RAVENSWORTH
OPERATIONS

GLENCORE

Ravensworth Operations Rehabilitation Management

Plan

Number: RAVOC-258458278-16258
Owner: Environment & Community Coordinator
Status: Approved
Version: 4.0
Effective: 18/05/2026
Review: 18/05/2029

Table of Contents

Summary Table

Name of mine		Ravensworth Open Cut Operations
Rehabilitation Management Plan commencement date		July 2022
Rehabilitation Management Plan revision dates and version numbers		Version 1. July 2022
		Version 2. July 2024
		Version 3. July 2025
		Version 4. May 2026
Mining leases	**Leaseholders**	**Mining Lease**
	Cumnock Management Pty Ltd	CL 378
		ML 1325
		ML1393
		ML 1576
		ML 1669
		ML 1683
		ML 1879
		A 385
	Ravensworth Operations Pty Limited	CCL 723
		CCL 739
		CL 380
		CL 580
		ML 1357
	Resource Pacific Pty Limited / AGL Macquarie Pty Limited	ML1484
		ML1485
Date of Submission		18 May 2026

1. Introduction to the Mining Project

Ravensworth Operations Pty Limited (Ravensworth Operations) is a coal mining operation located between the townships of Muswellbrook and Singleton in the Upper Hunter Valley region of New South Wales (NSW). Ravensworth Operations is comprised of the Ravensworth Open Cut (ROC) and the Ravensworth Coal Handling and Preparation Plant (RCHPP) and is a wholly owned subsidiary of Glencore Coal Assets Australia Pty Ltd (GCAA).

Ravensworth Operations is managed in accordance with the Project Approval (PA 09_0176) for the Ravensworth Operations Project (the Project), which was granted under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project consolidated a number of active and former open cut mines including Ravensworth West, Narama, Cumnock, Ravensworth South and Ravensworth No. 2. The Project also facilitated the expansion of open cut mining activities, including the new Ravensworth North mining area.

The RCHPP incorporates a coal handling and preparation plant (CHPP) and coal terminal. The RCHPP is used to beneficiate and transport coal extracted from Ravensworth Operations and previously, from Ravensworth Underground Mine (RUM).

Ravensworth Operations and RUM are collectively referred to as the Ravensworth Complex. RUM is managed under a separate development consent (DA 104/96) granted under the EP&A Act. RUM had been under care and maintenance since October 2014 and closure and decommissioning began in 2022. RUM has a separate Rehabilitation Management Plan (RMP).

RMP's are now required for all New South Wales (NSW) mine sites. Ravensworth Operations is classified as a 'Large Mine', with the RMP being in place as of 1 August 2022.

This RMP has been prepared in accordance with the *Form and Way Rehabilitation Management Plan for Large Mines (Resources Regulator, 2025*).

1.1 History of Operations

There is an extensive history of mining operations in the Ravensworth area. The Ravensworth South and Ravensworth No. 2 Mine commenced operations in the early 1970s. The Ravensworth No. 2 mine ceased coal production in 1987. Its mining areas were subsequently rehabilitated, and final voids are currently used by third parties for disposal of fly ash and tailings. Operations at Ravensworth South Mine ceased in 2000. The final voids were subsequently used for disposal of tailings associated with RUM.

Cumnock Mine commenced operations in the 1950s as an underground mine. Open cut mining was generally undertaken from 1993 until 2008; although mining in a small area known as the Wash Plant Pit continued until 2011. The Cumnock 3 final void is currently used for tailings emplacement whilst the Cumnock Void 1/2 Tailings Storage Facility (TSF) is scheduled for closure in the near future.

The Narama Mine and Ravensworth West Mine commenced operations in the early 1990s. Ravensworth West ceased operations in 2011 and Narama Mine completed coal mining in December 2014. Mining in the Ravensworth North mining area (approved by PA 09_0176) commenced in 2012 and will continue throughout the period of this RMP.

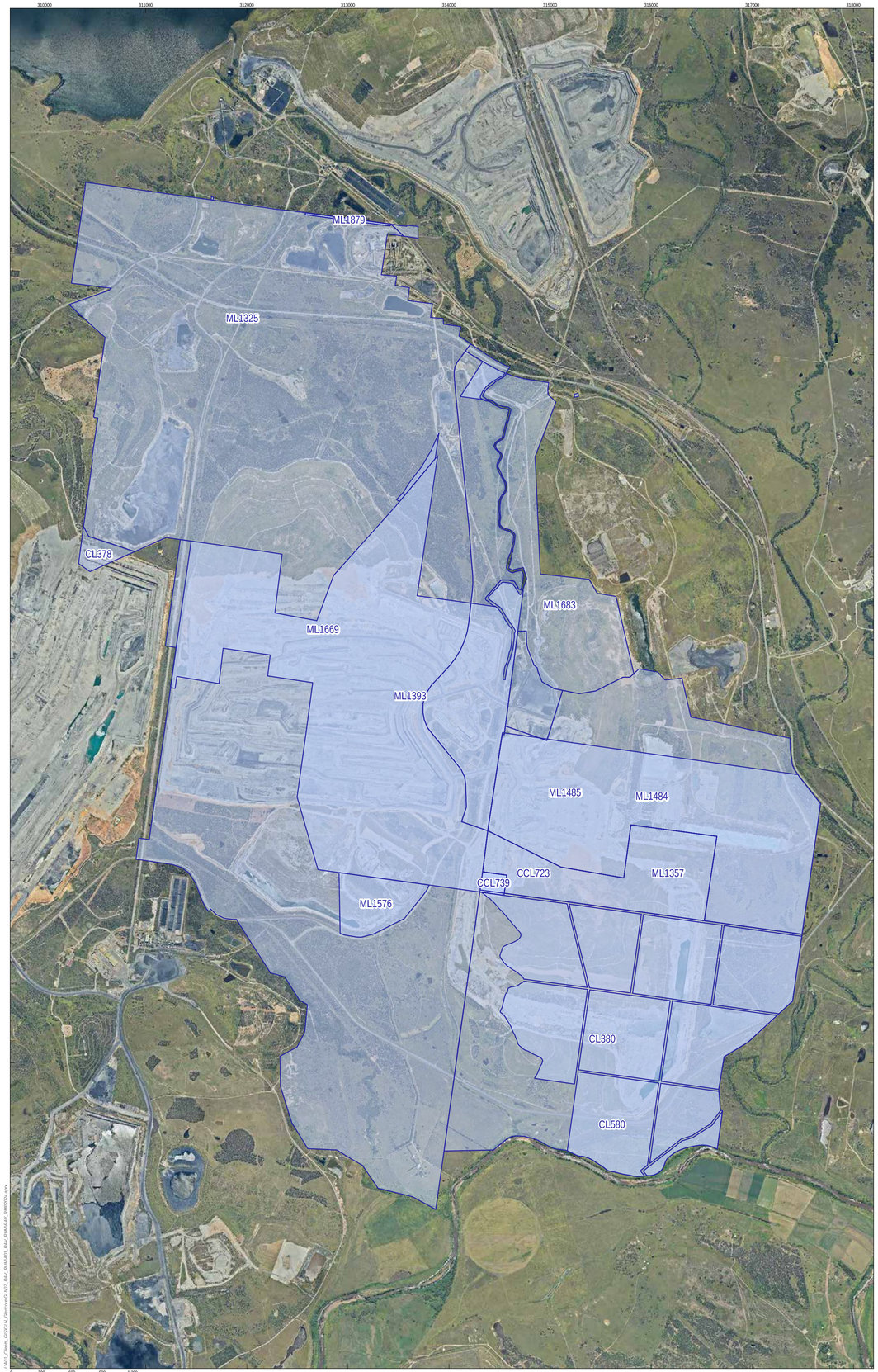
1.2 Current Development Consents, Leases and Licences

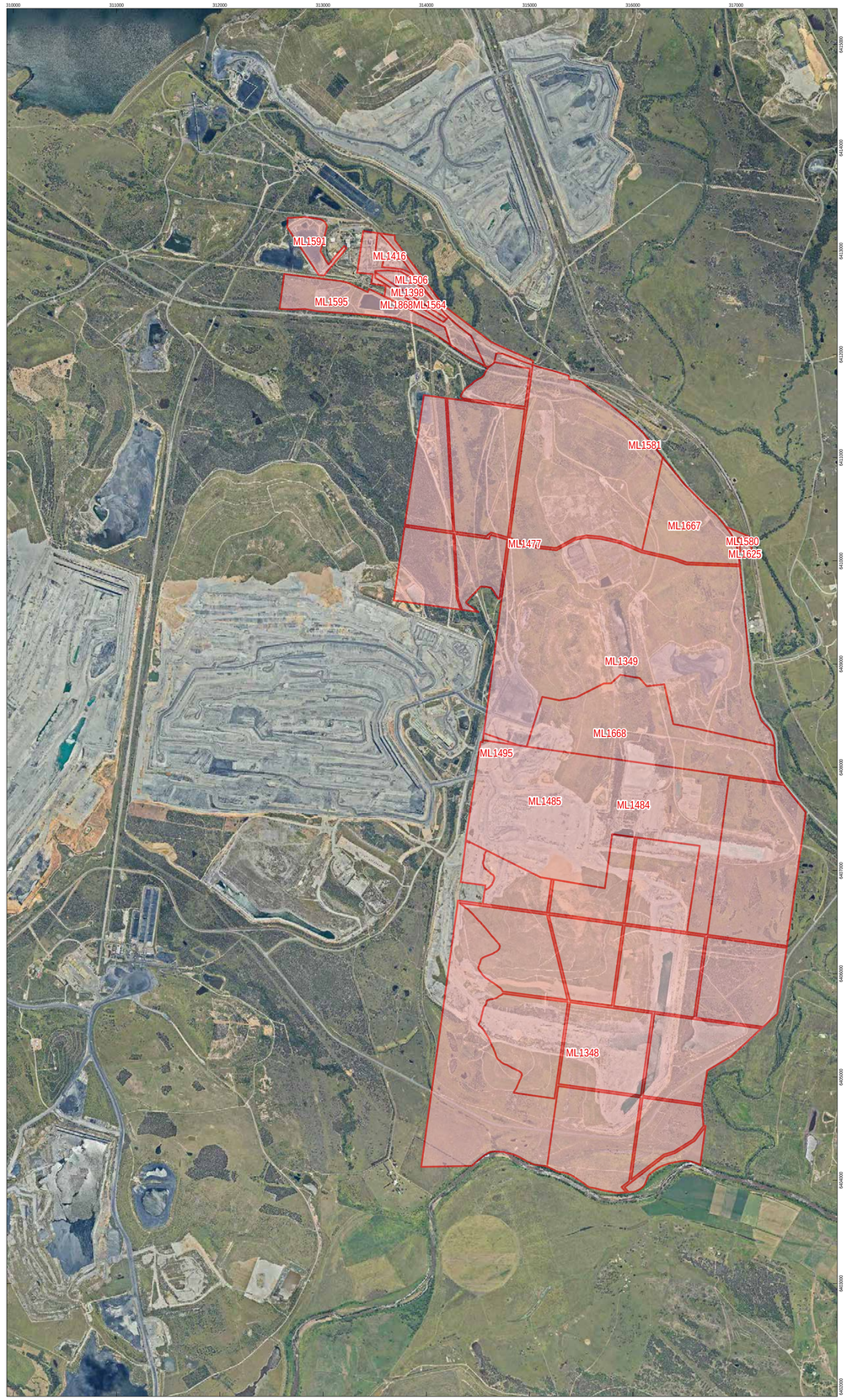
Current Development Consents, leases and licences are listed in Table 1-1 below. Lease boundaries are shown in **Figure 1A**.

Table 1-1 Summary of Approvals and Licences

Approval	Expiry Date	Description
PA 09-0176 (MOD 4)	31 December 2039	A modification (MOD4) was granted on 15 May 2023 for the construction and operation of a tailings pipeline from the RCHPP at Ravensworth Operations to Liddell Mine (also owned by a subsidiary of GCAA)
PA 09-0176 (MOD 3)	31 December 2039	A modification (MOD 3) was granted on 26 February 2016 to facilitate the construction of a tailings pipeline from RCHPP to the neighbouring Mount Owen Complex (also owned by a subsidiary of GCAA)
PA 09-0176 (MOD 2)	31 December 2039	A second modification (MOD 2) to PA 09_0176 was granted on 19 December 2014 to allow for an increase in overburden emplacement height to incorporate micro-relief into the final landform
PA 09-0176 (MOD 1)	31 December 2039	A modification (MOD 1) was granted on 16 August 2013 to facilitate the extraction of an additional 2.7 million tonnes (Mt) of run of mine (ROM) coal in the Narama West mining area.
PA 09-0176	31 December 2039	ROC Expansion Project Approval. authorises the expansion of open cut mining (including development of the Ravensworth North mining area) and an increase in coal production rates. The Project also consolidated the Cumnock, Narama and Ravensworth West mines under a single approval. The previous development consents for those mines were surrendered following the grant of PA 09_0176
Environment Protection Licence (EPL) 2652		EPL 2652 authorises the off-site discharge of surplus water via Licensed Discharge Point 2 (LDP002), located at the Narama In-pit Storage Dam
Environment Protection and Biodiversity Conservation Act Approval EPBC No. 2010/5389)	2040	States that a Mine Rehabilitation Management Plan for the progressive rehabilitation and revegetation of the project area should be prepared and approved by the Minister by 29 November 2013.
ML 1879	3 July 2045	The construction, maintenance or use (in or in connection with mining operations) of a road. 1.641 ha in size. ML held by Cumnock Management Pty Limited.

Approval	Expiry Date	Description
ML 1683	7 February 2034	ML held by Cumnock No.1 Colliery Pty Limited.
ML 1576	23 February 2027	ML held by Cumnock No.1 Colliery Pty Limited.
ML 1393	10 February 2027	ML held by Cumnock No.1 Colliery Pty Limited.
ML 1357	14 August 2036	ML held by Ravensworth Operations Pty Limited
ML 1325	9 September 2035	ML held by Cumnock No.1 Colliery Pty Limited.
ML 1484	31 January 2031	Resource Pacific Pty Ltd and AGL Macquarie Pty Ltd
ML 1485	17 August 2036	Resource Pacific Pty Ltd and AGL Macquarie Pty Ltd
Consolidated Coal Lease (CCL) 739	10 March 2029	CCL held by Ravensworth Operations Pty Limited
CCL 723	31 January 2045	CCL held by Ravensworth Operations Pty Limited
(Coal Lease) CL 580	31 December 2044	CL held by Ravensworth Operations Pty Limited
CL 380	23 September 2033	CL held by Ravensworth Operations Pty Limited
CL 378	10 March 2027	CL held by Cumnock No.1 Colliery Pty Limited.
A 385	2 June 2028	A held by Cumnock No.1 Colliery Pty Limited.
ML 1669	8 February 2033	ML held by Cumnock Management Pty Limited





LEGEND

- Ravensworth Operations Leases
- Ravensworth Underground Mine Leases

List of Leases

Ravensworth Underground Mine Leases

CODE	Title No.	ACT_YEAR	EXPIRY	TITLE_AREA
ML	1581	1992	21/05/2027	600 M2
ML	1348	1992	03/06/2033	701.8 HA
ML	1349	1992	31/12/2044	1931 HA
ML	1398	1992	10/02/2027	56 HA
ML	1416	1992	20/04/2039	5.703 HA
ML	1495	1992	1/10/2043	40.79 HA
ML	1580	1992	31/12/2044	2.93 HA
ML	1477	1992	30/11/2034	13.69 HA
ML	1506	1992	22/03/2044	7.838 HA
ML	1484	1992	31/01/2031	502.1 HA
ML	1485	1992	17/08/2036	375.2 HA
ML	1564	1992	31/07/2026	3.6 HA
ML	1591	1992	7/03/2028	13.92 HA
ML	1595	1992	4/05/2028	37.07 HA
ML	1625	1992	7/11/2029	1.647 HA
ML	1667	1992	31/12/2044	63.2 HA
ML	1668	1992	31/12/2044	243.8 HA
ML	1868	1992	23/11/2044	21.78 HA

Ravensworth Operations Leases

CODE	Title No.	ACT_YEAR	EXPIRY	TITLE_AREA
CCL	723	1973	31/01/2045	154.2 HA
CCL	739	1973	10/03/2029	4.5 HA
ML	1357	1992	17/08/2036	116.8 HA
CL	378	1973	10/03/2027	28.505 HA
CL	380	1973	23/09/2033	706.1 HA
CL	580	1973	31/12/2044	530 HA
ML	1325	1992	9/09/2035	5500 M2
ML	1393	1992	10/02/2027	753 HA
ML	1484	1992	31/01/2031	502.1 HA
ML	1485	1992	17/08/2036	375.2 HA
ML	1576	1992	23/02/2027	46 HA
ML	1669	1992	8/02/2033	2664 HA
ML	1683	1992	7/02/2034	383.3 HA
ML	1879	1992	3/07/2045	1.641 HA
ML	1879	1992	3/07/2045	1.641 HA

Ravensworth Operations

Figure 1A - Glencore RUM and Ravensworth Operations Leases

0 300 600 900 1,200
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Imagery: Glencore, February 2022

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1.3 Land Ownership and Land Use

Land ownership and land use within and surrounding Ravensworth Operations is shown on ***Figure 1B and C,*** with details provided in **Table 1-2** below. The area surrounding Ravensworth Operations is dominated by mining operations which are the major landholders within the area. GCAA and its subsidiaries own the majority of the land within the Project Area defined by PA 09_0176, with the other key landholders being AGL Macquarie, the Hunter Valley Operations Joint Venture (HVO JV) and Ashton Coal Operations Limited (ACOL).

Land at the RCHPP and Ravensworth North is owned by GCAA and its subsidiaries, while land at Narama is owned by GCAA and its subsidiaries, and AGL Macquarie. There is a formal agreement in place between Ravensworth Operations and AGL Macquarie regarding interactions between the two operations on AGL Macquarie owned land.

Land at the former Ravensworth West Mine is owned by GCAA and its subsidiaries. The land at the former Cumnock Mine is owned by GCAA and its subsidiaries, and HVO JV. The intended final land use for the former Cumnock Mine is native woodland, specifically using a seed mix to be similar to that found within a Central Hunter Grey Box Ironbark Woodland community.

The final land use at Ravensworth Operations will be predominantly returned to a woodland ecological community, interspersed with pasture which is to be consistent with PA 09_0176, which is comparable to the pre mining environment, consisting of a combination of pastoral land and native woodland.

Land ownership is summarised in **Table 1-2** below.

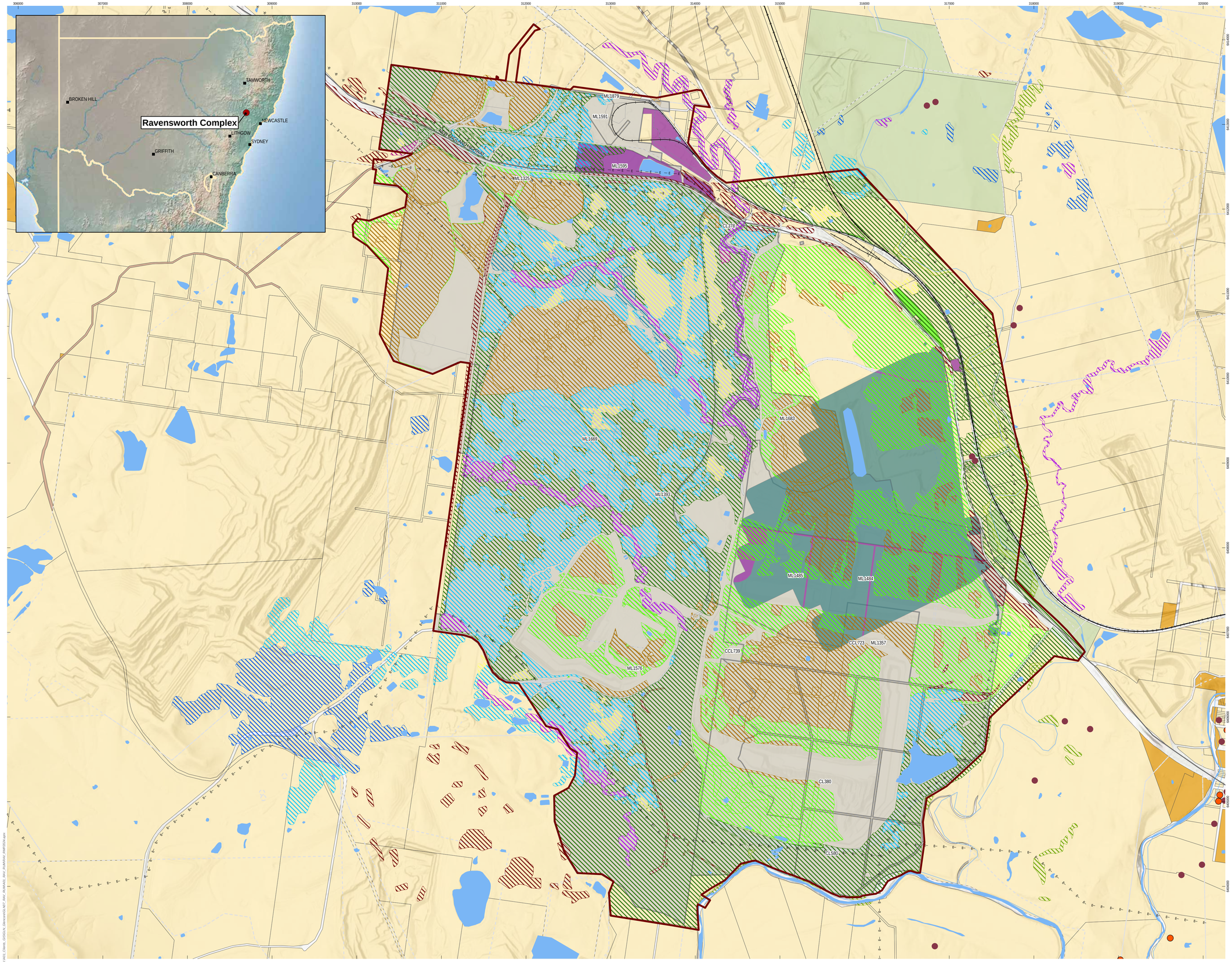
The status of current mining and rehabilitation is included as **Figure 1D and 1E**, to give context on current operations. This is not a requirement of the RMP Form and Way document. Further information about domains is outlined in **Section 2.4.**

Table 1-2– Land Ownership within Project Approval

Owner	Area of Ownership within Project Approval (PA 09_0176)
Ravensworth Surface Operations	1731.7 ha
AGL Macquarie	1430.3 ha
Ravensworth Surface Operations and Cumnock Joint Venture	1439.7 ha
RCT Joint Venture	91.2 ha
Resource Pacific	234.1 ha
Mount Owen Mine	4.7 ha
Glendell Mine	168.3 ha
Liddell Mine	27.3 ha
I Bowman Pty Ltd	2.5 ha
Daracon	4.3 ha

Owner	Area of Ownership within Project Approval (PA 09_0176)
HVO JV	178.4 ha
Government Departments	52.4 ha

See **Appendix B** for the Schedule of Lands.



