



The role of the Queensland Mine Rehabilitation Commissioner in best practice tailings rehabilitation

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Outline

- Legislative context in Queensland
- Best practice and the Rehabilitation Commissioner
- Rehabilitation challenges and opportunities -tailings

Recent Qld legislative reforms

- MERFP (2018)



Queensland

Mineral and Energy Resources (Financial Provisioning) Act 2018



Queensland

- EPOLA (2020)

Environmental Protection and Other Legislation Amendment Act 2020

MERFP Act 2018

1. to manage the financial risk to the State
2. to ensure rehabilitation to safe, stable landforms that do not cause environmental harm and sustain approved post-mining land uses.

Estimated Rehabilitation Costs (ERC)

Progressive Rehabilitation and Closure (PRC) plans

EPOLA 2020

1. appointment of a Rehabilitation Commissioner
2. clarify and enhance the residual risk framework

Queensland Mine Rehabilitation Commissioner

Residual Risk Assessment guideline, Post-surrender management reports

Rehabilitation Commissioner

- Chapter 8A inserted into the Environmental Protection Act (1994)

Key responsibilities

Connect



Research



Advise



Report



Best practice rehabilitation

Rehabilitation Commissioner

The Queensland Government has been implementing a suite of reforms to achieve better results for the rehabilitation of land disturbed by mining activities. Central to determining that land has been adequately managed or rehabilitated is **understanding what constitutes best practice**. Establishing an evidence-based and **clear determination of best practice rehabilitation** and management for mined land in Queensland will provide certainty for business and regulators, while also providing confidence to the community on the outcomes to be achieved for mined land. It is critical that completion standards reflect a **clear and shared understanding of best practice management**, and this includes consideration of the important role of Traditional Owners. Developing **best practice advice for rehabilitation** will support implementation of the rehabilitation reforms, including the return of mined land to other land uses for the ongoing benefit of the community.

Having a **clear determination of best practice management** also applies in relation to the management of those areas of land that cannot sustain a post-mining land use. These areas of land are referred to as non-use management areas.

Best practice advice

- s444K -Publish on a qld.gov.au website
- s176A –Link to PRC plans

- (2) In deciding whether to approve the proposed PRCP schedule for the plan, the administering authority must—
- (a) comply with any relevant regulatory requirement; and
 - (b) subject to paragraph (a), have regard to each of the following—
 - (i) the site-specific application;
 - (ii) the proposed PRC plan;
 - (iii) any response given for an information request for the proposed PRC plan;
 - (iv) the standard criteria;
 - (v) the guidelines under section 550;
 - (vi) any relevant advice, report or guidance published by the rehabilitation commissioner under section 444K.

OQMRC rehabilitation research (technical)

- Post-mining residual voids
- Topsoil deficits
- Mine waste cover systems
- Completion criteria for post-mining land uses

Mine waste cover systems research

- Cover systems are one tool for controlling the interaction between climate, mine waste and the receiving environment
- Focus on acid and/or neutral metalliferous drainage
- Prevention vs cover systems?
- Legacy issues
- Important for all metal mines estimating rehabilitation costs or preparing PRC plans

Mine waste cover systems -Qld

- Currently risks are categorised based on 'reactivity' and some geotechnical properties

Table 6-1 Risk Category Characteristics

Risk Category	Waste Rock Dumps	Heap Leach Pads	Tailings Storage Facilities
High Select this category if the waste structure has one or more of the following characteristics:	<p>Potentially acid forming material (PAF)</p> <p>Other highly reactive materials including (ARD/AMD/NMD)</p> <p>Observed contaminated seepage capable of causing environmental harm</p>	<p>Potentially acid forming material (PAF)</p> <p>Other highly reactive materials including (ARD/AMD/NMD)</p> <p>Observed contaminated seepage capable of causing environmental harm.</p>	<p>Potentially acid forming (PAF) material</p> <p>Other highly reactive materials including (ARD/AMD/NMD)</p> <p>Poor consolidation and low shear strength tails materials</p> <p>Requiring composite liners (e.g. HDPE)</p> <p>Embankments > 30 metres high</p> <p>Observed contaminated seepage capable of causing environmental harm.</p>

Mine waste cover systems -Qld

- Risk rating is then directly linked to a default cover system design

Table 6-2 Capping Engineering Cost and Default Minimum Thicknesses

Risk Category	Waste Rock Dumps	Heap Leach Pads	Tailings Storage Facilities
High	Engineering \$2,000/ha Working layer 0 m Capillary break 0.6 m Low permeability layer 0.5 m Top Rock Layer 1.5 m	Engineering \$2,000/ha Working layer 0 m Capillary break 0.6 m Low permeability layer 0.5 m Top Rock Layer 1.5 m	Engineering \$2,000/ha Working layer 0.5 m Capillary break 0.6 m Low permeability layer 0.5 m Top Rock Layer 1.5 m

OQMRC mine waste covers research

- ✗ Not a re-do of the ERC user guide or calculator
- ✓ Will provide a common platform for stakeholders to consider (geochemical) risks from mine waste structures
- ✗ Not development of one-size-fits-all performance criteria or cover design
- ✓ Will support PRC plan transitions with development of design objectives for covers, relating to geochemical risk
- ✓ Will showcase best practice examples

Risk framework (geochemical)

- Geochemical risk is a function of climate, net percolation through a waste structure, and material properties
 - Rainfall (intensity and seasonality) and evaporation
 - Waste structure design
 - Material characterisation

Design objectives linked to risk

- Risk rating is to inform management (e.g. via a cover system)
- Design objectives that correlate with risk to control e.g.
 - oxygen ingress
 - net percolation
 - capillary rise of contaminants
 - erosion

Design objectives linked to rehabilitation

- **Rehabilitation objectives** (EP Act s111A):
 - safe, stable, non-polluting, able to sustain a post-mining land use
- **Rehabilitation milestones:** key events or steps that mark progress towards objectives
- **Milestone criteria:** (quantitative) indicators to demonstrate milestones

Summary

- Suite of recent legislative reforms in Queensland
- Rehabilitation Commissioner tasked with providing 'best practice advice' www.qmrc.qld.gov.au
- Mine waste cover systems are a key part of rehabilitation planning
- Risk evaluation for mine waste can be informed by local climate, net percolation and waste characteristics
- Design objectives for cover systems scale with risk

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