REHABILITATION MANAGEMENT PLAN

Document Number:	MXC_MP_EC_16
Status:	Final
Version:	5
Effective:	31/12/2023
Review:	0

Summary Table

Name of mine	Maxwell Underground Coal Mine
Rehabilitation Management Plan commencement date	1 August 2022
Rehabilitation Management Plan revision dates and version numbers	1 August 2022 - Version 1 21 October 2022 – Version 2 31 May 2023 – Version 3 3 November 2023 – Version 4 31 December 2023 – Version 5
Mining leases and expiry dates	CL 229 (02/02/2045), CL 395 (21/01/2029), ML 1531 (25/02/2045), ML 1820 (10/11/2042) and ML 1822 (18/11/2042)
Name of lease holder(s)	Maxwell Ventures (Management) Pty Ltd
Date of submission	31 December 2023

Table of Contents

1 PART 1 - INTRODUCTION TO MINING PROJECT

1.1 History of Operations

Maxwell Ventures (Management) Pty Ltd (Maxwell), a wholly owned subsidiary of Malabar Resources Limited (Malabar) owns and operates the Maxwell Underground (UG) Project (the site). The site is located in the Upper Hunter Valley of New South Wales (NSW), east-southeast of Denman and south-southwest of Muswellbrook. The project locality is shown on **Plans 1** and **1.2**.

The site consists of the following areas:

- Underground area comprising the proposed area of underground mining operations and the mine entry area (MEA) to support underground mining and coal handling activities and provide for personnel and materials access;
- Maxwell Infrastructure (formerly Drayton mine) comprising previous open cut mining areas, existing coal handling and preparation plant (CHPP), train load-out facilities and rail loop, Antiene rail spur and other infrastructure and services; and
- Transport and services corridor between the underground area and Maxwell Infrastructure comprising the proposed site access road, covered overland conveyor, power supply and other ancillary infrastructure and services.

Substantial existing infrastructure at the Maxwell Infrastructure site will be used for the handling, processing and transportation of coal. This includes the existing CHPP, train load-out facilities and other infrastructure and services including water management infrastructure, administration buildings and workshops.

The area within and surrounding the site, which has previously been known as Mt Arthur South, Saddlers Creek and Drayton South, has long been identified as having a significant in-situ coal resource. Prospecting for coal commenced in the late 1940's with exploration intensifying during the 1960's and 1970's. Open cut coal extraction and mining activities commenced at the Maxwell Infrastructure site in 1983 and ceased in October 2016.

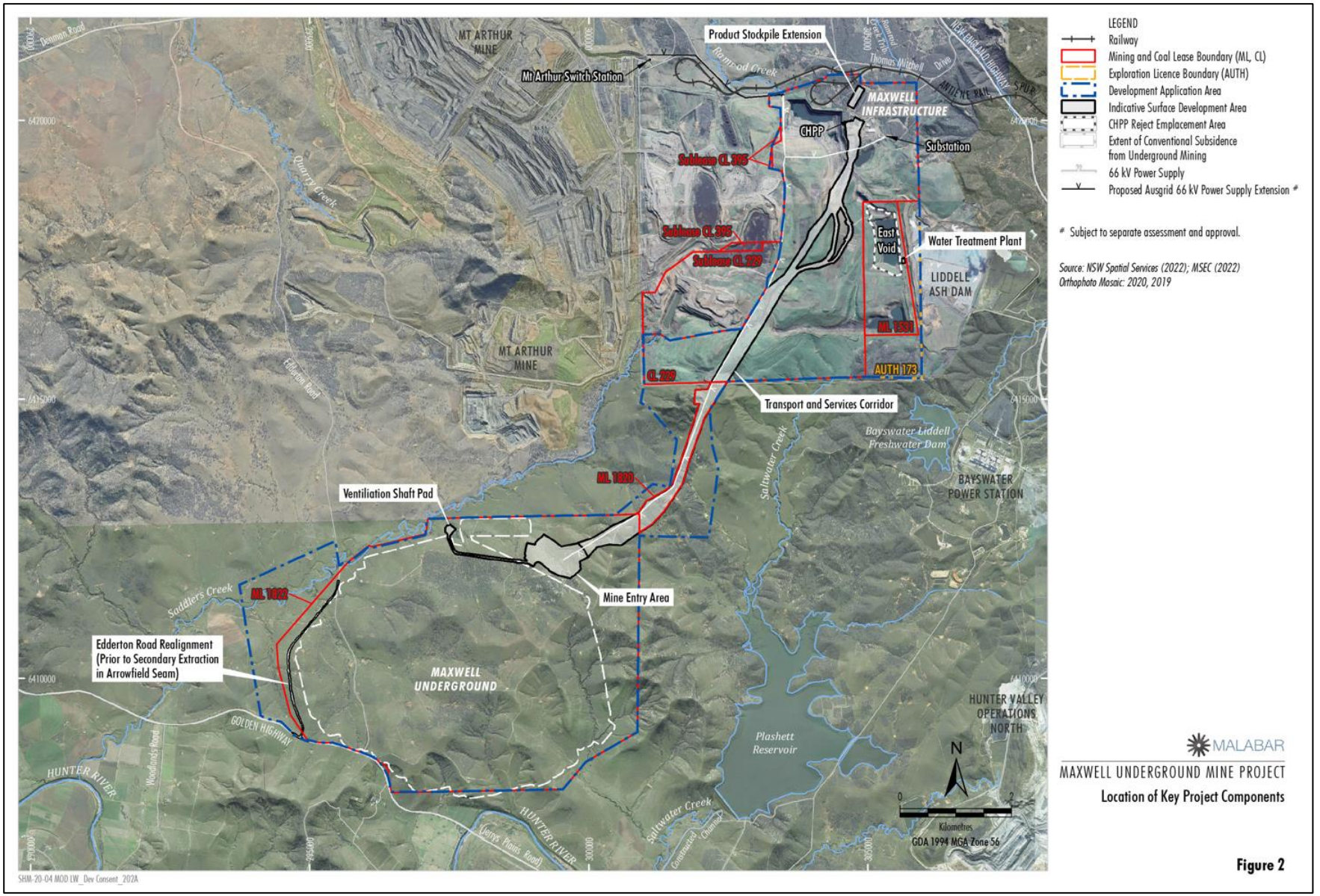
The post mining land use goal is to deliver a safe, stable, non-polluting and sustainable post-mining landform that is consistent with the surrounding natural topography. As an underground mine, the project would result in minimal changes to existing landforms. Approximately 850 hectares (ha) of previously open cut mined land associated with the Maxwell Infrastructure site has been rehabilitated.

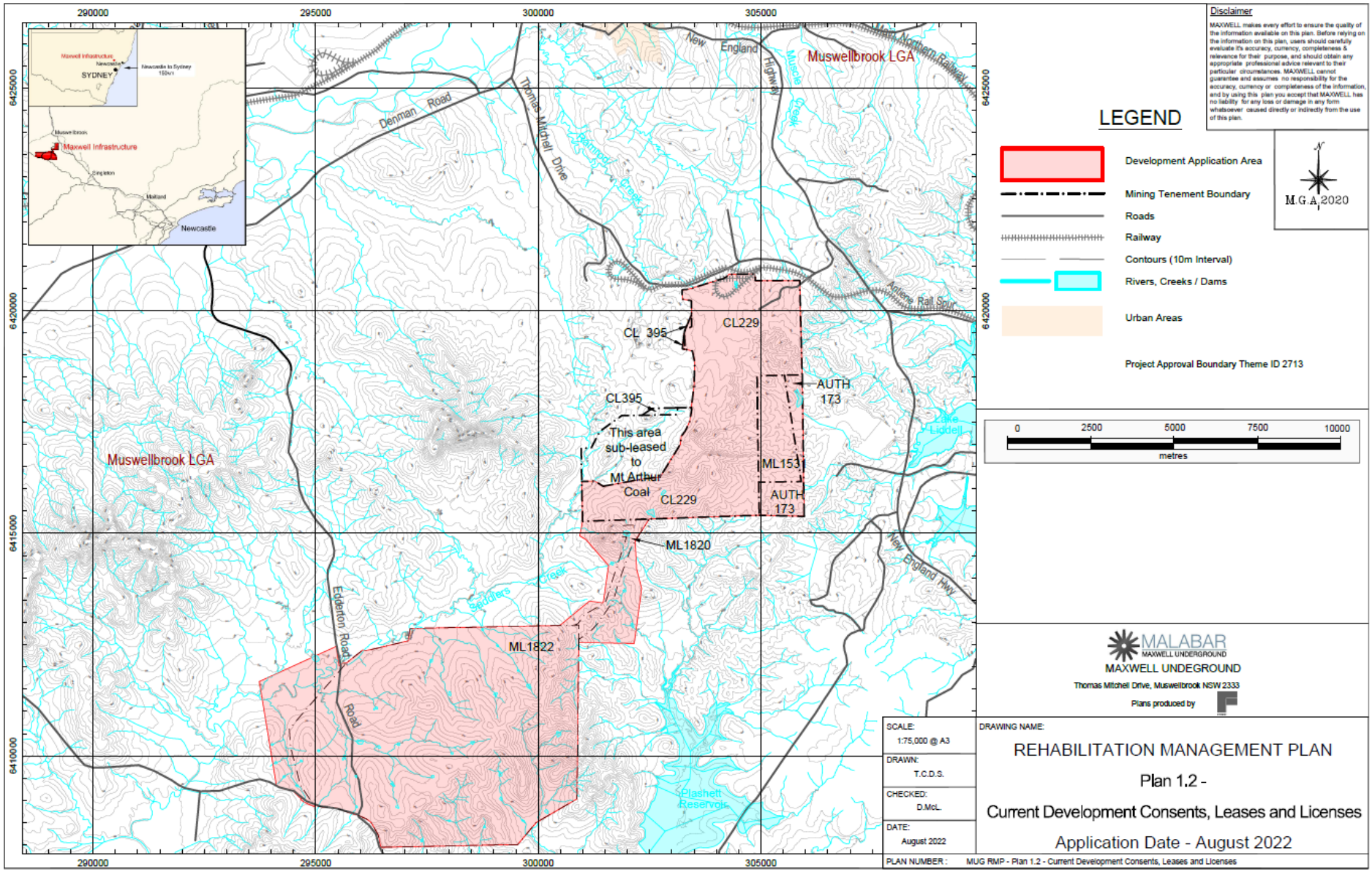
1.2 Current Consents, Authorisations and Licences

Operations at the Maxwell Infrastructure site commenced in 1983. A Development Consent granted by the Muswellbrook Shire Council in 2002 (DA 163/2002) allowed for the production of up to 5.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. The Antiene Rail Spur was utilised to transport export thermal coal to the Port of Newcastle via the Main Northern Railway.

On 1 February 2008, PA 06_0202 was granted for the extension of open cut mining operations with a maximum extraction rate of 8 Mtpa of ROM coal, and for the continued use and maintenance of surface infrastructure. A modification to PA 06_0202 was granted by the then Minister for Planning on 16 October 2009 to allow for an extension of the approved mining disturbance footprint and establishment of a new conservation area. A second modification to PA 06_0202 was granted by the then Minister for Planning and Infrastructure on 17 February 2012 to facilitate the development of an explosives storage facility and allow the disposal of tailings within the East Void.

Open cut mining at the Maxwell Infrastructure site ceased in October 2016 under the ownership of Anglo-American. Approval for coal extraction subsequently lapsed on 31 December 2017. On 26 February 2018, the ownership of the Maxwell Infrastructure site was formally transferred to Maxwell.


LEGEND
Railway
Mining and Coal Lease Boundary (ML, CL)
Exploration Licence Boundary (AUTH)
Development Application Area
Indicative Surface Development Area
CHPP Reject Emplacement Area
Extent of Conventional Subsidence from Underground Mining
66 kV Power Supply
Proposed Ausgrid 66 kV Power Supply Extension #
Subject to separate assessment and approval.
Source: NSW Spatial Services (2022); MSEC (2022)
Orthophoto Mosaic: 2020, 2019
Product Stockpile Extension
Mt Arthur Switch Station
MAXWELL INFRASTRUCTURE
CHPP
Substation
Sublease CL 395
Sublease CL 229
East Void
Water Treatment Plant
LIDDELL ASH DAM
ML 1501
AUTH 173
CL 229
Transport and Services Corridor
Bayswater Liddell Freshwater Dam
ML 1820
Ventiliation Shaft Pad
BAYSWATER POWER STATION
Mine Entry Area
ML 1822
Edderton Road Realignment (Prior to Secondary Extraction in Arrowfield Seam)
MAXWELL UNDERGROUND
HUNTER VALLEY OPERATIONS NORTH
Plashett Reservoir
MT ARTHUR MINE
Quarry Creek
Saddlers Creek
Saltwater Creek
HUNTER RIVER
GOLDEN HIGHWAY
Woodlands Road
Edderton Road
Denman Road
Ramrod Creek
Thomas Mitchell Drive
NEW ENGLAND HIGHWAY
MAIN NE RAIL
Jerrys Plains Road
Kilometres
GDA 1994 MGA Zone 56
MALABAR
MAXWELL UNDERGROUND MINE PROJECT
Location of Key Project Components
Figure 2
SHM-20-04 MOD LW_Dev Consent_202A


290000
295000
300000
305000
6425000
6420000
6415000
6410000
Maxwell Infrastructure
SYDNEY
Newcastle
Muswellbrook LGA
Denman Road
Thomas Mitchell Drive
New England Highway
Muscle Creek
Antiene Rail Spur
Northern Railway
CL 395
CL229
CL395
This area sub-leased to MLArthur Coal
AUTH 173
ML153
ML1820
ML1822
Lake Liddell
Sedgers Creek
Edderton Road
Plashett Reservoir
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LEGEND
Development Application Area
Mining Tenement Boundary
Roads
Railway
Contours (10m Interval)
Rivers, Creeks / Dams
Urban Areas
Project Approval Boundary Theme ID 2713
M.G.A.2020
0
2500
5000
7500
10000
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE:
1:75,000 @ A3
DRAWN:
T.C.D.S.
CHECKED:
D.McL.
DATE:
August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 1.2 -
Current Development Consents, Leases and Licenses
Application Date - August 2022
PLAN NUMBER :
MUG RMP - Plan 1.2 - Current Development Consents, Leases and Licenses

In August 2018, Maxwell submitted a request to the Department of Planning and Environment (DPE) for Secretary's Environmental Assessment Requirements for the Maxwell UG Project. Maxwell proposed to develop an underground coal mine and utilise substantial existing facilities at the Maxwell Infrastructure site. Development consent for the Maxwell UG Project ((State Significant Development 9526 (SSD 9526)) was granted on 22 December 2020 under clause 8A of the *State Environmental Planning Policy (State and Regional Development) 2011* and section 4.5(a) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The SSD 9526 was modified (Maxwell MOD1) on 19 November 2021 to allow for the following:

- Repositioning of the underground portal;
- Realignment of a small section of the proposed access road at the Maxwell Infrastructure site to utilise an existing haul road and minimise impacts to established mine rehabilitation;
- Repositioning of an approved clean water diversion for the MEA;
- Repositioning of the water treatment facility from the MEA to the Maxwell Infrastructure site; and
- Other minor works and ancillary infrastructure components within the existing approved surface development areas (e.g. works associated with the reconfiguration of the MEA, pumps/pipelines associated with the water treatment facility).

The SSD 9526 was further modified (Maxwell MOD2) on 19 October 2022 to allow for the following:

- Re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams resulting in a minor increase in the approved underground mining extent;
- Reduction in the width of some of the longwall panels in the Woodlands Hill Seam;
- Repositioning of the upcast ventilation shaft site and associated infrastructure; and
- Other minor works and ancillary infrastructure components (e.g. access road and ancillary water management infrastructure for the repositioned ventilation shaft site).

The development formerly authorised under the Maxwell Infrastructure Project Approval (PA) 06_0202 was surrendered in July 2022. Development Consent DA 106-04-00 for the existing rail loop and Antiene Rail Spur was granted on 2 November 2000 under Section 76(A)9 and 80 of the EP&A Act. DA 106-04-00 was modified on 18 September 2023 (Antiene MOD1) to align with the approved operating life of the Maxwell Underground Project (i.e. until 2047).

Open cut mining operations previously occurred within Mining Lease (ML) 1531, Coal Lease (CL) 229 and CL 395, targeting the Broughams, Grasstrees, Thiess, Puxtrees and Balmoral Seams within the Rowan Formation of the Greta Coal Measures. Mining consisted of a dragline, excavators and haul trucks to remove mining overburden and interburden. Loaders and or excavators were used for coal extraction supported by a fleet of haul trucks, which transported the ROM coal to the CHPP. Maxwell holds pre-existing leases CL 229, CL 395 and ML 1531. On 10 November 2021, Maxwell was granted ML 1820 for ancillary mining activities and ML 1822 was granted on 18 November 2021 for underground coal mining.

Hunter Valley Energy Coal Pty Ltd (HVEC) operates the Mt Arthur Coal mine. HVEC hold a sublease over a portion of CL 229. Any surface disturbance activities and rehabilitation for this area are addressed in the Mt Arthur Coal Forward Program and associated Rehabilitation Management Plan.

Current development consents, leases and licences relevant to the site are listed in **Table 1**.

Table 1. Current Development Consents, Leases and Licences

Reference	Description	Issue Date	Expiry Date
SSD 9526	Development Consent issued under Section 4.36 of the *Environmental Planning and Assessment Act 1979* for the Maxwell UG Project	22/12/2020	30/06/2047
DA 106-04-00	Development Consent issued under Section 76 (A), 9 and 80 of Part 4 of the *Environmental Planning and Assessment Act 1979* for use of the existing Drayton Rail Loop and Antiene Rail Spur.	02/11/2000	30/06/2047

Reference	Description	Issue Date	Expiry Date
ML 1531	Mining Lease issued under the *Mining Act 1992.*	26/02/2003	25/02/2045
CL 229	Coal Lease issued under the *Mining Act 1973.*	03/02/1982	02/02/2045
CL 395	Coal Lease issued under the *Mining Act 1973.*	23/06/1992	21/01/2029
A 173	Authorisation issued under the *Mining Act 1992.*	31/08/1979	31/08/2024
ML 1820	Mining Lease issued under the *Mining Act 1992* for ancillary mining activities.	10/11/2021	10/11/2042
ML 1822	Mining Lease issued under the *Mining Act 1992* for underground coal mining.	18/11/21	18/11/2042
EPL 1323	Environment Protection Licence (EPL) issued under Section 55 of the *Protection of the Environment Operations Act 1997* (POEO Act) for mining for coal and coal works.	19/05/2000	Ongoing
EPBC 2018/8287	Approval under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999*.	10/03/2021	30/06/2057
WAL 41559	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	23/02/2015	Perpetuity
WAL 41491 [1]	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	24/04/2020	Perpetuity
WAL 41234	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	01/09/2020	Perpetuity
WAL 43166	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	07/04/2020	Perpetuity
WAL 39739	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	12/05/2020	Perpetuity
WAL 43160	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	23/03/2020	Perpetuity
WAL 39791	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	25/02/2020	Leased for a period of five years
WAL 39792	Water Access Licence issued under the *Water Management Act 2000* for aquifer water extraction.	01/07/2020	Leased for a period of five years
20BL171953	Bore licence issued under the *Water Act 1912* for a test bore.	27/08/2008	Perpetuity
20BL171954	Bore licence issued under the *Water Act 1912* for a test bore.	27/08/2008	Perpetuity
20BL171955	Bore licence issued under the *Water Act 1912* for a test bore.	27/08/2008	Perpetuity
20BL171956	Bore licence issued under the *Water Act 1912* for a test bore.	27/08/2008	Perpetuity
20BL171957	Bore licence issued under the *Water Act 1912* for a test bore.	27/08/2008	Perpetuity
20BL174016	Bore licence issued under the *Water Act 1912* for a monitoring bore.	02/04/2019	01/04/2024

Reference	Description	Issue Date	Expiry Date
20BL174017	Bore licence issued under the *Water Act 1912* for a monitoring bore.	02/04/2019	01/04/2024
20BL174018	Bore licence issued under the *Water Act 1912* for a monitoring bore.	02/04/2019	01/04/2024

[1] WAL 41491 is held by AGL Macquarie Pty Ltd.

1.3 Land Ownership and Land Use

Land use within the site primarily consists of previous open cut mining areas and land used for cattle grazing. The site is bordered by Mt Arthur Coal to the west and AGL Macquarie's Bayswater and Liddell Power Stations to the east. The Antiene rural residential area exists to the north of the site with Coolmore Stud and Godolphin Woodlands Stud located to the south and south-west. The majority of the land within the site is primarily owned by Maxwell with the exception of Edderton Road, ML 1531, A 173 and a small parcel of land within the transport and services corridor which is owned by AGL Macquarie. A schedule of land ownership is provided in **Table 2** and shown on **Plan 1.3A**.

The Maxwell Infrastructure Biodiversity Offsets Areas comprise the Drayton Wildlife Refuge, Northern Offset Area and Southern Offset Area. The Northern Offset Area and Southern Offset Area were established as offsets for the former Drayton Mine. The Northern Offset Area was established in 2009 following approval of Modification 1 of PA 06_0202. The Northern Offset was located in the "Natural Area" of the 1987 Drayton Wildlife Refuge. The Northern Offset Area is located south-east of the Drayton Wildlife Refuge in the north-eastern corner of CL 229, with part of the area outside CL 229. This offset is on land owned by Maxwell and is approximately 12 ha in area. The Northern Offset Area includes approximately 6.3 ha of Hunter Lowland Redgum Forest.

