbance remaining after rehabilitation has increased by 13,975 hectares to 176,597 hectares from CY2019 to CY2024. The rate of progressive rehabilitation (historical to end CY2024) is 25 percent.

For metallurgical coal mines, the net disturbance remaining after rehabilitation at the end of CY2024 was 148,915 hectares. The rate of progressive rehabilitation was 22 percent (compared with 21 percent at the end of CY2023).

For thermal coal mines, the net disturbance remaining after rehabilitation at the end of CY2024 was 27,682 hectares. The rate of progressive rehabilitation was 40 percent (compared with 37 percent at the end of CY2023).

Figure 5 shows the improving rate of progressive rehabilitation over the past four reporting years (historical to the end of that CY) as well as the ‘spread’ of progressive rehabilitation performance across companies.

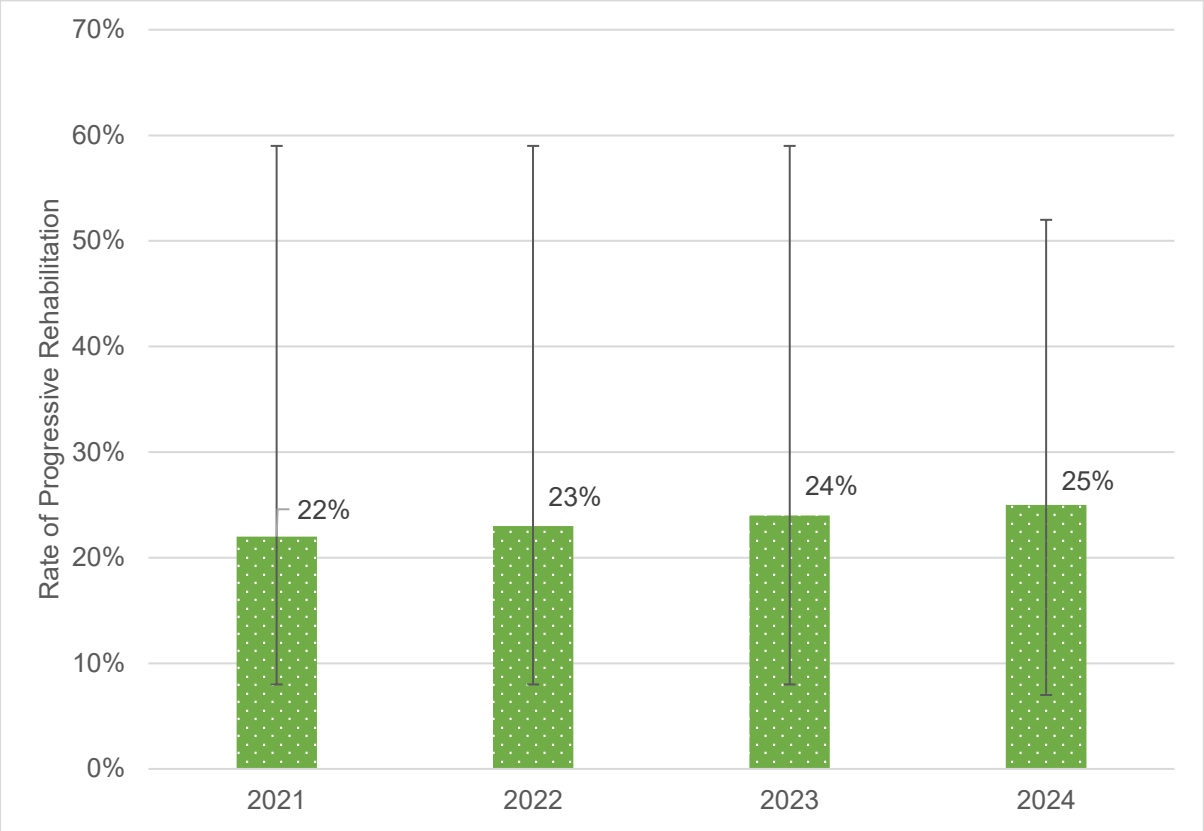

Figure 5. Changes in the rate of progressive rehabilitation for metallurgical and thermal coal mines to end CY2024

Figure 5 shows that the rate of progressive rehabilitation for metallurgical and thermal coal mines has increased from 22 percent to 25 percent over the period CY2021 to CY2024. Figure 5 also indicates the highest and lowest rates of progressive rehabilitation for active[1] coal companies in Queensland—the highest rate was 52 percent while the lowest was 7 percent. These upper and lower limits have decreased compared to the end of CY2023. This is due to many factors including changes in the area of land disturbed and rehabilitated by mining (see Figure 2) and the transfer of assets.

The difference between the highest and lowest rates of progressive rehabilitation shown in Figure 5 reflects the large diversity in progressive rehabilitation performance of individual companies. This diversity is further demonstrated in Figure 6, which plots the amount of disturbance and completed rehabilitation to the end of CY2024 for active[1] coal companies in Queensland. The solid line represents the total rate of progressive rehabilitation for all metallurgical and thermal coal mines to the end of CY2024.

[1] The metallurgical and thermal coal mining companies included in the analysis presented in Figure 5 and Figure 6 are limited to companies with mines that had disturbance and completed rehabilitation footprints prior to CY2024 and undertook additional disturbance and/or completed rehabilitation in CY2024. The disturbance and completed rehabilitation footprints for each company were calculated by combining the disturbance and completed rehabilitation footprints of each of their owned environmental authorities.