LEGEND

- Project Approval Boundary - PA 09_0176
- Residence - Mine Owned
- Residence - Private
- Railway
- Major Road
- Major Waterway
- Waterbody
- Electricity Transmission Line

Current Authorisations

- Relevant Coal Titles
- Surrounding Coal Titles

Land Ownership

- Crown
- Freehold
- Local Government Authority
- NSW Government
- Unknown

Lease Holder

- Glencore Newpac Pty Limited
- Resource Pacific Pty Limited

Vegetation Comunities*

- Rehabilitation pasture
- Planted areas
- Derived Grassland
- Hunter Floodplain Red Gum
- Hunter Valley River Oak (HVRO)
- River-flat Eucalypt Forest
- Woody rehabilitation
- Central Hunter Box Iron Bark
- Central Hunter Iron Bark
- Central Hunter Bull Oak
- Central Hunter Swamp Oak

NOTE: Entire site sits within Singleton Shire Council Local Government Area and Hunter Catchment Area

0 250 500 750 1,000 m

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GLENCORE

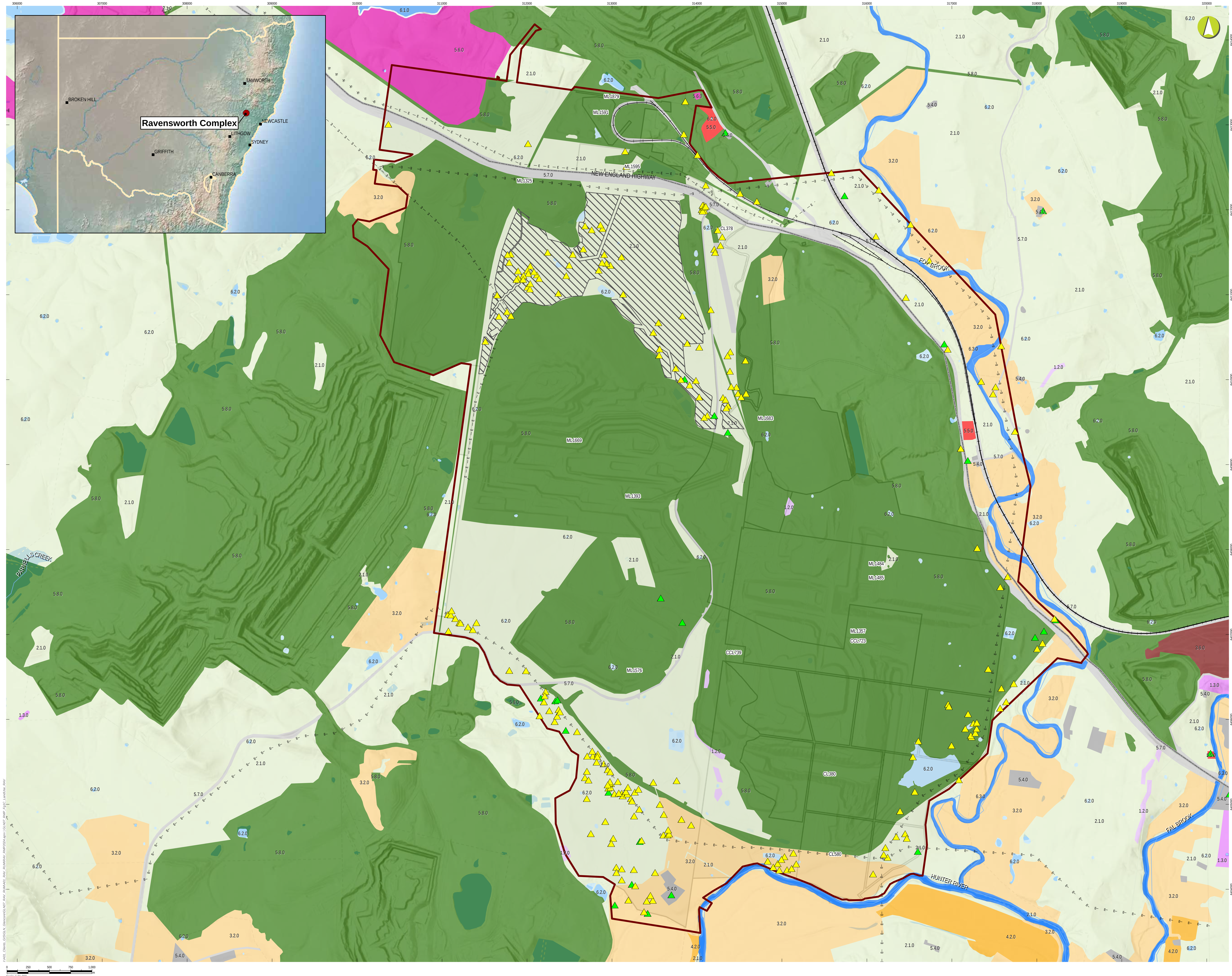
Source: Project Approval, Ravensworth North Offset Area and private land holders from Ravensworth Underground Mine (2024). Current Authorisations from DPIE (2024). Roads, watercourses, electricity transmission lines, Local Government Areas and Land Use information from DPIE (2023). World Hillshade from ArcGIS Online (2022).

Ravensworth Operations

Land Ownership

Figure 1B

Mine name	Ravensworth Operations
Plan name	Ravensworth Operations RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	19/07/2024



LEGEND

- Project Approval Boundary - PA 09_0176
- Railway
- Major Road
- Major Waterway
- Waterbody
- Electricity Transmission Line
- Historical Heritage
- Cultural Heritage
- Ravensworth North Offset Area

Current Authorisations

- Relevant Coal Titles
- Surrounding Coal Titles

Land Use

- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 3.6.0 Land in transition
- 4.2.0 Grazing irrigated modified pastures
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 6.2.0 Reservoir/dam
- 6.3.0 River

NOTE: Entire site sits within Singleton Shire Council Local Government Area and Hunter Catchment Area

Scale 1:21,000

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GLENCORE

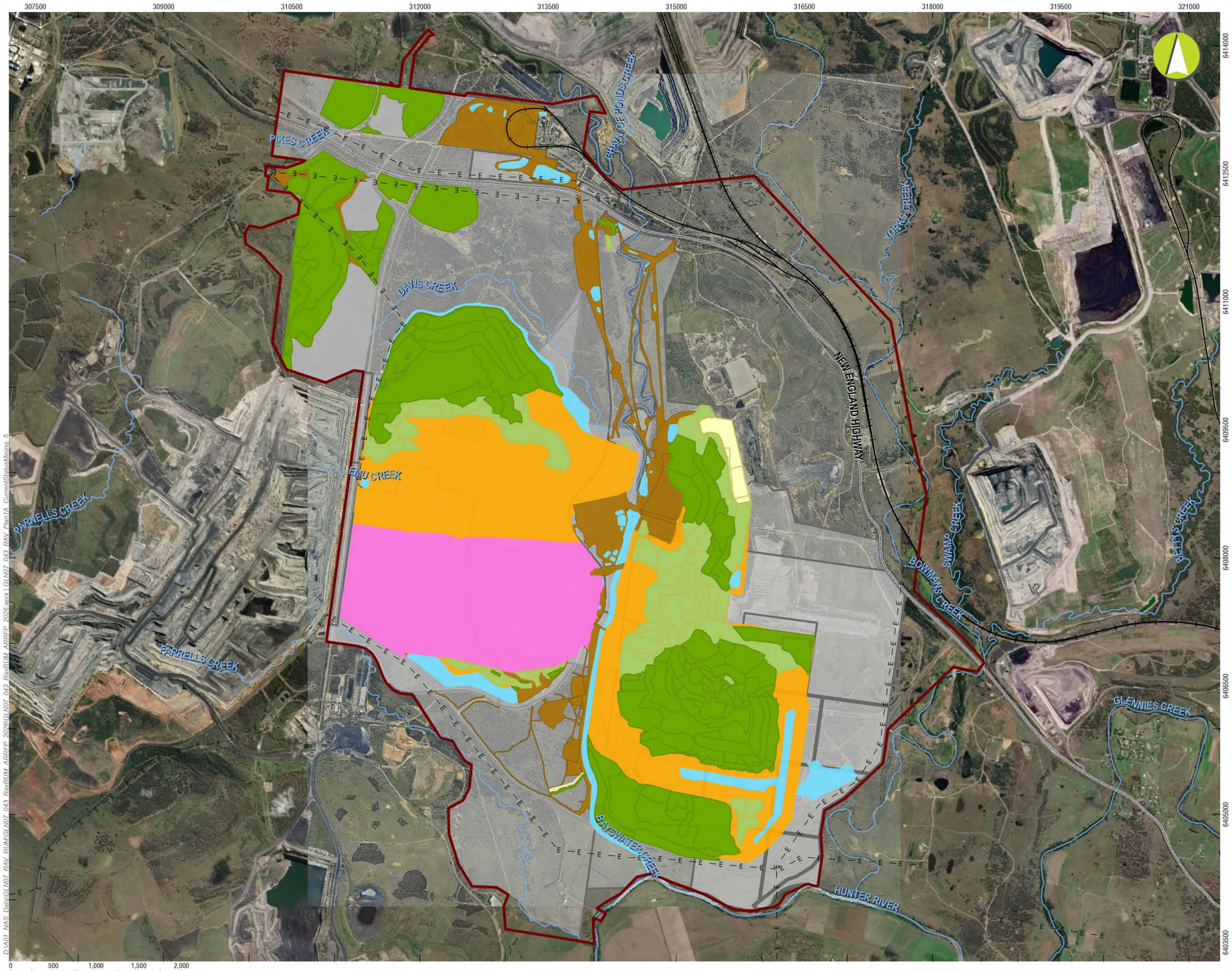
Source: Project Approval, Ravensworth North Offset Area and private land holders from Ravensworth Underground Mine (2024). Current Authorisations from DPIE (2024). Roads, watercourses, electricity transmission lines, Local Government Areas and Land Use information from DPIE (2023). World Hillshade from ArcGIS Online (2022).

Ravensworth Operations

Land Use

FIGURE 1C

Mine name	Ravensworth Operations
Plan name	Ravensworth Operations RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	19/07/2024



LEGEND

- Project Approval Boundary - PA 09_0176
- Railway
- Electricity Transmission Line
- Major Waterway
- Major Road

Current Authorisations

- Relevant Coal Titles

Rehabilitation Phase

- Landform Establishment
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development

Mining Domain Type

- Domain 1: Infrastructure Area
- Domain 2: Tailings Storage Facility
- Domain 3: Water Management Area
- Domain 4: Overburden Emplacement Area
- Domain 5: Active Mining Area (Open cut void)
- Domain 8: Other

Ravensworth Open Cut

Current Status of Mining and Rehabilitation Figure 1D

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut Status
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	13/03/2026

Source: Project Approval Boundary, Current Status and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2025). Aerial imagery from Ravensworth Open Cut (2025).

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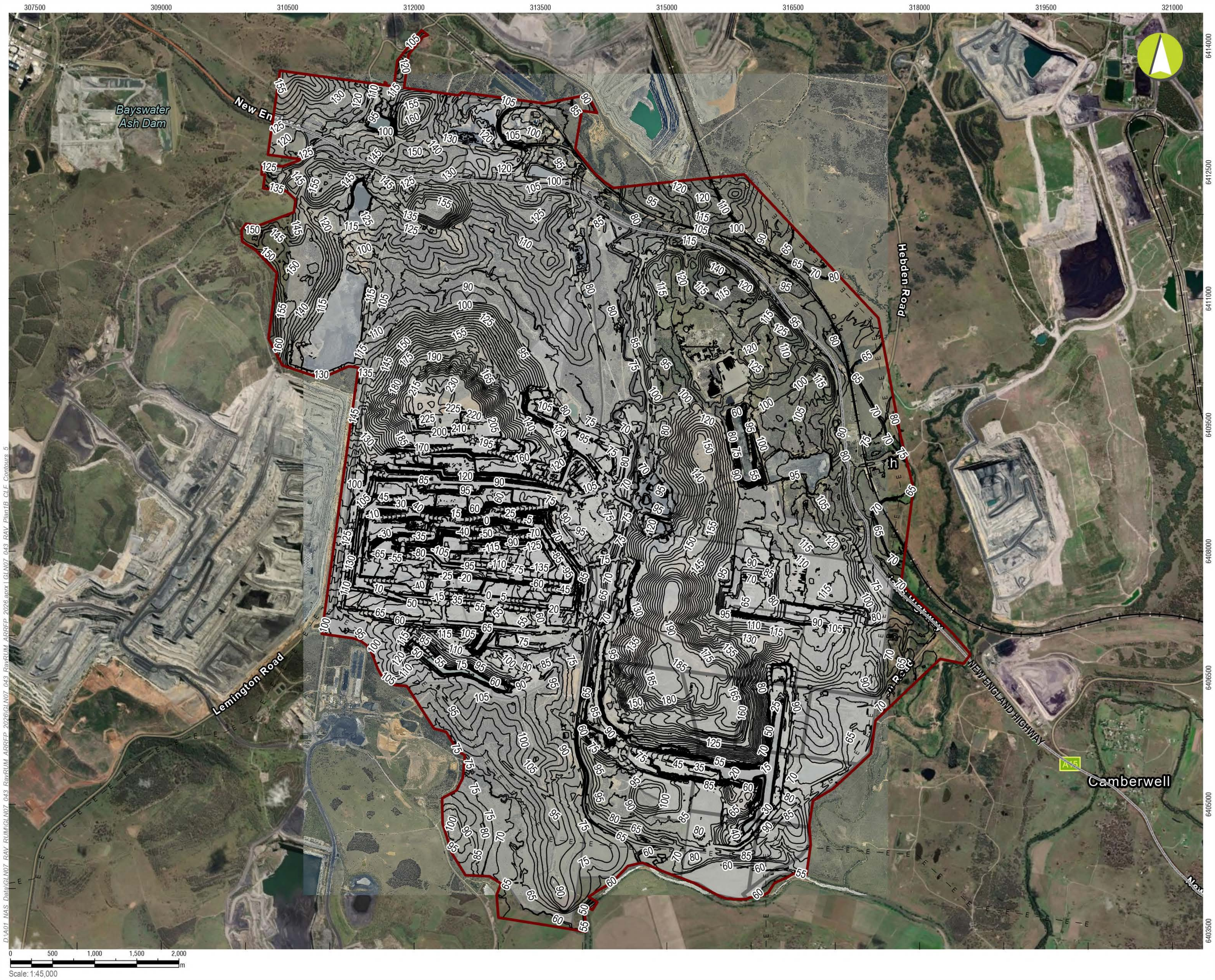

LEGEND

- Project Approval Boundary - PA 09_0176
- Electricity Transmission Line
- Railway
- Major Road
- Current Contours (5m)

Current Authorisations

- Relevant Coal Titles

Ravensworth Open Cut

Current Landform Contours
Figure 1E

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut Status
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	23/02/2026

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GLENCORE

Source: Project Approval Boundary, Current Status and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2025). Aerial imagery from Ravensworth Open Cut (2025).

2. Final Land use

2.1 Regulatory Requirements for Rehabilitation

As stated in **Section 1.3** of this RMP, final land use at Ravensworth Operations will include the establishment of a woodland ecological community, interspersed with pasture which is to be consistent with PA 09_0176. Regulatory requirements for post mining land use and rehabilitation are listed below in **Table 2-1**.

Table 2-1 – Regulatory Requirements Relating to Rehabilitation

<table>
<tr><th>Document</th><th>Condition</th><th>Requirement</th><th>Area</th><th>Timing</th><th>Section Addressed/ Comment</th></tr>
<tr><td>09_0176</td><td>Schedule 3, Condition 40</td><td>The applicant must:
(a) carry out rehabilitation progressively, that is, as soon as reasonably practicable following disturbance; and
(b) rehabilitate the site in accordance with the provisions under the Mining Act 1992 and must achieve the rehabilitation objectives described in the EA and the MOD 2 EA (depicted conceptually in the figures in Appendix 7), and comply with the objectives in Table 17.
Table 17: Rehabilitation Objectives
<table>
<tr><th>Rehabilitation Feature</th><th>Objective</th></tr>
<tr><td>Mine site (as a whole)</td><td>• Stable, safe and non-polluting.
• Final landforms to:
○ be designed to minimise the visual impacts of the development;
○ be in keeping with the natural terrain features of the area;
○ incorporate micro-relief;
○ be free draining (with the exception of the final void); and
○ avoid straight run drainage drop structures, as far as practical.</td></tr>
<tr><td>Final Void</td><td>• Designed as a long term groundwater sink and to maximise groundwater flows across back-filled pits to the final void.
• Minimise:
○ the size and depth of final void;
○ the drainage catchment of final void; and
○ any high wall instability risk.</td></tr>
<tr><td>Revegetation</td><td>Restore self-sustaining ecosystems, including establishing at least 1,767 ha of woodland vegetation in accordance with the biodiversity offset strategy in this consent.</td></tr>
<tr><td>Surface Infrastructure</td><td>To be decommissioned and removed, unless the Resources Regulator agrees otherwise.</td></tr>
<tr><td>Community</td><td>• Ensure public safety; and
• Minimise the adverse socio-economic effects associated with mine closure.</td></tr>
</table></td><td>Mine Site (Project as a whole)</td><td>Post Mining</td><td>Mine Site (Project as a whole) Objectives:
○ Section 4.0

Final Void:
○ Section 6.2.3.4

Community:
○ Section 4.2.1

Revegetation
○ Section 6.2.1.2;
○ Section 6.2.1.3;
○ Section 6.2.4.

Surface Infrastructure:
○ Section 6.2.2.3

Offset areas are managed under a Biodiversity Offset Management Plan (BOMP)</td></tr>
</table>

<table>
<tr><th>Document</th><th>Condition</th><th>Requirement</th><th>Area</th><th>Timing</th><th>Section Addressed/ Comment</th></tr>
<tr><td>09_0176</td><td>Schedule 3, Condition 41</td><td>Rehabilitation Management Plan
The Applicant must prepare a Rehabilitation Management Plan for the development in accordance with the conditions imposed on the mining leases(s) associated with the development under the provisions of the Mining Act 1992. Note: The plan should build on the concept strategy depicted in Appendix 7.</td><td>Mine Site (Project as a whole)</td><td>During the active mining phase, Decommissioning, Landform Establishment, End of Life and Post Mining Phase.

The RMP to updated annually as part of the Forward Program</td><td>This RMP</td></tr>
<tr><td rowspan="2">09_0176</td><td>Schedule 3, Condition 30</td><td>The applicant must:
(c) Reinstate Emu Creek generally in accordance with the concept design outlined in the EA (as depicted in the figure in Appendix 3.6) and minimizing net loss of stream length, as soon as practical following mining and rehabilitation in the applicable are, to the satisfaction of the Planning Secretary;
(d) Rehabilitate the Bayswater Creek diversion to provide a hydraulically and geomorphically stable stream as soon as practicable following mining and rehabilitation in the applicable area, to the satisfaction of the Planning Secretary; and
(e) Submit as-executed reports to the Planning Secretary and DPE Water, certified by a practicing engineer, confirming that the reinstated/ rehabilitated Emu Creek and Bayswater Creek are sufficiently hydraulically and geomorphically stable, prior to commissioning the reinstated/ rehabilitated creeks.</td><td>Water Management</td><td>End of Mine Life</td><td>• Section 6.2.3.1;
• Section 6.2.3.5</td></tr>
<tr><td>Schedule 3, Condition 32</td><td>The Applicant must implement the biodiversity offset strategy as outlined in Table 16 and as generally described in the EA (and shown conceptually in Appendix 7), to the satisfaction of the Planning Secretary.
Table 16: Biodiversity Offset Strategy
<table>
<tr><th>Area</th><th>Rehabilitation Objectives</th><th>Minimum Size</th></tr>
<tr><td>Ravensworth North Offset Area</td><td>Existing vegetation and vegetation to be established.</td><td>288</td></tr>
<tr><td>Hillcrest Offset Area</td><td>Existing vegetation and vegetation to be established.</td><td>1,376.4</td></tr>
</table></td><td>• Rehabilitation Biodiversity Offset Area;</td><td>End of Mine Life</td><td>Offset areas are discussed in:
• Section 6.2.1.2;
• Section 6.2.1.3.
Offset areas are managed under a BOMP</td></tr>
</table>

<table>
<tr><th>Document</th><th>Condition</th><th>Requirement</th><th>Area</th><th>Timing</th><th>Section Addressed/ Comment</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Clifton Offset Area</td><td>Existing vegetation and vegetation to be established.</td><td>105.4</td></tr>
<tr><td>Stewart Offset Area</td><td>Existing vegetation and vegetation to be established.</td><td>164.6</td></tr>
<tr><td>Rehabilitation Area</td><td>Woodland vegetation to be established.</td><td>1,767</td></tr>
<tr><td>Total</td><td></td><td>3,701.4</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Schedule 3, Condition 35</td><td>Long Term Security Offsets
The Applicant must make suitable arrangements to provide appropriate long term security for the:
(a) Ravensworth North Offset Area and Hillcrest Offset Area, by the end of December 2011;
(b) Clifton Offset Area and Stewart Offset Area, by the end of December 2013; and
(c) Woodland vegetation to be established in the rehabilitation Area at least 2 years prior to the completion of mining activities associated with the Development,
to the satisfaction of the Planning Secretary.</td><td>• Rehabilitation Biodiversity Offset Area;</td><td>Life of Mine</td><td>• Section 6.2.1.2;
• Section 6.2.1.3
Offset areas are managed under a BOMP.</td></tr>
<tr><td></td><td>Statement of Commitments 6.4.1</td><td>A Final Closure Plan will be developed for the development and submitted to the Planning Secretary for approval at least five years prior to anticipated mine closure, in accordance with GCAA standards for mine closure. The plan will be prepared in consultation with relevant stakeholders including the Department, 1&1 NSW, Singleton Council, other relevant government agencies as agreed with the Department, and the local community.</td><td>Mine Site (Project as a whole)</td><td>Within 5 years of closure</td><td>Section 4.2.1</td></tr>
<tr><td></td><td>Statement of Commitments 6.4.2</td><td>The rehabilitation strategy for the Development will be integrated with the proposed Biodiversity Management Plan for the Development through creating extensive areas of woodland within rehabilitated areas associated with the Development that target the following vegetation communities:
• Central Hunter Box-Ironbark Woodland;
• Central Hunter Swamp Oak Forest;
• Central Hunter Bulloak Forest Regeneration; and Grassland.</td><td>• Rehabilitation Biodiversity Offset Area;</td><td>Life of Mine</td><td>• Section 6.2.1.2;
• Section 6.2.1.3
Offset areas are managed under a BOMP.</td></tr>
<tr><td></td><td>Statement of commitments 6.4.3</td><td>The Applicant will re-establish Emu Creek within the rehabilitated landscape. The reinstated Emu Creek will be designed in accordance with relevant guidelines and in consultation with the NSW Office of Water (DPE Water). The reinstated Emu Creek will be re-established within a suitable substrate within the rehabilitated landform and will resemble a natural creek system with native vegetation planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system and to enhance the in-stream and riparian habitat created. The detailed design of the proposed reinstatement of Emu Creek will be undertaken in accordance with all relevant approvals from –DPE Water.</td><td>Water Management</td><td>End of Mine Life</td><td>• Section 6.2.3.1;
• Section 6.2.3.5</td></tr>
</table>

Document	Condition	Requirement	Area	Timing	Section Addressed/ Comment
	Statement of Commitments 6.4.4	Recovery and management of any topsoil will be undertaken in accordance with the controls provided in Section 5.1.1.5 of the EA.	• Mine Site (Project as a whole); • Overburden Emplacement Area • Active Mining Area (open cut void)	Life of Mine	• Section 6.2.1.1
09_0176	Statement of Commitments 6.7.1	The Applicant will develop a Biodiversity Monitoring Program as part of the Rehabilitation Management Plan which will include: • monitoring of areas of retained vegetation • monitoring of rehabilitated areas using appropriate methodologies; • fauna monitoring; • monitoring of Emu Creek aquatic habitats (once reinstated as part of the rehabilitation program); • fauna habitat monitoring including nest box structures; • green and golden bell frog population surveys in accordance with the *Green and Golden Bell Frog Key Population Management Plan* (DECC 2007); and • Monitoring of regeneration and revegetation initiatives to be designed and implemented within the proposed offset areas.	• Water Management Areas	End of Mine Life	• Section 6.2.1.2; • Section 6.2.1.3; • Section 6.2.3.1; • Section 6.2.3.5. Note that biodiversity offset areas are managed under a BOMP.

2.2 Final Land Use Options Assessment

A Final Land Use Options Assessment has not been completed as part of this RMP as the suitability of the proposed final land use(s) was determined in the existing Project Approval processes including the development consent and EIS.

There is however not a defined land use for the final void.

It is noted that Schedule 3 Condition 40 of the Project Approval outlines the following rehabilitation objectives for the final void:

- Designed as a long term groundwater sink and to maximise groundwater flows across back-filled pits to the final void.
- Minimise:
  - the size and depth of final void;
  - the drainage catchment of final void; and
  - any high wall instability risk .

See **Section 2.4** of this RMP for details on final land use domains. At this point in time the final void will be filled with water. The RMP will be updated once additional information is available regarding final void management.

All mining related infrastructure shall be decommissioned and removed, unless NSW Resources Regulator (RR) agrees otherwise per Condition 40 of the Project Approval (09_0176). There is the potential that parts of the RCHPP may remain at closure (in consultation with NSW Department of Planning, Housing and Infrastructure (DPHI)) for future industrial operations. This will be assessed in further detail closer to the closure of the overall Ravensworth Operations Project. Until that time the Rehabilitation Cost Estimate has costs to remove Ravensworth Operations infrastructure at closure.

2.3 Final Land Use Statement

The final land use and mining domains are outlined in **Section 2.4** of this RMP. The rehabilitation activities completed for this Project should be consistent with the objectives described in in Schedule 3 Condition 40 of the Project Approval, as included in **Table 2-1** above.