The Southern Offset Area was established following approval of Modification 1 of PA 06_0202 in 2009. The Southern Offset Area is located in the Saddlers Creek catchment, south-west of the former Drayton mining areas, within CL 229 and on land owned by Malabar. The Southern Offset Area is an 88 ha parcel of land that has been mined and revegetated to contain approximately 84 ha of native forest/woodland and 4 ha of rehabilitated woodland/pasture. The landform comprises north and south facing hillsides and a gully that drains towards part of the upper reaches of Saddlers Creek. The value of this land as an offset area can be attributed to the inclusion of the upper reaches of Saddlers Creek and its proximity to the dedicated Mt Arthur Coal conservation area along Saddlers Creek.

Table 2. Schedule of Land Ownership

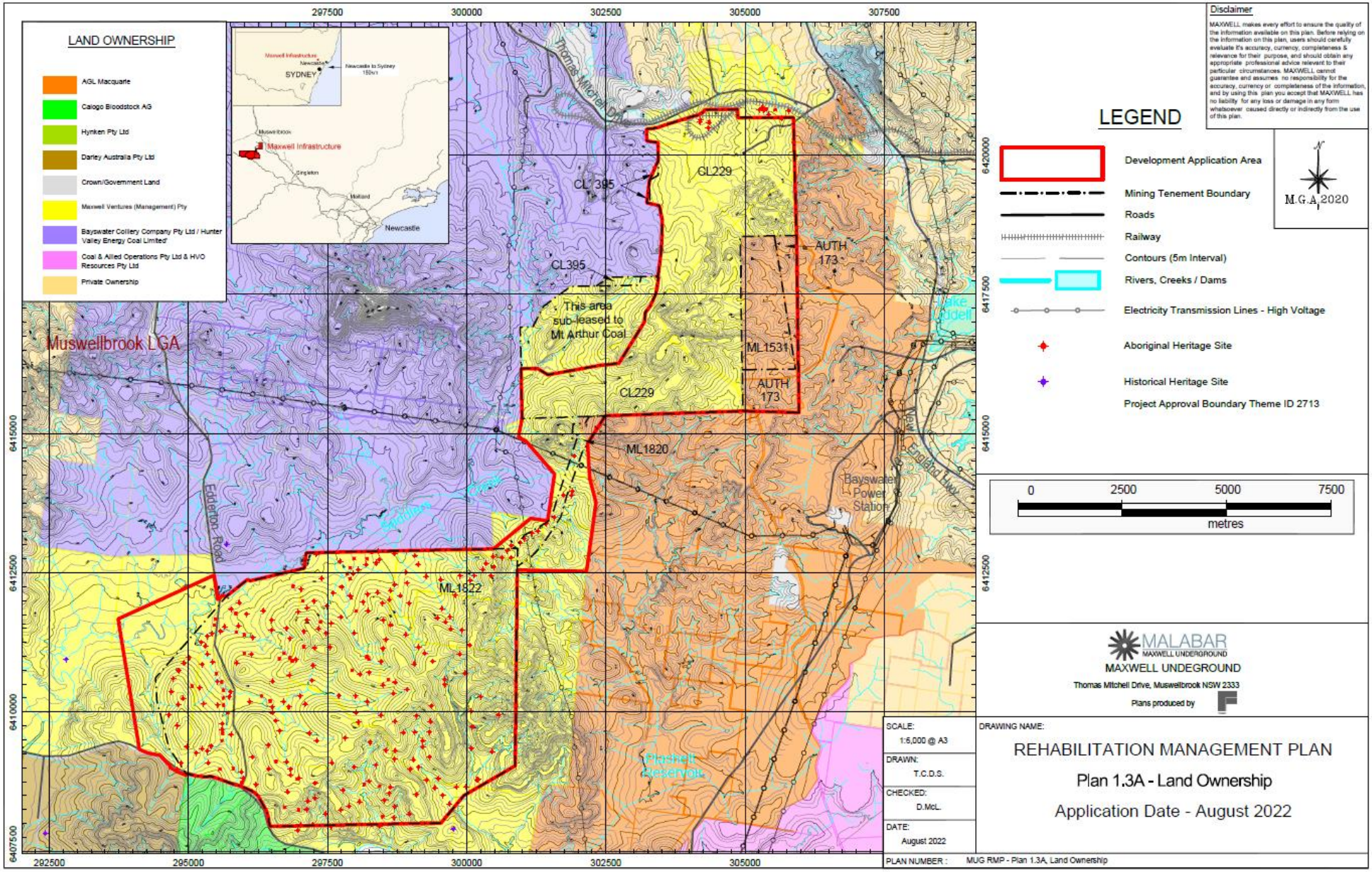
Lot//DP	Part or Whole	Mining Title	Tenure	Ownership	Use
1//247510	Whole	CL 229	Crown	The State of New South Wales	Maxwell Infrastructure
1//790994	Part	CL 229	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
10//701496	Part	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
12//701496	Whole	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
13//701496	Whole	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure

Lot//DP	Part or Whole	Mining Title	Tenure	Ownership	Use
14//701496	Whole	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
2//1095515	Part	CL 229	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
21//545087	Whole	CL 229 and ML 1531	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
4//701496	Part	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
6//701496	Part	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
64//850818	Whole	CL 229, CL 395 & SUBLEASE	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
65//850818	Whole	CL 229 & SUBLEASE	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
9//701496	Whole	CL 229	Freehold	Maxwell Ventures (Management) Pty Ltd	Maxwell Infrastructure
1//1095515	Part	ML 1531 & A 173	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
2//774681	Part	A 173	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
2//1095515	Part	A 173	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
2//1193252	Part	A 173	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
3//1193253	Part	A 173	Freehold	AGL Macquarie Pty Ltd	Maxwell Infrastructure
1//1159371	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
1/1179733	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
1//1211789	Whole	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
2//616024	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
2//1159371	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area

Lot//DP	Part or Whole	Mining Title	Tenure	Ownership	Use
5//843635	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
8//843635	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
20//1245080	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
22//1018587	Part	ML 1822	Freehold	Maxwell Ventures (Management) Pty Ltd	Underground area
2//1095515	Part	ML 1820	Freehold	AGL Macquarie Pty Ltd	Transport and services corridor
2//1159371	Part	ML 1820	Freehold	Maxwell Ventures (Management) Pty Ltd	Transport and services corridor
3//843635	Part	ML 1820	Freehold	Maxwell Ventures (Management) Pty Ltd	Transport and services corridor
321//625513	Part	ML 1820	Freehold	Maxwell Ventures (Management) Pty Ltd	Transport and services corridor

1.3.1 Land Ownership and Land Use Figures

Land ownership and land use are shown on **Plans 1.3A** and **1.3B**.


LAND OWNERSHIP
AGL Macquarie
Calogo Bloodstock AG
Hynken Pty Ltd
Darley Australia Pty Ltd
Crown/Government Land
Maxwell Ventures (Management) Pty
Bayswater Colliery Company Pty Ltd / Hunter Valley Energy Coal Limited
Coal & Allied Operations Pty Ltd & HVO Resources Pty Ltd
Private Ownership
Maxwell Infrastructure
Newcastle to Sydney 150km
SYDNEY
Newcastle
Muswellbrook
Singleton
Maitland
297500
300000
302500
305000
307500
6420000
6417500
6415000
6412500
6410000
6407500
292500
295000
Thomas Mitchell Drive
CL395
CL229
AUTH 173
This area sub-leased to Mt Arthur Coal
ML1531
ML1820
ML1822
Muswellbrook LGA
Edderton Road
New England Hwy
Bayswater Power Station
Flashett Reservoir
Lake Liddell
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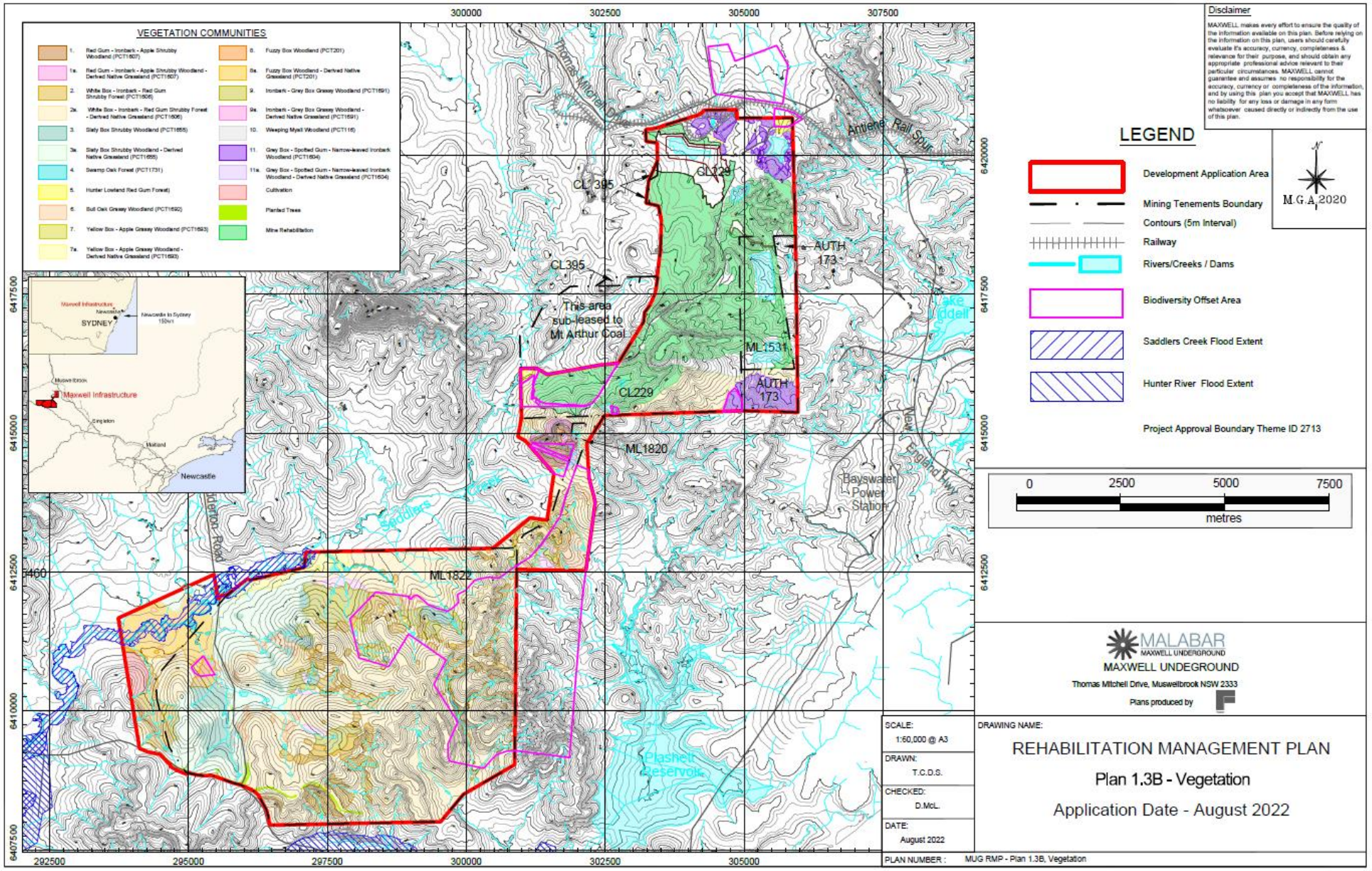
LEGEND
Development Application Area
Mining Tenement Boundary
Roads
Railway
Contours (5m Interval)
Rivers, Creeks / Dams
Electricity Transmission Lines - High Voltage
Aboriginal Heritage Site
Historical Heritage Site
Project Approval Boundary Theme ID 2713
M.G.A. 2020
0
2500
5000
7500
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE: 1:5,000 @ A3
DRAWN: T.C.D.S.
CHECKED: D.McL.
DATE: August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 1.3A - Land Ownership
Application Date - August 2022
PLAN NUMBER : MUG RMP - Plan 1.3A, Land Ownership


VEGETATION COMMUNITIES
1. Red Gum - Ironbark - Apple Shrubby Woodland (PCT1607)
1a. Red Gum - Ironbark - Apple Shrubby Woodland - Derived Native Grassland (PCT1607)
2. White Box - Ironbark - Red Gum Shrubby Forest (PCT1606)
2a. White Box - Ironbark - Red Gum Shrubby Forest - Derived Native Grassland (PCT1606)
3. Slaty Box Shrubby Woodland (PCT1655)
3a. Slaty Box Shrubby Woodland - Derived Native Grassland (PCT1655)
4. Swamp Oak Forest (PCT1731)
5. Hunter Lowland Red Gum Forest)
6. Bull Oak Grassy Woodland (PCT1592)
7. Yellow Box - Apple Grassy Woodland (PCT1593)
7a. Yellow Box - Apple Grassy Woodland - Derived Native Grassland (PCT1593)
8. Fuzzy Box Woodland (PCT201)
8a. Fuzzy Box Woodland - Derived Native Grassland (PCT201)
9. Ironbark - Grey Box Grassy Woodland (PCT1591)
9a. Ironbark - Grey Box Grassy Woodland - Derived Native Grassland (PCT1591)
10. Weeping Myall Woodland (PCT116)
11. Grey Box - Spotted Gum - Narrow-leaved Ironbark Woodland (PCT1604)
11a. Grey Box - Spotted Gum - Narrow-leaved Ironbark Woodland - Derived Native Grassland (PCT1604)
Cultivation
Planted Trees
Mine Rehabilitation
SYDNEY
Newcastle to Sydney 150km
Maxwell Infrastructure
Singleton
Muswellbrook
Maitland
Newcastle
300000
302500
305000
307500
292500
295000
297500
6420000
6417500
6415000
6412500
6410000
6407500
Thomas Mitchell Drive
Antiene Rail Spur
CL395
CL229
AUTH 173
This area sub-leased to Mt Arthur Coal
ML1531
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LEGEND
Development Application Area
Mining Tenements Boundary
Contours (5m Interval)
Railway
Rivers/Creeks / Dams
Biodiversity Offset Area
Saddlers Creek Flood Extent
Hunter River Flood Extent
Project Approval Boundary Theme ID 2713
M.G.A. 2020
0
2500
5000
7500
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE:
1:60,000 @ A3
DRAWN:
T.C.D.S.
CHECKED:
D.McL.
DATE:
August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 1.3B - Vegetation
Application Date - August 2022
PLAN NUMBER :
MUG RMP - Plan 1.3B, Vegetation

2 PART 2 – FINAL LAND USE

2.1 Regulatory Requirements for Rehabilitation

Regulatory requirements for rehabilitation are detailed in **Table 3**.

Table 3. Regulatory Requirements for Rehabilitation

<table>
<tr><th>Condition</th><th>Requirement</th><th>Area Applicable</th></tr>
<tr><td colspan="3">SSD 9526</td></tr>
<tr><td>Schedule B, Condition B76</td><td>The Applicant must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the document/s listed in condition A2I (and shown conceptually in the Rehabilitation Plans in Appendix 5), and must comply with the objectives in Table 8.

Table 8: Rehabilitation objectives
<table><tr><th>Feature</th><th>Objective[a]</th></tr><tr><td>All areas of the site affected by the development</td><td>• Safe, stable and non-polluting
• Fit for the intended post-mining land use/s
• Achieve the final landform and post-mining land use/s</td></tr><tr><td>Woodland Biodiversity Corridors, including the Southern Offset Area</td><td>• Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5[b]
• Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule
• Establish habitat, feed and foraging resources for threatened fauna species
• Facilitate local vegetation connectivity and wildlife corridors, particularly with respect to the adjacent Mt Arthur Coal Complex</td></tr><tr><td>Areas proposed for agricultural or pastoral use</td><td>• Establish/restore grassland areas to support sustainable agricultural activities
• Use species found in the local area that are suitable for pasture production
• Achieve land and soil capabilities that are suitable for the intended final land use
• Located adjacent to surrounding agricultural land, where practicable</td></tr><tr><td>Final Landform</td><td>• Stable and sustainable for the intended post-mining land use/s
• Compatible with surrounding topography to minimise visual impacts
• Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion</td></tr><tr><td>Final voids</td><td>• Reject emplacements are suitably capped and rehabilitated
• Designed as long term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final voids (see condition B79)
• Minimise to the greatest extent practicable:
– the size and depth;
– surface evaporation in void lakes;
– the drainage catchment;</td></tr></table></td><td>All areas of the site affected by the development</td></tr>
</table>

<table>
<tr><th>Condition</th><th>Requirement</th><th>Area Applicable</th></tr>
<tr><td></td><td>
<table>
<tr><th>Feature</th><th>Objective[a]</th></tr>
<tr><td></td><td>– any high wall instability risk; and
– the risk of spillover into the downstream environment;
– the risk of flood interaction;
• Maximise potential for beneficial reuse, where practicable</td></tr>
<tr><td>Surface infrastructure of the development</td><td>• To be decommissioned and removed, unless the Resource Regulator agrees otherwise
• All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment</td></tr>
<tr><td>Portals and vent shafts of the development</td><td>• To be decommissioned and made safe and stable</td></tr>
<tr><td>Underground mining area[c]</td><td>• No decline in land and soil capability</td></tr>
<tr><td>Watercourses subject to mine water discharges and/or subsidence impacts or environmental consequences that are greater than negligible[d]</td><td>• Hydraulically and geomorphologically stable
• Aquatic ecology and riparian vegetation that is the same or better than prior to grant of this consent</td></tr>
<tr><td>Water quality</td><td>• Water retained on the site is fit for the intended post-mining land use/s
• Water management is consistent with the regional catchment management strategy</td></tr>
<tr><td>Built features damaged by mining operations</td><td>• Repair to pre-mining condition or equivalent unless the:
– owner agrees otherwise; or
– damage is fully restored, repaired or compensated for under the Coal Mine Subsidence Compensation Act 2017</td></tr>
<tr><td>Steep slopes</td><td>• No additional risk to public safety compared to prior to mining</td></tr>
<tr><td>Existing Edderton Road alignment</td><td>• All road and associated infrastructure to be removed unless otherwise agreed with Council
• Alignment to be rehabilitated to a standard compatible with the adjacent land use(s)</td></tr>
<tr><td>Community</td><td>• Ensure public safety
• Minimise adverse socio-economic effects associated with mine closure</td></tr>
</table>
[a] These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by all underground mining of the development and to all surface infrastructure components of the development.
[b] The requirements in Table 5 apply to the Southern Offset Area only
[c] In Table 8, the 'underground mining area' means the subsidence area
[d] Where remediation of watercourses is likely to cause subsidence impacts or environmental consequences greater than those that require rehabilitation, alternative equivalent works may be undertaken within the affected watercourse
</td><td></td></tr>
<tr><td>Schedule B, Condition B77</td><td>The rehabilitation objectives in Table 8 apply to the entire site, including all disturbance under either this consent or previous consents. However, the Applicant is not required to undertake any additional earthmoving works on landforms that have been approved and constructed consistent with previous consents, except where those earthworks are required for the establishment of a stable, non-polluting and free-draining landform.</td><td>All areas of the site affected by the development</td></tr>
<tr><td>Schedule B, Condition B78</td><td>The Applicant must rehabilitate[a] the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.

[a] Nothing in this condition prevents further disturbance at some later stage of the development of areas that have been rehabilitated.</td><td>All areas of the site affected by the development</td></tr>
<tr><td>Schedule B, Condition B82</td><td>The Applicant must prepare a Rehabilitation Management Plan for the development, in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This plan must:

a) include a life of mine rehabilitation and mining schedule which outlines the key progressive rehabilitation milestones from the commencement of operations through to decommissioning and mine closure;</td><td>All areas of the site affected by the development</td></tr>
</table>

<table>
<tr><th>Condition</th><th>Requirement</th><th>Area Applicable</th></tr>
<tr><td></td><td>b) include Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan;
c) include detailed performance indicators and completion criteria for each rehabilitation domain, and triggers for remedial actions, including actions to be undertaken in the event that vegetation establishment is impacted by spontaneous combustion;
d) include an overview of the identified risks to achieving successful rehabilitation;
e) describe the measures to be implemented on the site to achieve the Rehabilitation Objectives in Table 8 and to address the identified risks;
f) include a program to monitor, independently audit and report on progress against the criteria in paragraph (a) and the effectiveness of the measures in paragraph I;
g) describe any further studies, work, research or consultation that will be undertaken to expand the site-specific rehabilitation knowledge base, reduce uncertainty and improve rehabilitation outcomes; and

outline intervention and adaptive management techniques to ensure rehabilitation remains on a trajectory of achieving the Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan as soon as reasonably practical.</td><td></td></tr>
<tr><td colspan="3">DA 106-04-00</td></tr>
<tr><td>Schedule B, Condition B10</td><td>Following cessation of rail movements under this consent, the Applicant must rehabilitate the site to comply with the objectives in Table 2.

