NSW GOVERNMENT

Code of Practice: Rehabilitation Management Plan for Large Mines

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More information

This document forms part of a suite of documents which may assist holders of mining leases granted under the *Mining Act 1992*:

- Code of Practice: Rehabilitation Management Plan for Small Mines, XXX 2018 (also the subject of consultation)
- Code of Practice: Annual Rehabilitation Report and Forward Program for Large Mines, XXX 2018 (also the subject of consultation)
- Code of Practice: Annual Rehabilitation Report and Forward Program for Small Mines, XXX 2018 (also the subject of consultation)
- Guideline 1: Rehabilitation Risk Assessment (also the subject of consultation)
- Guideline 2: Rehabilitation Records (also the subject of consultation)
- Guideline 3: Rehabilitation Controls (also the subject of consultation)
- Guideline 4: Rehabilitation GIS Portal – Overview and Access (also the subject of consultation)
- Guideline 5: Rehabilitation GIS Portal – Spatial Data (GIS) Guidelines, XXX 2018 (also the subject of consultation)
- ESP1: Rehabilitation Security Deposits, June 2017
- ESG1: Rehabilitation Cost Estimate Guidelines, June 2017
- Rehabilitation Cost Estimation Tool, June 2017
- Rehabilitation Cost Estimation Tool Handbook, June 2017
- Form ESF2: Rehabilitation Completion and/or Review of Rehabilitation Cost Estimate
- ESB28: Environmental Incident Reporting Guidelines, October 2007

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Preamble

Regulatory framework

Rehabilitation is a critical element of mining operations in NSW and is principally regulated under *the Environmental Planning and Assessment Act 1979* and the *Mining Act 1992*.

Before commencing mining operations, development consent is required from the relevant consent authority[1] under the *Environmental Planning and Assessment Act 1979*. The Final Land Use, which includes the final landforms and rehabilitation requirements, is assessed and approved as part of the development consent. These requirements of the development consent are regulated by either the local council (for non-State significant development) or the Planning Services Division within the Department of Planning and Environment (for State significant development).

Following the grant of development consent, a mining lease, which provides the right to mine, may be granted under the *Mining Act 1992*. Rehabilitation conditions, which are consistent with the development consent, are attached to all mining leases. The Resources Regulator within the Department of Planning and Environment is responsible for the regulation of mining operations (including rehabilitation) carried out under a mining lease granted under the *Mining Act 1992*.

Regulatory objectives

The overall regulatory objective for mine rehabilitation is to achieve best practice progressive rehabilitation that will sustain final land use outcomes.The regulatory framework also aims to ensure that the financial burden for rehabilitation is borne by a lease holder in order to minimise the potential for liability being transferred to the State.

Rehabilitation is essential to ensure that areas disturbed by mining and associated activities are returned to a condition that is safe, stable and capable of supporting the Final Land Use. To achieve this outcome, rehabilitation planning and practices must be integrated throughout all phases of mining. This includes monitoring rehabilitation and managing risk to continuously improve rehabilitation performance during the term of a mining lease.

Progressive rehabilitation is key to the rehabilitation regulatory framework and ensures that the lease holder is on the correct trajectory to achieving the Final Land Use. Progressive rehabilitation provides an effective means to:

- reduce the overall liability for rehabilitation works;
- provide stability for disturbed areas and reduce the exposure of sources of dust generation;
- sequentially establish key species associated with multi-storey plant community types;
- increase the likelihood of delivering successful rehabilitation;
- test and improve rehabilitation practices; and
- improve visual amenity.

[1] The consent authority varies depending upon how a mining development is characterised under the *Environmental Planning and Assessment Act 1979*.

Progressive rehabilitation can also assist in reducing the timeframe required to return land disturbed by mining and associated activities to a condition that is capable of supporting the Final Land Use on a sustainable basis.

Purpose of this Code

The purpose of this Code is to set out the mandatory requirements for the preparation of a Rehabilitation Management Plan for Large Mines. A Rehabilitation Management Plan is a standard requirement (via conditions) on all mining leases.

Purpose of the Rehabilitation Management Plan

The Rehabilitation Management Plan will evolve throughout the mine life, through to mine closure. The Department expects that the level of detail related to mine closure and rehabilitation outcomes will increase as a mining operation approaches closure.

A Rehabilitation Management Plan prepared in accordance with this Code will define the rehabilitation outcomes to be achieved under the *Mining Act 1992* for approval by the Minister. In addition, the Rehabilitation Management Plan will present the case to government, and the community, with regard to how industry will:

- achieve compliance with mining lease conditions related to environmental management, protection, rehabilitation planning and outcomes;
- commit to measurable performance outcomes;
- adopt innovative solutions and best practice techniques to meet performance outcomes;
- monitor performance and take corrective action if these outcomes are not being achieved.

A Rehabilitation Management Plan comprises the following components:

- Introduction to Mining Project;
- Final Land Use;
- Rehabilitation Objectives and Completion Criteria;
- Final Landform and Rehabilitation Plan;
- Rehabilitation Risk Assessment;
- Rehabilitation Implementation;
- Rehabilitation Quality Assurance Process;
- Rehabilitation Monitoring Program;
- Research, Rehabilitation Trials and Use of Analogue Sites;
- Intervention and Adaptive Management; and
- Review and Implementation.

In some cases, particularly for State significant mining projects, information relating to the above components has already been submitted to the Department as part of the development application process and subsequently approved in the development consent. Lease holders should refer to section below “Consistency with a development consent” regarding how this information should be treated as part of the Rehabilitation Management Plan required as a condition of a mining lease.

When this Code applies

This Code applies where specified in the conditions of mining leases granted under the *Mining Act 1992*.

Consistency with a development consent

The Rehabilitation Management Plan must be consistent with the relevant development consent granted under the *Environmental Planning and Assessment Act 1979*.

Development consents for mining operations often contain specific conditions related to rehabilitation, such as rehabilitation objectives, completion criteria, landform design and other related requirements.

To ensure consistency, the Rehabilitation Management Plan must specifically reference and incorporate **all** rehabilitation requirements set out in the development consent, in particular, rehabilitation objectives and completion criteria.

Where the Resources Regulator identifies an inconsistency between the Rehabilitation Management Plan and the development consent, the Resources Regulator will advise the lease holder and request that the Rehabilitation Management Plan be modified to reflect the requirements of the development consent and resubmitted.

Should the lease holder wish to modify an aspect of the relevant development consent, the lease holder must approach the consent authority with this request. Any modification to the development consent will require assessment and approval under the *Environmental Planning and Assessment Act 1979*.

Interaction with other regulations and approvals

Other consents, approvals or permissions may be required depending on the nature and scale of the activities, the location and the associated environmental risks. These may include, but are not limited to:

- an environment protection licence under the *Protection of the Environment Operations Act 1997* regulating noise, air, water and waste;
- an Aboriginal heritage impact permit under the *National Parks and Wildlife Act 1974*;
- licences or approvals under the *Water Management Act 2000* or the *Water Act 1912,* for activities or works that take, divert or use water;
- approvals under the *Heritage Act 1977* for the management of heritage items associated with an operation; and
- approvals for actions likely to have a significant impact on a matter of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

The lease holder remains responsible for ensuring that all operations, including the rehabilitation of the Land, are completed in compliance with the conditions of the mining lease, as well as the conditions of other relevant approvals such as the development consent.

Compliance requirements

The Minister and the Resources Regulator within the Department are responsible for regulating compliance for all matters relating to mining leases under the *Mining Act 1992*. The Resources Regulator's approach to compliance and enforcement is set out in its Compliance and Enforcement Approach 2017.

Lease holders must comply with the conditions of any mining lease(s) granted to them under the *Mining Act 1992.*

If the conditions of a mining lease require a lease holder to comply with any mandatory requirements of this Code, then a breach of those mandatory requirements will be a breach of the condition of the mining lease. If a condition of a mining lease is breached by any person, each holder of the mining lease will be guilty of an offence under section 378D of the *Mining Act 1992.* If there is any inconsistency between the mining lease conditions and this Code, the mining lease conditions prevail.

Approval Process

Following submission of a Rehabilitation Management Plan, the Department has a target of 30 business days to review and process the application.

The Department may suspend processing an application (i.e. "stop the clock") if the Rehabilitation Management Plan does not address the conditions of the mining lease or the mandatory requirements of this Code and additional information is required from the applicant to assist in the assessment of the application. The Department will recommence processing the application once all relevant information has been received. Where a "stop-the-clock" is applied or the application is refused, the Minister will notify the applicant of the date by which further information or a revised application is required to be submitted.

Under the mining lease conditions, the lease holder must have the following components of the Rehabilitation Management Plan approved by the Minister: the Rehabilitation Objectives and Completion Criteria (Part 5 of the Rehabilitation Management Plan); and, the Final Landform and Rehabilitation Plan (Part 6 of the Rehabilitation Management Plan).

The remaining components of the Rehabilitation Management Plan do not require approval but must still be provided as they comprise essential context for assessing the Rehabilitation Objectives and Completion Criteria, and the Final Landform and Rehabilitation Plan. The remaining components must be prepared to the satisfaction of the Minister.

The Rehabilitation Management Plan will be rejected if any component does not meet the requirements of the mining lease conditions and the mandatory requirements of this Code, or if any component is inconsistent with the relevant development consent.

The Department will provide written notification of its decision, including the reasons for any rejection of the Rehabilitation Management Plan.

Triggers for a Rehabilitation Management Plan

The mining lease conditions require that a Rehabilitation Management Plan must be prepared and submitted to the Department at the following times:

- before commencing surface disturbance;
- every 5 years from the date of approval of the lease holder's first Rehabilitation Management Plan for the land;
- at least 3 months before the final cessation of the extraction;
- concurrently with the submission of an extraction management plan (if required by the Development Consent in relation to some underground mines);
- within 30 days of suspending operations (i.e. going into care and maintenance following written consent from the Minister under clause 7A of Schedule 1B of the Mining Act); and
- as otherwise directed by the Minister.

Amendment of Rehabilitation Management Plan – Requests by Minister

The mining lease conditions provide that the Minister may require a lease holder to amend a Rehabilitation Management Plan in a time and manner as specified. For example, an amendment may be required where the Minister considers that the rehabilitation methods or practices are not likely to lead to a sustainable rehabilitation outcome or to the Final Land Use in an acceptable timeframe.

Amendment of Rehabilitation Management Plan – Requests by lease holder

The mining lease conditions allow the Rehabilitation Management Plan, including the Rehabilitation Objectives and Completion Criteria and the Final Landform and Rehabilitation Plan, to be updated at any time by the lease holder by submitting a Rehabilitation Management Plan Amendment to the Department. Any documents previously approved by the Minister will need to be re-submitted to the Minister for approval. Updates to a document previously approved by the Minister will not take effect until the updated document has been approved by the Minister.

The Department will refuse a Rehabilitation Management Plan Amendment if it is considered that the proposed activities do not comply with the development consent.

Departmental Review of Rehabilitation Performance

The Department will undertake an ongoing evaluation of the adequacy of rehabilitation being undertaken by a lease holder based on the Annual Rehabilitation Report and Forward Program.

Throughout the life of the mine, the Department will review whether rehabilitation is trending towards achieving the Final Land Use using the following mechanisms:

1. Department's inspection and audit program;
2. Review of the Rehabilitation Management Plan (specifically the Rehabilitation Objectives and Completion Criteria and the Final Landform and Rehabilitation Plan);
3. Review of the Annual Rehabilitation Report and Forward Program;

4. Review of monitoring data;
5. Review of any specialist advice and research studies;
6. Review of quality assurance records;
7. Review of the rehabilitation risk assessment;
8. Review of other relevant management plans; and
9. Review on-ground rehabilitation performance.