2.4 Final Land Use and Mining Domains

Table 2-2 – NSW Resources Regulator Domain Codes

FINAL LAND USE DOMAIN	CODE	MINING DOMAIN	CODE
Native Ecosystem	**A**	**Infrastructure Area**	**1**
Agricultural – Grazing	**B**	**Tailings Storage Facility**	**2**
Agricultural – Cropping	C	**Water Management Area**	**3**
Rehabilitation Biodiversity Offset Area	D	**Overburden Emplacement Area**	**4**
Industrial	E	**Active Mining Area (Open cut void)**	**5**
Water Management Areas	**F**	Underground Mining Area (SMP)	6
Water Storage (Excluding Final Void)	**G**	Beneficiation Facility	7
Heritage Area	H	Other	8
Infrastructure	I		
Final Void	**J**		
Other	K		

NOTES:

- The domains listed above are the required domains from the RMP Form and Way Document.
- The bold domains are the ones relevant to the Project Domains in grey are not applicable to the Project.
- Existing Project rehabilitation is classified as 'Domain A – Native Ecosystem or 'Domain B - Agricultural Grazing'.

2.4.1 Final Land use Domains

The table below (Table 2-3) outlines the relevant final land use domains for the Project. These domains are outlined in the Final Landform and Rehabilitation Plans, Plan 1 and 2.

Table 2-3 – Ravensworth Operations Final Land use Domains

Code	Final Land use Domain for RMP	Description
A	Native Ecosystem	The Form and Way document states this domain includes remnant vegetation or rehabilitation areas proposed to be subject to a Biodiversity offset application under the Biodiversity Conservation Act 2016. There are plans for additional woodland rehabilitation as the Project undertakes progressive rehabilitation. Woodland rehabilitation is completed as per a Central Hunter Grey Box - Ironbark Woodland vegetation mix. This is classified as an Endangered Ecological Community, with rehabilitation proposed to meet the future offsetting requirements of Schedule 3 Condition 33.
B	Agricultural – Grazing	Parts of existing rehabilitation are already classified as this secondary domain, in a specific rehabilitation phase. There are plans for additional agricultural grazing rehabilitation as the Project undertakes progressive rehabilitation.

Code	Final Land use Domain for RMP	Description
F	Water Management Areas	The RMP Form and Way document defines this domain as 'water management areas (e.g. creek realignments, constructed wetlands, significant final landform drainage features)'. For Ravensworth Operations this includes Emu Creek and other major drop structures.
G	Water Storage (Excluding Final Void)	The RMP Form and Way document defines this domain as water storage area (includes dams retained for the final land use, but excludes any anticipated permanent water body in the final void). The two main mine water dams that will remain at closure are the Narama Dam and the Highway Dam (at RCHPP). There will also be a series of smaller sediment dams that will remain in the final landform to assist with erosion and sediment control.
J	Final Void	There is a proposed final void at closure with this shown in Plan 1: Final Landform Features. With mining scheduled to 2034, the final void will increase in volume and size as the mine progresses. See **Section 2.2** regarding final void options. *However it is noted that the* Schedule 3 Condition 40 of the Project Approval states that the final void should: *Designed as a long term groundwater sink and to maximise groundwater flows across back-filled pits to the final void.* At this point in time the final void will be filled with water.

2.4.2 Mining Domains

The mining domains for Ravensworth Operations are defined below**.** These are classified as a land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).

Table 2-4 – Ravensworth Operations Mining Domains

Code	Mining Domain from RMP	Description
1	Infrastructure Area	For ROC this includes existing infrastructure features such as: • Administration facilities, • Workshop and buildings, • Haul roads, • material stockpile areas, • Switch stations; • Tailings pipelines and infrastructure; and • Water management infrastructure (pumps and pipelines); This RMP also includes the RCHPP and associated infrastructure including: • Main RCHPP facility; • Product stockpile at the RCHPP; • Conveyors (product and rejects); • Thickeners; and • Rail line within the Project Approval Area.
2	Tailings Storage Facility	Tailings facilities are outlined below: • 7 South Tailings Dam (capped) and dumped over; • Cumnock Void 1 & 2 (inactive) and 3 Tailings Storage Facility (active); • Washplant pit (inactive); and • Temporary TSF (inactive) (previously covered by RUM). **Section 6.2.3.3** outlines more details on tailings management.
3	Water Management Area	Includes any current operational water management area. This includes operational sediment dams, temporary creek diversions and other significant constructed drainage features.
4	Overburden Emplacement Area	Consists of areas within the Project Approval used for overburden emplacement (i.e. the out-of-pit overburden emplacements as well as the in-filled sections of the open cut).
5	Active Mining Area (Open cut void)	This is the active mining area. Mining is completed by truck and shovel methods, however dragline operations have previously been used within the Project area. It is proposed that truck and shovel methods would continue, however it is noted that ROC has approval to operate a dragline, if required.

3. Rehabilitation Risk Assessment

An initial Rehabilitation Risk Assessment was completed on 8 November 2021. The risk assessment was again reviewed and updated in June 2024. In 2025, the risk assessment was reviewed and updated following recommendations from the NSW Resources Regulator in relation to the 2024 Revegetation Targeted Assessment Program (TAP).
The risk assessment was further reviewed April 2026 and updated following NSW Resources Regulator in relation to the 2025 Landform Establishment TAP.
The objective of the risk assessment was to identify and risk assess the identified rehabilitation and closure risks for the Project, in accordance with:

- Rehabilitation Risk Assessment Guideline (NSW Resources Regulator, 2021); and
- AS/NZS ISO 31000:2018 Risk management Guidelines; and list risk mitigation actions to reduce the risks.

The Rehabilitation Risk Assessment has been provided in full as **Appendix A**.

4. Rehabilitation Objectives and Rehabilitation Completion Criteria

4.1 Rehabilitation Objectives and Rehabilitation Completion Criteria

Rehabilitation must be undertaken to be consistent with the objectives as set out in Project Approval 09_0176 and to the satisfaction of the Resources Regulator. Additionally, GCAA has developed a series of overarching corporate completion criteria, to allow consistency across all GCAA operations. The GCAA rehabilitation completion criteria are included as **Table 4-1** below. Additional criteria have been added to this section that is specific to Ravensworth Operations. Additional criteria are outlined in red. The post mining land use and mining domain columns have been updated to be specific to the domains at Ravensworth Operations.

Note as of April 2026 the rehabilitation objectives for Ravensworth Operations had not yet been approved by the NSW Resources Regulator. There have been several sessions to update the objectives, however this section of the document will not be updated until they are approved.

Table 4-1 – GCAA Completion Criteria

CURRENT INFRASTRUCTURE (Current Mining Domain 1 – Infrastructure Area)

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
Domain A – Native Ecosystem or Domain B – Agricultural - Grazing	Domain 1 – Infrastructure Area	Infrastructure All Project infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.	Removal of all services (power, water, communications) that have been connected on the site as part of the operation.	Infrastructure removed.	Statement provided.
			Heritage obligations (e.g. development consent under the *Environmental Planning and Assessment Act 1979,* approvals under the *Heritage Act 1977,* etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approval documentation.
			Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples.	Infrastructure removed.	As-constructed final landform plan, photos etc.
			Removal of all footings or removal to a certain depth (e.g. 0.5 metres) OR footings covered to an appropriate depth.	Infrastructure removed.	Surveyed and marked on the as-constructed final landform plan.
			Removal of all water management infrastructure (including pumps, pipes and power).	Infrastructure removed.	Statement provided and before/after photos.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			All drill cores have been removed and either taken to authorised storage or disposal location.	Cores removed.	Statement provided.
			Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	Sealing complete.	Engineering report/statement, Plug and Abandonment log, photos etc.

INFRASTRUCTURE TO REMAIN (Final Land Use Domain – Infrastructure I)

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
Domain I – Infrastructure (note, not shown in plans but to be determined prior to closure).	Domain 1 – Infrastructure Area	Infrastructure All infrastructure that is to remain as part of the final land use is safe.	Where applicable, necessary approvals are in place (e.g. development consent under the *Environmental Planning and Assessment Act 1979*) where buildings and infrastructure are to be retained as part of final land use	Permits and approval documents issued.	Copy of any relevant approvals.
			Potential hazards (e.g. electrical, mechanical) have been effectively isolated.	Hazards isolated.	Statement provided.
			Access tracks that are to remain are in a trafficable condition that is suitable for their intended purposes.	Any required Repairs or Upgrades complete.	Copy of any relevant plans, photos etc.
			Heritage obligations as required under the *Environmental Planning and Assessment Act 1979, Heritage Act 1977*, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted.	Copy of any relevant approval documentation.
			The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be safe for the intended final land use (to an engineering standard).	Engineering report/statement, photos etc.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth >0.5m	The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig where this is required by the Council or the relevant Authority.	Surveyed and marked on the as-constructed final landform plan.

LAND CONTAMINATION, LANDFORM STABILITY, BUSHFIRE, SURFACE WATER QUALITY, GROUNDWATER QUALITY, GROUNDWATER REGIME, WATER APPROVALS (All Domains)

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
Domain A – Native Ecosystem or Domain B – Agricultural - Grazing or Domain F – Water Management Areas	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)	<u>Land Contamination</u> There is no residual soil contamination on the Project area that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use	Contamination will be appropriately remediated so that appropriate guidelines for land use are met, e.g. Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999).	Contamination Remediation Report prepared by Land Contamination Consultant Site Contamination Audit Report and Site Audit Statement prepared by EPA Accredited Auditor (where required)
			Residual waste materials stored within the Project area (e.g. tailings dams) will be appropriately contained / encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Engineered capping design with specifications.
			Any areas of active erosion are within the parameters for safe and stable landform. Discharge points from rehabilitated landform to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan . Signs of erosion and or land	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent reports that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
				instability are recorded, measured and assessed. Erosion surveys to demonstrate that the average annual soil loss from the final landform at completion is to be equal or less than that predicted by the Revised Universal Sediment Loss Equation (or equivalent) for the approved land use. Spillway (where required) of final void and any remaining dams has been constructed in accordance with hydrological design.	with a specific site, stability will need to be evaluated over a number of years (e.g. 5 years).
			Residual waste materials stored within the Project area (e.g. tailings dams) will be appropriately contained / encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Engineered capping design with specifications. Testing confirms capping integrity. Sign off of tailings dams from RR.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
		Landform Stability The final landform is stable and does not present a risk of environmental harm downstream/ downslope of the Project or a safety risk to the public/ stock/ native fauna.	To achieve the rehabilitation objectives, slopes are generally consistent with Project Approval (09_0176) Any areas of active erosion are within the parameters for safe and stable landform. Discharge points from rehabilitated landform to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Signs of erosion and or land instability are recorded, measured and assessed. Erosion surveys to demonstrate that the average annual soil loss from the final landform at completion is to be equal or less than that predicted by the Revised Universal Sediment Loss Equation (or equivalent) for the approved land use. Spillway (where required) of final void and any remaining dams has been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent reports that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, stability will need to be evaluated over a number of years (e.g. 5 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
		Domain 2 Tailings Storage Area only Tailings Storage Areas The Project's tailings storage facilities will be capped to minimise the potential for exposure of potentially environmentally sensitive tailings material in the rehabilitated landform.	Residual waste materials stored within the Project area (e.g. tailings dams) will be appropriately contained / encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Engineered capping design with specifications. Testing confirms capping integrity. Sign off of tailings dams from RR.
			The Project's tailings storage facilities will be capped and reshaped to be free-draining to minimise the potential for exposure of potentially environmentally sensitive tailings material in the rehabilitated landform.	Final landforms are safe, stable, non-polluting and free-draining. Capped tailings geotechnical analysis indicates there is no evidence of AMD generation.	Confirmed by survey to be free draining following the expected settlement period. Soil analysis results Testing confirms: • capping integrity; and • Sign off of tailings dams from RR.
			Tailings storage areas have been capped in accordance with an approved Detailed Capping Design.	Capping depths and materials have been undertaken in accordance the approved Capping Design.	Monitoring records verifying that there is no evidence of spontaneous combustion.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Tailings storage areas have been capped and there is no occurrence of spontaneous combustion within the final landform.	No occurrence of spontaneous combustion in the final landform.	Statement provided and before/after photos.
		<u>Bushfire</u> The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire controls implemented appropriate to the final land use.	Statement provided and before/after photos.
		<u>Domain 3 Water Management Area only. Final Land use Domain G – Water Storage (Excluding Final Void)</u> <u>Surface Water Quality</u> Runoff water quality is similar to, or better than the pre-mining disturbance runoff water quality	Runoff water quality from rehabilitation areas represent an acceptable level of change from a background condition (baseline study).	Assessment of runoff water quality against local background water quality including: • EC • TSS • pH • Metals • Biological health in accordance with Australian River Assessment System (AUSRIVAS) or equivalent.	Water quality monitoring reports Independent biological health assessment report. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Water quality in all storages left within the Project area (other than final voids) is suitable for the approved final land use	Assessment of water quality against guidelines for the final land use (e.g. agricultural, industrial, recreational)	Independent report, water quality monitoring reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
			Water quality in any approved final voids does not pose a risk to the final land use.	Final void study completed, which includes predicted water quality and assessment of toxicity.	
		<u>Groundwater Quality & Regime</u> The risk to important groundwater assets (GDE's, Alluvial Aquifers, Landholder bores) has been addressed by the rehabilitation.	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the Project.	The measured water quality at important groundwater assets meets predictions. Modelled drawdown and water take is within predictions. Biological monitoring to demonstrate the health and conditions of GDE's (where applicable)	Independent hydro-geological assessment report, monitoring reports, independent ecological assessment. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
		Domain 3 Water Management Area only. Final Land use Domain G – Water Storage (Excluding Final Void) Water Approvals Structures that take water are appropriately licensed.	Licenses held, where required.	Hydrological and hydro-geological assessments are undertaken to determine water take at completion from the relevant water sources to confirm that sufficient allocations are held.	Confirmation from relevant Government Agency (e.g. NRAR) that licences are held.
		Soils Soil Chemistry within designated range	Soil depth (topsoil/ organic matter/ soil ameliorates) of approximately 100mm. Further studies will be conducted to determine viable soil depth and where possible direct seeding.	Soil depth	Standards Australia (2003)
Domain A – Native Ecosystem) or Domain B – Agricultural - Grazing	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area	Land Shaping Reshaping and seeding completing completed in accordance with the approved landform design.	The out of pit overburden dumping areas will be developed progressively over the life of the mine to a maximum height of approximately 230 metres RL and 190 metres RL for the northern and eastern dump respectively, or final landform as approved.	Annual Rehabilitation Inspection	Not Applicable

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
	Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)				
Domain F - Water Management Areas	Domain 3 - Water Management Areas	Emu Creek reinstated in accordance with PA09_0176 and Emu Creek Management Plan.	Once mining operation and overburden emplacement has advanced past the original alignment of Emu Creek Diversion Dam 1 will be commissioned and the creek line reinstated.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
			Native vegetation will be planted along the draining channels as part of the rehabilitation, to maximise the long term stability of the drainage system that will be constructed on filled and reshaped material.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Dams and drainage channels with shallow sloping edges to allow the planting of aquatic macrophytes and sedges.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
			A meandering design to slow down water movement and retain water within the landscape design.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
			Drainage channels with features to enhance habitat complexity such as pool and riffle sequences.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
			Salvaged habitat features such as fallen timbers and boulders will be carefully positioned within the bed of drainage channels and edges of dams to provide in-stream structures and habitat.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Schedule 2, Condition 30 (c), reinstate Emu Creek generally in accordance with the concept design outlined in the EA and minimising net loss of stream length, as soon as practicable following mining and rehabilitation in the applicable area, to the satisfaction of the Secretary.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
	Domain 3 - Water Management Areas	Emu Creek reinstated in accordance with PA09_0176 and Emu Creek Management Plan.	Schedule 2, Condition 30, (e) submit as-executed reports to the secretary and NRAR, certified by a practising engineer, confirming that the reinstated/ rehabilitated Emu Creek and Bayswater Creek are sufficiently hydraulically and geomorphologically stable, prior to commissioning the reinstated/ rehabilitated creeks.	Performance measures as per management plan. Noting measures are in draft, until closer to closure and re-establishing Emu Creek.	Not Applicable
	Domain 3 - Water Management Areas	Rehabilitate and revegetate Bayswater Creek (including drop structure) in accordance with PA 09-0176 and Creek Diversion Management Plan.	Remediate Bayswater Creek drop structure to provide hydraulically stable structure to prevent excess scouring and erosion. Schedule 2, Condition 30, (d) Rehabilitate and revegetate Bayswater Creek diversion to provide a hydraulically and gynomorphically stable stream as	Performance measures as per management plan. Noting measures are in draft, until closer to closure and rehabilitating Bayswater Creek.	Not Applicable

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			soon as practicable following mining and rehabilitation in the applicable area, to the satisfaction of the Secretary.		

ECOLOGICAL REHABILITATION OBJECTIVE 1, ECOLOGICAL REHABILITATION OBJECTIVE 2, ECOLOGICAL REHABILITATION OBJECTIVE 3 (Final Land Use Domain A – Native Ecosystems)

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
Domain A – Native Ecosystem	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)	<u>Ecological Rehabilitation Objective 1</u> The vegetation composition of the rehabilitation is recognisable as the target vegetation community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System) <u>OR</u> recognisable as a TEC as described by the NSW Scientific Committee Determination or approved conservation advice (for existing operations that committed to putting back a TEC prior to BAM). Note: Recognisable is defined as "Diagnostic species present for each Growth form for PCT/TEC using the scientific description of the PCT available on Bionet.	Native plant species are characteristic of the target plant community(s) Notes: "Characteristic of target plant community" is defined as "50% of all species in each Growth Form (i.e. trees, shrubs, grasses, forbs and ferns and other) that are known and accepted to form part of the PCT/TEC against benchmark value"	Native plant species richness assessed for each Growth Form against benchmark values/reference sites.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years). All native vascular plant species are recorded to species level from fixed monitoring plots. Monitoring in accordance with NSW BCD BAM Methodology.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
		Ecological Rehabilitation Objective 2 The vegetation structure of the rehabilitation is recognisable as, or is trending towards the target plant community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System) OR a recognisable as a TEC as described by the NSW Scientific Committee Determination or approved conservation advice" (Note: this is for existing operations that committed to putting back a TEC prior to BAM) Note: "Trending Towards the target plant community" requires use of time series data to show canopy height and cover for each Growth Form against benchmark value range (or successional benchmarks)	Cover and height range of all Growth Forms are characteristic of, or trending towards, the target plant community(s)	The: • Cover; and • Height range of all native vascular plant species, including: • Overstorey cover • Midstorey cover • Native groundcover (grasses, shrubs, other); and • Exotic plant cover.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years). Monitoring in accordance with NSW BCD BAM Methodology.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
		Ecological Rehabilitation Objective 3 Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable OR is trending towards the target plant community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System)	Growing media status is "suitable" for the target plant community(s) establishment, and indicators of nutrient cycling are "suitable" for sustaining the target plant community	Litter cover is recorded at fixed monitoring plots.	Rehabilitation monitoring reports, independent soil reports (where required) that demonstrate long term function of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years). Monitoring in accordance with NSW BCD BAM Methodology.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Plant recruitment is "suitable"1 for sustaining the target plant community(s) Suitable means: 1. Trees and shrubs- evidence of flowering and seeds or second generation juveniles. At least one individual less than 5cm DBH present per plot as per BAM. 2. Short lived growth forms, including grasses, herbs and forbs - requires demonstration of persistence over time including series monitoring and monitoring of reproductive structures (e.g. buds, flowers and fruit)	All Growth Forms are monitored for establishment and survival of juveniles/immatures	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years). Monitoring in accordance with NSW BCD BAM Methodology.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Plant competition is "suitable"1 for sustaining the target plant community(s) Suitable means: 1. Weeds - demonstrated decline in cover of high threat weeds measured as a moving average over time. Cover of high threat weeds within range measured at reference sites	The total cover of exotic plant species is recorded at fixed monitoring plots or transects as per BAM. The cover and abundance of each high threat weed is separately recorded.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that demonstrate long term stability of rehabilitated landform. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years). Monitoring in accordance with NSW BCD BAM Methodology.

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			Animal habitat is characteristic of the target plant community(s) (as measured by the above composition, structural and functional components)	Invertebrate habitat: • Litter cover, • Woody debris (evidence of litter invertebrates; ant nests, spider holes, ground and arboreal spider webs). • Vertebrate habitat: Woody debris and stags with hollows (or nest boxes), Rock material, Aquatic habitat established at the required densities	Supporting information – formal surveys of ground and/or litter invertebrates, small reptiles, small mammals, birds Note: bird surveys may be used as a surrogate for ecosystem function and presence of invertebrate activity, subject to further discussion with NSW BCD. Monitoring in accordance with NSW BCD BAM Methodology.
Domain A – Native Ecosystem	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area	Vegetation Composition as per completion criteria. Tree densities as per completion criteria values.	Rehabilitation areas contain flora species assemblages characteristic of each Growth Form for the target native vegetation communities.	Native plant species richness assessed for each Growth Form	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
	Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)		Indicative final minimum total tree/shrub densities for seeded areas to be 400 stems/ha.	Tree and shrub densities monitored for establishment and survival	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
Domain A – Native Ecosystem	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area	The rehabilitation is self-sustainable	Evidence of flowering and seeds or second generation juveniles for trees and shrubs or likely to be, based on comparable older rehabilitation sites.	Trees and shrubs are monitored for evidence of second generation juveniles and evidence of flowers and seeds	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
	Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)	Habitat features incorporated into final landform.	Habitat features (e.g. logs, rocks and nest boxes), including structures suitable for target species are incorporated into rehabilitation areas at required densities, as required by Approvals Native rehabilitation areas provide a range of structural features (e.g. trees, shrubs, ground cover, developing litter layer etc.).	Habitat and structural features recorded	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).
Domain A – Native Ecosystem	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area Domain 4 – Overburden Emplacement Area	Connectivity established for habitat corridors in final rehabilitation.	Habitat corridors are established and consistent with target vegetation community compositions, as required by Approvals.	Habitat corridors recorded	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
	Domain 5 Active Mining Area (Open Cut Void)				
Domain A – Native Ecosystem	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)	Target fauna assemblages and habitat in rehabilitation areas	Monitoring confirms target native fauna species are recorded utilising rehabilitation areas or habitat suitable for target species is present, as required by Approvals.	Monitoring for the presence and abundance of target fauna species and habitat	Rehabilitation monitoring reports, independent ecological reports (where required). Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

AGRICULTURAL REHABILITATION (Final Land Use Domain B – Agricultural - Grazing)

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
Domain B - Agricultural Grazing	Domain 1 – Infrastructure Area Domain 2 Tailings Storage Area Domain 3 – Water Management Area Domain 4 – Overburden Emplacement Area Domain 5 Active Mining Area (Open Cut Void)	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	Land and Soil Capability classification or Agricultural Land Classification criteria met. Rehabilitation areas comprise palatable grasses and legumes appropriate to the district and suitable for cattle grazing. Weed presence is within range found analogue sites and does not present a risk to the intended final land use. Cropping / Pasture establishment is in good health and provides adequate cover. Cropping yields from	Land and Soil Capability classification or Agricultural Land Classification assessed against Approval requirements The re-established growth medium substrate (e.g. topsoil / subsoil) is capable of supporting the targeted pasture / cropping regime on a sustained basis. Pasture composition assessed, including pasture weeds Demonstration of persistence over time for palatable grasses and legumes.	Results from Industry research, studies or trials, rehabilitation monitoring reports, independent soil reports, environmental monitoring records, independent agronomist reports. Depending on the nature, scale and risks associated with a specific site, achievement of criteria may need to be evaluated over a number of years (e.g. 5 years to 15 years).

POST MINING Land Use (FINAL LAND USE DOMAIN)	MINING DOMAIN	REHABILITATION OBJECTIVES	COMPLETION CRITERIA	PERFORMANCE INDICES	EXAMPLE OF JUSTIFICATION / VALIDATION METHODS
			rehabilitated areas is similar to adjacent cropping land. Ground cover (vegetation, leaf litter, mulch) is greater than 70%		
		Appropriate and reliable access to water for livestock. Access to shade.	Appropriate and reliable access to water for livestock. Appropriate shade and shelter for livestock (i.e. wooded/treed areas) during extreme weather conditions.	Location and density of dams or other watering points appropriate for the intended final land use Location and availability of shade and shelter for livestock appropriate for the intended final land use	Independent agronomist /consultant reports, photos

4.2 Rehabilitation Objectives and Rehabilitation Completion Criteria – Stakeholder Consultation

GCAA has a public commitment to effectively manage the environmental performance of its operations. One of the key focus areas for ongoing dialogue with stakeholders is progress in mine closure and rehabilitation planning, and the implementation process.

