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Know How

Annual EPBC Compliance Report 2021/2022

EPBC 2014/7351

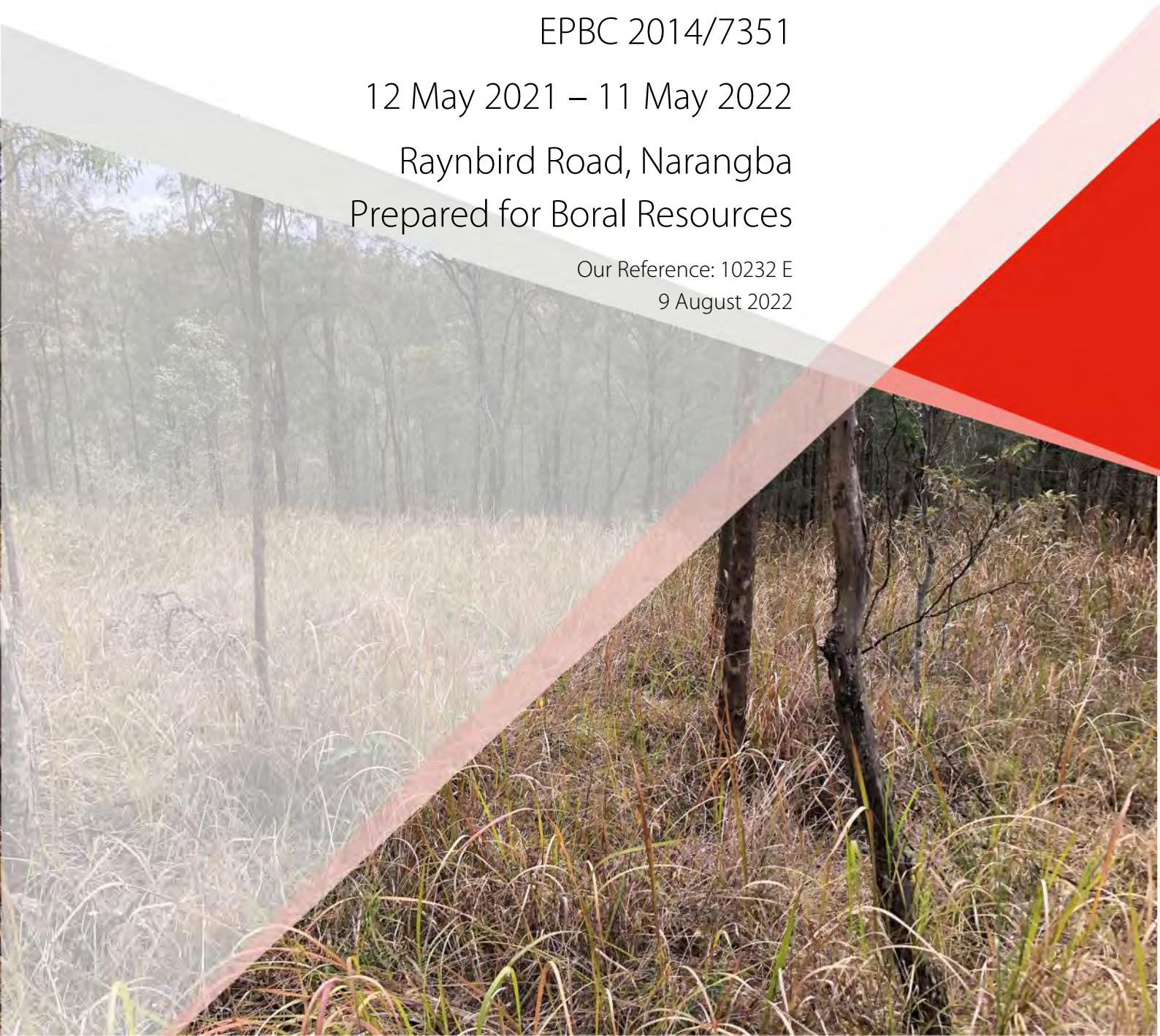
12 May 2021 – 11 May 2022

Raynbird Road, Narangba

Prepared for Boral Resources

Our Reference: 10232 E

9 August 2022



Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed 

Full name (please print) Megan McKinney

Position (please print) Principal Ecologist

Organisation (please print including ABN/ACN if applicable) Saunders Havill Group ABN 24 144 972 949

Date 09/08/2022

Document Control

Document: Annual Compliance Report 12 May 2021 – 11 May 2022, Narangba Quarry - Year 2 (EPBC 2014/7351), prepared by Saunders Havill Group Pty Ltd for Boral Resources Pty Ltd, dated 9 August 2022.

Document Issue

Issue	Date	Prepared By	Checked By
Issue A	27/07/2022	KH	MM
Issue B	09/08/2022	KH/MD	MM

Prepared by

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Reports and plans by others may be included in this document.

