austral bricks®

ABN: 52 000 005 550

Rehabilitation Management Plan

for the

Lot 2 Bunnygalore Quarry

Compiled by:

RWCorkery&co

August 2022

RWCorkery&co

ACN : 52 000 005 550

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Prepared for:

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Ref No. 537/48 August 2022

Summary Table

Name of Mine		Lot 2 Bunnygalore Quarry		
RMP Commencement Date		2 July 2022		
Mineral Authorities		M(MO)L8	**Expiry Date**	4 May 2039
Name of Leaseholder		The Austral Brick Company Pty Limited (ABN: 52 000 005 550)		
Version	**Author**	**Purpose**	**Approved by**	**Date of Submission**
1	S. Rosek			

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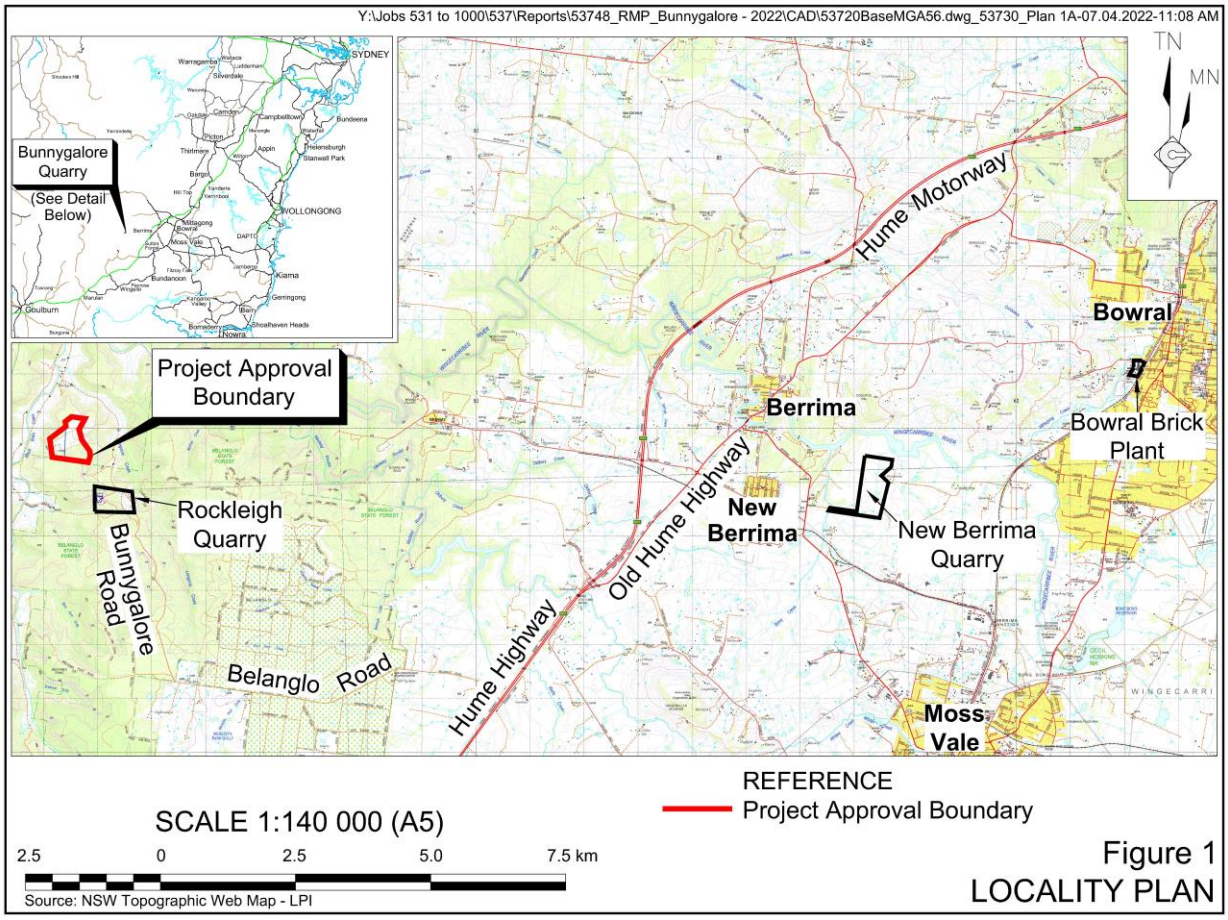
LIST OF ACRONYMS

AHD	Australian Height Datum
DA	Development Application
EPA	Environment Protection Authority
MOP	Mining Operations Plan
RWC	R.W. Corkery & Co. Pty Limited
RMP	Rehabilitation Management Plan

1. Introduction to Mining Project

This Rehabilitation Management Plan (RMP) for the Lot 2 Bunnygalore Quarry (the Quarry) has been compiled by R.W. Corkery & Co. Pty. Limited (RWC) in conjunction with The Austral Brick Company Pty Limited (Austral Bricks). The Quarry is located on Lot 2 DP 630269 near Belanglo State Forest approximately 20km west of Bowral. **Figure 1** displays the locality of the Quarry in relation to Belanglo State Forest and the Southern Highlands as well as Sydney and Wollongong.



This Rehabilitation Management Plan (RMP) has been prepared in accordance with the following documents and guidelines.

- *Form and Way: Rehabilitation Management Plan for Large Mines (July 2021)*
- *Form and Way: Rehabilitation Objectives, Rehabilitation Completion Criteria and Final Landform and Rehabilitation Plan for Large Mines (July 2021)*
- *Guideline 1: Rehabilitation Risk Assessment (July 2021)*
- *Guideline 2: Rehabilitation Records (July 2021)*

- *Guideline 3: Rehabilitation Controls (July 2021)*
- *Guideline 5: Rehabilitation Objectives and Rehabilitation Completion Criteria (July 2021)*

1.1 History of Operations

All activities associated with the Quarry are undertaken within an area identified as the "Quarry Site" (**Figure 2**).

Development Application (DA) 325/90 was granted on 23 July 1990 to permit the extraction of clay/shale from a 9.5ha area within the western part of Lot 2 DP630269. DA325/90 approves extraction of an average of 2,000 tonnes per month (24,000t per annum) from the approved extraction area. Extraction activities at the Quarry commenced in 1992. Clay/shale extraction at the Quarry complements extraction operations at the Rockleigh Quarry, located 2km to the southeast of the Quarry. Both operations supply raw materials to the Bowral Brick Plant owned and operated by Austral Bricks.

Although operations started in 1992, M(MO)L8 for the Bunnygalore Quarry was not issued until 4 May 2018, as previous legislation did not require a mining title for the extraction of privately-owned minerals.

The Quarry produces a cream to white-firing shale that, along with the output of the Rockleigh Quarry, is used in production of the Company's St Pauls Cream and Chillingham White bricks among others. Accordingly, extraction operations have historically relied on demand for these products.

Extraction operations are undertaken on a campaign basis with each campaign consisting of the following.

- Clearing of vegetation using a bulldozer or similar, with the blade positioned just above the surface. The vegetation is temporarily stockpiled adjacent to the extraction area for use in progressive rehabilitation activities.
- Stripping of soil material using a bulldozer and temporarily stockpiling adjacent to the active extraction area for progressive rehabilitation activities.
- Drilling and blasting of overlying sandstone (overburden).
- Relocation of sandstone into completed sections of the extraction area and shaping to form the final landform.
- Drilling and blasting of white-firing shale.
- Stockpiling of raw materials within the extraction area and / or the stockpiling area.
- Progressive loading and transportation of raw materials to the Bowral Brick Plant using a front-end loader and road-registered trucks.

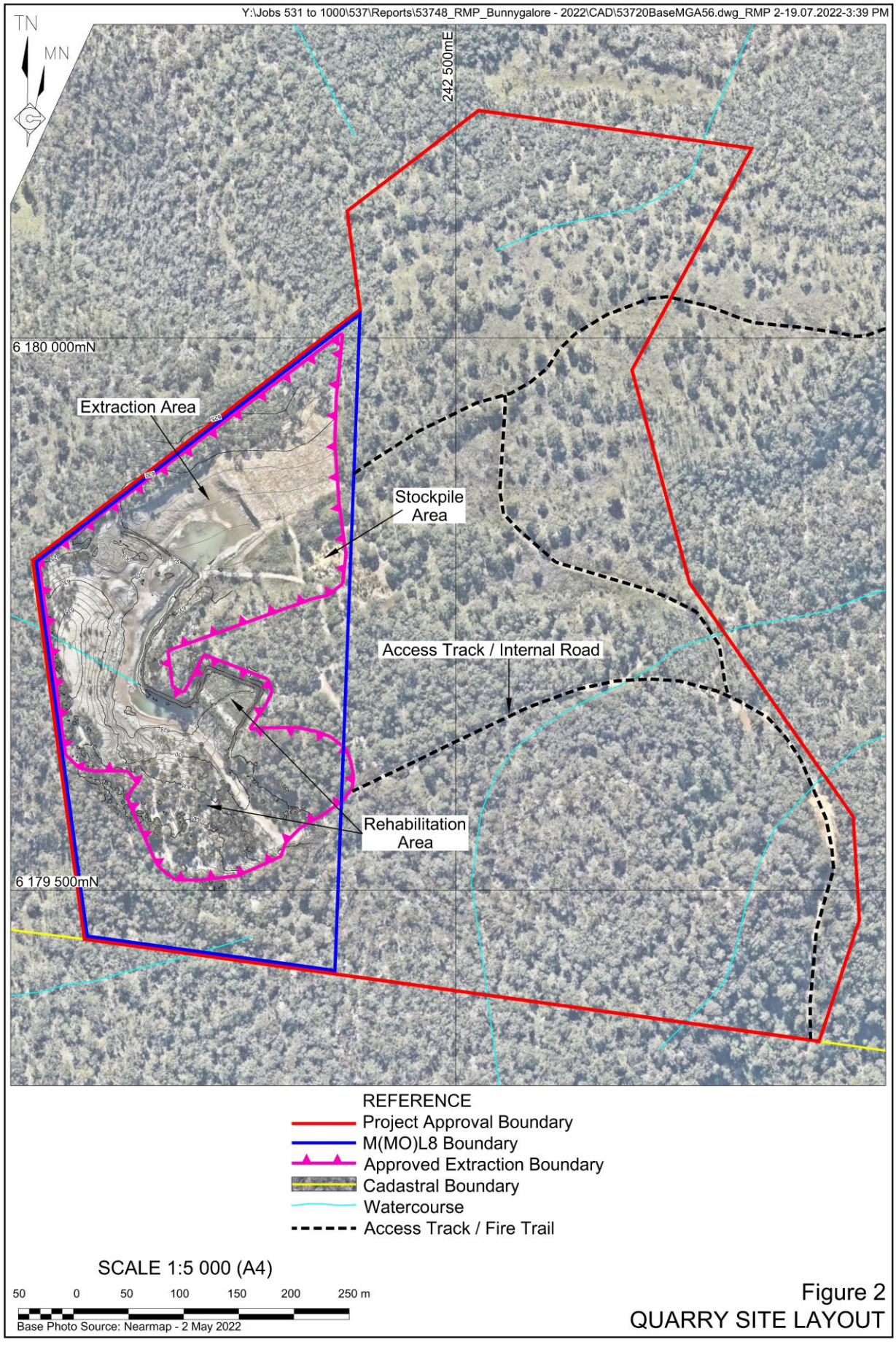


Figure 2
QUARRY SITE LAYOUT

1.1.1 Historic Rehabilitation Outcomes

Minor rehabilitation activities have been undertaken following a progressive rehabilitation schedule including landform creation as part of each extraction campaign (see **Plates 1** to **3**).

In summary, rehabilitation of these areas has been undertaken as follows.

- Removal of stockpiled materials and ripping of underlying soils.
- Progressive final landform establishment via placement and profiling of waste rock into completed extraction areas in accordance with the protocols outlined in Section 6.2.3.
- Spreading of soil materials across final shaped landforms.
- Natural vegetation through the soil seedbank and seed rain from adjacent trees.
- Placement of mulched vegetation and cut brush material on rehabilitated areas to enhance vegetation establishment and soil stabilisation.

1.2 Current Development Consents, Leases and Licences

Table 1 provides a summary of the relevant consents, authorisations and licences held by Austral Bricks for the Quarry.

Table 1
Current Consents, Authorisations and Licences

Approval/Lease/Licence	Issue Date	Expiry Date	Details / Comments
Development Consent			
DA325/90	23 July 1990	-	Development consent granted by the Wingecarribee Shire Council and amended on 12 July 1991 and further amended 26 April 2018.
Mining Authorisations			
M(MO)L8*	4 May 2018	4 May 2039	This lease was granted by DRG in response to M(MO)LA28, covers an area of 12.51ha and permits mining of clay / shale, kaolin and structural clay minerals.
Mining Authorisations			
EL9297	29 September 2021	29 September 2024	
Other Approvals and Licences			
EPL4249	13 February 2001	Re-issued Annually 1 May	Issued by the NSW Environment Protection Authority (EPA). Current licence version dated 20/02/2012.
* See **Figure 2**			

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Plate 1: A view to the northwest across the "Campaign 1" extraction area following backfilling of overburden and placement of soil materials

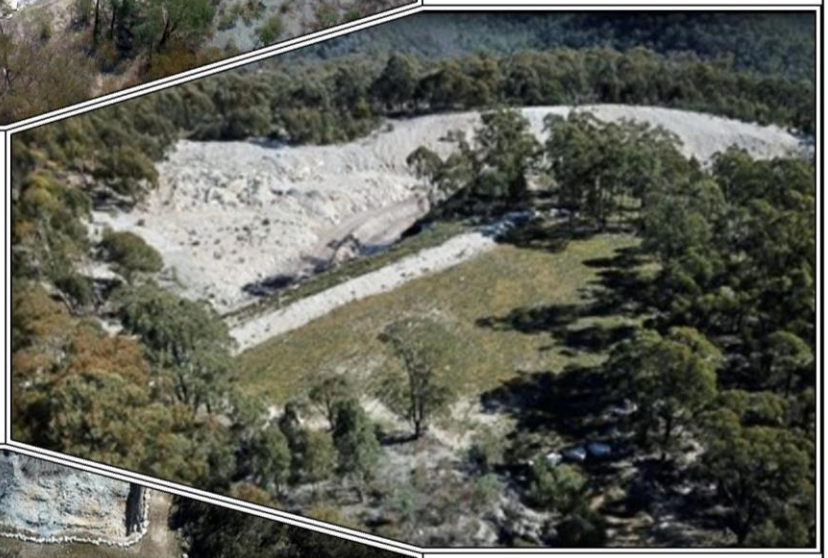


Plate 2: A view to the west across the "Campaign 1" extraction area following natural revegetation

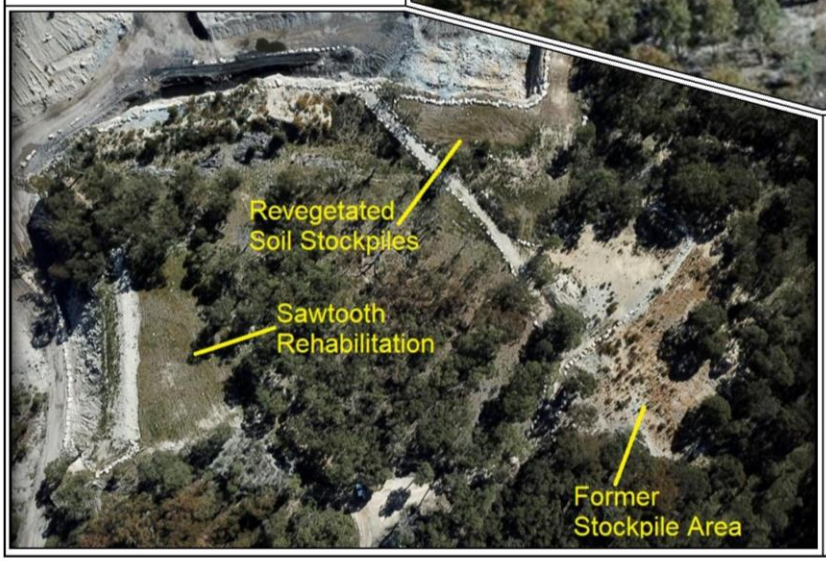


Plate 3: An overview of "Campaign 1" Rehabilitation Area, Revegetated Soil Stockpiles and Former Stockpile Area

1.3 Land Ownership and Land Use

Table 2 presents the land ownership for land within and adjacent to the Quarry. In summary, land within the Quarry consists of land owned by Austral Bricks. Land adjacent to the Quarry consists of privately owned land, Crown Land (Belanglo State Forest) and land owned by the NSW Government.

Table 2
Land Ownership

Lot	Deposited Plan	Tenure	Owner	Leases
Quarry Site				
2	630269	Freehold	The Austral Brick Company Pty Ltd	M(MO)L8
Land Adjacent to the Mine Site				
1	630269	Freehold	Privately owned	
7141	1203892	Crown Land	NSW Government	
Belanglo State Forest				

Land uses within the Quarry Site include extraction activities associated with the Quarry as outlined in Section 1.1.

Land uses in the vicinity of the Quarry include:

- Forestry within Belanglo State Forest;
- Recreation, namely the Bowral Pistol Club pistol range;
- Natural vegetation conservation on land adjacent to the Quarry;
- Transport via Bunnigalore Road; and
- Agricultural operations on cleared land.

1.3.1 Land Ownership and Land Use Figure

Figure 3 presents land ownership for areas within and surrounding the Quarry Site. **Figure 4** presents land uses in the vicinity of the Quarry Site. **Figure 5** presents the vegetation communities and heritage items within the Quarry Site and **Figure 6** presents land zoning in the vicinity of the Quarry Site.