Proposed consultation activities for this RMP term are summarised in the following sections and further detailed in the *Stakeholder Engagement Strategy*.

4.2.1 RMP Consultation

All consultation undertaken for previous versions of the RMP is summarised in **Table 4-2**. These stakeholders have had the chance to comment on post mining land use, rehabilitation objectives and completion criteria.

Table 4-2 – RMP Consultation

Date	Stakeholder	Details of Consultation	Actions by Ravensworth Operations
2022			
July 2022	DPE	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
July 2022	BCD	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
July 2022	EPA	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
July 2022	Water NSW	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
July 2022	Singleton Council	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
July 2022	CCC	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
2025			
August 2025	DPHI	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
August 2025	BCD	A copy of the RMP was sent to this department for comment.	Nil – no comments received.

Date	Stakeholder	Details of Consultation	Actions by Ravensworth Operations
August 2025	EPA	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
August 2025	Water NSW	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
August 2025	Singleton Council	A copy of the RMP was sent to this department for comment.	Nil – no comments received.
August 2025	CCC	A copy of the RMP was sent to the CCC for comment.	Nil – no comments received.
August 2025	Resources Regulator	A copy of the RMP was sent to this department for comment.	Nil – no comments received.

Note there was no feedback provided from these agencies or the CCC in 2022 or 2025. It is noted that following the approval of PA09_0176 MOD 4, RMP consultation with these agencies is no longer required.

4.2.2 Rehabilitation Objectives and Completion Criteria Consultation

Ravensworth Operations have been developing the Rehabilitation Objectives and FLRP in consultation with the Resources Regulator. This included email correspondence in October 2023 and meeting in November 2023. Further information regarding consultation will be provided once the ROBJs and FLRP are approved.

5. Final Landform and Rehabilitation Plan

This section outlines the Final Landform and Rehabilitation Plan (FLRP) for Ravensworth Operations which have been prepared as per the RMP Form and Way Document. It should be noted that the FLRP is not yet approved by the Resources Regulator.

The two plans include:

Plan 1: Final Landform Features.

Plan 2: Final Landform Contours.

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6414000 6412500 6411000 6409500 6408000 6406500 6405000 6403500

ML1879
ML1591
ML1595
ML1325
Non - mine owned land
CL378
Foy Brook
NEW ENGLAND HIGHWAY
Mixed Waste Organic Outputs (MWOO)
ML1683
ML1669
ML1393
Emu Creek Re-establishment
ML1484
ML1485
Final Void Water Level
Mixed Waste Organic Outputs (MWOO)
ML1357
CCL739
CCL723
ML1576
Fal Brook
Mixed Waste Organic Outputs (MWOO)
CL380
Lemington Rd Visual Bund
CL580
Hunter River

LEGEND

- Project Approval Boundary - PA 09_0176
- Railway
- Major Road
- Major Waterway
- Electricity Transmission Line

Current Authorisations

- Relevant Coal Titles
- Surrounding Coal Titles

Final Landform Feature

- Final Void Water Level
- Lemington Rd Visual Bund
- Mixed Waste Organic Outputs (MWOO)
- Emu Creek Re-establishment

Final Landuse Domain

- Domain A: Native Ecosystem
- Domain B: Agricultural – Grazing
- Domain F: Water Management Areas
- Domain G: Water Storage (Excluding Final Void)
- Domain J: Final Void

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Source: Project Approval Boundary, Final Landform and Current Authorisations from Ravensworth Open Cut (2024). Roads, watercourses and electricity transmission lines from LPI (2023). Aerial imagery from Ravensworth Open Cut (2022).

Ravensworth Operations

Final Landform and Rehabilitation Plan
Final Landform Features
PLAN 1

Mine name	Ravensworth Operations
Plan name	Ravensworth Operations RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	19/07/2024

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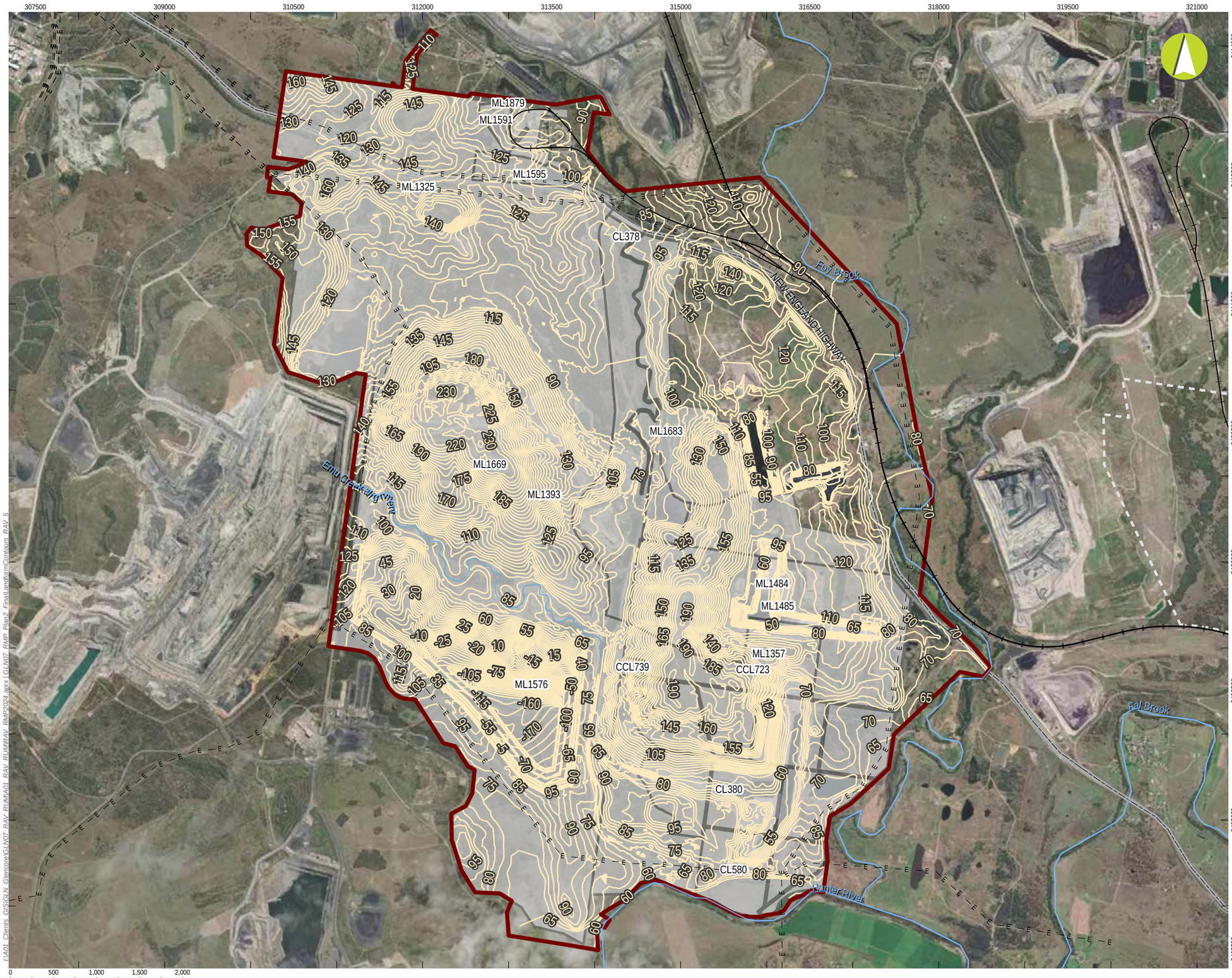

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LEGEND

- Project Approval Boundary - PA 09_0176
- Final Landform Contour (5m AHD)
- Railway
- Major Road
- Major Waterway
- Electricity Transmission Line

Current Authorisations

- Relevant Coal Titles
- Surrounding Coal Titles

Source: Project Approval Boundary, Final Landform and Current Authorisations from Ravensworth Open Cut (2024). Roads, watercourses and electricity transmission lines from LPI (2023). Aerial imagery from Ravensworth Open Cut (2022).

Ravensworth Operations

Final Landform and Rehabilitation Plan
Final Landform Contours
PLAN 2

Mine name	Ravensworth Operations
Plan name	Ravensworth Operations RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	19/07/2024

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6. Rehabilitation Implementation

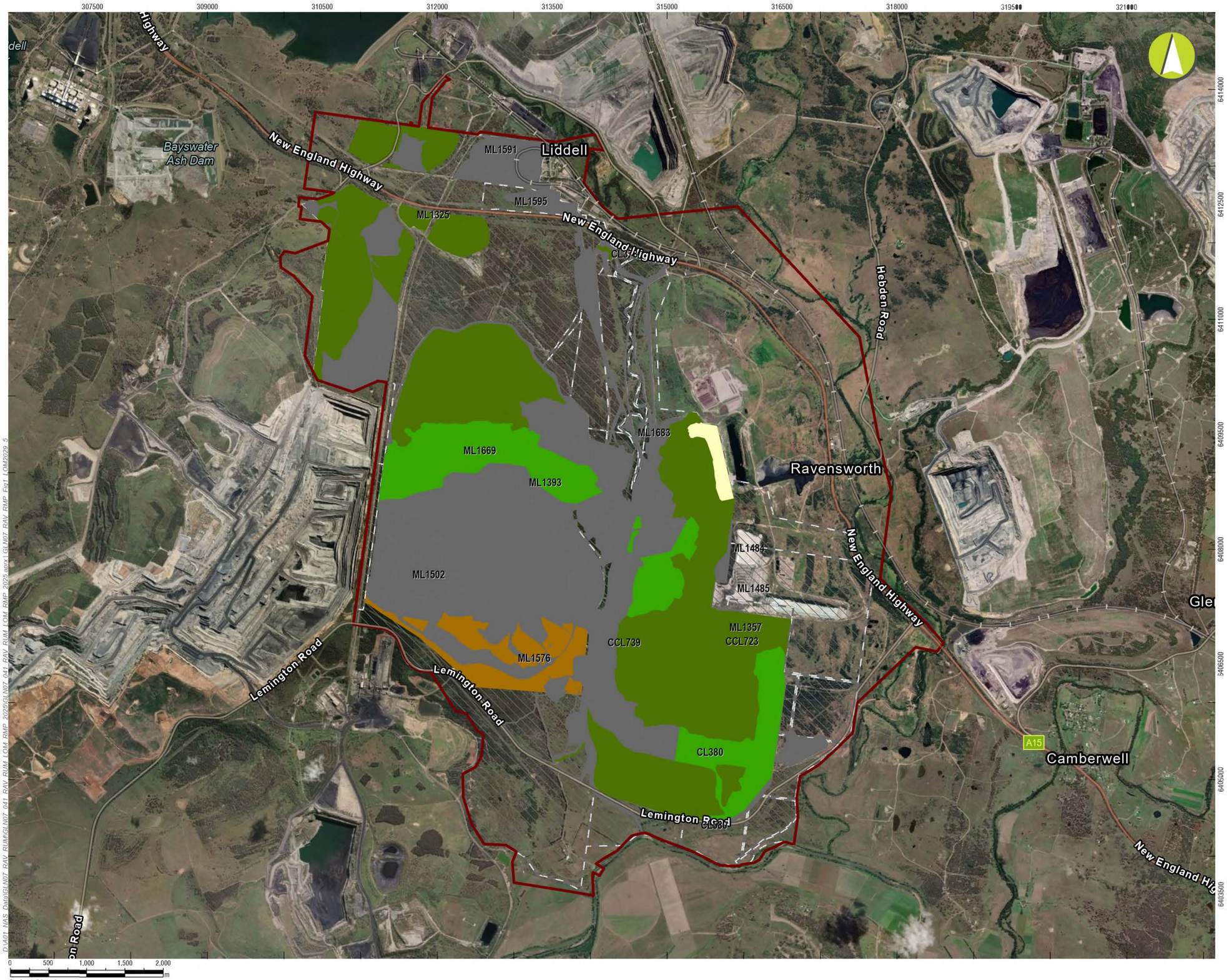
6.1 Life of Mine Rehabilitation Schedule

The RMP Form and Way document outlines that this section should describe the rehabilitation schedule over the life of the mine, from the commencement of the rehabilitation management plan until lease relinquishment. The life of mine rehabilitation schedule must include a series of plans illustrating the proposed mine layout and sequence of progressive rehabilitation across the leasehold area at a minimum of five-yearly intervals until completion of mining and achievement of the final land use.

An indicative Life of Mine rehabilitation schedule for Ravensworth Operations has been provided in **Table 6.1** below. Indicative progressive rehabilitation plans at five yearly intervals have been provided as **Figures 2, 3, 4 and 5**. The proposed final landform is provided in the FLRP (refer **Section 5**).

Table 6-1 Life of Mine Rehabilitation Schedule

Aspect	Description
a. Decommissioning of Key Infrastructure	Key infrastructure that is no longer required on site will start to be progressively removed following cessation of mining and processing activities. All other infrastructure (including the CHPP) is scheduled to be rehabilitated by approximately 2039.
b. Key final landform establishment activities	Landform shaping in rehabilitation areas will be undertaken progressively through to approximately 2039. Last coal is scheduled for 2037. Capping of tailings dams is scheduled to be completed by approximately 2039.
c. Investigations and Studies	Studies will commence in the 5 years prior to closure, as part of the development of the mine closure plan. These may include contamination studies, tailings capping studies, geotechnical assessments of highwalls, and groundwater assessments.
d. Assumptions and Principles	The key assumptions to achieving the life of mine rehabilitation schedule have include: • One final void will remain in the final landform. • The tailings dams on site have adequate capacity for life of mine tailings. • Meeting the production milestones and anticipated volumes of overburden to be handled • Staging of mining activities allows for progressive rehabilitation.



LEGEND

- Project Approval Boundary - PA 09_0176
- Relevant Coal Titles

Rehabilitation Staging - 2029

- Landform Establishment
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development

Disturbance Staging

- Disturbance Current - 2029
- Previous Disturbance

Ravensworth Open Cut

Life of Mine

Rehabilitation Schedule

2029

Figure 2

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	24/04/2026

Source: Project Approval Boundary, LOM Schedule and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2024). Aerial imagery from Ravensworth Open Cut (2023).

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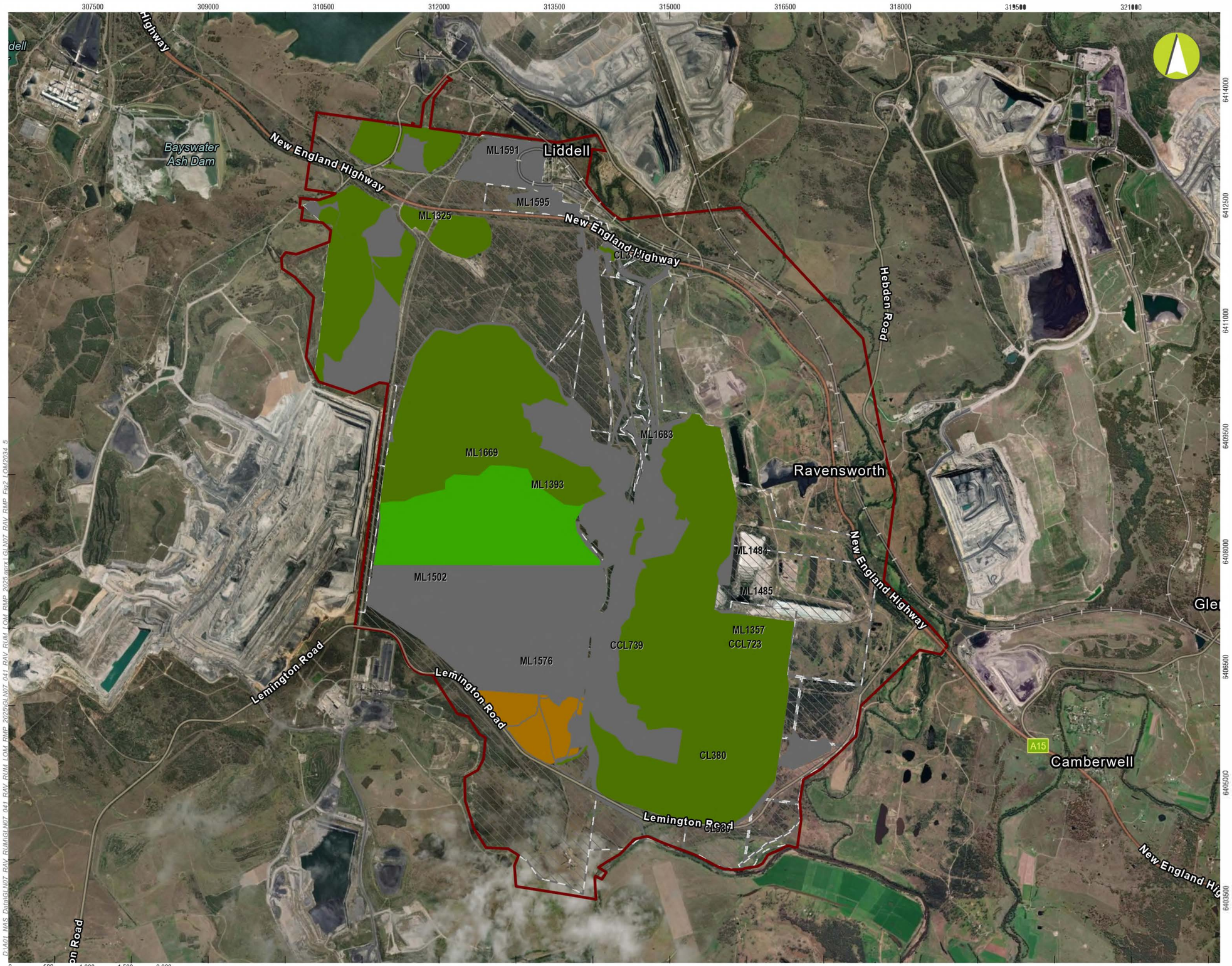

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LEGEND

- Project Approval Boundary - PA 09_0176
- Relevant Coal Titles

Rehabilitation Staging - 2034

- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development

Disturbance Staging

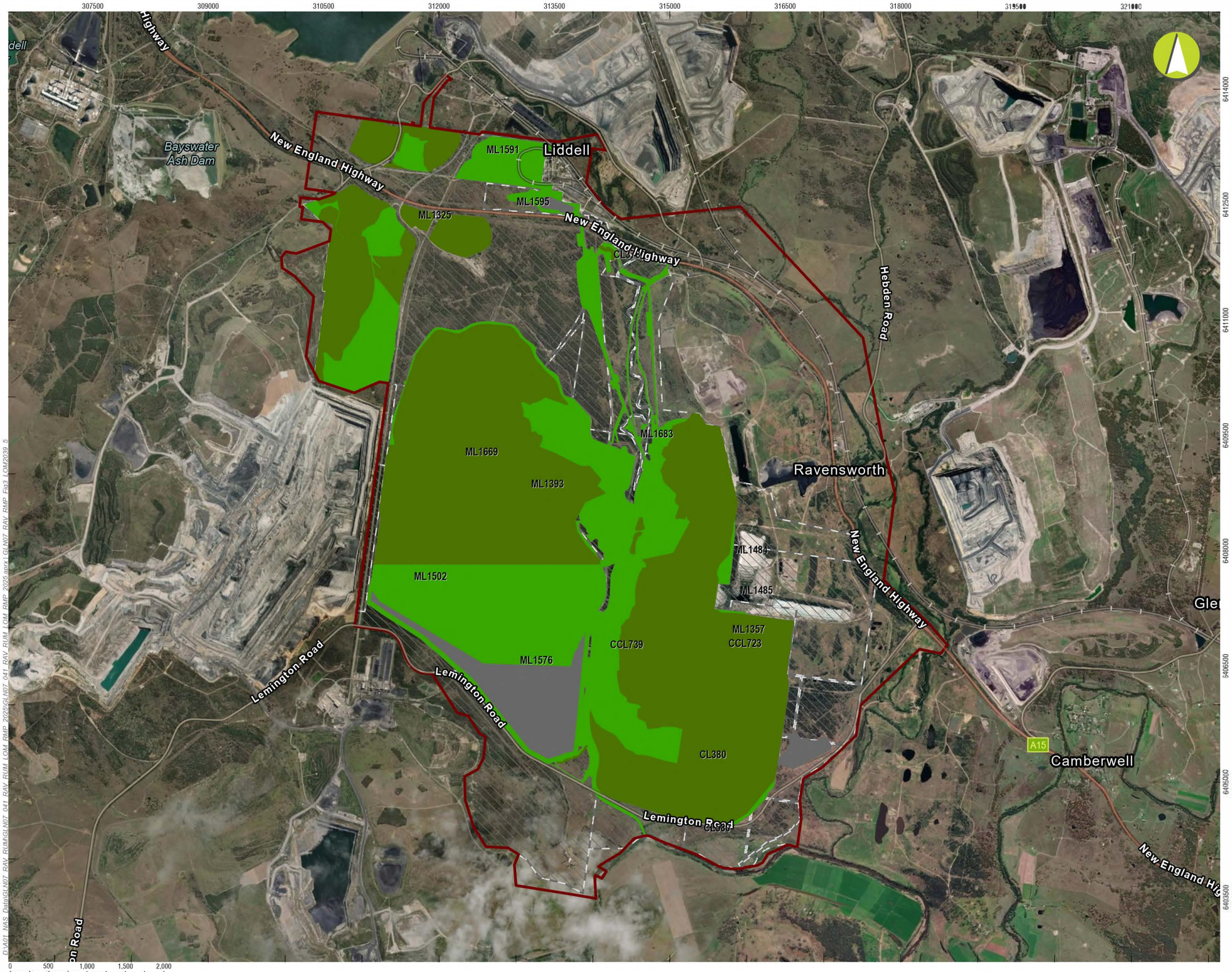
- Disturbance 2029 - 2034
- Previous Disturbance

Source: Project Approval Boundary, LOM Schedule and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2024). Aerial imagery from Ravensworth Open Cut (2023).

Ravensworth Open Cut

Life of Mine
Rehabilitation Schedule
2034
Figure 3

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	6/11/2025



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LEGEND

- Project Approval Boundary - PA 09_0176
- Relevant Coal Titles

Rehabilitation Staging - 2039

- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development

Disturbance Staging

- Previous Disturbance

Source: Project Approval Boundary, LOM Schedule and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2024). Aerial imagery from Ravensworth Open Cut (2023).

Ravensworth Open Cut

Life of Mine
Rehabilitation Schedule
2039
Figure 4

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	6/11/2025

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LEGEND

- Project Approval Boundary - PA 09_0176
- Relevant Coal Titles

Final Landuse Domain

- Water Storage (Excluding Final Void)
- Final Void

Rehabilitation Staging - 2044

- Ecosystem and Land Use Development

Disturbance Staging

- Previous Disturbance

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Source: Project Approval Boundary, LOM Schedule and Current Authorisations from Ravensworth Open Cut (2025). Roads, watercourses and electricity transmission lines from LPI (2024). Aerial imagery from Ravensworth Open Cut (2023).

Ravensworth Open Cut

Life of Mine
Rehabilitation Schedule
2044
Figure 5

Mine name	Ravensworth Open Cut
Plan name	Ravensworth Open Cut RMP
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	TBA following Portal Submission
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	6/11/2025

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6.2 Phases of Rehabilitation and General Methodologies

The final land use objectives will be achieved through a series of conceptual stages listed below:

- **Active** – The RMP Form and Way document states in the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
- **Stage 1: Decommissioning** – The removal of infrastructure associated with mining activities including preparation plants, hard stand areas, buildings, contaminated materials, hazardous materials. The RMP Form and Way document states that this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.
- **Stage 2: Landform Establishment** – The RMP Form and Way document states that this phase of rehabilitation consists of the processes and activities required to construct the approved final landform (as per the development consent and, for large mines, the approved Final Landform and Rehabilitation Plan). In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials). The landform design and construction part of this phase incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology.
- **Stage 3: Growing Media Development** – The RMP Form and Way document states that this phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short-lived pioneer species). This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion. Additional characterisation of materials e.g. subsoils, topsoils, organic additives and overburden surface is usually required in this phase to cross check data from the earlier phases.
- **Stage 4: Ecosystem and Land Use Establishment** – The RMP Form and Way document outlines that his phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community (e.g. Seeding or tube stocking) and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
- **Stage 5: Ecosystem and Land Use Development** – The RMP Form and Way document outlines that this phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving rehabilitation objectives, completion criteria and the Final Landform and Rehabilitation Plan. Completion criteria for this phase will include components

of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.