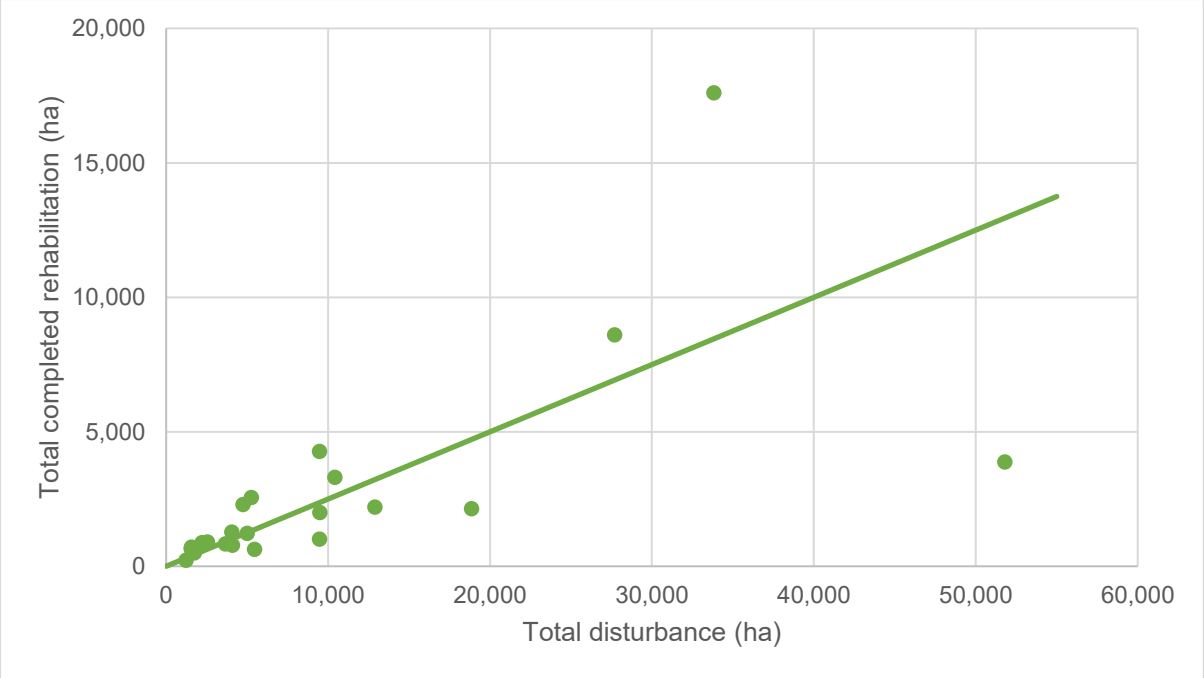

Figure 6. Scatter graph of disturbance and completed rehabilitation for active coal companies (dots) against the total rate of progressive rehabilitation (line) in Queensland to end CY2024

Rates of progressive rehabilitation by life cycle stage

To provide more insight into rehabilitation and disturbance trends for metallurgical and thermal coal mines, our analysis incorporated the progressive rehabilitation rate for each estimated production life stage. Table 1 shows the number of metallurgical and thermal coal mines we examined, by quartile of estimated production life at the end of CY2024.

Table 1. Metallurgical and thermal coal mines by quartile of estimated production life

Number of mines by quartile	Description at end CY2024
1st Quartile of Production Life (8 mines)	Metallurgical and thermal coal mines that are >0 percent to ≤25 percent of the way through their estimated production life.
2nd Quartile of Production Life (19 mines)	Metallurgical and thermal coal mines that are >25 percent to ≤50 percent of the way through their estimated production life.
3rd Quartile of Production Life (20 mines)	Metallurgical and thermal coal mines that are >50 percent to ≤75 percent of the way through their estimated production life.
4th Quartile of Production Life (15 mines)	Metallurgical and thermal coal mines that are >75 percent to <100 percent of the way through their estimated production life.
Finished Production (7 mines)	Metallurgical and thermal coal mines that have finished production.
Note: Of the 90 metallurgical and thermal coal mines analysed, 21 sites were not included above as their production life information was unavailable or they had not commenced operations.	

Figure 7 plots the amount of land disturbed and rehabilitated to the end CY2024 for different stages of the mine's production life (for metallurgical and thermal coal mine sites required to produce a PRC plan). The dashed lines represent the rate of progressive rehabilitation for each production life quartile.