Table of Contents

Figures

Tables

Plans

Acronyms and Abbreviations

ACR	Annual Compliance Report
BMP	Bushfire Management Plan, prepared by Land and Environment Consultants.
DAWE	Department of Agriculture, Water and Environment (Cth)
EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ha	hectares
KHMP	Koala Habitat Management Plan (EPBC 2014/7351), prepared by Saunders Havill Group, dated November 2020.
KMP	Koala Management Plan, prepared by Saunders Havill Group, dated October 2016.
km	kilometres
m	metres
MBRC	Moreton Bay Regional Council
MNES	Matters of National Environmental Significance
NCA	*Nature Conservation Act 1992* (Qld)
OMP	Offset Management Plan (EPBC 2014/7351), prepared by Saunders Havill Group, dated November 2019.
PMR	Protected Matters Report
RE	Regional Ecosystem
TEC	Threatened Ecological Community (under the EPBC Act)
VMA	*Vegetation Management Act 1999* (Qld)
VPMP	Vertebrate Pest Management Plan, prepared by Saunders Havill Group, dated April 2021.
WMP	Weed Management Plan (EPBC 2014/7351), prepared by Saunders Havill Group, dated April 2021.

1. Introduction

This Annual Compliance Report (ACR) Year 2 (12 May 2021 – 11 May 2022) has been prepared on behalf of Boral Resources (Qld) Pty Ltd (the Proponent) as per the EPBC approval transfer granted on 19 August 2016 for the Narangba Quarry Expansion (the Project) located on Raynbird Road, Narangba, Queensland (EPBC 2014/7351).

In accordance with the approval granted on the 19 August 2016 under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act), this ACR has been prepared in response to Condition 7 of the approval which states:

> *"Within three months of the anniversary of every 12-month anniversary of the commencement of the action, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in their conditions."*

1.1. Reporting Period

This ACR details the status and compliance of the Project for the 12-month reporting period between the 12 May 2021 and 11 May 2022.

The ACR must be published on the Proponent's website and notification provided to the Department of the Environment and Energy (now the Department of Agriculture, Water and the Environment, DAWE) within 3 months of the 12-month anniversary of the commencement of the action (12 August).

1.2. EPBC Approval

Boral Resources (Qld) Pty Ltd, as the Proponent of the Project (EPBC Act Referral 2014/7351) was issued with an approval by the Department of the Environment and Energy (now DAWE) on the 18 August 2016, subject to conditions. A variation was made to this approval and approved by the delegate of the Minister on the 24 August 2018. This included the removal of condition 3 of the approval and substitute with conditions 3 and 3A (refer **Appendix A**). An additional variation to the approval was made on 10 August 2019, subsequently approved by the minister, which added Condition 3B (refer **Appendix A**).

Key details related to the EPBC 2014/7351 approval, including variation conditions, are provided in **Table 1** below.

Table 1: Approval Details

Commonwealth Reference	EPBC 2014/7351
Approval Holder	Boral Resources (Qld) Pty Ltd
ACN	009 671 809
Project Name on the Approval	Narangba Quarry Expansion, Raynbird Road, Narangba, Queensland
Approved Action	Fifty-six hectare (56 ha) expansion of the existing Narangba Quarry, including clearing of 52 ha of vegetation. The quarry expansion site is located on Raynbird Road, 18 km south of Caboolture; as described in the

	referral received by the Department on 30 September 2014 [See EPBC Act referral 2014/7351].
Controlling Provision(s)	Listed threated species and communities (sections 18 & 18A)
Approval Date	19 August 2016
Variation to Conditions of Approval Date	24 August 2018 10 August 2019
Expiry Date of the Approval	18 August 2076
Date of Commencement of the Action	12 May 2020
Address	Raynbird Road, Narangba
Local Government Area	Moreton Bay Regional Council (MBRC)

