WHITEHAVEN COAL

ROCGLEN MINE
REHABILITATION MANAGEMENT PLAN

Approval	Name	Position	Signed	Date
Document Owner:	Andrew Raal	Superintendent - Closed Mines		29/7/22
Authorised by:	Daryl Robinson	Manager - Environment & Mine Rehabilitation		29/7/22

Contents

1 INTRODUCTION TO MINING PROJECT

Rocglen Coal Mine (Rocglen) (formerly known as Belmont Coal Project) is an open cut pit owned by Whitehaven Coal Limited and operated by Whitehaven Coal Mining Pty Ltd (Whitehaven) located approximately 28km north of Gunnedah (see **Figure 1-1**).

This Rehabilitation Management Plan (RMP, the Plan) has been prepared in accordance with the Mining Exploration and Geoscience – Resources Regulator's (RR) *Form and Way: Rehabilitation Management Plan for Large Mines* (RR, 2021) and associated guidelines (refer **Section 1.3**). The Plan has also been prepared to satisfy Condition 36, Schedule 3 of PA 10_0015 which requires Whitehaven to prepare and implement a Rehabilitation Management Plan to the satisfaction of the DRG (now Resources Regulator).

1.1 HISTORY OF OPERATIONS

Rocglen was originally granted consent (PA 06_0198) on 15 April 2008 under Part 3A (now repealed) of the EP&A Act. ML 1620 was subsequently issued for the Rocglen operation in June 2008 and coal production commenced in late 2008.

In summary, approximately 1.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal is approved to be mined within the open cut pit using truck and excavator method. The coal is transported approximately 30 kilometres by road to the Whitehaven Coal Handling and Preparation Plant (CHPP) for selective washing and subsequent transport by rail to the Port of Newcastle or by road to domestic customers.

On 27 May 2010, an approval was issued under Section 75W of Part 3A of the EP&A Act to modify PA 06_0198 (PA 06_0198 MOD 1). This modification permitted Whitehaven to undertake unplanned emergency earthworks to stabilise the eastern highwall following slipping adjacent to a fault structure in the north-eastern portion of the approved open cut pit. It was determined that stabilisation works were required to ensure the long-term stability and safety of the highwall, which would in-turn enable on-going extraction efforts at the northern end of the approved open cut.

Following further drilling and definition of the local geological features, as well as additional reviews of the mine plan, Whitehaven proposed to expand operations at Rocglen in order to maximise resource recovery and allow for improved mine progression.

Whitehaven received PA 10_0015 on 27 September 2011 under Part 3A of the EP&A Act for the Rocglen Coal Mine Extension Project. ML 1662 was issued on 9 January 2012 to cover the Rocglen Coal Mine Extension Project, specifically the water management and overburden emplacement activities proposed to occur outside the bounds of ML 1620. PA 06_0198 was subsequently surrendered.

Approval was issued for a modification to PA 10_0015 (MOD 1) on 10 November 2014 relating to coal haulage. Two further modifications to PA 10_0015 were granted on the 24 August 2015 and the 10 February 2017 and related to receipt of coal rejects and coal haulage respectively. An additional modification was approved in October 2018 to allow the continuation of the increased haulage into the 2018 calendar year. A Project Layout is shown in **Figure 1-2**

Coal production ceased in July 2019, with coal transporting activities ceasing in July 2019. Site activities are currently focused on decommissioning, rehabilitation, and water management.

WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FIGURE 1
REGIONAL LOCALITY

LEGEND

Project Approval Boundary

PA 10_0015

VICKERY S.F.

BOONALLA Aboriginal Area

WEAN ROAD

BLUE VALE

Data Sources:
DoR NSW Exploration and Mining Leases
NSW LPI Base Map

0 1 2 Kilometres

Coordinate System:	GDA2020
Scale:	1:50,000 at A3
Project Number:	630.30268
Date:	25-Jul-2022
Drawn by:	LC
Annual Reporting Period:	2021

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\\au.slr.local\Corporate\Projects-SLR\630-SrvNTL\630-NTL\630.30268.00000 Whitehaven RMPs\06 SLR Data\01 GIS\Rocglen\Rocglen Figure 1 - Regional Locality.mxd

WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FIGURE 2
SITE LAYOUT

LEGEND

Project Approval Boundary

Data Sources:
DoR NSW Exploration and Mining Leases
NSW LPI Base Map
Nearmap Imagery 2022

0 250 500 Metres

Coordinate System:	GDA2020
Scale:	1:14,869 at A3
Project Number:	630.30268
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Annual Reporting Period:	2021

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\\au.slr.local\Corporate\Projects-SLR\630-SrvNTL\630-NTL\630.30268.00000 Whitehaven RMPs\06 SLR Data\01 GIS\Rocglen\Rocglen Figure 2 - Site Layout.mxd

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES

1.2.1 DEVELOPMENT CONSENTS

Table 1-1 Below shows the Development Consent held by Rocglen

Table 1-1 Development Consents

Issuing / Responsible Authority	Development Consent*	Details	Date of Issue	Expiry
DPE	PA 10_0015	Project Approval for Rocglen Coal Mine Extension Project	27 September 2011	31 December 2022
DPE	PA 10_0015 (MOD 1)	MOD 1 (modification to coal haulage)	10 November 2014	
DPE	PA 10_0015 (MOD 2)	MOD 2 (changes to receipt of reject)	24 August 2015	
DPE	PA 10_0015 (MOD 3)	MOD 3 (modification to coal haulage)	10 February 2017	
DPE	PA 10_0015 (MOD 4)	MOD 4 (modification to coal haulage)	1 November 2018	

*Does not include Development Consents surrendered following approval of PA 10_0015.

1.2.2 EPBC APPROVAL

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires consideration of the potential for a "significant impact" to be imposed by an activity on a 'matter of national environmental significance'. In the event that such an impact is likely to be imposed, the activity must be referred to the Commonwealth for determination as to whether it constitutes a "controlled action". Where a development activity does constitute a controlled action, approval from the Australian Government Minister for the Environment is required.

EPBC Act approval EPBC 2010/5502 was granted on 21 December 2011 by the former Department of Sustainability, Environment, Water, Population and Communities (now Department of Agriculture, Water and the Environment). EPBC 2010/5502 was granted in relation to listed threatened species and communities and listed migratory species and expires on 16 November 2025.

Conditions within EPBC 2010/5502 that refer to rehabilitation are associated with biodiversity offsets and are addressed within the Rocglen *Biodiversity Offset Management Plan.*

1.2.3 AUTHORISATION

Rocglen currently holds ML 1620 and ML1662. These authorisations are outlined in **Table 1-2**

Table 1-2 Authorisations

Issuing / Responsible Authority	Licence	Grant Date	Expiry Date	Status
RR	ML 1620	10 Jun 2008	10 Jun 2029	Current
RR	ML 1662	9 Jan 2012	9 Jan 2033	Current

1.2.4 OTHER APPROVALS

A summary of all licences held by Rocglen for the mining operations are included in **Table *1-3***.

Table 1-3 Licences

Issuing / Responsible Authority	Licence	Licence Type	Grant Date	Expiry date
Environment Protection Authority (EPA)	EPL 12870	Environment Protection Licence	31 Jul 2008 (Variation issued 25 Oct 2021)	Anniversary date 31 July
WaterNSW	90BL254855	Monitoring bores	Various	-
	90BL254856			
	90BL254857			
	90BL254858			
	90BL254859			
	90BL110883			
	90BL104367			
	90BL102845			
WaterNSW	WAL 36758	Water Access Licence (WAL)	4 September 2014	Perpetuity

1.3 APPLICABLE GUIDELINES

In addition to the regulatory requirements identified above, this Plan has been prepared with consideration for the following guidelines, standards and policies:

- Form and way: Rehabilitation Management Plan (large mines);
- Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines;

- Guideline: Rehabilitation risk assessment;
- Guideline: Rehabilitation objectives and rehabilitation completion criteria;
- Planning for Integrated Mine Closure Toolkit (ICMM, 2008);
- Mining Amendment (Standard Condition of Mining Leases – Rehabilitation) Regulation 2021;
- Strategic Framework for Mine Closure (ANZMEC 2000);
- Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion, Mine Rehabilitation (Commonwealth Department of Industry, Tourism and Resources);
- Best Practice Environmental Management in the Mining Industry Series;
- Enduring Value (Mineral Council of Australia 2015); and
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP).

1.4 LAND OWNERSHIP AND LAND USE

The Rocglen Project Approval Area covers an area of approximately 460 hectares within the Parish of Tulucumba, County of Nandewar and Local Government Area of Gunnedah. It incorporates all or part of the following land parcels:

- Lot 1 DP 787417;
- Part Lot 1 DP 1120601;
- Lot 4 DP 1120601; and
- Public roads and road reserves.

The schedule of Lands attached to PA 10_0015 is summarised in **Table 1-4** and is reproduced in **Appendix A**.

Table 1-4 Schedule of Lands

Area	Land Title Reference	Land Ownership
Mining Lease	Lots 1 and 4 in DP 1120601 Lot 1 in DP 787417	Freehold (Whitehaven)

Land ownership within and surrounding Rocglen is shown in **Figure 1-3**, **Figure 1-4** and **Figure 1-5**.

Whitehaven currently owns all freehold land within ML 1620/1662 as well as the surrounding properties identified as “Glenroc”, “Costa Vale”, “Yarrawonga”, “Yarrari”, “Belah”, “Bentry”, “Stratford” and that part of the “Roseberry” property contained within the bounds of Rocglen. The remaining surrounding properties are privately owned.

The Vickery State Forest adjoining Rocglen to the west is owned by the Crown. The remaining land within and surrounding Rocglen occurs as public road reserves.

Rocglen is located in an area that is relatively isolated from other mining or extractive industry operations. At the time of preparing this RMP, the nearest operational mine is Whitehaven's Tarrawonga Coal Mine at approximately 15 kilometres north-west of Rocglen. Other mines within the vicinity are Vickery Extension Project and the closed Canyon Coal Mine which has now been incorporated within the Vickery extension project.

1.4.1 HISTORIC AND CURRENT LAND USE

The majority of ML 1620/1662 is utilised for open cut coal mining and mining-related activities permitted under PA 10_0015 and has been disturbed by historic land clearing, long-term agricultural production and/or coal mining. Successive years of such disturbance have limited the presence of remnant vegetation to relatively small, scattered areas, isolated stands and individual trees.

The Vickery State Forest adjoins Rocglen to the west and is declared under the Brigalow and Nandewar Community Conservation Area Act 2005 to be within Community Conservation Area (CCA) Zone 4 Vickery. Approximately 3.5 kilometres to the east of Rocglen is the CCA Zone 2 Kelvin. In accordance with the Brigalow and Nandewar Community Conservation Area Act 2005 this land, which was formally known as the Kelvin State Forest, is reserved under the National Parks and Wildlife Act 1974 as Aboriginal area.

The Whitehaven Regional BioBank Site is located to the east of Rocglen and provides for the long-term conservation of approximately 1,500 hectares of land owned by Whitehaven. This area of land has been registered as a BioBank Site under Part 7A of the Threatened Species Conservation Act 1995 (TSC Act). It is being actively managed via a Rocglen Biodiversity Offset Management Plan with in-perpetuity management funding and has the highest level of conservation status outside of National Parks via a BioBanking Agreement registered on the land title in-perpetuity.

The remaining land area within the vicinity of Rocglen is characterised by traditional agricultural production comprising a combination of livestock grazing and crop cultivation.

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ROCGLEN

FIGURE 3
LAND OWNERSHIP

Lot 5232 DP1207130
EL8224
Lot 4 DP219158
Lot 1 DP710325
ML1662
Lot 8 DP1182290
EL5831
Lot 18 DP754951
Lot 16 DP754951
NARRABRI
Lot 2 DP1120601
ML1620
Lot 36 DP754950
Lot 14 DP1225577
NAMOI WATER CATCHMENT AREA
Lot 14 DP1225577
Lot 13 DP1225577
Lot 5232 DP1207130
Lot 1 DP787417
Lot 29 DP754929
Lot 15 DP1225577
GUNNEDAH
Lot 3 DP1120601
Lot 5232 DP1207130
Lot 29 DP754929
Lot 15 DP1225577
Lot A DP405391
Lot 1 DP652360
Lot 1 DP652092
Lot 28 DP754929
Lot 32 DP754950
Lot 1 DP728391
Lot 38 DP754950
Lot 37 DP754950
Lot 23 DP754929
Lot 39 DP754950

LEGEND

- Project Approval
- Exploration Licence
- Mining Lease
- Local Government
- Property Boundaries
- Whitehaven Owned

Land Ownership

- Freehold
- NSW Government
- Unknown

Data Sources:
NSW Spatial Information Exchange
DoR NSW Exploration and Mining Leases
NSW LPI Land Status Cadastre & Ownership

0 250 500 m

Coordinate System:	GDA2020
Scale:	1:20,000 at A3
Project Number:	630.30268
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Drawn by:	LC
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WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FIGURE 4
LAND USE AND CONTOURS

EL8224
EL5831
NARRABRI
ML1662
ML1620
NAMOI WATER CATCHMENT AREA
GUNNEDAH

LEGEND

- Current Landform Contours (5m AHD)
- Project Approval Boundary
- Exploration Licence
- Mining Lease
- Local Government Area
- Property Boundaries
- BiodiversityOffsets

Land Use

- 2.1.0 Grazing native vegetation
- 2.2.0 Production native forestry
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 5.4.0 Residential and farm infrastructure
- 5.8.0 Mining

Data Sources:
NSW Spatial Information Exchange
DoR NSW Exploration and Mining Leases
ESRI Basemap world imagery 2022
NSW LPI Land Status Cadastre & Ownership
NSW DPE Landuse 2017

0 250 500 m

Coordinate System:	GDA2020
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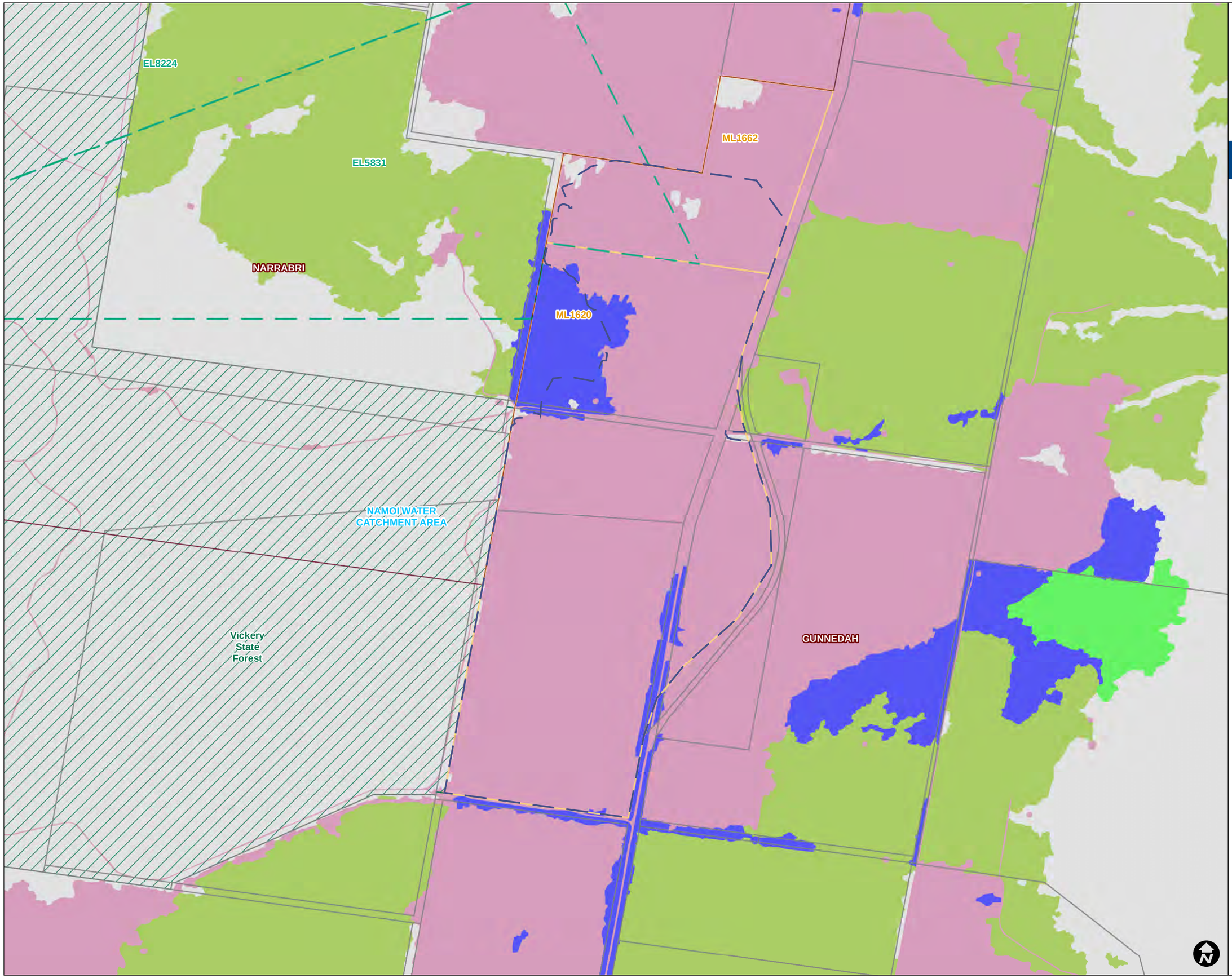
WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FIGURE 5
VEGETATION COMMUNITIES



LEGEND

- Project Approval
- Exploration Licence
- Mining Lease
- Local Government
- State Forest
- Property Boundaries

Plant Community Type

- No Data
- 0 - Non-Native
- 1 - Candidate Native Grasslands
- 433 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion
- 434 - White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion

Data Sources:
NSW Spatial Information Exchange
DoR NSW Exploration and Mining Leases
NSW LPI Land Status Cadastre & Ownership
NSW Seed OEH Board Rivers Gwydir/Namoi regional native vegetation map v2 2015

0 250 500 m

Coordinate System:	GDA2020
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\\au.slr.local\Corporate\Projects-SLR\630-SrvNTL\630-NTL\630.30268.00000 Whitehaven RMPs\06 SLR Data\01 GIS\Rocglen\Rocglen Figure 5 - Vegetation Communities.mxd

1.4.2 FUTURE LAND USE

The post-mining landform will include approximately 220 hectares (ha) of land rehabilitated with woodland species to enhance biodiversity values of the area. The rehabilitation of disturbed areas with woodland species targets the enhancement of habitat and movement corridors.