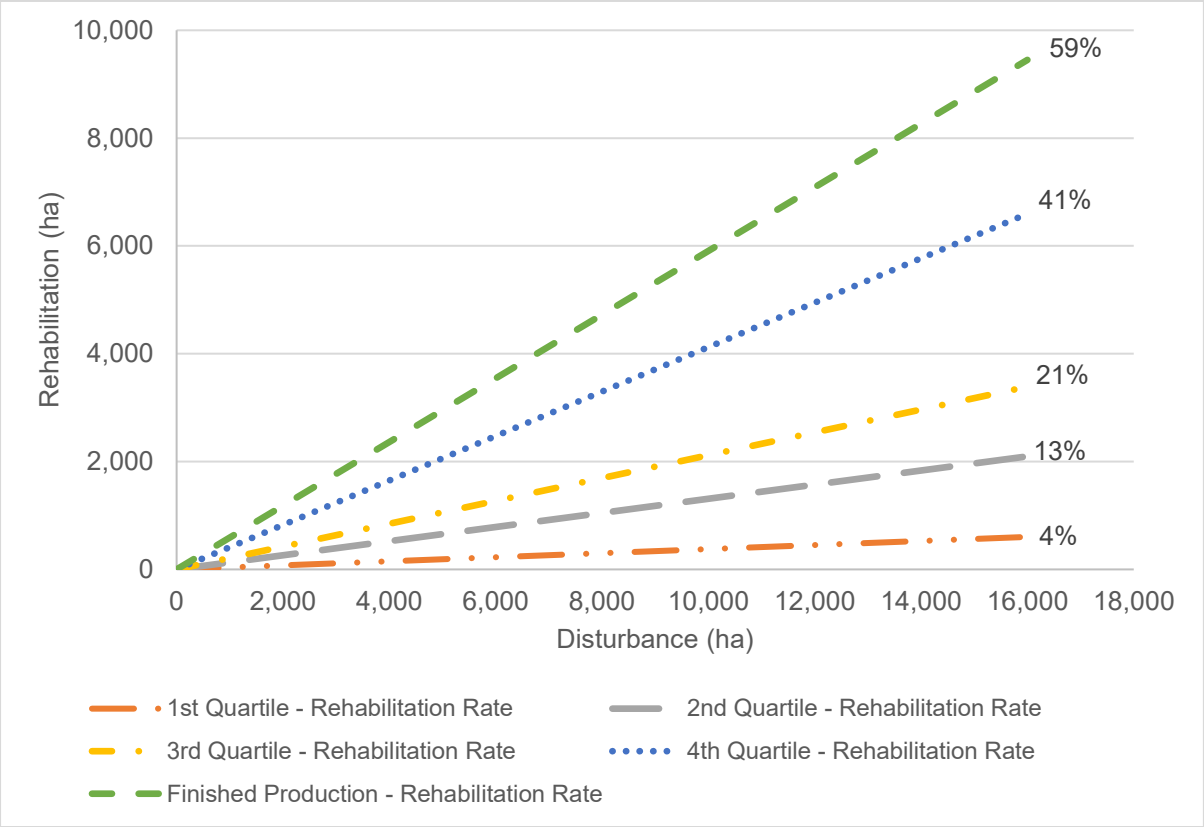

Figure 7. Line graph of rates of progressive rehabilitation for metallurgical and thermal coal mines at different quartiles of estimated production life

Figure 7 shows that the rate of progressive rehabilitation for metallurgical and thermal coal mines increases from 4 percent in the 1st quartile of production life to 59 percent for coal mines that have finished production.

Jurisdictional comparison

In our 2023–24 report, we introduced a comparison of rehabilitation performance and trends of the coal mining industries in Queensland and Wyoming. Although not identical, coal mining in the two states has certain similarities: both industries are large-scale, multi-decadal, predominantly open cut operations, which face similar rehabilitation challenges. This allows for some comparison between the two jurisdictions. However, there are also substantial differences. For example, unlike Queensland, Wyoming has thicker shallow seams that allow more coal extraction from less surface disturbance, lower strip ratios, no coal washing and less coal seam groundwater inflows. Also, Wyoming has long-standing requirements for coal mine voids to be backfilled whereas Queensland has many residual voids with approval to remain in the landscape.

Rehabilitation figures reported by the Wyoming government for FY2024 show that the rate of progressive rehabilitation for coal mines in the state is 54 percent. Historically, Wyoming has also approved the termination of jurisdiction on approximately 51,000 hectares of mined land—similar to the concept of ‘surrendering’ in Queensland. If the surrendered areas are included, Wyoming’s progressive rehabilitation rate is higher than the 54 percent reported.

Figure 8 shows the year-on-year changes to the rate of progressive rehabilitation and amount of saleable coal produced for metallurgical and thermal coal mines in Queensland and Wyoming.