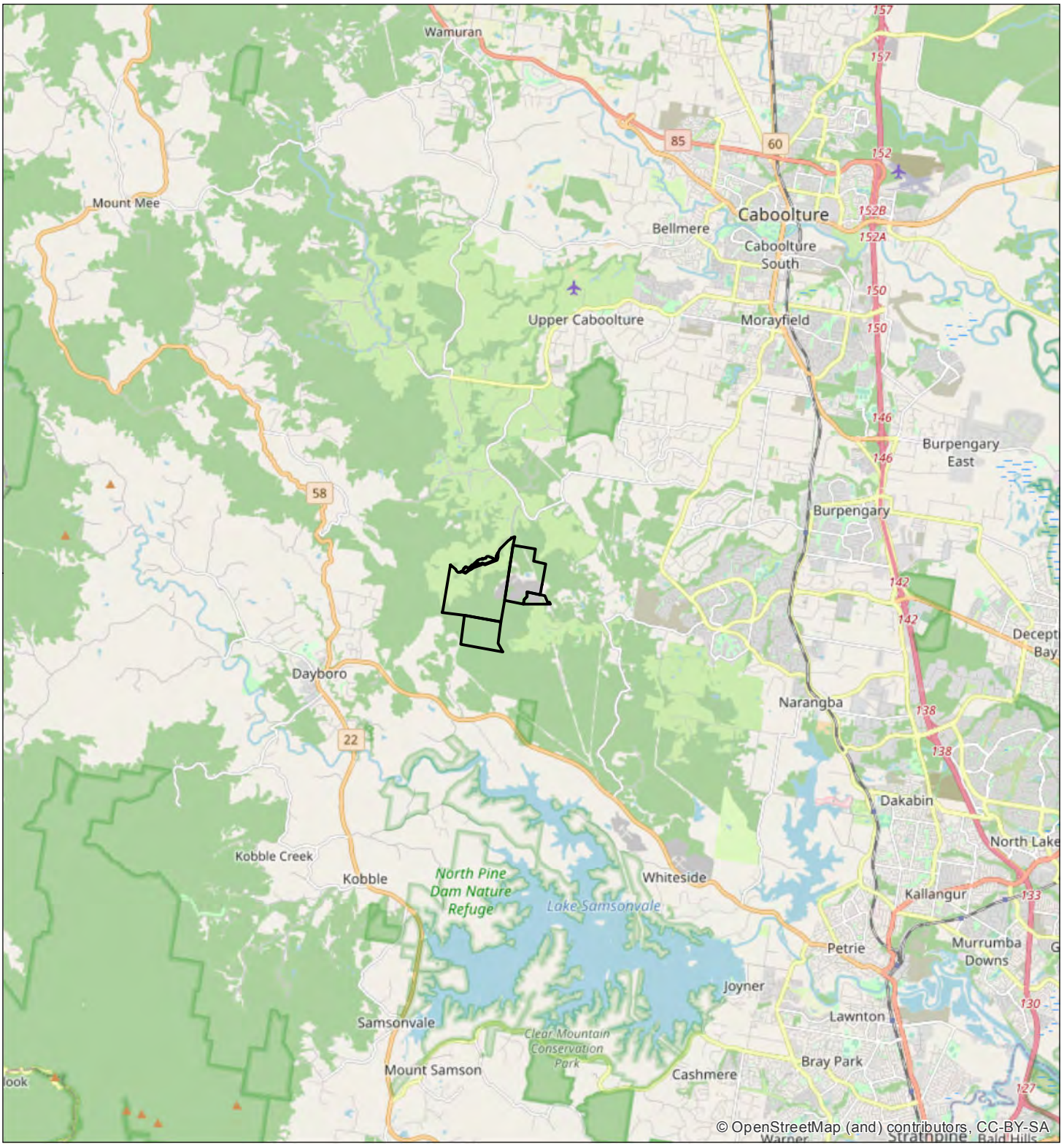
1.3. Site Context

Contextually, the Project is located in south-east Queensland, approximately 7.8 km north-west of Narangba Town Centre within the Moreton Bay Local Government Area. The Project is surrounded by rural and rural residential allotments and remnant vegetation (refer to **Figure 1** for the Site Context and **Figure 2** for Site Aerial).

1.4. Overview of Key Activities and Achievements

During Year 2 of compliance reporting, the following development and environmental management activities occurred:

- No clearing of Koala Habitat occurred in the Year 2 reporting period. Clearing of 2.6 ha habitat within the approved area occurred in Year 1 (see **Plan 1**).
- Monitoring MHQA surveys of Stage 1 offset area to ascertain habitat quality of vegetation in Year 2 compared to Baseline (2019).
- Annual weed mapping targeting Weeds of National Significant (WONS) conducted by SHG across Stage 1 offset area.
- Management and removal of WONS within Stage 1 offset area by Phoenix Environmental Services.
- Two plantings completed across the Stage 1 offset site.
- Vertebrate pest management activities carried out over the combined offset area (Stage 1, 2, and 3) by Biodiversity Australia including camera monitoring in April/May 2022, which resulted in the removal of one (1) Feral dog, two (2) European red foxes and a European Hare from the site.
- Bushfire Management, including prescribed burn plans and assessments, completed by Fireland.



Legend

Boral land holdings

Figure 1

Site Context

Boral Resources (Qld) Pty Ltd

File ref. 10232 E Figure 1 ACR 2 Site Context A
Date 12/07/2022
Project Narangba Quarry

0 1 2 3 4 km

N

Scale (A4): 1:150,000 [GDA 1994 MGA Z56]