Public access to Rehabilitation Management Plans

Rehabilitation Management Plans accepted by the Department, including the approved Rehabilitation Objectives and Completion Criteria and Final Rehabilitation and Landform Plan, will be made available to the public on the Resources Regulator's website via the DIGS platform. In addition, most contemporary development consents require that approved management plans be made publicly available on an applicant's website. The Rehabilitation Management Plan will also be made available to the public upon request at the relevant Departmental regional office. Spatial data for the Final Landform and Rehabilitation Plan may also be made available to the public using the Resources Regulator's Rehabilitation GIS Portal (under development).

Privacy considerations

Where personal information is supplied to the Department as part of a Rehabilitation Management Plan submission and/or associated documentation, the *Privacy and Personal Information Protection Act 1998* requires that a person must be made aware that the information is being collected for that purpose and that the information may be made available to the public.

Further Information

For further information regarding the application of this Code please contact the Resources Regulator:

Phone: 02 4063 6688

Email: rehabilitation.projects@planning.nsw.gov.au

Website: https://www.resourcesandenergy.nsw.gov.au/miners-and-explorers

References

References to other externally published guidance material that may assist lease holders to comply with mining lease conditions are provided in **Appendix 1**.

Mandatory Requirements

Explanatory note 1: Mandatory Requirements

The following 13 parts set out the mandatory requirements of this Code. In preparing the Rehabilitation Management Plan, the lease holder must address the structure, form and content requirements as specified in each part.

Under the mining lease conditions, the lease holder must have the following components of the Rehabilitation Management Plan approved by the Minister: the Rehabilitation Objectives and Completion Criteria (Part 5); and, the Final Landform and Rehabilitation Plan (Part 6). The remaining components of the Rehabilitation Management Plan do not require approval but must still be provided as they comprise essential context for assessing the Rehabilitation Objectives and Completion Criteria, and the Final Landform and Rehabilitation Plan. The remaining components must be prepared to the satisfaction of the Minister.

Mandatory Requirements Table of Contents

1. Part 1 – General

1.1 Structure of Rehabilitation Management Plan

The Rehabilitation Management Plan must have the parts, sections and sub-sections identified in the Mandatory Requirements Table of Contents and set out in Parts 2 to 13 (inclusive) of this Code.

Each part, section and sub-section of the Rehabilitation Management Plan must be identified by its name.

Each part, section and sub-section of the Rehabilitation Management Plan must contain the information specified for that part, section or sub-section as set out in this Code.

1.2 Document format and submission requirements

The Rehabilitation Management Plan must be in PDF format and submitted to:
minres.environment@planning.nsw.gov.au

In addition, plans required by this Code must meet the requirements of *Guideline 5: Rehabilitation GIS Portal - Spatial Data (GIS) Guidelines* (NSW Department of Planning and Environment, XX 2018) (also subject to consultation) and must be submitted using the Resources Regulator's Rehabilitation GIS Portal (under development).

1.3 Interpretation and Glossary

In this Code:

1. a reference to a document is a reference to the most recent version of that document, as amended or replaced from time to time.
2. terms in this Code have the same meaning given to them in the *Mining Act 1992* and the conditions of the mining lease.

A glossary of terms used in this Code is provided at the end of this Code.

2. Part 2 – Lease Block

This part must have a Lease Block, which must contain the following:

a. Name of Mine
b. Rehabilitation Management Plan Commencement Date
c. Rehabilitation Management Plan Completion Date
d. Mining Leases (Lease No.)
e. Name of lease holder(s)
f. Name of Operator (if different)
g. Name and Contact Details of the Manager (or equivalent)
h. Name and Contact Details of Environmental Representative
i. Name of Representative(s) of the Lease holder(s)
j. Title of Representative(s) of the Lease holder(s)
k. Signature of Representative(s) of the Lease holder(s)
l. Date
m. Version

The Lease Block must be on the first or second page of the Rehabilitation Management Plan.

The Lease Block must contain a certification made by or on behalf of the lease holder that the information provided is true and correct.

3. Part 3 - Introduction to Mining Project

3.1 History of operations

This section must provide a brief history of mining operations to give adequate context to the Rehabilitation Management Plan. This must include:

a. details of company and ownership, including an outline of previous ownership (where applicable);

b. location of site and associated infrastructure with a reference to Land Ownership and Land Use Figure (refer to **section 3.3.1**);

c. age of an operation; and

d. details of previous mining activities and infrastructure.

3.2 Current Development Consents, Leases and Licences

This section must show (in tabular form) the date of grant and duration of the following current approvals:

a. project approval/s or development consent/s granted under the *Environmental Planning and Assessment Act 1979*;

b. mining leases (and other mining authorities) granted under the *Mining Act 1992*;

c. exploration licences and assessment leases granted under the *Mining Act 1992*; and

d. all other relevant approvals and licences issued by Government agencies in respect of the mining operations.

Information must be included where there have been changes to the status of these approvals during the report period, including a summary of any new applications or modifications to existing approvals.

3.3 Information must be included where there have been changes to the status of these approvals during Land Ownership and Land Use

This section must provide an overview of the land tenure of the general area as well as a schedule of land ownership, occupancy, and leases over the mining lease area consistent with Land Ownership and Land Use Figure (refer to **section 3.3.1**).

All land tenures must be correctly identified (e.g. freehold, vacant crown land, Western Lands Lease, travelling stock reserves). It is sufficient to label land as private freehold without identifying the individual land owners.

This section must also provide a summary of the historic, current and proposed Final Land Uses. This section must include information about any Stewardship Agreement, Conservation Agreement or other similar agreement.

3.3.1. Land Ownership and Land Use Figure

This section must contain a Land Ownership and Land Use Figure(s).

The Land Ownership and Land Use Figure(s) must contain the following information:

a. the location of the project in a State-wide context, identifying the main and surrounding Local Government area/s and major towns;

b. surface and subsurface leases where relevant;

c. vegetation community boundaries;

d. land use boundaries, e.g. cropping, pasture, forest, undisturbed flora/fauna habitat;

e. natural features including wetlands and watercourses;

f. surface contours (e.g. 5 metre contour intervals for open cut coal mines are standard, however 1 metre or less may be necessary to show an appropriate level of detail for some areas);

g. flood prone land (i.e. 1:100 year event and the Probable Maximum Flood);

h. any other areas of particular environmental, cultural or heritage sensitivity identified for retention or special management as required by a development consent (e.g. Aboriginal objects, heritage items, biodiversity offset areas);

i. land ownership (e.g. private, Crown land, land owned by mining company, etc.);

j. main roads, railways and public infrastructure; and

k. neighbouring residences and neighbouring operations of significance (e.g. mines and industrial areas within, and adjacent to, the mining lease area).

4. Part 4 - Final Land Use

4.1 Regulatory Requirements for Rehabilitation

This section must list all of the regulatory requirements for rehabilitation that apply to the Land. This must include, but is not limited to:

a. conditions of development consent(s) and commitments outlined in the associated environmental assessments;

b. mining lease conditions;

c. the land use controls of relevant State Environmental Planning Policies;

d. the land use controls of relevant Local Environmental Plans (LEP); and

e. any other relevant Government approvals, policies and guidelines.

The requirements must be summarised in tabular form. The table must specify whether each requirement applies to the entire site or to a particular domain or defined parcel of land, the timing to meet the requirement, and the section of the Rehabilitation Management Plan that addresses the requirement.

Explanatory note 2: Relationship between development consent and mining lease requirements for a Rehabilitation Management Plan

In many cases, particularly State Significant Developments[2], the condition(s) of the development consent granted under the *Environmental Planning and Assessment Act 1979* require the preparation of a Rehabilitation Management Plan. Lease holders should be aware that the relevant consent authority regulates the implementation of these Rehabilitation Management Plans in accordance with the conditions of the development consent and relevant requirements of the *Environmental Planning and Assessment Act 1979*.

The Rehabilitation Management Plan submitted to the Department for approval under the condition of a mining lease must therefore:

- address and include any specific requirements outlined in the relevant condition(s) of the development consent under the *Environmental Planning and Assessment Act, 1979*; including specific requirements for the Final Land Use, Rehabilitation Objectives and Completion Criteria (refer to Part 5), and
- satisfy the requirements of the mining lease condition and this Code.

[2] The Government has identified certain types of development as State Significant Development (SSD). Schedules 1 and 2 of State Environmental Planning Policy (State and Regional Development) 2011 provides a full list of SSD types and identified sites. Large mining and extraction operations (including all coal mines) are identified as SSD.

Specific requirements for consistency between the development consent and components of the Rehabilitation Management Plan are discussed further in Explanatory notes 5 and 6.

4.2 Final Land Use Statement

This section must state the Final Land Use(s) for the Land except in circumstances where **section 4.3** applies. The Final Land Use must be depicted spatially on the Final Landform and Rehabilitation Plan (refer to **Part 6**).

4.3 Justification for the Proposed Final Land Use

In circumstances where the Final Land Use has not been identified or clearly defined in the development consent and associated environmental assessment(s), the lease holder must:

a. carry out a Final Land Use options assessment; and
b. include the outcomes of that assessment in this section.

When assessing Final Land Use options the lease holder must consider:

a. any relevant conditions of the mining lease;
b. local, regional and state environmental planning instruments and planning policies;
c. any local and/or regional land use strategies; and
d. other relevant policies and guidelines.

Where the options analysis has yet to be undertaken, this section must propose a schedule for when these works will be completed.

4.4 Stakeholder Consultation

In circumstances where the Final Land Use has not been identified or clearly defined in the development consent and associated environmental assessment(s), the lease holder must undertake the options assessment in consultation with relevant stakeholders. This section must include a detailed tabular summary of the consultation undertaken, which identifies each relevant stakeholder, the method of how they have been consulted and any resultant expectations and agreements in relation to the Final Land Use.

Where the Final Land Use has been explicity determined through the development consent process, where community consultation has occurred, the RMP is not the appropriate regulatory instrument to approve alternative Final Land Uses that may be raised by community members. Any proposed changes to Final Land Use will need to be referred to the appropriate approval authority under the *Environmental Planning and Assessment Act 1979*.

4.5 Final Land Use and Mining Domains

4.5.1. Final Land Use Domains

This section must define the Final Land Use Domain(s) for all areas within the lease. Example Final Land Use Domains are provided in Explanatory note 4.

4.5.2. Mining Domains

This section must describe the Mining Domain(s) for all operational/disturbance areas within the mine site. Example Mining Domains are provided in Explanatory note 4.

Explanatory note 4: Mining and Final Land Use Domains

Final Land Use Domains

Mining operations may have one Final Land Use (e.g. return the entire mining lease to native vegetation), or a number of Final Land Use units (e.g. a mix of pasture areas and native ecosystems).

Each Final Land Use unit represents a separate Final Land Use Domain (see Glossary) which will require specific rehabilitation methods.

Examples of Final Land Use Domain(s) include, but are not limited to the following:

- Native Ecosystem (for some projects this may require further specification and/or identification of particular Plant Community Types);
- Agricultural – Grazing;
- Agricultural – Cropping;
- Biodiversity Offsets (including remnant vegetation or rehabilitation areas proposed to be subject to a Biodiversity Offset application under the *Biodiversity Conservation Act 2016*);
- Water Management Areas (such as creek realignments, constructed wetlands, significant final landform drainage features);
- Water Storage (includes dams retained for the Final Land Use, but excludes any anticipated permanent water body in the final void);
- Heritage Area;
- Infrastructure (includes built infrastructure proposed to be retained for future use);
- Final Void (including the elevation (AHD) of any anticipated permanent water body); and
- Other.