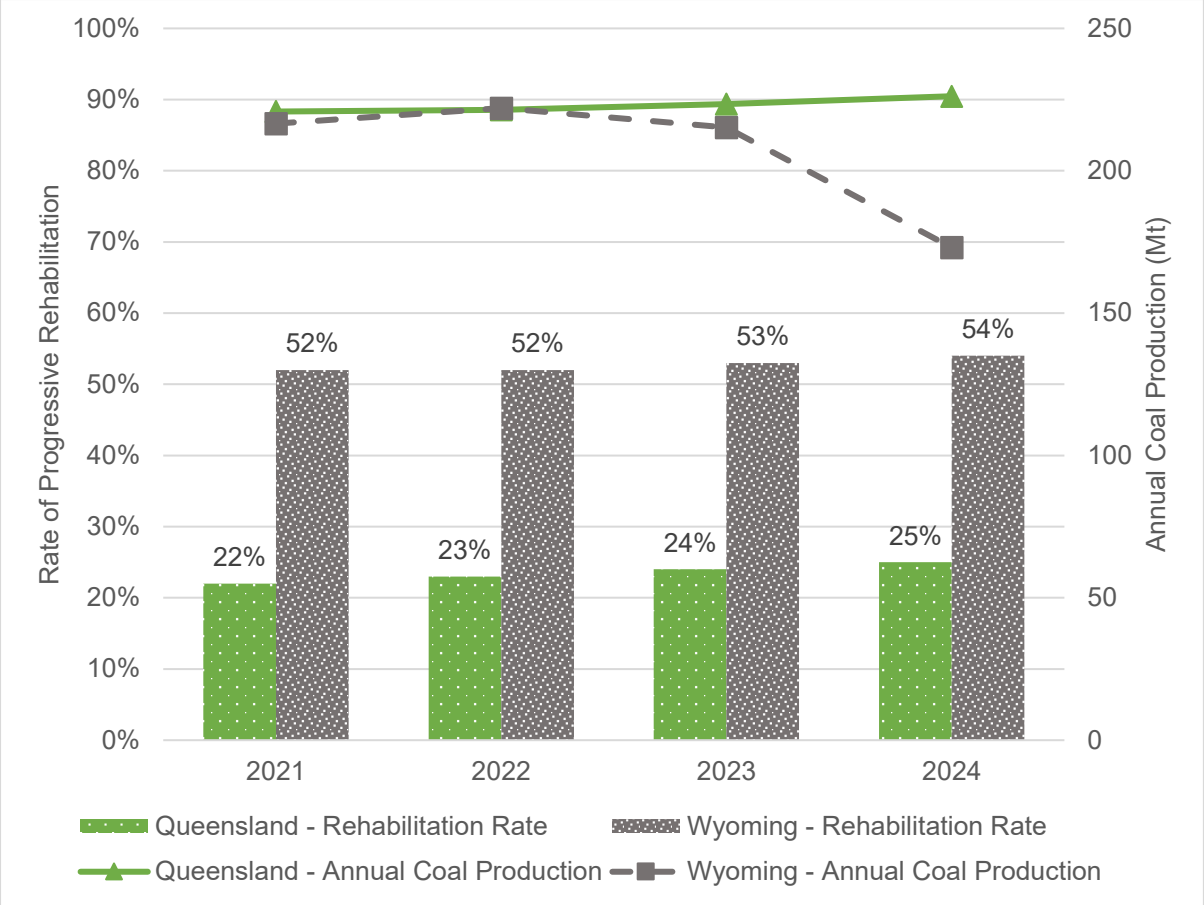

Figure 8. Rates of progressive rehabilitation[2] and production[3] for coal mines in Queensland and Wyoming

Figure 8 shows that, like Queensland, there has been a year-on-year increase in the rate of progressive rehabilitation for coal mines in Wyoming over the past three reporting periods. Figure 8 also shows that annual coal production for Queensland and Wyoming has been comparable over the past four reporting periods (approximately 200Mtpa), with a decrease in coal production in Wyoming reported for CY2024.

Several Queensland mining companies already undertake progressive rehabilitation at rates comparable to Wyoming. However, as can be seen in Figure 5, there are companies with progressive rehabilitation rates as low as 7 percent. As more PRC plans are approved, the rates of progressive rehabilitation will be 'locked in' to scheduled commitments.

We will continue to work with stakeholders to incorporate comparisons with other relevant national and international jurisdictions in future reports.

[2] Wyoming rehabilitation data taken from *Annual Evaluation Report for the Regulatory Program Administered by the Department of Environmental Quality – Land Quality Division of Wyoming for evaluation year 2024* (p.13), by OSMRE, 2024
[3] Wyoming coal production data take from *Annual Coal Report 2022* (p.3) by EIA, 2023 and *Quarterly Coal Report October–December 2024* (p.3) by EIA, 2025.

4.4. Large-scale strip mining (other than coal)

We analysed 19 mines extracting bauxite, phosphate, silica and mineral sands. Figure 9 shows the cumulative areas of disturbance and rehabilitation to the end of CY2024, from data provided by companies in their annual returns.

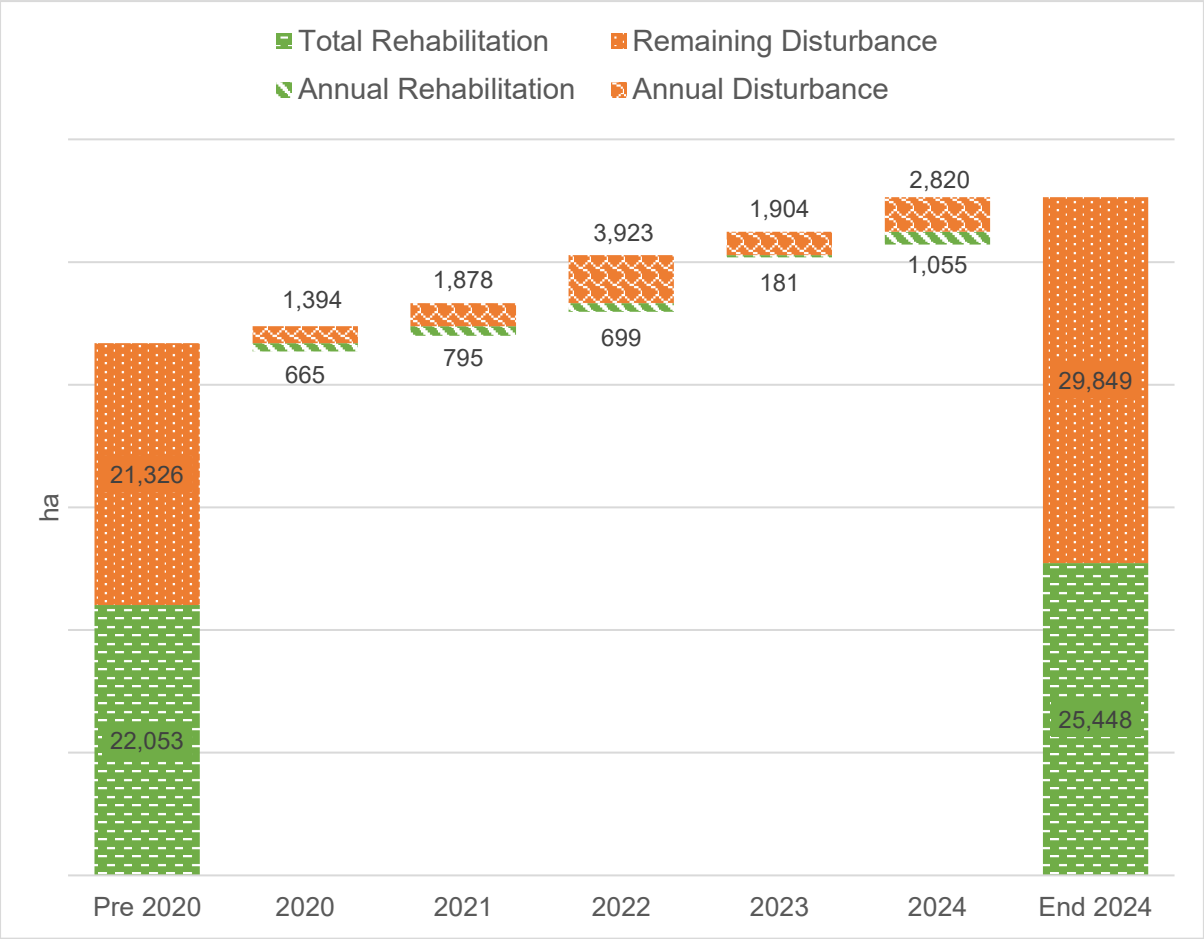

Figure 9. Progressive rehabilitation for strip mining (other than coal) to end CY2024