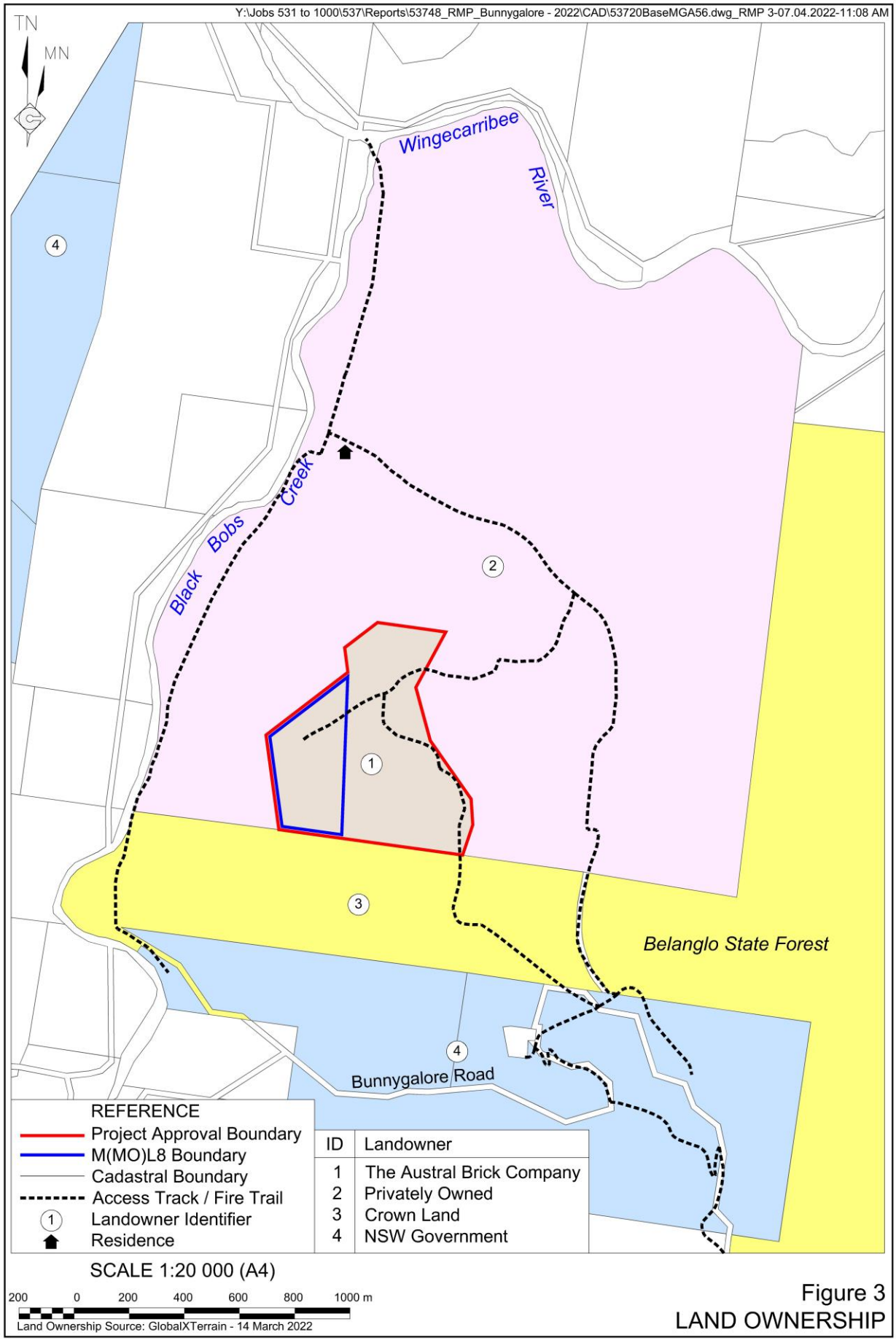


Figure 3
LAND OWNERSHIP

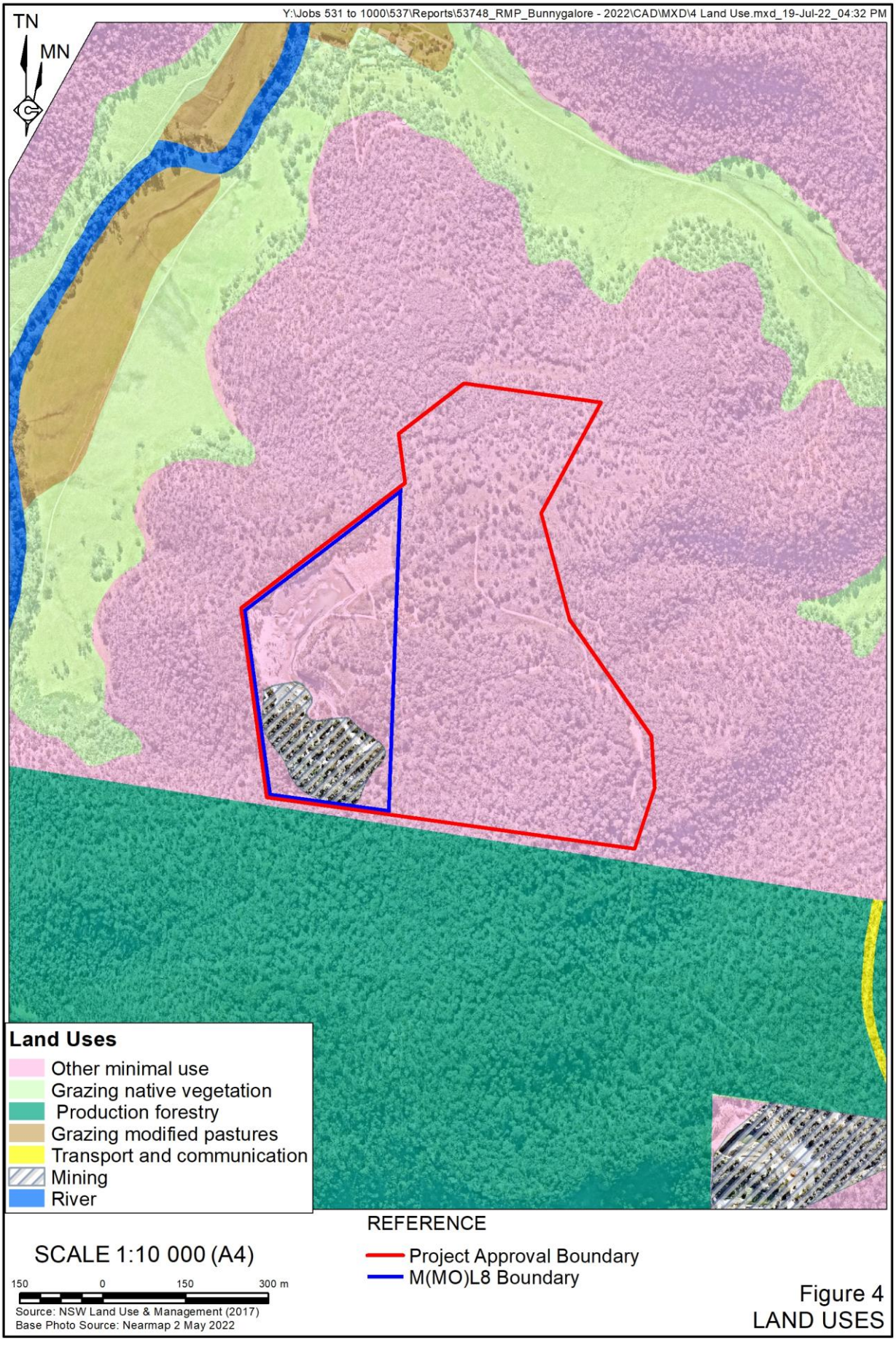


Figure 4
LAND USES

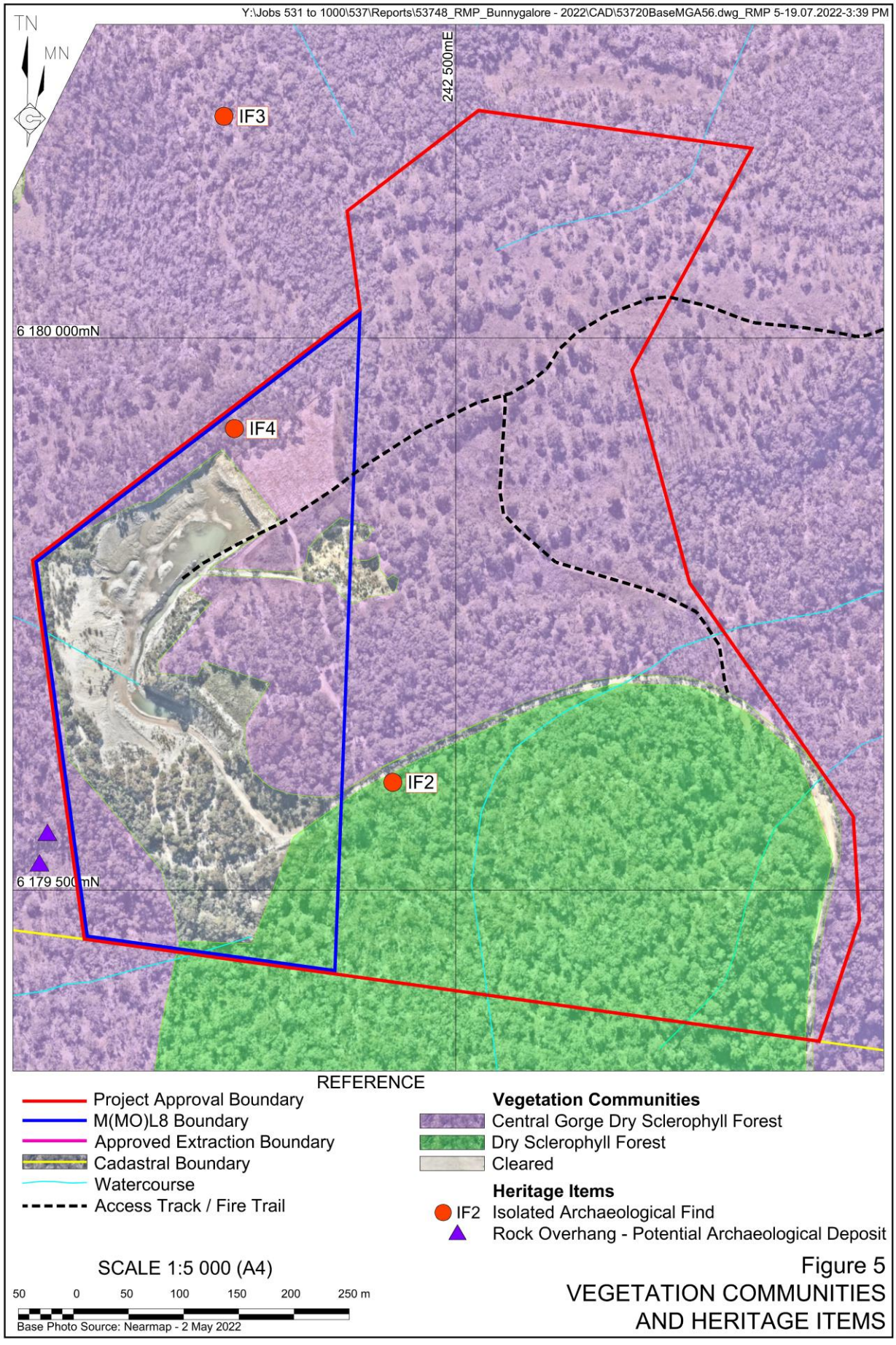


Figure 5
VEGETATION COMMUNITIES
AND HERITAGE ITEMS

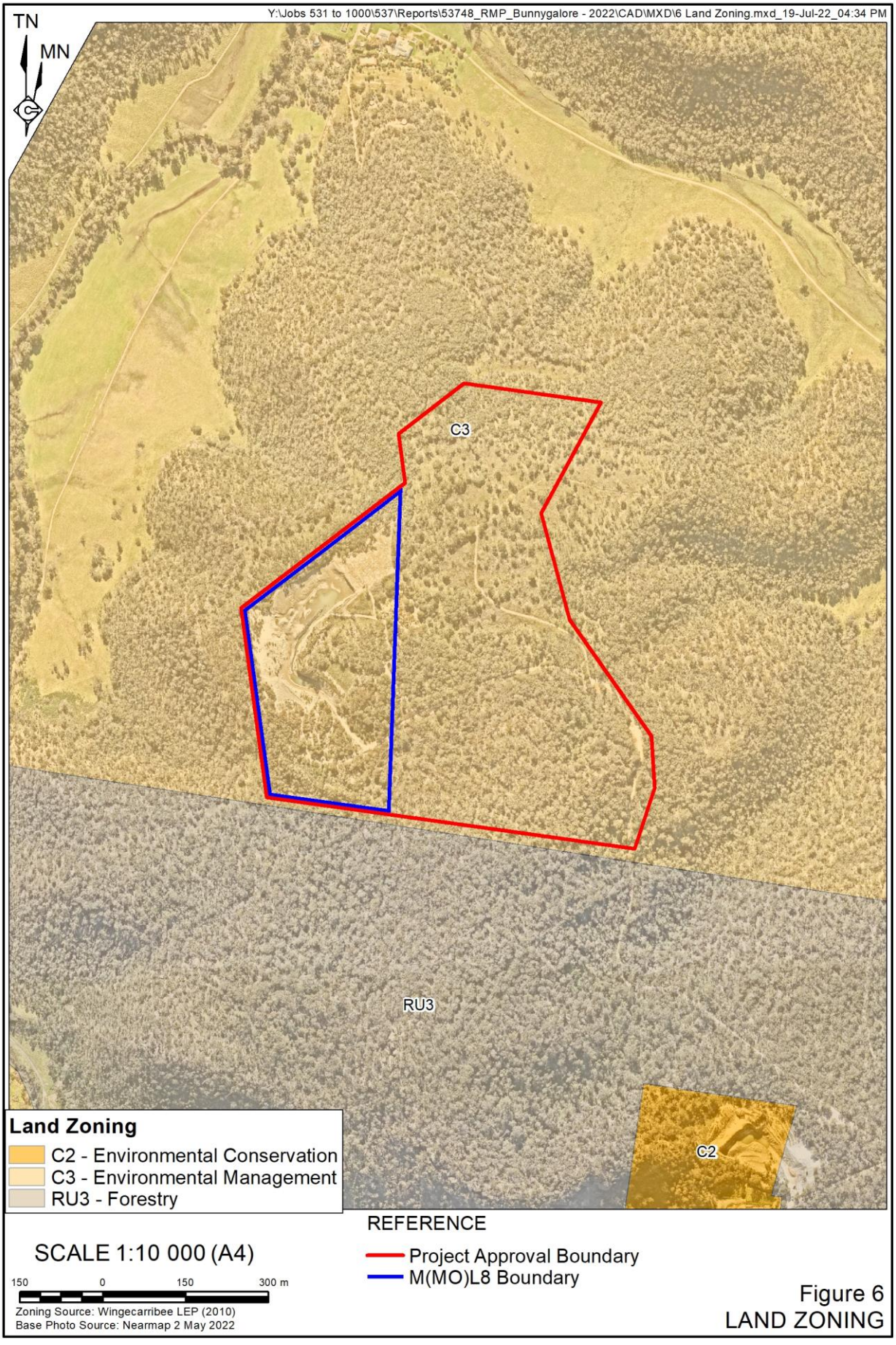


Figure 6
LAND ZONING

2. Final Land Use

2.1 Regulatory Requirements for Rehabilitation

Table 3 lists the regulatory requirements relating to rehabilitation of the Quarry Site and post-extraction land uses.

2.2 Final Land Use Options Assessment

The final land use following rehabilitation of the Quarry has historically been defined in the approved Mining Operations Plan (MOP) for the Quarry and is identified in Section 2.3. In accordance with *Form and Way: Rehabilitation Objectives, Rehabilitation Completion Criteria and Final Landform and Rehabilitation Plan for Large Mines* (Resources Regulator, 2021), no further land use options assessment is required.

2.3 Final Land Use Statement

Final land uses within the Quarry will include the following.

- Nature Conservation
- Rural Lifestyle

Final land use and rehabilitation plans for the Quarry are presented in Section 5.

2.4 Final Land Use and Mining Domains

The *Form and Way: Rehabilitation Management Plan for Large Mines (July 2021)* guideline defines a domain as follows.

> *"An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use."*

Table 3
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
DA325/90	3(B)	**Environmental Management Strategy** A comprehensive Environmental Management Strategy shall be submitted for approval by Council prior to commencement of any works on site. This plan shall include: (B) Site Rehabilitation i. plan showing stages of final site rehabilitation ii. Interim screen landscape iii. Final voids to be constructed with adequate spillways to prevent any erosion of the rehabilitated quarry.	Quarry Site	During operation and rehabilitation.	5.1
	4	**Rehabilitation Management Plan** The rehabilitation of the existing clay/shale quarry (site M.L39 in Belanglo State Forest) within 2 years of the commencement of operations at the new quarry. The applicant is to submit a comprehensive rehabilitation plan of the existing clay/shale quarry prior to the commencement of any works at the new quarry. The rehabilitation plan is to be to the satisfaction of Council, the Soil Conservation Service, the State Pollution Control Commission and the Forestry Commission.	Quarry Site and surrounds		This document
M(MO)L8	4	**Must prevent or minimise harm to the environment** (1) The holder of a mining lease must take all reasonable measures to prevent, or if that is not reasonably practicable, to minimise, harm to the environment caused by activities under the mining lease. (2) In this clause – **harm** to the environment has the same meaning as in the Protection of the Environment Operations Act 1997**.**	Quarry Site	During operation and rehabilitation.	Noted
M(MO)L8	5	**Rehabilitation to occur as soon as reasonably practicable after disturbance** i. The holder of a mining lease must rehabilitate land and water in the mining area that is disturbed by mining activities under the mining lease as soon as reasonably practicable after the disturbance occurs.		During operation and rehabilitation.	Noted

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	6	**Rehabilitation must achieve final land use** (1) The holder of a mining lease must ensure that rehabilitation of the mining area achieves the final land use for the mining area. (2) The holder of a mining lease must ensure any planning approval has been obtained that is necessary to enable the holder to comply with subclause (1). (3) The holder of the mining lease must identify and record any reasonably foreseeable hazard that presents a risk to the holder's ability to comply with subclause (1) **Note –** clause 7 requires a rehabilitation risk assessment to be conducted whenever a hazard is identified under this subclause. (4) In this clause – ***final land use*** for the mining area means the final landform and final land uses to be achieved for the mining area – (a) as set out in the rehabilitation objectives statement and rehabilitation completion criteria statement, and (b) for a large mine – as spatially depicted in the final landform and rehabilitation plan, and (c) if the final land use for the mining area is required by a condition of development consent for activities under the mining lease – as stated in the condition. ***planning approval*** means – (a) a development consent within the meaning of the *Environmental Planning and Assessment Act 1979*, or an approval under that Act, Division 5.1.			2.2, 3

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	7	**Rehabilitation risk assessment** (1) The holder of a mining lease must conduct a risk assessment (a ***rehabilitation risk assessment***) that – (a) identifies, assesses and evaluates the risks that need to be addressed to achieve the following in relation to the mining lease – (i) the rehabilitation objectives, (ii) the rehabilitation completion criteria, (iii) for large mines – the final land use as spatially depicted in the final landform and rehabilitation plan, and (b) identifies the measures that need to be implemented to eliminate, minimise or mitigate the risks. (1) The holder of the mining lease must implement the measures identified. (2) The holder of a mining lease must conduct a rehabilitation risk assessment – (a) for a large mine – before preparing a rehabilitation management plan, and (b) for a small mine – before preparing the rehabilitation outcome documents for the mine, and (c) whenever a hazard is identified under clause 6(3) – as soon as reasonably practicable after it is identified, and whenever given a written direction to do so by the Secretary.		During rehabilitation.	3
M(MO)L8	8	**Application of Division** This Division does not apply to a mining lease unless— (a) the security deposit required under the mining lease is greater than the minimum deposit prescribed under the Act, section 261BF in relation to that type of mining lease, or the Secretary gives a written direction to the holder of the mining lease that this Division, or a provision of this Division, applies to the mining lease.	M(MO)L8		Noted

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	9	**General requirements for documents** A document required to be prepared under this Division must— (a) be in a form approved by the Secretary, and **Note—** The approved forms are available on the Department's website. (b) include any matter required to be included by the form, and if required to be given to the Secretary—be given in a way approved by the Secretary.	M(MO)L8		This document
M(MO)L8	10	**Rehabilitation management plans for large mines** (1) The holder of a mining lease relating to a large mine must prepare a plan (a rehabilitation management plan) for the mining lease that includes the following— (a) a description of how the holder proposes to manage all aspects of the rehabilitation of the mining area, (b) a description of the steps and actions the holder proposes to take to comply with the conditions of the mining lease that relate to rehabilitation, (c) a summary of rehabilitation risk assessments conducted by the holder, (d) the risk control measures identified in the rehabilitation risk assessments, (e) the rehabilitation outcome documents for the mining lease, (f) a statement of the performance outcomes for the matters addressed by the rehabilitation outcome documents and the ways in which those outcomes are to be measured and monitored. (2) If a rehabilitation outcome document has not been approved by the Secretary, the holder of the mining lease must include a proposed version of the document. (3) A rehabilitation management plan is not required to be given to the Secretary for approval. (4) The holder of the mining lease— (a) must implement the matters set out in the rehabilitation management plan, and if the forward program specifies timeframes for the implementation of the matters—must implement the matters within those timeframes.	M(MO)L8		This document