Mining Domains

Mining domains are defined in the Glossary and are the footprint of areas disturbed for discrete mining related activities, and therefore having discrete geophysical and geochemical characteristics that will require specific rehabilitation treatments to achieve the Final Land Use(s).

Examples of mining domains are:

- Infrastructure Area (such as administration facilities, workshops, access roads, material stockpile areas);
- Tailings Storage Facility;
- Water Management Area (includes any operational sediment dams, temporary creek diversions and other significant constructed drainage features);
- Overburden Emplacement Area;
- Active Mining Area (open cut void);
- Underground Mining Area (the area to be managed for subsidence impacts, e.g. Subsidence Management Area in accordance with an Extraction Plan); and
- Other (e.g. temporary waste rock emplacement area, topsoil stockpile areas, on-lease exploration areas).

4.5.3. Asset Register

In tabular form, this section must define the following information for each Mining Domain and Final Land Use Domain:

- Final Land Use Domain / Mining Domain name
- Size – area and perimeter
- Assets included in the area - include items such as buildings (e.g. offices), public infrastructure and other plant (e.g. crushers, rail loops, treatment plants).

5. Part 5 - Rehabilitation Objectives and Completion Criteria

Explanatory note 5: Rehabilitation Objectives and Completion Criteria

The Rehabilitation Objectives and Completion Criteria approved under the mining lease must be achieved by the lease holder to demonstrate that the Final Land Use(s) has been met.

Rehabilitation Objectives are defined in the Glossary, and describe the qualities or features of Final Land Use Domains that must be demonstrated through the rehabilitation process to achieve the Final Land Use(s).

As a minimum, Rehabilitation Objectives must demonstrate that each Final Land Use Domain is safe, stable, non-polluting and sustainable. The lease holder must demonstrate that Rehabilitation Objectives have been met prior to lease relinquishment.

Completion Criteria are defined in the Glossary, and set the "benchmark" values for key attributes (indicators) proposed to demonstrate that the Rehabilitation Objectives have been met. Completion Criteria may also specify the target timeframe to achieve the benchmark value. As such, the Completion Criteria are intended to apply the SMART (specific, measurable, attainable, relevant, timely) criteria to the associated Rehabilitation Objective.

For example, to demonstrate the objective of achieving a stable landform, lease holders may nominate the attribute 'soil loss', and an associated 'benchmark' criterion as the maximum soil loss (tonnes) per hectare.

Lease holders will be required to maintain records that verify rehabilitation methodologies have been implemented during the various phases of rehabilitation, in accordance with the Rehabilitation Quality Assurance Process (refer to Part 9).

Consistency with the Development Consent

In many cases, particularly with State Significant Developments, the Rehabilitation Objectives (and sometimes Completion Criteria) are approved in the development consent granted under the *Environmental Planning and Assessment Act 1979.*

The Rehabilitation Objectives and Completion Criteria submitted to the Minister for approval under the condition of a mining lease must reflect (and be consistent with) those approved in the development consent under the *Environmental Planning and Assessment Act 1979***.** The Department may expect additional specificity in the Completion Criteria submitted to the Minister as the operations and rehabilitation under the mining lease progress.

For older development consents where Rehabilitation Objectives may be broad and non-specific (or even non-existent), this Code offers the regulatory framework for a lease holder to develop Rehabilitation Objectives and Completion Criteria to meet land use outcomes which are consistent with the development consent and have been agreed to with relevant stakeholders (refer to section 4.4).

Lease holders should be aware that the satisfaction of the Rehabilitation Objectives and Completion Criteria approved under the mining lease, does not guarantee satisfaction of the separate regulatory requirements prescribed through the development consent or other relevant legislation. Consequently, lease holders must consult with all relevant regulators to ensure that their rehabilitation meets the requirements of any other relevant approval, permit and/or authority.

5.1 Rehabilitation Objectives and Completion Criteria

This section must:

a. specify Rehabilitation Objectives and Completion Criteria for each Final Land Use Domain;

b. specify the validation method (records) to demonstrate that each criterion has been achieved;

c. define the attributes (performance indices) and benchmark values that will demonstrate that the corresponding Final Land Use has been achieved; and

d. present the Rehabilitation Objectives and Completion Criteria, validation method, attributes and benchmark values referred to above in tabular form (refer to example template in Appendix 2 *Example Rehabilitation Objectives and Completion Criteria for Large Mines*).

The Rehabilitation Objectives and Completion Criteria required by this section must:

a. be designed to achieve the Final Land Use;

b. be consistent with any criteria or plan approved under the development consent; and

c. apply the SMART criteria (i.e. specific; measurable; achievable; realistic; and time-bound).

5.2 Stakeholder consultation

The Rehabilitation Objectives and Completion Criteria required by **section 5.1** must be developed in consultation with the relevant stakeholders (refer to **Section 4.4**). This section must include a detailed tabular summary of the consultation undertaken which identifies each relevant stakeholder, the method of how they have been consulted and any resultant expectations and agreements in relation to the Rehabilitation Objectives and Completion Criteria.

6. Part 6 - Final Landform and Rehabilitation Plan

Explanatory note 6: Final Landform and Rehabilitation Plan

The Final Landform and Rehabilitation Plan, is used as the basis for the development of the Rehabilitation Objectives and Completion Criteria.

Spatial data required to generate the Final Landform and Rehabilitation Plan is to be submitted to the Department electronically in accordance with the requirements of *Guideline 5: Rehabilitation GIS Portal - Spatial Data (GIS) Guidelines* (NSW Department of Planning and Environment, XX 2018) for approval. Once approved, the Final Landform and Rehabilitation Plan will be made publicly available via the Department's Rehabilitation GIS Portal (under development).

Lease holders must also reproduce the Final Landform and Rehabilitation Plan in PDF format in the body of the Rehabilitation Management Plan.

Consistency with the Development Consent

In most cases, the Final Land Use is approved pursuant to the development consent under the *Environmental Planning and Assessment Act, 1979.* This approved Final Land Use can only be changed through a modification to that development consent (or the granting of a new development consent).

The Final Landform and Rehabilitation Plan submitted to the Minister for approval under the condition of a mining lease must reflect (and be consistent with) the final landform and land uses approved in the development consent under the *Environmental Planning and Assessment Act, 1979.*

6.1 Final Landform and Rehabilitation Plan requirements

The Final Landform and Rehabilitation Plan spatially defines the proposed Final Land Use and final land form at the end of the mine life.

The Final Landform and Rehabilitation Plan is to be developed and included as **Part 6** of the Rehabilitation Management Plan.

The Final Landform and Rehabilitation Plan must contain the following themes.

- Final Landuse
- Final Landform Features
- Final landform Contours
- Project Approval Boundary

Note: The Rehabilitation GIS Portal provides base maps and imagery, as well as the following system generated themes:

- Mine Operations Area
- Current titles

6.2 Final Landform and Rehabilitation Plan submission

6.2.1. Electronic Submission via the Rehabilitation GIS Portal

Lease holders must submit the Final Landform and Rehabilitation Plan electronically in accordance with *Guideline 5: Rehabilitation GIS Portal - Spatial Data (GIS) Guidelines* (NSW Department of Planning and Environment, XX 2018) for approval.

Note: Information on theme requirements is provided in the *Guideline 5: Rehabilitation GIS Portal – Spatial Data (GIS) Guidelines*.

6.2.2. Hardcopy Submission in the Rehabilitation Management Plan

PDF versions of the Final Landform and Rehabilitation Plan are to be generated using the Rehabilitation GIS Portal and included in Part 6 of the Rehabilitation Management Plan.

PDF versions of the Final Landform and Rehabilitation Plan must be separated and prepared in accordance with **Table 1.**

Table 1. Final Landform and Rehabilitation Plan PDF version recommendations

Plan ID	Themes	Base map	Scale
FLRP Plan 1	Final Landuse Final Landform Features Project Approval Boundary Current Titles Mine Operations Area	NSW Base Map	Appropriate scale to show all mine operations
FLRP Plan 2	Final Landform Contours Project Approval Boundary Current Titles Mine Operations Area	NSW Base Map	Appropriate scale to surface disturbance activities

6.3 Final Landform and Rehabilitation Plan – Cross sections

The Final Landform and Rehabilitation Plan section (**Part 6**) within the Rehabilitation Management Plan must include appropriate cross sections that clearly depict the mine progress in relation to the proposed final landform.

Vertical and longitudinal sections must be selected that support and clarify plans and text. Vertical sections must include:

a. a description of the mine cross sections;

b. the vertical extent of mining, emplacement shapes and sections; and

c. the following information:

- current shape;
- emplaced materials – overburden and / or tailings;
- floor of the open cut;
- natural surface;
- final landform;
- cover layers, including topsoil over emplacements and other disturbed areas;
- environment control features;
- water management structures;
- proximity to key infrastructure;
- geological seams of relevance to the mining operation;
- vegetation communities; and
- features to protect rehabilitated areas.

For open cut mining operations, cross sections must depict emplacements and final voids. Note: unless otherwise directed by the Department, sections at right angles to the direction of mining, at intervals of 1000 metres are considered appropriate for open cut coal mines. Unless highly irregular in shape, two sections at right angles should be sufficient for most other mines (i.e. open cut mining operations other than coal), waste emplacements and infrastructure features. Underground operations cross sections must clearly show any permanent structures constructed on the final landform, such as waste rock emplacements and tailings storage facilities.

The lease holder must submit this information in Part 6 of the Rehabilitation Management Plan.

7. Part 7 - Rehabilitation Risk Assessment

This part of the Rehabilitation Management Plan must:

a. summarise the risks to rehabilitation, in tabular form, identified in the most recent Rehabilitation Risk Assessment undertaken for the Land in accordance with the mining lease conditions and the *Guideline 1: Rehabilitation Risk Assessment*;

b. provide reference to where each of the identified risks (and all nominated controls) have been addressed in this Rehabilitation Management Plan.

Explanatory note 7: Managing Risks to Rehabilitation

A *risk*, as defined in the Glossary, is the effect of uncertainty on achieving objectives, and is measured in terms of likelihood and consequence. In the context of rehabilitation, risks of rehabilitation failure are associated with numerous site specific *risk sources* including, for example, material geophysical and geochemical properties and availability of suitable rehabilitation resources.

Given the timeframes required to achieve certain rehabilitation outcomes, extended delays in rehabilitation efforts or delays progressing between discrete rehabilitation phases can also pose a risk to the successful and timely achievement of Rehabilitation Objectives and Completion Criteria.

The Rehabilitation Management Plan should include sufficient information to satisfy the Minister that all identified risks to rehabilitation have been addressed in all aspects of rehabilitation planning and implementation. The Rehabilitation Management Plan should identify how all identified *risk controls* (i.e. the processes, actions, or measures proposed to eliminate, minimise, or mitigate identified risks) have been incorporated into rehabilitation practices, and the effectiveness of controls assessed.

An ongoing assessment of the effectiveness of nominated risk controls, as well as the emergence of any new risks to rehabilitation, should be incorporated into the Rehabilitation Quality Assurance Process (refer to **Part 9**) and Rehabilitation Monitoring Program (refer to **Part 10**).

Where the Rehabilitation Monitoring Program indicates that nominated controls are ineffective, or identifies the emergence of previously unidentified risks, the Rehabilitation Management Plan should identify appropriate management responses, including reviewing the Rehabilitation Risk Assessment in accordance with *Guideline 1: Rehabilitation Risk Assessment*.