Figure 9 shows that net disturbance remaining after rehabilitation has increased by 8,523 hectares to 29,849 hectares between CY2019 and CY2024. The 40 percent increase in net disturbance since the end of CY2019 can be mainly attributed to the expansion of the bauxite industry in western Cape York Peninsula. The rate of progressive rehabilitation (historical to end CY2024) is 46 percent which is unchanged from the rate reported at the end of CY2023.

4.5. Base and precious metals

We analysed 68 mines extracting base and precious metals. Figure 10 shows the cumulative areas of disturbance and rehabilitation to the end of CY2024, from data provided by companies in their annual returns.

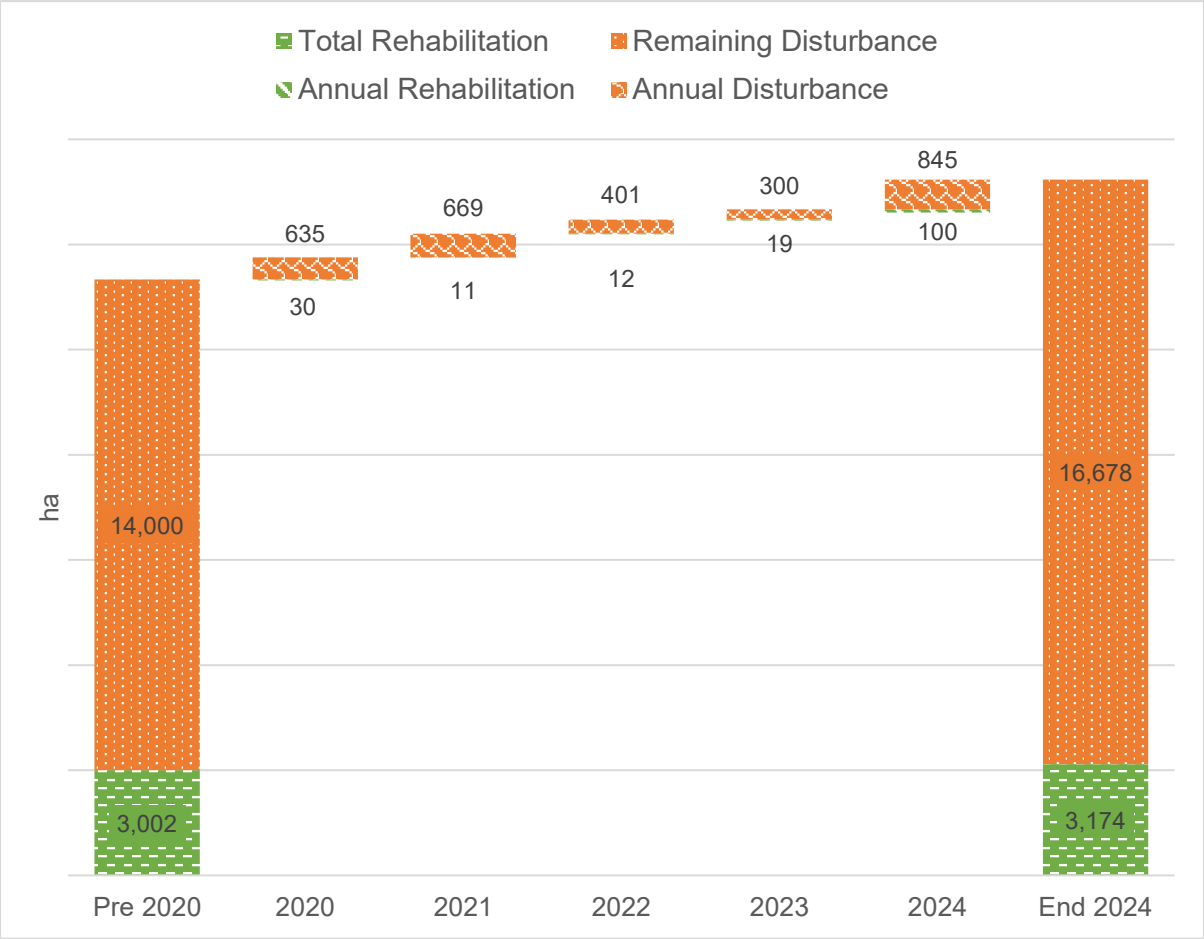

Figure 10. Progressive rehabilitation for base and precious metals mines to end CY2024

Figure 10 shows that the net disturbance remaining after rehabilitation increased by 2,678 hectares to 16,678 hectares between CY2019 and CY2024. The rate of progressive rehabilitation (historical to the end of CY2024) is 16 percent (compared with 17 percent reported at the end of CY2023).

Mine waste cover system trials

We have previously reported on the challenges associated with meaningful reporting on progressive rehabilitation trends for metals mines. Metals mines typically operate within a fixed disturbance footprint and much of the disturbed land is not available for progressive rehabilitation. As such, our previous reports have focused on a key aspect of rehabilitation at base and precious metals operations—the mitigation and management of AMD.