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	11	**Amendment of rehabilitation management plans** The holder of a mining lease must amend the rehabilitation management plan for the mining lease as follows— (a) to substitute the proposed version of a rehabilitation outcome document with the version approved by the Secretary—within 30 days after the document is approved, (b) as a consequence of an amendment made under clause 14 to a rehabilitation outcome document—within 30 days after the amendment is made, (c) to reflect any changes to the risk control measures in the prepared plan that are identified in a rehabilitation risk assessment—as soon as practicable after the rehabilitation risk assessment is conducted, whenever given a written direction to do so by the Secretary—in accordance with the direction.	M(MO)L8		11
M(MO)L8	12	**Rehabilitation outcome documents** (1) The holder of a mining lease must prepare the following documents (***the rehabilitation outcome documents***) for the mining lease and give them to the Secretary for approval— (a) the ***rehabilitation objectives statement***, which sets out the rehabilitation objectives required to achieve the final land use for the mining area, (b) the ***rehabilitation completion criteria statement***, which sets out criteria, the completion of which will demonstrate the achievement of the rehabilitation objectives, (c) for a large mine, the ***final landform and rehabilitation plan***, showing a spatial depiction of the final land use. If the final land use for the mining area is required by a condition of development consent for activities under the mining lease, the holder of the mining lease must ensure the rehabilitation outcome documents are consistent with that condition.	M(MO)L8		4, 5

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	13	**Forward program and annual rehabilitation report** (1) The holder of a mining lease must prepare a program (a ***forward program***) for the mining lease that includes the following— (a) a schedule of mining activities for the mining area for the next 3 years, (b) a summary of the spatial progression of rehabilitation through its various phases for the next 3 years, (c) a requirement that the rehabilitation of land and water disturbed by mining activities under the mining lease must occur as soon as reasonably practicable after the disturbance occurs. (2) The holder of a mining lease must prepare a report (an ***annual rehabilitation report***) for the mining lease that includes— (a) a description of the rehabilitation undertaken over the annual reporting period, (b) a report demonstrating the progress made through the phases of rehabilitation provided for in the forward program applying to the reporting period, (c) a report demonstrating progress made towards the achievement of the following— (i) the objectives set out in the rehabilitation objectives statement, (ii) the criteria set out in the rehabilitation completion criteria statement, (iii) for large mines—the final land use as spatially depicted in the final landform and rehabilitation plan. (2) If a rehabilitation outcome document has not been approved by the Secretary, the holder of the mining lease must rely on a proposed version of the document. (3) The holder of the mining lease must give the forward program and annual rehabilitation report to the Secretary. (4) In this clause— ***annual reporting period*** means each period of 12 months commencing on— (a) the date on which the mining lease is granted, or if the Secretary approves another date in relation to the mining lease— the other date	M(MO)L8		8.3

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	14	**Amendment of rehabilitation outcome documents and forward program** (1) This clause applies to— (a) a rehabilitation outcome document if it has been approved by the Secretary, and (b) a forward program if it has been given to the Secretary. (2) The holder of a mining lease must not amend a document to which this clause applies that relates to the mining lease unless— (a) the Secretary gives the holder a written direction to do so, or (b) the Secretary, on written application by the holder, gives a written approval of the amendment. (3) The holder of the mining lease must amend the document in accordance with the Secretary's direction or approval. Nothing in this clause prevents the holder of a mining lease preparing a draft amendment for submission to the Secretary for approval.	M(MO)L8		8.3
M(MO)L8	15	**Times at which documents must be prepared and given** (1) The holder of a mining lease must do the following before the end of the initial period— (a) prepare a rehabilitation management plan, and (b) prepare rehabilitation outcome documents and give them, other than the rehabilitation completion criteria statement, to the Secretary for approval, and (c) prepare a forward program and give it to the Secretary. (2) The holder of the mining lease must prepare a forward program and annual rehabilitation report and give them to the Secretary before— (a) 60 days after the last day of each annual reporting period, commencing with the annual reporting period in which the forward program was given to Secretary under subclause (1)(c), or (b) a later date approved by the Secretary.	M(MO)L8		11

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8 (Cont'd)	15 (Cont'd)	(3) A rehabilitation completion criteria statement relating to completion of rehabilitation during a period covered by a forward program must be given to the Secretary for approval when the forward program is required to be given to the Secretary. (4) The holder of the mining lease must prepare updated rehabilitation outcome documents for the mining lease and give them to the Secretary for approval before— (a) 60 days after a development consent is modified following an application referred to in clause 20(1)(b), or (b) a later date approved by the Secretary. (5) A rehabilitation completion criteria statement is not required to be given to the Secretary under subclause (4) unless a rehabilitation completion criteria statement has already been given to the Secretary under subclause (3). (6) The Secretary may, by written notice, direct the holder of a mining lease to prepare, or give to the Secretary, a document required to be prepared under this Division at a time other than that specified in this clause. (7) The holder of the mining lease must comply with the direction. (8) In this clause— initial period means the period commencing when the mining lease is granted and ending— (a) 30 days, or other period approved by the Secretary, after this Division first applies to the mining lease, or (b) if this Division applies to the mining lease because of an increase in the required security deposit— (i) when the surface of the mining area is disturbed by activities under the mining lease, or at a later date approved by the Secretary.			

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	16	**Certain documents to be publicly available** (1) This clause applies to the following documents— (a) a rehabilitation management plan, (b) a forward program, (c) an annual rehabilitation report. (2) The holder of a mining lease must make a document to which this clause applies publicly available by— (a) publishing it on its website in a prominent position, or (b) if the holder does not have a website— providing a copy of it to a person— (i) on the written request of a person, and (ii) without charge, and (iii) within 14 days after the request is received. (3) If a document is published on the website of the holder of the mining lease, the holder must ensure that it is published— (a) for a rehabilitation management plan—within 14 days after it is prepared or amended, or (b) for a forward program or an annual rehabilitation report—within 14 days after it is given to the Secretary or amended, Personal information within the meaning of the *Privacy and Personal Information Protection Act 1998* is not required to be included in a document made available to a person under this clause.	M(MO)L8		Noted
M(MO)L8	17	**Records demonstrating compliance** The holder of a mining lease must create and maintain records of all actions taken that demonstrate compliance with each of the conditions set out in this Part. **Note—** The Act, sections 163D and 163E provide for the form in which records must be kept and the period for which they must be retained.	M(MO)L8		This document

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
M(MO)L8	18	**Report on non-compliance** (1) The holder of a mining lease must provide the Minister with a written report detailing any non-compliance with— (a) a condition of the mining lease, or Note— The Act, section 364A contains provisions relating to the use and disclosure of information provided under this condition. (b) a requirement of the Act or this Regulation relating to activities under the mining lease. (2) The holder of the mining lease must provide the report within 7 days after becoming aware of the non-compliance. (3) The holder of the mining lease must ensure the report— (a) identifies the condition of the mining lease, or the requirement of the Act or this Regulation, to which the non-compliance relates, and (b) describes the non-compliance and specifies the date or dates on which, or the period during which, the non-compliance occurred, and (c) describes the causes or likely causes of the non-compliance, and describes the action that has been taken, or will be taken, to mitigate the effects, and to prevent any recurrence, of the non-compliance.	M(MO)L8		Noted
LEGISLATION					
Commonwealth Legislation					
Environmental Protection and Biodiversity Conservation Act 1999	s15B-15C	Discusses the requirement for approval for activities that may affect matters of national environmental significance including National Heritage places.	Quarry Site	During decommission and rehabilitation works.	6.2.1.13

Table 3 (Cont'd)
Regulatory Requirements for Rehabilitation

Consent	Condition No.	Requirement	Area	Timing	RMP Section
NSW Legislation					
Protection of Environmental Operations Act 1997	s42-58	Discusses the provision of Environment Protection Licences.	Quarry Site	During operations and rehabilitation works.	1.2
	s89-113	Discusses the application of Clean-up Notices.		During operations.	
	Chapter 5	Discusses environmental offences including water, air, noise and land pollution.		During operations and rehabilitation works.	
Heritage Act 1977	Part 3 (s27-30)	Discusses interim orders for items of State or local significance.		During decommission and rehabilitation works.	6.2.1.13
	Part 3A (s31-38)	Discusses listing of items, places or buildings on the state heritage register.		During construction, operations and rehabilitation works.	
	Part 4	Discusses the effect of interim heritage orders and listings on the State Heritage Register			
	Part 6	Discusses other measures for the conservation of environmental heritage.			
	Division 8	Discusses controlling and restricting harm to buildings, works, relics and places not subject to interim heritage orders or State Heritage Registered listings.			
Mining Act 1992	Division 3	Under these sections the Minister can direct a company to rehabilitate their land, or, should the company not comply with this direction, rehabilitate the land at the Ministers expense and recover the cost from the company.		During rehabilitation works.	Noted
Long-term Rehabilitation Objectives					
2018 SoEE (RWC, 2018)		Create a final landform that is stable both in the short term and long term particularly with respect to control of erosion.	Quarry Site	During rehabilitation works.	4, 5, 6.2.3
		Maximise the regeneration of the disturbed areas with native vegetation indigenous to the local area.			6.2.4, 6.2.5
		Ensure that the quality of surface water leaving the site complies with EPA criteria.		During operations and rehabilitation works.	6.2.1.10
		Restrict vehicular access to all areas other than the defined internal roads.			6.2.1

2.4.1 Final Land Use Domains

Table 4 defines the final land use domains for the Quarry as presented in **Figure 7**.

Table 4
Final Land Use Domains

Final Land Use Domain	Domain ID[1]	Domain Description
Native Ecosystem	A	This domain includes all areas disturbed by Quarry activities which will be returned to native woodland, similar to the surrounding existing woodland.
Water Management Area	F	This domain includes the final quarry sump/basin within the extraction area to be retained as a clean water dam / wetland.
Infrastructure	I	This domain includes the section of access road from Bunnigalore Road to be retained for long-term access to the Quarry.
Note 1: See **Figure 7**		

The additional unsealed access roads / fire trails beyond these domain areas are not utilised as part of the Quarry operations and therefore do not form part of the final land use Domains.

2.4.2 Mining Domains

Table 5 defines the mining domains for the Quarry as presented in **Figure 8**.

Table 5
Mining Domains

Mining Domain	Domain ID[1]	Domain Description
Infrastructure Area (Existing Access Roads)	1	This domain includes the existing access roads. The additional unsealed access roads / fire trails are not directly utilised as part of the Quarry operations and do not form part of this domain. This domain also contains raw material stockpiles.
Active Mining Area (Open Cut Void)	5	This domain includes the active and currently unrehabilitated extraction areas and includes areas where overburden has been placed within the extraction area.
Other (Historical Rehabilitation Area)	8a	This domain includes areas which have previously been extracted, backfilled with overburden, shaped and revegetated.
Other (Stockpiled Material)	8b	This area includes the existing stockpile area northeast of the current extraction area.

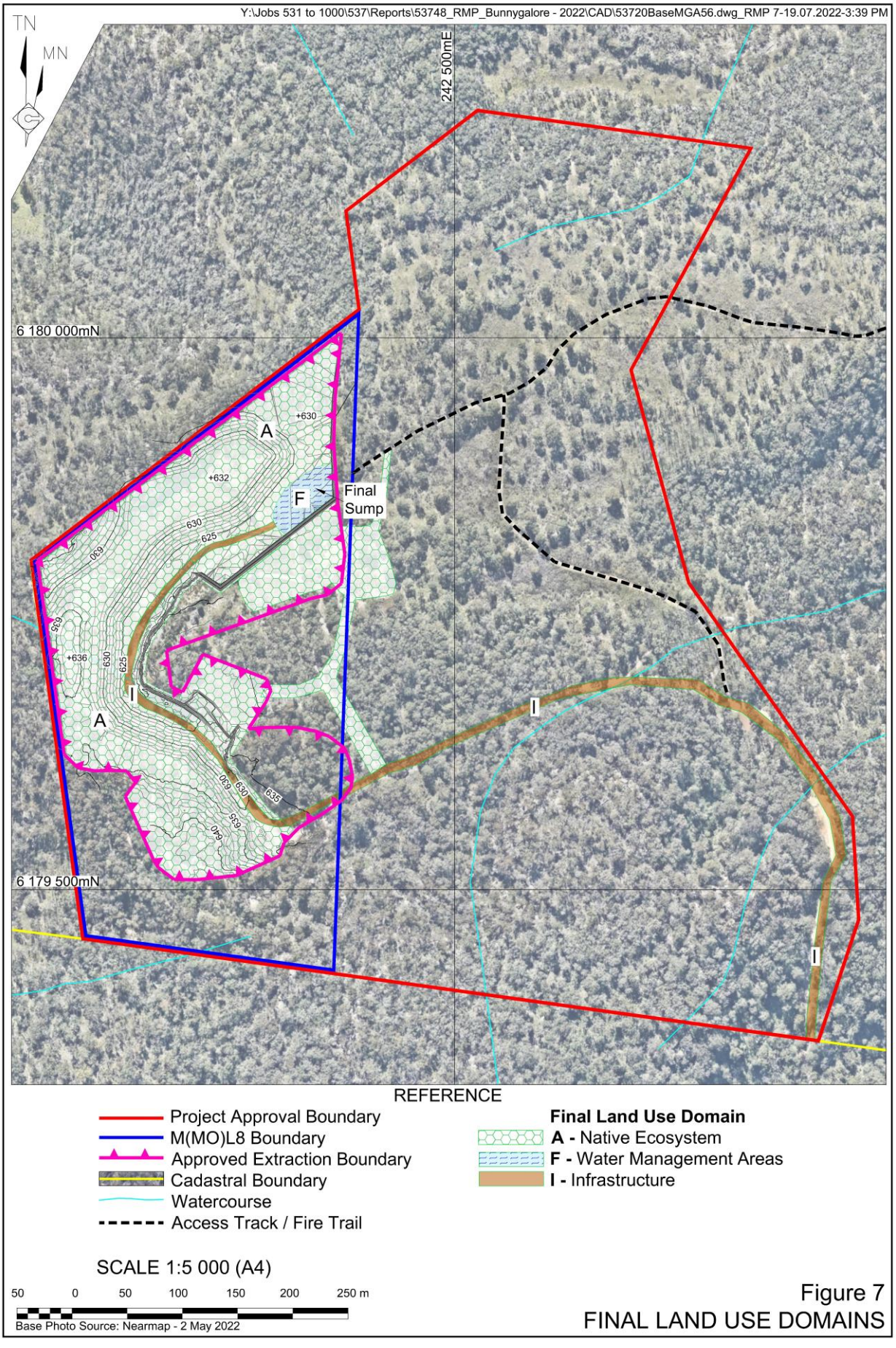


Figure 7
FINAL LAND USE DOMAINS

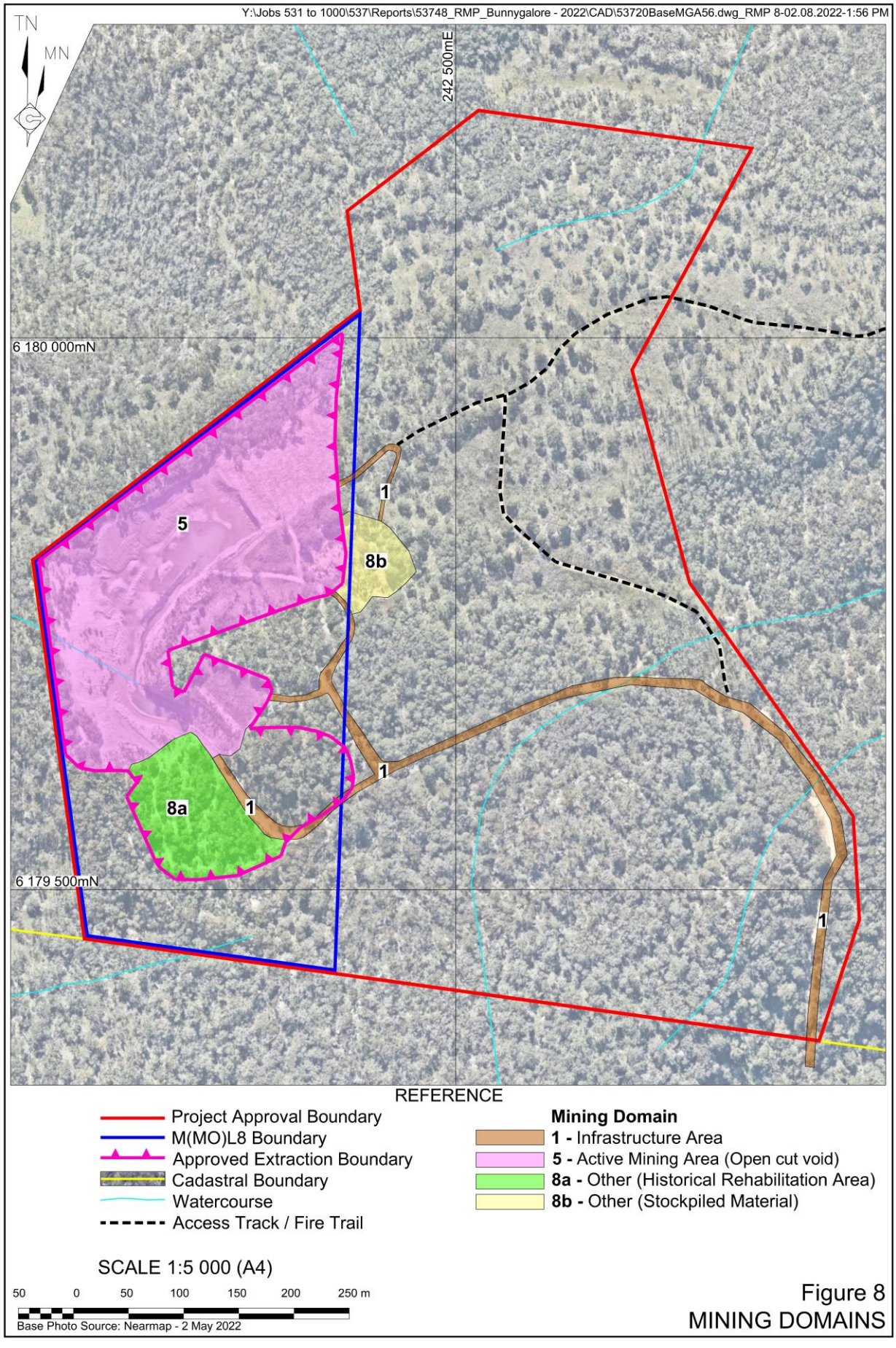


Figure 8
MINING DOMAINS

3. Rehabilitation Risk Assessment

The following risk assessment was undertaken generally in accordance with *Australian Standards HB 203:2006, AS/NZS 4360:2004 and AS/NZS ISO 31000:2018 Risk Management – Principles & Guidelines.*

Risks to achieving the rehabilitation objectives and rehabilitation completion criteria outlined in Section 4, as well as the final landform outlined in Section 5, were identified, and assessed jointly by the Company and R.W. Corkery & Co. Pty Limited during the preparation of this Plan. Site-specific threats to rehabilitation were assessed based on observations of site-specific conditions and threats to rehabilitation in collaboration with Austral Bricks. This risk assessment was completed with consideration of existing controls as well as those risk controls outlined in this Plan.

For each identified risk to rehabilitation, potential adverse outcomes were identified and allocated a risk rating based on the potential consequences and likelihood of occurrence. **Tables 6**, **7** and **8** present the consequence, likelihood and risk rating used during this analysis. Where risks were determined to be unacceptable, namely those risks classified as "Moderate" or above, a Trigger Action Response Plan has been developed and is presented in Section 10.

Table 9 presents the results of the risk analysis assuming the implementation of standard mitigation measures and those outlined within this Plan.