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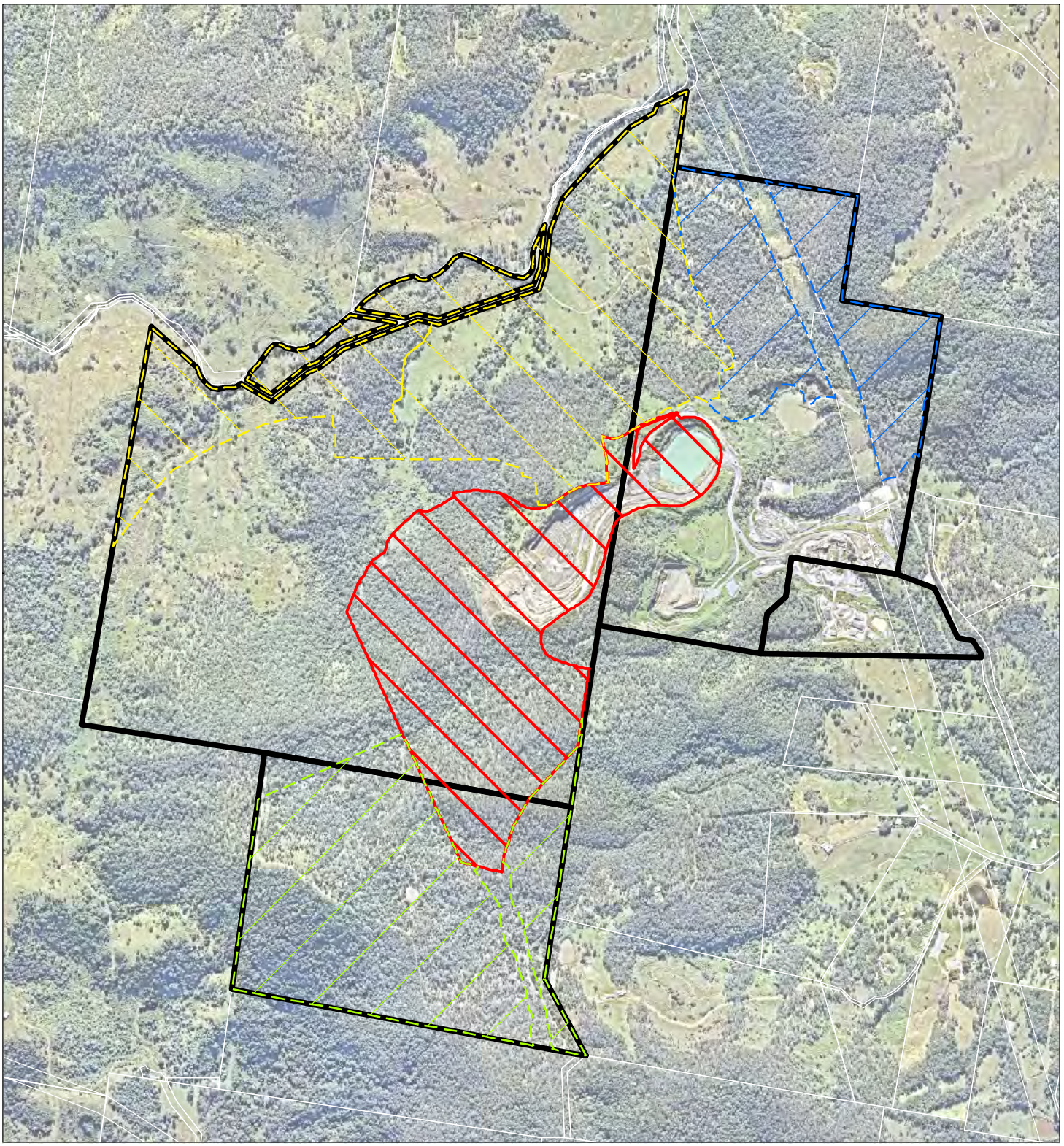
Layer Source: © State of Queensland 2022



Legend

- Qld DCDB
- Boral land holdings
- Impact site

Offset Stages

- Stage 1 [73.6 ha]
- Stage 2 [41.1 ha]
- Stage 3 [106.1 ha]

Figure 1

Site Aerial

Boral Resources (Qld) Pty Ltd

File ref. 10232 E Figure 2 ACR 2 Site Aerial A
Date 12/07/2022
Project Narangba Quarry

0 150 300 450 600 m

N

Scale (A4): 1:18,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2022, Nearmap 2022

2. Current Status of the Project

2.1. Offset Area Legally Secured

As required by Condition 3B of the EPBC Act approval, the offset land, which is located over parts of Lot 53 on RP895391, Lot 93 on SP193378, Lot 139 on SL10320 and Lot 1 on RP167435, Raynbird Road, Narangba, was legally secured via a Voluntary Declaration under the VMA by the Proponent on 24 February 2020 (refer to **Appendix B**). The Chief Executive of the Queensland Department of Natural Resources, Mines and Energy (DNRME) (now Department of Resources, DOR) declared the offset area in a Declared Area Map (DAM 2020/010206) as an area of high nature conservation value in accordance with section 19F(1) of the VMA. The offset area includes Stages 1 to 3 and is shown as Category A on a Property Map of Assessable Vegetation (PMAV) (PMAV 2020/010207) and is subject to management provisions of the Offset Management Plan EPBC 2014/7351, prepared by Saunders Havill Group, November 2019 (Offset Management Plan).

2.2. Vegetation Clearing

No clearing of Koala Habitat occurred in the current reporting period. A total of 2.6 ha of Koala habitat was cleared during the Year 1 reporting period and was presented within the previous ACR. Refer **Plan 1** for clearing extent area.

2.3. Key Consultants and Roles

Table 2 below is a list of the key staff and appointed contractors and their roles in the Project during Year 2.

Table 2: Key Consultants and Roles

Role	Appointed Contractor
Environment Manager	Boral - Matthew Allan
Site Supervisor	Boral – Liam Elsworth
Environmental Consultant	Saunders Havill Group – Megan McKinney
Bush Regeneration Contractor	Phoenix Environmental Services
Bushfire Management Contractor	Fireland
Pest Management Contractor	Biodiversity Australia

2.4. Year 2 Offset Reporting

Management activities have been conducted across the site in accordance with the management actions outlined in the OMP. Pest management and bushfire management activities were conducted across the entire offset site while weed management, habitat quality monitoring and weed mapping were conducted for Stage 1 only. Refer to **Plan 2.1** for map of Habitat Management Zones and **Plan 2.2** for Stage 1. Contractor Reports are provided in **Appendix H**.

A review of the OMP commitments and implementation is provided in **Table 3**.