In our 2023–24 report, we reported several opportunities for AMD improvement related to mine waste cover systems, based on preliminary analysis of trials in metals mines across Australia. In this reporting period, we built on that preliminary work and delivered three technical papers on the topic, including a comparative review of cover system trials and cover system performance. From more than 170 pieces of literature, we reported on 27 case

studies from Queensland, Northern Territory, Western Australia, New South Wales and South Africa. The case studies included trials on existing structures and test cells, and environmental monitoring of existing waste structures.

Many of the reviewed trials included elements of a complete study but none presented information on the whole life cycle of a trial (planning, design and implementation). Our review identified technical and practical issues that limit the success of field-scale trials, including:

- differences between cover designs and construction
- differences between modelling predictions and observations
- failure and inadequate maintenance of monitoring equipment
- influence of trial timeframes on results (for example, from lag effects or variation in climate)
- lack of quality assurance and quality control of cover construction.

Our review also revealed common failures for mine waste cover systems, including:

- lack of proper materials characterisation
- poor cover design or selection of the wrong type of cover system
- failure to construct the cover system as per the design
- increased infiltration due to surface ponding and preferential flow
- low points on the surface of the cover due to ongoing consolidation of underlying tailings materials.

The review and its findings were used to develop a leading practice approach to undertaking pragmatic, cost-effective, field-scale mine waste cover system trials in Queensland. The leading practice approach includes a five-step process:

- Step 1—Determine cover system objectives and design options (identify cover objectives, collect baseline information, model cover performance, identify a suitable cover design and prepare construction specifications).
- Step 2—Plan the field-scale trial (identify trial objectives, determine the trial design, choose a suitable site, determine location and size of test cells, set study duration and design the monitoring system).
- Step 3—Undertake the field-scale trial (construct and monitor).
- Step 4—Refine the design based on trial outcomes.
- Step 5—Report on the trial.

We will continue our work on mine waste cover system trials and rehabilitation of metals mines generally.

4.6. Other mining activities

A total of 29 of the 206 mines subject to PRC plan requirements fall into the ‘other resource activities’ grouping. They mine commodities such as bentonite, limestone, sandstone and clays. Mines in this group have not been assessed for progressive rehabilitation trends or performance, other than as part of the whole-of-industry analysis depicted in Figure 2. As previously stated, the primary focus of this report is large-scale mining operations, which have been identified as the highest priority sites for more and better rehabilitation.

Throughout 2024–25, we undertook site visits and discussed rehabilitation with key operators of sites in the ‘other resource activities’ grouping to understand their unique rehabilitation challenges and opportunities.

4.7. Progressive rehabilitation and closure plans

Of the 206 mines required to produce a PRC plan on 30 June 2025, 196 were existing mines transitioning into the PRC plan framework, of which 144 do not yet have an approved PRC plan. Therefore, it remains difficult to assess the impact of the framework on progressive rehabilitation at an industry level. As more PRC plans are submitted and approved over coming years, a better understanding of the industry’s rehabilitation progress and life-of-mine profile will emerge. Figure 11 shows the PRC plan status of the 206 mines required to produce a PRC plan.