Table 2: Rehabilitation objectives
<table><tr><th>Feature</th><th>Objective</th></tr><tr><td>Site</td><td>• Safe, stable and non-polluting
• Fit for the intended post-mining land use/s</td></tr><tr><td>Surface infrastructure</td><td>• To be decommissioned and removed within 5 years of cessation of rail movements, unless the Planning Secretary agrees otherwise</td></tr><tr><td>Community</td><td>• Ensure public safety at all times</td></tr></table></td><td>All areas of the Maxwell Rail Loop and Antiene Rail Spur</td></tr>
<tr><td colspan="3">CL 229, CL 395 ML 1531, ML 1820 and ML 1822</td></tr>
<tr><td>Standard Conditions</td><td>The prescribed standard conditions in the Mining Regulation 2016, Schedule 8A, Part 2 apply in addition to the conditions in this Schedule 2 (but have not been replicated in this Lease). The conditions imposed by the Mining Regulation 2016 prevail to the extent of any inconsistency with the conditions in this Schedule 2.</td><td>All areas of the site affected by the development</td></tr>
</table>

Note: [ ] indicates where there has been a name change to an entity.

2.2 Final Land Use Options Assessment

This section is not applicable because the final land use is defined in SSD 9526.

2.3 Final Land Use Statement

Maxwell UG Project EIS describes a post-mining land use as a combination of agriculture and nature conservation. The rehabilitation objectives in Condition B76 of SSD 9526 describes the final land use features as woodland biodiversity corridors and areas proposed for agricultural or pastoral use.

2.4 Final Land Use and Mining Domains

2.4.1 Final Land Use Domains

Final land use domains are defined on the basis of land management units characterised by a similar post-mining land use objective. The final land use domains for all areas within the leases are shown on **Plan 5.1** and listed and defined in **Table 4.**

Table 4. Final Land Use Domains

Spatial Reference	Final land Use Domain	Definition
A	Native ecosystem	Rehabilitation areas re-established with a native vegetation community suited for faunal habitat / movement and general ecological enhancement.
B	Agricultural – grazing	Rehabilitation areas re-established with an exotic pasture vegetation cover suited for livestock grazing land use.
D	Rehabilitation biodiversity offset area	Areas in the post-mining landscape designed and managed as Biodiversity Offsets, including the Southern Offset Area, Northern Offset Area, Wildlife Refuge and any biodiversity offset areas required for the Project.
F	Water management areas	Water storages and watercourses remaining in the final landscape, including dams and voids.

2.4.2 Mining Domains

Mining domains are defined on the basis of land management units within the site with unique operational and functional purpose and similar geophysical characteristics. The mining domains for all areas within the leases are listed and defined in **Table 5**.

Table 5. Mining Domains

Spatial Reference	Primary Domain	Definition
1	Infrastructure areas	Disturbed land modified by civil works and or the construction of operational structures, such as internal roads, laydown areas, hardstands and carparks, coal stockpile pads, fixed buildings, coal processing facilities, conveyors and gantries, rail loop, train load-out facilities
2	Tailings storage facility	Areas utilised for operational tailings management and emplacement.
3	Water management areas	All major water management dams and other structures. Water management structures and features used for the operational storage and conveyance of raw water, mine water and mine-affected water storage.
4	Overburden emplacement areas	Residual open cut pits previously used for operational purposes including highwalls, benches, pit floor, end walls and low walls. Areas currently and previously utilised for the emplacement of overburden and interburden material.

Spatial Reference	Primary Domain	Definition
6	Underground mining area	Areas that would be actively managed for potential subsidence from the Maxwell Project underground mining activities (i.e. those areas within the subsidence angle of draw).

3 PART 3 – REHABILITATION RISK ASSESSMENT

Environmental issues associated with activities at the Maxwell UG Project have been assessed as part of the EIS. Further to this, a rehabilitation risk assessment has been prepared. The purpose of the risk assessment was to identify and evaluate all potential threats to achieving the final land use and the specific measures to be implemented to mitigate the risks. The risk assessment was prepared in accordance with *AS NZS ISO 31000:2009 Risk Management – Principles and Guidelines*. A rehabilitation risk assessment is maintained on site and is available as a record. This risk assessment may be updated from time to time.

A summary of the potential threats identified in the most recent rehabilitation risk assessment are presented in **Table 6**.

Maxwell has developed environmental management strategies and plans to assist in identifying potential environmental impacts and appropriate mitigation measures. These documents form the Environmental Management System for the site and are available on the Maxwell website at https://malabarresources.com.au/corporate-governance/.

Table 6. Potential Threats to Rehabilitation

Potential Threat	Caused By	Where addresses in this RMP
Rehabilitation does not meet closure objectives	Inadequate resources for rehabilitation Insufficient skills and experience of rehabilitation personnel Lack of clearly defined responsibilities	Section 7 Rehabilitation Quality Assurance Process
Pit water quality level is not consistent with predictions	Inadequate surface contouring and bunding to minimise surface inflow to the void Final void quality and level predictions are inaccurate due to lack of calibration with monitoring data	Section 6.2.3.1 Water management Infrastructure
Heritage sites negatively impacted	Heritage site database not maintained GDP process not followed Heritage items not protected by a physical barrier	Section 6.2.1.13 Management of Potential Cultural and Heritage Issues
Contaminated land	Spills and leaks Poorly maintained plant and equipment Inadequate storage of hydrocarbons and chemicals Incorrect disposal of waste material Contaminated land register not maintained Remediation works not undertaken Inappropriate disposal of waste generated during demolition	Section 6.2.2.4 Management of Carbonaceous/Contaminated Material
Poor topsoil quality	Topsoil contamination with subsoil during stripping operations Poor stockpile management decreasing nutrient value No testing of topsoil quality Stockpiles not seeded with appropriate seed mix	Section 6.2.1.1 Soils and Materials
Insufficient topsoil	Poor stripping practices Insufficient topsoil stockpiled	Section 6.2.1.1 Soils and Materials

Potential Threat	Caused By	Where addresses in this RMP
Spontaneous combustion	Outbreaks Poor management of carbonaceous material Inadequate capping Insufficient quantities of materials suitable for capping Disturbance to existing capping Inadequate early identification of outbreaks	Section 6.2.1.7 Material Prone to Spontaneous Combustion
Short to medium term landform instability	Poor ground cover (due to poor vegetation establishment or weather impacts) Extreme rainfall events Inadequate water management structures (design and construction) Lack of maintenance of erosion and sediment control structures Increased slope gradient	Section 6.2.1.10 Erosion and Sediment Control Section 8.2 Rehabilitation Establishment Monitoring
Long-term landform instability	Lack of monitoring (i.e. walkover inspections, landform stability monitoring and post rainfall inspections) Lack of long-term modelling to identify areas of concern Inadequate water management structures (design and construction) Lack of maintenance of erosion and sediment control structures resulting in significant erosion	Section 6.2.6.1 Long Term Land Stability
Lack of species diversity	Inappropriate seed mix Seeding at less-than-optimal times Drought conditions Poor quality growth medium Weeds present	Section 6.2.1.2 Flora Section 6.2.4 Growth Medium Development Section 6.2.5 Ecosystem and Land Use Establishment
Limited vegetation structural development and habitat for targeted fauna species	Inappropriate seed mix Seeding at less-than-optimal times Drought conditions Introduced grass species dominate groundcover Hollows not recovered during vegetation clearing	Section 6.2.1.2 Flora Section 6.2.5 Ecosystem and Land Use Establishment
Weeds	Poor vegetation cover due to: • Failed rehabilitation • Incorrect seed mix • Drought conditions • Poor quality growth medium Lack of weed monitoring and control on rehabilitation Lack of weed management on topsoil stockpiles	Section 6.2.5 Ecosystem and Land Use Establishment

Potential Threat	Caused By	Where addresses in this RMP
Pest animals	Lack of pest animal monitoring and management	Section 8.2.1 Pest Animal Monitoring
Overgrazing	Increase in local kangaroo population Inadvertent access by stock Stocking rates greater than the carrying capacity	Section 8.2.1 Pest Animal Monitoring
Weather	Drought Bushfires Intense rainfall events	Section 8.2 Rehabilitation Establishment Monitoring
Failure of surface water management structures due to inadequate design or construction	Lack of or poor design criteria at construction Poor construction of surface water management structures Overtopping during extreme events	Section 6.2.6.1 Long Term Land Stability
Failure of surface water management structures due to inadequate rock material	Lack of testing of rock material prior to use Weathering of rock material Inadequate sizing of rock material	Section 6.2.6.1 Long Term Land Stability
Impacts to off-site water quality	Spills and leaks from hydrocarbons and chemicals Lack of separation of clean and mine affected water Saline water not contained Water with a high sediment load not contained Groundwater seepage resulting in localised impacts No clean water diversion in place	Section 6.2.2.5 Hazardous Materials Management Section 6.2.1.10 Erosion and Sediment Control Section 6.2.3.1 Water Management Infrastructure
Tailings emplacement not remediated to be safe, stable and non-polluting	Tailings emplacement not constructed or executed to design Tailings emplacement not regularly inspected Tailings remediation not informed by geochemical characterisation of tailings Tailings not capped with inert material	Section 6.2.1.8 Material prone to Acid Mine Drainage Section 6.2.1.9 Ore Beneficiation Waste Management (reject and Tailings Disposal)
No safe access to mining areas for rehabilitation	Geotechnical failure of high wall, low walls or ramps.	Section 6.2.3.4 Final Landform Construction: Final Void, Highwalls and Low Walls

4 PART 4 – REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1 Rehabilitation Objectives and Rehabilitation Completion Criteria

Rehabilitation objectives for the site describe the outcomes required to achieve the post-mining land use. **Table 7** provides the rehabilitation objectives in accordance with Schedule 2, Part B, Condition B76 of SSD 9526. The rehabilitation objectives as submitted to the Resources Regulator are provided in **Appendix 1**. These include the final land use domain, mining domain and spatial reference.

The completion criteria are objective target levels or values assigned to a variety of indicators which can be measured to demonstrate progress and ultimate success of rehabilitation. They provide a defined end point, at which point in time rehabilitation can be deemed successful and the lease relinquishment process can proceed. These indicators and criteria will be refined over time as more information is obtained from monitoring programs or knowledge gained from industry and operational experience.

Rehabilitation completion criteria will be submitted to the NSW Resources Regulator and be consistent with the proposed final land use for the site no later than three years before rehabilitation of the whole (or identified part) of the mining area is proposed to be completed.

Table 7. Rehabilitation Objectives in SSD 9526

Feature	Objective [a]
All areas of the site affected by the development	• Safe, stable and non-polluting. • Fit for the intended post-mining land use/s. • Achieve the final landform and post-mining land use/s.
Woodland Biodiversity Corridors, including the Southern Offset Area	• Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2I and in Table 5b. • Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. • Establish habitat, feed and foraging resources for threatened fauna species. • Facilitate local vegetation connectivity and wildlife corridors, particularly with respect to the adjacent Mt Arthur Coal Complex.
Areas proposed for agricultural or pastoral use	• Establish/restore grassland areas to support sustainable agricultural activities. • Use species found in the local area that are suitable for pasture production. • Achieve land and soil capabilities that are suitable for the intended final land use. • Located adjacent to surrounding agricultural land, where practicable.
Final landform	• Stable and sustainable for the intended post-mining land use/s. • Compatible with surrounding topography to minimise visual impacts. • Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.
Final voids	• Reject emplacements are suitably capped and rehabilitated. • Designed as long term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final voids (see condition B79). • Minimise to the greatest extent practicable: ○ the size and depth;

Feature	Objective [a]
	○ surface evaporation in void lakes; ○ the drainage catchment; ○ any high wall instability risk; ○ the risk of spillover into the downstream environment; and the risk of flood interaction; • Maximise potential for beneficial reuse, where practicable.
Surface infrastructure of the development	• To be decommissioned and removed, unless the Resource Regulator agrees otherwise. • All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment.
Portals and vent shafts of the development	• To be decommissioned and made safe and stable.
Underground mining area[c]	• No decline in land and soil capability.
Watercourses subject to mine water discharges and/or subsidence impacts or environmental consequences that are greater than negligible[d]	• Hydraulically and geomorphologically stable. • Aquatic ecology and riparian vegetation that is the same or better than prior to grant of this consent.
Water Quality	• Water retained on the site is fit for the intended post-mining land use/s. • Water management is consistent with the regional catchment management strategy.
Built features damaged by mining operations	• Repair to pre-mining condition or equivalent unless the: ○ owner agrees otherwise; or ○ damage is fully restored, repaired or compensated for under the Coal Mine Subsidence *Compensation Act 2017*
Steep slopes	• No additional risk to public safety compared to prior to mining.
Existing Edderton Road alignment	• All road and associated infrastructure to be removed unless otherwise agreed with Council. • Alignment to be rehabilitated to a standard compatible with the adjacent land use(s).
Community	• Ensure public safety. • Minimise adverse socio-economic effects associated with mine closure.

[a] These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by all underground mining of the development and to all surface infrastructure components of the development.

[b] The requirements in Table 5 apply to the Southern Offset Area only.

[c] In Appendix 1, the 'underground mining area' means the subsidence area.

4.2 Rehabilitation Objectives and Completion Criteria – Stakeholder Consultation

Stakeholder identification and consultation are integral in mine closure planning. Consultation has been undertaken during preparation of the previous Mining Operation Plans as well as Project-specific consultation undertaken for the Maxwell Project EIS.

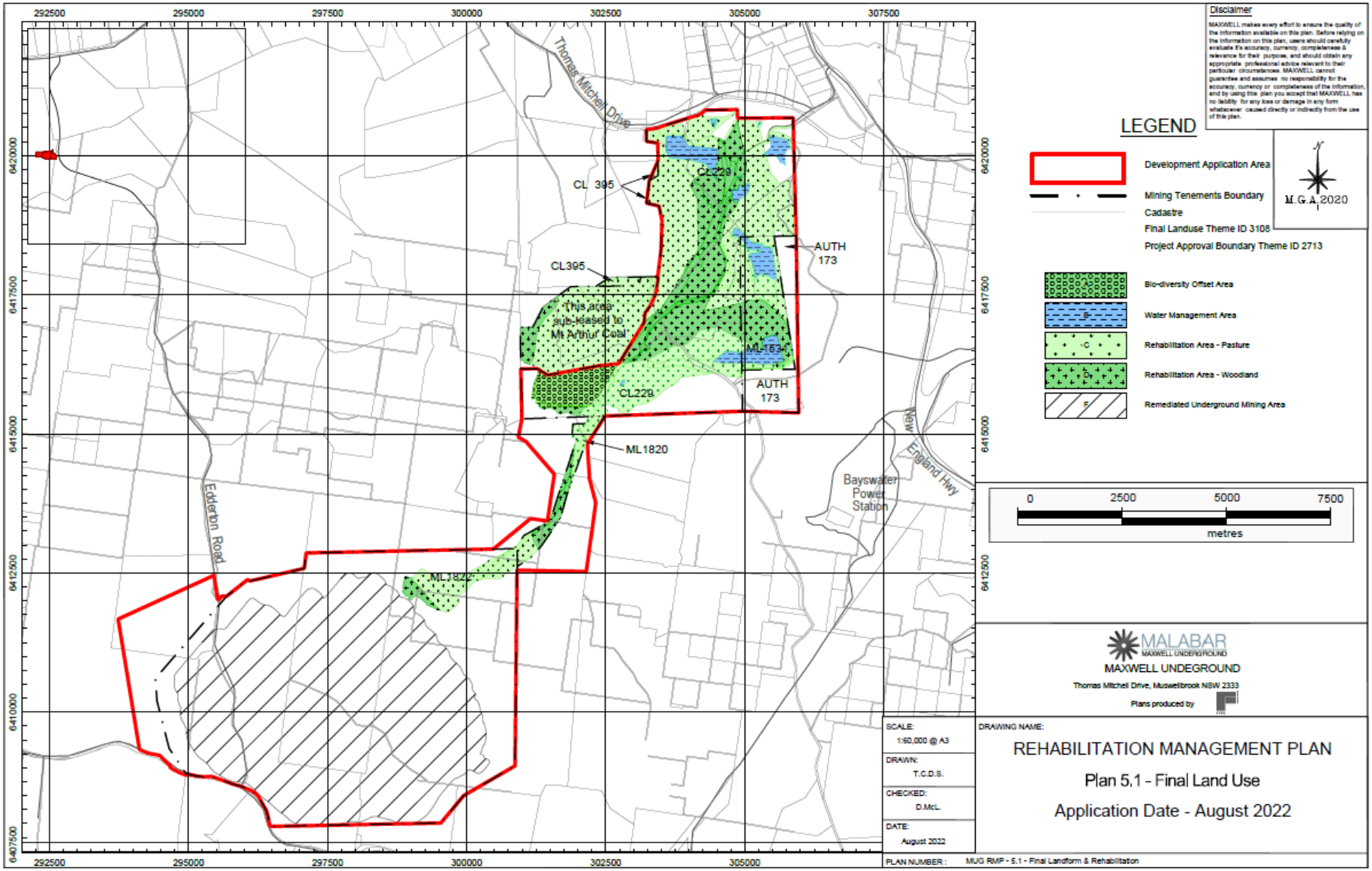
Community Consultative Committee (CCC) meetings have been undertaken since the early 1990s an continue on a quarterly basis. The CCC membership consists of community members representing the broader community, key stakeholders and the local council. Regulators and industry representatives are also invited to attend from time to time, as required. Meetings focus on ongoing environmental performance, mine rehabilitation, mine development issues and new developments.

Conditions B79 of SSD 9526 states that Rehabilitation Strategy must be prepared in consultation with the Resources Regulator, DPE Water, BCD and Muswellbrook Shire Council. This section will be updated following consultation with the appropriate regulatory authorities and outcomes of consultation will be included in this document.

5 PART 5 – FINAL LANDFORM AND REHABILITATION PLAN

5.1 Final Landform and Rehabilitation Plan – Electronic Copy

The final landform and rehabilitation plan spatially defines the proposed final land use and final landform at the completion of rehabilitation. These plans are consistent with SSD 9526 and have been prepared using theme data submitted to the mine rehabilitation portal. The final land use plan is provided in **Plan 5.1**. The final landform plan is provided in **Plan 5.2**.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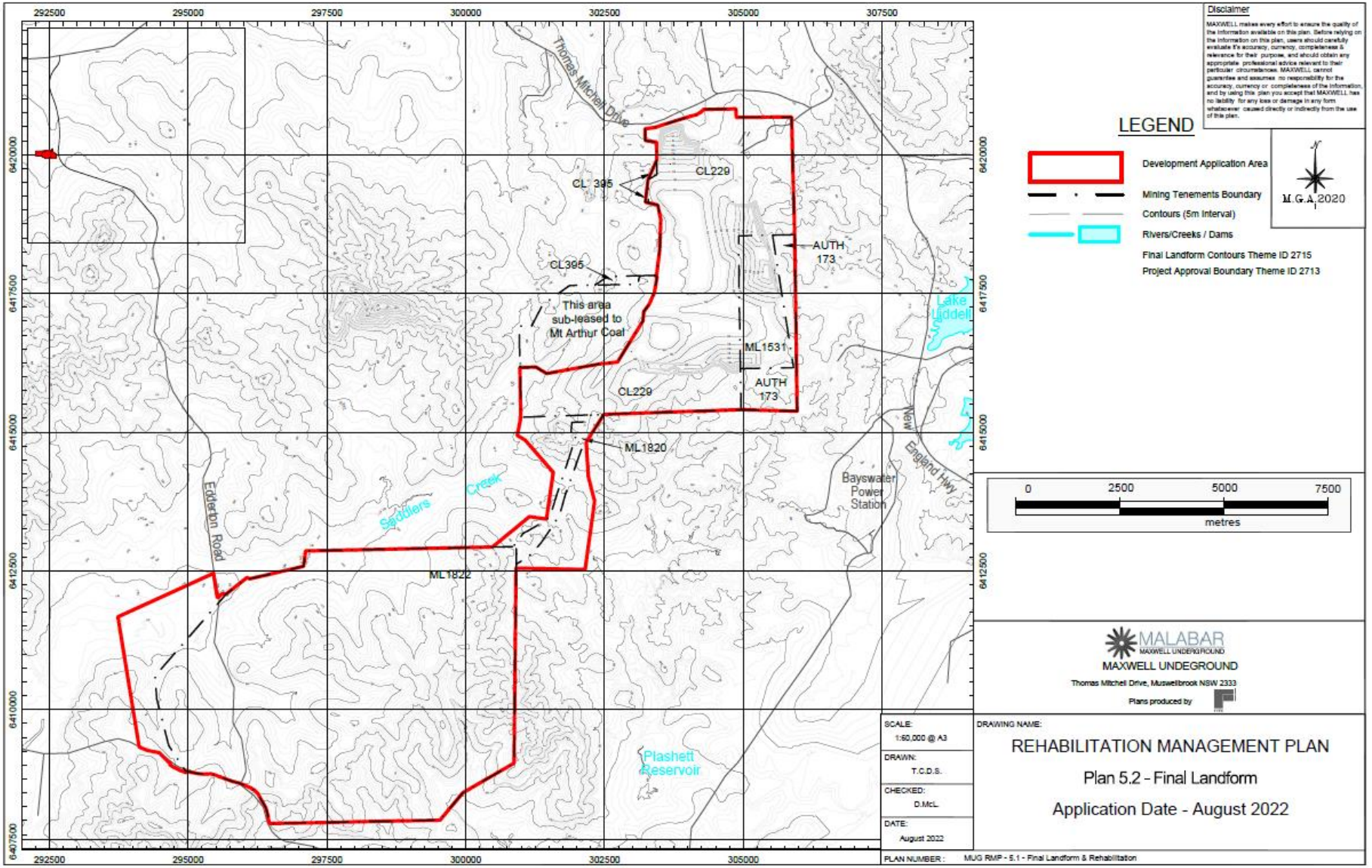
6412500
6410000
6407500
Thomas Mitchell Drive
CL 395
CL229
AUTH 173
CL395
This area sub-leased to Mt Arthur Coal
ML1634
AUTH 173
CL229
ML1820
ML1822
Edderton Road
New England Hwy
Bayswater Power Station
Disclaimer
MAXWELL makes every effort to ensure the quality of the information available on this plan. Before relying on the information on this plan, users should carefully evaluate it's accuracy, currency, completeness & relevance for their purpose, and should obtain any appropriate professional advice relevant to their particular circumstances. MAXWELL cannot guarantee and assumes no responsibility for the accuracy, currency or completeness of the information, and by using this plan you accept that MAXWELL has no liability for any loss or damage in any form whatsoever caused directly or indirectly from the use of this plan.
LEGEND
Development Application Area
Mining Tenements Boundary
Cadastre
Final Landuse Theme ID 3108
Project Approval Boundary Theme ID 2713
A
Bio-diversity Offset Area
B
Water Management Area
C
Rehabilitation Area - Pasture
D
Rehabilitation Area - Woodland
E
Remediated Underground Mining Area
M.G.A. 2020
0
2500
5000
7500
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE:
1:50,000 @ A3
DRAWN:
T.C.D.S.
CHECKED:
D.McL.
DATE:
August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 5.1 - Final Land Use
Application Date - August 2022
PLAN NUMBER:
MUG RMP - 5.1 - Final Landform & Rehabilitation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6407500
Thomas Mitchell Drive
CL 395
CL229
AUTH 173
CL395
This area sub-leased to Mt Arthur Coal
ML1531
AUTH 173
CL229
ML1820
Lake Liddell
New England Hwy
Bayswater Power Station
Saddlers Creek
Edderton Road
ML1822
Plashett Reservoir
Disclaimer
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LEGEND
Development Application Area
Mining Tenements Boundary
Contours (5m Interval)
Rivers/Creeks / Dams
Final Landform Contours Theme ID 2715
Project Approval Boundary Theme ID 2713
M.G.A. 2020
0
2500
5000
7500
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE:
1:60,000 @ A3
DRAWN:
T.C.D.S.
CHECKED:
D.McL.
DATE:
August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 5.2 - Final Landform
Application Date - August 2022
PLAN NUMBER :
MUG RMP - 5.1 - Final Landform & Rehabilitation

6 PART 6 – REHABILITATION IMPLEMENTATION

6.1 Life of Mine Rehabilitation Schedule

In accordance with Condition B78 of SSD 9526, Maxwell will rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps will be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies will be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.