The post-mining landform (including select areas of the out-of-pit emplacement and final depression) will include approximately 158 ha of land rehabilitated with a mix of native and exotic pasture species. Pasture rehabilitation areas will be created with a mix of land capability classes that is generally in accordance with the pre-mining environment to restore the potential for some productive grazing areas with characteristics similar to pasture areas in the general locality. It is expected that this area will be used for grazing purposes following closure of the Rocglen Coal Mine by future landowner/s. WHC may alternatively elect to retain ownership of the land and lease the area for ongoing agricultural use.

2 FINAL LAND USE

2.1 REGULATORY REQUIREMENTS FOR REHABILITATION

The regulatory requirements specific to post mining land use, rehabilitation, and closure at Rocglen are summarised in **Table 2-1 Regulatory Requirements Rehabilitation**.

Table 2-1 Regulatory Requirements Rehabilitation

Condition	Requirement	Domain	Timing	Section Addressed
Mining Lease (ML) 1620, Mining Lease (ML) 1662				
Part 2 Standard Conditions Division 1 Condition 4	Prevent or minimise harm to the environment.	All	Ongoing	Section 3
Part 2 Standard Conditions Division 1 Condition 5	Rehabilitate land and water as soon as reasonably practicable after disturbance occurs.	All	Ongoing	Section 6.1
Part 2 Standard Conditions Division 1 Condition 6	Achieve the approved final land use for the mining area as set out in the: • rehabilitation objectives statement; • rehabilitation completion criteria statement; and • final landform and rehabilitation spatial plan (large mines only).	All	Prior to relinquishment	Section 2.3
Part 2 Standard Conditions Division 2 Condition 7	Undertake a rehabilitation risk assessment and implement measures to eliminate, minimise or mitigate risks to achieving the final land use.	All	Complete/ Ongoing	Section 3

Condition	Requirement	Domain	Timing	Section Addressed
Part 2 Standard Conditions Division 3 Condition 10	Prepare and implement a rehabilitation management plan (large mines only).	All	Complete	This Plan
Part 2 Standard Conditions Division 3 Condition 13	Prepare an annual rehabilitation report which describes the progress of rehabilitation over the annual reporting period.	All	Ongoing	Section 6
Part 2 Standard Conditions Division 3 Condition 13	Prepare a forward program which includes the schedule of mining and rehabilitation activities for the next three years demonstrating how rehabilitation will occur as soon as reasonably practicable after disturbance.	All	Ongoing	Section 6
PA 10_0015				
Schedule 2 Condition 1	The Proponent shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.	All Domains	Life of Mine	Sections 2, 4 and 11
Schedule 2 Condition 5	The Proponent may carry out mining operations on the site until the end of December 2022. Note: Under this Approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of both the Secretary and DRE. Consequently, this approval will continue to apply in all other respects - other than the right to conduct mining operations - until the site has been rehabilitated and these additional undertakings have been carried out satisfactorily.	All Domains	Life of Mine	Section 1.1

Condition	Requirement	Domain	Timing	Section Addressed
Schedule 2 Condition 10	The Proponent shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.	All Domains	Decommissioning	Section 6.3.2
Schedule 3 Condition 31(a)	The Proponent shall: implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project	All Domains	Life of Mine	Sections 4, 6 and 8
Schedule 3 Condition 34	The Applicant must rehabilitate the site to the satisfaction of the Resource Regulator. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (and depicted conceptually in Figure 1 in Appendix 5) and comply with the objectives in Table 8.	All Domains	Life of Mine	Section 4 and 6

Feature	Objective
Mine site (as a whole)	Safe, stable and non-polluting
Final void	Minimise the size and depth of the final void as far as reasonable and feasible; and The final void is to be safe, stable and non-polluting
Surface infrastructure	To be decommissioned and removed, unless the Secretary agrees otherwise
Other land affected by the project	Restore ecosystem function including maintaining or establishing self-sustaining eco-systems comprised of:

Condition	Requirement		Domain	Timing	Section Addressed
		local native plant species; at least 206 hectares of woodland (see Figure 1 Appendix 5); and a landform consistent with the surrounding environment			
	Community	Minimise the adverse socio-economic effects associated with mine closures			
Schedule 3 Condition 35	The Proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.		All Domains	Life of Mine	Section 6.1
Schedule 3 Condition 36	The Proponent shall prepare and implement a Rehabilitation Management Plan to the satisfaction of DRG. This plan must: (a) be prepared in consultation with the Department, DoI Lands & Water, OEH, Council and the CCC; (b) be submitted to DRG by the end of February 2012; (c) be prepared in accordance with any relevant DRG guideline; (d) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval; (e) address all aspects of rehabilitation including mine closure, final landform, and final land use; and (f) build to the maximum extent practicable on the other management plans required under this approval.		All Domains	Life of Mine	This Plan

Condition	Requirement	Domain	Timing	Section Addressed
PA 10_0015 Appendix 7 Statement of Commitments	Soil Stripping, Stockpiling and Re-Spreading (h) A soil inventory will be maintained to ensure adequate material is available for planned rehabilitation activities.	Native Ecosystem and Agricultural - Grazing	Growth Medium Development	Section 6.3.1 and 7
PA 10_0015 Appendix 7 Statement of Commitments	Soil Stripping, Stockpiling and Re-Spreading (j) Whitehaven will adopt the general practice, where appropriate subsoil is available and targeting areas being rehabilitated to pasture, of including an intermediate layer of subsoil between the overburden material and the topdressing to improve the water holding capacity of the rehabilitated landform and reinstate a more natural soil profile. For areas being rehabilitated to woodland, Whitehaven may preferentially reduce the subsoil replacement depth and/or exclude subsoil replacement in selected areas to establish trial areas to monitor woodland development in different soil profiles.	Native Ecosystem and Agricultural - Grazing	Growth Medium Development	Section 6.3.1 and 6.3.4
PA 10_0015 Appendix 7 Statement of Commitments	Soil Stripping, Stockpiling and Re-Spreading (k) Where resources allow, topsoil and subsoil will each be spread to a nominal depth of between 100 to 150 mm, giving a combined depth of soil material on the rehabilitated landform of between 200 and 300 mm.	Native Ecosystem and Agricultural - Grazing	Growth Medium Development	Section 6.3.4 and 6.3.1
PA 10_0015 Appendix 7 Statement of Commitments	Progressive Rehabilitation (a) Whitehaven will adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, where practicable, completed mining and overburden emplacement areas are quickly shaped, top dressed and vegetated to provide a stable landform. Early reshaping and revegetation of the external batter slopes of the emplacement areas is particularly important and will be targeted as a priority.	All Domains	Life of Mine	Section 6.1

Condition	Requirement	Domain	Timing	Section Addressed
PA 10_0015 Appendix 7 Statement of Commitments	Progressive Rehabilitation (b) Disturbed areas will generally undergo rehabilitation overburden emplacement and reshaping.	All Domains	Life of Mine	Section 6.3.3
PA 10_0015 Appendix 7 Statement of Commitments	Drainage and Surface Water Structure Installation (g) Surface water management structures will be progressively installed on the rehabilitated landform. The heights (effective depths) and cross-sectional areas of the individual banks will be determined on the basis of individual sub-catchment areas but will typically be less than 0.7 metres and 3 square metres (m2), respectively. Rock-lined drains will be used, where required, to convey water safely from the rehabilitated landform into the surface water management system that takes water from the site.	All Domains	Landform Establishment	Section 6.3.1 Water Management Plan
PA 10_0015 Appendix 7 Statement of Commitments	Revegetation (h) The top-dressed surfaces of those areas designated to be restored to rehabilitated pasture will be sown with a mixture of pasture species appropriate for the season. The seed mixture will include fast growing, short-lived species and perennial grasses and legumes.	Agricultural - Grazing	Ecosystem and Land Use Establishment	Section 6.3.5
PA 10_0015 Appendix 7 Statement of Commitments	Revegetation (i) The top-dressed surfaces of those areas designated to be restored as rehabilitated woodland will be initially stabilised with a non-persistent cover crop followed by planting of a selection of locally occurring tree and shrub species that will encourage the re-establishment of the pre-mining vegetation communities and, in the medium to longer term, create habitat and corridors for native fauna.	Native Ecosystem	Ecosystem and Land Use Establishment	Section 6.3.5
PA 10_0015 Appendix 7 Statement of Commitments	Revegetation	Native Ecosystem and Agricultural – Grazing	Ecosystem and Land Use Establishment	Section 4 and 6

Condition	Requirement	Domain	Timing	Section Addressed
	(j) All areas identified for woodland and pasture re-establishment will be fenced and have stock excluded until it can be demonstrated that the vegetation is stable and self-sustaining, and that grazing will not impact upon its establishment.			
PA 10_0015 Appendix 7 Statement of Commitments	Rehabilitation Monitoring and Maintenance (k) Areas being rehabilitated will be regularly inspected and assessed against the long and short-term rehabilitation objectives. During regular inspections, aspects of rehabilitation to be monitored will include: ▪ Evidence of any erosion or sedimentation from areas with establishing vegetation cover; ▪ Success of initial grass cover establishment; ▪ Success of tree and shrub plantings; ▪ Adequacy of drainage controls; ▪ Presence/absence of weeds; and ▪ General stability of the rehabilitation site.	Native Ecosystem and Agricultural – Grazing	Life of Mine	Section 8.3.2
PA 10_0015 Appendix 7 Statement of Commitments	Rehabilitation Monitoring and Maintenance (l) Where the rehabilitation success appears limited, maintenance activities will be initiated. These may include re-seeding and where necessary, re-topdressing and/or the application of specialized treatments such as composted mulch to areas with poor vegetation establishment. Tree guards will be placed around planted tube stock if grazing by native animals is found to be excessive.	Native Ecosystem and Agricultural – Grazing	Life of Mine	Section 8 and 10
PA 10_0015 Appendix 7 Statement of Commitments	Rehabilitation Monitoring and Maintenance	All Domains	Ecosystem and Land Use Establishment and	Section 8 and 10

Condition	Requirement	Domain	Timing	Section Addressed
	(m) If drainage controls are found to be inadequate for their intended purpose or compromised by grazing stock or wildlife, these will be repaired and/or temporary fences installed to exclude animals. Should areas of excessive erosion and sedimentation be identified, remedial works such as importation of additional fill, soil material and/or the redesigning of water management structures to address erosion will be undertaken		Ecosystem and Land Use Development	
PA 10_0015 Appendix 7 Statement of Commitments	Rehabilitation Monitoring and Maintenance (n) Monitoring will be conducted periodically by independent, suitably skilled and qualified persons at locations that are representative of the range of conditions on the rehabilitating areas. Annual reviews will be conducted of monitoring data to assess trends and monitoring program effectiveness	All Domains	Ecosystem and Land Use Establishment and Ecosystem and Land Use Development	Section 8 and 10 Section 10
PA 10_0015 Appendix 7 Statement of Commitments	Conceptual Post-Mining Land Use (o) The disturbed area within the Project Site will be restored to either rehabilitated woodland or rehabilitated pasture, with approximately 5 hectares (1 percent) remaining as a stabilised highwall of the final void.	Agricultural - Grazing	Ecosystem and Land Use Establishment and Ecosystem and Land Use Development	Sections 4 and 6
PA 10_0015 Appendix 7 Statement of Commitments	Conceptual Post-Mining Land Use (p) Along the eastern boundary of the Project Site, adjacent to the realigned Wean Road, a strip of rehabilitated woodland will be established to screen the view of the final void and generally improve the visual amenity from Wean Road, as well as provide vegetation connectivity north-south on the eastern side of the void.	Native Ecosystem	Ecosystem and Land Use Establishment and Ecosystem and Land Use Development	Sections 2, 4 and 6
PA 10_0015 Appendix 7 Statement of Commitments	Conceptual Post-Mining Land Use	Native Ecosystem	Ecosystem and Land Use Establishment and	Sections 2, 4 and 6

Condition	Requirement	Domain	Timing	Section Addressed
	(q) In addition to the large area to be rehabilitated to woodland, strategically placed tree lots will be established within rehabilitated pasture areas to break-up the landform and act as wildlife refuges and linkages.		Ecosystem and Land Use Development	
PA 10_0015 Appendix 7 Statement of Commitments	Conceptual Post-Mining Land Use (r) Tree trunks and branches less than 300 mm diameter and other vegetative debris removed during clearing activities will be spread over areas to be restored as rehabilitated woodland where practical.	Native Ecosystem	Active Mining	Sections 2, 4 and 6
PA 10_0015 Appendix 7 Statement of Commitments	Final Void Management (s) The final void will be designed and managed as a stable landform. Appropriate long-term land use options for the void will be considered and adequately assessed in consultation with relevant stakeholders as the mine approaches closure.	Agricultural - Grazing	Landform Establishment	Section 4 and 6
PA 10_0015 Appendix 7 Statement of Commitments	Vegetation Clearing and Soil Stripping (c) Cleared trees and branches will be retained for use in stabilising slopes identified for restoration of rehabilitated woodland. No burning of vegetation is permitted or occurs on-site.	All Domains	Active Mining	Section 6.3.1
PA 10_0015 Appendix 7 Statement of Commitments	Rehabilitation (v) As per the commitments listed in Section 8.6, Whitehaven will adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, where practicable, completed mining and overburden emplacement areas are quickly shaped, top dressed and vegetated to provide a stable landform.	All Domains	Life of Mine	Section 6.1
PA 10_0015 Appendix 7 Statement of Commitments	Surface water	All Domains	Life of Mine	Sections 4.3 and 6.3

Condition	Requirement	Domain	Timing	Section Addressed
	m) Progressive rehabilitation of all re-shaped surfaces to assist in reducing the level of TSS (and possible high pH and salinity) in runoff from disturbed areas. This will also reduce the dependence on sediment controls and generally assist in improving water quality.			
PA 10_0015 Appendix 7 Statement of Commitments	Drainage Lines (s) Sections of drainage lines that are or will be impacted upon by the mining operation will be rehabilitated post-mining generally in accordance with Section 5.3.3 of the Blue Book (Volume 1) and the Guidelines for Controlled Activities – In-Stream Works (DWE 2008, as cited in GSSE 2010) for watercourse rehabilitation and riparian zone rehabilitation.	All Domains	Life of Mining	Section 4.3 and 6.3
PA 10_0015 Appendix 7 Statement of Commitments	Flora and Fauna (o) Regular monitoring of the vegetation within the Project Site and offset areas will be undertaken in order to enable effective management with regards to rehabilitation (planting), regeneration, watering, fencing and weed control.	All Domains	Life of Mine	Section 6.3.1
PA 10_0015 Appendix 7 Statement of Commitments	Visual Amenity (b) As per the commitments listed above in Section 8.6, Whitehaven will adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, where practicable, completed mining and overburden emplacement areas are quickly shaped, top-dressed and vegetated. Early reshaping and revegetation of the external batter slopes of the emplacement areas will be targeted as a priority.	All Domains	Life of Mine	Section 6.1, 4.1
PA 10_0015 Appendix 7 Statement of Commitments	Visual Amenity (c) In addition to retaining areas of existing remnant vegetation, it is proposed to restore approximately 206	Native Ecosystem	Ecosystem and Land Use Establishment	Section 4 and 6

Condition	Requirement	Domain	Timing	Section Addressed
	hectares (58 percent) of the disturbed area within the Project Site as rehabilitated woodland. This large area, which includes the western slopes of the Northern and Western Emplacement Areas, will blend in well with the retained remnant vegetation areas within the Project Site and within the adjacent Vickery State Forest and "Yarrawonga" property.			
PA 10_0015 Appendix 7 Statement of Commitments	Visual Amenity (d) Strategically placed woodland tree lots will be integrated into the post-mining landform to break-up the landform and provide visual texture. This will be complimented by the establishment of pasture grass areas that will provide short-term visual impact mitigation prior to the trees becoming established.	Native Ecosystem	Ecosystem and Land Use Establishment	Section 4 and 6

2.2 FINAL LAND USE OPTIONS ASSESSMENT

This section is not applicable to the Rocglen RMP as the final land use is specified under Condition 34, Schedule 3 of Project Approval PA 10_0015 (refer to **Section 2.1**).