Table 3: Offset Management Plan implementation

No.	Commitment	Evidence / Comments / Status
OMP-1	**Legally securing the offset area** A Voluntary Declaration will be placed over the entire offset area to legally secure the conservation use on the land prior to the action commencing. Boral will continue to manage the offset area for the life of the approval. Legally securing the offset area is listed in the Conservation Advice as a Priority Management Action, under "habitat loss, disturbance and modification". As required by the conditions of approval the Voluntary Declaration will be in place by 28 February 2020.	The Proponent legally secured the offset via a Voluntary Declaration under the *Vegetation Management Act 1999* on the 24 February 2020 (refer **Appendix B**). In accordance with Condition 3B, the offset was legally secured prior to the official commencement of the action on the 12 May 2020.
OMP-2	**WONS management** Management measures for the control of WONS, specifically Lantana will include: • Baseline weed mapping for WONS will be conducted and specific treatment techniques developed within six months of the commencement of each stage of clearing for the quarry extension. • All identified WONS will be treated within 12 months of the commencement of each stage of clearing for the quarry extension. • A suitably qualified bush regeneration contractor will be engaged to undertake the necessary weed control. • Control of infestations will utilise techniques that avoid disturbance to surrounding areas. WONS, and other high risk weeds, will be monitored annually until they are not observed, at which point monitoring will be carried out every 2 years until they are consistently identified at densities less than 10% of the baseline infestation. The monitoring will be undertaken during the same time of year, each year, to ensure that the timing is consistent and aligns with the baseline assessment. Completion criteria for the offset site are as follows: • WONS reduced to less than 10% of baseline levels.	A Weed Management Plan (WMP) was produced by SHG in the Year 1 reporting year to fulfil the requirements of the OMP. The purpose of the WMP is to ascertain baseline surveys of weed cover and weed species within the offset area. Specific management actions and timeframes have been developed for the control of weeds on-site as well as regular and annual monitoring. SHG Ecologists mapped the extent of WONS across the Stage 1 offset area during the 2021/2022 reporting period. WONS identified and mapped were predominantly *Lantana camara* (Lantana) (refer **Plan 4**). Weed management targeting WONS was conducted within the Stage 1 area by Spectrum Environmental then, Phoenix Environmental Services. Treated areas are shown on **Plan 5**. Management of WONS was not able to be completed across the entirety of the Stage 1 Offset area. This was primarily access issues on the steeper slopes of site in the southern portion. In addition, South East Queensland received unprecedented amounts of rainfall in early 2022, which resulted in a reduction of works that could be completed on-site, in addition to quarry closures at times, due to safety issues regarding access and operations onsite. The closest weather monitoring station, located in Redcliffe (Station 040958), recorded a total of 1072.6mm of rainfall in February 2022, where the monthly average is 163.2mm (Bureau of Meteorology, 2022).

No.	Commitment	Evidence / Comments / Status
		Due to access issues in the southern portion of Stage 1 offset site and the prolonged wet season, resulting in large amounts of rainfalls, this combination prevented weed management works from occurring throughout the entirety of Stage 1. There also continues to be safety and accessibility issues with the remnant portion in the south-western area of the site due to the lack of maintained tracks and therefore was not treated for WONS. The current bush regeneration contractors, Phoenix Environmental Services, have begun discussions with Boral for proposed spraying within the southern portion of the offset site whereby the accessibility and safety issues can be reliably addressed. In accordance with the OMP, management of weeds occurred within the habitat rehabilitation portion of Stage 1, assisting with natural regeneration of native vegetation. Two plantings were completed within the Stage 1 offset area, being described as Plantation A and Plantation B (**Plan 5.2**). Plantation A occurred in October 2021, where 100 trees, shrubs and groundcovers were planted in an open area from previous land uses. Plantation B was completed in June 2021, with 40 trees planted for compensating the loss of vegetation with unintentional clearing of the neighbour's dam located within the offset area, discussed in Year 1 ACR. No further intervention in the form of plantings was identified as necessary as habitat quality scores remained stable since the baseline surveys, indicating slight improvement in habitat quality.
OMP-3	**Feral and pest fauna species management** Management measures for the control of feral or unwanted domestic dogs across the offset area include: • Baseline pest monitoring including motion activated cameras and scat analysis to identify evidence of feral or unwanted dogs (and other pest species), and development of a property wide feral animal management program specifying techniques (trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised, will be completed within 12 months of commencement of the action. • Where practical and appropriate, participate cooperatively in pest management planning and implementation with local land managers (government departments, local governments and utility providers) to ensure effective pest management in the locality of the offset area.	Baseline monitoring of pest species across the offset site was conducted by SHG in 2020 which identified a number of pest species within the offset area including *Canis familiaris* (Feral dog), *Sus scrofa* (Feral pig) and *Vulpes vulpes* (Red fox). The results of the baseline monitoring are detailed in the Vertebrate Pest Management Plan (VPMP) produced by SHG (refer **Appendix E**). The VPMP outlines specific pest management measures and methods to be undertaken throughout the life of the offset. Pest management was undertaken by Biodiversity Australia across the entire offset area, primarily targeting wild dogs. This included a pre-control camera monitoring program and subsequent predator trapping program. The camera trapping program was conducted between 13 April for two (2) weeks, utilising eight (8) cameras. Camera traps detected four (4) pest species were detected on-site including Wild dog, European Red fox, Feral cat and European hare. Wild