Recovered topsoil and, if appropriate, subsoil, would be used in the rehabilitation or stockpiled for later use in rehabilitation. A woodland or pasture seed mix would be used to rehabilitate any disturbed areas. The selection of vegetation would be consistent SSD 9526 and based on flora species endemic to the local area.

Operational sediment and erosion control works would be maintained during the establishment of revegetation. However, once self-sustaining stable final landforms have been achieved within an area, key elements of the operational sediment control structures would be either left as passive water control storages or removed to allow the area to become free-draining. Investigations would be undertaken at mine closure to identify and remediate any contaminated soil that may exist (e.g., in infrastructure areas).

The proposed final landform includes the three remaining voids at the Maxwell Infrastructure site, although the Maxwell UG Project would involve the partial backfilling of the East Void with CHPP reject material. The accumulation of surface runoff combined with groundwater inflows may result in the formation of a pond of water in the voids which would rise until the average rate of inflow is balanced by evaporation from its surface.

Groundwater modelling undertaken for the Maxwell UG EIS included predictive modelling over the life of the mine as well as recovery modelling for a 1,000-year period post-mining. Initial pit lake equilibrium levels were determined based on direct rainfall to the void surface and catchment runoff, less evaporation losses. These pit lake levels were then implemented in the recovery groundwater model using a series of constant heads over time. The recovery groundwater modelling predicts that net groundwater inflows to the voids at the predicted equilibrium level would be negligible.

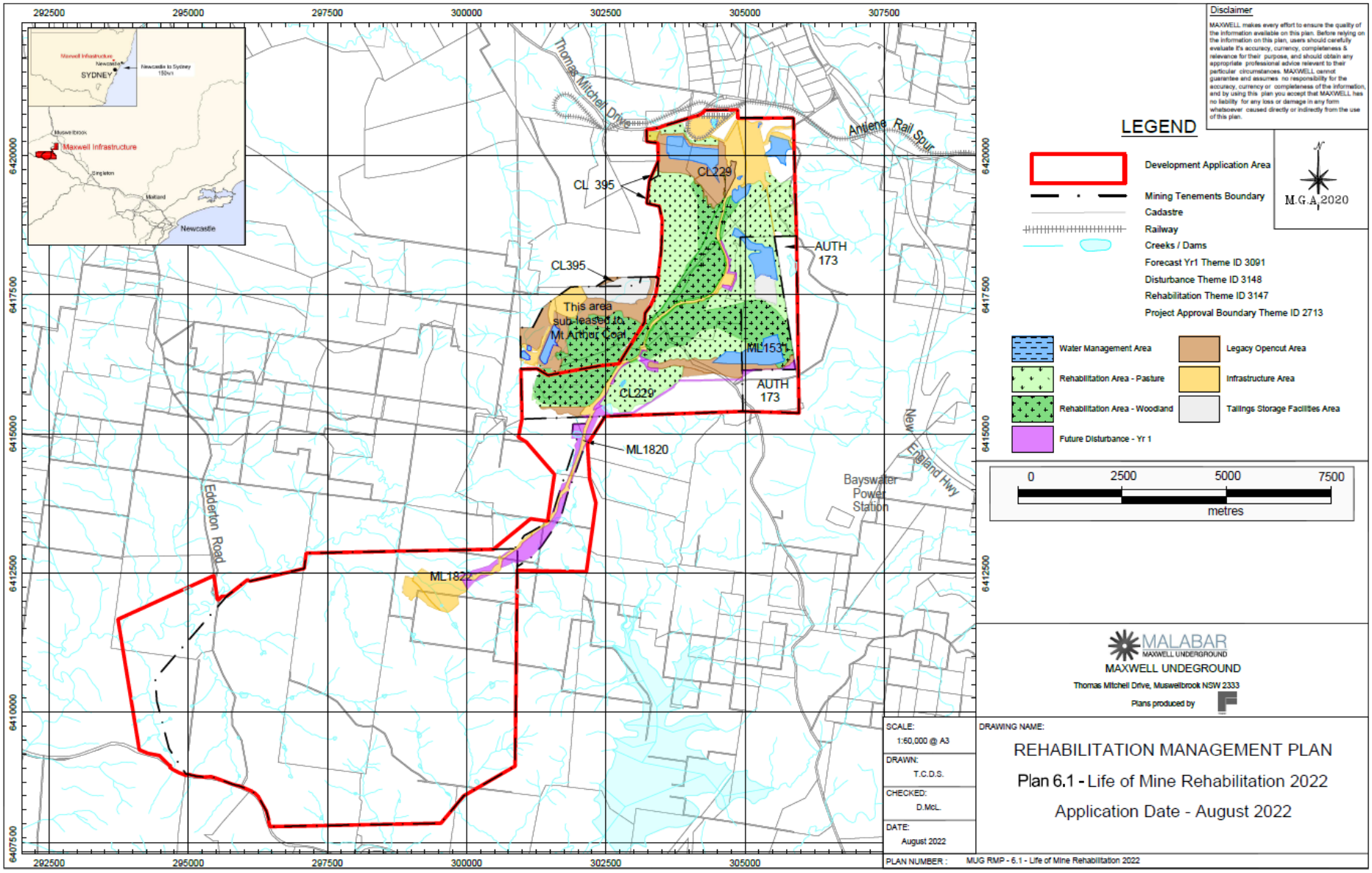
The simulated water levels within all three voids reach equilibrium between 160 m Australian Height Datum (AHD) and 164 m AHD after 100 years and generally remain at these levels throughout the remainder of the 400-year simulation (WRM, 2019). The maximum modelled water level is approximately:

- 44 m below the North Void overflow level;
- 9 m below the East Void overflow level; and
- 11 m below the South Void overflow level.

Maxwell will continue to investigate beneficial uses for the voids in CL 229 and ML 1531. This may include emplacing rejects from future underground mining activities and engagement with other mining and industrial facilities in the region (all would be subject to separate assessments and approvals).

Following the completion of mining, Project surface infrastructure areas would be decommissioned returned to either pasture or woodland vegetation. Project underground portals and ventilation shafts would be sealed in accordance with the requirements of MDG6001 Guideline for the Permanent Filling and Capping of Surface Entries to Coal Seams (NSW Trade and Investment, 2012) (or its latest version at the time).

Surface impacts from subsidence would be progressively remediated. Post-mining, subsidence monitoring would continue for a period agreed with the NSW Resources Regulator, and any observed surface impacts would continue to be remediated.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6407500
Maxwell Infrastructure
SYDNEY
Newcastle to Sydney 150km
Muswellbrook
Singleton
Maitland
Newcastle
Thomas Mitchell Drive
Antiene Rail Spur
CL229
CL 395
CL395
AUTH 173
This area sub-leased to Mt Arthur Coal
ML1530
CL220
ML1820
ML1822
Edderton Road
New England Hwy
Bayswater Power Station
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LEGEND
Development Application Area
Mining Tenements Boundary
Cadastre
Railway
Creeks / Dams
Forecast Yr1 Theme ID 3091
Disturbance Theme ID 3148
Rehabilitation Theme ID 3147
Project Approval Boundary Theme ID 2713
M.G.A. 2020
Water Management Area
Legacy Opencut Area
Rehabilitation Area - Pasture
Infrastructure Area
Rehabilitation Area - Woodland
Tailings Storage Facilities Area
Future Disturbance - Yr 1
0
2500
5000
7500
metres
MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
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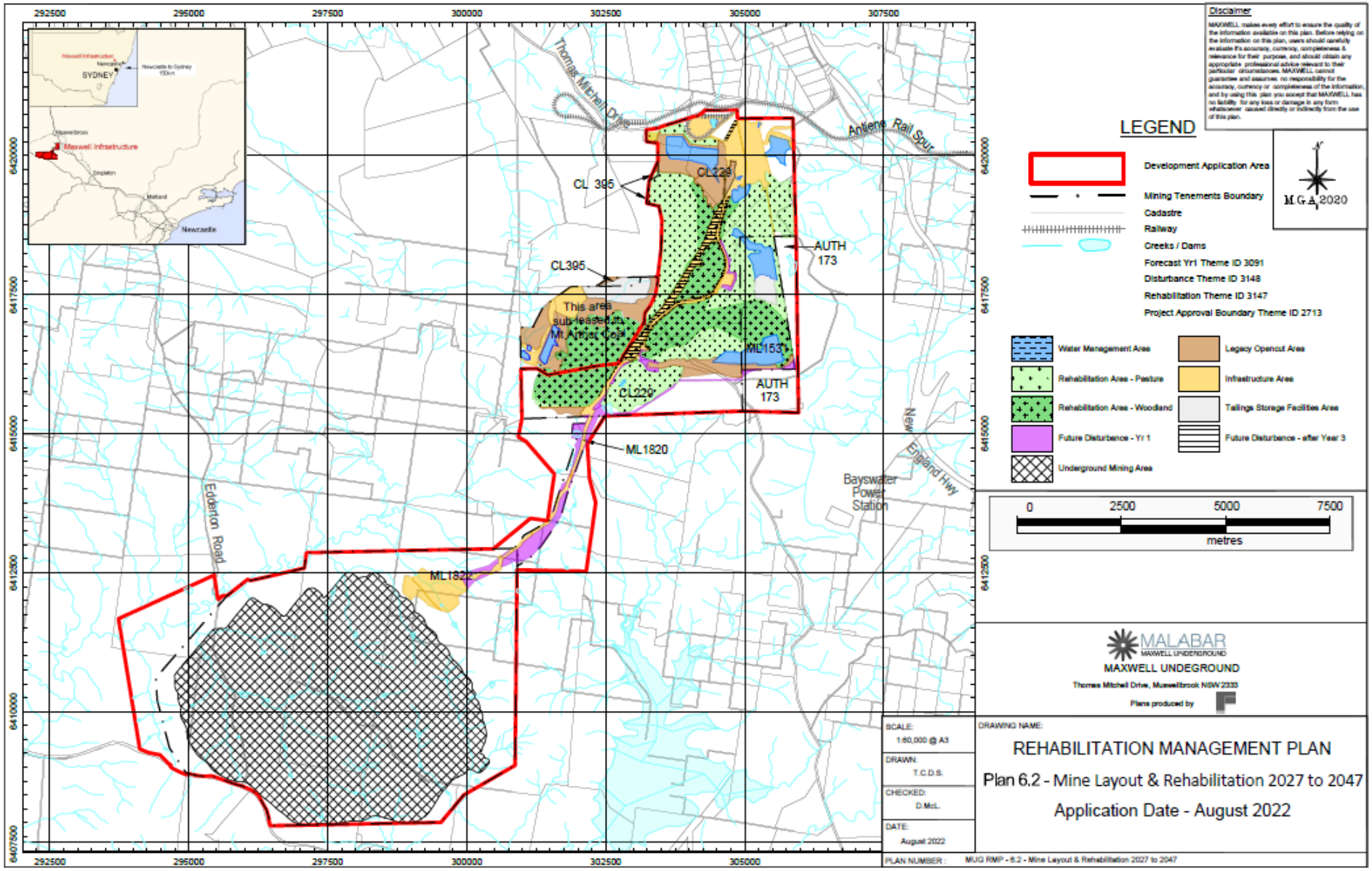
Plan 6.1 - Life of Mine Rehabilitation 2022
Application Date - August 2022
PLAN NUMBER :
MUG RMP - 6.1 - Life of Mine Rehabilitation 2022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This area sub-leased to Mt Arthur Coal
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AUTH 173
ML1820
New England Hwy
Bayswater Power Station
Edderton Road
ML1822
Maxwell Infrastructure
SYDNEY
Newcastle
Muswellbrook
Singleton
Maitland
Newcastle to Sydney 150km
LEGEND
Development Application Area
Mining Tenements Boundary
Cadastre
Railway
Creeks / Dams
Forecast Yr1 Theme ID 3091
Disturbance Theme ID 3148
Rehabilitation Theme ID 3147
Project Approval Boundary Theme ID 2713
Water Management Area
Rehabilitation Area - Pasture
Rehabilitation Area - Woodland
Future Disturbance - Yr 1
Underground Mining Area
Legacy Opencut Area
Infrastructure Area
Tailings Storage Facilities Area
Future Disturbance - after Year 3
MGA 2020
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MALABAR
MAXWELL UNDERGROUND
MAXWELL UNDEGROUND
Thomas Mitchell Drive, Muswellbrook NSW 2333
Plans produced by
SCALE: 1:60,000 @ A3
DRAWN: T.C.D.S.
CHECKED: D.McL.
DATE: August 2022
DRAWING NAME:
REHABILITATION MANAGEMENT PLAN
Plan 6.2 - Mine Layout & Rehabilitation 2027 to 2047
Application Date - August 2022
PLAN NUMBER: MUG RMP - 6.2 - Mine Layout & Rehabilitation 2027 to 2047

6.2 Phases of Rehabilitation and General Methodologies

The sequence of actions required to rehabilitate disturbed areas to achieve the final land use are classified into conceptual stages referred to as phases of rehabilitation. Rehabilitation phases are important to show progress towards the post mining land use goals. Rehabilitation phases can be divided into the following categories:

1. ***Active mining*** – includes activities undertaken as part of active mining that are associated with soils and materials, flora and fauna, rock/overburden emplacement, waste management, geology and geochemistry, spontaneous combustion, reject/tailings, erosion and sediment control, biological resources, mine subsidence, cultural heritage and exploration activities.
2. ***Decommissioning*** – includes the removal of buildings, CHPP, portals, ventilation shafts, mine entrances, hardstand areas, rail infrastructure (if no longer required) contaminated materials and hazardous materials.
3. ***Landform Establishment*** – incorporates gradient, slope, aspect, drainage, substrate material characterisation and capping of carbonaceous materials.
4. ***Growing Medium Development*** – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to establish vegetative cover.
5. ***Ecosystem and Land use Establishment*** – incorporates habitat augmentation, species selection, species presence and growth, together with weed and pest management and establishment of flora.
6. ***Ecosystem and Land use Development*** – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function.
7. ***Rehabilitation Complete*** – secondary domains meet completion criteria and can be relinquished in accordance with a Mine Closure Plan.

Early phases of rehabilitation (decommissioning, landform establishment, and growth medium development phases) are largely associated with engineering activities to construct the final landform. Later phases of rehabilitation (i.e. vegetated outcomes) such as ecosystem and land use establishment and development phases will generally take at least two years (and potentially more) before achieving all rehabilitation completion criteria. Risk and opportunities for each phase of rehabilitation is discussed in the sections below.

6.2.1 Active Mining Phase

6.2.1.1. Soils and Materials

Eight different Australian Soil Classification soil types were mapped across the site including:

- Eutrophic Brown Chromosols
- Epipedal Black Vertsols
- Epipedal Brown Vertsols
- Eutrophic Grey/Brown Chromosols
- Eutrophic Red Chromosols
- Mesonatric Brown Sodosols
- Self-mulching Brown Vertosols
- Subnatric Brown Sodosols

There is a risk that topsoil will not be suitable for rehabilitation activities or that topsoil will be contaminated during the stripping process. Prior to stripping, representative samples of topsoil will be analysed for:

- pH
- Electrical Conductivity
- Cation Exchange Capacity
- Exchangeable Sodium Percent
- Total Organic Matter
- Plant growth limiting factors (Molybdenum, Nickel, Iron, Manganese, Copper, Boron, Zinc)

- Available Phosphorus
- Available Nitrogen
- Available Potassium
- Available Sulphur

Results will be compared against the recommended soil standards from the NSW Department of Primary Industries (DPI) to determine the suitability of topsoil. The depth of topsoil for recovery will be ground-truthed to determine localised conditions (e.g. increased soil depths in drainage lines or shallow gravelly material on hill crests). Topsoil stripping will be undertaken using dozers and loaders (or similar).

Topsoil stripping will be checked at regular intervals to ensure continued effectiveness of the applied methods and management of topsoil. Stripping limits (including areas of no recovery) will be clearly delineated with survey pegs and adhered to during stripping operations.

Stockpiles will be no greater than 3 m in height and if possible, may be limited to 1 m in height to maximise aeration and reduce compaction of the topsoil. Stockpiles will be located away from drainage lines, operational water, operational areas, sloped areas and proposed disturbance areas as much as possible. Surface drainage in the vicinity of stockpiles will be diverted to minimise run-on and managed to minimise sediment laden run-off. All stockpiles will be ripped and sown with a pasture mix once their construction is completed. Stockpiles will be inspected periodically and, if required, treated for weed infestation.

6.2.1.2. Flora

Eleven vegetation communities were mapped across the site during surveys undertaken for the Maxwell UG Project EIS. Several of these communities were present in both remnant vegetation form and derived native grassland form. One threatened flora species, Pine Donkey Orchid (*Diuris tricolor*), listed under the *Biodiversity Conservation Act 2016* (BC Act) had been previously recorded on site however was not found during the surveys. Two other flora species, representatives of Endangered Populations under the BC Act were recorded, these included *Cymbidium canaliculatum* and *Acacia pendula*.

Maxwell has developed and implemented a *Ground Disturbance Permit (GDP) Procedure*. The purpose of this procedure is to outline the GDP process used at the site to ensure all disturbance activities are undertaken in accordance with statutory requirements, site environmental management plans and internal standards. This procedure applies to all activities that will result in:

- Disturbance to natural surface;
- Disturbance to mine rehabilitation;
- Vegetation removal;
- Changes to existing landforms and drainage patterns; and
- Any other activity where surface disturbance is to occur.

The GDP applicant must provide all relevant plans showing the proposed disturbance area, site access, drainage and any environmental controls. The Environmental Coordinator will identify the risks associated with the proposed disturbance. The location of the proposed disturbance with respect to the following features is also assessed so management measures can be implemented:

- An area requiring topsoil recovery or topsoil stockpile management.
- An area that requires erosion and sediment controls.
- An area of noxious weeds or large scale weed infestations.
- Aboriginal cultural heritage or heritage sites.
- Known contaminated land.

Sufficient time will be provided during the mine planning phase to allow for the implementation of appropriate pre-clearance procedures, and to appropriately salvage biological and habitat resources for use in rehabilitation if required.

In accordance with the Biodiversity Development Assessment Report prepared for the Project EIS, the following measures have been implemented to protect threatened flora not likely to be directly impacted by the Project:

- Malabar have erected a livestock-proof fence around a 20 metre (m) buffer from the Hunter Valley Weeping Myall (*Acacia pendula*) Woodland/Acacia pendula population in the Hunter Catchment. The area has been signed 'Environmental Protection Area'.
- Malabar have erected a livestock-proof fence around at least a 20 m buffer from the *Diuris tricolor* records. The area has been signed 'Environmental Protection Area'.