2.3 FINAL LAND USE STATEMENT

The overall closure goal for the Rocglen Coal Mine is to establish a stable and safe landform that is commensurate with the surrounding topography, which supports a mixture of rehabilitated woodland and pasture areas. The rehabilitation strategy also includes the enhancement of habitat value and ecosystem connectivity.

2.4 FINAL LAND USE AND MINING DOMAINS

2.4.1 FINAL LAND USE DOMAINS

Final land use domains are defined as land management units characterised by similar final land use objectives. Each final land use domain will require specific rehabilitation methods.

The final land use domains for this Plan are presented in **Table 2-2** and shown on the Final Landform and Rehabilitation Plan (refer to **Figure 5-1).**

Table 2-2 Final Land Use Domains

Code	Final Land Use Domain	Description
F	Water Management Areas	The network of dams and water management structures retained in the final landform. Dams will provide water resources for grazing areas and native fauna.
B	Agricultural - Grazing	Areas rehabilitated with native grasses and pasture species to a rural land capability of (at least) Class VI, suitable for grazing. Final depression of partially backfilled void. Some trees will be established within rehabilitated pasture areas to break-up the landform and provide animal refuges.
A	Native Ecosystem	Areas rehabilitated with native vegetation species analogous to adjacent remnant vegetation communities in the areas surrounding the Rocglen Coal Mine. Native vegetation areas will have characteristics similar to existing analogue sites to provide suitable habitat and movement corridors for native fauna. A strip of rehabilitated woodland will be established to screen the view of the final void and generally improve the visual amenity from Wean Road.

2.4.2 MINING DOMAINS

Mining domains identify the footprint of areas disturbed for mining related activities. For the purpose of this Plan, mining domains have been defined as the set of discrete areas that have a particular operational or functional purpose, therefore having similar geophysical and geochemical characteristics that will have similar rehabilitation requirements.

Mining domains are presented in **Table 2-3.**

Table 2-3 Mining Domains

Code	Mining Domain	Description
1	Infrastructure Area	Footprint of areas disturbed for existing and decommissioned infrastructure including amenity facilities, sealed and unsealed roads and carparks, stockpiled material and maintenance areas.
3	Water Management Area	The network of clean water and dirty water dams and associated infrastructure used for operational and rehabilitation water management.
4	Overburden emplacement areas	Footprint of out-of-pit overburden waste dumps.
5	Active Mining Area (open cut void)	Open cut footprint, inclusive of partially backfilled final void

3 REHABILITATED RISK ASSESSMENT

3.1 SUMMARY OF RISK ASSESSMENT

Multiple risk assessments have been completed historically for the rehabilitation and closure works associated with Rocglen. **Table 3-1** summarises the completed rehabilitation and closure risk assessments.

Table 3-1 Summary of Risk Assessment

Date	Risk Assessment	Details
March 2019	MOP Closure Risk Assessment	A risk assessment was conducted to calculate the consequence and likelihood of an event at the Rocglen Coal Mine during the Closure MOP term, to evaluate the subsequent risk level
October 2020	Gunnedah Open Cut Qualitative Risk Assessment	Determine the environmental aspects of the Gunnedah Open Cut Operations, rehabilitation and closure activities, products and services that it can control and those that it can influence and their associated environmental impacts.
2021	Gunnedah Open Cut Broad Brush Risk Assessment (BBRA)	BBRA review to review material risks and controls.
2021	Gunnedah Open Cut Bowtie Risk Assessment	Bowtie risk assessment for closed mine environmental risks.
December 2021	RMP Risk assessment	A risk assessment was conducted to identify the key issues that presented a risk to achieving satisfactory rehabilitation at Rocglen and inform the preparation of the RMP.

3.2 REHABILITATION RISK ASSESSMENT

Conditions of a mining lease granted under the Mining Act 1992 require the lease holder to conduct a rehabilitation risk assessment and implement measures to eliminate, minimise or mitigate the risks in accordance with the Resources Regulator's Guideline: Rehabilitation risk assessment.

A risk assessment workshop was undertaken on 16 December 2021. The workshop was used to identify the key issues that presented a risk to achieving satisfactory rehabilitation at Rocglen.

The risk assessment included key Whitehaven and SLR personnel and was undertaken in accordance with AS/NZS ISO 31000:2018 Risk Management – Guidelines and the Risk Management Handbook for the Mining Industry (MDG1010). Whitehaven's Risk Matrix was used to calculate the consequence and likelihood of an event and to evaluate the subsequent risk level (risk rank).

The risk assessment has been used to inform the preparation of this Plan. The objectives of the risk assessment were to:

- Identify the risks associated with rehabilitation and closure of Rocglen to achieve the approved post mining land uses;
- Identify knowledge gaps in Whitehaven's current understanding of the risks to rehabilitation;
- Identify the investigations/controls/action plans necessary to effectively mitigate risks and/or realise opportunities and to close any identified knowledge gaps;
- Inform the development of this RMP, to provide a basis to determine additional investigations and/or project works to be undertaken; and
- Provide the framework to satisfy relevant internal and government guidelines, requiring implementation of a risk-based approach to closure.

The risk workshop assessed a total of 52 key rehabilitation risks, which are summarised as:

- 14 risks were ranked as not applicable;
- 28 risks were ranked as low;
- 9 risks were ranked as moderate;
- 0 risks were ranked as significant
- 1 risk were ranked as high; and
- 0 risks were ranked as critical.

Rehabilitation risks, controls and proposed controls will regularly be reviewed and revised (as required)

3.2.1 SPECIFIC RISKS RELATING TO REHABILITATION

The key risks (including significant, high and critical risks) to successful rehabilitation and associated risk controls identified within the December 2021 workshop have been summarised in **Table 3-2.** The outcomes of the risk assessment workshop have been used to inform the preparation of this Plan.

Table 3-2 Key Rehabilitation Risks and Identified

Risk Rating	Key Risk	Key Controls	Sections Addressed
High	Weed infestation	TARP to drive rehabilitation success through responses where actions are required	Section 10
		Weed and Pest Management Plans	Section 6.3.5

Risk Rating	Key Risk	Key Controls	Sections Addressed
		Study on control of pasture species in rehabilitation	Section 9
		Annual Rehab Plan	Section 8.3.3
		Rehabilitation standard includes weeds and pests	Section 8.3.2
		Annual rehabilitation monitoring	Section 8
		Agronomist provides recommendations for priority weeds	Section 6.3.5

The full rehabilitation risk assessment completed as part of developing this RMP is maintained regularly and is available onsite.

3.2.2 FURTHER STUDIES/ACTION PLAN

Proposed controls and further studies were identified during the risk assessment workshop. **Table 3-3** presents an action plan for implementation of the additional risk controls (including significant, high and critical risks).

Table 3-3 Further Studies/Action Plan

Risk Rating	Risk	Proposed Control / Study	Timeframe
High	Weed infestation (Pasture species impacting woodland species)	Study on control of pasture species in rehabilitation	Literature review complete. Stage 1 trial to commence in spring 2022.

4 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1 PA 10_0015 REQUIREMENTS

In accordance with Schedule 3 Conditions 34 to 36 of PA 10_0015 (as modified), Whitehaven will:

a) Rehabilitate the site to the satisfaction of the Resources Regulator;

b) Rehabilitate the site to a final landform generally consistent with that approved and presented in the EA;

c) Rehabilitate all parts of the site to comply with the rehabilitation objectives in **Table 4-1;** and

d) Rehabilitate the site progressively, as soon as reasonably practicable after disturbance.

Table 4-1 Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	Safe, stable and non-polluting
Final void	Minimise the size and depth of the final void as far as reasonable and feasible; and The final void is to be safe, stable and non-polluting
Surface infrastructure	To be decommissioned and removed, unless the Secretary agrees otherwise
Other land affected by the project	Restore ecosystem function including maintaining or establishing self-sustaining eco-systems comprised of: - local native plant species; - at least 206 hectares of woodland (see **Figure 1 Appendix 5***); and - a landform consistent with the surrounding environment
Community	Minimise the adverse socio-economic effects associated with mine closures

*It is noted that total rehabilitation areas were revised following approval of the Rocglen Closure MOP and subsequent Landform Analysis.

4.2 SPECIFIC REHABILITATION OBJECTIVES

In order to achieve the broad rehabilitation objectives presented in PA 10_0015, the following short-term and long-term rehabilitation objectives have been adopted at Rocglen.

4.2.1 SHORT TERM REHABILITATION AND CLOSURE OBJECTIVES

Short-term rehabilitation and closure objectives at the Rocglen Coal Mine include:

- to schedule rehabilitation activities including landform shaping and revegetation to achieve target final landform/land use, and minimise visual exposure;
- to progressively rehabilitate areas of disturbance no longer required for mining-related operations;
- to apply soil (topsoil/subsoil) to the final landform based on material availability and post-mining land use;
- to stabilise all earthworks, drainage lines and disturbed areas in order to minimise erosion and sedimentation; and
- to control vermin, feral animals and noxious weeds that are impacting rehabilitation areas.

4.2.2 LONG TERM REHABILITATION AND CLOSURE OBJECTIVES

Long-term rehabilitation and closure objectives at the Rocglen Coal Mine include:

- continuation and/or restoration of biodiversity and ecological integrity of areas affected by mining or agriculture within the mining leases;
- to establish a low maintenance, geotechnically stable final landform commensurate with surrounding agricultural and nature conservation land uses;
- to blend the created landforms to appear as a natural extension with the surrounding landforms;
- to provide habitat for fauna and corridors for fauna movement within the final landform;
- to establish a minimum of 213.3 ha of woodland revegetation in rehabilitation areas;
- to monitor rehabilitation success in terms of physical and biological parameters; and
- to achieve relinquishment status of rehabilitated and decommissioned areas.

4.3 DOMAIN REHABILITATION OBJECTIVES

In order to achieve the broad rehabilitation objectives presented in PA 10_0015, Whitehaven have developed specific domain rehabilitation objectives.

The key rehabilitation objectives for each of the domains are defined in **Table 4-2.**

Table 4-2 Rehabilitation Final Land Use Domain Objectives

Mining Domain	Final Land Use Domain	Rehabilitation Objective
B	Water management areas	The final landform drainage will be designed and constructed to integrate with surrounding catchments. Some clean water dams will be retained. Final landform drainage will be designed and constructed to minimise erosion and enhance geomorphic stability. Retained dams will be made safe for the final land use. The final landform water management will not adversely impact downstream water users.

Mining Domain	Final Land Use Domain	Rehabilitation Objective
D	(Rehabilitation areas – pasture)	Pasture areas with characteristics comparable with analogue sites will be established on selected areas disturbed by mining (e.g., former infrastructure areas). Grazing rehabilitation areas will comply with (at least) a Rural Land Capability of Class VI. Management inputs required to sustain Class VI land use will be in the range of analogue sites. Strategically placed tree l will be established within rehabilitated pasture areas to break-up the landform and act as animal refuge.
E	Native ecosystem (Rehabilitation areas – Woodland)	A minimum of 213.3 ha of native vegetation will be established. Native vegetation with characteristics comparable with analogue sites will be established on selected areas disturbed by mining (e.g., overburden emplacement slopes). Local provenance seed will be used for woodland rehabilitation areas. Woodland rehabilitation areas will contribute to habitat resources for local fauna and provide linkages with adjacent native vegetation. A strip of rehabilitated woodland will be established to screen the view of the final void and generally improve the visual amenity from Wean Road.

4.4 REHABILITATION COMPLETION CRITERIA

Completion criteria are objective target levels or values assigned to a variety of indicators (e.g., slope, species diversity, percent groundcover), which can be measured to demonstrate progress and ultimate success of rehabilitation. As such, they provide a defined end point, at which point in time rehabilitation can be deemed successful and the lease relinquishment process can proceed.

The rehabilitation completion criteria for all areas at Rocglen are listed in **Table 4-3 to Table 4-5**.

These completion criteria will be utilised to demonstrate achievement of rehabilitation objectives. It is noted that the completion criteria may be subject to refinement as rehabilitation progresses, including as a result of ongoing consultation with the relevant stakeholders, studies yet to be completed and continuous improvement process informed by rehabilitation monitoring results. The achievement (or otherwise) of the completion criteria will be monitored and reported as required.

- Closure criteria have been informed by the following information:
- Relevant conditions of PA 10_0015;
- The Department of Regional NSW – Mining, Exploration & Geosciences (DRNSW – MEG) rehabilitation guideline documents including:
- Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines;

- Guideline: Rehabilitation objectives and rehabilitation completion criteria;
- Similar rehabilitation projects; and
- Specific information collected to date during detailed planning investigations

Table 4-3 Draft Rehabilitation Completion Criteria for Rocglen

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
Phase 1 Decommissioning					
Infrastructure Area					
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)	Infrastructure	All surface infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	No external services connected to site (generator and mobile communication tower used)	NA	NA
			Demolition and removal of all surface infrastructure that is not required for the final land use.	Infrastructure removed.	Statement provided Demolition records As-constructed final landform
			Removal of all concrete footings, foundations and pavements	All concrete footings, foundations and pavements have been removed	Demolition records Surveyed verification and marked on the as-constructed final landform plan. Disposal records/waste receipt
			Surveying and sealing of all drill holes and exploration boreholes in accordance with departmental guidelines and relevant standards.	Sealing completed and verified.	Engineering report/statement that verify complete to departmental guidelines and relevant standards.
Infrastructure		Retention of infrastructure (if applicable): All infrastructure that is to remain as part of the final land use is safe and does not pose any hazard to the community and is approved by the Secretary for retention.	Potential hazards (e.g., electrical, mechanical) have been effectively isolated and secured	Hazards isolated and secured.	Statement provided by suitably qualified engineer.
			Accesses are stable.	Erosion within background There are no gully or tunnel erosion features and there is an absence of rilling (> 300 mm deep) within each domain.	As-constructed plan, photos etc. LiDAR comparison
			Appropriate approvals have been sought and granted for retained infrastructure	Approval in place	Approval from the Secretary
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)		All hazardous and contaminated materials are appropriately removed or remediated	Waste material and/or visible contamination areas on site surface.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/ waste materials have been removed from site.	Statement provided and before/after photos. Waste disposal records
			Soil testing for contaminants of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) (NEPM) applicable to land use type.	Soil quality within appropriate guidelines for land use are met, e.g., Health Investigation Level (HIL) or Ecological Investigation Level (EIL) of the NEPM (1999).	Soil testing results and Report

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
			Carbonaceous material is removed from the footprint of the infrastructure areas	Any carbonaceous material has been removed from the footprint of the infrastructure areas and disposed of in the void, with at least 3m cover.	Photographs, Rehabilitation monitoring reports, as-constructed surveys, quality assurance records Test pit records
Water Management Areas					
Water management	Water management	All water management infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	Removal of all water management infrastructure (including pumps, pipes and power).	Infrastructure removed.	Survey verification records Rehabilitation completion report
Water management Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)		Domain stable and non-polluting	Mine water dams and sediment dams that are planned to remain post closure are desilted as required.	Sediment accumulated in mine water and sediment dams is removed	Rehabilitation completion report Rehabilitation records Survey records Soil quality and water quality data of post closure water structures
All Other Domains					
All domains	All domains	All surface infrastructure, plant and equipment has been decommissioned and removed, unless approved otherwise by the Secretary	Removal of all plant, equipment and associated equipment from the footprint of mining areas	Infrastructure and equipment (including mobile equipment) removed	Rehabilitation completion report Demolition /decommissioning records as-constructed final landform
Phase 2 Landform Establishment					
All Domains					
All domains	All domains	Stable and permanent landform established	Landforms are surveyed and demonstrated to be constructed in accordance with the Final Landform design, and as designed by engineer.	Survey verifies final landform construction in accordance with the Approved Final Landform design	As constructed surveys Landform signoff by engineer
			Rehabilitated slopes are generally less than 10 degrees (out of pit) and 14 degrees for (in pit)	Survey verifies slopes are generally less than 10 degrees (out of pit) and 14 degrees for (in pit)	As constructed surveys
			Landform stability and erosion	Survey or remote sensing of the rehabilitated landforms shows no slumping and settlement that could compromise stability.	Survey or remote sensing monitoring Landform signoff by engineer