8. Part 8 - Rehabilitation Implementation

8.1 Life of Mine Progressive Rehabilitation Schedule

This section must summarise the general Progressive Rehabilitation Schedule (sometimes also referred to as Life of Mine Rehabilitation Schedule or Disturbance and Rehabilitation Staging), and identify any assumptions and principles regarding the development of the Progressive Rehabilitation Schedule (e.g. production milestones, overburden handled, seasonal considerations). Where a development consent under the *Environmental Planning and Assessment Act 1979* includes information on progressive rehabilitation, the Progressive Rehabilitation Schedule must be consistent with the development consent.

Where a development consent does not contain requirements or commitments regarding rehabilitation programming or scheduling, this section must provide a schedule for optimising progressive rehabilitation through the life of the project in order to achieve the approved rehabilitation outcomes.

Explanatory note 8: Progressive Rehabilitation Schedule

The Rehabilitation Management Plan should include a proposed life of mine Progressive Rehabilitation Schedule with sufficient detail to satisfy the Minister that the leaseholder is maximising opportunities for progressive rehabilitation throughout the mine planning process

Progressive rehabilitation, as defined in the Glossary, refers to practices that seek to:

- commence rehabilitation on disturbed areas promptly after the area is no longer or not currently required for active operations; and
- effectively manage rehabilitation areas to advance through the phases of rehabilitation and achieve the Final Land Use in a timely and efficient manner.

The benefits of progressively rehabilitating disturbance areas include:

- achieving compliance with the requirements of development consents;
- reducing the timeframes to achieve the Final Land Use and lease relinquishment following cessation of mining;
- facilitating rehabilitation trials and therefore providing opportunities to assess and improve the effectiveness of rehabilitation methods;
- potentially reducing overall operational costs by programming rehabilitation with mining operations;

- minimising environmental impacts such as dust emissions and sediment laden runoff by stabilising disturbance areas;
- improving visual amenity; and
- reducing the rehabilitation liability and therefore the rehabilitation cost estimate and security bond held by the Department.

The Progressive Rehabilitation Schedule should be presented in a way that clearly indicates the progress of the operations, such as a series of figures depicting general disturbance and rehabilitation areas at key stages of the operation (for example 5-year intervals).

Where there is uncertainty regarding timing of rehabilitation (for example operations where ore extraction is intermittent) it may be appropriate to present the Progressive Rehabilitation Schedule based on other milestones, such as cumulative production volumes or in terms of specific commitments (e.g. rehabilitation will commence when active mining has advanced no more than 200m beyond the backfilled extraction area).

Specific detail regarding the forecast progress of disturbance and rehabilitation is to be submitted to the Department annually in the Forward Program component of the Annual Rehabilitation Report and Forward Program, which details a rolling 3-year rehabilitation implementation schedule.

The Department will assess rehabilitation performance in the context of progressive rehabilitation when undertaking a review of site records, the Annual Rehabilitation Report and Forward Program, site audits and inspections.

8.2 Rehabilitation Phases and general methodologies

For each rehabilitation phase identified below in subsections 8.2.1 – 8.2.6 the information provided must demonstrate that:

- risks and opportunities for rehabilitation identified in the Rehabilitation Risk Assessment have been considered in rehabilitation methodologies; and
- relevant controls nominated in the Rehabilitation Risk Assessment have been incorporated into the relevant activities.

Explanatory note 9: Rehabilitation phases and methodologies

The sequence of actions required to rehabilitate disturbed areas to achieve the Final Land Use can be classified into conceptual stages referred to as rehabilitation phases (defined in the Glossary). Rehabilitation phases that would typically apply to establishing Final Land Use(s) are listed in the table below:

Rehabilitation Phase	Description
Active Mining	Activities undertaken during operations to enhance rehabilitation, such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection.
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials. Includes all studies, assessments and activities associated with the decommissioning and demolition (or removal) of infrastructure and services. Includes contamination remediation and removal of hazardous materials, and any works to make safe or 'fit for purpose' any retained infrastructure, including heritage buildings.
Landform Establishment	The process of constructing the final landform surface profile. This phase includes all earthworks to construct the final landform into the desired surface profile. This phase includes works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (e.g. rock raking or ameliorating sodic materials).
Growth Medium Development	The establishment of the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short lived pioneer species). (For example, development of a productive, self-sustaining soil profile). Includes spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media.
Ecosystem and Land Use Establishment	The process of establishing the Final Land Use following construction of the final landform. For vegetated Final Land Uses, this phase comprises establishing the desired vegetation community (including short lived pioneer species. This phase also incorporates habitat augmentation and land management actions such as pest animal and weed control. Typically, rehabilitation areas would be in this phase for at least 2 years (and usually more) before rehabilitation can be

	classified as being in the Ecosystem and Land Use Development phase. This phase does not apply to infrastructure areas that are being retained as part of Final Land Use for the site.
Ecosystem and Land Use Development	The process of managing maturing rehabilitation areas on a trajectory toward meeting the approved Rehabilitation Objectives and Completion Criteria. For vegetated land uses, this phase incorporates the processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity.
Rehabilitation Completion	Land in this phase has satisfied all approved Rehabilitation Objectives and Completion Criteria for the intended Final Land Use.

The *Guideline 3: Rehabilitation Controls* provides an example rehabilitation controls checklist that lists suggested controls / actions / processes for each rehabilitation phase. This checklist provides a range of industry recognised best practice rehabilitation controls and techniques that are to be considered and used as guidance (not obligatory) by lease holders for achieving sustainable rehabilitation.

It is the expectation that rehabilitation techniques will be further developed and refined over the life of an operation through a continual process of research, trialing, monitoring and improvement. As such, it is the intention that the information provided in this section will not constrain the ability for an operation to adopt alternative practices to achieve the nominated outcomes.

Relationship to the Forward Program

The Rehabilitation Management Plan includes a summary of the proposed actions / methods / controls to rehabilitate each mining domain through each phase of rehabilitation. A more detailed description of the rehabilitation activities that will be undertaken in the 3 year Forward Program is submitted to the Department for approval in the Annual Rehabilitation Report and Forward Program.

8.2.1. Active Mining Phase

This section must summarise the risks and opportunities for rehabilitation associated with mining operations and the associated mining domains. As a minimum, the Rehabilitation Management Plan must address the matters listed below.

a. Topsoil Resource

This section must summarise the characterisation and assessment of topsoil and subsoil resources undertaken to date. This section must describe general processes / methods for future identification, characterisation and assessment of topsoil and subsoil resources not yet disturbed, to:

- develop the optimal approach to stripping and salvaging (including timing) suitable topsoils and/or subsoils; and
- maximise the integrity of the resources for future use in rehabilitation.

This section must include a statement indicating whether there is anticipated to be a soil resource deficit for life of mine rehabilitation, and propose actions to mitigate identified risks. These mitigation actions must be consistent with the development consent and associated environmental assessments.

b. Flora

This section must describe the management of resources required to establish any specific flora species in rehabilitation, including (but not limited to) threatened species, seed collection, propagation in a nursery, translocated plants, revegetation techniques, and weed and pest management.

c. Fauna

This section must describe the management of fauna, including habitat management (during clearing and progressive rehabilitation), threatened species, habitat augmentation (rock piles, frog ponds, log piles and translocated stag trees), and pest control.

d. Rock/overburden emplacement

This section must describe the areas identified for emplacements, the sequencing of emplacements, construction and management to facilitate sustainable landform design and rehabilitation outcomes.

e. Waste management

This section must describe the waste disposal and materials handling operations, including the disposal of putrescible waste, hydrocarbons, and management of contaminated soils.

f. Geology and geochemistry

This section must describe the geochemical risks related to waste emplacements and ore beneficiation (if any), and outline the management/mitigation measures relevant to rehabilitation.

g. Material prone to spontaneous combustion

This section must describe the potential for spontaneous combustion, including:

- a historical summary of previous spontaneous combustion occurrences;
- the risk of spontaneous combustion occurrence / propensity for combustion of ores and waste materials; and
- key management measures relevant to rehabilitation.

h. Material prone to generating acid mine drainage

This section must describe the potential for generation of acid forming materials, including a historical summary for those mines that have experienced acid mine drainage issues. Identify the risks of acid mine drainage and proposed mitigation measures, specifically with respect to rehabilitation.

i. Ore beneficiation waste management (reject and tailings disposal)

This section must describe:

- the geochemical and geophysical characteristics of the beneficiation waste stream and how it is managed. Describe how the process, including disposal methods (e.g. emplacement facilities), will be designed and managed to reduce risks to rehabilitation (e.g. geotechnical instability, geochemical constraints etc.); and
- stability issues and associated management/treatment strategies that may relate to tailings dams.

j. Erosion and sediment control

This section must:

- describe the potential for erosion and sedimentation on the site, including how soil stockpiles will be managed and how runoff from spoil dumps awaiting revegetation will be managed;
- detail the risks of erosion and sedimentation and their mitigation measures; and
- detail the geology and soils of the site as it pertains to the potential for erosion.

k. Ongoing management of biological resources for use in rehabilitation

This section must describe:

- how biological resources (e.g. topsoil stockpiles) will be effectively managed during the mining and production phase to maintain their integrity for later use in rehabilitation;
- weed management;
- residence times for species;
- required top soil depths for growth and survival; and
- methods for propagating native seeds and other propagules.

l. Mine subsidence

This section must describe:

- the potential for subsidence and the likely impacts to natural features, which may subsequently require rehabilitation. This may include, but is not limited to impacts to swamps, wetlands, creeks / rivers, native ecosystems, agricultural land and surface and groundwater resources. Information must be included that provides sufficient context regarding the likely rehabilitation liabilities that may be incurred;
- a brief history for those mines that have experienced subsidence issues. This must include a discussion of the risks of subsidence impacts and provide an overview of the monitoring program as well as any associated trigger action response plan to address the occurrence of potential damage requiring rehabilitation; and
- based on predicted impacts, the proposed mitigation/rehabilitation measures that may be implemented. To avoid duplication, a copy of the relevant components of the Extraction Plan or Subsidence Management Plan can be included as an appendix to the Rehabilitation Management Plan and or referenced to provide information on the rehabilitation of subsidence impacts.

m. Management of potential cultural and heritage issues

This section must provide the following details:

- Any heritage management obligations under any relevant statutory approvals (for example, *National Parks and Wildlife Act 1974*, *Environmental Planning and Assessment Act 1979*, *Heritage Act 1977*), regarding any places, objects, items, infrastructure, etc. This may also

include land which is to be secured by a specific instrument on title, such as a Conservation Agreement under the *Biodiversity Conservation Act 2016*;

- Any approved management plans or strategies based on the outcomes of any cultural and/or heritage assessments. This must include an outline of any scope of works and conservation actions, which may include, but are not necessarily limited to, the following:
    - protection / removal / relocation / salvage of heritage items, Aboriginal places and objects, etc.;
    - archival recordings;
    - demolition or part demolition;
    - dilapidation and integrity surveys; and
    - engineering works to make safe where infrastructure is to be retained for heritage management purposes;
- any approvals/permits that are required or are in place for the implementation of a cultural and/or heritage management plan or strategy. This must include information regarding the appropriate approval authority (e.g. Office of Environment and Heritage, Department of Planning and Environment or Local Council) as well as other relevant stakeholders that will need to be consulted (e.g. Department of Industry – Crown Lands, Local Aboriginal Land Councils, etc.);
- responsibility for implementing and managing heritage including agreement and/or funding arrangements to be in place for their ongoing management after lease relinquishment where objects, places, items, structures, etc. are to be retained for cultural/heritage management purposes; and
- (where the future cultural and heritage management obligations are uncertain), an outline of the investigations that the lease holder will be undertaking to confirm the strategy. (Note: the detailed program of works and progress towards completing any cultural and heritage assessments / investigations may be required to be provided in the Annual Rehabilitation Report and Forward Program submitted to the Department).

n. Exploration Activities

This section must describe the scope of works that may be required to rehabilitate any exploration activities that may continue to be undertaken on a mining lease. Guidance on the type of rehabilitation activities that need to be undertaken, including the management of all drilling cores and samples, is included in the *Exploration Code of Practice: Rehabilitation*.