- **Stage 6: Rehabilitation Competition** – The RMP Form and Way document outlines that this final phase of rehabilitation occurs where a rehabilitation area has achieved the final land use for the mining area as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria and spatially depicted in the approved Final Landform and Rehabilitation Plan. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by the lease holder.

The stages listed above and methodologies (where relevant) are discussed in more detail in the following sub-sections.

6.2.1 Active Mining Phase

The RMP Form and Way document states in the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation. This sub section summarises the risks and opportunities for rehabilitation associated with the active mining phase across the mining domains. The sub sections have been prepared as per the RMP Form and Way document.

6.2.1.a Soils and Materials

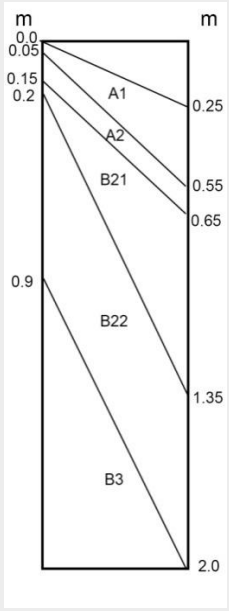
During the active mining phase, soils and materials should be managed by the controls specified in this RMP document relevant to each mining domain, which have been designed to achieve rehabilitation targets.

The Ravensworth North Topsoil Stripping Management Plan has been developed to manage topsoil stripping activities at site. This involved the completion of an initial desktop assessment and subsequent field assessment of the available soil materials at Ravensworth North. The investigations found that the topsoil resources within the approved disturbance area are generally suitable for stripping and reuse as topdressing during rehabilitation of the mine.

Previous topsoil testing and analysis, carried out in accordance with the NCST (2009) Australian Soil and Land Survey Guidelines (3rd Edition), was undertaken to determine nutrient composition and erodibility of topsoil and subsoil on site. Soil analysis identified three soil classification, Yellow and Brown Sodosol, Brown Dermosol and Reworked Material throughout Ravensworth Operations. The topsoil analysis identified that the soils at Ravensworth are of a sodic nature, requiring amelioration with mulch and gypsum to mitigate soil dispersion.

Yellow and Brown Sodosol

Soil Concept	**Yellow or brown texture contrast soil with sodic subsoil on sandstone**		
Australian Soil Classification	Yellow Sodosols	**Landform**	Gently undulating
Geology/ lithology	Sandstone	**Microrelief**	Nil
Permeability	Slowly permeable	**Runoff**	Slow to rapid

Soil Concept	**Yellow or brown texture contrast soil with sodic subsoil on sandstone**		
Effective Rooting Depth (ERD)	0.45 m	**Drainage**	Poorly drained
Surface Features	Firm setting, 100% grass cover, no cracking, occasionally sealed		
 **Soil profile diagram**	**A1:** Dark brown fine sandy loam, with blocky structure. Fine (<1 mm) roots (10%). Field pH 5 – 6.5. Clear boundary to - **A2:** Yellow light sandy clay loam, apedal massive. No roots. Field pH 5.5 – 7. Abrupt, boundary to - **B21:** Yellow brown light clay to medium clay, moderate sub-angular blocky structure. Manganese nodules (1 – 2 mm). Field pH 7 – 8. Clear to gradual boundary to - **B22:** Red to yellow brown medium clay, weak blocky structure with light brown mottles (< 20%). 2% manganese nodules (0.5 – 1 mm). Field pH 7 – 8. Gradual boundary to - **B3:** Yellow-brown weathered bedrock, apedal conditions. Field pH 8.5.		
			

Soil chemistry summary:

- Slightly acidic pH values in the topsoil; neutral to strongly alkaline pH values through the remainder of the profile. Alkaline pH values may be associated with elevated sodium concentrations;
- Chloride and ECe concentrations are generally low to moderately saline throughout the profile, increasing with depth;
- The CEC rating is low in the topsoil, becoming moderate with depth. This is a reflection of the increasing clay contents with depth;
- Major plant nutrients, such as phosphorus as nitrogen, were generally low (< 0.1 and < 10 respectively) across this landscape. Organic matter ratings were low to very low (< 1% - 0.4%) for these soils.

Physical soil characteristics summary:

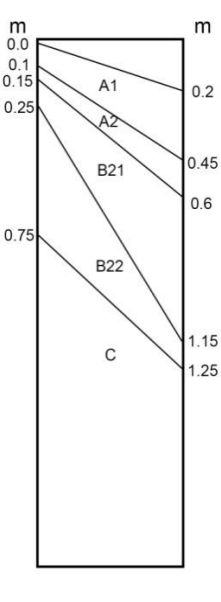
- Weak to moderately structured to apedal soil fabric were encountered throughout the unit.
- All Yellow Sodosol subsoils submitted for Emerson aggregate tests (EATs) scored a rating of 2, showing slaking and some dispersion. These subsoils are prone to water erosion. The EATs for the topsoil were more varied. While samples BH7 (0 - 0.15) and BH8 (0.5 - 0.7) had a rating of 2, all other topsoils from the Yellow Sodosols had EAT results of 7 or greater: showing no slaking, no dispersion, and slight or negligible swelling.

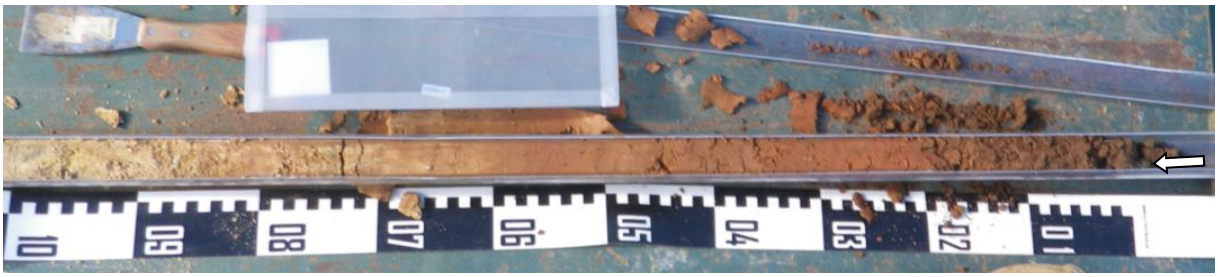
Soil stripping recommendations:

Material	Lower depth	Stripping recommendation
Topsoil	0.2 m	Stripping of the A horizon is considered appropriate (0.25 m). This should be confined to the coarser, loam soil – clay soils should *not* be stripped with the intention of reuse without appropriate treatment and management practices]
Root zone	0.8 m	Together with the moderately drained, moderately structured subsoil, the presence of roots to 0.8 m below ground level indicates that this soil may be useful to strip for reuse, provided that appropriate amelioration of the soils is undertaken.

Brown Dermosol

Soil Concept	Brown, weakly structured clay, with sodic subsoil on shales		
Australian Soil Classification	Brown Dermosol	**Landform**	Gentle undulating plain
Geology/ lithology	Shales	**Microrelief**	Nil
Permeability	Slowly permeable	**Runoff**	Moderately rapid
Effective Rooting Depth (ERD)	> 0.6 m	**Drainage**	Imperfectly drained
Surface Features	Soft to firm surface, with partly stabilised, minor sheet erosion		

Soil Concept	Brown, weakly structured clay, with sodic subsoil on shales
 **Soil profile diagram**	**A11:** Light Brown silty clay loam, with moderate polyhedral structure. Fine roots (< 10%). Field pH 5.5. Clear boundary to - **A12:** Light grey, medium clay, weak blocky structure. Some very fine roots (< 2%), and very small Mn nodules (< 1%). Field pH 6.5 - 8. Clear boundary to - **B21:** Yellow medium clay with angular blocky structure. Mn nodules (< 5 mm, 5 %). Field pH 8. Gradual boundary to - **B22:** Red, medium clay, weak, angular blocky structure. 5 % Mn nodules. Field pH 8. Gradual boundary to -



Soil chemistry summary:

- Slightly acidic pH topsoil, neutral to slightly alkaline pH through subsoil.
- ECe is low (< 2 dS/m) to moderately saline (4 - 8 dS/m). ECe and chloride levels in Area 2 are slightly elevated (2 – 4 dS/m) in the subsoil;
- Similar to the Yellow/Brown Sodosol soil, increases in CEC was related with clay content and depth;
- Nitrogen concentrations were up to 9.1 mg/kg in the Dermosols, while phosphorus was generally low (<0.4 mg/kg). These concentrations were marginally higher than those of the Yellow/Brown Sodosols. Organic matter concentrations are very high (> 5%) in samples BH26 (0.0 - 0.05) and BH27 (0.0 - 0.2), while nitrogen levels are moderate (0.05-0.25%). Phosphorus levels at these locations are low to moderate.

Physical soil characteristics summary:

- EAT results are comparable to the Yellow/Brown Sodosols (Class 2: slaking and some dispersion), except that the topsoils are Class 7 and Class 8 (non-slaking, swelling and non-swelling respectively, a likely reflection of the increased organic matter present in Dermosol topsoils). There is therefore potential to strip this soil to a slightly greater depth, assuming appropriate amelioration and mixing of the soils.

Soil stripping recommendations:

Material	Lower depth	Stripping recommendation
Topsoil	0.4 m	A horizon is suitable for stripping. This is generally characterised by dark brown clay loam material, above the yellow clay subsoil.
Root zone	1.0 m	Together with the moderately drained, moderately structured subsoil, the presence of roots to 0.8 m below ground level indicates that this soil may be useful to strip for reuse, provided that appropriate amelioration of the soils is undertaken.

Reworked material

Reworked material was encountered at boreholes BH23 and BH24 in the north east of Area 2. The origin of this material is unknown. No laboratory analyses were undertaken on this material. During the field investigation no indicators of gross sodicity or salinity were noted in this area, supported by high grass establishment in the area. Therefore, the material is considered suitable for reuse on site to a similar depth as stripping carried out to date in the northern area of ROC (0.5 m bgl).

In the likely occurrence that additional material is needed for topsoil dressing , additional work could be carried out to determine the suitability of the reworked material for site rehabilitation.

Soil stripping recommendations:

Material	Lower depth	Stripping recommendation
Topsoil	0.5	The reworked material may be highly variable in depth. As such, a conservative approach to the reworked material should be adopted. For simplicity, we recommend stripping of the soils be limited to approximately 0.5 m below ground level.

Material	Lower depth	Stripping recommendation
Root zone	0.2 m	Rooting depth is *not* associated with stripping depth

Ravensworth North have introduced controls to the stages of stripping, handling, and management of soils and materials in the active mining phase which are discussed in relevant sections of this RMP. The total volume of topsoil is to be stripped and salvaged per the Ground Disturbance Permit and salvaging procedures to maximise its value for re-use in rehabilitation of the mine.

Advanced clearing and topsoil removal should be minimised to reduce material loss caused by erosion. Where planned disturbance is to occur, the following should be completed:

- Material and soil characterisation (per Project BOMP and Ravensworth North Topsoil Stripping Management Plan), sampling (analytical and soil biota properties) and stripping details will be collected prior to clearing to assess suitability, application rate and required amelioration for rehabilitation activities;
- An annual topsoil testing program is undertaken on topsoil to be stripped and topsoil stockpiles to inform sodicity of soils and amelioration requirements for use in post mining rehabilitation.
- Erosion and sediment controls will be put in place at stockpiles and stripped areas to prevent off-site loss of topsoil and subsoil sediments;
- Topsoil will be stripped using appropriately sized earthmoving equipment i.e. track dozers;
- Where practical, soil should be stripped when moist. No stripping should occur in excessively dry or wet conditions;
- Any vegetation removed as part of Project and access track clearing requirements shall be transported to rehabilitation areas to maximise the value of the soil seed bank and soil biota;
- Sampling as required on recalcitrant exposed soils >400m^2 (determined by inspections) should be analysed for pH, Electro Conductivity (EC), Exchangeable Sodium percentage (ESP), macro nutrients and trace elements;
- Stripped topsoil stockpiled as part of Project (area) preparations should be replaced;
- Material and soil characterisation (including soil biota) will be undertaken prior to the re-handling of topsoil that has been stored within the Project area for a period of 2 years or more; and
- Erosion and sediment control should be maintained and remain in place until the areas of disturbance completely rehabilitated.
- ROC maintains a register where topsoil resources are tracked and recorded, as a system to assist with planning and performance of rehabilitation. Included in the register GIS mapping of uniquely identified topsoil resources. ROC topsoil inventories have identified that the site will have sufficient topsoil resources to complete rehabilitation across the life of mine.

When mining operations dictate that topsoil storage is necessary, stockpiling procedures outlined in **Section 0** of this RMP assist in maintaining the integrity of the material.

Recovery and management of any topsoil will be undertaken in accordance with the controls provided in **Section 5.1.1.5** of the EA. It should be noted that additional soil materials may be salvaged from the Ravensworth West rehabilitation areas that will be re-disturbed for mining.

6.2.1.b Flora

The low risks identified by the RMP Risk Assessment relate primarily to operational aspects relevant to flora conservation and management, specifically, rehabilitation, and seed propagation.

In order to mitigate the ecological impacts associated with the Project, Ravensworth Operations developed a comprehensive BOMP which aims to maintain or improve the biodiversity conservation of the region. The RMP Risk Assessment identified vegetation removal as an activity that may potentially cause a loss of threatened flora. Key controls in place to minimise the risk to flora and habitat are outlined in the BOMP and include:

- Weed Management;
- Demarcation and pegging out of areas;
- Ground Disturbance Permit;
- Tree felling procedures;
- Seed collection and propagation procedures;
- Bushfire management;
- Fencing;
- Weed and pest management;
- Management and monitoring within the offset areas (managed under the Project's BOMP);
- Flora monitoring; and
- Rehabilitation monitoring and maintenance.

Annual monitoring and monthly environmental inspections are completed at Ravensworth Operations to identify areas of weed infestations as well as review the effectiveness of previous weed control programs. Weed control measures are undertaken in rehabilitation areas, buffer lands and biodiversity offset areas (BOAs). Identified weed infestations are recorded in the GIS database.

Further details on clearing management, habitat augmentation and seed propagation are discussed in **Section 0**.

6.2.1.c Fauna

Biodiversity is managed in accordance with the BOMP which has been developed and approved in accordance with Schedule 3, Condition 24 of PA09_0176. The BOMP covers the management of biodiversity at Ravensworth Operations and biodiversity offset areas, and is available on the website.

Ravensworth Operations aims to mitigate effects of mining activities on native vegetation communities, fauna habitat and fauna species by planning and implementing programmes to maintain and improve the biological value of land. The programs are not only for rehabilitation areas but include other potentially degraded sites across the Ravensworth Operations. The main controls as part of clearing management relate to the Ground Disturbance Permit process and saving key features for

habitat augmentation. Where potential fauna habitat is identified during pre-clearing surveys and area salvaged as habitat for re-use in the rehabilitation.

Pre-clearing surveys will be undertaken as part of the Ground Disturbance Permit process to identify potential habitat features and any active threatened fauna prior to commencing clearing in each area. These surveys will inform appropriate management actions based on the specific habitat features or threatened species identified. The surveys will also target weed infestations requiring treatment before or during disturbance, as well as pest species that may require control prior to works. All pre-clearing surveys will be carried out by appropriately trained and suitably qualified personnel.

Management actions for any identified habitat features or active threatened fauna will be determined on a case-by-case basis. Actions may include selective clearing of non-habitat vegetation to encourage fauna to relocate naturally. Where required, appropriately trained and suitably qualified personnel will attempt to remove any remaining fauna that do not leave the area of their own accord.

6.2.1.d Rock/Overburden Emplacement

Once the mining area is cleared of vegetation and topsoil, the material lying above the target coal seams; known as overburden, is broken up through drilling and blasting to enable it to be removed.

The top layer of overburden is generally weathered material that may not require blasting and this material may be removed prior to blasting.

The mine plan has been developed to maximise opportunities for in-pit waste emplacement, thereby minimising the extent of out-of-pit overburden emplacement areas (OEAs). The western out-of-pit OEA at Ravensworth North will continue to be used through to 2029 and the Eastern out -of pit OEA at Narama was used through to 2023.

The Eastern OEA is located mostly on the rehabilitated voids associated with the former Ravensworth No. 2, Ravensworth South and Narama mining operations. The eastern out-of-pit OEA has been designed to progress in advance of the proposed mining sequence so that a barrier is created between the proposed mining operations and receiver areas to the south-east. Existing rehabilitation is present in a large area of the proposed eastern out-of-pit OEA. Vegetation and topsoil will be stripped and transported to designated storage areas prior to the excavation of overburden material from Ravensworth North. Further details on topsoil stripping are provided in **Section 6.2.1.a**.

6.2.1.e Waste Management

Ravensworth Operations manages waste materials generated during its operations in accordance with the internal Waste Management Plan and Hydrocarbon Management Plan.

The waste management system categorises waste materials into designated waste streams and ensures that each stream is treated accordingly. The objectives of the waste management system are to:

Comply with PA 09_0176, EPL 2652 and legislation relevant to waste storage and disposal;

- Minimise waste generation, encourage and facilitate re-use and recycling of waste streams where possible;
- Conduct appropriate segregation, storage, transportation and disposal of waste generated across the Project;
- Conduct proper hydrocarbon management, wastewater and sewage treatment; and
- Provide education and training programs to Project personnel and contractors regarding waste mitigate ion measures and proper waste handling and disposal.

The existing waste management contractor implements a comprehensive Waste Management System across the Project including detailed waste tracking, monitoring, measurement and recycling. Ravensworth Operations is committed to operating in an environmentally responsible manner and abides by the waste management hierarchy of "avoidance, reduction, reuse, recycling and disposal" as much as practicable to minimise the waste generated by the mine.

Waste management controls include:

- Correct waste storage;
- Waste minimisation;
- Communications and training;
- Recycling and reuse;
- Correct disposal; and
- Waste recording and inspections.

Management of coarse and fine rejects is detailed further in **Section 6.2.1.i**.

In the event hydrocarbons have contaminated soil material as a result from spillages for example, the contaminated material will be either removed from site by RO licensed waste contractor to an appropriate licensed facility for treatment or removed to RO's on site bioremediation area for remedial treatment. The bioremediation area is located within the Narama West Void area. The material is disposed of within active waste emplacement areas only after the material has been successfully remediated.

Ravensworth Operations is authorised to dump tyres on-site within mine void waste rock emplacement areas in accordance with EPL 2652.

6.2.1.f Geology and Geochemistry

The resource coal targeted for extraction at Ravensworth Operations includes seams of the Foybrook and Burnamwood Formations, which form part of the Wittingham Coal Measures. The coal seams targeted extend from the shallow Broonie Seams, through the Bayswater, Lemington, Pikes Gully, Arties, Liddell and Barrett Seams, to the Hebden Seam. The strata dips gently (<5 degrees) to the south-east within the mine towards the Bayswater Syncline and flattens to the south-west around the Ravensworth North monocline. A thin igneous dyke runs through the pit area on a north-easterly orientation and intersects a small volcanic plug in the north of the pit area. This volcanic breccia has been well defined by drilling.

Spoil material is regularly tested to determine the quality of material for rehabilitation. Recent soil testing on spoil material from Ravensworth Operations indicates the following:

- Spoil material tested was alkaline, highly saline and strongly sodic;
- The effective cation exchange capacity (eCEC) is moderate, indicating good nutrient retention and holding capacity;
- Certain soils are dispersible due to their sodicity and magnicity and should be managed accordingly;
- Phosphorus levels are suited to P sensitive plantings, including Australian natives; and

Where required, Gypsum will be applied to assist in balancing the cations and preventing dispersion.

6.2.1.g Material Prone to Spontaneous Combustion

Ravensworth Operations operates in accordance with a Spontaneous Combustion Principal Mining Hazard Management Plan which outlines the process for the placement of carbonaceous materials to ensure that the potential for spontaneous combustion to occur is minimised. The plan identifies potential sources of carbonaceous material and details methods to be used when handling and disposing of carbonaceous materials. A specific training module has been developed to communicate the requirements of this procedure to appropriate personnel.

Incidences of spontaneous combustion could potentially occur during stockpiling ROM coal. The principal method used to control spontaneous combustion is to ensure that stockpiled coal is transferred to the crusher as soon as possible. If coal cannot be transferred due to delays in schedules and the stockpile begins to generate heat with time, then coal in the stockpile will be spread out to allow the heat to dissipate as required. The height of the stockpile is kept as low as possible to enable access and treatment of coal. In the event that stockpiled coal is ignited or smouldering, the stockpiles are typically spread out in layers approximately 300mm thick, doused with water to extinguish the fire and compacted. The treated coal is then prioritised through the coal crushing process. Daily inspections are conducted to observe stockpile conditions and spontaneous combustion outbreaks.
Historically spontaneous combustion at Ravensworth Operations is isolated to old dragline waste emplacement areas and ROM stockpiles. This is currently managed by the *Spontaneous Combustion Principal Mining Hazard Management Plan,* which includes:

- Inspections;
- Designated tailings areas and selective placement of carbonaceous/ inert materials;
- Monitoring and testing of geochemically unsuitable materials;
- Thermography;
- Training; and
- Treatment plans (including TARPs).

In 2024 an investigation was undertaken into potential spontaneous combustion issues at the rehabilitation area identified as the Eastern Emplacement Area (EEA). The rehabilitation area has been identified as having a potential spontaneous combustion hazard and covers an approximate area of 20ha, which is currently fenced off.. The temperature was variable and was not consistent over the entire area.

The odour of sulphur dioxide gas (SO2) was also noted and appeared to correlate with higher surface temperatures.

There are a number of possible sources of oxygen that may be contributing to the oxidation of iron sulphide materials present in the mine waste that can initiate spontaneous combustion. The spoil material has been dumped historically, as such there is limited information available on their characteristics.

The spontaneous combustion hot spots are monitored through the use of thermal imaging technology and visual inspections. These hot spots are monitored and assessed on a regular basis to determine appropriate mitigation strategies as well as providing feedback into the understanding of spontaneous combustion at the mine.

Additional sampling will be conducted as mining operations progress further south to determine future risks associated with AMD, spontaneous combustion and sodicity.

Material that is prone to have spontaneous combustion risks is not used as part of rehabilitation works. When designing dumps which encroach on the approved final landform, the design is to allow for the management of coarse rejects. As per the ROC Environmental Assessment (EA), coarse rejects are required to be covered by a minimum of 2 meters of overburden. To allow for sufficient coverage and permit future landform changes, dump designs where the dump RL is 10m from the final landform are not permitted to have reject or carbonaceous material dumped as per the Fleet Management System Design Procedure (RAVOC-258458278-206).A specific works plan has been developed to address the heating and is detailed below.

As part of the work plan to remediate the areas of heating in the Eastern Emplacement Area (EEA) rehabilitation, a geochemical and spontaneous combustion sampling and analysis plan (GSC-SAP) was developed. Development of the plan was aided through thermal drone flights and ground penetrating radar surveys that covered the extent of the area impacted by heating. The GSC-SAP identified five test pitting locations.

Test pitting will be conducted through the use of a long reach excavator under the supervision of a geochemical, physical, and spontaneous combustion sampling specialist. Each test pit will be approximately 1m wide, 2m long and 1 – 4m deep. Each 1m interval of dirt that is excavated will be separated into bulk piles. Samples from each of the bulk piles will be taken for further analysis. Each test pit will be refilled in the opposite order so that the deepest material excavated is placed back at the deepest section of the test pit.

Samples will be subjected to a standard Acid Base Account (ABA) suite. This includes the determination of pH, EC, total sulfur, Acid Neutralising Capacity (ANC) and Net Acid Producing Potential (NAPP). Sulfide sulfur will be measured on selected individual samples with greater than >0.2 % total sulfur. Composite samples will then be subjected to further geochemical analyses such as acidity/alkalinity, total metals/metalloids in a weak (2-acid) digest, and soluble filtered metals/metalloids in static leach (shake flask extraction) tests. This approach results in a balance between sample coverage and cost and is an effective strategy for a geochemical assessment.

Spontaneous combustion analysis will be done by B3 laboratory on an assumed 5 selected individual or composite spoil samples. The testing may include the following: Incubation Test, R70/RIT Test, Gas Evolution Test, Coal Quality, Forms of Sulfur.