6.2.1.3. Fauna

A total of 227 fauna species were recorded on site during surveys undertaken for the Maxwell UG Project EIS. A total of 25 threatened fauna species listed as vulnerable under the BC Act were recorded. Four of the threatened fauna species including the Pink-tailed Legless Lizard (also known as the Pink-tailed Worm-lizard) (*Aprasia parapulchella*), Striped Legless Lizard (*Delma impar*), Squirrel Glider (*Petaurus norfolcensis*) and Southern Myotis (*Myotis enant e*) are species credit species (i.e. require credits to offset the negative impact).

Some small areas of woodland vegetation will be cleared during the construction of the Maxwell UG Project. Clearing protocols are in place to minimise impacts to fauna during clearing activities. Hollow bearing trees and other habitat structures such as stags, logs and stumps are marked to ensure controlled felling after-checks take place. Vegetation surrounding the marked habitat structures is cleared and the marked structures left undisturbed for a minimum period of 24 hours. Marked, hollow bearing trees are shaken prior to felling using a bulldozer or excavator and then left for a short period to allow any fauna using the hollows to be observed. Hollow bearing trees are then slowly pushed over using a bulldozer or excavator, with care taken to avoid damage to hollows.

Following felling, each of the identified hollows is examined for injured fauna. Where fauna is found fleeing or within the hollows during or after felling, trees will be left for a minimum period of 48-hours to allow the fauna to move into adjacent vegetation. Nocturnal species that do not immediately move into adjacent vegetation are captured and kept in a warm, dark and quiet place prior to release at night within the same vegetation community type in which it was captured.

6.2.1.4. Rock/Overburden Emplacement

Mine establishment rock will be removed from the MEA during construction. Based on a review of the detailed geochemical characterisation of the overburden and interburden from the surrounding mining operations, it is expected that the mine establishment rock would be NAF with low salinity (GEM, 2019). It was however, found that the establishment rock will likely be sodic and therefore should be treated with gypsum prior to use as construction fill. This has been incorporated as a mitigation measure for construction activities.

6.2.1.5. Waste Management

Waste is managed in accordance with the site *Waste Management Procedure*. Where appropriate, spent resources are reused or recycled in preference to being disposed of as waste. Where recycling options are not available, the different classifications of waste will be disposed of in an appropriate off-site waste facility.

6.2.1.6. Geology and Geochemistry

The site is situated within the Hunter Coalfield, which encompasses a significant portion of the northern part of the Sydney Basin. The Sydney Basin consists of coal bearing rocks of Permian age deposited during periods of marine and terrestrial sedimentation. Three major periods of coal formation in the Hunter Coalfield area are represented by the Greta Coal Measures, the Wittingham Coal Measures and the Newcastle Coal Measures (formerly known as Wollombi Coal Measures) (Beckett, 1988).

The target coal seams for the Maxwell UG Project belong to the Jerrys Plains Subgroup of the Wittingham Coal Measures and include the Whynot, Woodlands Hill, Arrowfield and Bowfield Seams. The Jerrys Plains Subgroup consists of sediment deposits up to 800 m thick comprising several coal bearing and non-coal

bearing deposits. The non-coal bearing strata typically consist of claystones, siltstones, sandstones and to a lesser extent conglomerates.

During previous open cut mining operations at the Maxwell Infrastructure site, coal was mined within the Lower Permian Greta Coal Measures. The mine targeted the Broughams, Grasstrees, Thiess, Puxtrees and Balmoral seams which were on average 3 to 10 m thick. Sub-crops and intrusions limited the extent of some seams. Interburden and overburden at the site consisted of interbedded sandstones and siltstone. Carbonaceous material, such as partings, was placed so that it did not form part of the final rehabilitated surface.

The geochemistry assessment undertaken as part of the Maxwell UG Project EIS included a review of existing documentation and analysis of samples representing the target coal seams, intra-seam partings, roof and floor rocks and mine establishment rock for the Maxwell UG Project. This is further discussed in **Section 6.2.1.8** and **6.2.1.9**.

6.2.1.7. Material Prone to Spontaneous Combustion

Coal and other carbonaceous materials oxidise when exposed to oxygen, producing heat. Heat increases the rate of oxidation. If oxygen is available and the heat from oxidation is not dissipated, increasing temperatures can cause the oxidation reaction to self-accelerate. If temperatures then become high enough, carbonaceous material will ignite, which is known as spontaneous combustion.

As discussed in Section 3.2.1, the target coal seams for the Maxwell UG Project are located within the Jerrys Plains Subgroup, which form part of the upper and middle units of the Wittingham Coal Measures. Coal quality data from boreholes across the target seams of the proposed underground mining area have been assessed to interpolate spontaneous combustion index parameter values for self-heating rate (R70), self-heating temperature (SHT) and crossing point temperature (CPT) (Beamish, 2020). These index parameters provide an indication of the intrinsic spontaneous combustion propensity of a particular coal using a relative rating scheme. The spontaneous combustion propensity ratings of the target seams are as follows:

- R70 self-heating rate index: Low-Medium to Medium
- SHT: Medium
- CPT: Low

Reactive pyrite-initiated heating, as documented for the Greta seams (Beamish, Theiler and Ward, 2017) is unlikely as the coal seams in the Wittingham Coal Measures have low sulphur concentrations.

Although all coals are liable to spontaneous combustion events under the right conditions, the Greta Coal Measures, which were previously mined at the Maxwell Infrastructure site, are known to have a high propensity for spontaneous combustion. This is caused by the heat balance between the intrinsic reactivity of the coal and the moisture contained within the coal. Subsequently, there is a risk of spontaneous combustion events in previously mined open cut areas and spoil emplacements at the Maxwell Infrastructure site.

Spontaneous combustion will be managed in accordance with the *Spontaneous Combustion Management Plan* which aims to prevent spontaneous combustion by reducing oxygen access to carbonaceous material. This is generally achieved through:

- Compaction and shaping of the surface.
- Application of inert material to a specified depth.
- Appropriate surface treatment including water management and vegetation establishment.

Areas are assessed as part of the rehabilitation planning process to determine the depth of inert material required based on the inert capping depth matrix provided in **Table 8** and the final landform.

Inert material is sourced from dedicated stockpiles consisting mostly of clays that were established during the open cut mining process. A review of historic monitoring data and an inspection using a thermal camera is undertaken to determine if heating is present. The degree of carbonaceous material is assessed visually.

This technique has been evaluated against an analytical technique and found to be a conservative estimate of spontaneous combustion propensity (Beamish 2017).

Table 8. Inert Capping Depth Matrix

Surface temperature	Inert capping depth (m)			
	No carbonaceous material	Some carbonaceous material	Mostly carbonaceous material	All carbonaceous material
Less than 35°C	0	1	2	3
35-80°C	1	2	3	4
Greater than 80°C	2	3	4	4

Monitoring of rehabilitation includes inspections for visible spontaneous combustion and or spontaneous combustion impacts on vegetation. If isolated outbreaks occur on rehabilitated land, carbonaceous material is loaded or pushed out to remove the ignition source. For larger outbreaks, reshaping and capping with inert material will be undertaken to remove airflow through the material.

Requirements for inert capping during remediation will be guided by the requirements summarised in **Table 9**. Inert capping will be compacted where access allows. Due to access restrictions in highwall areas, this matrix may not be able to be applied. In this instance, a case-specific plan will be implemented for individual outbreaks.

Table 9. Inert Capping Guide for Remediation

Surface temperature	Inert capping		
	Depth (m)	Buffer around outbreak (m)	Additional notes
Less than 25°C	None		
25 – 35ºC	1	5	-
36 – 80ºC	2	10	-
Greater than 80ºC, or blue smoke, or tar on surface.	3	10	Where possible, cracks will be filled with inert material with priority given to available material with a higher sand content.

A thermal aerial survey using infrared detection will be used to identify areas of heating on a site-wide basis and also to assess the integrity of existing capping. The thermal aerial survey will be flown on an annual basis however the frequency of the survey may be reduced if there have been no new areas of spontaneous combustion over a period of at least two consecutive years. Additional thermal aerial surveys (of isolated areas) will be considered for any major outbreaks. The thermal aerial survey will be compared against previous surveys to assess the horizontal extent and potential migration of heating.

Inspections are undertaken where smoke or steam emissions from spontaneous combustion are evident or have been evident within the previous twelve months. Areas where spontaneous combustion remediation works have been undertaken in the previous twelve months are also monitored.

6.2.1.8. Material Prone to Generating Acid Mine Drainage

It is understood that when mining commenced at the Maxwell Infrastructure site, the risk of developing acid and metalliferous drainage (AMD) was identified due to the previously reported occurrence of reactive

sulfides associated with the coal seams of the Greta Coal Measures and specifically within some of the coal seam partings (Anglo Coal, 2016).

Although a specific management plan for identifying and managing materials that had a risk of developing AMD was not prepared at the time, historic management of overburden to reduce the risk of spontaneous combustion by isolating carbonaceous materials from atmospheric oxidation also reduced the risk of AMD.

According to a previous MOP for the Maxwell Infrastructure site, coarse rejects were trucked to dedicated reject dumps located within the lower zones of selected pit floors, or in between the pre-stripped dragline spoil piles, and covered with a minimum of 10 m of inert overburden to avoid potential spontaneous combustion outbreaks (Anglo Coal, 2016).

As such the bulk of the overburden is expected to NAF and relatively barren in terms of acid generation and neutralisation. Although the carbonaceous mudstone and siltstone lithologies, of relatively minor occurrence, may have a risk of acid generation, with blending during disposal it is expected that the overall overburden would have a low risk of acid generation.

6.2.1.9. Ore Beneficiation Waste Management (Reject and Tailings Disposal)

Coal and Coal Rejects

Samples representing clean coal, coal rejects and the Milbrodale Claystone forming the base of the sequence were assessed based on their acid forming characteristics. The clean coal and coal reject samples were composited into the Whynot, Woodlands Hill, Arrowfield and Bowfield Seams. The results showed that:

- All coal seam samples were classified as non-acid forming (NAF).
- The Milbrodale Claystone Sample was classified as NAF.
- One reject sample was classified as NAF.
- Five reject samples were classified as potential acid forming (PAF), of which 3 were PAF low capacity (PAF-LC).

The coal rejects likely to be produced and disposed of in the East void are expected to be moderately to highly saline and have an acidic pH, most likely due to the presence of organic acids (GEM, 2019). The rejects are also expected to have moderate sulfur, the majority of which is likely to occur as reactive sulphide and low acid neutralising capacity. Based on these characteristics it is expected the rejects will typically be PAF with only a low capacity to generate acid (GEM, 2019).

As part of the ongoing process for managing CHPP rejects, geochemical characterisation will be undertaken to maintain an understanding of the materials classification. Reject emplacement will also be designed (where applicable) to prevent the reactive rejects from oxidising and the salts from migrating to the revegetation layer.

Roof and Floor Rock

Samples representing the roof and floor rock for each coal seam were collected from three separate drill holes including DD1132, DD1136 and DD1185. The samples were collected from immediately above and below each seam, with intervals ranging from 0.24 to 1.13 m. The results showed that all samples were classified as NAF with the exception of one sample in the woodlands hill floor, that was classified as PAF-LC (GEM, 2019).

6.2.1.10. Erosion and Sediment Control

There is potential for erosion to occur during construction activities. All sediment controls will be designed, installed and maintained in accordance with the Blue Book requirements.

Diversion banks will be installed upslope of areas to direct clean surface water runoff away from disturbed areas where practical. The diversion banks will be designed to ensure effective segregation of sediment-laden runoff and allow clean surface water to return to a natural watercourse. Diversions will be designed in

accordance with the Blue Book to cater for a minimum 100-year average recurrence interval (ARI) storm event.

Catch drains will be constructed, where appropriate, to capture runoff from disturbed areas and direct runoff into sediment dams. Catch drains will be designed to have a non-erosive hydraulic capacity to convey flow from a minimum 20-year ARI storm event. Energy dissipators (rock check dams, geotextiles and vegetation) will be installed if required to slow water velocity.

Sediment dams and basins will be installed to retain rainfall runoff such that suspended solids can settle to the base of the dam. Water will be released when the total suspended sediment level meets the recommended criterion of 50 milligrams per litre.

Temporary controls will be used when impacts are for short periods only and permanent control measures are not appropriate. Temporary control measures include, but are not limited to water diversion banks, sandbags, sediment fences, hay bales or geotextiles.

During final rehabilitation (on a gradient), ripping will be undertaken across the contour prior to seeding. A cover crop may be included in the seed mix to assist with initial soil stabilisation. Gypsum will be applied to assist with binding organic matter to clay in the soil.

6.2.1.11. Ongoing Management of Biological Resources for use in Rehabilitation

Refer to **Sections 6.2.1.1**, **6.2.1.2** and **6.2.1.3** for specific details on the ongoing management of biological resources for use in rehabilitation.

6.2.1.12. Mine Subsidence

First workings comprise a network of access roadways including drifts and main headings that will be designed to remain stable for the life of the mine (i.e. no subsidence). Second workings associated with the partial pillar extraction and longwalls will result in subsidence that develops predominately above the area of secondary extraction.

The surface area that is likely to be affected by the secondary extraction has been calculated as the surface area enclosed by the greater of the 26.5 degree (°) angle of draw from the limits of secondary extraction in each seam and by the predicted total 20 millimetre (mm) subsidence contour.

The land directly above the proposed underground mining area is owned by Maxwell and used for cattle grazing. Management strategies will be developed for mining-induced surface cracking, to manage the potential impacts on the cattle grazing operations. Where necessary, temporary fencing will be installed to temporarily relocate stock to areas outside of the active subsidence zone.

Aboriginal heritage sites located above the proposed mining area will be managed in accordance with the *Aboriginal Heritage Management Plan* which includes monitoring, remediation and salvage.

Edderton Road crosses directly above the proposed longwalls in the Woodlands Hill, Arrowfield and Bowfield Seams. If the road were to be maintained in its current alignment, cracking, heaving and stepping of the road pavement would occur as each of the proposed longwalls are mined directly beneath it (MSEC, 2019). As such, Maxwell will realign this section of Edderton Road, prior to second workings in the Arrowfield or Bowfield seams.

6.2.1.13. Management of Potential Cultural and Heritage Issues

A total of 39 open artefact sites would be wholly or partially disturbed within the surface development area for the Maxwell UG Project. A further 236 sites comprising 235 open artefact sites and one stone quarry, are located directly above the underground mining area. These sites may potentially be affected by cracking of the surface soils (typically between 25 and 50 mm) due to the effects of mining-induced subsidence from secondary workings. Subsidence monitoring will be undertaken during and post-secondary workings to determine if any Aboriginal archaeological sites have or will be impacted above the underground mining area. Any surface remediation activities or salvage programs will be managed in accordance with the *Aboriginal Cultural Heritage Management Plan*.

The plan provides a list of known Aboriginal archaeological sites that must be conserved in-situ and also details the process should a suspected new Aboriginal archaeological site be identified. Relevant employees and contractors will be made aware of the nature and location of the known sites and their legal obligation to respect them.

6.2.1.14. Exploration Activities

Surface trenching, magnetic surveys, test pits and the drilling of cored and non-cored holes are proposed to be undertaken. These exploration activities will assist with further defining the geological model and will provide reservoir (gas testing) characterisation. Geochemistry assessment may also be undertaken.

Prior to ground disturbance occurring, an approved Ground Disturbance Permit (GDP) will be obtained from the Maxwell Environment department in accordance with the Ground Disturbance Permit Procedure. The following tasks will be undertaken at the completion of any exploration activity:

- Remove and lawfully dispose of all grid pegs, tags, sample bags, flagging tape, drill chips and other waste. Remove all drill cores.
- Remove and lawfully dispose of all plant and equipment and any imported fill material.
- Remove equipment and logging tools from the borehole prior to sealing or plugging.
- Backfilling of sumps and sealing of boreholes.
- Returning subsoil and topsoil in sequential order. Soil ameliorant will be used, if required.
- Ripping cross-slope once topsoil has been placed to capture water runoff and reduce surface compaction.
- Seeding with an appropriate seed mix. If revegetation is delayed due to unsuitable seasonal conditions, undertake temporary stabilisation measures.
- Re-establishing any ecological features that had been salvaged prior to the exploration activities.

6.2.2 Decommissioning

A detailed Mine Closure Plan will be developed in consultation with government and other stakeholders and will include details such as re-use opportunities for facilities, infrastructure and services. Most decommissioning works will be planned and undertaken as soon as practicable following the cessation of mining, unless alternative post-mining uses have been identified.

6.2.2.1. Site Security

Security measures will be implemented during and following the decommissioning phase to prevent access by members of the public and to secure rehabilitation areas (including any heritage places or objects and any retained infrastructure items). Security measures to be implemented may include:

- Fencing, signage and locked gates.
- Security patrols and cameras.
- Site inductions, permitting and restricted access.

6.2.2.2. Infrastructure to be Removed or Demolished

Subject to the agreed final land use, decommissioning of surface infrastructure would include, but not be limited to, the following actions:

- de-energising equipment (e.g. removing connections to power, water, gas, compressed air and sewerage) and isolation of power to the site (if appropriate);
- removal of underground infrastructure, such as mining equipment and service infrastructure;
- sale of underground equipment or transfer to other Malabar sites;
- demolition and removal of buildings and other infrastructure (such as the CHPP, conveyors and train load-out facilities);
- demolition and removal of infrastructure from ventilation shaft site;

- removal of roadway, concrete footings, drainage structures, hardstand and foundations up to 1.5 m below ground level, if not required for the post-mining land use;
- removal and disposal of any hazardous materials such as fuel, lubricants, chemicals or other substances of concern;
- filling and/or sealing portals, ventilation shafts and underground roadways in accordance with the Mine Closure Plan and NSW Resources Regulator requirements;
- demolition and removal of concrete slabs, bitumen surfaces, redundant pipelines and services and redundant power lines;
- removal of rail line and sleepers, if not required for the post-mining land use; and
- excavation and removal of rail ballast (this may be emplaced in the final voids).

6.2.2.3. Buildings, Structures and Fixed Plant to be Retained

All infrastructure is currently planned to be decommissioned following the cessation of mining, however as part of the mine closure process, infrastructure which is proposed to be utilised by subsequent approved land uses will be retained as required.

6.2.2.4. Management of Carbonaceous/Contaminated Material

A contamination assessment was undertaken for the Maxwell UG Project EIS. The assessment found that there was a low potential for gross or widespread contamination at the site as a result of historical and or current site uses (JBS&G, 2019). Investigations will be undertaken at mine closure to identify and remediate any contaminated soil that may exist (e.g. in infrastructure areas), in accordance with the requirements of the *NSW Contaminated Land Management Act 1997*. Contaminated land would be remediated by removal and disposal at an appropriately licensed facility, encapsulation, or appropriate remediation treatment on-site.

6.2.2.5. Hazardous Materials management

All hazardous chemicals are stored and handled on the premises as per the Code of Practice for Managing Risks of Hazardous Chemicals in the Workplace (Safe Work Australia, 2019). Controls include labelling and storage of hazardous chemicals in designated bunded areas or approved storage facilities. Spills are managed in accordance with the Spill Response Procedure and Pollution Incident Response Management Plan.

6.2.2.6. Underground Infrastructure

Following the completion of mining, Project underground portals and ventilation shafts would be sealed in accordance with the requirements of MDG6001 Guidelines for the Permanent Filling and Capping of Surface Entries to Coal Seams (NSW Trade and Investment, 2012) or its latest version at the time. The following underground infrastructure are examples of what may remain underground

- Roof supports;
- Pans;
- Man gate and tail gate drives;
- BSL crushers;
- Boot ends;
- Run of Mine conveyor structure;
- Drive heads; and
- Belts.

6.2.3 Landform Establishment

6.2.3.1. Water Management Infrastructure

The water management system at the Maxwell UG Project does not actively draw water from external surface water sources (such as the Hunter River), nor discharge mine water to the environment (such as under the Hunter River Salinity Trading Scheme). A schematic of the site water balance model is provided in **Figure 1**. Potable water used on site is monitored, however, it is not included in the Water Balance due to the low volume.