Table 6
Qualitative Consequence Rating

Level	Descriptor	Description
1	Negligible	No detrimental impact on the final land use is measurable or envisaged.
2	Minor	An event which could have temporary and minor effects on the suitability of the final land use.
3	Moderate	An event which would create substantial temporary or minor permanent damage to the suitability of the final land use.
4	Major	An event which could have a substantial and permanent consequence to the suitability of the final land use.
5	Severe	A major event which could cause severe damage to the suitability of the final land use with actual or potential loss of credibility with key stakeholders, environmental liability, regulatory intervention, national publicity/complaints, or could close the operation prematurely.
Note:	Rating modified after AS ISO 31000:2018 Risk Management – Guidelines	

Table 7
Qualitative Likelihood Rating

Level	Descriptor	Description
A	Certain	Is an ongoing occurrence or will occur under all conditions.
B	Almost Certain	Is expected to occur in most circumstances.
C	Likely	Will probably occur in most circumstances.
D	Possible	Will probably occur under favourable circumstances.
E	Unlikely	May occur, but only under favourable circumstances.
F	Rare	Not expected to occur, unless subject to exceptional circumstances.
G	Very Rare	Theoretically possible but not expected to occur.
Source: Rating modified after HB 89:2012 – Figure B7		

Table 8
Qualitative Risk Rating

Likelihood	Consequences				
	1 Negligible	2 Minor	3 Moderate	4 Major	5 Severe
A Certain	M	H	H	VH	VH
B Almost Certain	M	M	H	VH	VH
C Likely	M	M	H	H	VH
D Possible	L	M	M	H	H
E Unlikely	L	L	M	M	H
F Rare	L	L	L	M	M
G Very Rare	L	L	L	L	M
Risk Rating: L = Low, M = Moderate, H = High and VH = Very High					
Source: Modified after HB 89:2012 – Figure B8					

Table 9
Rehabilitation Risk Assessment

Rehabilitation Phase	Risk	Risk Control	Final Land Use Domain / Risk Ranking			Where Addressed in RMP
			Domain A: Native Ecosystem	Domain F: Water Management Areas	Domain I: Infrastructure	
General	Insufficient skills and experience of rehabilitation personnel.	Extensive experience of management team. Development and implementation of *Integrated Management Plan* documentation, including inductions, toolbox talks and Contractor Permit to Work, safety contacts and workplace inspections. *Engagement of specialists consultants to address specific issues if and when required.*	L (F3)	L (F3)	L (F3)	7, 10
	Lack of clearly defined responsibilities.	Responsibilities as defined in the *Rehabilitation Management Plan* and Safety, Health and Environment Management System. Implementation of *Integrated Management Plan* documentation, including inductions, toolbox talks and Contractor Permit to Work.	L (G3)	L (G3)	L (G3)	7.10
	Insufficient funding for or prioritisation of rehabilitation activities.	Rehabilitation cost estimate and maintenance of security bond.	L (F3)	L (F3)	L (F3)	8
Active Mining Phase of Rehabilitation	Inappropriate biological resource (e.g. subsoil, topsoil, vegetative material, seedbank, rocks, habitat resources) through clearing, salvage, and handling practices.	Preparation of extraction campaign plans / toolboxes which specify management of vegetation and soil stripping, stockpiling and placement. Stockpiling of growth medium in location not subject to run-on water or vehicle access. Spraying of weeds on an as needed basis. *Record growth medium stockpile locations on map (when present).*	L(E2)	N/A	N/A	6.2.1.1, 6.2.1.11, 6.2.4
	Limited pre-existing biological resources for use (e.g. topsoil, woody debris).	Strip all available soil / growth medium resources and either immediately place on shaped landform or stockpile in accordance with Rehabilitation Management Plan. *Growth medium register.*	L(E2)	N/A	N/A	6.2.1.1, 6.2.1.11, 6.2.4
	Adverse meteorological conditions during salvage of biological resources.	Review of meteorological forecast prior to vegetation clearing and soil stripping and avoidance of salvage activities during high rainfall. Review site conditions prior to commencement of vegetation clearing and soil stripping.	L(F3)	N/A	N/A	6.2.1.1, 6.2.1.10
	Adverse geochemical/chemical composition of materials such as overburden, processing wastes, topsoils and subsoils.	Allowance for application of gypsum and fertiliser in rehabilitation cost estimate. *Testing of growth medium following spreading but prior to application of seed to confirm rates of gypsum, fertiliser and/or other soil ameliorants required.*	L(F3)	N/A	N/A	6.2.1.1
	Handling and containment of geochemical and geotechnically unsuitable process residue and reject materials.	No washing will be undertaken on site and so no processing wastes will be generated or require management.	N/A	N/A	N/A	-
	Adverse surface and/or groundwater quality and quantity.	Erosion and sediment control structures. Storage of all hydrocarbons and chemicals in accordance with AS1940:2017 – The storage and handling of flammable and combustible liquids. (Note: no permanent storages present on site)	N/A	L (F2)	N/A	6.2.1.4, 6.2.1.10, 6.2.1.7
Decommissioning Phase of Rehabilitation	Impacts on heritage items.	Maintenance of exclusion zone around ISF4 (until Aboriginal Heritage Impact Permit received). Maintain location of map of remaining Aboriginal heritage item locations. Implementation of traffic management plan and campaign plan / toolbox outlining location of heritage items and avoidance of those areas. Unexpected finds protocol in the event additional heritage items located.	L (G4)	L(G4)	L(G4)	6.2.1.13
	Hazards associated with retained infrastructure.	Inspection of roads following periods of intense rainfall to ensure trafficability. Inspection of retained fencing and bunding.	N/A	N/A	L (G3)	6.2.2.1, 6.2.2.3
	Contamination resulting from associated activities (e.g. storage and use of hydrocarbons/chemicals, drilling fluid, spillage of dirty water, brine, sewage).	Storage of all hydrocarbons and chemicals in accordance with AS1940:2017 – The storage and handling of flammable and combustible liquids. (Note: no permanent storages present on site) *Visual contamination inspection and report prior to relinquishment.*	L (G4)	L (G4)	L (G4)	6.2.1.7, 6.2.2.4, 6.2.2.5

Table 9 (Cont'd)
Rehabilitation Risk Assessment

Rehabilitation Phase	Risk	Risk Control	Final Land Use Domain / Risk Ranking			Where Addressed in RMP
			Domain A: Native Ecosystem	Domain F: Water Management Areas	Domain I: Infrastructure	
Decommissioning Phase of Rehabilitation (Cont'd)	Material and waste products from the demolition process retained on the final landform.	No demolition works applicable. Removal of all equipment and any associated spares / wastes in accordance with established protocols.	L(F2)	N/A	N/A	6.2.2.2
	Groundwater accumulation in former underground workings (e.g. potential for fill and spill or impacts on regional ground water users.	No underground workings present.	N/A	N/A	N/A	-
	Exposure or access to underground workings.	No underground workings present.	N/A	N/A	N/A	-
	Habitation of structures and/or underground workings by native fauna (e.g. bats).	No underground workings present.	N/A	N/A	N/A	-
Landform Establishment Phase of Rehabilitation	Unstable landform due to erosion and/or mass movement issues associated with inappropriate design and/or quality assurance during landform construction.	Progressive landform shaping in accordance with mine design plans. *Site Relinquishment Geotechnical Assessment.*	L(F3)	L(G3)	N/A	6.2.3.2
	Exposure or release of geochemical and/or geotechnically adverse material associated with containment design and construction, including capping/cover system.	No capping or containment systems present or required.	NA	NA	N/A	-
	Lack of availability of suitable materials for encapsulation or capping of adverse materials.	No capping or containment systems present or required.	NA	NA	N/A	-
	Borehole or gas well seals failure.	No boreholes or gas wells present.	N/A	N/A	N/A	-
	Final landform unsuitable for final land use (e.g. large rocks present affecting cultivation, unsuitable surface cover and landform settlement).	*Shaping and ripping of final batters and extraction floor to provide suitable grades and surface substrate for application of growth medium.* *Visual inspection prior to application of growth medium.*	L(F3)	NA	N/A	6.2.3.4
	Retained final landform is not free-draining / results unintended ponding of water.	*Shaping of batters and extraction floor to provide suitable grades directing surface water flows to the retained water management area.*	L(F3)	N/A	N/A	6.2.3.2, 6.2.3.4
	Uncontrolled public access to highwalls	Retention of bunding and warning signs.	M(F4)	NA	NA	6.2.2.1, 6.2.3.4
Growth Medium Development Phase of Rehabilitation	Inappropriate physical and structural properties of growth medium.	*Shaping and ripping of batters and extraction floor to provide suitable grades and surface substrate for application of growth medium.* *Light ripping of growth medium across contours to key in to substrate, reduce surface runoff velocities, and retain seed (when spread).* Allowance for application of gypsum in rehabilitation cost estimate. *Testing of growth medium following spreading but prior to application of seed to confirm rates of gypsum and/or other soil ameliorants required.* *Restriction of vehicular access following spreading of soil material*	L(F3)	N/A	N/A	6.2.4
	Subsoil and topsoil deficit for rehabilitation activities.	Strip all available soil / growth medium resources and either immediately place on shaped landform or stockpile in accordance with Rehabilitation Management Plan. *If required, suitable source of additional soil material to be identified, including the need for importation of growth medium or soil conditioners to increase volume of on-site growth medium.*	M(E3)	N/A	N/A	6.2.1.1, 6.2.4
	Substrate inadequate to support revegetation or agricultural land capability (e.g. lack of organic matter, nutrient deficiency, lack of soil biota, adverse soil chemical properties, exposed hostile geochemical materials, and any other factors impeding the effective rooting depth).	Allowance for application of gypsum and fertiliser in rehabilitation cost estimate. *Testing of growth medium following spreading but prior to application of seed to confirm rates of gypsum, fertiliser and/or other soil ameliorants required.*	L(F3)	N/A	N/A	6.2.1.1, 6.2.4

Table 9 (Cont'd)
Rehabilitation Risk Assessment

Rehabilitation Phase	Risk	Risk Control	Final Land Use Domain / Risk Ranking			Where Addressed in RMP
			Domain A: Native Ecosystem	Domain F: Water Management Areas	Domain I: Infrastructure	
Ecosystem and Land Use Establishment Phase of Rehabilitation	Lack of availability and quality of target seed resources, including genetic integrity.	*Source and purchase of appropriate native seed mix for ground stabilisation and ecosystem establishment suitably in advance of planned rehabilitation activities.*	L(F3)	N/A	N/A	6.2.5, 8, 9
	Poor seed viability or seed dormancy.	*Source and purchase of appropriate native seed mix for ground stabilisation and ecosystem establishment suitably in advance of planned rehabilitation activities.*	L(F3)	N/A	N/A	6.2.5
	Seed predation.	*Use of appropriate sowing and seeding techniques.* *Selection of seed mix appropriate to the season / current weather conditions so that germination occurs as soon as practicable following sowing.*	L(F3)	N/A	N/A	6.2.5, 8, 9
	Damage to seed through revegetation process.	*Use of appropriate sowing and seeding techniques.*	L(E2)	N/A	N/A	6.2.5
	Poor quality tubestock.	*Purchase of suitable tube stock grown from locally collected seed and a reputable supplier.*	L(E2)	N/A	N/A	6.2.5
	Weed infestation associated with both introduction and control (or lack thereof).	Implement weed inspection and control program. Implement equipment delivery protocol to ensure equipment does not import weeds.	L(E2)	N/A	L(E2)	6.2.6.1
	Adopting inappropriate or inadequate rehabilitation techniques, including equipment fleet.	Extensive experience of management team. *Engagement of experienced contractors.* *Rehabilitation personnel induction and training.*	L(F3)	L(F3)	L(F3)	7
	Inappropriate revegetation species mix for targeted final land use.	*Consult with suitably experienced expert to confirm suitable seed mix that compliments the existing / retained native vegetation community.* *Source seed mix from reputable supplier.*	L(F3)	N/A	N/A	6.2.5, 8, 9
	Adverse weather and climatic influences (e.g. drought; intense rainfall events; bushfire and climate change).	*Review long-term weather forecast prior to purchase of seed mix.* *Consult with suitably experienced expert to confirm suitability of seed mix for seasonal conditions.* *If required, utilisation of stored water for irrigation of revegetation areas to achieve effective root establishment.*	M(E3)	N/A	N/A	6.2.5
	Lack of infrastructure to support intended final land use (e.g. bunding, fences, watering facilities).	*Inspection of existing fencing and retained bunding to confirm integrity.*	L(F3)	L(F3)	L(F3)	6.2.5, 7
Ecosystem and Land Use Development Phase of Rehabilitation	Hazards associated with retained infrastructure.	Inspection of retained roads following periods of high intensity rainfall to ensure trafficability. Regular inspection of safety bunds and signage.	L(F3)	N/A	L(E2)	6.2.6.2, 6.2.6.4
	Adverse weather and climatic influences (e.g. drought; intense rainfall events; bushfire and climate change).	Review long-term weather forecast. *If existing seed mix is inappropriate for current weather conditions, consult with suitably experienced expert to confirm alternative species and/or cover crop or mulch for temporary stabilisation.*	L(F3)	L(F2)	L(F2)	6.2.6.2, 6.2.6.3
	Substrate inadequate to support revegetation or agricultural land capacity.	*If inadequate groundcover / projected foliage cover achieved, consult with suitably experienced expert to confirm appropriateness of species selection or need for additional soil amelioration requirements (gypsum, fertiliser, organic matter).*	L(F3)	N/A	N/A	6.2.6.3
	Post-closure water quality and quantity issues.	*Ensure adequate projected foliage cover to limit erosion / silt entrainment.* *Ensure water management structures remain stable and functional.*	N/A	L(G2)	N/A	6.2.6.2, 6.2.6.3, 6.2.6.4
	Damage to rehabilitation (e.g. fauna, domestic stock, vandalism, vehicular interactions, bushfire).	Maintain existing property fencing. *Creation of barrier to vehicular entry to the rehabilitation areas.* *Rehabilitation monitoring program.*	L(F3)	L(G2)	L(G2)	6.2.2.1, 6.2.6.4
	Re-disturbance of established rehabilitation areas.	*Appropriate rehabilitation planning / scheduling.* *Creation of barrier to vehicular entry to rehabilitation areas.*	L(F3)	L(G2)	NA	6.2.6

Table 9 (Cont'd)
Rehabilitation Risk Assessment

Rehabilitation Phase	Risk	Risk Control	Final Land Use Domain / Risk Ranking			Where Addressed in RMP
			Domain A: Native Ecosystem	Domain F: Water Management Areas	Domain I: Infrastructure	
Ecosystem and Land Use Development Phase of Rehabilitation (Cont'd)	Insufficient establishment of target species and limited species diversity.	*Rehabilitation monitoring program.* *Supplementary sowing of additional species seed mix (if required to maintain adequate projected foliage cover or species diversity).* *If required, suitably qualified ecologist or revegetation expert engaged to assess reasons for failure of appropriate species to emerge and recommend actions to ensure that the final vegetation community is suitably complimentary to the surrounding remnant vegetation community.*	L(F3)	N/A	N/A	6.2.6.2, 6.2.6.3
	Erosion and failure of landform, drainage and water management/storage structures.	*Site Relinquishment Geotechnical Assessment.* Visual inspection program.	L(F3)	L(F2)	N/A	6.2.3.2, 6.2.6
	Lack of infrastructure to support intended final land use (e.g. bunding, fences).	*Inspection of existing fencing and bunding to confirm integrity.*	L(F3)	NA	NA	6.2.3.2, 6.2.6.4
	Lack of resources for rehabilitation maintenance.	Rehabilitation cost estimate and maintenance of security bond. Rehabilitation planning / scheduling	L (G3)	L (G3)	L (G3)	6.2.3.2, 6.2.6.4, 8, 10
Other Risks (Non-Phase Specific)	Redirection of creek and river flows.	No watercourses present in extraction areas.	NA	NA	NA	-
	Subsidence cracking.	No underground mining undertaken.	NA	NA	NA	-
	Interconnective cracking with underground workings	No underground mining undertaken / no historic underground workings present.	NA	NA	NA	-

4. Rehabilitation Objectives and Rehabilitation Completion Criteria

4.1 Rehabilitation Objectives and Rehabilitation Completion Criteria

Table 10 presents the objectives and rehabilitation completion criteria and the methods used to validate the criteria for the Quarry.

4.2 Rehabilitation Objectives and Rehabilitation Completion Criteria – Stakeholder Consultation

Table 11 presents a summary of consultation undertaken with relevant stakeholders with regards to the rehabilitation objectives, rehabilitation completion criteria and proposed final land uses and landforms presented in this Plan. Consultation has historically been undertaken with the operator of the Bowral Pistol Club and the closest residential neighbour, the owner of the adjoining "Bunnygalore" property, in relation to the 2018 modification of DA325/90. Both supported the application and raised no issues with the Quarry operations. Given the results of this consultation and the scale and location of the Quarry, no further consultation with the surrounding community was undertaken, or deemed necessary, in relation to rehabilitation completion criteria.

Austral Bricks consulted with the then Division of Resources and Geoscience (now Mining, Exploration and Geoscience) as part of the application process for M(MO)L8 and during preparation of the (previously) approved MOP. Austral Bricks has also previously consulted with the Forestry Corporation of NSW in regard to the Rockleigh Quarry and has been advised that the Corporation has no interest in the ongoing activities of the Lot 2 Bunnygalore Quarry.

Table 11 will be updated with each revision to this Plan to include details of further consultation with relevant and interested stakeholders.

Table 10
Proposed Rehabilitation Objectives and Rehabilitation Completion Criteria – Bunnygalore Quarry

Final Land Use Domain	Mining Domain	Spatial Reference	Rehabilitation Objective	Indicator	Rehabilitation Completion Criteria	Validation Method
Native Ecosystem	Infrastructure Area, Active Mining Area (Open cut void), Other (Historic Rehabilitation), Other (Stockpiled Material)	A1, A5, A8a, A8b	***Decommissioning Phase***			
			All stockpiles and equipment removed.	No remaining stockpiles or equipment.	All stockpiles and equipment removed.	Preparation of a single occurrence relinquishment inspection and report, including photographs, following decommissioning (unless follow up actions are identified).
			Domains safe and free from contaminated and hazardous materials.	Contaminated land identified and remediated.	Contaminated land assessment indicates contamination acceptable for final land use.	Single occurrence visual contamination assessment and report prepared by a suitably qualified person.
			Landform Establishment Phase			
			Free draining, stable and permanent landform established.	Final landform contours.	Mapping confirms that the landform is free draining or drain to the retained water management area.	Final survey plan(s) prepared by surveyor. Relinquishment inspection and report, including photographs. Site relinquishment geotechnical assessment (if required).
					Final batters are generally consistent with the final landform plan.	
				Retained highwalls are stable.	Overall highwall slope no greater than 90° or as specified in geotechnical review.	
				Presence of erosion / sedimentation.	No visible evidence of mass movement or active erosion.	
			Growth Medium Development Phase			
			Establish soil / growth medium suitable for establishment of woodland vegetation community.	Presence of surface compaction.	Compacted areas are deep ripped cross slope.	Single occurrence inspection and photographs of ripped areas following completion of ripping.
				Appropriate depth of growth medium.	Minimum soil depth of 50mm over all areas stripped of soil. OR Soil conditioner and mulch (particles <16mm and thickness 20mm to max 40mm / 200m^3 per ha).	Single occurrence testing using small 'test pits' (5 per ha) and report, including photographs, following final placement/shaping of growth medium.
			Ecosystem Establishment Phase			
			Establishment of vegetation communities with a similar species composition to the surrounding native woodland.	The rehabilitated area does not constitute and erosion hazard.	Total projected foliage cover is greater than 70% cover OR equivalent to analogue sites not disturbed by Quarry activities.	Establish a minimum of one monitoring point per 5ha of rehabilitation and two analogue sites. Monitoring to be completed by suitably trained / qualified person and a report prepared summarising performance of the rehabilitation against the completion criteria / analogue monitoring point annually for a minimum of 5 years.
				Establishment of target species.	At least 80% of species established are consistent with or complementary to surrounding local vegetation communities and represent >80% of the total projected foliage cover.	
				Weeds are not competing or impacting on rehabilitated area.	Revegetation monitoring confirms that, after 2 years from planting, the non-native / non-target species (weeds) represent less than 20% of projected foliage cover OR equivalent to surrounding vegetation not disturbed by Quarry activities.	
				Grazing not adversely impacting on ecosystem development.	Domestic grazing animals are excluded from the rehabilitation area. Feral animal control programs implemented if required.	
			Ecosystem Development Phase			
			Self-sustaining vegetation communities with a similar species composition to the surrounding native woodland.	Vegetation is self-sustaining.	Monitoring confirms: • evidence of new growth of target species; • evidence of successive generations of target species; and • no further active weed control required (beyond that considered necessary at analogue sites).	Establish a minimum of one monitoring point per 5ha of rehabilitation and two analogue sites. Monitoring to be completed by suitably trained / qualified person and a report prepared summarising performance of the rehabilitation against the completion criteria / analogue monitoring points.
			Rehabilitation Completion / Relinquishment Phase			
			Relinquish lease and return of the security lodged for M(MO)L8.	Demonstrated compliance with all performance indicators.	Demonstrated compliance for all rehabilitation completion criteria.	Relinquishment report prepared by suitably qualified or experienced person(s) prior to relinquishment.