No.	Commitment	Evidence / Comments / Status
	• Install appropriate signage informing the area is under feral control. As the management of feral and pest species can only be achieved at a landscape level, management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension. Pest animal management and monitoring will be undertaken in accordance with the *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015* (Cwlth) and the *Biosecurity Act 2014* (Qld), which, in general, require all reasonable and practical steps to prevent or minimise biosecurity risks; minimise the likelihood of causing a 'biosecurity event'; and the limitation of consequences if such an event is caused. The control of pest animals will be undertaken using legal methods, by suitably qualified pest management contractor(s). Pest animal control is to be undertaken in a humane manner. Annual pest monitoring will be reported and outcomes of that monitoring included in the ACR. The annual pest management report is to provide detail on detected pests, control efforts, and total trapped/baited individuals during the given management period and identified trends of the population of pest animals within the offset area. Completion criteria for the offset site are as follows: • Dogs or evidence of dog presence are not detected on the offset area for a period of three years.	dogs were the most abundant pest species, followed by European hares and European Red Foxes. Soft-jaw trapping was completed from 26 April until 9 May 2022. This trapping resulted the removal of one (1) European Hare, two (2) European Red Foxes and one (1) feral dog. Pest trapping was completed by Pest Animal Management Queensland conducted in July 2021 for thirteen consecutive days (outside the year 1 reporting timeframe) which resulted in the trapping and removal of three (3) foxes. It is noted in the pest management report that the trapping period occurred during a period of low activity for wild dogs (refer to **Plan 6**). Refer **Appendix H** for Vertebrate Pest Management Report from Biodiversity Australia and report from Pest Animal Management Queensland.
OMP-4	**Bushfire Management Plan** Management measures will be outlined in the Bushfire Management Plan (BMP) for the control of bushfire across the offset area but will include: • Installation of firebreaks and fire trails. • Annual inspection and maintenance of firebreaks and access tracks required to achieve compliance with Offset Area Bushfire Management Plan. • Prescribed burning undertaken in consultation with, and under the guidance of the Queensland Rural Fire Brigade and in compliance with the *Fire and Emergency Services Act 1990*. • Use of domestic livestock or other methods to reduce fuel loads in the event that a fire risk professional (e.g. representative of Queensland Rural Fire Service) and a suitably qualified person deem that conditions are not	A Bushfire Management Plan was created for the site by Land and Environment Consultants (LEC) in accordance with OMP commitment 4 and details management measures that will be implemented across the site to reduce risk of bushfire. Fireland carried out an inspection of the offset site in September 2021. Fireland proposed to complete a controlled burn in early 2022 throughout FMU Zone 14 (refer to **Plan 7**) and completed an Operational Prescribed Burn Plan for the zone (refer to **Appendix H**). However, the large amounts of rainfall throughout February to April 2022, continued to delay the proposed controlled burn. Two to three weeks of dry weather conditions are required to dry out the site for the prescribed burn. Although outside of the Year 2 Reporting Period, this prescribed burn is proposed for July 2022, pending suitable weather.

No.	Commitment	Evidence / Comments / Status
	suitable for an ecological burn and that grazing is appropriate to manage a high level of fire risk. Level of risk (and any need to repeat this grazing cycle) is to be re-assessed by the aforementioned professionals following the grazing event. As the management of bushfires can only be achieved at a landscape level management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension. Monitoring requirements will be informed by the bush fire management plan and include regular review of access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of livestock.	Maintenance (dozing) of all accessible fire trails (where grading was required) was conducted in July 2021 by Boral in accordance with the management measures of the BMP. Firebreaks and access tracks as shown on Figure 4.1 of the BMP will be further maintained throughout the next reporting year (2021-2022). In accordance with the BMP, prescribed burn plans will be subsequently formulated for relevant fire management units. Refer **Appendix F** for Bushfire Management Plan (BMP).
OMP-5	**Koala habitat improvement** Management measures for each zone are detailed as: <u>Remnant vegetation</u> • Stop activities reducing habitat values, specifically selective logging and grazing. • Assisted natural regeneration practices where removed weeds leave open areas – replanting with locally endemic species. • Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage. <u>Habitat rehabilitation</u> • Assisted regeneration, seeding, or planting of endemic canopy tree species specifically selected to provide Koala habitat. • Removal of impediments to Koala movement such as old fences. • Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage. <u>Habitat revegetation</u> • Implementation of rehabilitation techniques that aim to promote the regeneration of native vegetation and improve habitat values: ○ Where natural regeneration is ineffective, implementation soil amelioration and seeding with native endemic seeds,	A Koala Habitat Management Plan (KHMP) (Rehabilitation Plan) was developed in Year 1 reporting period for the Stage 1 offset area which details strategies that will be implemented in order to achieve the Koala habitat rehabilitation aims set out in the OMP. The management zones relevant to the Stage 1 offset area include 'Remnant Vegetation' and 'Habitat Rehabilitation.' In accordance with the OMP, management of WONS, namely Lantana, occurred within the habitat rehabilitation portion of Stage 1, assisting with natural regeneration of native vegetation. Management of WONS was not able to be completed within the 'Remnant Vegetation' management area due to safety concerns in accessibility and current issues with addressing these concerns without degrading the structural integrity of the steep slope, by developing access tracks in strategic locations across it. This, in conjunction with a prolonged wet season, which reduced the window of suitable conditions for potential works to be carried out, constrained the ability to complete weed treatment within the remnant areas onsite. At present, a plan is being discussed to provide safe, effective access to these areas during dry weather, to allow personnel to carry weed treatment equipment and successfully treat weeds in the area, while maintaining the integrity of the landform. Annual habitat quality monitoring of Koala habitat using the Modified Habitat Quality Assessment (MHQA) technique was conducted across the Stage 1 offset area during the 2021/2022 reporting period. MHQA scores for the Stage 1 area are reported within this ACR. This includes Transect 1 within the 'Remnant Vegetation' management area and Transect 3 and 4 within the 'Habitat Rehabilitation' management area (refer **Plan 3**).