8.2.2. Decommissioning

This section must provide an overview of the range of decommissioning activities that may occur following either the cessation of mining or progressively over the life of an operation. It is recognised that this information may be conceptual as part of the initial stages of an operation. Note: it is the expectation that information will become more detailed as an operation nears the cessation of mining or production.

a. Site security

This section must detail the security measures to be implemented during and following the decommissioning process to protect the community as well as any retained infrastructure items.

b. Site services

This section must detail the scope of works and timing for the disconnection and termination of services (e.g. electricity, water, telecommunications, sewerage, security etc.).

c. Decommissioning and demolition activities

This section must identify and describe those areas and structures to be decommissioned and/or demolished to achieve the Final Land Use. The Rehabilitation Management Plan must identify the key actions, assessments, studies, detailed designs, and regulatory approvals required to decommission and / or demolish built infrastructure in accordance with the development consent issued under the *Environmental Planning and Assessment Act 1979*, mining lease conditions and any approvals or licences issued by other regulatory agencies.

Explanatory note 10: Decommissioning and Demolition Activities

The Rehabilitation Management Plan should outline the key processes and activities required to decommission and demolish built infrastructure including any assessments or designs. Where relevant, this section should reference any regulatory requirements or agency approvals required for decommissioning and/or demolishing infrastructure. The range of activities that should be described include, but are not necessarily limited to:

- the demolition, dismantling or removal of:
    a. buildings (workshop, offices, bathhouse, small buildings);
    b. coal / mineral handling and processing plants;
    c. ore and product stockpiling and transport infrastructure (such as bins, conveyors, reclaim tunnels, product and ore stockpile pads, rail and loading infrastructure);
    d. all tailings management infrastructure;
    e. utilities, services and fuel infrastructure (including pipelines – underground and surface, powerlines, fuel tanks and hazardous material storage tanks);
    f. remote infrastructure (e.g. ventilation buildings, ballast borehole facilities, services borehole facilities, gas wells, gas flares);
    g. concrete foundations and footings; and
    h. hardstand and bitumen sealed areas, haul roads and access tracks;
- the management of any hazardous items (e.g. radioactive density gauges) or materials (e.g. asbestos) that may be encountered during the demolition process; and
- decommissioning, removal and/or augmentation of the mine water management system including any dams prescribed by the Dams Safety legislation.

The discussion should nominate the potential timing of decommissioning and demolition activities, and all potential risks or opportunities for rehabilitation associated with the activities.

Further detail regarding decommissioning and demolition activities will be required in the Annual Rehabilitation Report and Forward Program if any plant and/or infrastructure is proposed to be decommissioned in the 3 year Forward Program.

d. Buildings, structures and fixed plant to be retained

This section must identify and describe those areas and structures (including infrastructure) to be retained for future use as part of the Final Land Use of the site. It must describe the process that will be implemented to:

- determine the structural integrity of the building / structure / infrastructure to be retained;
- identify the associated short and long term risks to public safety and the environment from the structures remaining in situ, which should identify potential modes of failure;
- address any potential residual risks and modes of failure; and,
- engage (where required) a suitably qualified engineer to verify that any risks have been satisfactorily addressed.

e. Management of carbonaceous / contaminated material

This section must detail the process that will be implemented to identify and appropriately manage any risks associated with the potential occurrence of carbonaceous and or contaminated material. The information must include, but is not limited to, the following:

- removal and management of carbonaceous/contaminated material from footprint of surface infrastructure including stockpiles, access roads and haul roads;
- the scope of contamination studies required;
- an overview of potential remediation strategies that will be adopted (e.g. on-site bioremediation or disposal off-site); and
- where required, the engagement of a suitably qualified contamination expert to verify that any contamination has been adequately managed in accordance with any standards associated with the intended Final Land Use.

This section must provide identify and describe the potential timing of contamination remediation activities and how this may impact upon the overall timing of completing rehabilitation activities on site.

f. Hazardous materials management

This section must detail the process that will be implemented to identify and appropriately manage any hazardous materials (e.g. hydrocarbons, chemicals etc.) that may remain following the cessation of an operation.

g. Underground infrastructure

This section must identify and describe how underground mining infrastructure will be decommissioned to achieve the Final Land Use. Activities that must be described include, but are not necessarily limited to, the following:

- the sealing of any portals, decline entries, shafts etc. and how the process will be designed, supervised and subsequently validated by a suitably qualified engineer that any risks associated with achieving the Final Land Use outcome have been adequately addressed;
- the sealing and decommissioning of any remaining boreholes including services, gas wells, dewatering etc.;
- investigation of the integrity of any former underground mine entries that may have been previously sealed but may require further work to ensure long term stability;
- security measures that will be implemented for public safety purposes whilst sealing and decommissioning works are undertaken on shafts, adits and drifts;
- implementation of any specific measures required for the future management of groundwater accumulation in the underground workings. This may include measures to be implemented to minimise any environmental or community impacts associated with potential future discharges from the underground workings;
- details of any consultation with Government agencies and any subsequent approvals that may be required to allow for any ongoing discharges; and,
- the removal of any remaining subsidence monitoring pegs (pending approval under the *Surveying and Spatial Information Act 2002*) that pose a risk to the public, wildlife and stock when subsidence monitoring has ceased and subsidence related impacts have met relevant approvals.

This section must describe the potential timing of underground works and how this may impact upon the overall timing of completing rehabilitation activities on site.

h. Ongoing environmental management and monitoring

This section must detail the ongoing environmental management and associated monitoring activities that will continue during the decommissioning and subsequent rehabilitation phases until it can be demonstrated that the site is safe, stable and non-polluting, and where relevant, that targeted vegetation communities have met the Completion Criteria.

8.2.3. Landform Establishment

This section must provide an overview of the key characteristics of the final landform as shown in the Final Landform and Rehabilitation Plan (refer to Part 6).

The final landform reflected in Final Landform and Rehabilitation Plan, must be constructed in accordance with the requirements of the relevant development consent(s). As far as reasonably practical, the design must be sympathetic with the topography of the local area.

The key items that must be addressed are as follows:

a. Water management infrastructure

This section must detail the location, treatment and or rehabilitation of water management infrastructure.

Where it is proposed to retain infrastructure for future use, this section must detail the measures that will be implemented to ensure that it is fit-for-purpose and appropriately licensed for the intended Final Land Use(s).

b. Reject emplacement areas and tailings dams

This section must detail:

- how reject emplacement areas and tailings dams will be rehabilitated to a condition / capability that supports the Final Land Use for the site and that is safe, stable and non-polluting; and
- measures (e.g. capping; dewatering strategies; groundwater) that will be implemented (and their associated timeframes) to address potential geotechnical / geochemical risks of achieving a sustainable rehabilitation outcome.

Based on the identified risks associated with the reject emplacement areas / tailings dam, supplementary information such as specialist reports must be submitted as an appendix to the Rehabilitation Management Plan to justify the proposed rehabilitation approach.

c. Landform design / shape

This section must detail how the final landform design will be constructed to address the following issues as a minimum:

- potential geotechnical and geochemical issues;
- incorporating characteristics of surrounding landforms (where feasible) into the final landform design (e.g. macro-relief) and general considerations for the visual amenity of the final landform; and
- surface water management to optimise landform stability and integration with surrounding catchments.

d. Final voids, highwalls and lowwalls

This section must identify the key design features (e.g. size, depth, orientation and location) and processes associated with the final void(s), and how the design minimises impacts to public safety and reduces the sterilisation of land available for future Final Land Uses. This section must also describe any additional strategies or requirements prescribed in the development consent that relate to final voids.

Where details regarding the rehabilitation of the final void are conceptual in nature, details must be provided in this section as to what processes will be implemented over the life of the operation to develop a final void management strategy. The information must include the following:

- details of the process for investigating Final Land Use options for the final void;
- the scope and timing of required studies including (but not limited to):
    - final void water balance including groundwater modelling to determine the likely final void water level;
    - water quality assessments including geochemical studies required to inform management of potential pollution impacts; and

    - geotechnical studies required to determine what stabilisation and public safety measures will need to be incorporated into the final design; and

- details regarding future water licensing requirements for water retained within final voids following mine closure.

Unless an earlier timeframe is specified in the development consent, when a mine is within 5 years of the end of its expected mine life, this section must include a detailed schedule to complete the required technical assessments and studies to inform the development of the final void design.

Where a lease holder has a development consent requirement to prepare a Final Void Management Plan (or equivalent document), they must consult with the relevant regulator to ensure this plan meets the requirements of the development consent. Once this separate document has been approved, it must be appended to the Rehabilitation Management Plan.

e. Construction of creek / river diversion works

This section must detail the construction of any creek or river diversion works that will form part of the final landform, including relevant approvals from Government agencies.

As riverine rehabilitation and recovery is typically complex and site specific, this section must describe studies required for the detailed design including (but not limited to) geomorphological and hydraulic modelling and aquatic ecological assessments.

Methods to address any commitments and/or regulatory requirements associated with the development consent, mining lease conditions, or other agency licences and approvals must be included in this section. This may include, but not be limited to describing the re-creation of aquatic habitat features (such as woody debris, snags, gravel beds, cobbles, rocks, boulders, or rock bars), establishment of aquatic vegetation species, and assessing ecological processes such as fish passage and aquatic life cycles.

8.2.4. Growth Medium Development

This section must outline how rehabilitation areas will be prepared with growth media (i.e. vegetation substrate) suitable for establishing vegetation in accordance with the intended Final Land Use (e.g. agriculture, native ecosystems etc.).

Based on the nature, scale and risks associated with a site, the information provided must include, but is not limited to, the following:

- the process that will be undertaken to characterize the geochemical nature of the substrate and associated materials (e.g. subsoils, topsoils, organic additives, overburden surface etc.);
- an overview of the type of ameliorants and or strategies that may be implemented to address any potential constraints and or enhance the substrate (based on the outcomes of the characterisation analysis);
- the type of erosion and sediment controls that will be installed to protect the substrate from surface water runoff and wind exposure whilst a vegetative cover is established;
- the type of mechanical treatments that may be required (e.g. deep ripping, harrowing etc.) to maximise water infiltration into the substrate and to provide for an adequate seed bed;
- topsoil and subsoil management as well as other substitutes (e.g. organic material) and how these will be applied;

- weed control techniques;
- potential seasonal considerations that will need to be factored into the process in order to maximise the viability of the substrate;
- how rehabilitation areas will be managed (to minimise degradation of the substrate, dust generation and erosion) should adverse conditions delay vegetation establishment; and
- where required, measures that will be implemented to augment habitat value (e.g. structures such as tree hollows, logs and other woody debris, ponds etc.).

8.2.5. Ecosystem and Land Use Establishment

This section must describe how the target vegetation associated with the Final Land Use will be established and subsequently managed to progress to the Ecosystem and Land Use Development phase (refer to **section 8.2.6**).

The information provided must include, but is not limited to, the following:

- potential seasonal considerations (e.g. drought conditions; excessive heat, etc.) that will need to be factored into the process to optimise conditions to support the initial establishment of the target vegetation;
- an overview of the methodologies that may be applied as part of the revegetation process (e.g. direct seeding, tree plantings, use of a seed drill, etc.);
- the type and range of species that will be planted, including short lived pioneer species, to achieve the intended revegetation outcome;
- how seed will be sourced, handled and applied to maximise viability;
- the use of cover crops (where required) to protect the substrate whilst the target revegetation cover is established;
- where required, the type of initial measures that may be adopted (e.g. watering) to promote vegetative establishment and growth; and
- weed management and pest animal control to protect juvenile vegetation.