The R70/RIT Test determines the R70 adiabatic self-heating rate, crossing point temperature (CPT) and the relative ignition temperature (RIT). These tests can provide an indication of the intrinsic spontaneous combustion propensity (ISCP) of a particular sample material, which in Australia is based on a simple classification scheme that utilises the adiabatic self-heating (R70) value (Industry and Investment NSW, 2011).

Determination of the ISCP Class and Propensity Rating for the areas subject to heating will help to inform the next stage of remediation and management required to mitigate areas of rehabilitation affected by heating.

6.2.1.h Material Prone to Generating Acid Mine Drainage

There are no known Acid Mine Drainage (AMD) issues at ROC and therefore, this aspect is not a major consideration in relation to Project rehabilitation. Testing has been conducted on exploration samples to determine propensity for AMD generation, across the Project. No evidence of AMD has been found to date. In the event that AMD is identified, mitigation measures will be implemented and may include selective dumping, monitoring and recording.

Material characterisation undertaken in 2023 of progressive mining strips identified that most overburden/interburden materials represented in samples tested have very low sulphur content, excess acid neutralising capacity (ANC), and are classified as non-acid forming (NAF). A small number of samples are classified as potentially acid forming (PAF) and represent carbonaceous mudstone and carbonaceous siltstone, sandstone, siltstone materials, respectively, from the floor of the Hebden coal seam. The Hebden coal seam is not mined at Ravensworth and therefore based on current open cut operations; there is no risk of AMD generation associated with the floor material of the Hebden coal seam.

Further material characterisation studies will be undertaken by Ravensworth as required to continue to inform overburden and interburnden materials.

6.2.1.i Ore Beneficiation Waste Management (Reject and Tailings Disposal)

Coarse rejects

Rejects are conveyed from the RCHPP to a reject bin, where it is collected using haul trucks for transport and disposal to the approved emplacement areas (open cut voids). The haul trucks transport rejects via internal haul roads for co-disposing in the OEAs in accordance with PA09_0176.

Tailings

A Life of Mine Tailings Storage Strategy (ATC Williams) has been prepared for Ravensworth Operations. This Tailings Storage Strategy outlines the proposed tailings storages and tailings disposal strategies. Tailings will be pumped to the approved tailings areas to minimise additional surface disturbance. Across the Project footprint, there are a number of existing reject and tailings emplacement areas currently servicing coal processing facilities. The following emplacement areas may be used:

- Cumnock Void 3 - This void is located in the western area of the Project and will be utilised for tailings storage and deposition. Void 3 tailings storage facility ownership is shared between Ravensworth Operations and Hunter Valley Operations. As such, a Joint Tailings Facility (JTF) Agreement is in place, with HVO currenting utilising Cumnock Void 3 under the JTF Agreement.
- Cumnock Wash Plant Pit Void - This void is located in the north-western extent of the Project and will be utilised for water and tailings storage;
- West Pit Void at Ravensworth East (Mount Owen site)- This void is located in the Ravensworth East southern area approved and currently being utilised by Mt Owen Complex. Tailings will be transferred from the RCHPP to Mt Owen using the Greater Ravensworth Area Water and Tailings Scheme (GRAWTS); and
- Temporary TSF at RUM which has ceased operation (i.e no longer accepting disposal of tailings and reject material) and is subject to capping during mine closure process. Now covered under this RMP, is being used a storage facility for material that has cleaned out from water management facilities on site

The Cumnock Void 1/2 TSF is scheduled for closure. The closure process does not preclude further deposition of tailings in the void. In fact, targeted deposition may reduce the quantity of earthworks

required to produce a free draining final landform. The RMP will be revisited if further tailings deposition is planned for the Cumnock Void 1/2 TSF.

The GRAWTS pipeline facilitates the transfer of water and tailings between Ravensworth Operations, the Mount Owen Complex, Liddell Operations and Integra Operations. Once emplacement of tailings is completed in Cumnock Void 3, tailings from the RCHPP will be transferred to West Pit Void at Ravensworth East (within the Mount Owen Complex). Mt Owen Pty Limited will be responsible for management of the West Pit Void.

Decommissioning of tailings storage facilities will be completed in accordance with high risk activity (HRA) notifications under the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 and GCAA's Tailings Storage Facilities Protocol. Current tailings management is undertaken in accordance with the Life of Mine Tailings Storage Strategy. A Final Tailings Dam Management Plan will be completed at least five years before mine closure which will include a risk assessment conducted by an experienced geotechnical engineer. Once the proposed tailings and reject emplacement areas can safely support earthmoving equipment, they will be rehabilitated and covered with a minimum of two metres of overburden. This overburden will be contoured (for water management), spread with topsoil, ripped, seeded, and will be geotechnically stable against floods, erosion and subsidence.
The aim of *the Life of Mine Tailings Strategy* includes:

- Deposition of tailings with pipe head flocculation (also known as secondary flocculation);
- Controlled placement of tailings to provide an initial thick crust; and
    - **Stage 1:** Continuous filling of tailings to a level that is generally 3.5 to 4.0 m below the full supply level of the storage. Filling will then be diverted to the next storage in the sequence (apart from ongoing placement of Stage 2 tailings, as discussed below);
    - **Stage 2:** Controlled filling such that the rate of rise is limited to 1.0 m/year, to comply with the requirements for capping by controlled placement of tailings;
- Placed capping layers;

To facilitate rehabilitation requirements, the filling of each storage will be completed in the two stages as described above. During the active deposition of tailings, material will continue to be tested for physical and chemical characteristics.

The locations of tailings storage facilities are illustrated in RMP Plans (Figure 1D). Tailings management is outlined further in **Sections 6.2.1.d** and **6.2.3.c.**

6.2.1.j Erosion and Sediment Control

Main risks associated with erosion and sediment control is pollution of waters and impacts and degradation on rehabilitation areas. Erosion and sedimentation impacts are managed in accordance with the Ravensworth Complex Erosion and Sediment Control Plan (ESCP) which forms part of the approved Ravensworth Complex Water Management Plan. Erosion and sediment control in rehabilitation areas will be reviewed as part of regular inspections and as a component of the rehabilitation monitoring programs. Any management actions required will be implemented as soon as practicable. Section 8 outlines rehabilitation monitoring in additional detail.

The conceptual final landform has been designed to blend into the surrounding environment and includes a drainage pattern capable of conveying runoff from the newly created areas whilst minimising the risk of erosion and sedimentation. These landforms offer a diversity of habitat that can

enhance the value of rehabilitated ecological systems. All final landform design will be reported in the Annual Review. The OMCP has been updated to provide additional details regarding landform design.

The main operational erosion and sediment controls used by Ravensworth Operations in rehabilitation include:

- Training;
- Monitoring
- Clean water diversion drains and banks;
- Catch drains and sediment dams;
- Sediment fences and other temporary controls;
- Completion of revegetation works;
- Ground Disturbance Permit process; and
- Ongoing maintenance of erosion and sediment control structures.

All active mining and rehabilitation areas across the Project have appropriate containment facilities such as drains and sedimentation basins to retain runoff water. These sedimentation dams are regularly inspected and maintained to ensure that there is sufficient capacity available for sediment containment. Erosion and sediment controls will continue to be implemented at Ravensworth Operations to mitigate the impacts on nearby water courses and the surrounding environment. Standard erosion and sediment control techniques will be used in accordance with the requirements Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) (the Blue Book). Further detail regarding the management of erosion and sedimentation is outlined in the Ravensworth Complex Water Management Plan.

As part of the final landform design, RO has implemented a comprehensive final drainage system with assistance from GeoFluv landform design specialists. This system incorporates natural drainage features to attenuate flows and improve the long-term erosional stability of key drainage lines within the backfilled open cuts. The design process considered pre-mining drainage patterns, post-mining bed profiles, geomorphic parameters, and hydraulic modelling of stream power and shear stress.

To mitigate erosion during the establishment phase of rehabilitation, the soil is deep ripped to a depth of approximately 200-300mm. Through ripping the topsoil whilst vegetation is establishing, the run off is slowed, spreading the water out mitigating erosion and loss of growth medium. During the ripping stage, gypsum is spread with the topsoil, the gypsums enables greater soil organism activity breaking down material in the soils which produces a glue stabilising the soil structure. A fast growing cover crop is added to the seed mix to help bind the soil together in the early stages of establishment.

If erosion is observed during regular inspections, preventative action is implemented to minimise loss of growth material through re-ripping the topsoil, or the installation of contour banks to direct surface runoff into the drains.

Erosion and loss of sediment from rehabilitation is monitored through monthly inspections, an annual walk over of the rehabilitation, and targeted erosion modelling with the use of Lidar to model the loss of material and erosion hotspots. Erosion that is identified as part of the monitoring is rectified where applicable.

6.2.1.k Ongoing Management of Biological Resources for Use in Rehabilitation

Seed Collection and Propagation

Seed collection will be conducted in accordance with the requirements of the Florabank Guidelines (2000). Native revegetation activities in rehabilitation areas will preferentially use local provenance seed for direct seeding or tubestock propagation. Ravensworth Operations has developed a seed collection program with its supplier to ensure seed quality and viability to maximise the amount of seed of local provenance for use in rehabilitation and revegetation activities. The program includes:

- A seed calendar that contains information relating to fruiting and seed collection times for key native species;
- Data on seed collection including species, collection location and date of collection;
- Seed assessment of native vegetation within the pit shell in order to allow for seed collection prior to or immediately following clearing;
- Required volumes of seed to be collected in order to enable adequate supply of native seed for reuse; and
- The utilisation of record sheets and a GIS database to track collection, storage and utilisation of the seed resource.
- The seed collection program adopts innovations to industry best practice techniques, where relevant. Where adverse seasonal conditions (i.e. drought) affect the availability of local provenance seed, supplementation with non-local provenance seed may be required. Alternatively, revegetation works may be delayed until sufficient stocks of local provenance species are available.

Salvage of Tree Hollows, Stags and Timber

The salvage of hollow bearing trees, hollow logs, fallen timber and boulders will be undertaken, where practical, during the clearing process. The relocation of such habitat resources into post-mining rehabilitation areas and offset and conservation areas (where deemed to be appropriate) is aimed at increasing habitat complexity in these areas, in order to make them more habitable for native species, particularly key threatened species.

Soil Seed Bank Management

Soil seed bank management undertaken at Ravensworth Operations are outlined below:

- Stockpiles will be generally less than 3 metres high to retain biological activity within the topsoil.
- Stockpiles to be kept longer than 3 months will be sown with a suitable cover crop to minimise soil erosion and the invasion of weed species.
- Weed growth will be monitored and subsequently controlled if necessary.
- During the growth medium establishment phase, topsoil is spread to a depth of approximately 100mm.
- Further details on the management of biological resources at RO including topsoil, tree hollows, fallen timber and native seed collection are provided in ***Section 6.2.1a, Section 6.2.1b*** and ***Section 6.2.1c***.

6.2.1.l Mine Subsidence

ROC is an open cut mine, therefore subsidence is not generally applicable, however, it should be noted that some surface areas are potentially affected by subsidence from the previous Cumnock underground mining and RUM & RUMex underground mining. Much of the areas are heavily disturbed areas which are still used for active mining. Overburden has been emplaced over much of the RUM workings.

The management of mine subsidence is outlined in the RUM RMP.

6.2.1.m Management of Potential Cultural and Heritage Issues

Aboriginal Heritage

Aboriginal Cultural Heritage is managed in accordance with the approved Ravensworth Complex Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP has been developed to address the management of Aboriginal cultural heritage sites across the Ravensworth Complex, and to ensure compliance with statutory requirements.

Ravensworth Operations have sought to avoid and minimise potential impacts on the significant archaeological values of the Project throughout the project planning process. This has included the avoidance of direct impacts on Davis Creek which contains identified grinding grooves, which has been identified as an archaeological feature of high cultural and archaeological significance. In addition, Ravensworth Operations has sought to minimise potential indirect impacts on this site through the management of potential blasting impacts, and the design of the comprehensive water management system. Ravensworth Operations proposes to undertake salvage programs at any sites that will be directly impacted by mining operations in accordance with procedures developed in consultation with the Aboriginal community and Heritage NSW.

Ravensworth Operations has committed to a comprehensive mitigation strategy that will provide for the long term management of Aboriginal heritage sites identified within the Project area, but located outside of proposed disturbance areas, and the long term conservation of identified sites within the Ravensworth North Offset Area. The ongoing management and conservation strategies for these sites are detailed further in the ACHMP.

Historic Heritage

Historic heritage is managed in accordance with the approved Ravensworth Complex Heritage Management Plan.

A Historical Heritage Assessment was completed as part of the 2010 EA. The identified and potential heritage components of the Project are of low local significance with no to low research potential. The listed historic heritage items within and surrounding the project area are of relatively higher significance as reflected by their listing on relevant registers/databases. Ravensworth Operations will implement the following historical heritage management measures associated with continued operations including managing blasting practices to meet relevant blast impact assessment criteria at listed heritage sites/items within the vicinity of the Project.

In the event that unexpected archaeological remains or potential heritage items are discovered, all works in the immediate area will cease, the remains and potential impacts will be assessed by a qualified archaeologist or heritage consultant and if necessary, Heritage NSW and DPE will be notified in accordance with the *Heritage Act 1977.*

6.2.1.n Exploration Activities

Ravensworth Operations has developed procedures for the management of exploration activities so that they are conducted in an environmentally responsible manner and with due consideration to the community. Ravensworth Operations will be responsible for the final rehabilitation of any exploration sites.

At the completion of the exploration, the following will be completed:

- Capping and backfilling of boreholes outside the mining footprint in accordance with Exploration Code of Practice: Rehabilitation (DRG, 2017);
- Rehabilitation of disturbance areas in accordance with this RMP;
- Access roads are to be rehabilitated so that they do not alter the natural path of overland flow;
- Disturbed areas surrounding the drill sites will be returned to the same topography as that immediately preceding drilling;
- Any vegetation removed as part of Project and access track clearing requirements will be used in Project rehabilitation works;
- Stripped topsoil stockpiled as part of Project preparations will be replaced; and
- Erosion and sediment control devices will be maintained and remain in place until the drill sites and associated tracks are completely rehabilitated.

Any future mine exploration activities will continue to be undertaken within Ravensworth Operations mining authorities (listed above in Table 1-1**)**.

The results from Ravensworth Operations exploration activities will be used to investigate aspects such as geological/geotechnical features, seam structure and coal/overburden characteristics as input to detailed mine planning and feasibility studies.

The GDP process will be completed prior to undertaking any exploration activity.

6.2.2 Decommissioning

The decommissioning Stage refers to removal of relevant above and below ground infrastructure, hard stand areas, remediation and/ or removal of any identified contaminated materials and hazardous materials to the extent practicable. The RMP Form and Way document states that this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment (subject to approval by Resource Regulator(RR)).

The mine infrastructure facilities associated with the former Ravensworth West mine are located within the footprint of mining for 2023 (and later years). This is already shown as disturbance, with there being no change shown in the forward program Accordingly, any remaining infrastructure within this area will need to be decommissioned and removed to facilitate the southward progression of approved mining operations. Ravensworth Operations will decommission fixed plant, built infrastructure and services progressively as infrastructure items and plant become redundant. Ultimately, all mining related infrastructure shall be decommissioned and removed, unless RR agrees otherwise per Condition 40 of the Project Approval (09_0176).

6.2.2.a Site Security

Ravensworth Operations implements a variety of control strategies to minimise the potential for public safety incidents within the Project area, including the following:

- Ravensworth Operations is a controlled Project with all visitors required to report to the reception areas on arrival and complete an induction process to ensure all safety requirements are addressed;
- Access points to control areas have boom gates, and the remainder of the access points are secure with locked gates and fencing;
- Operational staff or security are present on the Project at all times;
- Safe operation of all mining equipment and processes are undertaken in accordance with the existing Ravensworth Operations Safety Management System;
- Hazardous substances are managed within the Project area in licenced facilities to ensure safe handling and storage;
- Blasting activities are undertaken in accordance with the Blast Management Plan; and
- Ravensworth Operations operates a 24 hour emergency response line for the public to report any concerns regarding public safety associated with Ravensworth Operations.

  Further details of site security measures and the retention of infrastructure at the decommissioning phase and during other mine closure activities will be provided in the Final Closure plan.

6.2.2.b Infrastructure to be Removed or Demolished

Ravensworth Operations will decommission and remove all built infrastructure not required for the final landform during the mine closure phase. Decommissioning activities will be done in consultation with the Resources Regulator, and ideally, in accordance with a decommissioning plan that will be used as a guide for sequencing and the process of infrastructure removal. Decommissioning activities include:

- Disconnection of all above ground and buried services and removal of associated infrastructure;
- Removal of all built infrastructure and plant such as:
  - Electrical switchyards & substation;
  - Buildings/ tanks, industrial buildings;
  - Aerial conveyors;
  - Concrete pads;
  - Stacker reclaimer;
  - Water pipelines (Narama Void to Ravensworth West Void, Narama Void to RCHPP, highway dam, RCHPP highway dam to Liddell CHPP);
  - Water pumping infrastructure;
  - Dam infrastructure at (i.e. pontoons, pumps, telemetry system);
  - RCHPP (if not required post closure).
- Removal of all wastes and hazardous materials; and

- Removal (or on-site remediation) of any contaminated soils in accordance with a contaminated land assessment (where required).

Where possible, items of value at ROC may be transferred to other Glencore businesses. As part of the closure project an asset register will be developed to assist with the transfer of assets to other businesses.

Pursuant to Schedule 2, Condition 10 of PA 09_0176, demolition activities will be conducted in accordance with *AS2601-2001: The Demolition of Structures*, or its latest version.

6.2.2.c Buildings, Structures and Fixed Plant to be retained

As discussed in **Section 6.2.2.b**, all mining related infrastructure shall be decommissioned and removed, unless RR agrees otherwise per Condition 40 of the Project Approval (09_0176). There is the potential that parts of the RCHPP will remain at closure (in consultation with DPE) for future industrial operations. This will be assessed in further detail closer to the closure of the overall Ravensworth Operations Project.

Some infrastructure is likely to remain such as some access tracks and underground pipelines that have been made safe.

During the preparation of the Final Closure Plan, ROC will undertake further assessments regarding buildings, structures and fixed plant likely to have a beneficial post mining use in consultation with DPE.

6.2.2.d Management of Carbonaceous/Contaminated Material

Contaminated Material

Hydrocarbon contaminated material resulting from spillages are cleaned up using oil absorbent material. This oil affected material is then removed from within the Project boundary by appropriately licensed transporters, and taken to a licensed facility for treatment and disposal in accordance with Project procedures as part of the EMS. Hydrocarbon contaminated water is contained and treated at the Project's industrial water treatment plant and treated water is recycled for re-use. In the event of accidental contamination of on-site dams, contaminated water is removed by vacuum truck and disposed off-site by an BCD approved licensed contractor.

Ravensworth Operations has a bioremediation area which meets the requirements of *Environmental Guidelines: Solid Waste Landfill* (EPA, 2016). All hydrocarbon contaminated waste material within pit, hardstand and truck wash areas is bio-remediated and disposed of within the Project boundary. The Project has been designed to prevent contamination and the storage and handling of chemicals which is to be undertaken in accordance with Australian Standards and relevant Government guidelines.

Additional management measures include:

- Inspecting and maintaining equipment and plant including the conveyor networks regularly to minimise potential for leaks associated with equipment failures;
- Management of identified asbestos at various buildings across Ravensworth Operations in accordance with the Asbestos Management Plan;
- Maintaining the existing bioremediation areas and establishing additional bioremediation areas as required to treat soils contaminated by hydrocarbon spills; and
- Maintaining a Contaminated Sites Register.

The RMP Risk Assessment identified a medium risk associated with potential residual contaminated resulting from storage and use of hydrocarbons, chemicals, drilling fluids, spillage of dirty or produced saline water, brine and sewage etc.

As part of closure and the development of the Final Closure Plan, Phase 1 and Phase 2 contaminated material assessments may be undertaken to inform remediation strategies as part of rehabilitation and closure.
Ultimately at closure there will be no long-term contamination issues from the Project.

Carbonaceous Material

Excess coal material remaining at closure will be scraped-up and disposed of to the tailings/ coarse reject emplacement area, or capped with inert material carbonaceous materials should be managed in in accordance with the Waste Management Plan and/ or Spontaneous Combustion Principal Mining Hazard Management Plan which describes the methods to be used when handling and disposing of carbonaceous materials. Any potential contamination issues will be assessed and dealt with in the mine closure and decommissioning processes.

6.2.2.e Hazardous Materials Management

Hazardous materials should be removed as part of Stage 1 (decommissioning) phase of rehabilitation in accordance with the Waste Management Plan and/ or Spontaneous Combustion Principal Mining Hazard Management Plan as discussed above in **Section 6.2.2.d**. Hazardous materials will be assessed as part of a Final Closure Plan.

Further assessments as part of development of the Final Closure Plan will help to inform the removal and treatment plans for hazardous materials.

6.2.2.f Underground Infrastructure

There is no underground mining infrastructure for Ravensworth Operations.

6.2.3 Landform Establishment

Landform establishment is the process of shaping the final landform to a safe, stable and free draining landform that is appropriate for the desired final land use and consistent with the surrounding landscape.

The final shaped landform will be constructed in accordance with the requirements of this document. Rehabilitation will be undertaken progressively, generally commencing as soon as practicable following the completion of mining related activities.

The RMP Form and Way document states that this phase of rehabilitation consists of the processes and activities required to construct the approved final landform (as per the development consent and, for large mines, the approved Final Landform and Rehabilitation Plan). In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials). The landform design and construction part of this phase incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology per landform design planning.

General Landform Design and Construction Process - (Requirements under the Ravensworth Operations Rehabilitation Construction Quality Control Plan)

The general landform design and construction process for GCAA sites is outlined below:

- **Landform Design Inspections**
    - **Area Selection** to ensure planned areas are as per the approved Annual Rehabilitation and Closure Plan (ARCP) and RMP;
    - **Design compliance** to identifying any potential non-conformances prior to commencing work in order to ensure the landform design (ie final landform design and drainage) meets requirements of the RMP, relevant EA and Project Approval
    - **Design Finalisation and Approval** to ensure plans (ie final landform, cut/fill volumes, contours, drainage) have been developed by a suitably qualified person;
- **Landform Construction Inspection**
    - **Issue of Design** to ensure all relevant information has been provided to relevant supervisor and contractor such as design files (GPS), construction/ work plans, rehabilitation boundaries;
    - **Construction Sign off** to identify any potential non-conformances and consists of the final survey pick-up of completed area to be rehabilitated and confirmation that profiling (landform, drainage, boundaries) has been completed in accordance with approved design;
    - **Handover** where the constructed landform (including Rehabilitation Slope Trigger Action Response Plan (TARP) and heat maps) is transferred to the rehabilitation supervisor/ contractor;
    - **Survey control Set up** where drainage designs are surveyed and pegged including contours, drainage lines, dam embankments and diversion drains. Drop structures should be surveyed prior to rock placement rock volume required is confirmed against design;
    - **Drainage Construction** to confirm contour drains are constructed appropriately and drainage aligns with relevant adjacent areas and to ensure drop structures have been constructed to design. At this stage, quality control sample points are identified and fall is confirmed using survey pickups or drone data. All non-conformances should be reworked, rechecked and closed out; and
    - **Surface Preparation** including preparation of pastural and woodland areas removal (rock removal and addition of ameliorants where necessary).

6.2.3.a Water Management Infrastructure

A key design criterion of the water management system is to maximise the potential for capture, transfer and storage within the Project boundary, for re-use as part of on-site processes. The design should consider proposed new water storage areas and the integration with existing water management system components such as drainage and dams, as discussed below.

Drainage

Managing runoff from rehabilitation is critical in achieving long term stability and success of rehabilitated areas. Inappropriate drainage can lead to instability and failure of landforms as well as failure of revegetation efforts. Detailed drainage designs are to be prepared by an experienced consultant for all primary rehabilitation areas, these designs are to be prepared in accordance with the Blue Book, approved final landform. These designs generally contain all runoff water on-site until rehabilitation has progressed to a sufficient stage to be classified as clean water. The following design elements should be considered:

- Drainage upslope of rehabilitation areas to minimise overland concentrated flows;
- Water off active advancing dumps and flat areas should be managed to prevent runoff onto rehabilitated areas;
- Drainage paths, contour drains, ridgelines and emplacements, to be shaped as much as practical, to undulating profiles in keeping with natural landforms of the surrounding environment; and
- Drainage designs for each area will include consideration of the final landform and future adjacent rehabilitation areas to produce a free draining final landform to mitigate potential reworking of fringes where drainage designs may not match up adequately.