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
		Final Landform non-polluting	No polluted or contaminated runoff from the landform	Water quality measured at discharge points and downstream monitoring locations in generally consistent with water quality in surrounding waterways. Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site, within EPA Criteria. Soil quality meets contaminated soil quality guideline criteria for land use are, e.g., Health Investigation Level (HIL) or Ecological Investigation Level (EIL) of the NEPM (1999).	Water quality sampling and analyses as per the approved *Water Management Plan* *Annual soil sampling as part of annual ecological monitoring*
		Final landform blends with the surrounding topography	Visual assessment and as constructed survey	Visual assessments and as constructed survey verifies the regraded landform blends with the surrounding topography	As constructed survey
Water Management Areas					
Water Management Area	Water Management Area	Domain stable and non-polluting	Redundant water management structures backfilled	No pooling of water in backfilled structures following rainfall	Observation/Photographs As constructed survey, including LiDAR
			Remaining water management structures non-polluting	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site, within EPA Criteria	Water quality testing as per the approved *Site Water Management Plan*
		Water Approvals Structures that take or divert water such as final voids, dams, levees etc. are appropriately licensed (e.g., under the Water Management Act 2000).	Water approvals	Water approvals / licences are granted by relevant NSW Government Agency. Water harvestable and storage rights within DPE requirements (10%)	Relevant water approvals / licences. Site survey and drainage calculation.
Overburden Emplacement Area					
Native ecosystem (Rehabilitation areas – Woodland) or	Overburden Emplacements	Landform design included stabilised structures as determine by engineer as guided by erosion modelling	Landforms are surveyed and demonstrated to be constructed in accordance with the Final Landform Design.	Survey verifies final landform construction in accordance with the Approved Final Landform plan	As constructed Landform signoff by engineer

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
Agricultural – Grazing (Rehabilitation Area – Pasture)		Landform designed by suitable qualified engineer included hydrological model.			
		Stable and permanent landform established , consistent with the surrounding environment	Rehabilitated slopes are generally less than 10 degrees	Survey verifies slopes are generally less than 10 degrees	As constructed surveys
			Suitable surface water controls installed and operating effectively	Monitoring of water discharged from the Mine complies with EPL limits No identifiable erosion or sedimentation that would compromise the water structure. Water structure functioning as per design	Water quality sampling Photographs Rehabilitation monitoring reports
All domains		Runoff and/or leachate from the landform is non-polluting	Water quality of runoff is non-polluting	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site. Soil quality meets contaminated soil quality guideline criteria for land use and plant growth impact are, e.g., Health Investigation Level (HIL) or Ecological Investigation Level (EIL) of the NEPM (1999).	Sampling and analyses of runoff Annual soil sample, analytes within background and guideline levels.
Void (Open Cut Void)					
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)	Void (Open Cut Void)	The size, depth and slopes of the final void have been minimised and are in accordance with the approved final landform	Landforms are surveyed and demonstrated to be constructed in accordance with the final landform	Survey verifies final landform construction in accordance with the Approved Final Landform plan (surface area of 130 Ha).	As constructed survey Hydrologist signoff on construction
			Rehabilitated slopes are generally less than 14 degrees	Survey verifies slopes are generally less than 14 degrees	As constructed survey
			The final depression is backfilled to no less than 244m AHD	Survey verifies depth of the final depression is 244m AHD	As constructed survey
		Final depression is safe and stable	Final depression geotechnically stable	Geotechnical report indicating no unacceptable risk of instability	Independent engineers report
			There is no evidence of slumping or settlement that could compromise stability	Survey or remote sensing of the rehabilitated landforms shows an absence of slumping that could compromise stability.	As constructed survey

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
			There is no evidence of erosion that could compromise stability	Survey or remote sensing of the rehabilitated landforms shows an absence of erosion that could compromise stability. There are no gully or tunnel erosion features and there is an absence of rilling (> 300 mm deep).	Survey or remote sensing monitoring
			Suitable surface water controls installed and operating effectively	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site No identifiable erosion or sedimentation. Water quality within EPA discharge limits	Water quality testing as per the approved *Site Water Management Plan* Photographs
		There is no evidence of spontaneous combustion which may present a risk to the final landform or final land use	There is no evidence of spontaneous combustion	Heat monitoring verifies no evidence of spontaneous combustion or heating in the final depression	Heat monitoring results.
		Carbonaceous material is appropriately covered and capped	All coal and carbonaceous material is capped with inert material	All coal and carbonaceous material are capped with a minimum of 3m of inert overburden, subsoil and topsoil.	As constructed survey plans, Test pits
Phase 3 Growth Medium Development					
All Domains					
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Growth media is appropriate to support the final land use	Soil thickness on shaped landform	Rehabilitation records verify that rehabilitation areas includes subsoil with a nominal depth of 100-150 mm.	Rehabilitation records Test pits As constructed survey
				Rehabilitation records verify that rehabilitation areas include topsoil with a nominal depth of 100-150 mm.	Rehabilitation records As constructed survey
			Soil characteristics in the range of pre-mining soil	Monitoring verifies soil characteristics are similar to analogue sites and/or does not limit plant growth.	Soil monitoring and ecological report
			Ameliorant application.	Soil ameliorants applied as per soil quality data	Rehabilitation records Soil quality data

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
		The rehabilitated area does not represent an erosion hazard.	Suitable surface water controls installed and operating effectively.	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site No identifiable erosion or sedimentation	Water quality testing as per the approved *Site Water Management Plan* Photographs
Phase 4 Ecosystem and land use Establishment					
All Domains					
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Weeds and feral animals do not present a risk to rehabilitation.	Weed presence	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Rehabilitation monitoring reports
			Feral animal density	Monitoring records indicate that feral and pest animal species abundance is no greater than surrounding lands.	
		Grazing stock is excluded from rehabilitation areas and enrichment zones during establishment	Stock exclusion fencing around native ecosystem that adjoins grazing	Rehabilitation areas and enrichment zones are fenced to exclude grazing stock (until stable and grazing will not impact upon its establishment).	
		Erosion does not present a safety hazard or compromise the post-mining land capability.	Erosion control	Visual monitoring indicates there is no significant erosion that compromises land capability or the intended final land use.	
				Monitoring verifies there are no gully or tunnel erosion features, or rills >300 mm deep or wide.	Rehabilitation monitoring reports LiDAR survey
Native ecosystem (Rehabilitation areas – Woodland) or Agricultural – Grazing (Rehabilitation Area – Pasture)		Bushfire: The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Appropriate bushfire hazard controls (where required) have been implemented	Bushfire controls implemented similar to surround land management on similar vegetation communities	Rehabilitation monitoring reports. site aerial image
Water Management					
Water Management Area	Water Management Area	Domain stable and non-polluting	Water management structures stabilised and capable of retaining and conveying waterwithout causing pollution	No identifiable erosion or sedimentation that would compromise the water structure, Water structure functioning as per design	Survey or remote sensing monitoring Photographs Engineer report

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
			Water discharged from site within relevant criteria	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site	Water quality testing as per the approved *Water Management Plan*
Native Ecosystem (Rehabilitation Area - Woodland)					
Native ecosystem (Rehabilitation areas – Woodland)	All domains	Restore ecosystem function of at least 213.3 ha of woodland has been established	Area of woodland rehabilitation	Rehabilitation records and landform survey verifies that at least 220 ha of rehabilitation areas have been reseeded with native woodland species	Rehabilitation records Annual ecological monitoring report
		Woodland rehabilitation revegetation for Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (BVT 316 and PCT 592) as consulted with OEH September 2018	Native species richness Native overstorey cover Native mid storey cover Native ground cover (grasses)	Rehabilitation monitoring verifies that native ecosystem indicators have achieved the completion criteria targets listed in **Table 4-4**.	Rehabilitation monitoring records.
Agricultural – Grazing (Rehabilitation Area - Pasture)					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Re-establishing agricultural land over the areas disturbed by the mine. Pasture areas will be capable of grazing as per Class VI land capability that reflects the pre-mining environment.	Area of pasture rehabilitation	Rehabilitated pasture areas have been sown with a mixture of pasture species including fast growing, short- lived species and perennial grasses and legumes.	Rehabilitation records
			Species selection	Rehabilitation areas comprise a mixture of grasses representative of regionally occurring vegetation where possible. Grasses species sown are listed in the RMP.	Rehabilitation records Rehabilitation monitoring reports
			Vegetation establishment	Rehabilitation monitoring records verify that groundcover (vegetation, leaf litter, and mulch) is at least 85%. The first monitoring program is undertaken within 12 to 18 months of rehabilitation to quantify pasture establishment.	Rehabilitation monitoring reports
				No bare surfaces >20 m^2 in area or >10 m in length down slope as indicated by rehabilitation monitoring at Year 5 following establishment.	Rehabilitation monitoring reports
			Vegetation health	Rehabilitation monitoring shows that pasture health is comparable to Class VI land capability and analogue sites.	Rehabilitation monitoring reports
Phase 5 – Ecosystem and Land Use Development					

Final Land Use Domain	**Mining Domain**	**Rehabilitation Objective** ***(describe the desired feature and/or characteristics of the final land use domain)***	**Indicator** ***(specific attribute associated with the objective)***	**Rehabilitation Completion Criteria** ***(benchmark for the indicator, based on analogue data where appropriate)***	**Example Justification Validation Method** ***(evidence that the benchmark has been achieved)***
All domains	All domains	Weeds are controlled.	Weed presence	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Rehabilitation monitoring reports
		Feral animal pests are controlled	Feral animal density	Monitoring records indicate feral and pest animal species abundance is no greater than surrounding lands.	Rehabilitation monitoring reports
All domains	All domains	erosion does compromise the post-mining land capability	Erosion and sediment control	There are no gully or tunnel erosion features and there is an absence of rilling (> 300 mm deep) within each domain.	Rehabilitation monitoring reports
		Monitoring demonstrates soil profile development in rehabilitated areas (e.g., development of organic layer, litter layer).	Soil quality	Soil testing indicates that topsoil soil characteristics (pH, EC [electrical conductivity], ESP) generally meet the following criteria: - pH – between 4.5 and 8.5, or is comparable to relevant analogue sites; - EC - < 1 dS/m, or is comparable to relevant analogue sites; and - ESP – that is comparable to the analogue sites. Where soil testing results indicate values outside the above criteria, rehabilitation monitoring at the relevant area verifies that the soil quality is not inhibiting plant growth.	Soil monitoring and testing reports Rehabilitation monitoring reports
			Surface cover	Rehabilitation monitoring records verify that groundcover (vegetation, leaf litter, and mulch) is greater than 85 %.	Rehabilitation monitoring reports
Water Management Area					
Water management areas	Water management areas	Final landform drainage will integrate with surrounding catchments, achieve long-term geomorphic stability and minimise erosion.	Discharge water quality	Discharge water quality meets EPL requirements.	Water quality results
			Geomorphic stability	Water management structures are assessed to be stable	Engineers reports
Native ecosystem (Rehabilitation areas – Woodland)					
Native ecosystem (Rehabilitation areas – Woodland)	All domains	Woodland rehabilitation revegetation for Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (BVT 316 and PCT 592) as consulted with OEH September 2018 to restore woodland habitat	Native species richness	Rehabilitation monitoring verifies that native ecosystem indicators have achieved the completion criteria targets listed in **Table 4-5**.	Rehabilitation monitoring records.
			Native overstorey cover		
			Native mid storey cover		
			Native ground cover (grasses)		

Final Land Use Domain	Mining Domain	Rehabilitation Objective *(describe the desired feature and/or characteristics of the final land use domain)*	Indicator *(specific attribute associated with the objective)*	Rehabilitation Completion Criteria *(benchmark for the indicator, based on analogue data where appropriate)*	Example Justification Validation Method *(evidence that the benchmark has been achieved)*
Agricultural – Grazing (Rehabilitation Area – Pasture)					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Pasture areas will be capable of grazing as per Class VI land capability that reflects the pre-mining environment, supporting economically viable grazing operations	Species composition	Rehabilitation monitoring verifies that species in pasture rehabilitation areas comprise a mixture of grasses representative of pasture vegetation.	Rehabilitation monitoring records.
			Regeneration	Established species survive and/or regenerate after disturbance	Rehabilitation monitoring records.
				Species are capable of setting viable seed, flowering or otherwise reproducing.	Rehabilitation monitoring records.
			Vegetation health	Rehabilitation monitoring verifies that vegetation health is comparable to reference sites (within 20%).	Rehabilitation monitoring records.
			Land capability	Pasture areas are assessed to have a Rural Land Class VI or better (capable of sustaining grazing), consistent with the final landform	Rehabilitation monitoring records. Agricultural/Grazing/Economic assessments

Table 4-4 Draft Rehabilitation Completion Criteria for Rocglen - Phase – Ecosystem and land use Establishment

Phase – Ecosystem and land use Establishment (Rehabilitation areas Woodland)*		Methodology	Benchmark	Initial establishment monitoring (12 to 18 months)	2 to 5 years	5 to 10 years	Justification Validation Method *(evidence that the benchmark has been achieved)*	Comment
Woodland rehabilitation revegetation for Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (BVT 316 and PCT 592)	Native Species Richness	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Minimum Target	At least 19 individuals per 20x20 plots	At least 24 individuals per 20x20 plots	At least 24 individuals per 20x20 plots	Rehabilitation monitoring records.	Targets are set to allow for ecosystem and land use establishment phase to be achieved within 10 years of initial seeding
	Abundance of Species that will Contribute to Native Overstorey Cover	Measured following the BBAM methodology will target between the Benchmark and Analogue Site values.	Minimum Target	At least 8 individuals per 20x20 plots	At least 8 individuals per 20x20 plots	At least 8 individuals >2m per 20x20 plots	Rehabilitation monitoring records.	
	Abundance of Species that will contribute to Native Mid-storey Cover	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Minimum Target	At least 2 species present per 20x20 plots	At least 2 species present per 20x20 plots	At least 2 species present per 20x20 plots	Rehabilitation monitoring records.	
	Native Groundcover (Grasses)	Measured following BBAM methodology will target	Minimum Target	20%	20%	20%	Rehabilitation monitoring records.	

Phase – Ecosystem and land use Establishment (Rehabilitation areas Woodland)*		Methodology	Benchmark	Initial establishment monitoring (12 to 18 months)	2 to 5 years	5 to 10 years	Justification Validation Method *(evidence that the benchmark has been achieved)*	Comment
		between the Benchmark and Analogue Site values.						
	Vegetation Surface Cover	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Minimum Target	60%	60%*	60%	Rehabilitation monitoring records.	
*** Minimum targets set based on analogue data with reference to Sunnyside completion criteria.**								

Table 4-5 Draft Rehabilitation Completion Criteria for Rocglen - Phase – Ecosystem and land use Development

Phase – Ecosystem and land use Development		Methodology	Benchmark	BVT NA 592	Local Reference (Analogue) (80%)	Justification Validation Method *(evidence that the benchmark has been achieved).*
Woodland rehabilitation revegetation for Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (BVT 316 and PCT 592)	Native Species Richness	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Mean Target	24	38*	Rehabilitation monitoring records.
			Minimum Target	19	33*	
	Native Overstorey Cover	Measured following the BBAM methodology will target between the Benchmark and Analogue Site values.	Mean Target	40%	19%*	
			Minimum Target	25%	10%*	
	Native Mid-storey Cover	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Mean Target	25%	35.7%*	
			Minimum Target	6%	11.7 %*	
	Native Groundcover (Grasses)	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Mean Target	30%	37.9 %*	
			Minimum Target	20%	8.3% *	
	Vegetation Surface Cover	Measured following BBAM methodology will target between the Benchmark and Analogue Site values.	Target	>85%	>60%*	
*** Local analogue data based on one monitoring event (2021).**						

4.5 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA – STAKEHOLDER CONSULTATION

4.5.1 STAKEHOLDER ENGAGEMENT PLAN

Rocglen has prepared a Stakeholder Engagement Plan (SEP) to facilitate stakeholder consultation for Rocglen's rehabilitation objectives and completion criteria. This document details Rocglen's stakeholders and the strategies used to communicate with them and provide the foundation for working with stakeholders prior to and during the closure process. The SEP will be regularly revised to reflect the outcomes of technical investigations, final landform/land use opportunities the ongoing development, execution of this RMP and the outcomes of ongoing engagement.