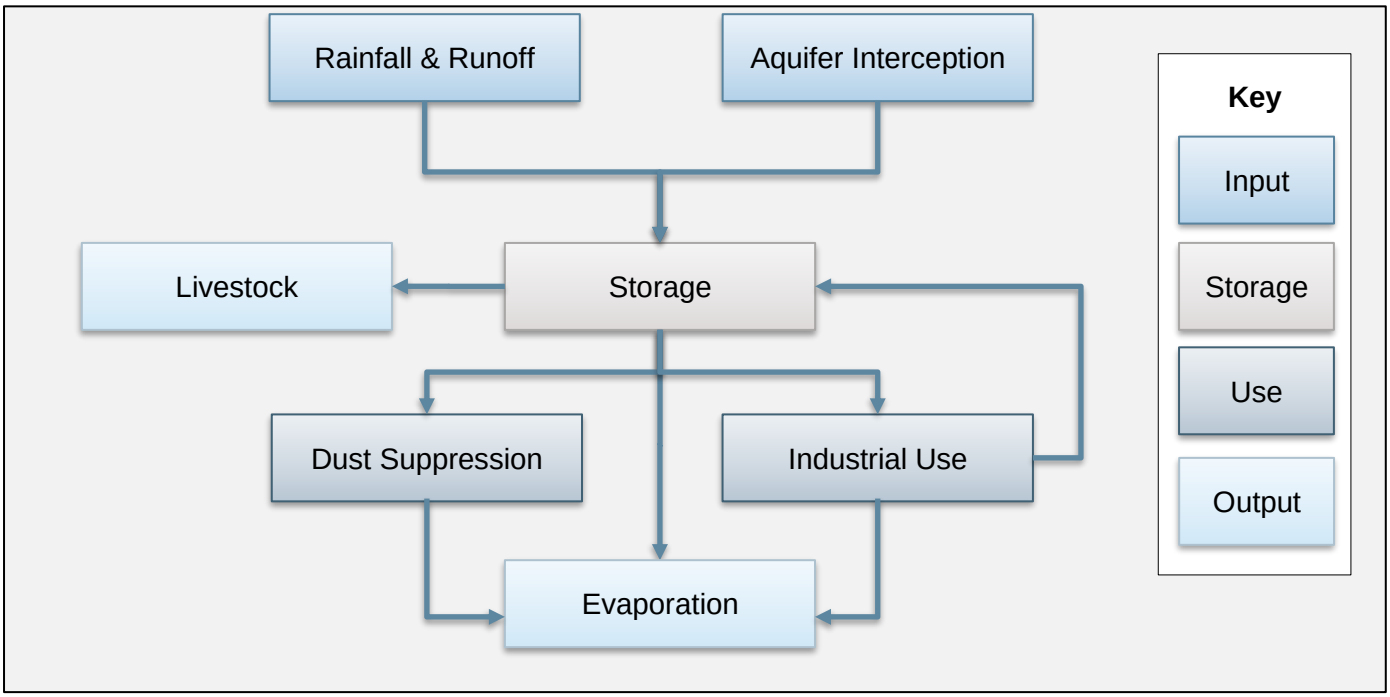

Figure 1. Schematic of Site Water Balance Model

A key focus of water management at site is managing the raw water system to ensure that no mine-affected water is discharged offsite. Preventing mine-affected water discharge drives the site water storage and transfer requirements. To prevent mine-affected water impacting on the nearby watercourses, Maxwell has implemented the following controls:

- High level alarms on dams that have a risk of an offsite discharge.
- Automatic pumping stations to transfer water from high risk dams into other storages;
- Pipelines, where possible, are located within water storage catchments to contain any uncontrolled release of mine-affected water in the event of a rupture or leak;
- A permit system and automatic shut-off timers for high risk dams; and
- Regular inspections of dams in the site water system that have a risk of an offsite discharge.

Clean water diversions (contours and bunding) will be installed in to minimise clean surface water runoff to dams and voids. Clean water diversions have been installed upstream of the Access Road Dam. As vegetation establishes on rehabilitated areas, Maxwell will progressively develop drainage with the aim of minimising the long-term catchment areas of the mine voids as far as practicable.

A Surface Water Assessment was undertaken for the Maxwell UG Project EIS. The assessment identified the configuration and the major drainage catchments of the indicative final landform. It notes that the site water management system would change over the 26-year Project life, including changes in catchment areas, production profile and site water demands. A water balance model was run on a daily time step for a 27-year period, corresponding to an initial construction phase followed by a 26-year period of operation.

To represent the progressive rehabilitation of the Maxwell Infrastructure over time, the site water balance was modelled in five discrete stages. The first stage of rehabilitation activities at Maxwell Infrastructure

would be completed during the initial construction phase. From Stage 2, drainage works would be undertaken to work towards the final landform configuration. However, the western rehabilitation area would continue to drain into North Void until Stage 5, when a diversion drain would be constructed to divert the western rehabilitation area past North Void and Into a tributary of Ramrod Creek. The design of the final landform may be refined prior to the completion of mining once there is a better understanding of the overburden material characteristics.

Maxwell will consider the following items as part of the post-mining water management system:

- Verifying the continued use and suitability of existing dams or removing dams where they are not required in the final landform
- If required, reshaping dams in accordance with their intended use
- For dams which are to be retained, design drainage structures to capture runoff from catchment areas
- Erosion and sediment control measures will be installed where appropriate

6.2.3.2. Final Landform Construction: General Requirements

The post mining land use goal is to deliver a safe, stable, non-polluting and sustainable post-mining landform that is consistent with the surrounding natural topography. As an underground mine, the project would result in minimal changes to existing landforms. As far as is practical, Maxwell seeks to develop drainage features in the post-mine landform that mitigate erosion potential. These include:

- Incorporating natural landscapes into landform design rather than engineered structures.
- Reshaping areas to integrate seamlessly with adjacent landforms.
- Creating undulating landforms over predominately flatter areas.
- Redesigning drainage structures to appear less intrusive.
- Establishing a mix of gentle slope gradients and steeper slopes up to a maximum of 18 degrees.

Inspections of the landforms are conducted by Environmental personnel following rehabilitation to ensure the design is appropriate and landform stability is achieved to prevent erosion and create a suitable growth medium for vegetation.

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

The Maxwell UG Project will involve the pumping of CHPP rejects (including both coarse rejects and tailings) into the existing East Void via a dedicated pipeline. It is anticipated that approximately 22 million bank cubic metres of rejects will be produced over the life of the mine.

The CHPP reject material will be progressively emplaced in the East Void from the south to the north and will be disposed of below the estimated post-mining groundwater level. Historically, tailings were deposited at the northern end of the East Void during open cut operations at the Maxwell Infrastructure site.

The tailings will be confined by natural rock and spoil piles. Decant water from the CHPP rejects will be collected in sumps and pumped to a mine water storage dam for re-use. If required, decant water will be treated prior to use in the CHPP. Infrastructure for the transfer of CHPP rejects and decant water will be developed and relocated progressively over the life of the mine.

At the conclusion of mining operations, the tailings emplacement area will be capped (to a minimum of 2 m) and rehabilitated, unless consent for continued emplacement is granted. Maxwell will prepare a capping strategy prior to the emplacement of tailings for the Maxwell UG Project. The strategy will determine the appropriate capping depth and material to be used and any other geotechnical investigations required. The tailings emplacement area will be rehabilitated to pasture, consistent with SSD 9526.

CHPP rejects likely to be produced and disposed of in the East void are expected to be moderately to highly saline and have an acidic pH, most likely due to the presence of organic acids. Based on the coal characteristics it is expected that the rejects will typically be PAF with only a low capacity to generate acid (GEM, 2019). Rejects are expected to be enriched with arsenic (As), antimony (Sb) and selenium (Se) in

varying degrees and the contained Se is likely to be readily soluble (GEM, 2019). This is consistent with the geochemical characteristics of CHPP rejects generated by other mining operations targeting the Jerrys Plains Subgroup in the Hunter Valley (GEM, 2019). Maxwell would implement the following management measures for the emplacement of CHPP rejects:

- Ongoing geochemical characterisation of rejects throughout the life of the mine (including kinetic net acid generation testing) to confirm the geochemical lag period of the material.
- Surface alkali treatment to extend the geochemical lag period of the rejects or over-dumping with rejects within the geochemical lag period so that acid conditions do not develop during active dumping.
- The reject emplacement in the East Void would be designed to prevent the reactive rejects from oxidising and the salts from migrating to the revegetation layer.
- Water quality monitoring program for the East Void to include; pH, EC, alkalinity/acidity, sulphate (SO_4), As, Sb and Se.
- As areas within the East Void reach the final landform surface, they will be progressively capped and rehabilitated where practical.

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

The final landform design includes three final voids (the North, East and South voids). The North, East and South voids are currently being managed as part of the ongoing operations at the Maxwell Infrastructure sure and are used as water storages as part of the site water management system.

The voids themselves as well as the pit access are managed to be safe and stable through implementation of the *Ground or Strata Management Plan* which includes, amongst other things, regular inspections of low walls and highwalls. Any corrective action as advised by appropriately qualified person will be undertaken as required.

A potential hazard posed by the final void is impacts of final void water on groundwater quality. Modelling undertaken for both the Drayton Mine Extension Environmental Assessment and the Maxwell UG Project EIS showed that, similar to most mines in the Hunter Valley, the North, East and South voids, if left as open water bodies, will act as sinks to groundwater seepage. Evaporative losses from the void surface area will reach a balance with the overall influxes from rainfall, groundwater inflow and minimal surface runoff at an equilibrium level that is well below the pre-mining groundwater level.

The evaporative sink of the void will result in a continuing hydraulic grade to the void, which will ensure that there will be no outflow of water from the void. Surface contouring and bunding will minimise surface inflow to the void negating the potential for the voids to fill and overflow. The voids acting as a groundwater sink will prevent the migration of higher salinity void water away from the voids and reduce the risk of contaminating surrounding aquifers and waterways.

Groundwater drawdown and water quality monitoring of surrounding bores will be undertaken in accordance with the *Water Management Plan*. Results will be used to verify and calibrate the site water balance model. Indicative groundwater monitoring parameters are included in **Table 10.**

Long-term trends in standing groundwater levels, measured in the monitoring program will be compared to modelled predictions at least annually. Groundwater quality results from quarterly monitoring will be reviewed annually. Water levels in the voids will be surveyed on a monthly basis.

Table 10. Groundwater Monitoring Parameters

Monitoring Site	Parameter	Units	Frequency
Standpipes	Reduced standing water level	m AHD	Quarterly
	pH	-	
	Electrical conductivity	mS/cm	

Monitoring Site	Parameter	Units	Frequency
	Total dissolved solids	Mg/L	Annual
	Total suspended solids		
	Major Cations (calcium, magnesium, sodium)		
	Major anions (chloride, sulfate, carbonate, bicarbonate)		
	Total alkalinity		
	Dissolved metals (Al, As, B, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Se, Ag & Zn)		
	Total Metals (Al, As, B, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Se, Ag & Zn)		
Data loggers	Reduced standing water level	m AHD	Continuous (downloaded quarterly)
VWPs	Reduced standing water level	mAHD	Continuous (downloaded quarterly)

As vegetation establishes on rehabilitated areas, Maxwell will progressively develop drainage with the aim of minimising the long-term catchment areas of the mine voids as far as practicable.

6.2.3.5. Construction of Creek/River Diversion Works

As discussed in **Section 6.2.3.1** a key feature of the final landform is the diversion of the western rehabilitated area past North Void and into a tributary of Ramrod Creek. This proposed diversion drain would be constructed around the commencement of Stage 5 as part of the establishment of the long-term drainage plan. The design of the final landform may be refined prior to the completion of mining once there is a better understanding of the overburden material characteristics.

6.2.4 Growth Medium Development

All rehabilitation areas will be prepared for growth media as soon as reasonably practicable to allow the establishment of vegetation. A combination of topsoil, subsoil and ameliorants will be used for future rehabilitation.

Reshaping would be undertaken using dozers (or similar). Where possible, landform designs were modified to more natural landscapes, incorporating dams and natural drainage lines. Up to two metres of inert material would then placed on the reshaped areas that were assessed as being prone to spontaneous combustion.

Topsoil will be placed to approximately 100mm in depth. For older topsoil stockpiles, the topsoil may be analysed to understand the geochemistry prior to placement and weeds will be sprayed or manually removed. Soil ameliorants will be used to increase soil organic matter, improve soil nutrient levels and promote vegetation growth. Biosolids, which are a by-product of the wastewater treatment process, may be used on site as a soil ameliorant in pasture areas. Compost made up of garden organics and biosolids may be used as a soil ameliorant in some woodland areas. Where required, gypsum may also be applied at a rate of 5 tonnes per hectare.

Contour drains would be installed on rehabilitated slopes. All drains have a longitudinal gradient of 1 to 1.5 per cent. Deep ripping across the contour would also be undertaken on steeper slopes. Temporary sediment controls may also be used as an interim measure until vegetation has established.

Where appropriate, habitat trees and other habitat features such as ponds may be installed.

6.2.5 Ecosystem and Land Use Establishment

The establishment of appropriate flora species for targeted vegetation communities in rehabilitated areas and the management of existing flora across the site is essential to achieving mine closure objectives. Potential risks to achieving targeted vegetation communities during the ecosystem and land use establishment phase include:

- pre-established non-target vegetation communities;
- weed infestation during vegetation establishment;
- insufficient establishment of target species and limited species diversity;
- weather and climatic influences (e.g. drought, intense rainfall events, bushfire etc.);
- limited vegetation structural development and habitat for targeted fauna species; and
- damage to rehabilitation by overgrazing fauna (e.g. kangaroos, feral goats, etc.).

Control measures to manage risks associated with establishment of appropriate flora species and achieving mine closure objectives are detailed in the *Biodiversity Management Plan*.

Risks to achieving targeted vegetation communities are assessed through implementation of the flora monitoring program. The program includes BAM vegetation sampling which allows direct comparison to the NSW DPE Vegetation Information System. Monitoring also includes a review of recent aerial photography and an annual rapid walkover assessment to review vegetation cover, erosion and sediment control and any potential impacts to the rehabilitation, general vegetation, establishment of target species and weed cover.

The impact of weather and climatic influences is also assessed through monitoring and evaluation of monitoring trends will be used to determine if any poor ground cover and target species results are due to weather or other factors. Mitigation measures will be undertaken based on the outcomes of monitoring and include adjusting seed mixes, adjusting the time of seeding, weed management, selective thinning, grazing management and infill planting.

Seeding

Activities that could impact the successful germination of seed include poor seed preparation, inadequate seed mixes and seeding at the incorrect time of year. An exotic pasture seed mix or native woodland seed mix will be used to rehabilitate disturbed areas. The selection of vegetation would be consistent with SSD 9526 and based on flora species endemic to the local area.

Exotic pasture seed will be blended with on average 200 kilograms per hectare of fertiliser and applied with a tractor and seeder combination. Cover crop rates will be minimised to allow the establishment of perennial species. A typical exotic pasture seed mix is provided in **Table 11**.

Table 11. Typical Pasture Seed Mix

Species	Seeding Rate (kg/ha)
Millet or Oats	8
Kikuyu	3
Panic	3
Couch	4
Lucerne	2
White Clover	2
Barrel Medic	1

Species	Seeding Rate (kg/ha)
Burr Medic	1
Vetch	2
Phalaris	2
Cocksfoot	2
Kangaroo Valley Rye	3

The native woodland seed mix will be combined with a native grass mix (of up to 2 kilograms per hectare) and a non-persistent cover crop such as Oats (during Autumn/Winter) or Japanese Millet (during Spring/Summer) and applied by hand seeding. Native species that require heat treatment to break dormancy mechanisms will be treated with either boiling or smoke water. Where appropriate, seed will be chemically treated to limit ant predation and inoculated with mycorrhiza to promote faster establishment. Suitable native tube stock will also be planted if in-fill planting is required.

Seed mixes may be modified, to target species that are more likely to germinate and successfully grow using the methods and equipment available. Species endemic to the local area will be preferentially used, except where seed supply is a limiting factor. In this case, other appropriate species that have performed well in the region will also be considered.

Seed collection may be undertaken during vegetation clearing activities or in accordance with the *Biodiversity Management Plan* and used for rehabilitation and revegetation activities.

A typical native woodland seed mix is provided in **Table 12**.

Table 12. Typical Native Woodland Seed Mix

Species	Seeding Rate (kg/ha)
Millet or Oats	7.0
Cynodon dactylon	3.0
Atriplex semibaccata	0.1
Calotis lappulacea	0.0
Einadia hastata	0.1
Einadia trigonos	0.1
Enchylaena tomentosa	0.1
Hardenbergia violacea	0.1
Cassinia enant a	0.1
Indigofera australis	0.1
Senna artemisioides ssp zygophylla	0.2
Acacia decora	0.2
Acacia falcata	0.2

Acacia deanei	0.1
Acacia filicifolia	0.1
Dodonaea viscosa	0.2
Allocasuarina littoralis	0.2
Acacia implexa	0.2
Acacia salicina	0.2
Eucalyptus blakelyi	0.1
Eucalyptus crebra	0.1
Corymbia enant ea	0.3
Native Grass Seed Mix	
Aristida mix (includes A. enanta, A. vagans)	2.0
Austrodanthonia mix (includes A. setacea, A. fulva, A. caespitosa)	
Austrostipa scabra	
Austrostipa verticillata	
Bothriochloa macra and B. decipiens	
Dichelachne micrantha	
Chloris truncata	
Cymbopogon refractus	
Dicanthium sericeum	
Microleana stipoides	
Panicum effusum	
Eragrostis sp.	
Elymus scaber	
Digitaria sp.	
Sporobolus creber	
Themeda triandra	
Chrysocephalum apiculatum (herb)	

Revegetation

Supplementary planting and replacement planting will occur during the optimal seasonal conditions to ensure maximum plant retention. This is likely to be autumn (March to April) and spring (September to October), as temperatures are cooler and rainfall is higher but may be year-round, depending on local weather conditions in the months prior to planting.

Newly planted tube stock may be accompanied with tree guards to protect the fresh foliage from predation, and from possible spray drift resulting from maintenance weeding operations. Follow up watering may be undertaken depending on the climatic conditions.

Native plant species to be planted would be selected on a site-by-site basis, depending on nearby remnant vegetation associations, soil types, aspect and site conditions. The species selected would aim to establish vegetation that reflects the composition and structure of vegetation communities present in the area.

Weed Management

A total of 85 weed species including 14 species, were recorded on site during a baseline flora assessment for the Maxwell UG Project EIS. A list of the I species and their control mechanisms and timing are provided in **Table 7**. Weeds were relatively evenly distributed across the site which means that it is unlikely that there would be any dispersal of species that were not already present in the surrounds. The potential impacts from the site to surrounding native vegetation is therefore considered to be low. There is potential for construction activities to spread weeds during soil disturbance and vehicle movements.

Table and results from the flora monitoring will be used to guide weed management activities on site. An annual weed control program will be prepared each year and will include spraying, cut and paint, slashing, grazing and manual removal techniques.

Table 13. Control and Timing forIE Weed Species Recorded on Site

Species	Common Name	Control Mechanism	Timing
Galenia pubescens	Galenia	Foliar spray	Mid-Spring through to mid-Autumn
Bidens pilosa	Cobblers Pegs	Foliar spray	Warmer months
Carthamus lanatus	Saffron Thistle	Foliar spray	Late-Winter through to early-Summer
Senecio madagascariensis	Fireweed	Foliar spray	Late-Winter through to early-Summer
Xanthium occidentale	Noogoora Burr	Foliar spray	Warmer months
Xanthium spinosum	Bathurst Burr	Foliar spray	Warmer months
Opuntia humifusa	Eastern Pricky Pear	Foliar spray	All year
Opuntia stricta	Erect Prickly Pear	Foliar spray	All year
Juncus acutus	Spiny Rush	Foliar spray	Warmer months
*Cenchrus clandestinus**	Kikuyu Grass	Foliar spray, slashing or grazing	All year
Chloris gayana	Rhodes Grass	Slashing or grazing	All year
Hyparrhenia hirta	Coolatai Grass	Foliar spray	Warmer months
Paspalum dilatatum	Dallas Grass	Foliar spray, slashing or grazing	All year
Lycium ferocissimum	African Boxthorn	Cut and Paint or Foliar Spray	All year

** This species is considered a weed species within native vegetation however is considered suitable as an exotic pasture for grazing.*

6.2.6 Ecosystem and Land Use Development

Rehabilitated lands are actively managed to ensure rehabilitation is sustainable and can be demonstrated to have achieved the approved rehabilitation objectives, completion criteria and the final landform. Based on outcomes of the rehabilitation monitoring program the following management and maintenance activities may be undertaken:

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

Information from the monitoring program will also be used to refine closure criteria and modify rehabilitation procedures as required. This program will continued as required until it can be demonstrated that the rehabilitation meets relevant completion criteria.

6.2.6.1. Long Term Landform Stability

In January 2022, landform evolution modelling was undertaken by SRK using CAESAR-Lisflood to predict the erosion and deposition as a result of run-off from the waste emplacements. The landform evolution modelling was run using a 1,000-year synthetic hourly precipitation record and considering two vegetation scenarios (defined as either ‘successful’ or ‘failed’ vegetation). Results of the Landform evolution modelling showed that the predicted erosion rates were relatively low because the landform was characterised by relatively shallow short slopes controlled by contour banks and surface water management structures.

The adequacy of the installed surface water management structures was also assessed by SRK. This assessment included a hydrological assessment (using Hydraulic Engineering Centre River Analysis System) and a desktop study of available information. The results of the assessment of the surface water management structures showed that based on ‘typical’ dimensions adopted for each channel, most of the structures (11 out of 12) have sufficient capacity to pass the 1% annual exceedance probability (AEP) event. However, given the inconsistent as-constructed geometry along the structures, the results indicate that most (9 out of 12) of the structures are likely to overtop to some extent in the 1% AEP event.

A key finding of the SRK LEM included identification of several key erosion areas (referred to as areas of concern) for which some preliminary recommendations were made. These areas were caused by several different mechanisms which were identified by SRK based on the failure patterns including exceeding the available flow capacity in lined drains, increase in shear stresses of rock armouring, lined drains discharging into unlined areas, large catchments, convergent slopes, and failed contour banks. These areas of concern are further discussed below.

In May 2023, a further assessment was undertaken by WSP to verify the current landform erosional performance. The WSP Assessment Report found that the measured values were comparable to the SRK LEM outputs, in that the vegetated rates in the short term do appear to be of a similar order of magnitude to the predicted rates for 10 years, although probably tending to an average of around 4 t/ha/year rather than 2.2 t/ha/year.