Suitable erosion control measures (e.g. catch drains, sediment dams, silt fences, mulches, etc.) will be implemented to minimise soil loss from areas undergoing rehabilitation. In addition, sedimentation dams are incorporated into the final landform to collect runoff from the rehabilitated areas and the dam capacity.

Sedimentation Dams

Sedimentation dams should be incorporated into the final landform to collect runoff from rehabilitated areas and the dam capacity is designed to allow time for suspended sediment to settle out.

Subject to the decision to retain or remove the sedimentation dams and associated infrastructure (i.e. pipes and pumps), sedimentation dams may be infilled, reshaped and rehabilitated with suitable vegetation covering consistent with the surrounding final landform. Local erosion and sediment control measures will be implemented during this process. Prior to demolition and closure activities, Erosion and Sediment Control Plans detailing the specific inspection maintenance and revegetation should be implemented.

Spillway Augmentation

The decision to retain or remove spillways will be reviewed in the Final Closure Plan to assess if additional work is required for discharge points.

Emu Creek and Bayswater Creek (Diversion)

The Emu Creek Levee will be constructed to prevent floodwaters from potentially entering the Ravensworth North mining area. The levee will be located at the confluence of Emu Creek and Bayswater Creek and has been designed to contain a 1 in 100 year flood event. Emu Creek and Bayswater Creek will be reinstated as part of the mine rehabilitation works. The reinstatement of these creeks is discussed further in **Section 6.2.3.e**.

6.2.3.b Final Landform Construction: General Requirements

The conceptual final landform for ROC has been designed to be consistent with the 2010 EA, MOD 2 EA and the rehabilitation objectives in Schedule 3, Condition 40 of PA 09_0176. Objectives include:

- A safe, stable, non-polluting landform;
- Designed to minimise the visual impacts of the development;
- Designed to be in keeping with the natural terrain features of the area;
- Incorporate micro-relief;
- Be free draining; and
- Avoid straight drainage structures, as far as practical.
- The out-of-pit OEAs will be developed progressively over the life of the mine to maximum heights of approximately 230 metres RL and 190 metres RL for the western and eastern out-of-pit OEAs, respectively.

With the RCHPP area being predominately flat there would only be minor areas of reshaping required in the areas that are rehabilitated at closure. The final RCHPP landform will be completed in the future.

Erosion

Subject to approval by the RR, the capacity of the existing water storage facilities at Ravensworth Operations will be retained as part of the final landform. There will be a requirement to maintain existing and construct new erosion and sediment control structures including sediment dams, sediment fencing and drainage lines. As discussed above in **Section 6.2.3.a**, erosion control measures (e.g. catch drains, sediment dams, silt fences, mulches, etc.) will be implemented to minimise soil loss from areas undergoing rehabilitation. In addition, sedimentation dams are incorporated into the final landform to collect runoff from the rehabilitated areas and the dam capacity.

Visual Amenity and Final Landform

Conceptual landform design is predominantly undertaken at the Environmental Assessment (approval) phase of the project and is then integrated into the RMP. This process involves the selection of emplacement locations, location of the final void and the development of a 'final landform' which must be adhered to throughout the life of the operation. Considerations such as landform profiles, dump heights, gradients and drainage flow paths are addressed at this stage.

The final landform design has considered potential visual impacts on surrounding areas including the distance to potentially affected areas and shielding provided by natural topographic features and the landforms associated with approved rehabilitated mining areas.

Micro- Relief

The final landform at Ravensworth Operations will be progressively developed through the life of mine. Micro-relief features will be developed in all parts of the final landform above natural ground level. The process of designing micro-relief landform features and incorporating them into the rehabilitated landform is closely linked to the detailed mine planning process. Due to the need to develop the microrelief features around discrete catchment areas, the detailed design and incorporation of the microrelief features in the landform is heavily dependent upon mine development.

The actual elevation and size of overburden emplacements can alter in practice due to variables such as:

- Overburden swell factor;

- Changes to detailed mine plan sequencing due to market requirements;
- The performance of different plant and equipment; and
- Operational constraints from weather conditions.

The successful implementation of micro-relief in rehabilitated landforms is best achieved by developing the detailed design of the micro-relief features progressively as part of the detailed mine planning process undertaken for each mining sequence. It is important to incorporate the conceptual final landform designs into the bulk overburden emplacement designs to ensure sustainable final design outcomes can be achieved. The final landform will include a drainage pattern capable of conveying runoff from the newly created areas whilst minimising the risk of erosion and sedimentation. Elements such as drainage paths, contour drains, ridgelines, and emplacements will be shaped, where possible, in undulating informal profiles in keeping with natural landforms of the surrounding environment.

A geomorphic landform design has been adopted which reduces the reliance on contour drains and drop-structures, however, depending on the design, these structures and other water management structures such as dams may still be required to manage water on rehabilitated areas. If required, these structures should be the first step in the Project preparation process to eliminate the need to drive heavy equipment, which has the potential to compact soil over areas which have already been rehabilitated. These structures form part of the final approved landform.

Construction of contours is to be undertaken in accordance with the following details:

- The detailed drainage design, including contour bank layout and specifications.
- Generally, contour banks should be designed and installed with a longitudinal slope of not more than 1.2%; and
- Contour banks must be flat from front to back and not have high or low points along the channel.

The RMP Risk Assessment identified a low risk associated with the potential for the final landform to be unsuitable for final land use (e.g. large rocks present affecting cultivation, settlement and surface subsidence leading to extended ponding).

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

Tailings Facilities

Decommissioning and capping of the tailings storage facilities (TSF) (7 South Tailings Dam, Cumnock Void 1/2 TSF, Cumnock 3 TSF, Wash Plant Pit and RUM Temporary TSF) is required to be undertaken in accordance with approval granted under High Risk Activity under *Work Health and Safety (Mines) Regulation 2014* and the requirements of the GCAA Tailings Storage Facilities Protocol (GCAA-625378177-15551). Tailings storage facilities will be sufficiently dry prior to capping. A Final Tailings Dam Management Plan will be completed at least 5 years before mine closure, which will include a risk assessment. The risk assessment team needs to incorporate an experienced geotechnical engineer.

The 7 South Tailings Dam has been decommissioned and capping has been completed. Overburden emplacement will continue, placed in operational lifts of 15 to 30 m, until the approved final landform height has been achieved. This area is now classified as overburden in the domain figures.

A conceptual closure plan has been developed for the Cumnock Void 1/2 Tailings Storage Facility (WSP, 2020) to achieve a safe, stable and non-polluting landform (post decommissioning) the following design parameters have been adopted:

- Maximum slope batter of 6H:1V;
- Maximum slope length of 220 m;
- The proposed capping layer will be approximately 1.3 m thick and comprised predominantly of mine spoil from previously rehabilitated areas.
- Void 2 should be capped and rehabilitated before Void 1, with runoff from Void 2 reporting to Void 1 to ensure sediment storage and storm surcharge capacity is available, and the need for a spillway is not triggered during the construction period;
- Maximum settlement expected is in the order of 5.5m, likely to occur over an extended period;
- Decommissioning of the Cumnock Void 1/2 TSF will incur a High Risk Activity notification under Section 33 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (WHS (Mines) Regulation).

Conceptual closure studies and plans have been developed for Cumnock Void 3 (WSP, 2023). The following design parameters have been adopted in order for the closure and capping of Cumnock Void 3 Tailings Storage Facility to achieve a safe, stable and non-polluting landform:

- The proposed capping layer will be a minimum of 2m thick comprised predominantly of mine spoil from mining operations or previously rehabilitated areas.
- Long term settlement of 3m is expected near the center of the TSF, with consolidation expected to be completed within the first 2 to 4 years.
- The maximum slope batter will be 3H : 1V
- Two drop structures have been designed, one of which is not on the TSF, designed to pass the 1% Annual exceedance Probability (AEP), the other on the drop structure to pass a 0.5% event.
- Decommissioning of the Cumnock Void 3 TSF will incur a High Risk Activity notification under Section 33 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (WHS (Mines) Regulation).

Further detailed testing is planned for Cumnock Void 3 to characterise the material properties and strength gain within the tailings to be used through the detailed design and construction phase. The investigation program may comprise vane shear testing, Cone Penetration Testing (CPTu) and laboratory testing.

Conceptual final landform studies have been developed for Cumnock Wash Plant Pit (WSP, 2024). As part of the landform design where practical, average slopes have been reduced to around 1V:5H, a gradient that has been found to work well with the geomorphic designs while limiting the maximum slopes for safety in construction. Material required to fill Cumnock Wash Plant Pit will come from rehabilitated landform nearby. As part of the conceptual final landform studies, no geohydrological or geotechnical (including settlement and consolidation) investigations were undertaken. While the final landform is flat enough for the risk of geotechnical instability to be extremely low, dewatering of the void prior to the placement of spoils into the void, as well as the potential long term groundwater level and associated risk of seepage from the area is still to be addressed.

Prior to use, proposed capping materials will be subject to geotechnical and geochemical investigations to confirm their suitability for capping purposes.

Deposition information will be collected so that it can be reviewed and inform the detailed designs, to assist in developing ground models and to identify areas that may contain lower strength tailing, particularly the areas that have been frequently under water.

Detailed designs for capping and final landform are required to be completed. The detailed design will include assessment of capping methodologies local and global stability of capping layer during placement, and stability of final landform slopes based on tailing testing results. Capping of tailings facilities will take place following a staged layered methodology, building up to the capping thickness as per designs. Undertaking a staged capping approach will allow for progressive settlement to be monitored.

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

Final Void

The following principles would be adopted to provide a safe and stable final void in the long-term:

- Designed as a long term groundwater sink and to maximise groundwater flows across back-filled pits to the final void.
- Minimise:
  - the size and depth of final void;
  - the drainage catchment of final void; and
  - any high wall instability risk.

A final void will remain at Ravensworth Operations in the southern extent of the Project boundary. As part of the final void design, a Final Closure Plan (which includes void management) will be developed five years prior to planned mine closure in accordance with detailed mine planning and GCAA standards. In the Final Closure Plan there will be a requirement to ensure the safety of the final void and the surrounding final slopes are left in a condition where the risk of slope failure is minimised.

- At the cessation of mining, battering back and shaping open cut pit walls to a slope of a maximum batter slopes of 6H:1V and no longer than 220m to mitigate potential for failures and mass movement;
- Void high walls to achieve a minimum Factor of Safety (FoS) of 1.5;
- Excavating or capping exposed carbonaceous material with inert material, to prevent ignition from spontaneous combustion, bushfires or human interference;
- Diverting surface runoff from land surrounding the void by constructing bunds and/or drains to limit the drainage catchment of the final void and the potential for instability of the void walls associated with runoff flows eroding void walls;
- Constructing a physical barrier, including a safety berm and security fence, around the entire perimeter of the final void to control human access; and
- Installing signage, clearly stating the risk to public safety and prohibiting public access, at intervals along the entire length of the perimeter security fence.

Various technical studies/assessments should be undertaken during the post-closure phase to verify and confirm that the rehabilitation completion criteria have been met. Anticipated technical studies and assessments to be undertaken post-closure include:

- A geotechnical stability assessment of the final void to verify the long-term stability and safety of the final void;
- A stability assessment of key final landforms (e.g. OEAs and retained water management infrastructure including long-term drainage structures and sediment dams) to confirm the landforms and structures are operating as designed and are stable in the long-term;
- Verification and re-simulation of final void groundwater model and water balance using post-mine groundwater and surface water monitoring program results to confirm predictions after the cessation of mining and verify long-term final void waterbody recovery predictions; and
- A rehabilitation assessment to confirm that Project rehabilitation completion criteria have been met. The Ravensworth Operations rehabilitation completion criteria include water quality criteria for runoff from rehabilitated landforms, which would therefore also be assessed in the rehabilitation assessment.

The RMP Risk Assessment identified a medium risk associated with:

- A lack of detail around final void management strategy (e.g. water balance, water quality, geotechnical assessments, future water licencing requirements); and
- Less than adequate location, size and treatment of final voids, highwalls and ramps.

Lowwalls

The assessment on the stability of low walls will be undertaken as part of a Final Closure Plan. The GCAA Mine Closure Planning Protocol commits to Determination of geotechnical stability should be based on an assessment of the spoil material.

6.2.3.e Construction of creek/river Diversion Works

The overall final landform design, exclusive of final void drainage, have been designed to maximise surface water drainage into the natural environment. Creek diversion management will be undertaken in accordance with the Creek Diversion Management Plan. The Creek Diversion Management Plan provides a framework for the management of Bayswater Creek, and more specifically details regarding the construction, remediation and rehabilitation phases. The Plan has been prepared to meet the requirements of Condition 31b, Schedule 3 of PA 09_0176.

Emu Creek

The design of the Emu Creek diversion is currently a conceptual design based on the catchment and flood modelling, reflecting both current and approve natural and disturbed catchment areas. Once mining operations and overburden emplacement has advanced past the original alignment of Emu Creek, the Emu Creek diversion Dam 1 will be decommissioned, and the creek line will be reinstated generally in accordance with PA 09-0176. Taking into account the following design considerations:

- Native vegetation will be planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system that will be constructed on filled and reshaped material;
- Dams and drainage channels with shallow sloping edges to allow the planting of aquatic macrophytes and sedges;
- A meandering design to slow down water movement and retain water within the landscape longer; and

- Drainage channels with featured such as fallen timber and boulders will be carefully positioned within the bed of drainage channels and edges of dams to provide in-stream structures and habitat.

Bayswater Creek Diversion

Bayswater Creek should be rehabilitated as soon as is practicable following mining in the applicable area with consideration given to the following:

- Rehabilitation and revegetation of Bayswater creek to provide a hydraulically and geomorphically stable stream; and
- Remediate Bayswater Creek drop structure to provide hydraulically stable structure to prevent excess scouring and erosion.

Following rehabilitation of Emu Creek and Bayswater Creek, 'as-executed' reports should be submitted to the secretary and NRAR (formerly NOW), certified by a practising engineer, confirming that the rehabilitated Creeks are sufficiently hydraulically and geomorphically stable, prior to commissioning the creeks. Per Commitment 43 (Table 2.1 of the Ravensworth Complex Water Management Plan), all Bayswater Creek and Emu Creek rehabilitation management issues of interest to the community will be addressed in regular community consultation meetings in accordance with the Ravensworth Complex Social Involvement Plan (SIP).

6.2.4 Growth Medium Development

Surface preparation activities for rehabilitated areas will commence as soon as practicable following the completion of mining activities. The RMP Form and Way document states that this phase of rehabilitation consists of activities such as spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants required to establish the physical, chemical and biological components of the substrate to establish the desired vegetation community (including short-lived pioneer species). Planning in this phase includes actions to minimise loss of growth media due to erosion in addition to the following:

- Periodic analysis of topsoil/ subsoil (refer **Section 6.2.1.f**) to assess quality and determine amelioration requirements;
- Determination of available resources provision of specifications to contractor;
- Calculating topsoil volumes and volume availability;
- Topsoiling placement, ensuring topsoil is applied evenly and to specification;
- Amelioration (e.g. gypsum, mulch) application to top soil at recommended rates, informed by topsoil/subsoil analysis;
- Topsoil stockpile management to ensure remaining topsoil stockpiles have been rolled over, ripped, seeded with cover crop and weed management where required;
- Stockpiles re-surveyed/scanned and inventory and GIS database updated;
- Suitable erosion control measures will be implemented to minimise soil loss from areas undergoing rehabilitation, including deep ripping, geofluv landform design, contour banks and drainage structures to control water flow;
- Erosion modelling and monitoring is completed to identify high risk areas of erosion throughout the rehabilitation requiring management in order to mitigate erosion;
- Ripping of the topsoil is undertaken to enhance the water infiltration and provide suitable seed bed. Rehabilitation is deep ripped to different depths depending on the final landform and final

vegetation. In woodland rehabilitation the topsoil is ripped to a depth of approximately 200 – 400mm to enhance water infiltration and seed germination. In agricultural rehabilitation, the topsoil is ripped to a depth of approximately 100 – 300mm to prevent large rocks being pulled to the surface whilst still providing a suitable seed bed for; and

- Habitat augmentation is completed to provide additional habitat for native fauna during the early stages of rehabilitation through the placement of logs, rock piles and large woody debris.
-

The RMP Risk Assessment identified potential unwanted events which may result in (low) risk outcomes as listed below with recommended treatment plans:

- Lack of information regarding the geochemical nature of the substrate and associated materials (e.g. subsoils, topsoils, organic additives, overburden surface);

6.2.5 Ecosystem and Land Use Establishment

This section outlines the methodologies to establish appropriate vegetation communities for the intended final land use of woodland ecological community interspersed with pasture, consistent with PA 09_0176.

This RMP Form and Way document outlines that this phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community (e.g. Seeding or tube stocking) and implementing land management activities such as weed control. This phase of rehabilitation incorporates revegetated lands and may include habitat augmentation such as installation of nest boxes, weed and pest animal control / management and establishment of flora. Key steps for GCAA sites are outlined below:

- **Seeding plan** where:
    - Specifications and materials are provided to the Contractor and community establishment areas are pegged (if required);
    - Seed mix and fertiliser application rates are determined, which will include the use of cover crops;
- **Ripping and seeding sign off** to check the area has been seeded with correct mix and at required rate and that area has been ripped to specification (i.e depth, spacing and contouring).
    - Vegetation removed as part of Project and access track clearing requirements shall be transported to the Project rehabilitation areas to maximise the value of the soil seed bank and soil biota; and
    - The Ravensworth North Topsoil Stripping Management Plan has been developed to manage topsoil stripping activities at Ravensworth North opencut coal mine which is discussed previously in **Section 6.2.1.a**.
- **Rehabilitation completion** which ensures:
    - Annual Rehabilitation target have been met;
    - Resources Regulator GIS database and survey data has been updated;

- Landform establishment forms completed; and
- All non-conformances are closed out and Quality Control Plan complete.

Seeding

Rehabilitation campaigns are planned so that seeding coincides with favourable conditions in spring and autumn. Opportunistic sowing may occur in summer and winter if areas become available and weather conditions are predicted to be favourable for germination.

The timing of seeding may be postponed to avoid seeding and planting in adverse conditions or where sufficient provenance seed is not available. Where seeding with the final seed mix is delayed, prepared rehabilitation areas will be sown with a suitable cover crop to minimise dust generation and erosion.

The seeding plan should be reviewed every three years. Ravensworth Operations will liaise with seeding contractors to obtain suitable seed mixes to meet post mining land use requirements and vegetation communities. Short-lived pioneer species and early colonies are utilised within the seed mix. Nitrogen fixing plants part of the Fabaceae family are also included in the seed mix to convert nitrogen in a usable form that helps enrich the soils and other plants to grow.

Seed viability testing is undertaken to confirm the viability to seed sources from Contractors.

Cover Crops

Key species for cover crops in the Hunter Valley include Japanese Millet (in Spring and Summer) and Oats (in Autumn and Winter). Cover crops can be sown by themselves for short term erosion / dust control and / or increased organic matter in poor structured and / or infertile soils / spoils. Cover crops are commonly included in perennial pasture mixes to provide initial (rapid) cover, increased organic matter and mulching (moisture conservation) whilst the long term species are establishing; and in tree / shrub mixes (using a very low sowing rate) to provide short term erosion control.

Weed Control

Weed management protocols are applicable to both the Ravensworth Complex and corresponding offset areas. Management controls will be undertaken in accordance with the BOMP as previously discussed in **Section 6.2.1.b**.

Inspections and rehabilitation monitoring will continue until areas are relinquished by the Project under the Resources Regulator ESF2 Form process.

Management measures

Where identified as part of annual and regular monitoring, actions are developed as required for areas and aspects of the rehabilitation that pose a risk to achieving final land use. This includes but not limited to detailed plans to remediate:

- Weed infestations;
- Unstable landforms;
- Erosion and loss of topsoil;
- Inadequate water management structures.

6.2.6 Ecosystem and Land Use Development

The RMP Form and Way document outlines that this phase of rehabilitation (Stage 5 - Ecosystem and Land Use Development) consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving rehabilitation objectives, completion criteria and the Final Landform and Rehabilitation Plan. Completion criteria for this phase will include components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.

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

- Weeds and pest animal control;
- Managing bushfire risks;
- Minor earthworks to remediate any significant erosion features, including contour banks and diversion channels;
- Infill planting and/or seeding to meet vegetation community requirements;
- Maintaining erosion and sediment controls;
- Maintenance of access tracks throughout the rehabilitation;
- Crash grazing trials to control exotic grasses in slam paddocks prior to infill planting and seeding;
- For pasture rehabilitation, fencing, water storage and cattle yards will be installed to enable successful cattle grazing throughout the pasture and
- A rehabilitation monitoring program to assess the progress of rehabilitation areas toward the nominated completion criteria, including ecological, agricultural and land capability monitoring.

Rehabilitation monitoring will be undertaken until it can be demonstrated that rehabilitation areas have met all conditions for relinquishment. Rehabilitation monitoring is discussed below in **Section 8**.

6.3 Rehabilitation of Areas Affected by Subsidence

As stated in **Section 0**, this section is not applicable at Ravensworth Operations. Refer to the RUM Rehabilitation Management Plan.

7. Rehabilitation Quality Assurance Process

Table 7-1 below outlines the rehabilitation and quality assurance process for Ravensworth Operations.

The GCAA rehabilitation quality assurance protocol will be implemented for the Project.

Table 7-1 – Rehabilitation Quality Assurance Criteria

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)	Procedures/Documentation
Active Mining	Records of competent personnel for active mining and rehabilitation.	Records in place.	Position descriptions
	Up to date mine plans.	Completed for this RMP and the Annual Rehabilitation Report and Forward Program.	Mining planning procedures
	Documentation of pre-clearance surveys (covering all key environmental aspects).	Records in place.	Ground Disturbance Permit. Ravensworth Operations Land Clearing and Topsoil Stripping Procedure. Specific environmental management plans.
	Maintenance of a topsoil inventory to document stripped, stockpiled and re-spread resources.	Location of soils stockpiles are known	Survey Plans of Locations. Topsoil balance
	Regular inspections of erosion and sediment controls.	Inspections currently being completed	Water Management Plan Erosion and Sediment Control Procedure
	Regular inspections to identify potential weed infestations. Details of weed status included in rehabilitation monitoring.	Inspections currently being completed	GCAA Monitoring Rehabilitation Procedure Annual Rehabilitation Monitoring
	Weed management spraying records	Current records kept for weed spraying	GCAA Monitoring Rehabilitation Procedure Annual Rehabilitation Monitoring
	Regular inspections to review spontaneous combustion	Currently being completed	Spontaneous Combustion Management Plan
	Overburden and reject material testing to determine PAF	Drillhole sampling for PAF Known locations of PAF Sign off process when inert	Spontaneous Combustion Management Plan

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)	Procedures/Documentation
		material is placed over the PAF/rejects.	
	Soil testing	Completed annually.	Ravensworth Operations Topsoiling Protocol. Soil testing results.
Decommissioning	Inspections and demolition reports to confirm all infrastructure has been removed.	Still required prior to closure. To be covered in Final Void and Closure Plan.	To be covered in the Mine Closure Plan (to be developed within 5 years of closure).
	Removal of waste	Waste records	
	Validation testing to ensure any contamination/hazardous substances has been appropriately remediated and/or removed.	Still required prior to closure. To be covered in Final Closure Plan.	
	Public safety risks are assessed during decommissioning.	Fencing, signage, security. To be covered in Final Closure Plan.	
Landform Establishment	Landform establishment and survey process. Quality assurance signoff of constructed landforms including slopes, landforms and water drainage structures.	Currently in place	GCAA Monitoring Rehabilitation Procedure. Preparation of the Annual Rehabilitation Plan.
	Records of reject capping depth for the Project area.	Currently in place	Rejects Management Procedure
	Recording depths of ripping of rehabilitation areas.	Currently in place	GCAA Monitoring Rehabilitation Procedure Preparation of the Annual Rehabilitation Plan. Mine Closure Plan (to be prepared within 5 years of closure).
	Slopes, geotechnical and stability assessment required for the Final Closure Plan	Regularly reviewed but to be covered in more detail in the Mine Closure Plan.	GCAA Monitoring Rehabilitation Procedure Preparation of the Annual Rehabilitation Plan.
	Void Water Management Assessment completed as part of Final Closure Plan.	To be covered in Mine Closure Plan.	Mine Closure Plan (to be prepared within 5 years of closure).