Since the commencement of rehabilitation and closure planning for Rocglen, Whitehaven has consulted with regulatory authorities including RR as well as relevant landholders as summarised in **Table 4-6** and **Table 4-5.**

4.5.1.1 RELEVANT STATUTORY AUTHORITIES

Whitehaven has consulted with and will continue to consult with the following regulatory bodies in relation to the Rocglen operations, rehabilitation and completion criteria:

- Department of Planning and Environment
- NSW Environment and Heritage Group in the Department of Planning and Environment;
- NSW Office of Water (NOW) (now Department of Planning and Environment - Water)
- NSW Office of Environment and Heritage (now Environment and Heritage Group in the Department of Planning and Environment)
- NSW Department of Industry and Investment (I&I NSW) (now NSW Department of Industry);
- NSW Roads and Traffic Authority (RTA) (now Transport for NSW);
- Gunnedah Shire Council (Council);
- Namoi Catchment Management Authority (CMA); and
- Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA) which is now known as the Commonwealth Department of Sustainability, Environment, Water, Population and Community (SEWPaC) (now Department of Agriculture, Water and Environment (DAWE)).

4.5.1.2 OTHER KEY STAKEHOLDERS

Rocglen has consulted with and will continue to consult with a number of community groups and landholders in relation to the Rocglen operations and rehabilitation, including:

- Local Aboriginal groups (including RAP's);
- Surrounding residents; and
- Country Energy.

4.5.1.3 COMMUNITY CONSULTATIVE COMMITTEE

A Community Consultative Committee (CCC) operates in accordance with Schedule 5, Condition 5 of PA 10_0015 with an independent chair and appropriate representation from Whitehaven, Gunnedah Shire Council and the local community.

4.5.2 SUMMARY OF STAKEHOLDER ENGAGEMENT COMPLETED TO DATE

Extensive stakeholder consultation was undertaken throughout all stages of the Rocglen Coal Mine Extension Project assessment and approval process. Rocglen engaged with the local communities and stakeholder groups to consult regarding issues addressed in the MOP including final land use options and rehabilitation expectations.

Key issues associated with final land use and rehabilitation addressed in the Rocglen Coal Mine Extension Project EA consultation process included:

- The configuration options for the final landform and final void;
- Development of a rehabilitation strategy for the site including the post mining land use and the post mining landforms for the project;
- The proposed methods of rehabilitation, land uses and final landforms in relation to current land uses and landforms;
- Impacts of clearing, access and rehabilitation on the current and proposed long−term land uses;
- Reject disposal and the methods for rehabilitation and long-term land uses; and
- Justification of the final landform.

All issues raised in the consultation process for the Project EA were comprehensively addressed in the approval process and are reflected in the commitments in the Project EA Statement of Commitments and PA 10_0015 conditions. Consultation was also undertaken for the Rocglen Coal Mine Extension Project EA modifications.

Table 4-6 presents a high-level summary of the additional key consultation undertaken for the project to date.

Table 4-6 Consultation Summary to Date

Stakeholder	Date	Issues Raised
RR	22 February 2019	The Closure MOP was originally submitted to the Resource Regulator (RR) for approval on 22nd February 2019 to allow for approval prior to the expiry of the current Rocglen MOP Amendment A, October 2020.
RR	5 February 2020	On 5th February 2020, RR issued a Request for Additional Information providing an adequacy assessment of the MOP and requiring Whitehaven to submit a revised MOP by 5th March 2020. This revised version of the MOP has been prepared to address comments provided by the RR including Action table 5 from the Aspect Ecology Rehabilitation Report 2019.

4.5.3 PROPOSED FUTURE CONSULTATIOIN

Consultation will continue with stakeholders during rehabilitation and closure as required and in accordance with the SEP. **Table 4-7** presents a summary of the proposed future consultation activities key stakeholders.

Table 4-7 Summary of Proposed Future Stakeholder Engagement Activities

Stakeholder	Activities
RR	Ongoing revisions of the RMP Submission of the Annual Review and Annual Rehabilitation Report Detailed Mine Closure Planning
DPE	Annual Reviews Ongoing revisions of the RMP Submission of the Annual Review and Annual Rehabilitation Report Detailed Mine Closure Planning
CCC	Annual Reviews Ongoing revisions of the RMP Quarterly CCC Meetings Detailed Mine Closure Planning
Agencies	Annual Reviews Ongoing revisions of the RMP Submission of the Annual Review and Annual Rehabilitation Report Detailed Mine Closure Planning
Stakeholder and Community Interest Groups	Ongoing revisions of the RMP Detailed Mine Closure Planning
Registered Aboriginal Parties	Detailed Mine Closure Planning

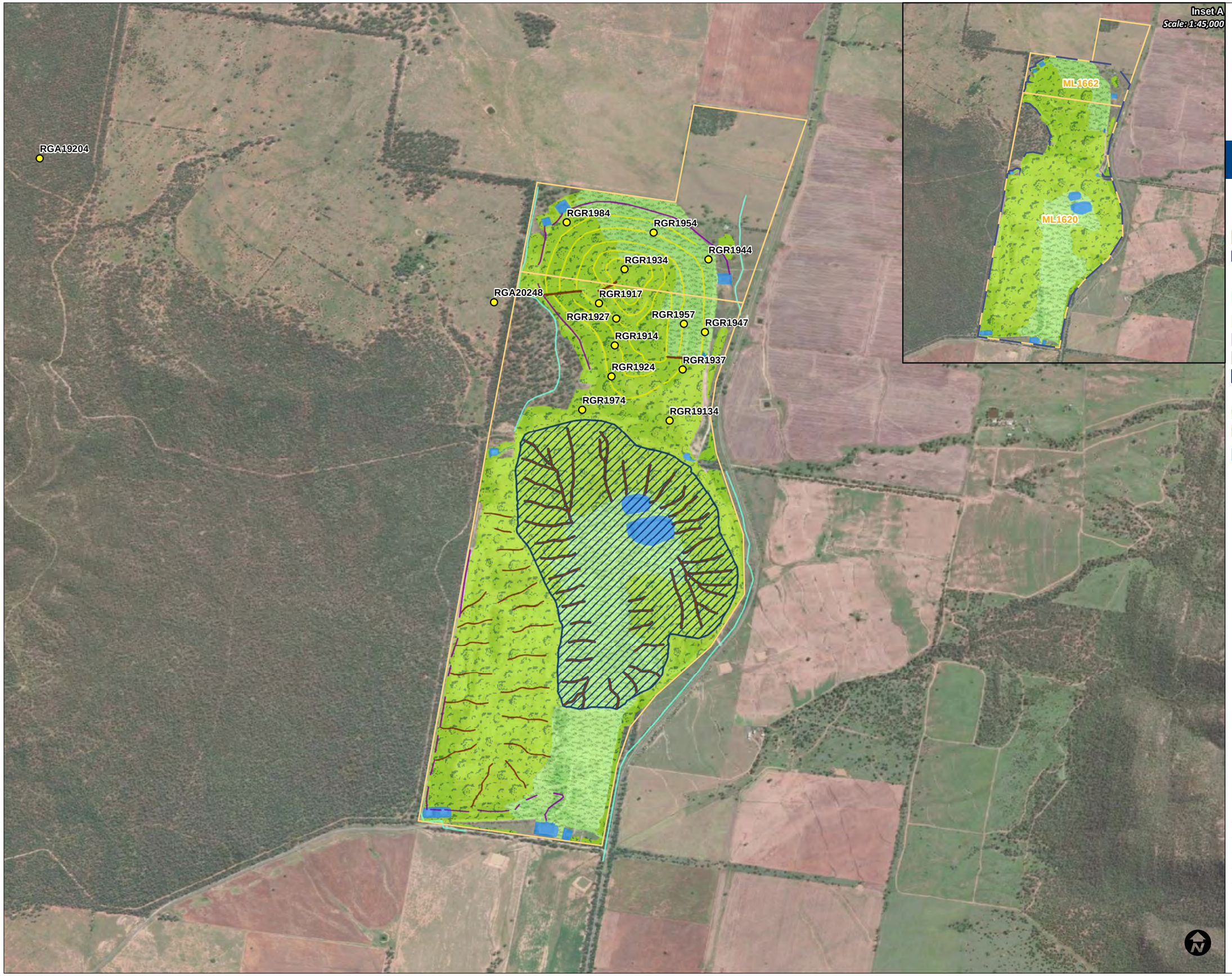
5 FINAL LANDFORM AND REHABILITATION PLAN

In accordance with the requirements of the Form and Way: Rehabilitation Management Plan for Large Mines (RR, 2021a) a Final Landform and Rehabilitation Plan has been prepared to show the proposed final land use and final landform of Rocglen (refer to **Figure 5-1** and **Figure 5-2).**

WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FLRP PLAN 1: FINAL LANDFORM FEATURES



LEGEND

- Rehabilitation Monitoring Sites
- Mining Lease
- Project Approval Boundary

Final Landform Feature

- Clean Water Diversion Bank + Drain
- Contour Bank
- Dirty Water Drain/Bank
- Rock Drain
- Void with Intergrated Shaping

Final Landuse Domain

- Agricultural – Grazing
- Native Ecosystem
- Water Storage (Excluding Final Void)

0 250 500 Metres

Coordinate System:	GDA2020
Scale:	1:20,000 at A3
Project Number:	630.30268
Date:	26-Jul-2022
Drawn by:	LC

WHITEHAVEN COAL

UAV Image Capture Date: 28th October 2021

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WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

FLRP PLAN 2: FINAL LANDFORM CONTOURS

Inset A
Scale: 1:60,000

SEE MAIN MAP

ML1662

ML1620

LEGEND

- Final Landform Contour (2m AHD)
- Mining Lease
- Project Approval Boundary

0 250 500 Metres

Coordinate System:	GDA2020
Scale:	1:15,000 at A3
Project Number:	630.30268
Date:	27-Jul-2022
Drawn by:	LC

WHITEHAVEN COAL

UAV Image Capture Date: 28th October 2021

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6 REHABILITATION IMPLEMENTATION

6.1 LIFE OF MINE REHABILITATION SCHEDULE

Whitehaven will adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, remaining mining disturbance areas are promptly shaped, top-dressed and vegetated to provide a stable landform.

The life of mine rehabilitation schedule associated with rehabilitation activities is has been presented in **Figure 6-1**. The figure illustrates the projected rehabilitation status at closure (within next five-yearly interval) with the completion of decommissioning activities and achievement of the final land use.

6.1.1 INFRASTRUCTURE

There are no further construction activities planned for key infrastructure at Rocglen.

Key infrastructure will be decommissioned to prepare land for rehabilitation including removal of built infrastructure, foundation and hardstand materials, services, equipment and materials including wastes and contamination.

The indicative timeline of rehabilitation and decommissioning activities are shown in **Table 6-1** and further details are provided in **Section 6.3.2**.

Table 6-1 Indicative Timeline of Rehabilitation and Decommissioning Activities

2022	2023	2026
▪ Ongoing rehabilitation of in-pit and out-of-pit emplacement batters. ▪ All carbonaceous material from re-handled overburden and infrastructure area transferred to in-pit emplacement and capped. ▪ Rehabilitation of in-pit and reshaped out-of-pit emplacement.	▪ Final in pit and out-of-pit emplacement rehabilitation and ongoing maintenance rehabilitation of mine site. ▪ Supplementary earthworks completed. ▪ Demolition and removal of site office, workshop and carpark. ▪ Decommissioning of internal access roads/tracks that are no longer required. ▪ Site contamination testing and remediation as required. Decommissioning of water dams that are not being retained as part of the final landform.	▪ Final landform is geotechnically stable, safe and non-polluting. ▪ Rehabilitation to Ecosystem and Land Use Establishment established across all relevant areas of the mining lease. ▪ Decommissioning of any residual infrastructure not being retained, and on-site remediation of any remaining contaminated areas. ▪ Ongoing rehabilitation, monitoring and management. ▪ Decommissioning of water storages that are not being retained as part of the final landform.

6.1.2 MINING ACTIVITIES

Production at Rocglen ceased in 2019, with coal production no longer occurring. Works remaining are limited to rehabilitation activities including: Bulk earth moving/shaping using dozers, placement of subsoil and topsoil, seeding, tube stock planting and rock lining of drainage structures.

Any vegetation clearing activities that are required to achieve the final land use will be conducted in accordance with this RMP and associated Management Plans.

6.1.3 MINE PRODUCTION SCHEDULE

Coal extraction at the Rocglen Coal Mine ceased in June 2019. There is no production or overburden dumping scheduled.

6.1.4 REHABILITATION ACTIVITIES

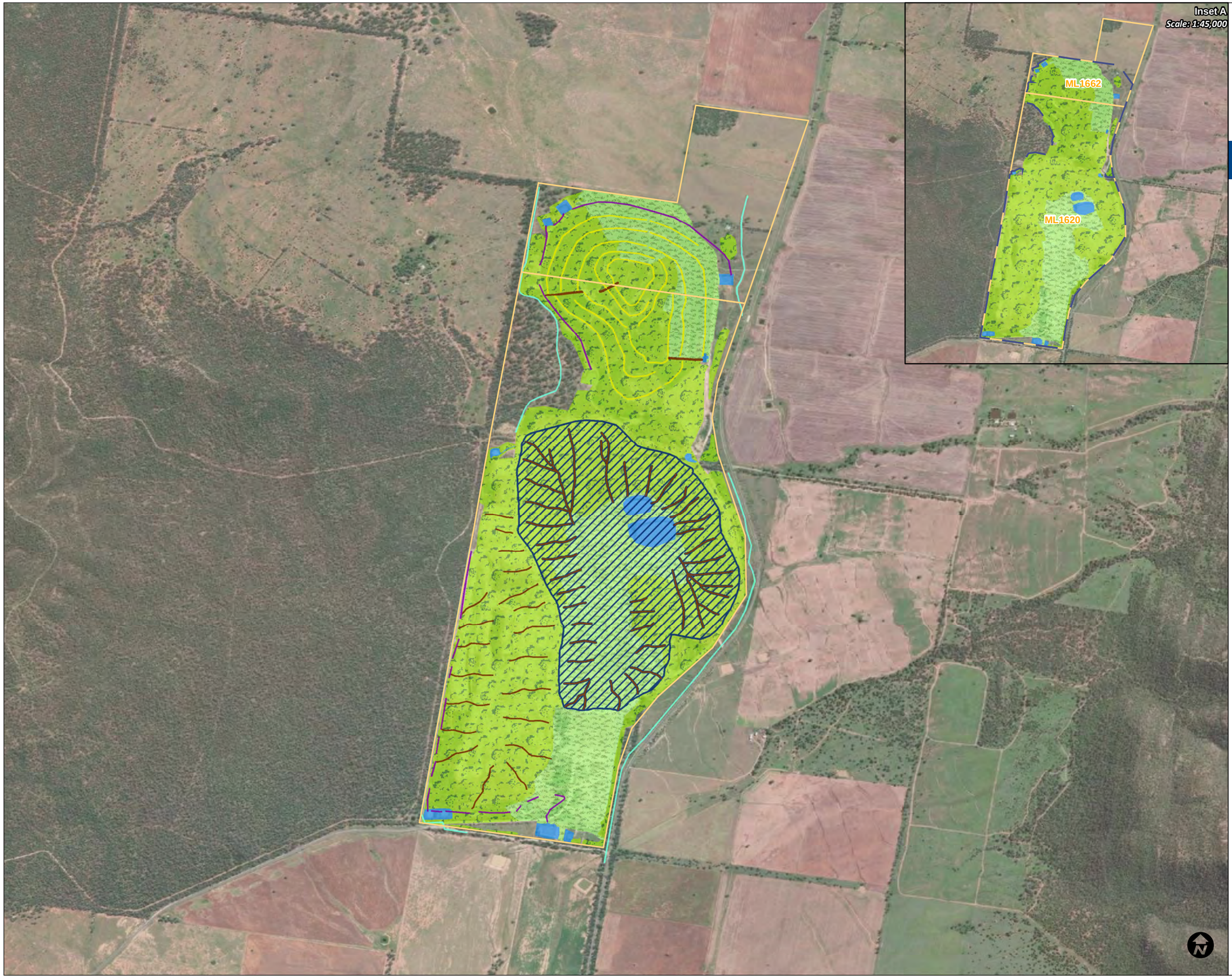
Remaining rehabilitation activities at Rocglen are described in **Table 6-1**.