The WSP Assessment Report proposes the following remedial works are undertaken to address the areas of concern:

- Diversion of surface water away from the North Void highwall and reduction in the volume of water reporting to the erosion point.
- Re-directing the contour banks at the East Void to flow towards the rock structure to the west and re-shaping (where possible) and seeding the eroded slope.
- Geomorphic landform designs have been generated for the older rehab area above the Southern Void and involves the removal and reconstruction of contour banks whilst minimising the impact on areas that are already well vegetated and stable.

An implementation schedule for this work is provided in **Table 14**.

The WSP Assessment Report also found that Drains ID 5, 7, 8, 9, and 10 need to be widened due to the rock size being inadequate for the current drain width and computed peak flows. The widening will reduce the required flow depth to below the minimum estimate depth in all cases except for drain ID5. Therefore, ID5 does not require widening. Maxwell proposed to undertake the work using an excavator to widen and box the drain prior to rock placement taking care to ensure that the outer edges of the drain remain at the same elevation. This may require widening of both sides in some instances, or just on the upstream side in others. The new rock will also need to be integrated properly with the existing lining. An implementation schedule for this work is provided in **Table 14**.

Further, testing of the rock material also found that the rock was generally competent, although localized weathering of some fractions can be expected. WSP noted that this has also been observed in the field. Indications are that the percentage of rock that will weather excessively should be low, however ongoing monitoring of the rock will be continued over the next few years to substantiate this. To assess the adequacy of the rock sizes in the drains, two approaches were undertaken by WSP:

- the mean rock size was computed using a Wolman count at 36 transects across the site, with an average of three transects per drain.
- Secondly, the options to address concerns around the rock sizing for each of the drains was undertaken using the mean rock size computed from the Wolman count.

It was found that the average size of the rock in the drains is relatively consistent with the D50 ranging between 200mm and 400mm with a consolidated average of all transects of 300mm. This aligns with the values used by SRK in their assessment.

Further quantification work, monitoring and field inspections were also recommended as part of the WSP Assessment Report and have been included in **Table 14**.

Table 14. Implementation Schedule

Item	Description	Timing
1	Widening of drains ID 7 and 8 and 9.	Completed in FY24
2	Widening of drains ID 10.	FY25
3	Diversion of surface water away from the Northern Void highwall and reduction in the volume of water reporting to the erosion point.	Completed in FY24
4	Re-directing the contour banks at the East Void to flow towards the rock structure to the west and re-shaping (where possible) and seeding the eroded slope.	Completed in FY24
5	Removal and reconstruction of contour banks the older rehab area above the Southern Void whilst minimising the impact on areas that are already well vegetated and stable.	Completed in FY24
6	Future erosion quantification work to see if erosion rates trending lower, and whether rills identified in the current work have stabilised or require additional work. This will also allow the performance of the planned improvements to the old rehabilitation areas to be reviewed.	FY24
7	Possible extension of the erosion quantification to check the extent of sediment build up in the contour banks using the current survey as a comparison of available freeboard.	FY24

Item	Description	Timing
8	Ongoing assessment of rock weathering using the 36 transects. The extent of additional weathering will be determined by repeating the Wolman count and noting if the average rock size has changed significantly, and visual inspection of photos of the rock from different dates.	Ongoing
9	Field inspections in support of the above, both to validate any areas of concern identified and to assess the overall performance of the rehabilitation.	Ongoing
10	Monitoring the performance of areas potentially impacted on by spontaneous combustion (such as where the sulphur smell was noted on site associated with poor vegetation uptake).	Ongoing

6.3 Rehabilitation of Areas Affected by Subsidence

The Subsidence Monitoring Program will describe the monitoring against performance measures and the remediation approach for any predicted subsidence impacts. If subsidence monitoring or inspections indicate there are impacts related to subsidence the following management measures will be enacted:

- Investigation of the cause of subsidence impacts;
- Liaison with relevant stakeholders;
- Assessment of monitoring data;
- Continuation of monitoring data and inspections;
- Reporting as per the Extraction Plan;
- Implement specific mitigation measure to rectify the
- Final liaison with relevant stakeholders and the Resource Regulator.

7 PART 7 - REHABILITATION QUALITY ASSURANCE PROCESS

The rehabilitation quality assurance process addresses the key actions and processes for each of the rehabilitation phases throughout the life of the mine. The purpose of the process is to

- implement the rehabilitation in accordance with the nominated methodologies; and
- identify risks to rehabilitation before proceeding to the next phase of rehabilitation.

Table 15. Rehabilitation Quality Assurance Process

Phase	Key Quality Assurance Steps	Responsible	Documentation	Review Process
Active Mining	Pre-clearance surveys. Topsoil test pits. Inspections of erosion and sediment controls. Weed management programs. Routine and ad-hoc inspections and monitoring.	HSEC Manager Construction Manager	Ground disturbance permits. Topsoil inventory. Weed spraying records. Inspections	Process reviewed annually or following an incident.
Decommissioning	Inspections and demolition reports to confirm all infrastructure has been removed. Validation testing to ensure any contamination has been appropriately remediated and/or removed.	Infrastructure Manager	Decommissioning reports Contamination assessments Waste disposal records	Process reviewed annually or following an incident.
Landform Establishment	Survey and preparation of as-constructed drawings of final constructed slopes, landforms and water drainage structures.	Mine Manager	Mine plans Survey records	Process reviewed annually or following an incident.
Growth Medium Development	Topsoil testing. Ameliorants applied as required. Inspections of erosion and sediment controls. Weed management programs. Routine and ad-hoc inspections and monitoring. Recording depths of ripping and rehabilitation. Inspection to confirm growth medium materials have been	HSEC Manager Mine Manager	Topsoil analysis Delivery records Inspections Weed spraying records. Rehabilitation sign-off form	Process reviewed annually or following an incident.

Phase	Key Quality Assurance Steps	Responsible	Documentation	Review Process
	applied appropriately prior to application of seed and/or tubestock			
Ecosystem and Land Use Establishment	Verification of correct seed mix/plant species and application area prior to seeding. Seeding and planting activities. Weed and feral pest management. Water monitoring. Rehabilitation monitoring.	HSEC Manager	Seed and plants lists. Inspections Weed spraying records. Feral pest management records. Surface water monitoring results. Rehabilitation sign-off form Ecological monitoring reports	Process reviewed annually or following an incident.
Ecosystem and Land Use Development	Weed and feral pest management. Water monitoring. Rehabilitation monitoring.	HSEC Manager	Inspections Weed spraying records. Feral pest management records. Surface water monitoring results. Ecological monitoring reports.	Process reviewed annually or following an incident.

8 PART 8 - REHABILITATION MONITORING PROGRAM

8.1 Analogue Site Baseline Monitoring

Sites located in offset areas are used as a reference site to measure remnant vegetation and fauna habitat in areas not likely to be impacted by mining. These sites are referenced against the woodland rehabilitation to provide ecological targets for ecosystem integrity and species diversity. Monitoring is undertaken annually, with each site monitored every second year. BAM vegetation sampling is undertaken enantat seven reference and 18 rehabilitation sites. Sites are representative of Ironbark-Spotted Gum-Grey Box Woodland, Narrow-leaved Ironbark Woodland and Forest Red Gum Woodland. Flora monitoring is discussed further in Section 8.3.4.

Fauna monitoring is undertaken every second year at reference sites 1b, 1c, 3a, 3c, 5a and 10d. Fauna monitoring methods are discussed further in Section 8.3.5.

8.2 Rehabilitation Establishment Monitoring

8.2.1 Walkover Inspection

An annual rapid walkover inspection will be undertaken at each flora monitoring site. For each site, a review of recent aerial photography will be undertaken to determine target areas for the on-ground walkover inspection. The aerial photography review targets vegetation cover, erosion and sediment control and any potential impacts to the rehabilitation. The on-ground assessment targets general health of the vegetation, establishment of target species, weed cover, impacts from pest animals and erosion and sediment control.

8.2.2 Landform Stability Monitoring

Landform stability monitoring will be undertaken on areas of mine rehabilitation at least every five years. Monitoring will look to identify any significant areas of active erosion and will include a review of aerial photography and an inspection of rehabilitated areas across the site.

8.2.3 Post Rainfall Inspections

Site drainage and sediment control structures will be inspected following rainfall greater than 25 mm in 24 hours to check for scouring of diversion drains (and their outlets) and accumulation of sediment in sediment traps (including sediment fences, sediment basins, etc.). All sediment controls will be maintained in accordance with the Blue Book.

8.2.4 Spontaneous Combustion Inspections

Spontaneous combustion inspections will be undertaken on areas where:

- Smoke or steam emissions from spontaneous combustion are evident or have been evident within the previous twelve months; or
- Spontaneous combustion remediation works have been undertaken in the previous twelve months.

Inspections will be undertaken shortly after daybreak, to reduce interference from the heating of the surface from the sun. Barometric pressure, wind speed, wind direction and temperature at the time of the inspection will be recorded. The following will be recorded for each area inspected:

- A unique identifier.
- The approximate surface area in square metres exhibiting smoke or steam emissions.
- Classification of the intensity of the outbreak.
- The approximate location, classification and surface area affected on a site plan.
- A photograph using a thermal camera (where appropriate).

A summary of actions taken to prevent the development or to control the spread of spontaneous combustion and the effectiveness of such actions will also be recorded.

8.2.1 Pest Animal monitoring

Pest animal monitoring is undertaken during fauna monitoring site. A search for evidence of pest animals is undertaken throughout the 20 m by 50 m monitoring plot, targeting scats, tracks, diggings, prey carcass and/or bones. Pest animal sightings are also recorded throughout the year and results are reviewed as part of the pest animal monitoring and to assist with the implementation of any control programs (i.e. baiting or trapping).

8.3 Measuring Performance Against Rehabilitation Objectives and Rehabilitation Completion Criteria

Rehabilitation monitoring is undertaken to compare progress against rehabilitation objectives and completion criteria. The monitoring program includes topsoil analysis, land and soil capability assessment, feed sample analysis, landform stability monitoring, post rainfall inspections, spontaneous combustion inspections, walkover inspections and flora and fauna monitoring.

Flora monitoring is undertaken at 25 sites including representative rehabilitation sites (located in both pasture and woodland rehabilitation) and reference sites established in remnant woodland vegetation (i.e. not disturbed by mining).

Fauna monitoring is undertaken at five reference sites and any woodland rehabilitation sites that have vegetation structure suitable to support fauna. Currently, fauna monitoring is undertaken at rehabilitation site 10d.

Flora and fauna monitoring sites are divided into two groups and monitored on alternative years. There are no reference pasture sites as historic pasture sites at Maxwell Infrastructure were seeded to exotic pastures for grazing. As an alternative, feed sample analysis will be undertaken on pasture rehabilitation sites to determine vegetation health.

As new areas of rehabilitation are completed, new rehabilitation monitoring sites will be established in consultation with an Ecologist. A full list of the flora and fauna monitoring sites is provided in **Table 16**.

Results from monitoring will be discussed in the Annual Review. Any remedial actions will be entered into the site corrective actions database where they are assigned to a role and given a recommended due date. Actions can only be closed out once sufficient evidence of completion is provided.

Table16. Monitoring Sites

Site Name	Monitoring Type	Vegetation Community/Target	PCT	General Location	Monitoring Group *
1a	Reference flora	Narrow-leaved Ironbark Woodland	1603	Wildlife Refuge	1
1b	Reference flora and fauna	Ironbark-Spotted Gum-Box Woodland	1604	Wildlife Refuge	2
1c	Reference flora and fauna	Ironbark-Spotted Gum-Box Woodland	1604	Northern Offset Area	1
3a	Reference flora and fauna	Forest Red Gum Woodland	1696	Wildlife Refuge	1
3b	Reference flora	Forest Red Gum Woodland	1696	Wildlife Refuge	2
3c	Reference flora and fauna	Forest Red Gum Woodland	1696	Northern Offset Area	2

Site Name	Monitoring Type	Vegetation Community/Target	PCT	General Location	Monitoring Group *
5a	Reference flora and fauna	Yellow Box-Grey Gum Woodland	622	Southern Offset Area	1
6a	Rehabilitation flora	Narrow-leaved Ironbark Woodland	1603	Southern Offset Area	1
7a	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	Southern Offset Area	1
7b	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	Southern Offset Area	2
8a	Rehabilitation flora	Forest Red Gum Woodland	1696	Southern Offset Area	1
8b	Rehabilitation flora	Forest Red Gum Woodland	1696	Southern Offset Area	2
9a	Rehabilitation flora	Yellow Box-Grey Gum Woodland	622	Southern Offset Area	1
10b	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	North Tip	1
10d	Rehabilitation flora and fauna	Ironbark-Spotted Gum-Box Woodland	1604	North Tip	2
10e	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	North Tip	1
11c	Rehabilitation flora	Exotic Pasture	N/A	North Tip	1
11d	Rehabilitation flora	Exotic Pasture	N/A	North Tip	2
11f	Rehabilitation flora	Exotic Pasture	N/A	South Tip	1
11g	Rehabilitation flora	Exotic Pasture	N/A	Central Tip	1
11h	Rehabilitation flora	Exotic Pasture	N/A	East Tip	1
11i	Rehabilitation flora	Exotic Pasture	N/A	East Tip	2
12a	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	Central Tip	1
12b	Rehabilitation flora	Ironbark-Spotted Gum-Box Woodland	1604	Central Tip	2
12c	Rehabilitation flora	Exotic Pasture	N/A	South Tip	2

** Represents alternating years for monitoring.*

8.3.1 Topsoil Analysis

Topsoil analysis will be undertaken at each rehabilitation monitoring site at least every five years. Soil will be analysed for

- pH
- Electrical Conductivity
- Cation Exchange Capacity
- Exchangeable Sodium Percent
- Total Organic Matter
- Plant growth limiting factors (Molybdenum, Nickel, Iron, Manganese, Copper, Boron, Zinc)
- Available Phosphorus
- Available Nitrogen
- Available Potassium
- Available Sulphur

Results will be compared against the recommended soil standards from the NSW DPI to confirm that the growth media is not likely to inhibit the sustainable development of a vegetative cover.

8.3.2 Land and Soil Capability Assessment

A land and soil capability (LSC) assessment will be undertaken for areas of mine rehabilitation at least every five years. The assessment will consider hazards associated with water erosion, wind erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and mass movement. Each hazard is given a rating between 1 (best, highest capability land) and 8 (worst, lowest capability land). The final LSC class of the land is based on the most limiting hazard. An agronomist will be engaged to assess the LSC with the aim of achieving a LSC suitable for the intended final land use.

8.3.3 Feed Sample Analysis

Feed sample analysis will be undertaken on pasture rehabilitation prior to and during grazing activities to monitor pasture health and assist with determining the carrying capacity of the land. Analysis will be undertaken using the NSW DPI Feed Sample Submission Form and include:

- Dry matter
- Ash content
- Total Nitrogen and crude protein
- Neutral detergent fibre
- Acid detergent fibre
- Dry matter digestibility
- Metabolisable energy
- Water soluble carbohydrates

Results will be incorporated into relevant grazing management plans.

8.3.4 Flora Monitoring

Flora monitoring at both rehabilitation and reference sites will be undertaken during Spring each year using BAM vegetation sampling, as outlined in the BAM Operation Manual (OEH 2018a). This method allows for direct comparison of results to the Bionet Vegetation Information System database. BAM determines scores based on entering data for each site on Compositional, Structural and Functional attributes values into the BAM Calculator (OEH 2018b). The calculator references the data against the target Plant Community Type (PCT). An Integrity Score is generated which indicates the difference between the sites attribute scores with those of the target PCT. A score of 100 for an Integrity Score indicates that a site has achieved the benchmark conditions determined for the target PCT. A score of 50 indicates a site provides 50 percent of the benchmark attributes, or difference from the benchmark, determined for the target PCT.

The following data will be collected at each monitoring plot location:

- BAM Compositional, Structural and Functional attributes:
    - Compositional: the number of native plant species (richness) observed within a 20m x 20m plot. Each species must be allocated to a growth form group (tree/shrub/grass/forb/fern) and determined as native, exotic, or high threat exotic.
    - Structural: an estimate of the foliage cover for each native and exotic species present within a 20m x 20m plot.
    - Functional: the number of large stems, stem size class, tree regeneration, length of logs and litter cover.
- Photographs – An image at the start and end of each monitoring transect was captured to compare with photographs from previous years.
- Erosion –The extent of any erosion present and comparison to previous photos taken at the site.
- Spontaneous Combustion – inspections for visible spontaneous combustion or spontaneous combustion impacts on vegetation (e.g. phyto-toxicity).
- Record flowering/fruiting resources, habitat features and water resources.
- The following will be undertaken for pasture rehabilitation:
    - At 1 m intervals along the 50 m transect measure presence/absence of target pasture species (percent cover of target pasture species); and
    - Calculate the number of perennial species per square metre at four random 1 m x 1 m plots.

Sampling involves a plot design as shown in Error! Reference source not found. where BAM parameters are recorded within a permanent 20 m x 50 m plot, with a nested 20 m x 20 m plot. Star pickets or marker pegs are established at both the start and end of a centre transect and photographs taken from each end.

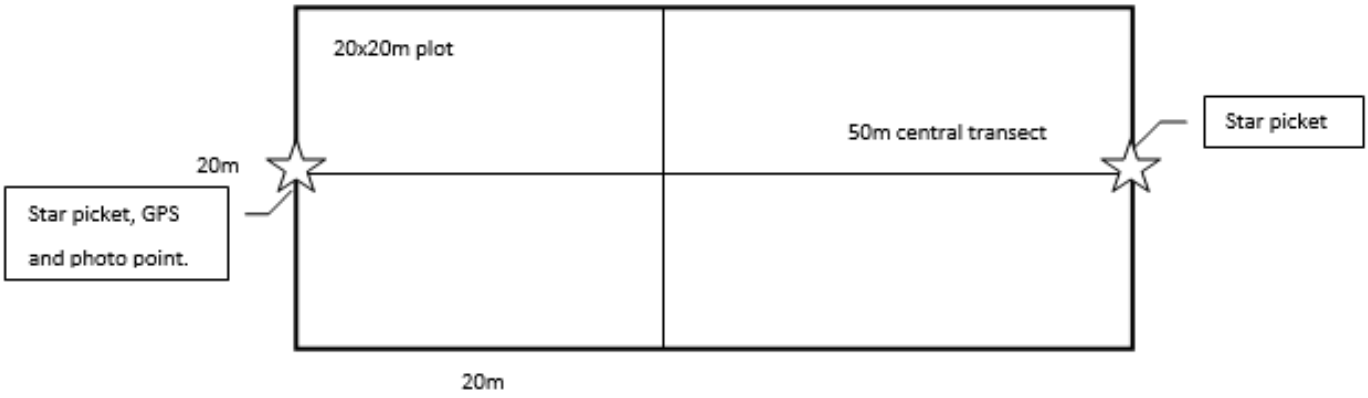

Figure 2. Vegetation monitoring plot layout

8.3.5 Fauna Monitoring

Fauna monitoring is undertaken at five reference sites and any woodland rehabilitation sites that have vegetation structure suitable to support fauna. Currently, fauna monitoring is undertaken at rehabilitation site 10d. Fauna monitoring includes:

- Diurnal bird surveys – Bird surveys undertaken at each fauna monitoring site for 20 minutes, between 6pm and 8pm. Following the initial 20-minute listening period, each new species identified triggers a further five minutes of survey effort.
- Herpetological surveys – Targeted surveys for reptile and amphibian species are undertaken at each fauna monitoring site over a 20-minute period. Surveys involve searching through likely habitat within 2 hectares of the flora monitoring site. Searches include watching for individuals basking, under rocks and logs, in the bark of trees, around water bodies and in man-made features.
- Nocturnal surveys – Spotlighting surveys targeted nocturnal mammals, birds and herpetofauna within 2 ha of the flora monitoring site. Searches are undertaken over a one-hour period on foot using a handheld spotlight. Species are identified based on visual observations or vocal calls.
- Remote camera surveys – Remote camera surveys target mammal species. One remote camera is installed at each fauna monitoring site for 14 days.

- Micro-bat echolocation recording – Recording of micro-bat echolocation calls are conducted over two nights at each of the fauna monitoring site.

9 PART 9 - REHABILITATION RESEARCH MONITORING AND TRIALS

9.1 Current Rehabilitation Research, Modelling and Trials

9.1.1 Native Grass Trial

A native grassland establishment trial was undertaken at the Maxwell Infrastructure site during 2013. The trial involved seeding a small area with locally collected grassland species. The seed mix was dominated by Red Grass (*Bothriochloa macra*) and Queensland Bluegrass *(Dichanthium sericeum*). The trial was monitored throughout 2013 and determined to be unsuccessful due to poor germination. The area was re-inspected during 2018 and is now showing to be dominated by native grasses, particularly Lobed Bluegrass (*Bothriochloa biloba*) and Queensland Bluegrass. Given the success of the trial, Queensland Bluegrass which is a warm season perennial grass palatable to livestock, was added into the existing pasture mix during 2018 and applied to a 24 hectare parcel of land that was rehabilitated. Monitoring of the area will continue to determine if the Queensland Bluegrass should be included in other pasture areas.