Table 10 (Cont'd)
Proposed Rehabilitation Objectives and Rehabilitation Completion Criteria – Bunnygalore Quarry

Final Land Use Domain	Mining Domain	Spatial Reference	Rehabilitation Objective	Indicator	Rehabilitation Completion Criteria	Validation Method
Water Management Area	Active Mining Area (Open cut void)	F5	***Decommissioning Phase***			
			All stockpiles and equipment removed.	No remaining stockpiles or equipment.	All stockpiles and equipment removed.	Preparation of a single occurrence relinquishment inspection and report, including photographs, following decommissioning (unless follow up actions are identified).
			Domain safe and free from contaminated and hazardous materials.	Contaminated land identified and remediated.	Contaminated land assessment indicates contamination acceptable for final land use.	Single occurrence visual contamination assessment and report prepared by a suitably qualified person.
			Landform Establishment Phase			
			Stable, permanent and non-polluting landform established.	Presence of erosion or landform instability.	No evidence of active erosion or other landform instability (e.g. mass movement) that would require moderate or significant maintenance is observed.	Relinquishment inspection and report, including photographs.
			Growth Medium Development, Ecosystem Establishment and Development Phases			
			Phases not applicable to Final Land Use Domain F Water Management Area			
			Rehabilitation Completion / Relinquishment Phase			
			Relinquish lease and return of the security lodged for M(MO)L8.	Demonstrated compliance with all performance indicators.	Demonstrated compliance for all rehabilitation completion criteria.	Relinquishment report prepared by suitably qualified or experienced person(s) prior to relinquishment.
Infrastructure Area	Infrastructure Area	I1	***Decommissioning Phase***			
			Domain safe and free from contaminated and hazardous materials.	Contaminated land identified and remediated.	Contaminated land assessment indicates contamination acceptable for final land use.	Single occurrence visual contamination assessment and report prepared by a suitably qualified person.
			Landform Establishment Phase			
			Final landform is safe and stable.	Access controls	Barriers are placed adjacent retained access road to prevent public access to potentially hazardous landforms or sensitive rehabilitation areas, if required.	Single occurrence relinquishment inspection and report, including photographs, following decommissioning.
				Retained access road is in suitable condition.	The retained access road surface provides access suitable for four-wheel drive vehicles and road batters do not present an erosion hazard.	Single occurrence relinquishment inspection and report, including photographs, following decommissioning.
			Growth Medium Development, Ecosystem Establishment and Development Phases			
			Phases not applicable to Final Land Use Domain I Infrastructure Area			
			Rehabilitation Completion / Relinquishment Phase			
			Relinquish lease and return of the security lodged for M(MO)L8.	Demonstrated compliance with all performance indicators.	Demonstrated compliance for all rehabilitation completion criteria.	Relinquishment report prepared by suitably qualified or experienced person(s) prior to relinquishment.

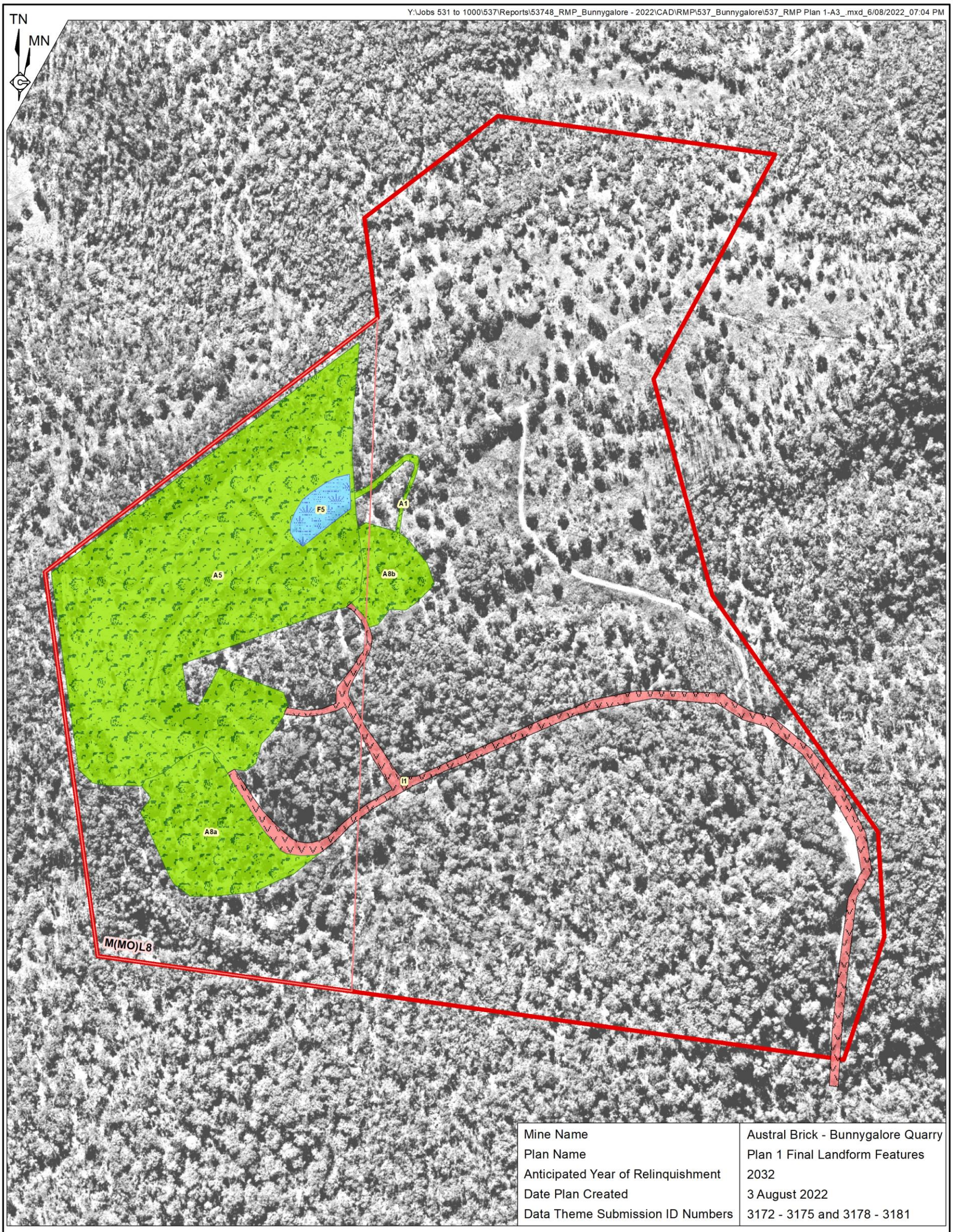
Table 11
Community Consultation Activities

Stakeholder	Consultation Activities
Resources Regulator	• Form of Consultation: Letter (email transmission). • Date: 11 July 2022. • Matters Subject to Consultation: Rehabilitation Objectives and Rehabilitation Completion Criteria, and Final Land Use Domain Plans. • Outcomes: – The Resources Regulator responded on 3 August 2022 – Response: The Resources Regulator will review, assess and determine the rehabilitation objectives statement and rehabilitation completion criteria once submitted for approval.
Mining, Exploration and Geoscience	• Form of Consultation: Letter (email transmission). • Date: 11 July 2022. • Matters Subject to Consultation: Rehabilitation Objectives and Rehabilitation Completion Criteria, and Final Land Use Domain Plans. • Outcomes: No response received by 11 August 2022.
Wingecarribee Shire Council	• Form of Consultation: Letter (email transmission). • Date: 11 July 2022. • Matters Subject to Consultation: Rehabilitation Objectives and Rehabilitation Completion Criteria, and Final Land Use Domain Plans. • Outcomes: No response received by 11 August 2022.
Environmental Protection Authority (EPA)	• Form of Consultation: Letter (email transmission). • Date: 11 July 2022. • Matters Subject to Consultation: Rehabilitation Objectives and Rehabilitation Completion Criteria, and Final Land Use Domain Plans. • Outcomes: – The EPA responded on 26 June 2022 – Response: The EPA has reviewed the documents and have no specific comments regarding the proposed actions.
Illawarra Local Aboriginal Land Council (Illawarra LALC)	• Form of Consultation: Letter (email transmission). • Date: 11 July 2022. • Matters Subject to Consultation: Rehabilitation Objectives and Rehabilitation Completion Criteria, and Final Land Use Domain Plans. • Outcomes: – Illawarra LALC responded on 25 June 2022 – Response: Proposed amendments to the Rehabilitation Completion Criteria and request for further consultation regarding identification of culturally appropriate flora species for use in revegetation activities. – Actions: Suggested amendments to rehabilitation criteria have included within **Table 10**. Consultation with Illawarra LALC will be undertaken regarding flora species identification of use in “Ecosystem Establishment” activities.

5. Final Landform and Rehabilitation Plan

5.1 Final Landform and Rehabilitation Plan – Electronic Copy

Plan 1 presents the final landform features for the Quarry Site and **Plan 2** presents the final landform contours for the Quarry Site.



Mine Name	Austral Brick - Bunnygalore Quarry
Plan Name	Plan 1 Final Landform Features
Anticipated Year of Relinquishment	2032
Date Plan Created	3 August 2022
Data Theme Submission ID Numbers	3172 - 3175 and 3178 - 3181

Final Land use Domain	Mine Domain	Ref	Area (ha)
Native Ecosystem	Infrastructure Area	A1	0.06
Native Ecosystem	Active Mining Area (Open cut void)	A5	5.9
Native Ecosystem	Other (Historic Rehabilitation)	A8a	1.1
Native Ecosystem	Other (Stockpiled Material)	A8b	0.4
Water Management Area	Active Mining Area (Open cut void)	F5	0.2
Infrastructure	Infrastructure Area	I1	1.0
		Total Area	**8.7.**

REFERENCE
- Project Approval Boundary
- Mineral Authority Boundary

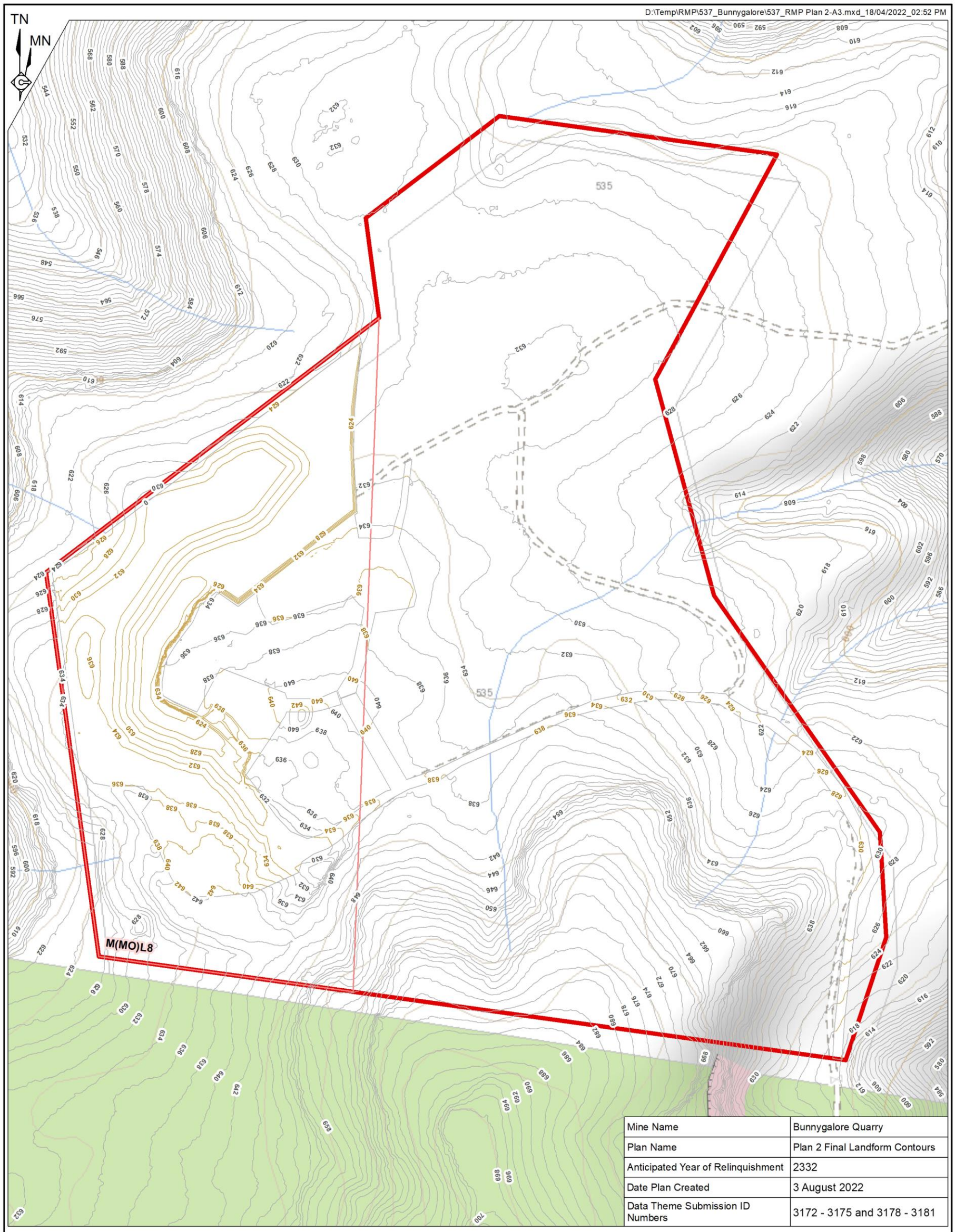
Final Landuse Domain
- Infrastructure
- Native Ecosystem
- Water Management Areas

SCALE 1:3 500 (A3)

40 0 40 80 120 160 m

Base Photo Source: Nearmap 2 May 2022

Plan 1
FINAL LANDFORM FEATURES



Mine Name	Bunnygalore Quarry
Plan Name	Plan 2 Final Landform Contours
Anticipated Year of Relinquishment	2332
Date Plan Created	3 August 2022
Data Theme Submission ID Numbers	3172 - 3175 and 3178 - 3181

REFERENCE

- Project Approval Boundary
- Mineral Authority Boundary
- Existing Contour (mAHD)(Interval=1m)
- Final Landform Contour (mAHD)(Interval=1m)

SCALE 1:3 500 (A3)

40 0 40 80 120 160 m

Base Map Source: LPI Online Base Map

Plan 2
FINAL LANDFORM CONTOURS

6. Rehabilitation implementation

6.1 Life Of Mine Rehabilitation Schedule

Based on the limited scale of extraction operations at the Quarry Site, it is unknown when extraction operations are anticipated to be completed.

Prior to cessation of extraction operations, rehabilitation will only be undertaken in areas which are no longer required for operational purposes. As the extent of disturbance at the Quarry is largely confined to operational areas required to support ongoing extraction activities as well as storage areas for rehabilitation materials (i.e. topsoil stockpiles), opportunities for progressive rehabilitation prior to the completion of extraction operations are limited.

Figure 8 depicts the current extent of disturbance at the Quarry (i.e. the Mining Domains). **Plans 3** and **4** present the indicative rehabilitation schedule for the Quarry by depicting those areas which would be rehabilitated during the 10-yearly period between the commencement of this plan and Quarry closure. It is noted that this schedule is applicable only until the completion of the Ecosystem and Land Use Establishment phase of rehabilitation operations within all Mining Domains (see Section 6.2). Approximate timings for the Ecosystem and Land Use Development phase of rehabilitation have not yet been defined as this phase will principally involve the monitoring and maintenance of completed rehabilitation works until completion criteria identified in Section 4.1 have been achieved.

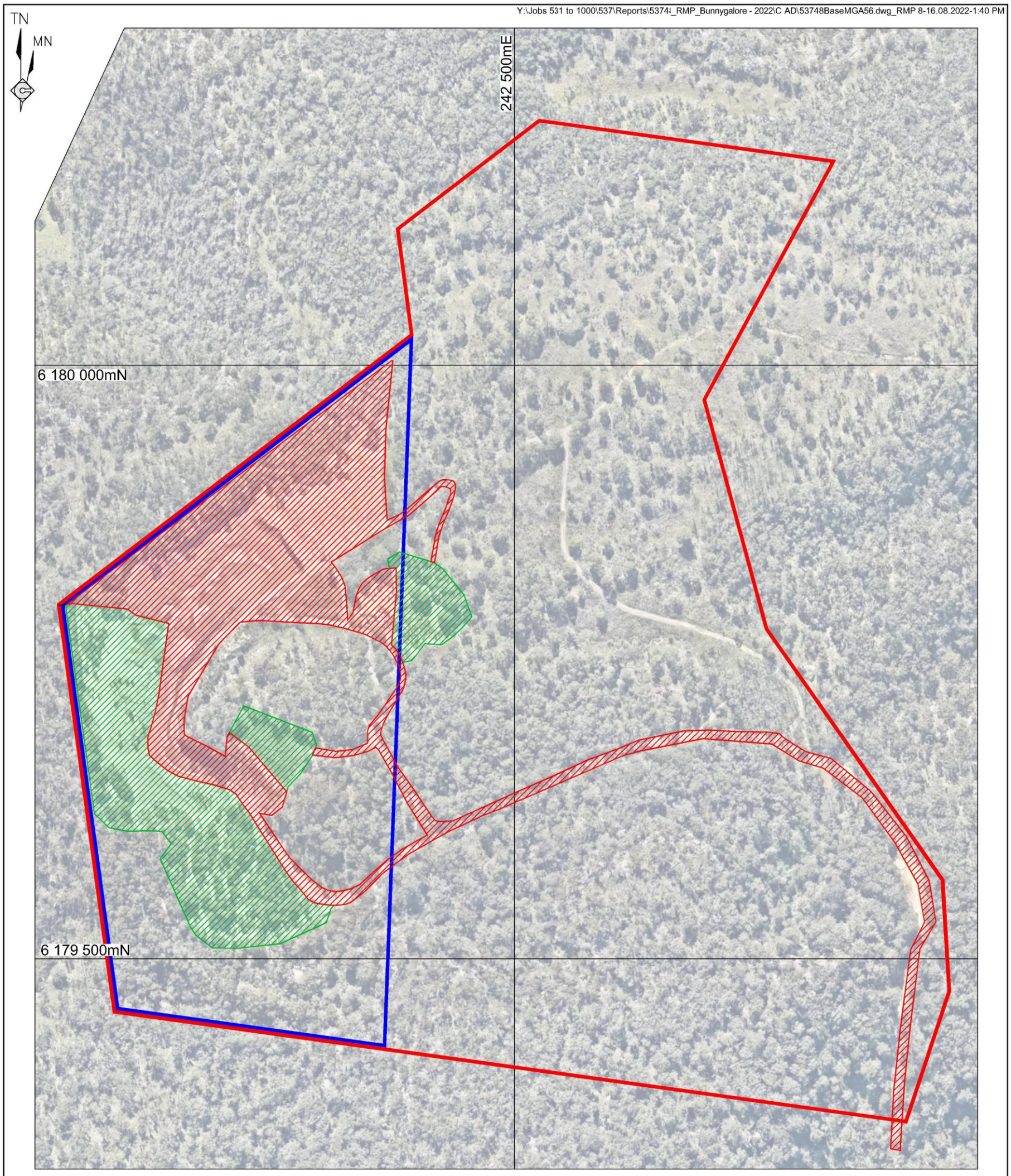
In summary, the rehabilitation schedule indicates that rehabilitation of the western extent of the extraction area would be undertaken concurrently with ongoing extraction operations. Following the cessation of extraction operations, all other Mining Domains would be subject to the decommissioning, landform establishment, growth medium development and ecosystem and land use establishment rehabilitation phases as outlined in Section 6.2. It is unknown when it is anticipated that the rehabilitation of all Mining Domains and the successful establishment of all Final Land Use Domains (up to the Ecosystem and Land Use Establishment phase, as a minimum) will be completed.