6.2 LOM REHABILITATION PLANS

WHITEHAVEN REHABILITATION MANAGEMENT PLAN

ROCGLEN

LOM PLAN 1



LEGEND

- Mining Lease
- Project Approval Boundary

Final Landform Feature

- Clean Water Diversion Bank + Drain
- Contour Bank
- Dirty Water Drain/Bank
- Rock Drain
- Void with Intergrated Shaping

Final Landuse Domain

- Agricultural – Grazing
- Native Ecosystem
- Water Storage (Excluding Final Void)

0 250 500 Metres

Coordinate System:	GDA2020
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Project Number:	630.30268
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Drawn by:	LC

WHITEHAVEN COAL

UAV Image Capture Date: 28th October 2021

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6.3 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

Achievement of a safe and stable landform that is commensurate with the surrounding topography will be demonstrated through the implementation of a series of conceptual rehabilitation phases. As defined by the Form and way: Rehabilitation Management Plan (large mines) the rehabilitation phases are presented in **Table 6-2.**

Table 6-2 Rehabilitation Phases

Rehabilitation Phase	Description
Phase 1: Active Mining	This phase is associated with active mining operations across the domains.
Phase 2: Decommissioning	This phase of rehabilitation includes activities associated with the removal of mining infrastructure, unless agreed to be retained, and the removal, remediation or management of contaminated and hazardous materials.
Phase 3: Landform Establishment	This phase of rehabilitation consists of the processes and activities required to construct the approved final landform. In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials).
Phase 4: Growth Medium Development –	This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short-lived pioneer species) to ensure achievement of the approved or, if not yet approved, the proposed: - rehabilitation objectives; - rehabilitation completion criteria; and - final landform and rehabilitation plan. This phase may include 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, and actions to minimise loss of growth media due to erosion.
Phase 5: Ecosystem and Land Use Establishment -	This phase of rehabilitation consists of the processes to establish the 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.
Phase 6: Ecosystem and Land Use Development –	This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved or, if not yet approved, the proposed: - rehabilitation objectives;

Rehabilitation Phase	Description
	- rehabilitation completion criteria; and - final landform and rehabilitation plan. For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile. This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Phase 7: Rehabilitation Completion (sign-off) –	The final phase of rehabilitation when a rehabilitation area has achieved the final land use for the mining area: - as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria; and - as spatially depicted in the approved final landform and rehabilitation plan. Rehabilitation areas may be classified as complete when the RR has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by the lease holder.

6.3.1 ACTIVE MINING PHASE

Coal extraction at Rocglen ceased in 2019. Bulk earthworks associated with rehandling overburden into the open cut is ongoing. Appropriate measures and strategies were and where relevant continue to be implemented during the active phase of mining to enhance rehabilitation outcomes. Works in this phase are summarised below.

a) Soils and Materials

Management protocols for soils and subsoils were implemented to minimise risks and enable soil resources within disturbance areas to be characterised, stripped, stockpiled, and re-used appropriately.

There is no further topsoil stripping planned at Rocglen.

Soil Resource

Soil resources at Rocglen were assessed in the Soils and Land Resource Assessment by GSSE in 2010. GSSE identified and classified soils to be stripped ahead of disturbance for the Rocglen operations. Soil resources identified to be salvaged for rehabilitation were predominantly representative of three discrete soil mapping units (SMUs), being:

- SMU 1 - Brown Duplex Sandy Loams (Eutrophic Brown Chromosol);
- SMU 2 - Self Mulching Black Earths (Self Mulching Black Vertosol); and
- SMU 3 - Sodic Brown Alluvial Clays (Calcic Brown Dermosol).

The land overlying these SMUs has been used for, grazing and cropping. The assessment found that the SMUs are suitable for use in rehabilitation.

Soil Resources Balance

The available soil resource for rehabilitation has been re-assessed in 2022 and presented in **Table 6-3.**

Table 6-3 Topsoil Resources

Soil Type	Approximate Volume (m^3)	Demand (m^3)	+ Surplus / - Deficit (m^3)
Topsoil	236,700	215,000 at 0.15m	+21,700
Subsoil	272,000	253,500 at 0.2m	+18,500
Total	**508,700**		

As outlined in **Table 6-3** soil available onsite for rehabilitation will total 508,700 (m^3) which has been calculated as a surplus and will likely be sufficient to complete the remaining rehabilitation activities. Contingency measures to be implemented should a deficiency in soil volume be identified are described in the TARP (refer to **Table 10-1**).

Management

Active mining at the Rocglen Coal Mine ceased in 2019. Topsoil and subsoil stripping is not applicable for this RMP.

Ongoing soil stockpile management measures include:

- Implementation of a weed control program in the event that unacceptable weed generation is observed; and
- avoiding the operation of machinery on the soil stockpiles to prevent compaction and maintain soil aggregation.

Topsoil and subsoil will be respread following establishment of the final landform. Subsoil will be respread to a nominal depth of 100 - 150 millimetres (mm) and Topsoil to a depth of 100 – 15000 to give a combined total depth of soil material on rehabilitation landform of between 200 and 300mm All rehabilitation area receiving subsoil and/or topsoil will be ripped to key in soil layers and improve water infiltration. The addition of soil ameliorants and application of seed will be carried out where possible in consecutive operations to reduce the potential for soil loss to wind and water erosion. Soil testing to determine topsoil amelioration requirements has been undertaken. Ameliorants include gypsum, urea and composts (Cattle Manure).

b) Flora Management

The Rocglen Mine is located in an area which had previously (prior to mining) been extensively cleared for grazing and cropping. Subsequently no major areas of native vegetation have, or will be, cleared within the footprint of the operation. Notwithstanding, if clearing is required, the following measures will be implemented to minimise the risk of impacts to flora:

- All efforts will be made to avoid disturbance of the vegetation communities within Rocglen and to maintain and enhance as much of the existing remnant vegetation on-site as possible.

- The minimal practicable amount of clearing will be undertaken as a general objective, particularly within those areas that currently contain identified threatened species or ecological communities.

- Ground disturbance permits will document tree felling controls, supervision requirements, demarcation, habitat salvage, weed control practices, inspections and monitoring measures.

Resources

The following measures will be implemented to salvage flora resources:

- Where possible, vegetative debris removed during clearing activities will be spread over woodland rehabilitation areas
- target overstorey species will be collected from stock that is of regional providence and either provided to a nursery for propagation into tubestock/hikos or used in seed mix and direct sown on the rehabilitation area;
- provenance seed of mid storey and ground cover species will be collected and sown in target planting areas by conventional agricultural methods i.e., preparation of surface to form seed bed, broadcast seeding and scarification; and

b) Fauna Management

The Rocglen Mine is located in an area which had previously (prior to mining) been extensively cleared for grazing and cropping. Subsequently, the observed presence of fauna is limited. Notwithstanding, if clearing is required, the following measures will be implemented to minimise the risk of impacts to fauna:

- All efforts will be made to avoid impact to fauna observed within the existing onsite remnant vegetation;

- The minimal practicable amount of clearing will be undertaken as a general objective, particularly within those areas that currently contain identified threatened species or ecological communities.

- Ground disturbance permits will document tree felling controls, supervision requirements, demarcation, habitat salvage, weed control practices, inspections, and monitoring measures.

c) Rock/Overburden Emplacement

Active mining at the Rocglen Mine ceased in 2019. Rock and overburden emplacement limited to rehandling overburden into the open cut pit to partially backfill the void.

Existing out-of-pit emplacements have been rehandled and used to partially backfill the open cut to minimise the depth of the final void.

d) Waste Management

Wastes produced at the Rocglen Coal Mine comprise of:

- general domestic-type wastes from on-site buildings and routine maintenance consumables;
- oils and grease; and
- sewage.

Domestic-type wastes will be collected and disposed of by a licensed waste disposal contractor, with recyclable materials separated, where possible. Waste oils from maintenance activities are pumped from equipment to bunded storage tanks or removed from site by licensed waste disposal contractor. Sewage is managed via onsite facilities serviced by licensed contractors.

Prior to decommissioning, soil assessment will be undertaken to identify potential land contamination. Should contamination be identified, consideration will be given to the remediation and management of contaminated soil onsite.

e) Geology and Geochemistry

The Project Site is located in the Gunnedah Basin, which forms the central part of the Sydney Gunnedah-Bowen Basin system extending along the eastern margin of Australia. The Gunnedah Basin covers an area of just over 15,000 square kilometres and comprises rocks of Permian and Triassic age.

Rocglen coal mine targets the Upper Glenroc, Lower Glenroc and Belmont Seams. These coal resources are influences by a north-northwest oriented asymmetrical anticline that plunges and flattens to the south as well as northern syncline that appears to be bounded by steeply dipping and faulted strata. The overburden within the Project Site comprises a deeply weathered section of interbedded claystone, siltstone, sandstone, conglomerate and tuffaceous claystone.

f) Material Prone to Spontaneous Combustion

The coal at Rocglen has a low percentage of inorganic sulphur and hence a low potential for exothermic oxidation reactions. The risk of spontaneous combustion of reject is inherently lower than for coal and is further minimised through the dilution and dispersion effect of overburden co-disposal.

Measures implemented during active mining to minimise spontaneous combustion included:

- Co-disposal of reject within the footprint of the pit shell with waste material.
- Reject represents a small percentage (approximately 2.5%) of overall material disposed of within the pit shell footprint.
- Co-disposal of reject in discrete areas within the overburden emplacement, reducing potential for large volumes of reject material and therefore, combustion potential.
- The combustion potential is minimised by the minimum 3m of cover material in the final landform which is considered to be sufficient to reduce exposure to lightning strikes and reduces oxygen dispersion which would be required to sustain combustion.
- Annual sampling and analysis of representative source reject material from the CHPP was undertaken during co- disposal to assess for spontaneous combustion potential.

Measures implemented during rehabilitation and decommissioning to minimise spontaneous combustion will include:

- selective handling of carbonaceous material if encountered during backfilling;
- reporting spontaneous combustion incidents; and
- training in spontaneous combustion management.

- In areas where there is no documentation of carbonaceous material dumping. Test pitting or auguring the final landform will be undertaken to confirm that there is no carbonaceous material within 3m.

g) Material Prone to Generating Acid Mine Drainage

A material characterisation assessment completed prior to mine commencement found that samples exhibited a negative Net Acid Producing Potential (NAPP). This indicates that the materials would not be a source of acid leachate generation when exposed. The following reject emplacement methodology was employed to limit sulphide oxidation and acid generation and/or the migration of any acid or sulphate species that may be generated from migrating beyond the pit shell:

- The acid forming potential of reject was minimised through the dilution effect of co-disposal with overburden (including ongoing cover of overburden as part of the operational overburden emplacement process);
- Reject was placed inside the pit shell footprint;
- A setback angle of 30° was utilised for 'supercharged' co-disposed rejects and overburden material (i.e., for areas where the backfill is higher than the original topography);
- Growth medium will be provided above the cover for rehabilitation to support successful long-term revegetation;
- Water quality monitoring is undertaken to review the implementation of the abovementioned methodology; and
- Survey controls (to record where reject material was placed and to confirm appropriate placement of rejects material).

h) Ore Beneficiation Waste Management (Reject and Tailings Disposal)

Coal from Rocglen was sent to the Whitehaven CHPP for washing. Whitehaven blend product coal from its mines in the Gunnedah region (including Rocglen) to produce thermal coal and coking coal prior to shipment through the Port of Newcastle. Whitehaven typically produce three main products.

Co-disposal of reject material at Rocglen Coal Mine was undertaken for coarse coal and from 2016, fine rejects through back-haulage from the Whitehaven CHPP. Reject materials were disposed of within the footprint of the pit shell with at least 3 metres of overburden material.

i) Erosion and Sediment Control

Key sources of erosion and sedimentation are generally related to surface water runoff from exposed surfaces, including cleared areas, shaped landform, stockpiles (soil and waste rock), unsealed roads, and wind erosion from emplacement areas.

Access tracks will be installed and maintained in accordance with relevant regulatory requirements and the guideline document.

Erosion and sediment control (ESC) at Rocglen is managed in accordance with the Rocglen Water Management Plan (including an Erosion and Sediment Control Plan), relevant regulatory requirements and the guideline document.

j) Ongoing Management of Biological Resources for Use in Rehabilitation

Biological resources are managed as detailed throughout this Section **(6.3.1)** including completed and ongoing resource recovery and soil management.

k) Mine Subsidence

Rocglen is located in an area where no historic underground mining has been undertaken. Subsequently, mine subsidence is not applicable to Rocglen.

l) Management of Potential Cultural and Heritage Issues

Aboriginal heritage is managed in accordance with the Aboriginal Cultural Heritage Management Plan which was developed in consultation with the local Aboriginal community and OEH (now Heritage NSW).

Engagement with RAPs and Heritage NSW will be undertaken as part of detailed mine closure planning. Advice will be sought as to the management of heritage sites post closure.

m) Exploration Activities

No exploration activities are expected to be undertaken at Rocglen.

Disturbance from any previous exploration activities will be rehabilitated prior to mine closure. All exploration drill holes will be sealed in accordance with relevant RR DRG guidelines at the time.

6.3.2 DECOMMISSIONING

The Decommissioning Phase encompasses all works required to prepare land for rehabilitation including removal of any unnecessary built infrastructure, foundation and hardstand materials, services, equipment and materials including wastes and contamination.

Decommissioning, demolition and removal of infrastructure from the mine site will generally be undertaken during the mine closure phase.

Temporary access tracks will be ripped, topsoiled and revegetated as soon as feasible after mining operations.

Any infrastructure including dams, roads and buildings which is beneficial for future use by post mining landowners may be left in place subject to relevant landowner agreements and regulatory approvals.

Decommissioning and demolition will include:

- Demolition and removal of site office and facilities.
- Demolition and removal of coal handling infrastructure (already removed).
- Removal of other concrete pads and footings, if required.
- Removal of access roads and carpark, if required.
- Grouting and capping of exploration boreholes.
- Removal of internal access roads.
- Removal of UG power lines from generator to offices and workshop

Decommissioning and demolition activities will be appropriately planned and documented to ensure that appropriate approvals are in place for the works.

a. Site Security

Actions to be undertaken to prevent unauthorised access to the Rocglen Coal Mine include:

- signage at the entries to the Rocglen Coal Mine indicating that authorised personnel only are permitted on-site;
- the entry points to the Rocglen Coal Mine have gates which are locked when the mine is not in operation;
- signage on boundary fencing indicating that the Rocglen Coal Mine is an active mine (when the mine is in operation) and indicating that unauthorised access is not permitted;
- all persons are required to sign in at the site office;
- inductions for all persons; and
- visitors and personnel not inducted are required to be accompanied by an inducted person.

Public safety measures following closure of the Rocglen Coal Mine would be developed during detailed mine closure planning, in consultation with relevant stakeholders. Notwithstanding, the Rocglen Coal Mine final landform (including its proposed future land uses) has been designed to be safe, stable and non-polluting. It is expected that relevant signage, fencing and bunding for safety would be retained, subject to consultation with future landowner(s) and stakeholders.

b. Infrastructure to be Removed or Demolished

Site features, services and structures to be decommissioned and demolished to achieve the final land use are described in **Table 6-4**.

Table 6-4 Infrastructure to be Decommissioned

Code	Mining Domain	Description	Indicative Timing
1	Infrastructure	Helipad, Carpark, Administration Building, Ablution Building, Underground Electricity, Workshop Building, Laydown Area, , Septic Tank, Signage, Mining associated infrastructure location on undisturbed land to be decommissioned: Boreholes (MP07, MP08, Production Bore & WB03 – Refer to Water Management Plan Figure 5), Signage	2023
3	Water Management Area	/Crusher Dam Water Pump/Pipes, Sediment Basins (SB4, SB5, SB6, SB7, SB8, SB12, SB13, SB14, SB15, SB15A, SB16, SB17, SB20, A, A1, A2, B1, C, C1– Refer to Water Management Plan Figure 3), Storage Dams (SD3, Crusher Dams, Dam B – Refer to Water Management Plan Figure 3), Signage	2023

Code	Mining Domain	Description	Indicative Timing
4	Overburden Emplacement Area	Two-way Communication Tower, Signage	2023
5	Active Mining Area (open cut void)	Signage	2023

As required by the Rocglen consent, all demolition work on site is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.

c. Buildings, Structures and Fixed Plant to be Retained

Site features, services and structures to be retained for future use as part of the final land use are described in **Table 6-5.**

Table 6-5 Infrastructure to be Retained

Code	Mining Domain	Description	Indicative Timing
3	Water Management Area	All infrastructure to be removed unless otherwise agreed following consultation completed as part of detailed mine closure planning	
4	Overburden Emplacement Area		
5	Active Mining Area (open cut void)		

The *Rocglen Rehabilitation and Closure Plan* provides further details regarding decommissioning, including:

- Determine and obtain the necessary approvals;
- Determine the structural integrity of the building/structure/infrastructure to be retained;
- Identify the associated short-term and long-term risks to public safety and the environment from the structures remaining in place, which should identify potential modes of failure;
- Address any potential residual risks such as potential for structures to fail; and
- Engage (where required) a suitably qualified engineer to verify that any risks have been satisfactorily addressed.

d. Management of Carbonaceous/Contaminated Material

Carbonaceous Material

During decommissioning, ongoing inspections will be undertaken within the footprint of surface infrastructure including stockpiles, access roads and haul roads to identify remaining sources of carbonaceous material. Following the inspections any carbonaceous material will be transferred into the open cut and capped with at least 3 m of inert overburden, subsoil and topsoil.