9.1.2 GeoFluv^{TM} Trial

During 2013, an area of 11.5 ha of mine rehabilitation was undertaken based on designs provided by the GeoFluvTM natural landform software. The design included four main channels with six side channels to drain water from the slope. The area, which was seeded with native shrubs and a cover crop, has high erosional stability and now contains a dense cover of grass species. Opportunities to utilise this approach on the remaining areas of rehabilitation at the Maxwell Infrastructure site were not available due to restrictions forced by the available dump area. However, where possible, landforms have been designed to create topographies that blend into the surrounding natural landscapes (micro relief).

9.1.3 Horse Grazing Trial

In August 2014, several horses were introduced into a 16 hectare paddock of pasture mine rehabilitation. The trial was designed to determine whether any negative impacts to horse health would occur when grazing in close proximity to active mining operations. Flora monitoring was also undertaken to measure the response of the pasture to grazing. Outcomes of the trial included:

- There were no signs or symptoms of ill health, discomfort, restlessness or injury within any of the horses that inhabited the area;
- Horse condition and growth were not negatively impacted and there were no requirements to seek veterinary treatment;
- Monitoring of the grass feed in the paddock showed sustainable pastures with no requirement to supplementary feed; and
- There were no significant changes in species composition or abundance in vegetation.

Horses were removed from the paddock in April 2019 in preparation for cattle grazing as part of the trial described below.

9.1.4 Cattle Grazing Trial

In November 2018, Maxwell commenced a cattle grazing trial on a parcel of pasture mine rehabilitation. The trial involved bringing 50 head of cattle into the Maxwell Infrastructure to graze an area of 141 ha, of which approximately 53 ha was mine site rehabilitation. The trial was commenced after vegetation monitoring identified that the diversity of introduced and native grass species in this area was adequate for grazing. The trial aims to demonstrate that Maxwell can create a post mining landscape that is compatible with the surrounding landscape and capable of sustaining a productive land use. The grazing area was

expanded to include two additional rehabilitation paddocks in 2019. The trial will continue during the RMP term as Maxwell works towards relinquishment of the area.

10 PART 10 - INTERVENTION AND ADAPTIVE MANAGEMENT

10.1 Threats to Rehabilitation

A rehabilitation risk assessment was undertaken to identify and evaluate all potential risks to achieving the rehabilitation goal and the specific measures to be implemented to mitigate the risks.

10.2 Trigger Action Response Plan

The potential threats that are relevant to rehabilitation activities being undertaken have been considered in the rehabilitation Trigger Action Report Plan (TARP). The TARP describes the adaptive management process that would be implemented if a threat is identified during rehabilitation monitoring. In accordance with the Mining Regulation, the TARP does not need to be reproduced in full in the rehabilitation management plan. This is so lease holders can regularly review all aspects of risk management to continuously improve rehabilitation practices.

11 PART 11 - REVIEW, REVISION AND IMPLEMENTATION

The Annual Review is prepared in accordance with the Annual Review Guideline published by the DPE in October 2015. It fulfils the Annual Review requirements under the conditions of development consents SSD 9526, PA 06_0202 and DA 106-04-00 and the Annual Environmental Management Report requirements under the conditions of a mining titles CL 229, CL 395 and ML 1531.

The Annual Review is prepared and submitted to the relevant government agencies and made publically available on the Maxwell website (https://malabarresources.com.au/corporate-governance/). It provides an overview of the following:

- Rehabilitation activities undertaken each year.
- Summary of rehabilitation monitoring results and a comparison against previous years.
- Progress against RMP commitments.
- Results of rehabilitation audits and trials.
- Any non-compliances, incidents and corrective actions.
- Rehabilitation goals and commitments for the following year.

12 ACRONYMS

Term	Definition
A	Authorisation
AC	Alternating Current
AHD	Australia Height Datum
AMD	Acid and Metalliferous Drainage
Antiene MOD1	Drayton Rail Loop and Antiene Rail Spur (DA 106-04-00) Modification 1
ARI	Average Recurrence Interval
As	Arsenic

Term	Definition
BC Act	Biodiversity Conservation Act
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
CL	Coal Lease
CPT	Crossing Point Temperature
DC	Development Consent
DPE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EL	Exploration Licence
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act
EPL	Environment Protection Licence
FY	Fiscal Year
GDP	Ground Disturbance Permit
Ha	Hectares
THE	High Threat Exotic
HVEC	Hunter Valley Energy Coal
IPC	Independent Planning Commission
km/hr	Kilometres per hour
LC	Low Capacity
LSC	Land and Soil Capability
m	Metres
mm	Millimetres
m^2	Square metres
MAC	Mt Arthur Coal
Maxwell MOD1	Maxwell Underground Project (SSD 9526) Modification 1
Maxwell MOD2	Maxwell Underground Project (SSD 9526) Modification 2
MEA	Mine Entry Area

Term	Definition
MEG	Mining, Exploration and Geoscience
ML	Mining Lease
MLA	Mining Lease Application
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
MWOO	Mixed Waste Organic Outputs
NAF	Non-Acid Forming
NSW	New South Wales
OPC	Oil Pollution Control
PA	Project Approval
PAF	Potential Acid Forming
pH	Potential of Hydrogen
POEO	Protection of the Environment Operations Act
ROM	Run-of-mine
R70	Self-heating Rate
Sb	Antimony
Se	Selenium
SEARs	Secretary's Environmental Assessment Requirements
SHT	Self-heating Temperature
SO4	Sulphate
SSD	State Significant Development
STP	Sewage Treatment Plant
TARP	Trigger Action Response Plan
TSF	Tailings Storage Facility
UG	Underground
°	Degree

13 REFERENCES

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WRM Water & Environment Pty Ltd (2019) *Surface Water Assessment – Maxwell Project*.

WSP (2023) *Assessment Report of the Rehabilitated Landform and Surface Water Management Structures*

Approvals

Development Consent SSD 9526 Maxwell Underground Coal Mine Project

Development Consent 106-04-00 – Drayton Rail Loop and Antiene Rail Spur

Standards and Guidelines

AS NZS ISO 31000:2009 Risk Management – Principles and Guidelines

Australian and New Zealand Guideline for Fresh and Marine Water Quality (2018)

MDG6001 Guidelines for Permanent Filling and Capping of Surface Entries to Coal Seams

Roads and Other Vehicle Operating Areas Hazard Management Plan

Safe Work Australia (2019) *Code of Practice for Managing Risks of Hazardous Chemicals in the Workplace.*

Plans and Procedures

Aboriginal Cultural Heritage Management

Air Quality and Greenhouse Gas Management Plan

Biodiversity Management Plan

Community Complaints and Enquiries Procedure

Ground Disturbance Permit Procedure

Ground or Strata Management Plan

Noise and Blasting Management Plan

Rehabilitation Guidelines

Spill Response Procedure and Pollution Incident Response Management Plan.

Spontaneous Combustion Management Plan

Waste Management Procedure

Water Management Plan

14 APPENDIX 1

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A1	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B1	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B2	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B6	Landform stability	Land surface safe, stable and remediated to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	D4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	F2	Landform stability	Capped surface safe, stable and suited to post mining land use requirements.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	F1	Landform stability	Retained water features are safe, stable, non-polluting and suited to selected post mining use.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	F3	Landform stability	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	F4	Landform stability	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A1	Ecological rehabilitation	Tree and shrub establishment to facilitate development of native woodland vegetation.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A4	Ecological rehabilitation	Tree and shrub establishment to facilitate development of native woodland vegetation.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B1	Ecological rehabilitation	Groundcover vegetation established to support low intensity grazing.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B2	Ecological rehabilitation	Groundcover vegetation established to support low intensity grazing.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B4	Ecological rehabilitation	Groundcover vegetation established to support low intensity grazing.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B6	Ecological rehabilitation	Groundcover vegetation established to support low intensity grazing.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	D4	Ecological rehabilitation	Targeted vegetation communities are established.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A1	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A4	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B1	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B4	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	D4	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains 26 ha of self-sustaining native woodland ecosystem Narrow-leaved Ironbark Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation structure of the rehabilitation contains 26 ha of self-sustaining native woodland ecosystem Narrow-leaved Ironbark Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains 19 ha of self-sustaining native woodland ecosystem Spotted-Gum-Grey Box Open Forest Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation structure of the rehabilitation contains 19 ha of self-sustaining native woodland ecosystem Spotted-Gum-Grey Box Open Forest Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains 15 ha of self-sustaining native woodland ecosystem Forest Red Gum Open Forest and Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation structure of the rehabilitation contains 15 ha of self-sustaining native woodland ecosystem Forest Red Gum Open Forest and Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains 24 ha of self-sustaining native woodland ecosystem Yellow Box and Grey Gum Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	The vegetation structure of the rehabilitation contains 24 ha of self-sustaining native woodland ecosystem Yellow Box and Grey Gum Woodland.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Establish self-sustaining native woodland ecosystems as described in the document/s listed in condition A2(c) and in Table 5. The requirements in Table 5 apply to the Southern Offset Area only. Table 5: Southern Offset Area Requirements: Narrow-leaved Ironbark Woodland (26ha), Spotted-Gum-Grey Box Open Forest Woodland (19ha), Forest Red Gum Open Forest and Woodland (Hunter Lowland Redgum Forest EEC) (Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (15ha), Yellow Box and Grey Gum Woodland (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC) ((Identified vegetation communities must be established to a level that meets the listing criteria for the relevant EEC or CEEC as defined under the BC Act) (24ha), Rehabilitated woodland/pasture (4ha).	D4	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A1	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A1	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation community Central Hunter Grey Box-Iron Bark Woodland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A1	Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A1	Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation community Central Hunter Grey Box-Iron Bark Woodland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A1	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A4	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation community Central Hunter Grey Box-Iron Bark Woodland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A4	Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A4	Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation community Central Hunter Grey Box-Iron Bark Woodland found in the local area.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish local plant community types, with a particular focus on the CEECs listed in condition B50 of this Schedule. That is White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions CEEC, and (ii) Central Hunter Grey Box-Iron Bark Woodland in the NSW North Coast and Sydney Basin Bioregions CEEC.	A4	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish habitat, feed and foraging resources for threatened fauna species.	A1	Ecological rehabilitation	Establish habitat, feed and foraging resources for threatened fauna species including Pink-tailed Legless Lizard; Striped Legless Lizard; Swift Parrot; and Regent Honeyeater.
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish habitat, feed and foraging resources for threatened fauna species.	A4	Ecological rehabilitation	Establish habitat, feed and foraging resources for threatened fauna species including Pink-tailed Legless Lizard; Striped Legless Lizard; Swift Parrot; and Regent Honeyeater.
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Establish habitat, feed and foraging resources for threatened fauna species.	D4	Ecological rehabilitation	Establish habitat, feed and foraging resources for threatened fauna species including Pink-tailed Legless Lizard; Striped Legless Lizard; Swift Parrot; and Regent Honeyeater.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Facilitate local vegetation connectivity and wildlife corridors, particularly with respect to the adjacent Mt Arthur Coal Complex.	A1	Ecological rehabilitation	Woodland biodiversity corridor provides connectivity with surrounding woodland areas.
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Facilitate local vegetation connectivity and wildlife corridors, particularly with respect to the adjacent Mt Arthur Coal Complex.	A4	Ecological rehabilitation	Woodland biodiversity corridor provides connectivity with surrounding woodland areas.
SSD9526	Woodland Biodiversity Corridors, including the Southern Offset Area: Facilitate local vegetation connectivity and wildlife corridors, particularly with respect to the adjacent Mt Arthur Coal Complex.	D4	Ecological rehabilitation	Woodland biodiversity corridor provides connectivity with surrounding woodland areas.
SSD9526	Areas proposed for agricultural or pastoral use: Establish/restore grassland areas to support sustainable agricultural activities.	B1	Agricultural revegetation	Pasture vegetation and landscape able to support sustainable (low density) livestock grazing.
SSD9526	Areas proposed for agricultural or pastoral use: Establish/restore grassland areas to support sustainable agricultural activities.	B2	Agricultural revegetation	Pasture vegetation and landscape able to support sustainable (low density) livestock grazing.
SSD9526	Areas proposed for agricultural or pastoral use: Establish/restore grassland areas to support sustainable agricultural activities.	B4	Agricultural revegetation	Pasture vegetation and landscape able to support sustainable (low density) livestock grazing.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Areas proposed for agricultural or pastoral use: Establish/restore grassland areas to support sustainable agricultural activities.	B6	Agricultural revegetation	Pasture vegetation and landscape able to support sustainable (low density) livestock grazing.
SSD9526	Areas proposed for agricultural or pastoral use: Achieve land and soil capabilities that are suitable for the intended final land use.	B1	Agricultural revegetation	Achieve Land and Soil Capability Class 5 (moderate-low capability)
SSD9526	Areas proposed for agricultural or pastoral use: Achieve land and soil capabilities that are suitable for the intended final land use.	B2	Agricultural revegetation	Achieve Land and Soil Capability Class 7 (very low capability)
SSD9526	Areas proposed for agricultural or pastoral use: Achieve land and soil capabilities that are suitable for the intended final land use.	B4	Agricultural revegetation	Achieve land and soil capabilities that are suitable for the intended final land use.
SSD9526	Areas proposed for agricultural or pastoral use: Achieve land and soil capabilities that are suitable for the intended final land use.	B6	Agricultural revegetation	Achieve Land and Soil Capability Class 5 (moderate-low capability)
SSD9526	Areas proposed for agricultural or pastoral use: Located adjacent to surrounding agricultural land, where practicable.	B1	Agricultural revegetation	Locate areas proposed for agricultural or pastoral use adjacent to surrounding agricultural land, where practicable.
SSD9526	Areas proposed for agricultural or pastoral use: Located adjacent to surrounding agricultural land, where practicable.	B2	Agricultural revegetation	Locate areas proposed for agricultural or pastoral use adjacent to surrounding agricultural land, where practicable.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Areas proposed for agricultural or pastoral use: Located adjacent to surrounding agricultural land, where practicable.	B4	Agricultural revegetation	Locate areas proposed for agricultural or pastoral use adjacent to surrounding agricultural land, where practicable.
SSD9526	Areas proposed for agricultural or pastoral use: Located adjacent to surrounding agricultural land, where practicable.	B6	Agricultural revegetation	Locate areas proposed for agricultural or pastoral use adjacent to surrounding agricultural land, where practicable.
SSD9526	Final Landform: Stable and sustainable for the intended post-mining land use/s, Compatible with surrounding topography to minimise visual impacts, Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.	A1	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements. Tree and shrub establishment to facilitate development of native woodland vegetation.
SSD9526	Final Landform: Stable and sustainable for the intended post-mining land use/s, Compatible with surrounding topography to minimise visual impacts, Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.	A4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements. Tree and shrub establishment to facilitate development of native woodland vegetation.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Final Landform: Stable and sustainable for the intended post-mining land use/s, Compatible with surrounding topography to minimise visual impacts, Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.	B1	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements. Groundcover vegetation established to support low intensity grazing.
SSD9526	Final Landform: Stable and sustainable for the intended post-mining land use/s, Compatible with surrounding topography to minimise visual impacts, Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.	B4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements. Groundcover vegetation established to support low intensity grazing.
SSD9526	Final Landform: Stable and sustainable for the intended post-mining land use/s, Compatible with surrounding topography to minimise visual impacts, Incorporate relief patterns and design principles consistent with natural drainage that mimic natural topography and mitigate erosion.	D4	Landform stability	Land surface safe, stable and reshaped to meet post mining land use requirements. Targeted vegetation communities are established.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Final voids: Minimise to the greatest extent practicable: the size and depth; surface evaporation in void lakes; the drainage catchment; any high wall instability risk; and the risk of spillover into the downstream environment; the risk of flood interaction. Maximise potential for beneficial reuse, where practicable.	J2	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm or a safety risk to the public.
SSD9526	Steep slopes: No additional risk to public safety compared to prior to mining.	A4	Landform stability	Reshaped overburden emplacements safe and stable.
SSD9526	Steep slopes: No additional risk to public safety compared to prior to mining.	B4	Landform stability	Reshaped overburden emplacements safe and stable.
SSD9526	Community: Ensure public safety.	F4	Landform stability	Engineered water management structures established with appropriate vegetation providing stability and erosion protection with appropriate fencing and signage.
SSD9526	Final voids: Reject emplacements are suitably capped and rehabilitated.	B2	Management of waste and process materials	Residual waste materials stored on site (e.g. tailings and coarse rejects) will be appropriately contained so it does not pose any hazards or constraints for intended final land use.
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	A4	Management of waste and process materials	Risks to vegetation establishment from spontaneous combustion is monitored and managed.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	All areas of the site affected by the development: * Safe, stable and non-polluting. * Fit for the intended post-mining land use/s. * Achieve the final landform and post-mining land use/s.	B4	Management of waste and process materials	Risks to vegetation establishment from spontaneous combustion is monitored and managed.
SSD9526	Final voids: Designed as long term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final voids (see condition B79). B79(k): The Rehabilitation Strategy must include a post-mining land use strategy to investigate and facilitate post-mining beneficial land uses for the site (including the final void), that: (i) align with regional and local strategic land use planning objectives and outcomes; (ii) support a sustainable future for the local community; (iii) utilise existing mining infrastructure, where practicable; and (iv) avoid disturbing self-sustaining native ecosystems, where practicable.	J2	Groundwater	Impacts to groundwater regime are within range as per development consent/ pre-mining environmental assessment.
SSD9526	Surface infrastructure of the development: To be decommissioned and removed, unless the Resource Regulator agrees otherwise.	A1	Removal of infrastructure	Surface infrastructure of the development to be decommissioned and removed, unless the Resource Regulator agrees otherwise.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Surface infrastructure of the development: To be decommissioned and removed, unless the Resource Regulator agrees otherwise.	B1	Removal of infrastructure	Surface infrastructure of the development to be decommissioned and removed, unless the Resource Regulator agrees otherwise.
SSD9526	Surface infrastructure of the development: All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment.	B1	Agricultural revegetation	Surface infrastructure sites are to be revegetated with suitable plant species and to a landform consistent with the final land use of pastoral use.
SSD9526	Portals and vent shafts of the development: To be decommissioned and made safe and stable.	A1	Removal of infrastructure	Portals and vent shafts of the development to be decommissioned and made safe and stable.
SSD9526	Portals and vent shafts of the development: To be decommissioned and made safe and stable.	B1	Removal of infrastructure	Portals and vent shafts of the development to be decommissioned and made safe and stable.
SSD9526	Underground mining area (meaning the subsidence area): No decline in land and soil capability.	B6	Surface water	Achieve Land and Soil Capability Class 4 (moderate capability) or Class 6 (low capability)
SSD9526	Watercourses subject to mine water discharges and/or subsidence impacts or environmental consequences that are greater than negligible: Hydraulically and geomorphologically stable. Where remediation of watercourses is likely to cause subsidence impacts or environmental consequences greater than those that require rehabilitation, alternative equivalent works may be undertaken within the affected watercourse.	B6	Surface water	Watercourses subject to subsidence impacts or environmental consequences that are greater than negligible are hydraulically and geomorphologically stable. Where remediation of watercourses is likely to cause subsidence impacts or environmental consequences greater than those that require rehabilitation, alternative equivalent works may be undertaken within the affected watercourse.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Water quality: Water retained on the site is fit for the intended post-mining land use/s.	F1	Surface water	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	Water quality: Water retained on the site is fit for the intended post-mining land use/s.	F2	Surface water	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	Water quality: Water retained on the site is fit for the intended post-mining land use/s.	F3	Surface water	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	Water quality: Water retained on the site is fit for the intended post-mining land use/s.	F4	Surface water	Retained water features are safe, stable, non-polluting and suited to selected post mining use.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F1	Surface water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F2	Surface water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F3	Surface water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F4	Surface water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F1	Surface water	Water management is consistent with the regional catchment management strategy.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F2	Surface water	Water management is consistent with the regional catchment management strategy.

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F3	Surface water	Water management is consistent with the regional catchment management strategy.
SSD9526	Water quality: Water management is consistent with the regional catchment management strategy.	F4	Surface water	Water management is consistent with the regional catchment management strategy.
SSD9526	Final voids: Designed as long term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final voids (see condition B79). B79(k): The Rehabilitation Strategy must include a post-mining land use strategy to investigate and facilitate post-mining beneficial land uses for the site (including the final void), that: (i) align with regional and local strategic land use planning objectives and outcomes; (ii) support a sustainable future for the local community; (iii) utilise existing mining infrastructure, where practicable; and (iv) avoid disturbing self-sustaining native ecosystems, where practicable.	J2	Water approvals	Final voids are appropriately licensed (under the Water Management Act 2000) and where required sufficient licence shares are held in the water sources to account for water take

Development Consent Reference Number	Rehabilitation Objectives Sourced from Development Consent	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
SSD9526	Built features damaged by mining operations: Repair to pre-mining condition or equivalent unless the: owner agrees otherwise; or damage is fully restored, repaired or compensated for under the Coal Mine Subsidence Compensation Act 2017.	B6	Retention of infrastructure	Built features damaged by mining operations will be repaired to pre-mining condition or equivalent unless the owner agrees otherwise or damage is fully restored, repaired or compensated for under the Coal Mine Subsidence Compensation Act 2017.
SSD9526	Surface infrastructure of the development: To be decommissioned and removed, unless the Resource Regulator agrees otherwise.	A1	Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and/or licence, lease or binding agreement).
SSD9526	Surface infrastructure of the development: To be decommissioned and removed, unless the Resource Regulator agrees otherwise.	B1	Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and/or licence, lease or binding agreement).