6.2 Phases of Rehabilitation and General Methodologies

6.2.1 Active Mining Phase

6.2.1.1 Soils and Materials

The soils covering the Quarry Site reflect the nature of the underlying bedrock. The soils are skeletal on the top surface of the plateau having a maximum profile depth of up to 300mm and an average depth of 150mm. Residual soils of greater depth, up to 800mm, occur in small gully floors on the plateau. These residual soils are heavy clays developed on shale.

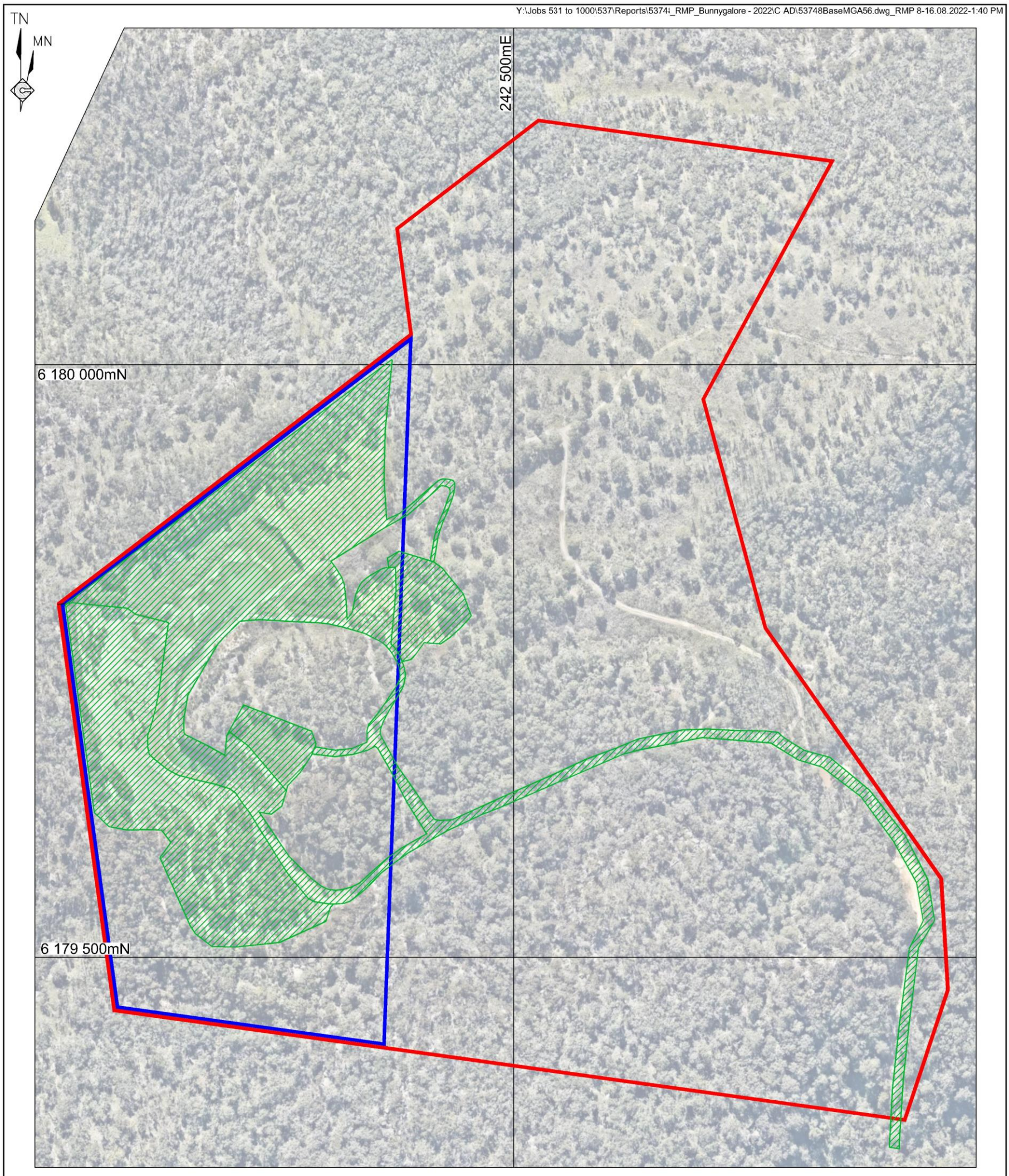


REFERENCE
Project Approval Boundary
M(MO)L8 Boundary
Rehabilitation Forecast
Forecast Disturbance
Forecast Land Prepared for Rehabilitation
Ecosystem and Land Use Establishment

Mine Name	Austral Brick - Lot 2 Bunnygalore Quarry
Plan Name	Plan 3 Progressive Rehabilitation Schedule - Year 5
Anticipated Year of Relinquishment	2032
Date Plan Created	16 August 2022
Data Theme Submission Numbers	3172 - 3175 and 3178 - 3181

SCALE 1:3 500 (A3)
50 0 50 100 150m
Base Photo Source: Nearmap - 2 May 2022

Plan 3
PROGRESSIVE REHABILITATION - YEAR 5



REFERENCE
Project Approval Boundary
M(MO)L8 Boundary
Rehabilitation Forecast
Forecast Disturbance
Forecast Land Prepared for Rehabilitation
Ecosystem and Land Use Establishment

Mine Name	Austral Brick - Lot 2 Bunnygalore Quarry
Plan Name	Plan 4 Progressive Rehabilitation Schedule - Year 10
Anticipated Year of Relinquishment	2032
Date Plan Created	16 August 2022
Data Theme Submission Numbers	3172 - 3175 and 3178 - 3181

SCALE 1:3 500 (A3)
50 0 50 100 150m
Base Photo Source: Nearmap - 2 May 2022

Plan 4
PROGRESSIVE REHABILITATION - YEAR 10

Topsoils within the Quarry Site are very high in organic matter resulting in a very dark colour - either dark brown or black. The topsoils have a field pH of 5.5 and sandy clay to sandy loam texture.

Subsoils within the Quarry Site have a slightly lighter colour - brownish-black to brown and a field pH from 5.5 to 6. Clay content of the subsoils is higher than the topsoils with sandstone fragments up to 50mm common. The soils have a high water holding capacity and are chemically moderately fertile. Waterlogging after consistent rainfall results from the clayey nature of the soils.

Soils within the Quarry Site have been assessed as being slightly to moderately erodible, and there is no evidence of sheet or gully erosion in the vicinity of the extraction area.

Where possible, stripped soil is transferred as part of the same extraction campaign for use in progressive rehabilitation. Where this is not possible, it is stockpiled and stabilised to prevent degradation of the soil resource and sedimentation. Temporary stabilisation and soil stockpile management includes the following practices.

- Minimise, as far as practicable, the operation of machinery on soil stockpiles to minimise compaction.
- Ensure that soil stockpiles have a maximum height of 2m and maximum side slopes of 1:3 (V:H).
- Leave the surface of the soil stockpile with an even but roughened surface to assist in erosion control and seed germination and emergence.
- Permit natural revegetation of soil stockpiles.

6.2.1.2 Flora and Fauna

An ecological survey of the Quarry Site was conducted in September 1987 by W.S. Osborne and M.S. Davis during the preparation of the EIS (RWC, 1990). In this survey, three vegetation types were identified including:

- tall open-forest;
- heath; and
- grassland.

A total of 65 species of native flora were recorded during this survey with no rare or endangered species recorded. Vegetation within the Quarry Site and specifically within the approved extraction area was considered either regenerating from past clearing activities or had been cleared at the time of the survey. It was considered to have a low habitat value.

The ecological survey further identified a number of mammals, birds and reptiles within the Quarry site. A total of 30 native mammal species were identified including echidnas, common wombats, eastern grey kangaroos, rabbits and foxes. 22 species of birds were recorded; however, these were primarily restricted to areas of tall open-forest and it was considered unlikely that the Quarry would impact the habitat of any rare or endangered birds. No rare or endangered reptile species were identified within the Quarry Site.

The survey did not identify any ecological features which might impart significant nature conservation status to the Quarry and similar vegetation was determined to be plentiful in the surrounding areas. No threatened flora or fauna was identified in the area extracted outside the approved extraction boundary.

Environmental management control relating to flora and fauna are as follows.

- Vegetation clearing will be restricted to approved areas of disturbance.
- Rehabilitation and maintenance works will continue to be implemented as advised by contracted ecological specialist.
- Weed control will continue to be undertaken by site management and contracted specialist.
- Ongoing inspections will continue to be undertaken and reported within the respective AEMR / Annual Rehabilitation Report.

6.2.1.3 Rock / Overburden Emplacement

Overburden materials (generally constituting overlying sandstone with occasional minor bands of carbonaceous shale) is directly placed in completed extraction areas as backfill and shaped to the final landform.

Some fine material is also used within the Quarry for road construction and maintenance, as required.

6.2.1.4 Waste Management

The principal production waste to be generated during the active mining phase is overburden material which will be managed as discussed in Section 6.2.1.4. Equipment maintenance will be undertaken off site between campaigns. However, should any equipment repair or maintenance be required during a campaign, all wastes generated will be removed by the contractor for off-site disposal and/or recycling.

6.2.1.5 Non-production waste management

Any non-production waste (such as lunch waste) generated during extraction campaigns and loading operations will be removed from the Quarry by the personnel generating the waste for off-site disposal and/or recycling.

6.2.1.6 Geology and Geochemistry

M(MO)L8 is situated near the western extremity of the Sydney Basin, comprising a thick sequence of sedimentary rocks of Permian to Triassic age (290 to 200 million years old). Within M(MO)L8, units of the Illawarra Coal Measures are overlain by Hawkesbury Sandstone. Historic exploration indicates that the Illawarra Coal Measures sequence has a shallow dip of 0.5° to 3° in a north-eastern direction.

The target unit for extraction as brick-making material is a shale bed 2m to 4.5m thick occurring as the uppermost unit in the lower cyclothem. The shale is light grey to grey when fresh, hard and well laminated. The shale has a low plasticity and produces cream to white fired products. Overburden comprises sandstone predominantly with minor interbedded shale and occasional thin lenses of coal.

6.2.1.7 Material Prone to Spontaneous Combustion

The minor bands of carbonaceous shale within the overburden are weathered and oxidised and are therefore not prone to spontaneous combustion.

Accordingly, no specific risks to rehabilitation associated with spontaneous combustion have been considered.

6.2.1.8 Material Prone to Generating Acid Mine Drainage

The Quarry does not contain any geological material that is acid forming or potentially acid forming. Therefore, no specific risks relating to acid generation material have been considered further.

6.2.1.9 Ore Beneficiation Waste Management (Reject and Tailings Disposal)

As no processing of ore is undertaken with the Quarry Site, no process residues or tailings will be produced and associated wastes have therefore not been considered further.

6.2.1.10 Erosion and Sediment Control

The key erosion and sediment control management measure implemented at the Quarry Site is the containment of sediment-laden water.

Erosion and sediment control measures at the Quarry include the following.

- Use of a water retention basin and associated rock barrier to reduce the potential for sediment-laden runoff from the stockpile area.
- Potential contaminants will be removed from the Quarry by the earthmoving contractor.
- Ensure surface water flows within the extraction area are internally draining.
- All persons undertaking activities within the Quarry will be inducted and made aware of the relevant water management measures.
- Rock barriers will be placed and maintained to prevent inadvertent disturbance of areas of retained vegetation and spread soil material.

6.2.1.11 Ongoing Management of Biological Resources for Use in Rehabilitation

Appropriate sedimentation controls, including sediment fencing will be placed immediately down slope of any soil stockpiles and maintained until such time as a stable vegetation cover over the stockpile is achieved. Any soil stockpile likely to be retained for more than 3 months and that has not naturally established vegetation cover will be stabilised using a non-persistent cover crop.

In the event that unacceptable weed generation is observed on the soil stockpiles, a weed eradication program will be implemented. There will be no vehicle access on the soil stockpiles.

6.2.1.12 Mine Subsidence

As no previous underground mining has occurred within the immediate area, no specific mine subsidence management measures are necessary.

6.2.1.13 Management of Potential Cultural and Heritage Issues

An aboriginal heritage survey was completed as part of the original development application. Four isolated artefact finds were identified, including one (IF4) located on the boundary of the approved extraction area (**Figure 5**). It is noted that the 2018 modification to DA325/90 was approved such that IF4 would be removed.

Austral Bricks will also continue to make all employees and contractors aware of their obligations under the *National Parks and Wildlife Act 1974* and, should any suspected relic be uncovered during extraction-related activities, work in the area surrounding the relic would cease and Heritage NSW and the Local Aboriginal Land Council will be notified.

Austral Bricks will seek the relevant permits to relocate the isolated artefacts associated with IF4 prior to undertaking any disturbance within the vicinity.

6.2.1.14 Exploration Activities

Exploration activities that may be undertaken within the Quarry during the active mining phase may include the following.

- Resource extensional drilling programs.
- Diamond drilling to define shale resources adjacent to operations.

Prior to commencement of any ground-disturbing exploration activities, all necessary approvals would be sought.

6.2.2 Decommissioning

6.2.2.1 Site Security

Existing site security measures will be maintained during decommissioning and active rehabilitation operations at the Quarry unless they are required to be modified for rehabilitation purposes. No public access to the Quarry Site is currently permitted, with the main site entry points secured by locked gates during and outside of operating hours. Exclusion of the public from the Quarry Site is currently provided via a combination of perimeter security fencing and stock-proof fencing.

Existing security fencing that is to be retained will be structurally assessed and repaired or replaced where necessary. Permanent safety bunds will be constructed around the top edge of batter walls to prevent inadvertent access to steep batter slopes and rehabilitated areas. Where safety bunds are already in place, these will be assessed and repaired as required or removed and replaced with waste rock safety bunds where existing safety bunds contain growth medium material required for rehabilitation.

6.2.2.2 Infrastructure to be Removed of Demolished

Table 12 presents a list of the site features to be decommissioned to achieve the final land use. Any infrastructure not required for the final land use will be subject to engineering assessments to identify potential risks associated with closure and decommissioning activities, where required.

Table 12
Assets in Mining Domains to be Removed or Decommissioned

Domain[1]	Assets	Decommissioning and Demolition Requirements
1 – Infrastructure Area	Internal unsealed haul roads and access roads.	Selected access roads, internal roads and perimeter access tracks will be retained for future site management and tourism access purposes. All remaining roads and access tracks will be ripped, soiled and revegetated.
5 – Open Cut Void / Extraction Area	Mobile earthmoving equipment.	No specific demolition requirements – all mobile equipment to be floated from site following completion of operations / rehabilitation.
8a – Other (Historical Rehabilitation Area)	No assets present.	No specific demolition requirements.
8b – Other (Stockpiled Material)	Stockpiles of varying size, mostly for product, some for temporary storage of overburden.	No specific demolition requirements. Any product not sold and remaining overburden stockpiles will be utilised in final landform creation.
Note 1: see **Figure 8**		

All demolition procedures and subsequent waste removal undertaken during the decommissioning phase of rehabilitation operations will comply with requirements as identified through consultation with Council.

As a minimum, the following controls will be implemented during demolition works at the Quarry Site.

- Sites will be continually damped down with water to suppress dust during demolition, with potentially contaminated water captured as appropriate.
- Works will be undertaken so as to minimise the generation of particulate matter.
- Works will not be undertaken during periods of high wind.
- Loads of waste material removed from demolition sites will be covered prior to transportation.

All material and waste products generated from any demolition, decommissioning and/or removal operations will be collected and either disposed of within the Quarry Site where appropriate, removed immediately from the Quarry Site or stored in appropriate (i.e. disturbed) areas for removal by a licensed waste contractor as soon as practicable.

6.2.2.3 Buildings, Structures and Fixed Plant to be Retained

Figure 7 shows the key infrastructure to be retained as part of the final land use. Existing infrastructure is to be retained is restricted to roads, namely:

- the access road off Bunnigalore Road; and
- internal access roads for site maintenance.

Short-term risks associated with the retention of nominated roads are relatively low as these features have primarily been retained for safety purposes to facilitate access to areas of the Quarry Site.

Long-term risks to public safety and the environment associated with retained infrastructure and structures would only occur in the absence of appropriate maintenance. Roads will need to be inspected following high intensity rainfall events to ensure that conditions remain suitable for safe access to publicly accessible areas. Failure of roads would potentially contribute to the generation of sediment laden water which may impact water quality within local watercourses.

Prior to and during the decommissioning and landform establishment phases of rehabilitation operations, structural and engineering assessments will be carried out as required prior to the relinquishment of retained roads. Any necessary repair, replacement or re-design works recommended as part of these assessments will be carried out and assessed by a suitably qualified engineer.

6.2.2.4 Management of Carbonaceous / Contaminated Material

Carbonaceous materials within the Quarry Site are limited to minor bands of carbonaceous shale within the overburden. These materials are effectively considered a component of the overburden and will be directly placed in completed extraction areas as backfill and shaped to the final landform as outlined in Section 6.2.1.3.

No contaminated or polluted land has been identified within the Quarry Site, however, in the event that contaminated materials are identified and it is not possible or practicable to remediate these materials either on or off site, contaminated materials will either be removed from the Quarry Site and disposed of at an appropriately licenced waste facility or disposed of at the Quarry Site, where appropriate.

6.2.2.5 Hazardous Materials Management

No hazardous materials are proposed to be retained following the cessation of extraction and rehabilitation operations.

Explosives will be retained and stored off site for any final shaping of void walls, if required, and will be handled exclusively by appropriately licensed persons at all times.

6.2.2.6 Underground Infrastructure

No underground infrastructure exists at the Quarry Site, therefore, no specific management or decommissioning measures are required.

6.2.3 Landform Establishment

6.2.3.1 Water Management Infrastructure

As identified in **Figure 7**, the final sump/basin within the extraction will be retained and converted into a clean water storage. Landform establishment activities relating to the Extraction Area are detailed in Section 6.2.3.4.