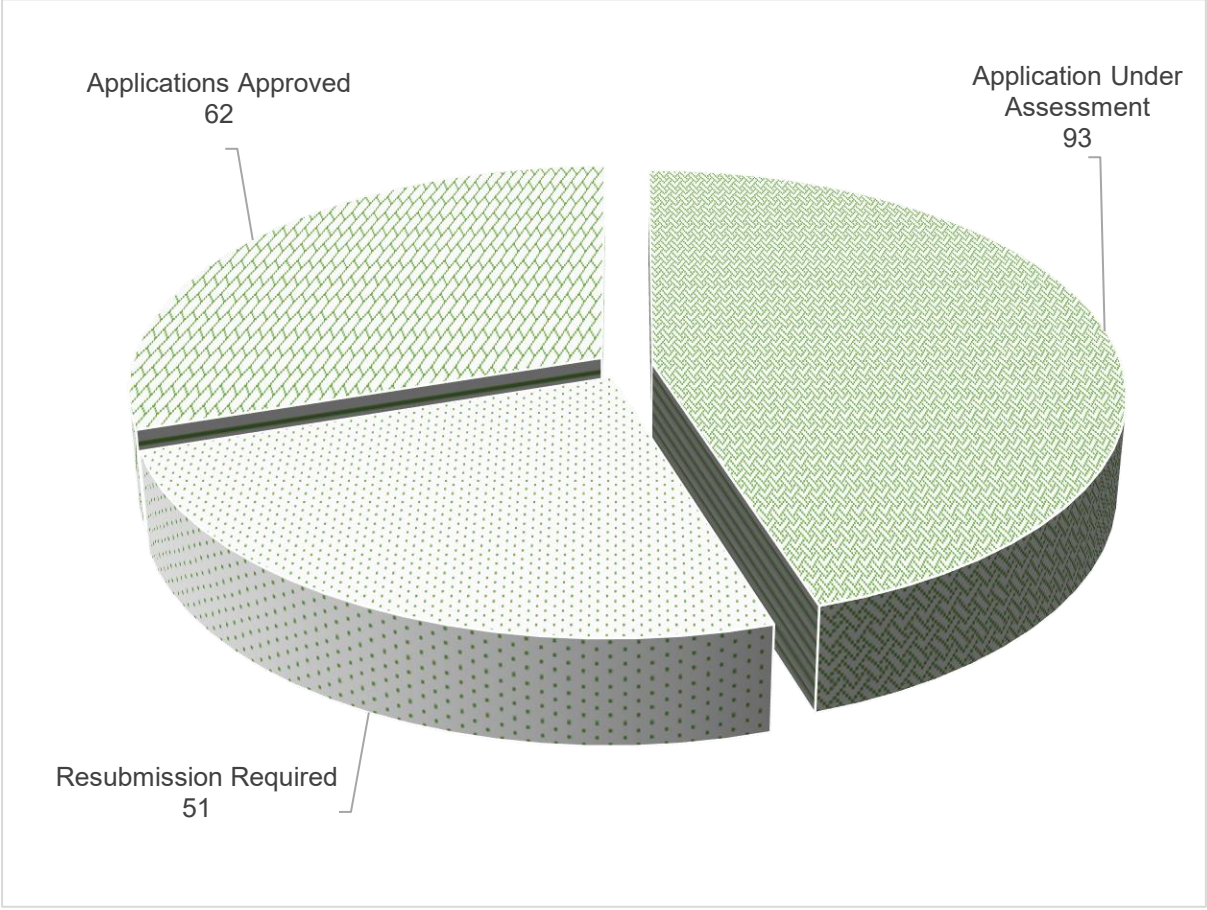

Figure 11. Status of PRC plan delivery as at 30 June 2025

4.8. Public interest evaluations

The Commissioner is required (under s444I of the EP Act) to provide the Minister with advice on public interest evaluation processes and performance. To date, no public interest evaluations have been submitted to the administering authority. Should public interest evaluations be submitted in future, the Commissioner will assess the process and performance as required.

4.9. Petroleum

While progressive rehabilitation of large-scale mining operations remains the focus of the QMRC team, we have continued examining key rehabilitation issues associated with the petroleum (oil and gas) sector. During 2024–25, we undertook site visits and rehabilitation discussions with key Queensland petroleum operators.

Disclaimed petroleum leases

In our 2023–24 report, we emphasised the need for measures by industry and government to ensure that the nearly 20,000 petroleum wells in Queensland can be decommissioned effectively and the importance of adequate provisioning for the task.

The recent disclaiming of two petroleum leases has further highlighted the importance of provisioning. The two petroleum leases, both located in the Surat Basin, were disclaimed at the end of 2023 and early 2024, leaving the task of decommissioning and rehabilitating several wells and related infrastructure to the Queensland Government.

According to two Environmental Protection Orders issued by the Department of the Environment, Tourism, Science and Innovation, the quoted costs of decommissioning wells on site were beyond the financial capacity of the company, leading to an inability to comply with the surrender requirements. The leases were subsequently disclaimed. Although the disturbance footprints and affected infrastructure were modest compared with other petroleum operations, it serves as an example of why adequate provisioning for petroleum operations is important to protect the state’s interests.

The QMRC team will continue to monitor rehabilitation processes in the petroleum sector and will engage with industry and government to help safeguard against future disclaimed sites. We will work to identify cost-effective and robust processes to ensure the timely surrender of authorities and relinquishment of tenures, and sufficient provisioning of sites.

5 Looking forward

In 2025, the Department of the Environment, Tourism, Science and Innovation completed a review of the Office of the Queensland Mine Rehabilitation Commissioner and presented its report to the Minister. Stakeholders provided valuable feedback on the operation of the Commissioner and QMRC team, which will inform our forward work program. Feedback suggested stakeholders were seeking more involvement in scoping work programs and greater promotion of leading practice case studies, which we will work to improve.

The QMRC team will continue to develop and publish leading practice advice to support innovation in mine rehabilitation. To understand the value and practicality of our work, we will continue to engage with stakeholders and publish work that compares Queensland's rehabilitation record with relevant national and international examples. We hope to include progressive rehabilitation performance for the New South Wales (NSW) coal sector in next year's report, pending successful roll-out of the NSW environmental data sharing portal (SEED).

Work resourced from the Financial Provisioning Scheme on cover system trials described in section 3.1 will continue, examining opportunities to incentivise high-quality trials and identify successful designs that reduce the impacts of AMD.

Additional projects will complement the current practice notes developed to support best practice management of residual voids, including NUMAs. We will also continue to actively seek partnerships to explore key research questions, especially those involving the deployment of innovative post-mining land uses. Facilitating more renewable energy projects on rehabilitated mine lands is one such key area.

6 Appendix A – Administration

6.1 Corporate support

The Department of the Environment, Tourism, Science and Innovation continues to provide corporate support to the QMRC team.

6.2 Human rights

The Commissioner and the QMRC team carry out their role with appropriate consideration of human rights under the *Human Rights Act 2019*, including recognising the unique interests of First Nations peoples. As per section 6 of the EP Act, we consult with, and have regard to, the views and interests of First Nations peoples under tradition and custom.

6.3 Integrity Act 2009

The Commissioner is undertaking a higher degree by research program at the University of Queensland. Professor Neville Plint, former Director of the Sustainable Minerals Institute, University of Queensland is the degree supervisor. The Commissioner is involved with the Cooperative Research Centre for Transformations in Mining Economies through those studies.

6.4 Directions from the Minister

The Minister has sought advice from the Commissioner regarding small resource operators and the administration of financial assurances for this sector. While rehabilitation reforms to date have focused on larger operators, it is now timely to review the administrative processes for approximately 4,000 small resource operators in the state. The QMRC team undertook analysis to understand the small resource operator cohort, including the number of different permit types and the ERC associated with each. We then engaged key stakeholders to understand their concerns and any solutions and developed options that were investigated, evaluated and shortlisted. The Queensland Government is now working through implementation of improvements to the administration of small resource operator approvals.