8.2.6. Ecosystem and Land Use Development

This section must detail how rehabilitated lands will be actively managed to achieve the intended Final Land Use. Based on the outcomes of the rehabilitation monitoring program (refer to **Part 10** – Rehabilitation Monitoring Program) this section must provide an overview of the management and maintenance program and monitoring that will be implemented to achieve the approved Rehabilitation Objectives and Completion Criteria and demonstrate that rehabilitation is likely to be sustainable in the long term.

The scope of this management and maintenance program must include, but is not limited to, the following:

- weed and feral animal control of rehabilitation areas;
- erosion and drainage control works;

- environmental monitoring and management of surface water, groundwater, ecology, land capability, etc.;
- re-seeding/planting of rehabilitation areas that may have failed or where key species are under-represented (e.g. lack of germination, high plant mortality rate, etc.);
- maintenance of fertilising; and
- repair of fence lines, access tracks and other general related land management activities.

For agricultural Final Land Use(s), this section must outline how these areas will be managed to demonstrate agricultural productivity (e.g. grazing trials)

8.3 Rehabilitation of areas affected by subsidence

This section must describe subsidence remediation processes associated with underground mining operations. The information provided must include, but is not limited to, the following:

- the nature and scale of predicted subsidence;
- the sensitivity of the environment that may be the subject to the occurrence of subsidence;
- the process of monitoring for subsidence, including post mining, until subsidence can no longer be measured;
- details regarding any Trigger Action Response Plans (TARPs) that will be implemented as a result of subsidence monitoring;
- the range of subsidence mitigation and remediation techniques that may be implemented; and
- the process of validating whether subsidence mitigation and remediation techniques have been effective.

Where an Extraction Plan and/or Subsidence Management Plan is required to be submitted to the Department in accordance with development consent or mining lease conditions, the mandatory requirements of the Rehabilitation Management Plan can be met by referencing the relevant plan or appending it to the Rehabilitation Management Plan.

9. Part 9 - Rehabilitation Quality Assurance Process

This part must describe the Rehabilitation Quality Assurance Process that will be implemented throughout the life of an operation for each of the following Phases of Rehabilitation:

a. Active Mining (e.g. land clearing and salvaging rehabilitation resources);

b. Decommissioning;

c. Landform Establishment;

d. Growth Medium Development;

e. Ecosystem and Land Use Establishment; and

f. Ecosystem and Land Use Development.

For each phase of rehabilitation, key actions and/or processes must be nominated that will be validated via monitoring, inspections, or records to ensure that:

- rehabilitation is implemented in accordance with the nominated methodologies; and
- identified risks to rehabilitation are adequately addressed before proceeding to the next phase of rehabilitation.

The type of actions / processes to be included in the scope of the Rehabilitation Quality Assurance Process must be aligned with the rehabilitation risks and controls identified in the Rehabilitation Risk Assessment, and developed to demonstrate that all regulatory requirements for rehabilitation listed in **section 4.1** will be met.

This part must describe how the Rehabilitation Quality Assurance Process will be formally integrated into the day to day operations, including:

a. the responsibilities for implementation;

b. how the process will be formally documented and recorded (e.g. Inspection Test Plans); and

c. how the process will be reviewed and refined over time to promote continuous improvement.

Explanatory note 11: Rehabilitation Quality Assurance Process

The Rehabilitation Quality Assurance Process should address the key actions and/or processes for each rehabilitation phase, where a validation process is required to ensure that identified risk controls have been implemented before proceeding to the next phase of an operation. This will usually require the development and maintenance of records to

validate that these actions / processes have been completed in accordance with nominated specifications.

An example rehabilitation controls checklist that may be considered by a lease holder when implementing the Rehabilitation Phases is provided in *Guideline 3: Rehabilitation Controls.*

This checklist provides a range of industry recognised best practice rehabilitation controls and techniques that are to be considered and used as guidance by lease holders for achieving sustainable rehabilitation.

The Department may require copies of any records to be made available by the lease holder as evidence that quality assurance processes are in place to demonstrate that the conditions of relevant development consents and mining leases regarding rehabilitation are being met. Further guidance is provided in *Guideline 2: Rehabilitation Records.*

10. Part 10 - Rehabilitation Monitoring Program

This part must include a Rehabilitation Monitoring Program that addresses the requirements set out in **sections 10.1 and 10.2**.

Explanatory note 12: Rehabilitation Monitoring Program

A Rehabilitation Monitoring Program is required to be developed and implemented to evaluate the progress of rehabilitation towards fulfilling Rehabilitation Objectives and Completion Criteria (including non-disturbed areas for reference (analogue) sites).

The scope of the monitoring program should be “fit for purpose”, i.e. reflect the:

- identified risks to rehabilitation associated with the operation;
- Final Land Use obligations; and
- development consent conditions and commitments.

In designing a Rehabilitation Monitoring Program, a lease holder should select the most appropriate indicators and monitoring methods that:

- align the monitoring program with the nominated rehabilitation objectives and completion criteria;
- are relatively simple to measure and are reproducible; and
- are effective for tracking rehabilitation progress, or regression and potential risks.

The design of the monitoring program should be flexible enough to:

- incorporate industry accepted techniques and / or expert recommendations to address any emerging issues; and
- assess any new or refined rehabilitation completion criteria that are proposed as a result of rehabilitation and/or analogue site monitoring.

The frequency of monitoring will depend on site-specific circumstances and the selected monitoring methodology. As a guide, the frequency of monitoring will be more intense immediately following rehabilitation until such time that there is adequate ground cover or adequate species establishment.

As a minimum, annual monitoring must be undertaken in accordance with the requirements set out in the Annual Rehabilitation Report and Forward Program.

10.1 Rehabilitation Establishment Monitoring

This section must document the inspection regime that will be implemented following the completion of each rehabilitation phase.

This section must also include appropriate monitoring parameters and methods that will:

- enable early identification of actual or emerging issues that have the potential to delay revegetation establishment;
- identify if triggers have been met for preventative or mitigation controls to minimise the impacts of emerging issues in accordance with the Trigger Action Response Plan (refer to **Part 12**); and
- provide data that may inform continuous improvement of rehabilitation methods.

Explanatory note 13: Relationship between rehabilitation establishment monitoring and the quality assurance program

Verification tools included in the Rehabilitation Quality Assurance Program demonstrate that rehabilitation has been implemented *in accordance with* rehabilitation methodologies. The purpose of rehabilitation establishment monitoring is to assess the *effectiveness* of rehabilitation methodologies.

The Department expects that rehabilitation establishment monitoring results will be assessed to determine if there are any emerging risks including a risk of rehabilitation failure requiring early intervention.

10.2 Measuring Performance against Rehabilitation Objectives and Completion Criteria

This section must assess performance against the approved Rehabilitation Objectives and Completion Criteria, and ultimately demonstrate that Rehabilitation Objectives and Completion Criteria have been met. Monitoring parameters in the Rehabilitation Monitoring Program must be aligned to the Completion Criteria, specifically the performance indices. Where Completion Criteria have not yet been developed based on suitable reference (analogue) benchmark data, the Rehabilitation Monitoring Program must also include baseline monitoring that is to be undertaken on non-mined areas nominated as reference sites, including justification for the site(s) selection with respect to the Final Land Use(s) for rehabilitation areas.

This section must also detail the monitoring activities (such as inspections) undertaken following the completion of key rehabilitation steps and Rehabilitation Phases.

The Rehabilitation Monitoring Program must be designed to ensure that collection and analysis of data is undertaken in a robust and statistically valid manner. The Rehabilitation Management Plan must identify how rehabilitation monitoring data will be used to assess rehabilitation performance by identifying developing trends on areas undergoing rehabilitation, and whether rehabilitation is on a trajectory toward success or at risk of failure.

11. Part 11 - Research, Rehabilitation Trials and Use of Analogue Sites

This part must outline any aspects of rehabilitation that require further research or rehabilitation trials to address knowledge gaps and / or risks identified in the Rehabilitation Risk Assessment.

This part must also:

a. provide the status of ongoing trials and research programs;

b. analysis of outcomes of any completed trials and research; and

c. describe how results have been used to develop future trials and review rehabilitation methods.

Explanatory note 14: Research, Rehabilitation Trials and Analogue Sites

Current leading practice is to compare characteristics of rehabilitation areas to appropriate reference or analogue sites. Suitable reference sites (analogues) should be identified for each intended Final Land Use. Analogue sites may provide realistic and relevant Completion Criteria against which rehabilitation areas can be assessed to demonstrate that the intended Final Land Use has been achieved.

Lease holders should proactively seek to improve rehabilitation methodologies using a range of resources including, but not limited to:

- rehabilitation trials at existing rehabilitation areas;
- undertaking literature reviews to assess the suitability of various rehabilitation techniques, and identify industry best practices; and
- partnering with research institutions to undertake research programs that address specific knowledge gaps.

The Rehabilitation Management Plan should provide sufficient detail to satisfy the Minister that the lease holder has developed a strategy to utilise trials and research programs to address identified knowledge gaps. A detailed discussion regarding proposed trials and research programs, and a discussion of the outcomes of trials and research, is to be provided in the Annual Rehabilitation Report and Forward Program.

The presence of a knowledge gap should not delay progressive rehabilitation.

12. Part 12 - Intervention and Adaptive Management

This part must contain a Trigger Action Response Plan (TARP) to identify proposed contingency strategies in the event of unexpected variations in rehabilitation outcomes (e.g. a failure to meet a nominated completion criterion).

To facilitate early response to emerging threats to rehabilitation, the outcomes of the Rehabilitation Risk Assessment (refer to **Part 7**) must be used to form the basis of the TARP.

The TARP must include, but is not limited to, the following:

- the major threats to rehabilitation success;
- the trigger levels (i.e. the level at which response actions are required) if early trends indicate there is a risk to rehabilitation progress or success;
- a summary of the response actions to be implemented if monitoring indicates an exceedance of trigger levels;
- scientific and/or quantifiable evidence that each planned response action is suitable for managing a situation before threats to rehabilitation success become unacceptable, unmanageable or irreversible;
- measures to mitigate, remediate, and/or compensate any identified impacts;
- details about how impacts will be monitored; and
- a protocol for notifying the Department, and other relevant stakeholders, of exceedance which may result in major impacts to rehabilitation.

13. Part 13 - Review and Implementation

This part must describe the triggers for reviewing and revising the Rehabilitation Management Plan and the process for document management. The lease holder must include (in tabular form):

- all statutory triggers for reviewing the Rehabilitation Management Plan in accordance with the development consent conditions, mining leases, and other regulatory requirements and statutory approvals; and
- the process for ensuring that mining and rehabilitation activities are being conducted in accordance with the Rehabilitation Management Plan.

This part must also identify (in tabular form) the personnel (or position titles) for the individuals responsible for the implementation, review and revision of the Rehabilitation Management Plan.