Contaminated Material

Contamination assessments will be completed as part of the mine closure reporting and decommissioning processes:

- Rocglen will utilise a suitably experienced and qualified person to conduct contamination and remediation assessments;
- If contamination is identified, a Remedial Action Plan will be developed, detailing remediation strategies for potential contamination.

e. Hazardous Materials Management

During decommissioning, hazardous materials (hydrocarbons and chemicals) will be managed and stored in accordance with the approved site waste management strategies. Removal of hazardous materials will be undertaken by a licensed waste disposal contractor and disposed / recycled at a licensed waste facility.

f. Underground Infrastructure

Rocglen is an open cut mine and does not have any portals, decline entries, shafts, underground workings, underground equipment, or subsidence monitoring lines. Subsequently, underground infrastructure is not applicable to Rocglen.

6.3.3 LANDFORM ESTABLISHMENT

Landform establishment is the process of shaping the final landform to a safe, stable and non-polluting landform that is appropriate for the desired final land use and consistent with the surrounding landscape. The final landform for the Rocglen Coal Mine is shown on the Final Landform Plan in **Section 5**.

a. Water Management Infrastructure

Elements such as drainage paths, contour drains, ridgelines, and emplacements will be shaped, as required, to undulating profiles in keeping with natural landforms of the surrounding environment. Water management structures are designed to collect surface runoff from rehabilitation or disturbed areas.

Sedimentation dams will be constructed and retained during rehabilitation to collect runoff from rehabilitated areas until discharge water quality meets regulatory criteria and dams can be decommissioned.

Water management structures that will remain following mine closure is detailed in **Figure 5-1**.

b. Final Landform Construction: General Requirements

- Landform establishment will involve the progressive earthworks as well as supplementary earthworks, which would involve reshaping of the out-of-pit and in-pit overburden emplacement areas and final depression to achieve the final landform.
- Whitehaven have rehandled waste rock from the western out-of-pit waste emplacement to achieve generally 10-degree slopes. Material was rehandled using fleet items currently approved for mining operations (e.g., dozers, excavators and haul trucks or scrapers).

- The rehandle of the out of pit emplacement where practicable include selective handling of vegetation, topsoil, and subsoil to minimise biota loss.
- Material removed from the top of the waste emplacement was used to partially backfill the open cut.
- Rehabilitated slopes of the final depression will be verified by survey to be generally 14 degrees.

c. Final Landform Construction: Reject Emplacement Areas and Tailings Dams

ROM coal was transported from the Rocglen Coal Mine by trucks along public roads on the approved coal haulage route to the Whitehaven CHPP. Coarse and fine coal rejects are approved to be returned from the Whitehaven CHPP to Rocglen for emplacement in the mined-out areas of the open cut. Since September 2019 site has no longer been receiving any reject material from the Gunnedah CHP.

Measures to minimise spontaneous combustion and acid mine drainage are detailed in **Section 6.3.1**

d. Final Landform Construction: Final Voids, Highwalls and Low Walls

Final Void

The open cut is to be partially backfilled, resulting in a minimum elevation of approximately 244 m AHD. The maximum contour depth presented is 240 m AHD associated with the two water management areas within the final depression.

Material removed from the western waste emplacement has been used to partially backfill the open cut, which would result in a reduced final depression.

The total final void/depression surface area is 130 ha. The catchment area will be managed to ensure that no runoff from the surrounding landform will report to the final depression.

Rehabilitated slopes would be verified by survey to be generally 10 degrees for out-of-pit emplacements, and 14 degrees for the final depression.

To ensure the ongoing stability of slopes retained in the final landform, geotechnical assessment and survey of all key areas will be undertaken to assess the stability of the landform and to verify that it has been constructed in accordance with the final landform design as shown in **Figure 5-1**.

Survey or remote sensing of the rehabilitated landforms would be undertaken to identify any evidence of slumping or weathering that could compromise the stability of the landform.

Low Wall

Final landform construction will be undertaken so that there will be no final low wall in the Rocglen final landform. All slopes within the void will be battered down to 14 degrees.

Highwall

Final landform construction will be undertaken so that there will be no final highwall in the Rocglen final landform. All slopes within the void will be battered down to 14 degrees.

e. Construction of Creek/River Diversion Works

The construction of creek/river diversion works is not applicable to Rocglen.

6.3.4 GROWTH MEDIUM DEVELOPMENT

In the context of this RMP, growth media development encompasses activities to reinstate soils with the initial physical, chemical and biological characteristics required to establish the desired vegetation community.

Characterisation

Sampling will determine if the topsoil and subsoil is suitable for rehabilitation use or if it requires amelioration or selective handling and placement. If the growth medium cannot be effectively ameliorated, unsuitable subsoil and spoil, will be buried and capped.

Capping spoil will be ameliorated if required, and contour ripped prior to the placement of the subsoil.

Topsoil Respreading and Amelioration

Topsoil will be spread onto areas requiring rehabilitation to a nominal depth of 100 to 150 mm for all rehabilitation areas, and will consider the soil depth information obtained through the pre-stripping soil sampling;

- The soil testing results will be used to determine if physical and/or chemical amelioration is required, and the rates and method of application. The spreading of soil, addition of soil ameliorants, fertiliser, and application of seed will be carried out where possible in consecutive operations to reduce the potential for soil loss to wind and water erosion.
- All soils will be ripped prior to seeding. This will be conducted along contour where possible and will be managed to minimise the potential for unsuitable spoil material being ripped up to the surface;

Seed Bed Preparation

Thorough seedbed preparation will be undertaken to ensure optimum establishment and growth of vegetation. All soils will be lightly ripped prior to seeding to ensure any ameliorants are incorporated into the soil and rough surface is established to capture seed. This will be conducted along the contour where possible and will be managed to minimise the potential for unsuitable spoil material being ripped up to the surface.

For tree planting / tubestock areas, tree mounds will be utilised if required, to capture rain, improve soil moisture and ongoing moisture retention.

6.3.5 ECOSYSTEM AND LAND USE ESTABLISHMENT

In the context of this RMP, ecosystem establishment includes activities to establish the desired floristic composition (species diversity and density) and habitat features. The phase incorporates seeded and management actions such weed and feral pest control to achieve species establishment and growth to juvenile communities, and habitat augmentation.

Domain B – Agricultural – Grazing

Following the re-creation of the final landform a pasture mix will be sown by conventional agricultural methods i.e., preparation of surface to form seedbed, broadcast seeding and scarification. This will help with the stabilisation of the landform and to return the land to agricultural productivity. The pasture species will be appropriate for the season and will include but not be limited to the species identified in **Table 6-6**

Table 6-6 Recommended Pasture Species Seed Mix

Native Pasture Species	Species Name	Indicative Rate (kg/ha)
Queensland Red Grass	*Bothriochloa spp.*	0.6
Queensland Blue Grass	*Dicathium spp.*	0.6
Wallaby Grass	*Austrodanthonia spp.*	0.6
Kangaroo Grass	*Themeda triandra*	2.2
Introduced Pasture Species		
Bombatsi Panic	-	1-2
Purple Pigeon Grass	-	1-2
Subterranean Legume	-	4-5
Barrel (Sephi) medic	-	2-4
Snail (sava) medic	-	3-5
Woolly Pod Vetch	-	4-6
Serradella (Elgara)	-	1-2
Lucerne	-	0.5
Phalaris (Sirolan or Holdfast)	-	1-2

Domain A – Native Ecosystem

Native vegetation areas are seeded with a native seed mix and planted with native Tubestock/Hiko species. Woodland Rehabilitation Areas will include areas with include species commensurate with the Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (PCT 592). Species used in revegetation will consider a range of species that contribute to each canopy layer such as grasses, herbs, forbs, mid storey and canopy species. including but not limited to species detailed in **Table 6-7 Woodland Species**.

Table 6-7 Woodland Species

Common Name	Species Name
Narrow-leaved Ironbark	*Eucalyptus crebra*

Common Name	Species Name
White Cypress	*Callitris glaucaphylla*
White Box	*Eucalyptus albens*
Yellow Box	*Eucalyptus melliodora*
Blakely's Red Gum	*Eucalyptus blakelyi*
Tumbledown Red Gum	*Eucalyptus dealbata*
Pilliga Box	*Eucalyptus pilligaensis*
Poplar Box	*Eucalyptus populanea*
Wilga	*Geijera parviflora*
Belah	*Casuarina cristata*
Kurrajong	*Brachychiton populneus*
Wattle	*Acacia spp.*
Hopbush	*Dodonaea spp.*
Cassinia	*Cassinia spp.*
Senna	*Senna spp.*
Queennsland Red Grass	*Bothrichloa spp.*
Queensland Blue Grass	*Dicathium spp.*
Wallaby Grass	*Austradanthonia spp.*
Kangaroo Grass	*Themeda triandra*

Cover crops (oats, millet) will be used in in conjunction with native seeds for revegetation, where necessary, to provide for an effective groundcover until the target seed species are established. This will minimise the likelihood for erosion and weed infestation during the initial establishment phase of the rehabilitation

Weed and Vertebrate Pest Control

Ecosystem Establishment includes initial management actions to limit the introduction of weeds and vertebrate pest species in rehabilitation areas. Ongoing weed and pest management and monitoring is considered for the ecosystem and land use development phase (refer **Section 6.3.6**).

Weed management practices adopted include:

- ongoing visual assessments and weed monitoring as part of the rehabilitation monitoring program;
- application of herbicides where required to control weed infestations;
- recording and controlling any occurrences of priority weeds;
- restriction of grazing and vehicular traffic to minimise spread of weeds;
- liaison with the North West Local Land Services (LLS);
- if required, advice is sought from an Agronomist;
- weed and pest plans;
- camera monitoring and inspections for all the nominated vertebrate pests; and
- 1080 poison baiting (where required).

6.3.6 ECOSYSTEM AND LAND USE DEVELOPMENT

For the purposes of this RMP, the ecosystem and land use development phase represent those activities required to develop sustainable ecosystems that have characteristics comparable to similar undisturbed vegetation associations in the area prior to mine closure.

All Domains

Activities associated with the ecosystem and land use sustainability phase of rehabilitation are generally ongoing maintenance and land management activities and rehabilitation monitoring. Maintenance at rehabilitated areas will include, but not be limited to:

- Ongoing environmental management to minimise risks to rehabilitation;
- Comparing specific ecosystem characteristics such as soil profile development, floristic composition and structure and faunal diversity and abundance with the characteristics of appropriate analogue sites; and
- Undertaking adaptive management and remedial works where characteristics of the rehabilitation are not trending toward desired outcomes.

Rehabilitation monitoring will be undertaken throughout the ecosystem and land use development phase until it can be demonstrated that rehabilitation areas have met all conditions for relinquishment.

Rehabilitation maintenance activities will be identified by rehabilitation monitoring and ongoing requirements will be reported annually in the Annual Rehabilitation Report and Forward Program.

6.3.7 REHABILITATION COMPLETION (SIGN OFF)

Rehabilitated areas will be progressively signed-off by the Resources Regulator as they meet the rehabilitation criteria outlined in **Section 4**, in accordance with the Guideline: Achieving Rehabilitation Completion (Sign-off).

6.4 REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

The Rocglen Coal Mine is located in an area where no historic underground mining has been undertaken. Subsequently, mine subsidence is not applicable to Rocglen.

7 REHABILITATION QUALITY ASSURANCE PROCESS

A Rehabilitation Quality Assurance Process (RQAP) has been developed for Rocglen. This will include details of inspections, monitoring and record keeping which will be required to ensure that:

- Rehabilitation was implemented in accordance with the nominated methodologies; and
- Identified risks to rehabilitation are being adequately addressed and closed out for relinquishment.

Whitehaven will implement the RQAP through the rehabilitation and closure to confirm that the rehabilitation strategies outlined in this RMP have been completed in accordance with the nominated methodologies (see **Section 6.3**). The RQAP will also include inspections and documentation to verify that each phase of demolition and rehabilitation has been completed and has met the completion criteria detailed in **Section 4**. Documentation to be maintained would include (but not limited to):

Phase 1 – Active Mining (Where available 2008 to 2019)

- Documentation of pre-clearance surveys and LDPs;
- Resource salvage records (soil, rocks, habitat trees);
- Dumping plans and surveys; and
- Detailed Landform designs.

Phase 2 – Decommissioning

- Documentation of boreholes sealing and sign off by RR;
- Inspection and demolition reports to confirm all infrastructure to be demolished has been removed; and
- Validation testing to ensure any contamination has been appropriately remediated and/or removed.

Phase 3 – Landform Establishment

- Survey and preparation of as constructed drawings of final constructed slopes, landforms and water drainage structures; and
- Verification reporting to confirm the specified depth of capping has been implemented (i.e., aerial surveys).

Phase 4 – Growth Medium Development

- Maintenance of a Subsoil and topsoil inventory to document stripped, stockpiled and re-spread resources;
- Site records of re-spread topsoil, ameliorants, fertiliser etc.; and
- Soil testing results to confirm appropriate soil geochemical parameters for plant establishment.
- Survey and preparation of as Build plan that detail soil depths applied as per requirements

Phase 5 – Ecosystem and Land Use Establishment

- Documentation of seeding and reseeding or planting activities undertaken, such as date of planting, weather conditions, seeding rates and/or planting rates;

- Site inspections and monitoring of rehabilitated areas to allow early identification of any emerging threats to rehabilitation; and
- Rehabilitation Monitoring

Phase 6 – Ecosystem and Land Use Development

- Rehabilitation inspection for erosion;
- Weed inspection infestations;
- Documentation of Rehabilitation Monitoring; and
- Documentation of actions undertaken to repair/improve rehabilitation progress and of weed and feral animal management and eradication programs.

Whitehaven have developed a Rehabilitation Quality Checklist to be signed off after each phase of rehabilitation prior to proceeding to the next phase (refer to **Figure 7-1**).

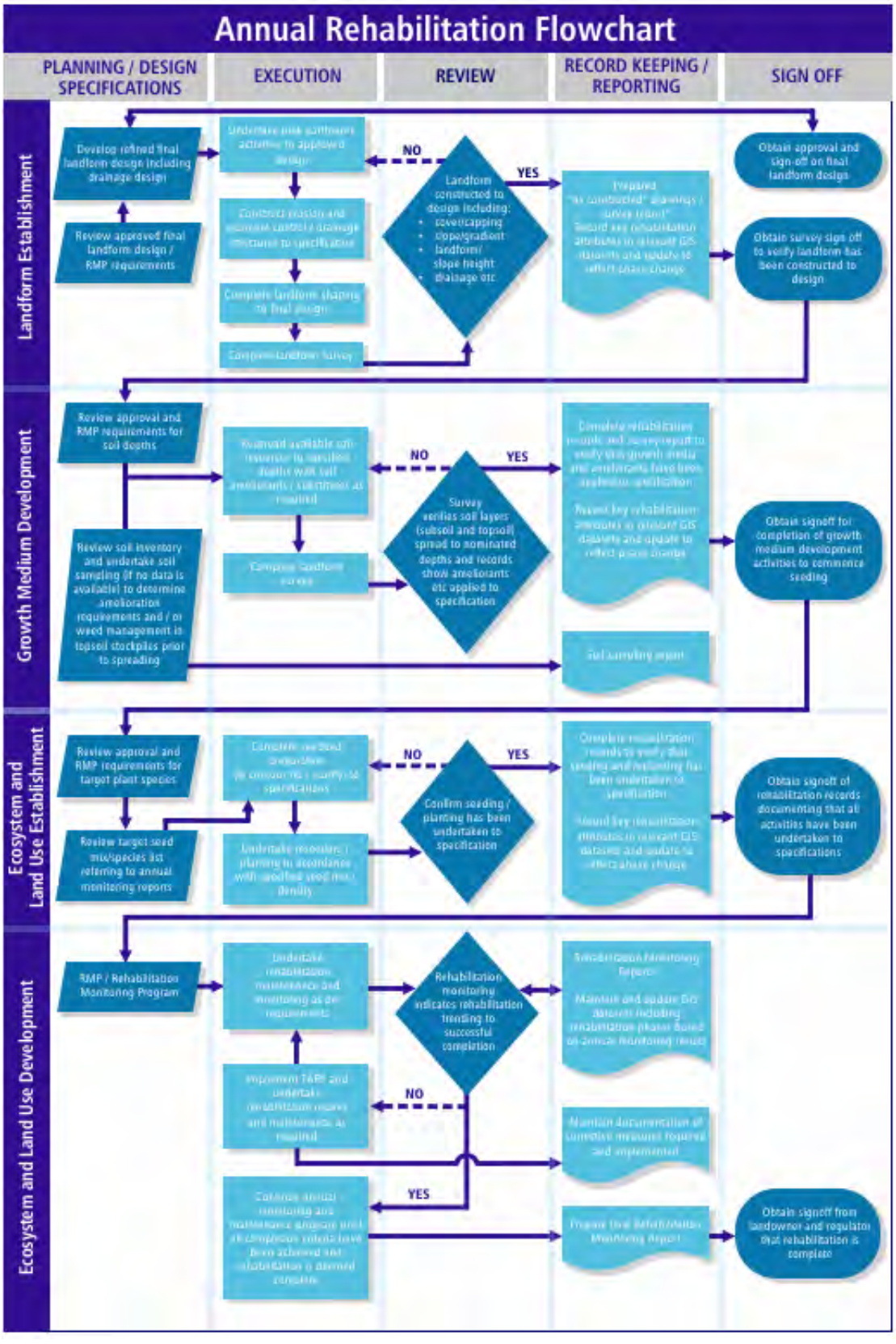

Figure 7-1 Rehabilitation Quality Assurance Process

8 REHABILITATION MONITORING PROGRAM

Rehabilitation monitoring is undertaken at Rocglen to measure and assess rehabilitation performance against the stated rehabilitation and closure criteria outlined in this document. The monitoring results are also used to identify the need for corrective actions for rehabilitation performance. The monitoring program incorporates the most appropriate indicators and methods that:

- Provide a measure of completion criteria to be assessed in accordance with the defined rehabilitation objectives;
- Adequately track changes to rehabilitation phases;
- Are reproducible;
- Utilise scientific recognised techniques; and
- Are cost-effective.