7 Appendix B – Key QMRC research topics

Research Topic	Contract Award Date	Partner	Status
Post-mining land uses			
Native ecosystem rehabilitation in Queensland	Internal	QMRC team with input from lead technical author	Evaluating methods for assessing native ecosystem mine rehabilitation success (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0025/307636/evaluating-methods-for-assessing-native-ecosystem-mine-rehabilitation-success.pdf Evaluating options for native ecosystem mine site rehabilitation (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0021/303438/evaluating-native-ecosystem-rehabilitation-options-in-qld.pdf Stakeholder Survey Report – Options for native ecosystem mine site rehabilitation (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0022/303439/options-native-ecosystem-mine-site-rehabilitation-in-qld.pdf
Grazing as a post-mining land use	Internal	QMRC team	Implications for leading practice (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0026/352367/implications-leading-practice-grazing-post-mining-land-use.pdf
Final landforms			
Modelling to predict long-term stability	13 October 2023	Aquaterra International Pty Ltd	Delivered. Technical paper (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0027/383274/applying-erosion-lem-assess-post-mining-landform-stability.pdf
Leading practices to review landform design	7 August 2024	Landloch Pty Ltd	Commenced.

Research Topic	Contract Award Date	Partner	Status
modelling for mine rehabilitation			
Mine waste cover system research trials	3 May 2024	Environmental Geochemistry International Pty Ltd	Delivered. Mine waste cover system trials – a literature review (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0027/395352/mine-waste-cover-trials-literature-review.pdf Mine waste cover system trials – a comparative review of case studies (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0029/395354/mine-waste-cover-trials-case-study-review.pdf Mine waste cover system trials – a leading practice approach for field-scale trials in Queensland (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0028/395353/mine-waste-cover-trials-leading-practice-approach.pdf
Exploring frameworks to accelerate rehabilitation of mine waste landforms	29 September 2024	Affinitas Holdings Pty Ltd	Commenced.
Management of coal mine voids as non-use management areas	Internal	QMRC team	Interim practice note (published) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0036/391698/practice-note-management-coal-mine-voids-numa.pdf
Geotechnical management of non-use management areas	3 March 2025	Henderson Geotech Pty Ltd	Commenced.
Manufacturing growth media to achieve successful revegetation on	19 March 2025	Verterra Ecological Engineering Pty Ltd	Commenced.

Research Topic	Contract Award Date	Partner	Status
Queensland mines			
Water management			
Water rights and licencing for mine rehabilitation in Queensland	Internal	QMRC team	Biennial review completed – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0028/290692/managing-water-during-and-after-mine-rehabilitation.pdf
Modelling residual voids for rehabilitation planning	Internal	QMRC team with input from lead technical author	Review of current approaches to model residual mines voids for rehabilitation planning (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0025/305872/review-of-current-approaches-to-model-residual-mine-voids-for-rehabilitation-planning.pdf Approaches for leading practice modelling of residual mine voids for rehabilitation planning (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0024/305871/approaches-for-leading-practice-modelling-of-residual-mine-voids-for-rehabilitation-planning-1.pdf Applying leading practice modelling of residual mine voids for mine rehabilitation planning (biennial review completed) – https://www.qmrc.qld.gov.au/__data/assets/pdf_file/0023/305870/applying-leading-practice-modelling-of-residual-mine-voids-for-mine-rehabilitation-planning-1.pdf
Student report			
Regulatory requirements for mine closure and rehabilitation in South American countries	18 February 2025	Environmental Management Industry Placement student, University of Queensland.	Commenced.

Research Topic	Contract Award Date	Partner	Status
compared to Queensland			

8 Appendix C – Sectoral mine groupings

Groupings / number of mines	Description	Example commodity
Metallurgical and thermal coal (90 mines)	Major coal operations that predominantly mine in a horizontal direction (i.e. shallow deposit or pre-strip operations) such that land can be progressively rehabilitated. Underground coal mines are included as several mines use both open cut and underground workings.	Hard coking coal, pulverised coal for injection, thermal coal
Other large-scale strip mining (19 mines)	Major operations that predominantly mine in a horizontal direction (i.e. shallow deposit or pre-strip operations) such that land can be progressively rehabilitated.	Bauxite, phosphate, silica, mineral sands
Base and precious metals (68 mines)	Major operations that predominantly mine in a vertical direction such that land cannot be progressively rehabilitated as readily.	Copper, gold, lead, silver, zinc
Other resource activities (29 mines)	Medium/major operations that do not fit into the groupings above. Typically, these operations are bespoke and may progress horizontally, vertically or both.	Clay, bentonite, limestone, sandstone
Note: We grouped operations with multiple commodities or mining styles to best reflect their context (for example, coal infrastructure leases were allocated to the ‘metallurgical and thermal coal’ group).		

9 Appendix D – Glossary

AMD	Acid and metalliferous drainage
Commissioner	Queensland Mine Rehabilitation Commissioner
CRC TiME	Cooperative Research Centre for Transformations in Mining Economies
CY	Calendar year
DETSI	Department of the Environment, Tourism, Science and Innovation
EP Act	*The Environmental Protection Act 1994*
ERC	Estimated rehabilitation cost
FY	Financial year
Minister	Minister for the Environment and Tourism and Minister for Science and Innovation
Mtpa	Metric tonnes per annum
NUMA	Non-use management area
PRC plan	Progressive Rehabilitation and Closure Plan
QMRC	Queensland Mine Rehabilitation Commissioner
QMRC Team	The Commissioner and staff of the Office of the Commissioner
Resources sector	Mining, petroleum and gas activities (excludes quarries)
SEED	Sharing and Enabling Environmental Data in NSW

10 References

EIA. (2023). Annual Coal Report 2022. U.S. Energy Information Administration. https://www.eia.gov/coal/annual/archive/0584_2022.pdf

EIA. (2025). Quarterly Coal Report October–December 2024. U.S. Energy Information Administration. https://www.eia.gov/coal/production/quarterly/pdf/qcr_all.pdf

OSMRE. (2024). Annual Evaluation Report for the Regulatory Program Administered by the Department of Environmental Quality – Land Quality Division of Wyoming for evaluation year 2024. Office of Surface Mining Reclamation and Enforcement.