Glossary

Term	Definition
Access track	All unsealed routes that will be traversed multiple times, but does not include single pass (ingress and egress) routes or seismic survey shot and receiver lines.
Active	In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
Annual Rehabilitation Report	A report that sets out the rehabilitation carried out for the Land in the previous 12-month period and is prepared in accordance with the *Code of Practice Annual Rehabilitation Report and Forward Program*.
Annual Rehabilitation Report and Forward Program Code	means: • for a Small Mine – the *Code of Practice: Annual Rehabilitation Report and Forward Program for Small Mines*; or • for a Large Mine – the *Code of Practice: Annual Rehabilitation Report and Forward Program for Large Mines*.
Biodiversity offset	Land secured and managed for the protection and enhancement of biodiversity values. The biodiversity offsets scheme is set out in Section 6.2 of the *Biodiversity Conservation Act 2016*.
Biological resources	In biology and ecology, a substance that is required by an organism for normal growth, maintenance or reproduction. In the context of rehabilitation, biological resources are those materials salvaged from the land, or sourced externally, that are used to enhance the biological and ecological functioning of a rehabilitated site. Includes topsoil and subsoils, woody or vegetative materials, rocks and nesting structures.
Borehole	A hole made by drilling or boring but excluding: • sampling and coring using hand held equipment; and

Term	Definition
	• petroleum wells.
Completion criteria	Defined in the mining lease conditions. Objective target levels, or values, or standards contained in the Rehabilitation Management Plan that are measured to quantitatively demonstrate the progress and ultimate success of rehabilitation. For further description, these are the attributes (indicators) and target values (typically numerical) that must be achieved to demonstrate that rehabilitation objectives have been met prior to the relinquishment of a mining lease. They may include an element based on time.
Conservation Agreement	An agreement made under section 305 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).
Conservation Area	A defined area on a mining lease that is set aside for conservation and is not disturbed by the mining process.
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials.
Department	The Department of Planning and Environment.
Disturbance	See Surface Disturbance
Disturbance area	An area that has been disturbed for mining related activities, requiring rehabilitation to be suitable for the approved Final Land Use. Includes, but is not limited to, on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. temporary rehabilitation).
Domain	A land management unit usually with similar geophysical characteristics.
Drilling	The perforation of the earth's surface crust by mechanical means, whether the hole caused by the perforation is vertical, inclined or horizontal, and includes all operations for preventing collapse of the

Term	Definition
	sides of any such hole or for preventing it from being filled with extraneous materials including water.
Ecosystem and Land Use Development	The process of managing maturing rehabilitation areas on a trajectory toward meeting the approved Rehabilitation Objectives and Completion Criteria.
Ecosystem and Land Use Establishment	The process of establishing the approved Final Land Use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control.
Environment Protection Licence (EPL)	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.
Exploration	Has the same meaning as that term under the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.
Fauna	Has the same meaning as that term under the *National Parks and Wildlife Act 1974*.
Final Land Use	Refer to mining lease conditions. In simple terms, it is the final post-mining land form/s and land use/s following completion of all rehabilitation.
Final Land Use Domain	A land management unit characterised by a discrete or specific Final Land Use. Examples of Final Land Use Domain(s) include, but are not limited to: • Native Ecosystem; • Agricultural – Grazing; • Agricultural – Cropping; • Biophysical Strategic Agricultural Land (BSAL) • Rehabilitation area as a Biodiversity Offset; • Industrial; • Water Management Areas; • Water Storage (Excluding Final Void); • Heritage Area; • Infrastructure; and • Final Void.

Term	Definition
Final Landform and Rehabilitation Plan	The spatial depiction of the approved final land use and final land form at the end of mine life contained in the Rehabilitation Management Plan for a Large Mine, which is used as the basis for the development of the Rehabilitation Objectives and Completion Criteria.
Forward Program	Means a program that specifies all rehabilitation, monitoring and related activities to be carried out on, in, under or over the Land for the next 3 years that is prepared in accordance with the *Code of Practice Annual Rehabilitation Report and Forward Program.*
Growth Medium Development	The establishment of the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short lived pioneer species). (For example, development of a productive, self-sustaining soil profile).
Habitat	Has the same meaning as that term under the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994* (as relevant).
Land	Refer to the mining lease conditions. In simple terms, it is the area of land and water to which a mining lease applies.
Landform Establishment	The process of constructing the final landform surface profile.
Large mine	A mine which requires an Environment Protection Licence under the *Protection of the Environment Operations Act 1997*.
Mining Domain	Defined in the mining lease conditions as a land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the Final Land Use(s).
Minister	The Minister administering the *Mining Act 1992*.
Native vegetation	Has the same meaning as that term under section 60B of the *Local Land Services Act 2013*.
Overburden	Material overlying coal or a mineral deposit.

Term	Definition
Performance indicator	An attribute of the biophysical environment (e.g. pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objectives. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion i.e. defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.
Phase of rehabilitation	Defined in the mining lease conditions as the successive stages of rehabilitation specified in Part 8 of the Rehabilitation Management Plan Code. By way of further description, a phase of rehabilitation is a logical step in the process of achieving the Final Land Use. Phases are successive and generally require demonstrated completion of an earlier phase before the next stage can be commenced. Phases of mining include active mining, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and relinquished lands.
Progress	A description of where mining and rehabilitation are in relation to meeting completion. This may be described in terms of domains, phases, performance indicators and completion criteria.
Progressive rehabilitation	Defined in the mining lease conditions. Means that the rehabilitation of the Land is carried out as soon as practicable following surface disturbance, so that that part of the Land progresses through the phases of rehabilitation in a timely manner to achieve the Final Land Use.
Rehabilitation Completion	The final phase of rehabilitation where all approved Rehabilitation Objectives and Completion Criteria for the Final Land Use are met (verified by records).
Rehabilitation cost estimate	The estimate of the cost to rehabilitate all liabilities and obligations associated with a mining lease, and other relevant legislative requirements, at a nominated point in time.
Rehabilitation Management Plan	Means the plan required under conditions of a mining lease. This plan sets out the overarching framework for planning and implementing rehabilitation activities for the Land, that is prepared in accordance with the *Rehabilitation Management Plan Code*.

Term	Definition
Rehabilitation Management Plan Code	means: • for a Small Mine – the *Code of Practice: Rehabilitation Management Plan for Small Mines*, or • for a Large Mine – the *Code of Practice: Rehabilitation Management Plan for Large Mines*.
Rehabilitation Objectives	Defined in the mining lease conditions as objectives contained in the Rehabilitation Management Plan that describe the qualities or features of the Final Land Use Domains that must be demonstrated through the rehabilitation process to achieve the Final Land Use. For further description, these may include environmental, social and economic outcomes. They may be described in terms of Final Land Use, biodiversity values, conservation values, health and safety outcomes, aesthetics or social outcomes or combinations of these. The Rehabilitation Objectives must be consistent with any rehabilitation objectives approved in the development consent.
Rehabilitation Phases	Refer to Phases of Rehabilitation
Rehabilitation Schedule	The defined timeframes for progressive rehabilitation set out in the Forward Program.
Relevant stakeholders	Means persons or bodies who may be affected by the activities carried out on the land, and includes: a. the relevant development consent authority; b. the local council; c. community consultative committee (if required under the development consent) or equivalent consultative group; d. affected land holder(s); e. government agencies relevant to the Final Land Use; f. affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities); g. local Aboriginal communities; and h. any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.
Risk	The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
(risk) control	A measure (process, device practice or action) that modifies a risk.

Term	Definition
River	Has the same meaning as that term under the *Water Management Act 2000*.
Security deposit	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
Small mine	A mine which does not require an Environment Protection Licence under the *Protection of the Environment Operations Act 1997*.
State significant development (SSD)	Has the same meaning as that term under the *Environmental Planning and Assessment Act 1979*. Note: Schedules 1 and 2 of *State Environmental Planning Policy (State and Regional Development) 2011* provide a full list of SSD types and identified sites. Large mining and extraction operations (including all coal mines) are identified as SSD.
Surface Disturbance	Defined in the mining lease conditions as any disturbance of any part of the Land arising from activities under this lease. Examples of surface disturbance include: • disturbance, exposure, or covering of the surface of the land in any manner for any mining related purpose or as a result of any activities carried out under the lease; and • the degradation or deterioration in any manner of the physical surface of the land caused by any activities carried out under the lease.
Tailings	A combination of the fine grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water[3].
Temporary stabilisation	The short-term stabilisation and vegetation of an area that is intended to be utilised in the future as an active mine area. It is to be treated as an active mine site for reporting purposes.
Lease holder	The holder of a mining lease.

[3] Commonwealth of Australia (DITR), 2007. *Tailings Management*.

Term	Definition
Waste	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.
Watercourse	A river, estuary or lake, as those terms are defined under the *Water Management Act 2000*.
Wetland	Has the same meaning as that term under clause 38 of the *Environmental Planning and Assessment Regulation 2000.*

Appendix 1. Further Reading

- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Hazardous Materials Management
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Biodiversity Management
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Managing Acid and Metalliferous Drainage
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Tailings Management
- Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Cyanide Management Australian Government, Department of Industry, Innovation and Science 2016: Leading Practice Sustainable Development Program for the Mining Industry – Evaluating Performance: Monitoring and Auditing
- Australian National Committee on Large Dams Incorporated (ANCOLD) 2012: Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure
- Gullison, R.E, J. Hardner, S. Anstee, M. Meyer. 2015: Good Practices for the Collection of Biodiversity Baseline Data. Prepared for the Multilateral Financing Institutions Biodiversity Working Group & Cross-Sector Biodiversity Initiative
- Ian D. Rutherfurd, Kathryn Jerie and Nicholas Marsh (2000). A Rehabilitation Manual for Australian Steams. Cooperative Research Centre for Catchment Hydrology. Land and Water Resources Research and Development Corporation 2000.
- International Council on Mining and Metals January 2011: Planning for Integrated Mine Closure: Tool Kit
- Landcom 2004a: Managing Urban Stormwater: Soils and Construction
- Landcom 2004b: Managing Urban Stormwater: Soils and Construction Volume 2E, Mines and Quarries
- P. Cottingham, N. Bond, P.S. Lake, A. Arthington & D. Outhet (2005) Recent Lessons on Riverine Rehabilitation in Eastern Australia. Cooperative Research Centre for Freshwater Ecology, Canberra.

Appendix 2. Example Rehabilitation Objectives and Completion Criteria for Large Mines

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
Native Ecosystem or Agricultural Land Use or Other (Note: where there are multiple land uses, a set of Rehabilitation Objectives and Completion Criteria will need to be developed for each land use)	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other.	Infrastructure All infrastructure that is not to be used as part of the Final Land Use is removed to ensure the site is safe and free of hazardous materials.	Removal of all services (power, water, communications) that have been connected on the site as part of the operation.	All utility infrastructure removed.	Statement provided.
			Heritage obligations (e.g. development consent under the *Environmental Planning and Assessment Act 1979,* approvals under the *Heritage Act 1977,* etc.) have been met (e.g. archival recording, building	Permits and approval documents issued. All archival reports required are complete and submitted.	Copy of any relevant approval documentation.

[4] It is the expectation that the relevant justification/validation sources will be collated and presented in the Rehabilitation Completion application to the Department (refer to *Form ESF2 Rehabilitation Completion and/or Review of Rehabilitation Cost Estimate*)

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			retention or building demolition with footings preserved).		
			Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples.	Infrastructure removed.	As-constructed final landform plan, photos etc.
			Removal of all footings or removal to a certain depth (e.g. X metres).	Infrastructure removed.	Surveyed and marked on the as-constructed final landform plan.
			Removal of all water management infrastructure (including pumps, pipes and power).	Infrastructure removed.	Statement provided and before/after photos.