No.	Commitment	Evidence / Comments / Status
	○ Where natural regeneration and / or seeding is ineffective, planting of endemic trees and shrubs specifically selected to provide Koala habitat • Management of the revegetated areas to ensure habitat density requirements are achieved. • Removal of impediments to Koala movement such as old fences. • Protecting revegetated areas from cattle and horses through the implementation of fauna friendly fencing. • Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage. Performance criteria for the offset are as follows: • Rehabilitation plans for each stage of offset delivery developed within 6 months of the commencement of the corresponding clearing stage. • Natural regeneration, seeding or planting to commence within 12 months of the commencement of the corresponding quarry clearing stage. • Planted areas will have a 90% plant survival rate after 12 months of planting being carried out. • Areas allowed to regenerate will display signs of native vegetation regrowth at rates expected for those species. • Habitat quality monitoring will be completed annually for the first three years after commencement of the operation and every five years ongoing. • Habitat quality will be maintained at the current values (7/10 for remnant areas and 6/10 for rehabilitation and revegetation areas) and display signs of improvement within 5 years of the commencement of improvement works. Completion criteria for the offset site are as follows: • Offset zones reach the habitat quality scores identified in the Amended Offsets Strategy (values below): ○ Remnant areas improve from a habitat quality score of 7/10 to 8/10 ○ Rehabilitation and revegetation areas improve from a habitat quality score of 6/10 to 8/10 ○ Koala habitat quality will be assessed using the modified habitat quality assessment method detailed in the Amended Offsets Strategy. Any alternate methodology would require prior agreement between Boral and DAWE.	Transect 1 within 'Remnant Vegetation' management area (mapped as RE12.11.3a) achieved a rounded score of 6/10 (refer **Table 4**), representing an increase in score from 5.88 to 6.13/10 from the baseline (2019) surveys. Transect 3 & 4 within 'Habitat Rehabilitation Area' (RE12.11.18) achieved a rounded score of 6/10 (refer Table 5), representing an increase in habitat quality score from 6.33 to 6.38/10 from the baseline (2019) surveys. As a result, both the 'Remnant Vegetation Management Area' and the 'Habitat Rehabilitation' management area saw a minor increase in habitat quality from baseline studies conducted in 2019, confirming Koala habitat quality has been maintained during Year 2 in accordance with the requirements of the OMP (refer **Table 6**). No further intervention in the form of plantings was identified as necessary and suitable based on the achievement of stable and slowly increasing habitat quality scores from the 2019 baseline assessment surveys. As reduction of WONS (specifically lantana) is identified as a core requirement of rehabilitation, providing suitable conditions for assisted natural regeneration, this technique was utilised to maximise opportunities for native vegetation to regrow, at this stage of the offset

No.	Commitment	Evidence / Comments / Status
	• Koala habitat quality remains at target values or better for two consecutive five-year monitoring events.	

Table 4: Modified Habitat Quality Assessment – Transect 1 / Remnant Vegetation Management Area / RE12.11.3a

Attribute	Condition characteristics	Score (RE12.11.3a)
Site Condition (30 %)	Recruitment of woody perennial species	5/5
	Native plant species richness - trees	2.5/5
	Native plant species richness - shrubs	2.5/5
	Native plant species richness - grasses	2.5/5
	Native plant species richness - forbs	2.5/5
	Tree canopy height	5/5
	Tree canopy cover	3.5/5
	Shrub canopy cover	3/5
	Native perennial grass cover	1/5
	Organic litter	5/5
	Large trees	10/15
	Coarse woody debris	0/5
	Weed cover	0/10
	Quality and availability of food and foraging habitat	10/10
	Quality and availability of shelter	10/10
	Site condition score	**62.5/100**
	Site condition score (out of 3)	**1.88**
Site Context (30 %)	Size of the patch	10/10
	Connectedness	4/5
	Context	4/5
	Ecological corridors	6/6
	Role of site location to species overall population in the State	4/5
	Threats to the species	7/15
	Species mobility capacity	7/10
	Site context score	**42/56**
	Site context score (out of 3)	**2.25**
Species Stocking Rate (40 %)	SAT survey results	20/40
	Koala population (density of 0.02 – 0.08 Koalas per ha)	-
	Species stocking rate score	**20/40**
	Species stocking rate score (out of 3)	**2**
Unit Scores Total		**6.13 (rounded to 6)**