6.2.3.2 Final Landform Construction: General Requirements

As shown on **Figure 7**, the majority of the Quarry Site will be progressively rehabilitated to achieve the appearance of vegetated natural landforms in the surrounding area. Areas which will remain unvegetated, including the retained roads and water storage, will be consistent with the final land uses for the Quarry Site. Furthermore, it is envisaged that the final landform would be safe, stable and internally draining to ensure there would be no impacts to downslope cultural or ecological values. Notwithstanding, should any changes to the final landform arise, any potential downslope impacts will be re-assessed.

Disturbed areas within the Quarry Site which do not form part of identified infrastructure or water management areas will be rehabilitated to achieve a final land use of Nature Conservation. Following revegetation with species based on analogue sites established in the vicinity of the Quarry Site (see Section 8.1), these areas will enhance habitat connectivity and ecosystem values within adjacent areas of remnant vegetation.

Following the completion of rehabilitation operations, it is not expected that these areas will present any specific geotechnical or geochemical risks. Additionally, it is not expected that these areas will require specific erosion and sediment control measures following the establishment of vegetation. Notwithstanding, a geotechnical assessment of the final landform will be completed prior to relinquishment.

6.2.3.3 Final Landform Construction: Reject Emplacement Areas and Tailings Dams

As identified in Section 6.2.1.3, no dedicated overburden emplacement area exists at the Quarry Site as overburden is used to progressively backfill former extraction areas.

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

The extraction area will be progressively rehabilitated as extraction progresses and as such, rehabilitation activities will be linked to the extraction campaigns. Notwithstanding, rehabilitation activities undertaken within the extraction area to achieve a final landform consistent with that presented on **Plans 1** and **2** are as follows.

- Overburden removed for recovery of shale will be relocated into completed extraction areas and shaped in accordance with the final landform. The shaped overburden will form an inward sloping final landform with final slopes of 1:3 (V:H) or less.
- 'Fine' grained overburden material will be preferentially placed at the surface so as to provide a layer of material that will better maintain moisture and facilitate establishment of vegetation.
- The surface of the final landform will be lightly scarified and soil material spread to a minimum of 50mm. In the event that adequate soil material is not available, soil conditioner / fertiliser and mulch (particles <16mm and thickness 20mm to max 40mm / 200m^3 to 400m^3 per ha) will be spread to create a growth medium.
- Vegetation material recovered from clearing activities will then be spread across the final landform.
- The area will then be seeded with species selected from the Central Gorge Dry Sclerophyll Forest community (see Section 6.2.5).

6.2.3.5 Construction of Creek / River Diversion Works

No creek or river diversion works will be required during rehabilitation of the Quarry Site.

6.2.4 Growth Medium Development

As identified in Section 6.2.3.4, growth medium development activities will primarily involve placement of fine-grained overburden material at the surface before being lightly scarified and spread to a minimum of 50mm. In the event that adequate soil material is not available, soil conditioner / fertiliser and mulch (particles <16mm and thickness 20mm to max 40mm / 200m^3 to 400m^3 per ha) will be spread to create a growth medium.

Water carts will be employed to lightly wet growth medium material prior to spreading in order to minimise dust generation. Areas which are not considered vulnerable to erosion will be sown using a combination of direct and broadcast seeding methods or allowed to revegetate naturally from the stored seedbank and airborne seed. Growth medium spreading will not be undertaken during excessively wet or windy conditions.

Seasonal and local meteorological conditions will be monitored to identify conditions which may result in delaying vegetation establishment (e.g. extended drought conditions). Land preparation and growth medium spreading activities will only be undertaken where conditions are predicted to be favourable (i.e. average or above average annual rainfall) to the establishment of vegetation.

6.2.5 Ecosystem and Land Use Establishment

Vegetation establishment activities at the Quarry will occur only where favourable climatic conditions are observed and/or expected. Consequently, prolonged drought periods may result in extended delays to rehabilitation activities including growth medium spreading and seeding. Seeding of available areas will be completed using a combination of direct and broadcast application methods.

Given suitable climatic conditions, rehabilitation earthworks will comprise the first stage of the process. The aim of these earthworks will be to control surface water runoff and also provide micro-scale niche environments where nutrients, water and seed can collect and increase the likelihood of germination and survival of emergent seedling. Contour ripping on flat and sloped ground will be preferentially employed to achieve these aims.

Revegetation will be undertaken following any earthworks and surface preparation works. Areas located adjacent to sustainable vegetation which are generating seed on a routine basis (e.g. former unsealed road areas) may not require the application of supplemental seed during rehabilitation operations. Larger disturbed areas will require direct seeding of local species following the completion of earthworks.

Seed material will be sourced where possible from local suppliers, nurseries and/or propagation specialists. Seed will also be sourced from commercial suppliers where the required volume of seed material or specific species are not available locally for rehabilitation works.

Table 13 presents an indicative (but not exhaustive) list of species that will be used during revegetation of the Quarry Site The species listed in **Table 13** represent those which have been identified within analogue sites representative of the target vegetation community types (see Section 8.1).

Table 13
Revegetation Species Selection List - Central Gorge Dry Sclerophyll Forests

Page 1 of 2

Trees
Eucalyptus punctata, E. crebra, E. sparsifolia, E. tereticornis, E. Eucalyptus crebra (narrow-leaved ironbark), *E. melliodora* (yellow box), *E. moluccana* (grey box), *E. punctata* (grey gum), *E. sparsifolia* (narrow-leaved stringybark) *and E. tereticornis* (forest red gum) are widespread, with localised occurrences of *Angophora floribunda* (rough-barked apple), *E. blaxlandii* (brown stringybark), *E. eugenioides* (narrow-leaved stringybark) and *E. sieberi* (silvertop ash). Smaller trees include *Acacia clunies-rossii* (Kowmung wattle), *A.* (hickory wattle), *Allocasuarina littoralis* (black sheoak), *A.* (forest oak) *and Backhousia myrtifolia* (grey myrtle).

Table 13 (Cont'd)
Revegetation Species Selection List - Central Gorge Dry Sclerophyll Forests

Shrubs
Breynia oblongifolia (coffee bush), *Bursaria spinosa* (blackthorn), *Citriobatus pauciflorus* (orange thorn), *Elaeocarpus reticulatus* (blueberry ash), *Goodenia ovata* (hop goodenia), *Indigofera australis* (hill indigo), *Lissanthe strigosa* (peach heath), *Olearia viscidula* (wallaby weed), *Persoonia linearis* (narrow-leaved geebung), *Sigesbeckia orientalis subsp. orientalis* (Indian weed).
Groundcover
Clematis aristata (old mans beard), *Geitonoplesium cymosum* (scrambling lily), *Hardenbergia violacea* (native sarsaparilla), *Pandorea pandorana* (wonga vine). *Desmodium gunnii, Dianella revoluta* (blue flax lily), *Dichondra repens* (kidney weed), *Goodenia hederacea var. hederacea* (forest goodenia), *Plectranthus parviflorus, Pomax umbellata, Asplenium flabellifolium* (necklace fern), *Cheilanthes sieberi subsp. sieberi* (poison rock fern), *Pellaea falcata var. falcata* (sickle fern), *Aristida ramosa* (purple wiregrass), *A. vagans* (threeawn speargrass), *Cymbopogon refractus* (barbed wire grass), *Lomandra multiflora subsp. multiflora* (many-flowered mat-rush), *Notodanthonia longifolia* (long-leaved wallaby grass), *Oplismenus imbecillus*.
Source: OEH

6.2.6 Ecosystem and Land Use Development

6.2.6.1 Weed and Pest Management and Monitoring

Several parameters associated with the presence of weeds and grazer impacts will be recorded as part of rehabilitation monitoring activities. The Annual Rehabilitation Report will include the following.

- An overview of any weed and pest management measures implemented at the Mine Site during the reporting period.
- A list of weed species identified during rehabilitation monitoring and any other inspections completed at the Quarry Site.
- Details of any pests or evidence of grazer damage to revegetated areas identified during inspections, including a plan showing distribution within the Quarry Site, where appropriate.
- Recommendations for specific weed and pest management measures to be implemented during the subsequent 12-month period.

6.2.6.2 Environmental Management and Monitoring Program

Surface Water

Visual inspections of erosion and drainage control structures will be undertaken following significant rainfall events.

Groundwater

No monitoring of groundwater quality is currently undertaken or required at the Quarry.

6.2.6.3 Revegetation

Vegetation establishment activities at the Quarry, including growth medium spreading and seeding operations, will occur only where favourable climatic conditions are expected to occur. Consequently, prolonged drought periods may result in extended delays to these rehabilitation conditions. In the event that extended drought periods occur at the Quarry Site, rehabilitation schedules will be updated to prioritise other rehabilitation activities and opportunities to prepare additional areas for revegetation once favourable conditions return will be investigated.

The management measures will be implemented to monitor revegetation operations during the ecosystem development phase of rehabilitation will be consistent with those identified in **Table 10**, namely, establishment of one monitoring point per 5ha of rehabilitation and two analogue sites.

Results from rehabilitation monitoring will be used to assess the progress of revegetated areas towards target values based on analogue sites for each of the established vegetation community types (see Section 8.1).

The results of rehabilitation monitoring will also be compared against the triggers outlined in Section 10 and additional management actions implemented as required. These additional management actions may include, but would not be limited to:

- growth medium amelioration (e.g. fertiliser or organic matter application);
- reseeding of areas with seed of target species where species assemblages are not consistent with those of analogue sites; and
- engaging a suitably qualified expert to provide recommendations to improve rehabilitation outcomes.

6.2.6.4 Land management and infrastructure maintenance

Site infrastructure including retained roads, security and stock-proof fencing, safety bunds and signage will be inspected on an annual basis. Additionally, infrastructure vulnerable to erosion (e.g. unsealed roads) will be inspected following significant rainfall events.

The results of infrastructure inspections as well as records of annual infrastructure maintenance activities and costs will be included as part of an Annual Rehabilitation Report.

6.3 Rehabilitation of Areas Affected by Subsidence

No incidences of mine subsidence have been identified as occurring within the Quarry Site or as a result of mining operations associated with the Quarry. As outlined in Section 6.2.1.12, subsidence represents a low risk to rehabilitation at the Quarry Site. As such, no specific subsidence-related management and maintenance programs are required at the Quarry.

7. Rehabilitation Quality Assurance

The following section details the rehabilitation quality assurance process for the Quarry in accordance with *Guideline 3: Rehabilitation Controls (July 2021).* The rehabilitation quality assurance checklist included in this section is intended to be used as an indicative guide for rehabilitation operation managers and practitioners responsible for the rehabilitation of the Quarry Site.

As the Quarry is currently operational, many of the pre-disturbance risk controls outlined in *Guideline 3* (e.g. baseline assessments and monitoring) have either been completed or form part of ongoing investigations to be undertaken during rehabilitation planning. As such, **Appendix 1** presents a condensed risk control checklist containing items applicable to the remaining active mining and planned rehabilitation phases of the Quarry Site.

It is anticipated that rehabilitation operations within the Quarry Site will occur on a progressive basis as areas are no longer require for operational purposes. Consequently, it is noted that rehabilitation progress through the planned rehabilitation phases will not occur concurrently across all mining domains identified in **Figure 8**.

As part of the rehabilitation quality assurance process, relevant records and documentation will be recorded in a Rehabilitation Quality Assurance Register and reported as part of the Annual Rehabilitation Report. The Rehabilitation Quality Assurance Register will, as a minimum, include a copy of the checklists presented in **Appendix 1** as well as a compliance register used to assess the status of compliance with requirements under relevant development consents, leases and licences. The Rehabilitation Quality Assurance Register will be maintained, reviewed and refined by the Environment Manager to ensure that it is reflective of current rehabilitation progress, risk controls implemented at the Quarry Site and the outcomes of any updated rehabilitation risk assessments.

Table 14 outlines key responsibilities for Austral Bricks and Quarry personnel with regards to rehabilitation operations.

Table 14
Key Roles and Responsibilities

Page 1 of 2

Role	Responsibility
Raw Materials and Mining Manager	• Comply with applicable laws, regulations, licences and approvals. • Ensure all contractors, sub-contractors and service personnel are appropriately qualified and/or licenced to undertake the required work. • Ensure that appropriate resources are available to site management and personnel to enable the implementation of this Plan.

Table 14 (Cont'd)
Key Roles and Responsibilities

Role	Responsibility
Environment Manager / Site Supervisor	• Ensure that the Rehabilitation Quality Assurance register is maintained and up to date based on site activities. • Ensure that the workforce is aware of relevant development and rehabilitation risks and management and mitigation measures, including any additional corrective and/or preventative measures. • Ensure that the rehabilitation quality assurance process outlined in Section 7 is implemented as required. • Ensure that the documentation and recording of rehabilitation risk controls occurs within a suitable timeframe • Ensure that specialist contractors adhere to the guidelines and methodologies outlined in this RMP where required, or that the guidelines and methodologies in this Plan are updated to reflect those employed at the Quarry Site.
All Quarry Personnel	• Follow direction provided by the Environment Manager / Site Supervisor. • Notify the Quarry Manager / Site Supervisor in the event that uncontrolled rehabilitation risks are identified at the Quarry.

8. Rehabilitation Monitoring Program

8.1 Analogue Site Baseline Monitoring

The rehabilitation objectives rehabilitation completion criteria as defined in Section 4 and **Table 10** were developed with reference to visual inspections of appropriate analogue sites, namely areas of undisturbed native vegetation located within and adjacent to the Quarry Site. Given that the Quarry Site is located adjacent to Belanglo State Forest and considering the rehabilitation phases and methodologies defined in Section 6, successful establishment of native vegetation within rehabilitated areas of the Quarry Site is likely, and therefore, no specific baseline monitoring has been undertaken or deemed necessary.

8.2 Rehabilitation Establishment Monitoring

Rehabilitation monitoring will focus upon determining whether progress towards achieving the relevant performance indicators and completion and relinquishment criteria presented in Section 4 and **Table 10** is being achieved. This will consist of regular quarterly visual inspections until such time that total projected foliage within rehabilitated areas is greater than 70% or higher than those recorded in relevant analogue sites, namely areas of undisturbed native vegetation located within and adjacent to the Quarry Site.

8.3 Measuring Performance Against Rehabilitation Objectives and Rehabilitation Completion Criteria

Details of validation methods and indicators to be employed during monitoring in order to assess performance against the rehabilitation completion criteria for the Quarry Site are provided in Section 4.1.

The Rehabilitation Quality Assurance Register will be used to record details of any additional management measures or risk controls implemented during the ecosystem development phase in response to the analysis of rehabilitation monitoring results.

An Annual Rehabilitation Report and Forward Program will be prepared for the Quarry as required under *Condition 13* of M(MO)L8 as specified by the *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021*. Austral Bricks proposes to submit an Annual Rehabilitation Report and Forward Program for the Mine by 1 July each year to cover the previous 12-month calendar year period. As part of the Annual Rehabilitation Report and Forward Program, Austral Bricks will validate and certify that the security deposit covers the estimated cost of rehabilitation liabilities each year.

9. Rehabilitation Research and Trials

9.1 Current Rehabilitation Research and Trials

As presented in **Plate 4**, the ongoing revegetation and rehabilitation of completed areas of the active extraction area can be considered successful to date. Ongoing quarterly visual inspections of this rehabilitation area to monitor progress towards achieving the relevant performance indicators and completion and relinquishment criteria presented in Section 4 and **Table 10** will be undertaken until such time that the area is considered fully rehabilitated.

Plate 4: A view looking to the southwest showing successful ongoing rehabilitation of an area where extraction activities have been completed

9.2 Future Rehabilitation Research and Trials

Given that the methodologies to achieve rehabilitation of completed areas of the active extraction area will be utilised for rehabilitation of the remainder of the Quarry Site, no further rehabilitation research or trials are required.

10. Intervention and Adaptive Management

Table 15 presents the Trigger Action Response Plan for each of the rehabilitation threats and potential adverse outcomes identified in **Table 9** as having a risk rating of moderate or above.

The results of any rehabilitation trials, including the development of procedures to be implemented during rehabilitation operations, will be continually reviewed and reported in the Annual Rehabilitation Report for the Quarry. Where rehabilitation trial outcomes suggest that rehabilitation methods outlined in this Plan may not support the realisation of rehabilitation completion criteria, this Plan will be updated to detail additional or alternative rehabilitation methods as required. Additionally, where the development of procedures or plans described in Section 9 is completed, this Plan will be updated to reflect specific management implications for individual areas of the Quarry Site and/or target values associated with rehabilitation completion criteria.

Table 15
Trigger Action Response Plan

Rehabilitation Risk	Potential Adverse Outcome	Trigger	Action / Response
Landform Establishment Phase of Rehabilitation			
Uncontrolled public access to highwalls.	Public access to Void and Portal poses unacceptable risk to public safety.	Rehabilitation monitoring identifies potential for public access to highwalls or access by unauthorised persons is identified.	If necessary, additional security measures to be installed including fencing, suitable signage, additional bunding, etc.
Growth Medium Development Phase of Rehabilitation			
Subsoil and topsoil deficit for rehabilitation activities.	Insufficient soil available for construction of sustainable final landform and land use.	Sufficient soil resources are not available within a reasonable distance of the Mine Site.	Suitable source of additional soil material / growth medium to be identified.
			Commence investigation into measures that may be implemented to ameliorate other materials to make them suitable for use as a growth medium.
Ecosystem and Land Use Establishment Phase of Rehabilitation			
Adverse weather and climatic influences (e.g. drought; intense rainfall events; bushfire and climate change).	Delay to or failure of vegetation establishment.	Visual monitoring during and/or after adverse weather/climatic events identifies limited opportunities for progressive rehabilitation or negative effects on vegetation establishment	Review of rehabilitation schedule and update to forward schedule.
			Rehabilitation areas are assessed for damage and necessary repairs and/or revegetation efforts are employed as required.

11. Review and Implementation

Table 16 presents the triggers for reviewing this Plan. Following each review, this Plan will be revised if significant structural amendments are necessary and provided to the Resources Regulator. Additionally, further consultation with relevant stakeholders will be undertaken where revisions to this Plan result in significant changes to proposed final land uses final landforms, rehabilitation objectives, rehabilitation completion criteria and/or the rehabilitation schedule. Milestones as documented in this Plan will be updated in the Annual Rehabilitation Report and will trigger an update to this Plan in the event that a significant change in rehabilitation risks and/or proposed rehabilitation methodologies is identified.

Table 16
Rehabilitation Management Plan Review Triggers

Trigger	Review
Request from the Resources Regulator or other relevant government agency to review the Plan.	As required by any notice.
Modification of an existing development consent.	Within 3 months.
Modification of an existing Mining Lease.	Within 3 months.
Preparation of a revised Rehabilitation Risk Assessment.	Within 1 month.
Submission of each Annual Rehabilitation Report and Forward Program.	Within 1 month.
Completion of a rehabilitation trial.	Within 1 month.
Receipt of a specialist consultant report prepared in response to a trigger outlined in Section 10.	Within 3 months.
Consultation with relevant stakeholders with significant implications for the final land use and/or final landform.	Within 3 months.
Consultation with relevant stakeholders with significant implications for rehabilitation objectives and/or rehabilitation completion criteria.	Within 3 months.

In addition to reviews of this Plan as outlined in **Table 16**, a Rehabilitation Quality Assurance Register will be developed and regularly maintained to ensure that mining and rehabilitation activities at the Quarry Site are being conducted in accordance with this Plan. The Rehabilitation Quality Assurance Register will include the checklist presented as **Appendix 1** as well as a compliance register used to assess the status of compliance with requirements under relevant development consents, leases and licences. Additionally, the Rehabilitation Quality Assurance Register will include:

- records of any contaminated water or hazardous materials collected at the Quarry Site and disposed of off site;
- the latest map of weed distribution at the Quarry Site;
- the latest map of contamination at the Quarry Site; and
- details of any additional rehabilitation measures and/or risk controls implemented within individual subdomains during rehabilitation operations.