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			All drill cores have been removed and either taken to authorised storage or disposal location.	Cores removed.	Statement provided.
			Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	Sealing complete.	Engineering report/statement, Plug and Abandonment log, photos etc.
Native Ecosystem or Agricultural Land Use or Other (Note: where there are multiple land uses, a set of Rehabilitation Objectives and Completion Criteria will need to be developed for each land use)	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other.	Infrastructure to Remain All infrastructure that is to remain as part of the Final Land Use is safe and does not pose any hazard to the community.	Potential hazards (e.g. electrical, mechanical) have been effectively isolated.	Hazards isolated.	Statement provided.
			Damage to access tracks have been repaired and stabilised.	Repairs complete.	As-constructed final landform plan, photos etc.
			Where applicable, necessary approvals are in place (e.g. development consent under the *Environmental Planning*	Permits and approval documents issued.	Copy of any relevant approvals.

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			and Assessment Act 1979) where buildings and infrastructure are to be retained as part of Final Land Use.		
			Heritage obligations as required under the *Environmental Planning and Assessment Act 1979*, *Heritage Act 1977,* etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approvals.
			The structural integrity of the infrastructure is suitable and safe for use as part of the intended Final Land Use.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended Final Land Use.	Engineering report/statement, photos etc.
			Infrastructure is in a condition that is suitable for	Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for	Letter from landowner.

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			the intended Final Land Use.	the intended Final Land Use.	
			If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended Final Land Use. *Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth >0.8m*	The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig.	Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig
			Heritage obligations as required under the *Environmental Planning and Assessment Act 1979*, *Heritage Act 1977,* etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approvals.

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			The structural integrity of the infrastructure is suitable and safe for use as part of the intended Final Land Use.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended Final Land Use.	Engineering report/statement, photos etc.
Native Ecosystem or Agricultural Land Use or Other (Note: where there are multiple land uses, a set of Rehabilitation Objectives and Completion Criteria will need to be developed for each land use)	• Infrastructure Area; • Tailings Storage Facility; • Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other.	Land Contamination There is no residual soil contamination on site that is incompatible with the Final Land Use or that poses a threat of environmental harm.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/ waste materials removed from site.	Visibility of contamination. Surface layer is free of any hazardous materials.	Statement provided and before/after photos.
			Contamination will be appropriately remediated to a condition that does not pose any hazards or constraints for the Final Land Use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met, e.g. Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999).	Contamination Remediation Report prepared by Land Contamination Consultant Site Contamination Audit Report and Site Audit Statement prepared by EPA Accredited Auditor (where required)

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
				Excess sludge/material has been removed from surface water dams.	
			Residual waste materials stored on site (e.g. tailings dams) will be appropriately contained / encapsulated so it doesn't pose any hazards or constraints for intended land use.	Engineered capping design with specifications.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended Final Land Use and not cause pollution.
			There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/ waste materials removed from site.	Visibility of contamination. Surface layer is free of any hazardous materials.	Statement provided and before/after photos.
		<u>Landform Stability</u> The final landform is stable and does not present a risk of environmental harm downstream/downslope of	Minimal erosion that would not require moderate to significant ongoing management and maintenance works.	Signs of erosion and or land instability are recorded, measured and assessed. Maximum slope of final landform: Where the	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent geotechnical reports (where required) that demonstrate long term

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
		the site or a safety risk to the public/stock/native fauna.	No areas of active gully erosion. No evidence of excessive sediment build up (from sheet erosion) at the base of slopes. No evidence of tunnel erosion. No active scouring where the runoff from rehabilitation areas discharges into natural channels. Contour banks are stable and there is no evidence of overtopping or significant scouring as a result of runoff.	landform exceeds 10 degrees, a geotechnical assessment undertaken by a suitably qualified person concludes that the landform is suitable for the Final Land Use. The final landform has been constructed in accordance with the Final Landform & Rehabilitation Plan[5]. Spillway of final void and any remaining dams has been constructed in accordance with hydrological design.	stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, stability will need to be evaluated over a number of years (e.g. 5 years).
Native Ecosystem or Agricultural Land Use or Other	• Infrastructure Area; • Tailings Storage Facility;	Bushfire The risk of bushfire and impacts to the community, environment and	Appropriate bushfire hazard controls (where required) have been implemented on	Bushfire controls implemented.	Statement provided and before/after photos.

[5] Refer to **Part C** of this Code – Final Landform and Rehabilitation Plan

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
(Note: where there are multiple land use, a set of Rehabilitation Objectives and Completion Criteria will need to be developed for each land use)	• Water Management Area; • Overburden Emplacement Area; • Void (Open Cut void); • Underground Mining Area (subsidence management); • Beneficiation Facility; and • Other.	infrastructure has been addressed as part of rehabilitation.	the advice from the NSW Rural Fire Service.		
		Surface Water Quality Runoff water quality is similar to, or better than the pre-disturbance runoff water quality.	Runoff water quality from rehabilitation areas represent an acceptable level of change from a defined reference condition Surface water quality both on a mining lease and downstream represent an acceptable level of change from a defined reference condition	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence, sampled and test both upstream and downstream locations	Water quality monitoring reports
				Assessment of biological health in accordance with Australian River Assessment System (AUSRIVAS)	Independent biological health assessment report. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
		Groundwater Quality Groundwater quality is similar to, or better than the pre-disturbance groundwater quality.	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence	Independent hydrological assessment report. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
		Groundwater Regime Impacts to groundwater regime are within range as predicted in pre-mining environmental assessment	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Groundwater levels, groundwater flow	Independent hydrological assessment report. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
		Water Approvals Structures that take or divert water such as final voids, dams, levees etc. are appropriately licensed (e.g. under the *Water*	Final landform considers advice from relevant Government Agency (e.g. DPI – Water) whether sufficient licence shares are available in the water source to account for water	Water approvals / licences are able to be granted by NSW Government Agency (e.g. DPI Water)	Confirmation from relevant Government Agency (e.g. DPI Water) that relevant water approvals / licences are able to be granted.

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
		Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.	stored in voids and dams in the proposed final landform.		
Native Ecosystem	All domains	Ecological Rehabilitation Objective 1 The vegetation composition of the rehabilitation is recognisable as the target vegetation community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System)	Native plant species are characteristic of the target plant community(s)	All native vascular plant species are recorded to species level from fixed monitoring plots Native plant species richness, overstorey cover, overstorey regeneration, midstorey cover, native groundcover (grasses, shrubs, other); of those species characteristic of the target community(s). Exotic plant cover, logs, stags with hollows. Recorded from fixed monitoring plots	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
		Ecological Rehabilitation Objective 2	Cover, abundance and height range of native plant strata are characteristic of,	The cover, abundance and height range of all native vascular plant species are	Before and after photos, rehabilitation monitoring reports, independent

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		The vegetation structure of the rehabilitation is recognisable as, or is trending towards the target plant community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System)	or trending towards, the target plant community(s)	recorded from fixed monitoring plots	ecological reports (where required) that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
		Ecological Rehabilitation Objective 3 Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable	Growing media status is "suitable"[1] for the target plant community(s) establishment, and indicators of nutrient cycling are "suitable"[1] for sustaining the target plant community	Litter biomass is recorded at fixed monitoring plots. Routine Soil Test (bulked soil cores 0-10 cm) – Includes: Total Carbon (TC), Total Nitrogen (TN), Organic Matter, TC/TN Ratio; Bray I and II Phosphorus; Colwell Phosphorus; Available cations (Calcium, Magnesium, Potassium, Ammonium, Nitrate, Phosphate, Sulfur); Available Micronutrients	Rehabilitation monitoring reports, independent soil reports (where required) that demonstrate long term function of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
				(Zinc, Manganese, Iron, Copper, Boron, Silicon); Exchangeable (Sodium, Potassium, Calcium, Magnesium, Hydrogen, Aluminium, Cation Exchange Capacity); pH and EC (1:5 water); Basic Colour, Basic Texture	
			Plant recruitment is "suitable"[1] for sustaining the target plant community(s)	All growth forms are monitored for establishment and survival of juveniles/immatures, at fixed monitoring plots or transects	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
			Plant competition is "suitable"[1] for sustaining the target plant community(s)	The total cover of exotic plant species is recorded at fixed monitoring plots or transects. And the cover and abundance of each noxious, invasive, or weed of national significance is separately recorded.	

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			Plant health is "suitable"[1] for sustaining the target plant community(s)	All growth forms are monitored for; foliage loss from insect attack or stress, and foliage health or disease (e.g. myrtle rust), at fixed monitoring plots or transects	
			Animal biodiversity (habitat) is characteristic of the target plant community(s)	Invertebrate habitat: Litter biomass, woody debris (evidence of litter invertebrates; ant nests, spider holes, ground and arboreal spider webs). Vertebrate habitat: Woody debris and stags with hollows (or nest boxes), rock material, aquatic habitat. Supporting information – formal surveys of ground and/or litter invertebrates, small reptiles, small mammals, birds	

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			Plant recruitment is "suitable"[1] for sustaining the target plant community(s)	All growth forms are monitored for establishment and survival of juveniles/immatures, at fixed monitoring plots or transects	
			Plant competition is "suitable"[1] for sustaining the target plant community(s)	The total cover of exotic plant species is recorded at fixed monitoring plots or transects. And the cover and abundance of each noxious, invasive, or weed of national significance is separately recorded.	
			Plant health is "suitable"[1] for sustaining the target plant community(s)	All growth forms are monitored for; foliage loss from insect attack or stress, and foliage health or disease (e.g. myrtle rust), at fixed monitoring plots or transects.	

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			Threats to rehabilitation	Vertebrate pest species – presence and damage is recorded and controlled. Domesticated stock - presence and damage is recorded and controlled.	Rehabilitation monitoring reports
			Resilience to drought and fire	Rainfall records are maintained on site. Resilience demonstrated by the effects of drought and fire on composition, structure and other function attributes.	Rehabilitation monitoring reports, environmental monitoring records
		Agricultural Revegetation Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended Final Land Use.	Land and Soil Capability classification or Agricultural Land Classification criteria met. The re-established topsoil / subsoil substrate is capable of supporting the targeted pasture / cropping regime on a sustained basis. Cropping / Pasture establishment is consistent	Routine Soil Test (bulked soil cores 0-10 cm) – Includes: Total Carbon (TC), Total Nitrogen (TN), Organic Matter, TC/TN Ratio; Bray I and II Phosphorus; Colwell Phosphorus; Available cations (Calcium, Magnesium, Potassium, Ammonium, Nitrate,	Rehabilitation monitoring reports, independent soil reports, environmental monitoring records, independent agronomist reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may

Final land use domain	Mining domain	Rehabilitation Objectives *(describe the desired features and/or characteristics of the Final Land Use domain)*	Indicator *(specific attribute associated with the objective)*	Completion Criteria *(benchmark and timeframe where appropriate)*	Example Justification/ validation methods[4] *(evidence that the benchmark has been achieved)*
			with the range of species utilised within the region. Cropping / Pasture establishment is in good health and provides adequate cover. Cropping yields from rehabilitated areas is similar to adjacent cropping land. Appropriate and reliable access to water for livestock. Appropriate animal refuge areas for livestock (i.e. wooded/treed areas) during extreme weather conditions. Resilience to drought and fire. *Further detail on reinstatement of BSAL like soils to be provided by proponent.*	Phosphate, Sulfur); Available Micronutrients (Zinc, Manganese, Iron, Copper, Boron, Silicon); Exchangeable (Sodium, Potassium, Calcium, Magnesium, Hydrogen, Aluminium, Cation Exchange Capacity); pH and EC (1:5 water); Basic Colour, Basic Texture. Commodity data (i.e. stocking rates, livestock weights, crop yields, pasture composition). Rainfall records are maintained on site. Resilience demonstrated by the effects of drought and fire on composition, structure and other function attributes of pasture and cropping lands.	need to be evaluated over a number of years (e.g. 5 years to 15 years).