Monitoring is conducted by a suitably skilled and qualified person(s) at locations representative of the range of conditions on the rehabilitating areas and appropriate analogue sites. Monitoring results will inform refinements of rehabilitation methodology as required. Rehabilitation monitoring will be continued until it can be demonstrated that rehabilitation has satisfied all rehabilitation and closure criteria.

8.1 ANALOGUE SITE BASELINE MONITORING

Analogue sites are used to determine if the appropriate characteristics are developing or being achieved. For benchmarking purposes, there are replicate sites within each vegetation community target, and repeat monitoring to capture seasonal variation. Protocols have been established to ensure that sites are appropriately located and position, as detailed in the Rehabilitation Monitoring Methodology.

8.2 REHABILITATION ESTABLISHMENT MONITORING

Annual Rehabilitation monitoring is undertaken within 12 to 18months and general on site seeded since the previous monitoring event. Annual Rehabilitation Monitoring of the newly established sites will identify issues and success within developing rehabilitation.

Annual Rehabilitation monitoring results will link with the TARP management system in **Section 10** if issues are identified during the monitoring period.

The data yielded from the monitoring program allows an adaptive management approach by providing information to inform the type and implementation of management activities and determining the status of rehabilitation performance in relation to completion criteria. This facilitates the continual improvement and refinement of rehabilitation techniques.

8.3 MEASURING PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

8.3.1 ANNUAL REHABILITATION WALK OVER INSPECTIONS

Annual walk-through of all rehabilitated areas is undertaken internally by a suitably qualified person(s) in Spring to assess the general progress of completed rehabilitation and to identify areas where corrective action is necessary. This assessment has simple objectives relating to vegetation establishment, weeds, erosion presence, surface water management and erosion and sediment control structures.

Any issue identified during the walk over will be recorded and the *Annual Site Rehabilitation Plan* which is updated to include remediation or monitoring activities on the issues.

8.3.2 ANNUAL REHABILITATION MONITORING

Annual Rehabilitation Monitoring is undertaken during spring each year when species are generally flowering, and more species diversity can be identified in rehabilitation areas. Annual rehabilitation monitoring is undertaken in accordance with the Annual Rehabilitation Monitoring Methodology (Rehabilitation Monitoring Method).

The monitoring provides detailed (transect-based) scientific data and trends on vegetation community establishment and development, from which an accurate assessment can be made on the status of rehabilitation against completion criteria.

Rocglen has permanent rehabilitation monitoring plots measuring 20 x 50 m and within each, a nested plot of 20 m x 20 m is established based on the Biodiversity Assessment Methodology (BAM). The rehabilitation plot sampling rate used has been determined with reference to the BAM and takes into account RMP objectives. The rate is generally one site per 10 ha (or part thereof) based on the total hectares of rehabilitation for a given year seeded.

Each year additional permanent sites are established in rehabilitation that has been seeded since the previous monitoring event. Further periodic or standalone monitoring projects are commissioned as required, and may include targeted fauna, soil, and trial studies.

Detailed analysis of the monitoring data generated by the annual rehabilitation monitoring program is undertaken to determine the trajectory rehabilitation is tracking towards to achieve the final land uses detailed above. The analysis and monitoring outcomes are documented in annual monitoring reports.

Regular visual inspections of all phases of rehabilitation are also undertaken by WHC personnel. These informal assessments facilitate early management intervention, and include:

- Success of initial germination after seeding;
- Success of tree and shrub plantings;
- Adequacy of drainage controls;
- Presence/absence of weeds; and
- General stability of the rehabilitation site.

Any issue identified during rehabilitation inspection and documented in the annual rehabilitation monitoring report is actioned in the *Annual Site Rehabilitation Plan*.

8.3.3 REHABILITATION PERFORMANCE

Outcomes of monitoring results as described in **Section 8.3.1** to **8.3.2** are incorporated within the *Annual Site Rehabilitation Plan* which is developed every year by the end of June to align with the budget period. The *Annual Site Rehabilitation Plan* provides additional specific detail, maps and statistics on planned rehabilitation activities and schedules for the next 12-month period. Notwithstanding this, planned activities are consistent with those in the Forward Program/LOM Plans. The *Annual Site Rehabilitation Plan* will provision for rehabilitation activities depending on the phase of rehabilitation at a particular area. The *Annual Site Rehabilitation Plan* will be the key document for tracking the progress of rehabilitation through rehabilitation phases.

9 REHABILITATION RESEARCH, MODELLING AND TRIALS

There is currently a ground flora rehabilitation study underway at Rocglen that include literature review and field trial. Focused on;

- The eradication or removal exotic pasture species in woodland rehabilitation; and
- Cost effective strategies and technologies to enhance ground flora diversity and cover/abundance in rehabilitation.

Rehabilitation monitoring and rehabilitation methodology records are also shared among Whitehaven operations to inform decision-making regarding rehabilitation campaigns.

9.1 FUTURE REHABILITATION RESEARCH, MODELLING AND TRIALS

Biomass assessments will be supplemented with grazing trials to quantify the sustainable carrying capacity (DSE equivalent) of rehabilitated pasture areas.

No further research, modelling or trials are currently proposed to be undertaken at the Rocglen Coal Mine.

10 INTERVENTION AND ADAPTIVE MANAGEMENT

Where rehabilitation performance is not trending toward the nominated completion criteria this may indicate that there is a potential threat to long term rehabilitation success. Threats to rehabilitation may include events such as extended periods of drought, bushfire events, or pressures from weeds and feral/pest animals.

A Rehabilitation and Closure Trigger Action Response Plan (TARP) has been developed to provide a framework to manage potential key risks to rehabilitation. The Rehabilitation and Closure TARP includes:

- Identification of the principal contributing factors and impacts for each major risk to rehabilitation;
- Identification of upper limits (trigger values) for causes and impacts that are considered to represent an unacceptable level of risk; and
- Identification of appropriate responses to mitigate or remediate the causes and impacts, including a notification protocol.

The Rehabilitation and Closure TARP provides management responses for lower (first tier) and upper (second tier) trigger values. First tier trigger values identify opportunities for closer monitoring or early intervention that may mitigate potential impacts before notable impact to rehabilitation occurs. Second tier trigger values identify when indicators have reached a threshold that requires more substantive or widespread remedial actions to remediate or mitigate rehabilitation failure.

Should any trigger conditions be met resulting in the requirement for intervention or adaptive management, actions will be reported in the Annual Rehabilitation Report. Whitehaven will notify the Resource Regulator and other relevant stakeholders of any incident (such as bushfire or disease) that results in major impacts to rehabilitation that are likely to significantly impact the potential to achieve rehabilitation success.

The Rehabilitation and Closure TARP is provided in **Table 10-1** and will be revised as conditions at Rocglen change or new risks to rehabilitation are identified.

Table 10-1 Trigger Action Response Plan

Aspect/ Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
Landform stability	Slope gradient	1	Trigger	Survey data indicates that the landform is not built to the final landform design.	<55% of the rehabilitation area has slopes within the limits stipulated in the final the RMP.
			Response	Check machinery guidance system on dozers and update if required Check site datum and update if required. Undertake regrading as required	Undertake a review of the landform design and make an assessment of the stability of the landform including material characterisation. Undertake stability enhancement works including revegetation if required. Consider regrading to achieve stability.
	Erosion control	2	Trigger	Minor gully or tunnel erosion present and/or minor rilling (rilling up to 200 mm in depth or width).	Slumping and / or active gully or tunnel erosion present and / or rilling >200mm, which is compromising landform stability.
			Response	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to improve current water management infrastructure to address erosion. Remediate as appropriate.	Engage suitably qualified person(s) to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.
	Water management Structures	3	Trigger	Water management structures (sediment dams, channels, contour banks) minor erosion and/or scouring as determined by monitoring.	Water management structures fail or display significant scouring / erosion as determined by monitoring.
			Response	An inspection of the site will be undertaken by a suitably trained person. Identify remedial actions such as amelioration, re-vegetation or alternative scour protection	Engage a suitably qualified person to develop a site-specific remediation plan and review water management structure design criteria. Provide for physical works on the basis of design review.
Soil/spoil Quality	Salinity	4	Trigger	Increasing trend in soil/water salinity levels	Presence of salt scalds
			Response	Undertake soil/spoil testing to verify EC and recommend further soil / spoil amelioration	Engage a specialist consultant suitably qualified person to develop a site-specific management report to be implemented to remediate salinity scalds. Undertake works as required.
	Spoil surface layers chemical characteristics	5	Trigger	Increasing trend in soil dispersivity (EAT)	Soils are moderately to highly dispersive
			Response	Undertake testing to determine required amelioration and undertake amelioration as required.	Review material handling practices to confirm that non-dispersive spoil is selectively dumped at final RL where possible and /or dispersive spoils emplaced at surface are appropriately ameliorated.

Aspect/ Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
					Ameliorate dispersive spoils (for examplewith coarse gypsum) as required. Re-vegetate if required.
	Soil biophysical and chemical characteristics	6	Trigger	Soil biophysical and chemical characteristics not able to sustain vegetation growth for required vegetation community	Soil physical, chemical and biological characteristics continues to illustrate signs of not able to sustain the desired final land use.
			Response	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.
	Subsoil depth	7	Trigger	Subsoil is not reinstated to, at least, the minimum depth specified for the proposed final land use. As identified in the quality assurance process	Sufficient suitable subsoil cannot be identified for reinstatement at the minimum specified depth for the proposed final land use i.e.,200mm.
			Response	Spread additional subsoil to achieve required depth	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.
	Topsoil depth	8	Trigger	Topsoil is not reinstated to, at least, the minimum depth specified for the proposed final land use. As identified in the quality assurance process	Sufficient suitable topsoil cannot be identified for reinstatement at the minimum specified depth for the proposed final land use i.e.,100mm to 1500mm.
			Response	Spread additional topsoil to achieve required depth	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.
Biodiversity (native vegetation)	Native Species Richness	9	Trigger	Less than 19 individuals per 20x20 plots	Greater than 19 but less than 24 individuals per 20x20 plots.

Aspect/ Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
			Response	Use rehabilitation monitoring report to guide what species are not present in revegetation areas. Re-seed or maintenance planting of revegetation areas with unsatisfactory species richness. Review viability results and modify seed species as required	Undertake a field survey to identify which species do not present in revegetation areas. Engage an independent specialist to review seed viability and others causes for revegetation failure and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required.
	Native Groundcover	10	Trigger	Less than 20% of groundcover species sown recorded.	Less than 20% of groundcover species sown recorded.
			Response	Undertake a field survey to identify likely causes of unsatisfactory germination rates. Re-seed areas with unsatisfactory cover. Review seeding procedures incl. seasonal mixes, timing and seed rate per hectare.	Undertake a field survey to identify which species do not present in revegetation areas. Engage an independent specialist to review seed viability and others causes for revegetation failure and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required.
	Exotic Plant Cover (Weeds)	11	Trigger	Increasing number and cover of exotic species since last rehab monitoring and/or occurrence of newly identified exotic species.	More than 20% of domain area and/or significant weed invasions.
			Response	Engage weed management contractor to remove / spray introduced weed species.	Engage weed management contractor to remove introduced weed species. Investigate management measures to improve native plant establishment and weed suppression. Implement recommendations as appropriate.
Water Quality	Water quality	12	Trigger	Water quality exceeds baseline values	Long term trend outside the Water Quality Guidelines (2018) limit values
			Response	Review and investigation of water quality monitoring and management where appropriate. Implement relevant remedial measures where required.	Specialist to review sampling and climate data and review likely cause(s). If mine related, undertake assessment to identify sources of water quality degradation and recommend remedial actions Implement specialist recommendations
	Discharge water quality at licence discharge points	13	Trigger	Sediment basin discharge exceeds EPL criteria for pH, TSS and/or oil/grease	Long term trend outside the Water Quality Guidelines (2018) limits
			Response	Re-sampling to confirm results and investigate potential causes.	Review sediment basin maintenance and discharge procedures, and sediment basin capacity requirements. Undertake required corrective actions.

Aspect/ Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
			Response	Undertake a review of the landform design to assess risks to stability and free draining design.	Engage a specialist to assist with the management of settlement and slumping and provide recommendations to appropriately remediate. Consider rehandling material and/or regrading if required.
	Monitoring of final landform	14	Trigger	Survey or remote sensing of the rehabilitated landforms indicates settlement or slumping that could compromise stability.	Survey or remote sensing of the rehabilitated landforms indicates major settlement or slumping.
			Response	Undertake a review of the landform design to assess risks to stability and free draining design.	Engage a specialist to assist with the management of settlement and slumping and provide recommendations to appropriately remediate. Consider rehandling material and/or regrading if required.

11 REVIEW, REVISION AND IMPLEMENTATION

11.1 REVIEW AND REVISION OF PLAN

The Plan will be reviewed and if required revised in the event of the following:

- An amendment to the rehabilitation objectives, completion criteria or proposed final land use;
- Changes to risks, risk control measures or rehabilitation strategies being identified during the completion of rehabilitation risk assessment or additional investigations;
- When directed to by the RR Secretary; and
- When triggered by consent conditions (Annual Reviews, Independent Environmental Audits, Incident Reports, Modifications).

11.2 IMPLEMENTATION

The process for ensuring that mining and rehabilitation are conducted in accordance with the RMP is the preparation and implementation of an Annual Rehabilitation Plan. The Annual Rehabilitation Plan is prepared and managed by the site Environmental superintendents and approved by the Mine Manager.

ACCOUNTABILITIES

Role	Accountability
General Manager	Ensure adequate resources are available to the Operations Manager to complete required rehabilitation activities according to the forward plan; Ensure adequate resources are available to enable the Environment Manager/Supt to complete the required monitoring and quality control activities in this plan.
Manager	Complete rehabilitation activities according to the schedule put forward in the Forward Plan. Ensure adequate resources are made available to monitor and assure the quality during the rehabilitation process.
Technical Expert	Monitor the progress of the rehabilitation completed against completion criteria and objectives. Monitor and report on any risks to rehabilitation success and communicate those risks effectively. Provide advice to the Operations Manager on all rehabilitation matters.
All Workers	Complete any rehabilitation activities according to procedures and protocols. Advise the Environmental Supt or delegate of any issues or risks encountered during rehabilitation activities.

SUPPORTING DOCUMENTATION

The following supporting documentation which includes associated training materials may need to be consulted and, where appropriate, used when applying this Standard and/or any subordinate procedures:

- *WHC-PRO-GOC-Annual Rehabilitation Planning Process*

Revisions	Revision Description	Who Consulted	Date
1	Document Developed	Environmental Manager, Ops Mgr, Env Supt, Env Officer	29/7/22
2			

APPENDIX A – LAND OWNERSHIP

Tenure Type	Lot Number	Deposited Plan Number
WHC	1 and 4	1120601
WHC	1	787417
Narrabri Shire Council	23 and 28 Council roads and road reserve, including • Shannon Harbour road reserve; • Hoad road (SR 95); • Blue Vale Road (SR 7); and • Kamilaroi Highway (SH 29)	754929
Narrabri Shire Council	Wean Road (SR 6)	748046

APPENDIX B – STANDARD MINING LEASE CONDITIONS

Refer to website: https://legislation.nsw.gov.au/view/pdf/asmade/sl-2021-360