12. References

Australian Standards *HB 203:2006, AS/NZS 4360:2004 and AS/NZS ISO 31000:2018 Risk Management – Principles & Guidelines*

R.W. Corkery & Co. Pty Limited (RWC) (1990). *Environmental Impact Statement.*

R.W. Corkery & Co. Pty Limited (RWC) (2018). *Statement of Environmental Effects.*

Appendix 1

Rehabilitation Risk Control Checklist

(Total No. of pages including blank pages = 13)

Table A
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Active Mining (Production)	
Soil and Materials Management	
Develop and maintain a materials and soils balance and database to include the following information: • volume of overburden, topsoil and subsoil stockpiled. • location, age and quality of stockpiles. • chronology of treatments (e.g. weed control, application of cover crop) undertaken on the stockpile. • volume of material, topsoil and subsoil required for application to current and future disturbance areas. • an estimate of the volume of suitable alternative material required to be imported onto site to supplement potential material, topsoil and subsoil deficits. • record data on the location of the stockpiled material including date stripped, source area, indicative volume, pre-strip plant community type. Information is to be stored using site-based GIS.	
Locate soil stockpiles away from traffic areas and at an appropriate distance from watercourses.	
Locate soil stockpiles on level or gently sloping areas to minimise the potential for erosion and soil loss.	
Limit soil stockpiles to less than two to three metres high and set out in windrows to maximise surface exposure and biological activity.	
Install appropriate erosion, dust and sediment controls around soil stockpiles to reduce the potential for soil loss.	
Appropriately sign-post soil stockpiles to identify the area and minimise the potential for unauthorised use or disturbance.	
Monitor and control weed growth on soil stockpiles.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Active Mining (Production) (Cont'd)	
Materials Handling	
Develop specific strategies (e.g. selective handling, management and placement) for materials management to address potential geochemical and geotechnical constraints for rehabilitation as follows: • adopt an appropriate geological model (typically block model for metalliferous mines) to determine source of problematic material. • continued identification and sampling/testing as required of overburden/interburden materials during operations to confirm the potential geochemical constraints across the deposit (e.g. spontaneous combustion). • continued sampling to ensure materials are understood (e.g. particle size distribution) and to identify potential changes in material properties. • development of a procedure/strategy for selective handling and management of materials.	
Seek specialist advice (as relevant) to develop effective mitigation strategies to minimise any potential interference to rehabilitation establishment or downstream pollution due to exposure of adverse geochemical material.	
Develop and maintain a register of any contaminated sites, waste landfill sites and bioremediation areas and where they are located.	
Environmental Monitoring	
Develop, maintain and document an environmental monitoring program that includes: • surface water • flora • land contamination • historic heritage	
Management of potential heritage issues	
Before demolition activities, undertake any necessary assessments to determine potential heritage approvals and or management measures that may be required (e.g. AHIP).	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Active Mining (Production) (Cont'd)	
Site Services	
Electricity services to any infrastructure scheduled for demolition will be removed before the start of building demolition works.	
Telecommunications, water supply and other services will also be disconnected and removed where practical.	
Where services are buried (e.g. pipelines, cables) and their retrieval may lead to further disturbance, the infrastructure may be left in situ (subject to any necessary approvals or agreements) if they don't pose constraints to the final land use. In this situation, the location of the services will be surveyed and marked on the site plan and a suitable caveat developed to provide that they are readily identifiable for future land holders.	
Buildings and Fixed Plant	
Before demolition, the infrastructure should be evaluated in terms of the presence of hazardous substances (e.g. asbestos, radiation devices and sources) and appropriate management strategies developed to protect employees, the public and minimise potential environmental harm. This includes the identification of the various waste streams and development of management strategies in accordance with the appropriate waste legislation.	
All buildings, fixed plant and other infrastructure that are not required as part of the final land use will be demolished and removed. Demolition will be carried out in accordance with the relevant Australian Standard.	
Remaining structures will be surveyed and recorded on a plan, with a suitable caveat developed to provide that they are readily identifiable for future land holders.	
Buildings and Fixed Plant to be Retained	
Where infrastructure is approved to remain as part of the final land use, a structural assessment should be prepared by a suitably qualified person to: • determine the structural integrity of the structure. • identify the associated short and long-term risks to public safety and the environment from the infrastructure remaining in situ, which should identify potential modes of failure. Based on assessment, identify and implement controls to address any potential residual risks and modes of failure.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Active Mining (Production) (Cont'd)	
Equipment Storage Areas, Hardstand Areas, Roadways, Sealed and Unsealed Roads and Car Parks	
Any redundant plant or equipment will either be sold for reuse, recycled (e.g. scrap metal) or disposed of at an authorised landfill facility.	
Removal of ore spillages and hazardous materials.	
Storage areas and hardstands will be assessed for potential contamination (e.g. hydrocarbons, salt accumulation) and remediation undertaken as required.	
Waste material (e.g. bitumen, concrete, ore) generated as part of the removal of car parks and hardstands is to be managed in accordance with relevant guidelines under the *Protection of the Environment Operations Act 1991*. The relevant guidelines can be found on the Environment Protection Authority's website. Where authorised to dispose of on the site, waste material must be buried at depth or suitably capped to ensure that it does not compromise the final land use.	
Management of Contaminated Material	
Any contaminated material should be managed in accordance with relevant guidelines under the *Contaminated Land Management Act 1997*. Records will need to be retained to validate that contamination has been remediated or managed effectively to meet the final land use rehabilitation objectives and rehabilitation completion criteria.	
Hazardous Materials Management	
All remaining hydrocarbons such as diesel and lubricants and other hazardous materials will be either used or discarded by an authorised waste contractor.	
Removal of any oily water treatment system, following the demolition of the workshop and associated facilities.	
Removal of sewage treatments systems and associated sewerage network.	
Storage tanks of hazardous materials will be removed and, depending on their condition, either sold or disposed at an authorised facility.	
Specific consideration should be given to managing asbestos materials, radiation devices, hydrocarbon as well as other contaminated substances/materials/soils in accordance with relevant guidelines that can be found on the Environment Protection Authority's website.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Active Mining (Production) (Cont'd)	
At the Completion of Exploration Activity	
Remove and lawfully dispose of all grid pegs, tags, sample bags, flagging tape, drill chips and other waste.	
Remove all drill core.	
Survey, seal and rehabilitate all boreholes.	
Remove and lawfully dispose of all plant and equipment (including surface pipelines) and imported fill material.	
Removal of concrete and footings.	
Undertake a visual contamination assessment where potential pollution generation activities have occurred (e.g. hazardous substance storage, saline water storage) to identify potential signs of contamination. Where contamination is present, develop and implement a contamination remediation program to ensure that the rehabilitation objectives and rehabilitation completion criteria for the intended post-exploration land use are met.	
Phase: Landform Establishment	
Emplacement Areas	
The geotechnical stability of the emplacement areas during construction must be understood and a strategy implemented to ensure: • location of emplacement areas are clearly defined. • emplacement dimensions (e.g. height – RL) are consistent with those approved by the development consent. • consideration is given to geotechnical stability during placement, including methods to promote compaction/consolidation during construction. • consideration is given to material selection and treatment (e.g. handling low strength or dispersive/sodic soils). • material handling field practices are in accordance with defined management practices – location, dump process, lift heights, compaction/consolidation treatment.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Landform Establishment (Cont'd)	
Emplacement Areas (Cont'd)	
The emplacement capping strategy should ensure that the capping material type, source and quantity has been identified and assessed as suitable for the final land use (e.g. does not become a source of contamination). Methods to quarantine adequate quantities of capping material should be specified and implemented.	
Landform Design/Shape	
The final landform design should build on the minimum requirements of the development consent and, wherever practicable, take into account the following: • a landform that is commensurate with surrounding natural landform and, where appropriate, incorporates geomorphic design principles. • appropriate use of landform design stability principles of reduced slope length and surface water management structures. • use of erosion models to optimise the landform design and to show where high-risk erosion areas are likely to occur (and to nominate how risk controls will be incorporated into the final landform design to appropriately treat these risks).	
• use of erosion modelling and/or hydrological projections to demonstrate the long-term competency of the capping of problematic material emplacement (e.g. acid mine drainage waste rock emplacements). • use of appropriate parameter model inputs – preferably field parameter data collected from the materials to be used in rehabilitation. • potential for settlement and how this will be accounted for in the design (especially differential settlement). • long-term stability of voids/pit walls and steep slopes, including determination of engineering treatments required for walls/ steep slopes.	
Develop specific strategies (e.g. selective handling and placement) for materials management to address potential geochemical constraints for rehabilitation (e.g. spontaneous combustion) based on sampling and testing of overburden/interburden materials used to construct the final landform.	
Develop specific strategies (e.g. selective handling and placement) to address any potential geotechnical issues associated with the final landform, including seepage pathways into groundwater and surface waters, for example saline seepage. Based on risk, these strategies may need to be developed in consideration of geotechnical studies.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Landform Establishment (Cont'd)	
Water Management Infrastructure	
Depending on the final land use, issues that should be addressed as part of the post-extraction water management system may include: • removal of excess sediment (e.g. saline sediment) from the surface dams for future use by the subsequent land owner or alternatively filling or removing the dams if they are no longer required. • the installation of appropriate sediment and erosion control measures. • water within final voids is appropriately licensed in perpetuity (e.g. under the *Water Management Act 2000*).	
Sediment material extracted from surface dams should be analysed to determine the potential for contamination and, if present, must be appropriately managed as identified above (refer to *Management of carbonaceous/contaminated material* above).	
Construction of Creek/Diversion Works	
Where practicable, similar characteristics and natural features as evident in upstream and downstream sections should be incorporated into the design of a creek or river that is to be constructed or re-established (e.g. pool and riffle sequences, low flow channels, high flow channels, log jams). This should be based on detailed geomorphological and hydraulic modelling to determine whether these key features can be adapted to the materials as well as water flows associated with creek restoration/re-establishment/ diversions works.	
Where engineering structures are required (e.g. drop structures, rock armoured banks, rock groins), they are to be designed and constructed in consideration of hydraulic assessments to ensure the long-term integrity and sustainability of the creek. These structures should also be designed to ensure that fish passage has not been compromised as part of the creek/river diversion works, and that fish passage is incorporated into the final landform (Policy and guidelines for fish habitat conservation and management, NSW Department of Primary Industries (Update 2013)).	
The final stabilisation and revegetation strategy associated with creek remediation/ rehabilitation works should be designed and implemented based on the outcomes of the above assessments as well as ecological assessments. Refer to Policy and guidelines for fish habitat conservation and management, NSW Department of Primary Industries, (Update 2013).	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Landform Establishment (Cont'd)	
As-Constructed Drawings	
Prepare 'as-constructed' drawings to verify that drainage and landform have been completed in accordance with design before 'growth medium development' phase.	
Phase: Growth Medium Development	
Before Commencing Rehabilitation (substrate preparation)	
Develop rehabilitation methodologies in consideration of site-specific constraints (e.g. topsoil and subsoil availability and quality, presence of contamination) required to achieve the approved, or if not yet approved, proposed rehabilitation objectives and rehabilitation completion criteria.	
Where revegetation is required, analyse representative samples to characterise the nature of the substrate (e.g. sodicity, acid-generating potential, particle size distribution, nutrient levels for planting) and determine any potential limitations to rehabilitation and sustainable plant growth. Immediately prior to application, collect and analyse samples of topsoil stockpiles to characterise material to determine any potential impacts to vegetation (e.g. sodicity, limited microbial activity, nutrients, organic matter).	
Use the results to determine specific amelioration techniques (e.g. addition of gypsum, lime, organic matter, fertiliser) that will be used to overcome potential limitations to landform stability, vegetation establishment and growth. Apply ameliorants (e.g. gypsum or lime) and organic material (e.g. mulch) based on the outcomes of the substrate characterisation analysis (as appropriate to address limitations in the revegetation substrate). Before revegetation activities, analyse the prepared substrate to determine whether amelioration measures have been successful.	
Implement suitable erosion control measures (e.g. catch drains, sediments dams, silt fences, mulches, cover crops) to minimise soil loss from areas undergoing rehabilitation.	
Preferentially schedule and undertake revegetation activities in or just before suitable seasonal conditions.	
Where permissible, should revegetation be delayed due to unsuitable seasonal conditions, undertake temporary stabilisation measures (e.g. sterile cover crops, erosion and sediment controls) to avoid erosion and further land degradation.	
Return topsoil and subsoil layers in sequential order, assuming suitability of material for the final land use.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Growth Medium Development (Cont'd)	
During Rehabilitation (general methodologies)	
Use appropriate earthmoving equipment to avoid compacting the rehabilitation substrate.	
Restore soil structure by scarifying or ripping (if soil compaction or erosion has occurred) in parallel with the contour. Apply soil ameliorants (where required) such as fertiliser to the substrate before the start of revegetation activities.	
Implement erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and Construction Volume 2E, Mines and Quarries* (DECC 2008b).	
Where direct seeding is planned, rip final surfaces parallel with the contour before the application of seed to provide for an adequate seed bed.	
Where access tracks are to be removed (e.g. not to be left as part of the final land use as defined by rehabilitation objectives and rehabilitation completion criteria), remove imported fill material (where used) and reprofile the disturbance area to the pre-existing landform.	
Topsoil shortages are to be supplemented with suitable alternatives such as biosolids, organic growth medium or another substitute, if required. However, the risk of introducing hazards to the establishment of the preferred plant community type (e.g. non-native species, elevated nutrient levels through the application of soil ameliorants) should be evaluated.	
Identify key habitat requirements for key fauna species.	
Use structures such as tree hollows, logs and other woody debris, rock material to augment the target habitat value of native rehabilitation (if appropriate, in consideration of bushfire risks).	
Phase: Ecosystem and Land Use Establishment	
During Rehabilitation (revegetation – native ecosystem)	
Native revegetation activities in rehabilitation areas should preferentially use local provenance seed for direct seeding or tube stock propagation.	
Use of seed orchards or onsite nurseries should be considered to ensure an appropriate stock is maintained for rehabilitation works.	
Consider techniques such as brush-matting where disturbed areas are situated directly adjacent to mature native ecosystems/area of clearing associated with mining that provide a good source of local seed, to stabilise the site while natural recruitment occurs.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Ecosystem and Land Use Establishment (Cont'd)	
During Rehabilitation (revegetation – native ecosystem) (Cont'd)	
Where adverse seasonal conditions (e.g. drought) or other factors affect the availability of local provenance seed and supplementary non-local provenance seed is required, seed stock should be purchased from reputable suppliers with quality control processes including seed viability testing. (It is good practice to record the name of the supplier and batch of seed being applied. Recording such details may assist in prevention/management of misidentified seeds).	
If revegetation is delayed due to unsuitable seasonal conditions, undertake temporary stabilisation measures (e.g. sterile cover crops, erosion and sediment controls) to avoid erosion and further land degradation.	
Undertake treatment of seed in terms to address issues such as seed dormancy and insect predation. Timing of treatment is to be aligned to timing of application with a focus on reducing the storage time of treated seed.	
Confirm the availability of seed and plant material and amend the seed mix or schedule of revegetation based on material supply.	
Spread seed as soon as possible following ripping/scarifying. If seeding is delayed following ripping/scarifying, undertake an assessment to determine whether further re-ripping/tilling is required before applying seed to ensure sufficient surface roughness (e.g. to break up any crusting that may have resulted from rainfall events).	
Develop a bushfire management plan (having regard to relevant ecological considerations and species fire tolerance) in consultation with NSW Rural Fire Service. Bushfire considerations should be factored into rehabilitation design (e.g. access tracks).	
Revegetation mix to capture species of all strata aligned to the plant community type. (If foundation species are being used, ensure that they do not compromise the attainment of the targeted plant community types).	
Use appropriate earthmoving equipment to avoid compacting the rehabilitation substrate.	
Weed/pathogen control on equipment for sensitive sites to prevent the spread of pathogens.	
Rehabilitation can include direct seeding and/or tube stock planting. Seed germination and seeding/seedling rate records are to be retained so that future rates can be assessed to ensure that target densities are achieved.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Ecosystem and Land Use Establishment (Cont'd)	
During Rehabilitation (revegetation – native ecosystem) (Cont'd)	
Maximise the number of target species (groundcover, mid-story and canopy) within the first round of revegetation activities to facilitate species richness. If the target plant community type requires a staged seeding approach to achieve the species mix, underrepresented species may be prioritised in subsequent revegetation rounds.	
Stock control fencing should be erected where required to protect ecological rehabilitation areas.	
Rehabilitation Establishment Inspections	
Conduct an initial establishment inspection no later than three months following the completion of each rehabilitation campaign to determine whether performance issues have occurred or are emerging, which have the potential to delay revegetation establishment.	
Conduct regular site inspections (e.g. at least quarterly) to assess soil conditions and erosion, drainage and sediment control structures, runoff water quality, revegetation germination rates, plant health and weed infestation, until vegetation has become well established and the site can be considered stable.	
Where possible, use drones or LiDAR to conduct additional inspections and analysis of developing rehabilitation.	
Record outcomes of inspections and implement any required intervention/adaptive management actions as soon as practicable after a monitoring program indicates that rehabilitation performance is unsatisfactory as part of the rehabilitation management and maintenance program.	
Rehabilitation Monitoring Programs	
Implement long-term rehabilitation monitoring program and evaluate trajectory of rehabilitation against achieving rehabilitation objectives and rehabilitation completion criteria.	
Broadly, the scope of the ecosystem rehabilitation monitoring program will be required to include indicators that measure site condition, vegetation composition and vegetation structure and ecosystem function. The range of indices should directly relate to the rehabilitation objectives and rehabilitation completion criteria identified for the specific ecological outcome.	
While the program should be designed to be comparable between monitoring periods, the program will also need to be flexible to enable incorporating evolving best practice in monitoring techniques.	
Include the monitoring and control of changes to surface and groundwater quality over time.	
The scope of the monitoring program should usually include photographic monitoring from fixed points.	

Table A (Cont'd)
Rehabilitation Risk Control Checklist

Rehabilitation Phase / Activity	Comment / Completion Date(s)
Phase: Ecosystem and Land Use Establishment (Cont'd)	
Rehabilitation Management and Maintenance Program	
Develop and implement a rehabilitation management and maintenance program based on the needs identified in the rehabilitation monitoring program. Examples of what this program may include are as follows: • weed and feral animal control. • erosion and drainage control works. • monitoring and control of changes to surface and groundwater quality over time. • reseeding/planting of failed rehabilitation areas (e.g. through lack of germination, high plant mortality rate). • repairing fence lines, access tracks and other general related land management activities. • regular site inspections to assess rehabilitation performance. The objective of this program is to facilitate rehabilitation progressing towards achieving the rehabilitation objectives and rehabilitation completion criteria in accordance with an approved progressive rehabilitation schedule (forward program).	
Phase: Ecosystem and Land Use Development (Management of Rehabilitated Lands)	
During Rehabilitation (revegetation – native ecosystem)	
Continue rehabilitation management and maintenance program (refer to Ecosystem Establishment Phase) until rehabilitation can be demonstrated to have achieved the approved rehabilitation objectives, rehabilitation completion criteria and (for large mines) the final landform and rehabilitation plan.	
Continue rehabilitation monitoring programs (refer to Ecosystem Establishment Phase) until rehabilitation can be demonstrated to have achieved the approved rehabilitation objectives, rehabilitation completion criteria and (for large mines) the final landform and rehabilitation plan.	
Actively manage rehabilitated lands to achieve the approved final land use(s).	