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)	Procedures/Documentation
Growth Medium Establishment	Soil assessment for existing rehabilitation areas.	Covered in rehabilitation monitoring.	Ravensworth Operations Topsoiling Protocol.
	Soil assessment for future rehabilitation areas.	Required prior to future rehabilitation.	Ravensworth Operations Topsoiling Protocol.
	Register of topsoil and subsoil for future rehabilitation.	Location of soils stockpiles are known	Ravensworth Operations Topsoiling Protocol.
	Records of identification and management of actual acid forming, potentially acid forming (PAF) and non-acid forming (NAF) material and ongoing monitoring.	Records in place	Ravensworth Operations Topsoiling Protocol.
Ecosystem and Land Use Establishment	Documentation of seeding or planting activities undertaken including: • Date of planting; • Weather conditions; • Seed mix; • Seeding rate (kg/ha) and/or planting rate (tubestock/ha); • Fertiliser rate (kg/ha); • Records of the salvage of all rehabilitation resources including suitable capping materials, topsoils/subsoils, seeds, habitat structures (e.g. tree hollows and rocks) for use in rehabilitation.	Records in place. To be recorded for future monitoring programs.	Seeding contractor quotes and records GCAA Monitoring Rehabilitation Procedure Preparation of the Annual Rehabilitation and Closure Plan
	Regular Project area inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation.	Monthly inspections completed	
	Rehabilitation monitoring in accordance with **Section 8** to monitor the success of rehabilitation.	Records of existing and proposed rehabilitation monitoring.	
	Continuation of environmental monitoring program.	Ongoing. To be reviewed closer to final closure.	

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)	Procedures/Documentation
	Weed and feral animal infestations; and Documentation of all weed management and eradication programs and follow-up inspections.	Current weed management records kept.	
Ecosystem and Land Use Development	Rehabilitation monitoring in accordance with **Section 8** to monitor the success of rehabilitation.	Criteria assessed in the annual rehabilitation monitoring.	GCAA Monitoring Rehabilitation Procedure Preparation of the Annual Rehabilitation Plan/Forward Program
	Regular Project inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation.	Monthly inspections.	
	Weed and feral animal infestations; and Documentation of all weed management and eradication programs and follow-up inspections.	Current records kept.	

The rehabilitation quality assurance process will be used when planning future rehabilitation activities. The objective for rehabilitation will be one of continuous improvement and includes:

- Utilising relevant industry best practice rehabilitation techniques;
- Utilising key personnel with rehabilitation and closure experience;
- Continuing to undertake rehabilitation monitoring and assessing against rehabilitation criteria; and
- Reviewing rehabilitation performance against the Trigger Action Response Plan in **Section 10**.

8. Rehabilitation Monitoring Program

8.1 Analogue Site Baseline Monitoring

Native Ecosystems

Reference sites form an integral part of the GCAA (and Ravensworth Operations) rehabilitation monitoring program for areas where specific PCTs are targeted for re-establishment. Reference sites are used to establish performance targets and benchmarks for a range of criteria, particularly pertaining to species composition, vegetation structure and vegetation function.

A reference sites data sharing program was initiated by GCAA in 2020. A range of references sites have been established across various GCAA Hunter Valley operations (within a ~50 km radius) representative of all specific native communities targeted for re-establishment on post-mined lands. Reference sites are monitored concurrently to and using the same methodology as the rehabilitation, and the collected data and monitoring results are made available and shared between operations. This approach is intended to better capture the variability in native vegetation condition at the regional scale, thereby achieving greater representativity of reference data.
For the native communities currently relevant and applicable to RO rehabilitation, the following reference sites are used:

- SOF: a total of four reference sites will be utilised located at Bulga Coal (2 sites) and Ravensworth Operations (2 sites).
- GBIW: total of eleven reference sites located at Liddell Coal Operations (1 sites), Ravensworth Operations (1 site), Bulga Coal (3 sites), Hunter Valley Operations (1 site), Mangoola Coal (4 sites) and United Wambo (1 site).

Grassland / Pasture

GCAA investigated but decided against the use of reference sites to assess pasture rehabilitation. Indeed, pastoral lands in the locality (and across the broader Hunter Valley region) are mainly comprised of unimproved native pastures with minimal to no resemblance to pastures re-established on post-mined rehabilitation (i.e. exotic/tropical improved pastures). This, together with different management regimes, precludes any scientifically robust and meaningful comparisons between the two pastoral systems.
However, sufficient data and reliable information exist that will be used to assess and determine the condition of rehabilitated pastures, including:

- Documentation published by NSW DPI (e.g. NSW DPI 2005, 2006a, 2006b; 2010); and/or
- Results from previous grazing studies documenting the productivity of rehabilitated pastures in the Hunter Valley, i.e. grazing trials undertaken by Glencore at Liddell and by the Upper Hunter Mining Dialogue at Hunter Valley Operations and Mt Arthur.

8.2 Rehabilitation Establishment Monitoring

Following closure of the operation, the existing environmental monitoring program as per the requirements of PA 09_0176 and EPL 2652 will be maintained until all decommissioning and

rehabilitation works have been completed. Notwithstanding this, there may be the need to establish some additional monitoring sites depending on:

- The nature of the decommissioning works; and
- In response to finding possible sources of pollutants to the environment.

Ravensworth Operations undertakes a rehabilitation monitoring program in accordance with GCAA Standard 11.16 Completion Criteria and Rehabilitation Monitoring. The monitoring program considers statutory obligations targeted post mining land uses, rehabilitation objectives and nominated completion criteria, as well as the scale of the rehabilitation areas to be monitored. The program aims to:

- Facilitate continuous improvement in rehabilitation practices through appropriate monitoring and remedial action;
- Inform remedial action, including on-going rehabilitation repair and maintenance works; and
- Assess the long term stability and functioning of rehabilitation areas that will facilitate progressive rehabilitation certification and eventual lease relinquishment following mine closure.

The rehabilitation monitoring program is designed such that outputs can be used to confidently demonstrate that rehabilitation objectives and criteria have been achieved. Information from this monitoring program will also be used to refine closure criteria as required. The approach for the rehabilitation monitoring program at Ravensworth Operations includes:

- An annual rehabilitation inspection;
- Rehabilitation monitoring – collecting more detailed (plot-based) scientific data and trends on vegetation community establishment and development; and
- Fauna Monitoring – seasonal monitoring of protected and threatened fauna species and availability of their habitat across established rehabilitation.

Each of these monitoring methods is discussed further in the following sections.

Annual Rehabilitation Inspection

On an annual basis, a qualified third party will undertake an inspection of the rehabilitation works completed during the current budget year. The inspection may also cover rehabilitation completed in previous years.

The primary focus of the inspection is to identify rehabilitation failures or maintenance issues that if left unchecked could hinder succession of rehabilitation or result in expensive remediation. While covering the study area on foot, opportunistic sightings and assessments are made identifying the following factors where relevant:

- Erosion processes (e.g. rill, gully and tunnel) and their severity;
- Stability and functioning of erosion and sediment control and water management structures;
- Visual assessment of vegetation cover (i.e. identification of large bare patches), species diversity, vegetation health and growth rates; and
- Presence of weeds and pests.

A report documenting the findings of this inspection is provided to relevant Project personnel following the inspection.

Rehabilitation Monitoring

Ongoing monitoring and maintenance of rehabilitation areas at Ravensworth Operations will be conducted in accordance with **Table 4-1** (**Section 4-1** above). The overarching objectives of the rehabilitation monitoring program are to:

- Assess the long term stability and functioning of re-established ecosystems on mine affected land;
- Assess rehabilitation performance against the performance indicators and closure criteria; and
- Facilitate continuous improvement in rehabilitation practices.

The rehabilitation monitoring programme for this RMP has been developed specifically in relation to threats to rural pasture establishment and comprises assessment of:

- Evidence of erosion, potholing or slumping;
- Evidence of contamination or other limitations to vegetative establishment;
- Pasture species diversity;
- Evidence of soil profile development; and
- Threats to rehabilitation success, such as the presence of weeds or pests.

The results and outcomes of the rehabilitation monitoring are reported into the Annual Rehabilitation Monitoring Report and in the Annual Review.

Rehabilitation monitoring is undertaken based on two distinct time periods. The Initial Establishment monitoring (**IEM**) procedure applies to rehabilitation that is ≤3 years old, while the Long-Term Monitoring (**LTM**) procedure applies to rehabilitation areas that are a minimum of four years since establishment – with the following rationale and key differences:

- IEM (Years 1–3) is a rapid assessment focussing on ground cover establishment, the initial emergence and establishment of seedlings (germination success), early signs of erosion (landform stability) and presence and abundance of problematic weed species that may hinder further development of the rehabilitation.
- LTM (≥4 years old) is a more detailed assessment encompassing the full range of pasture composition and productivity attributes for agricultural rehabilitation areas, and of ecological attributes/floristic aspects for native vegetation rehabilitation; the objective being to evaluate the progress of rehabilitation towards relevant completion criteria and targeted post mining land use.

Rehabilitation performance condition during the IEM phase is typically only reported against the TARP defined in the RMP; while rehabilitation condition during the LTM phase is assessed against both the TARP and completion criteria defined in the RMP for the relevant final land uses.

Fauna Monitoring

Fauna Monitoring at Ravensworth Operations has been undertaken every three years since 2014 in accordance with approval conditions and the relevant management plans.

The primary aim of the monitoring program is to provide information that is useful in ensuring the continued survival and management of the native fauna of the area. The key objectives of the program are to:

- Provide information on species present;
- Provide information on the distribution and habitat use of species in the management areas;

- Provide information on the success of fauna management and the conservation program; and
- Enable informed decisions about future monitoring and management practices.

Fauna monitoring results are documented in the annual fauna monitoring reports and in the Annual Review.

8.3 Measuring Performance Against Rehabilitation Objectives and Rehabilitation Completion Criteria

Monitoring methods are implemented at Ravensworth Operations to assess against the proposed rehabilitation objectives and criteria (**Section 4.1**). Record keeping and rehabilitation methodology records are outlined below:

- Ravensworth Operations will record the details of each rehabilitation campaign so that they are available for future interpretation of rehabilitation monitoring results, with the aim of continually improving rehabilitation standards. The key monitoring parameters to be captured in records include:
- Landform design details;
- Drainage design details;
- Substrate characterisation;
- Project preparation techniques (e.g. topsoil and source, time of seeding, and soil ameliorants used etc.);
- Revegetation methodologies (e.g. rate and type of fertiliser, cover crop type and seeding rates, pasture/woodland seeding mix applied and application rates, and seed viability);
- Weather conditions at the time of seeding;
- Photographic records; and
- Initial follow-up care and maintenance works (including watering and weed management).

Ravensworth Operations will evaluate the rehabilitation monitoring and methodologies annually based on performance and consultation with key stakeholders. Any changes will be outlined in the RMP, Annual Review and Annual Forward Program.

9. Rehabilitation Research, Modelling and Trials

9.1 Current Rehabilitation Research, Modelling and Trials

As discussed in **Section 8.1**, Ravensworth Operations have undertaken numerous rehabilitation trials in the past, with excellent rehabilitation results achieved from some of these trials. There are no current trials.

The Hunter Ironbark Research Program was conducted in accordance with Schedule 3, Condition 36 of PA 09_0176. The research program was funded by Ravensworth Operations and undertaken by the University of Newcastle's Centre for Sustainable Ecosystem Restoration from 2013 to 2016. The final report on this research program is published on the Ravensworth Operations website:

https://www.ravensworthoperatio11s.c0m.au/en/publications/Pages/research-plans-programs.aspx
The findings of this research program inform rehabilitation programs across the Project.

9.2 Future Rehabilitation Research, Modelling and Trials

In addition to the future trials proposed below for Ravensworth Operations, key learnings from previous rehabilitation trials may be incorporated into rehabilitation planning during future monitoring; including landform design, seed mixes and the use of ameliorants (e.g. biosolids). Other rehabilitation trials continue at other GCAA operations in the Hunter Valley, with this information to be shared across GCAA operations.

a. Rock competency testing

To help inform the suitability of rock sources from the various seams at Ravensworth, rock competency testing is to be undertaken. The rock competency testing will include geological and geotechnical testing in the field, coupled with laboratory testing to help understand the characteristics of the material and determine suitable seams rock can be sourced from to construct water management structures in the rehabilitation.

b. Spontaneous combustion investigation

Both known areas and aeras with potential to contain material that is prone to spontaneous combustion will continues to be monitored and the potential impacts modelled through the use of thermal scans. Thermal scans can detect abnormal heat buildup beneath the surface, allowing for identification and management of potential hotspots early in areas prone to spontaneous combustion.

10. Intervention and Adaptive Management

Potential threats to rehabilitation have been identified as part of the RMP Risk Assessment discussed in **Section 3**, with a full copy of the risk assessment attached as **Appendix A**. Ravensworth Operations undertake and record annual rehabilitation monitoring/inspections to assess the success of overall rehabilitation and identify any areas that require improvement.

Where rehabilitation monitoring indicates that rehabilitation outcomes are not trending toward the nominated completion criteria, Ravensworth Operations will instigate early intervention and adaptive management to identify the cause and minimise the potential for rehabilitation failure.

Mitigation actions will be recorded on the Ravensworth Operations document control system for implementation. Where necessary, rehabilitation procedures will be reviewed and revised in order to improve rehabilitation outcomes.

Ravensworth Operations will also refer to the Project -specific The Trigger Action Response Plan (TARP) shown in **Table 10-1**. The TARP identifies the proposed contingency strategies in the event of unexpected variations or impacts to rehabilitation outcomes. The TARP outlines the key identified risks, their trigger and proposed mitigation measures to reduce the identified risks.

Table 10-1 – Trigger Action Response Plan -Rehabilitation and Closure

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
Landform Stability	Erosion control	Trigger	Minor gully or tunnel erosion present and/or minor rilling (rilling up to 200 mm).	Slumping and /or significant gully or tunnel erosion present and/or significant rilling (where required)
		Response	An inspection of the Project area will be undertaken by a suitably trained person. Investigate opportunities to install water management structures to address erosion. Remediate as appropriate.	Engage a consultant to assist with the management of erosion and sedimentation at the affected site(s) and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable. Review, and update where required, the Erosion and Sediment Control Plan.
	Free Draining Landforms	Trigger	Landforms exhibiting minor ponding.	Landforms exhibiting significant drainage issues, threatening or causing material harm to the environment.
		Response	An inspection of the Project area will be undertaken by a suitably trained person. Investigate opportunities to address issues. Remediate as appropriate.	Undertake a review of the landform design, including survey if required. Undertake re-grading and re-vegetation of the area.
	Water Management Structures	Trigger	Water management structures (sediment dams, channels, contour banks) minor erosion and/or scouring.	Water management structures fail or display significant scouring / erosion (where required
		Response	An inspection of the Project area will be undertaken by a suitably trained person. Identify remedial actions such as amelioration, re-vegetation or alternative scour protection.	Engage specialist consultant to develop a Project specific remediation plan and review water management structure design criteria.

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
Biodiversity (native vegetation areas)	Ground cover percent	Trigger	Bare surfaces do not meet the requirements of rehabilitation objectives. However, there is greater than 50% coverage.	During Ecosystem Establishment, vegetative cover is 50% or less.
		Response	Undertake a field survey to identify likely causes of unsatisfactory germination rates. Re-seed areas with unsatisfactory cover. Review seeding procedures incl. seasonal mixes, timing and seed rate per hectare. Undertake soil testing	Engage a suitably qualified specialist to investigate causes for germination failure and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required. Undertake soil testing
	Rehabilitation success	Trigger	<75% but >55%of shrubs and/or trees are healthy when ranked healthy, sick or dead in during rehabilitation inspections in the Ecosystem Establishment phase.	<55% of shrubs and/or trees are healthy when ranked healthy, sick or dead in during rehabilitation inspections in the Ecosystem Establishment phase.
		Response	Undertake a field survey to identify likely causes of vegetation sickness and/or death rates. Re-seed or re-plant areas with high sickness or death rates. Review seeding and/or planting procedures.	Engage a suitably qualified specialist to investigate causes for vegetation sickness and death. Implement appropriate management actions including revising rehabilitation procedures if required.
	Weed Presence	Trigger	> 10% but <25% cover of undesirable species present in Ecosystem Establishment phase.	>25% cover of undesirable species present in Ecosystem Establishment phase.

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
		Response	Engage weed management contractor to remove / spray introduced weed species. Treatment of infestations as appropriate to the species.	Engage weed management contractor to remove introduced weed species. Investigate management measures to reduce weeds including additional soil amelioration, establishment and retention of cover crops until weed presence is at acceptable levels. Implement recommendations as appropriate.
	Pasture Seed Mix	Trigger	Palatable, nutritious pasture grass species cover <75% but >55% during the Growth Medium Development phase.	Palatable, nutritious pasture grass species cover <55% Growth Medium Development phase.
		Response	Undertake a field survey to identify likely causes of unsatisfactory germination and/or growth rates. Re-seed areas with unsatisfactory cover. Review seeding procedures incl. seasonal mixes, timing and seed rate per hectare.	Engage a suitably qualified specialist to investigate causes for germination failure and/or reduced growth rates and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required.
	Temporary Rehabilitation	Trigger	<75% but >55% of vegetation cover is present on areas where hydromulching has been applied within 6 months.	<55% of vegetation cover is present on areas where hydromulching has been applied within 6 months.
		Response	Review RMCP. An inspection of the Project area will be undertaken by a suitably trained person. Investigate opportunities to address issues. Revegetate as appropriate.	Engage specialist consultant to develop a Project specific remediation plan. Revegetate as appropriate.
	Pest animal species presence	Trigger	Pest animal species presence and density increased in annual monitoring events.	Significant numbers of pest animals causing widespread damage to rehabilitation.

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
		Response	Consult with relevant government agencies (including BCD) to recommend and implement appropriate pest animal control campaign.	Consult with relevant government agencies (including BCD) to recommend and implement appropriate pest animal control campaign. Update to BOMP.
	Native Fauna Presence	Trigger	Decrease in the number of vertebrate species over successive seasons prior to mine closure.	Continued decline in trend in recorded vertebrate species numbers and/or presence and abundance (allow for natural variation occurring in analogue sites).
		Response	Engage ecologist to undertake investigation to determine the cause of change.	Engage ecologist to undertake investigation to determine the cause of change. Liaise with relevant government agencies.
	Native Fauna Presence	Trigger	Loss or deterioration of nest boxes, or pest animal species usage of nest boxes.	Decline in trend in recorded fauna numbers and/or presence and abundance (allow for natural variation occurring in analogue sites).
		Response	Replace damaged / lost nest boxes. Relocate and replace boxes adopted by pests.	Engage ecologist to undertake investigation to determine the cause of change. A Project specific management report may be prepared and implemented where necessary that aligns with the *OMCP*.
	Native Animal Control	Trigger	Damage to rehabilitation from native fauna.	Continued damage to rehabilitation from native fauna after tree guards and fencing has been installed.

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
		Response	Options will be incorporated to maintain survival rates.	Liaise with government agencies and consider a culling program in accordance with National Parks and Wildlife Service regulations.
Topsoil / subsoil	Topsoil /subsoil quality (geochemical / physical / structural properties)	Trigger	Some small patches of bare ground, or poor vegetation growth indicating a potential issue with soil/spoil quality or structure including geochemical and physical properties	Large areas (>400 m2) of bare ground, or poor vegetation growth indicating a potential issue with soil/spoil quality
		Response	Conduct investigation and take samples of soil/spoil to determine the need for ameliorants or other management options	Engage a consultant to assist with recommendations to appropriately remediate soil/spoil quality and depth. Remediate as soon as practicable
	Topsoil / subsoil quantity	Trigger	Topsoil balance indicates a deficiency in topsoil available for rehabilitation over the Life of the Mine	Deficiency significant enough to delay rehabilitation progression
		Response	Investigate options and alternatives (e.g. OGM) to be able to meet future topsoil requirements. Trial methods of rehabilitation that are more topsoil efficient i.e. use of compost on overburden	Source and budget for the purchase of topsoil for use in rehabilitation. Investigate use of alternatives such as OGM or subsoil in suitable locations
	Evidence of Spontaneous Combustion	Trigger	Isolated incidence of heating in rehabilitation areas	Widespread or repeated incidents of heating / ignition in rehabilitation areas

Aspect/Category	Key Element	Trigger Response	1st Level Trigger	2nd Level Trigger
Spontaneous Combustion		Response	Investigate sources of potential ignition. Excavate material with propensity for spontaneous combustion in proximity to rehabilitated surface. Review overburden/coarse reject emplacement practices.	Develop remediation plan to mitigate spontaneous combustion such as increased capping. Review Spontaneous Combustion Principal Hazard Management Plan and material emplacement practices
Presence of non – native / endemic species (e.g. *Acacia Saligna*)	Evidence of non – native / endemic species e.g *Acacia Saligna*	Trigger	Isolated areas of *Acacia Saligna* in rehabilitation areas	Widespread areas of *Acacia Saligna* in rehabilitation areas
		Response	Engage weed management contractor to remove / spray species.	Engage weed management contractor to remove introduced species. Develop management measures to reduce widespread or repeated presence of species. Implement recommendations as appropriate.

11. Review, Revision and Implementation

11.1 Review and Revision

In accordance with Clause 11 of Schedule 8A to the Mining Regulation 2016, Ravensworth Operations will amend this RMP in the following circumstances:

- As a consequence of an amendment made to the rehabilitation objectives, rehabilitation completion criteria or final landform and rehabilitation plan;
- To reflect any changes to the risk control measures in the rehabilitation management plan that are identified in a rehabilitation risk assessment; and
- Whenever directed in writing to do so by the Secretary.

The Lease holder must ensure the Rehabilitation Management Plan remains current and relevant to ensure it defines the rehabilitation outcomes to be achieved in relation to the mining area and sets out the strategy to achieve those outcomes.

Whenever any foreseeable hazard is identified that presents a risk to achieving the rehabilitation objectives, the rehabilitation completion criteria and the final landform and rehabilitation plan, the lease holder is required to update the Rehabilitation Risk Assessment and the Rehabilitation Management Plan.

11.2 Implementation

Responsibilities for implementation of this RMP are outlined in **Table 11-1** below.

Table 11-1 – Responsibilities for implementation of this RMP

Position	Responsibility
OPERATIONS MANAGER	• Provide adequate resources for mine rehabilitation including qualified personnel, adequate financial resources and training as required
MINE MANAGER	• Implement the procedures referenced in this RMP; • Undertake training in relevant Management Plans and procedures as required; • Provide adequate resources for the completion of rehabilitation activities; and • Construct landforms in accordance with this RMP.

Position	Responsibility
TECHNICAL SERVICES MANAGER	• Implement the procedures referenced in this RMP; • Undertake training in relevant Management Plans and procedures as required; • Design landforms in accordance with this RMP; • Provide resources required to implement these procedures; • Develop mine plans to allow for progressive rehabilitation of mined land; and • Liaise with the Environment and Community Department to ensure that regulatory commitments relating to rehabilitation are considered during mine planning processes.
ENVIRONMENT & COMMUNITY MANAGER	• Ensure the relevant Management Plans are prepared; • Coordinate the development of annual rehabilitation plans to guide rehabilitation activities; • Coordinate the development of the site rehabilitation objectives and closure criteria in consultation with key stakeholders; • Coordinate the completion of rehabilitation activities in accordance with this document; • Coordinate the rehabilitation monitoring program and an annual review of monitoring results to provide a continual improvement process for rehabilitation: • Coordinate maintenance as required; • Consult with regulatory authorities as required; • Ensure all personnel undertaking works in relation to this RMP are trained and competent; • Report the progress of rehabilitation in accordance with Development Consent and Clauses 9 and 13 of Schedule 8A to the Mining Regulation 201
COMMERCIAL MANAGER	• Ensure that there are adequate provisions available for mine closure

11.3 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in the table below.

Table 11-2 – Change Information

Version	Date	Review	Change Summary
1.0	2 August 2022	K Marchant / IEMA	New document
2.0	19 July 2024	K Marchant / IEMA	Inclusion of Mining Lease 1879 and MLA 477 (text and figures). Inclusion of Standard Mining Lease Conditions. Change of final landuse coding to be consistent with Resources Regulator feedback. Update to risk assessment. Inclusion of revision table.
3.0	7 August 2025	K Marchant	Updates include risk assessment review, 2024 Revegetation TAP recommendations, following submission of FWP 2025-2027
4.0	18 May 2026	Ravensworth E&C/IEMA	Updated to reflect new requirements of *Form and Way: Rehabilitation Management Plans for Large Mines* (September 2025), 2025 Landform Establishment TAP recommendations.