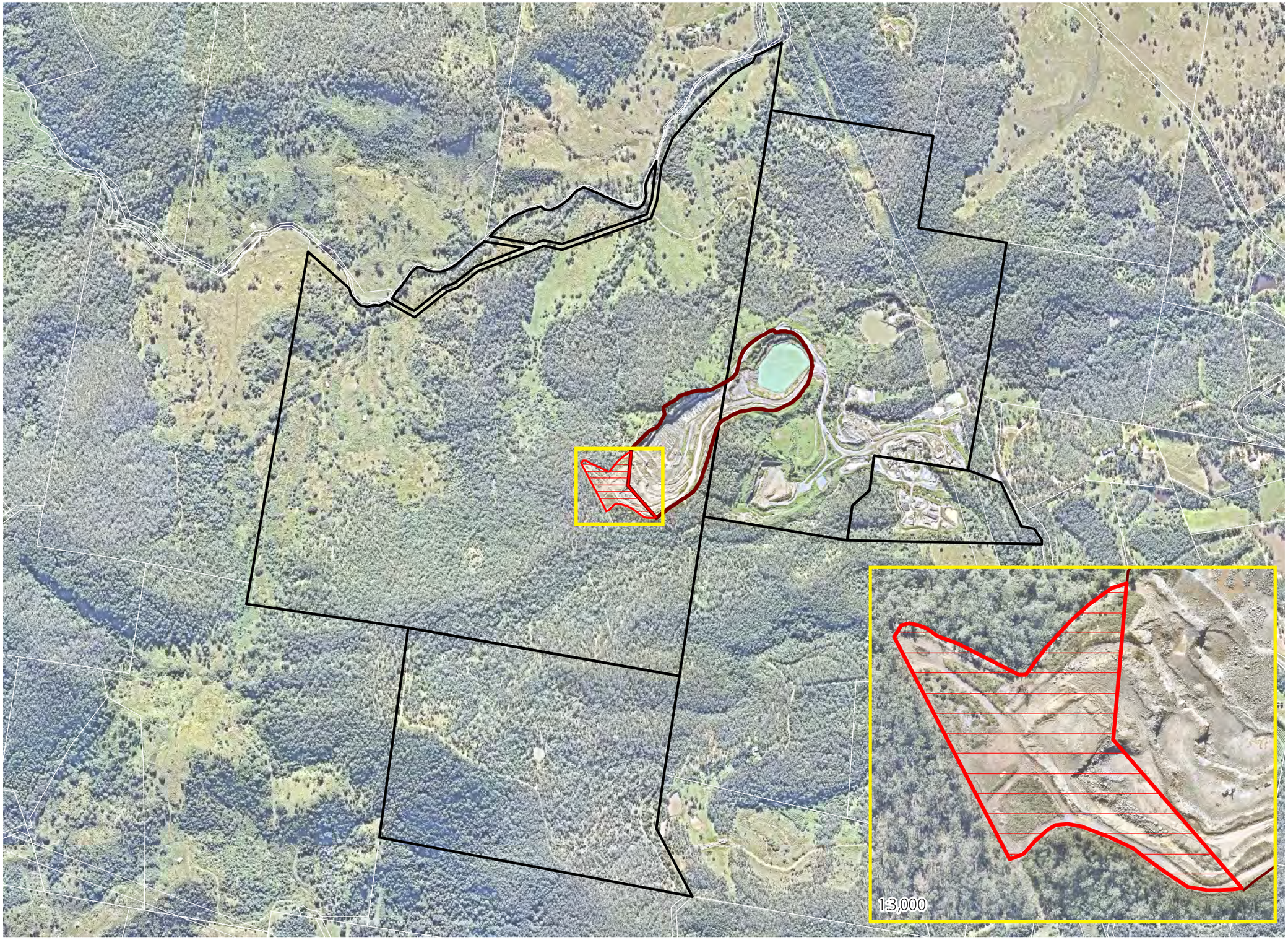
Table 5: Modified Habitat Quality Assessment – Transect 3 & 4 / Habitat Rehabilitation Area / RE12.11.18

Attribute	Condition characteristics	Score (RE12.11.18)
Site Condition (30 %)	Recruitment of woody perennial species	5/5
	Native plant species richness - trees	5/5
	Native plant species richness - shrubs	5/5
	Native plant species richness - grasses	2.5/5
	Native plant species richness - forbs	2.5/5
	Tree canopy height	5/5
	Tree canopy cover	5/5
	Shrub canopy cover	3/5
	Native perennial grass cover	5/5
	Organic litter	3/5
	Large trees	5/15
	Coarse woody debris	0/5
	Weed cover	5/10
	Quality and availability of food and foraging habitat	10/10
	Quality and availability of shelter	10/10
	Site condition score	**71/100**
	Site condition score (out of 3)	**2.13**
Site Context (30 %)	Size of the patch	10/10
	Connectedness	4/5
	Context	4/5
	Ecological corridors	6/6
	Role of site location to species overall population in the State	4/5
	Threats to the species	7/15
	Species mobility capacity	7/10
	Site context score	**42/56**
	Site context score (out of 3)	**2.25**
Species Stocking Rate (40 %)	SAT survey results	20/40
	Koala population (density of 0.02 – 0.08 Koalas per ha)	-
	Species stocking rate score	**20/40**
	Species stocking rate score (out of 4)	**2**
Unit Scores Total		**6.38 (rounded to 6)**

Table 6: Comparison of MHQA scores

Biocondition Score	Baseline (2019)	Year 2 (2021)	Comment
Transect 1			
Site condition	1.7	1.88	
Site context	2.1	2.25	Minor increase in score
Species stocking rate	2.0	2	
Total	**5.88**	**6.13**	
Transect 3&4			
Site condition	2.2	2.13	
Site context	2.1	2.25	Minor increase in score
Species stocking rate	2.0	2	
Total	**6.33**	**6.38**	

1. Stage 1 Clearing Extent (Year 2)



Notes:
This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources

Legend

- Qld DCDB
- Boral land holdings
- Existing quarry/cleared area
- Clearing extent prior to ACR Year 1 [2.6 ha]

No clearing occurred on-site during the second reporting period (ACR Year 2).

Issue	Date	Description	Drawn	Checked
A	13/07/2022	Preliminary	TF	KH

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:14,000 @ A3

Address / RPD: 53/RP895391

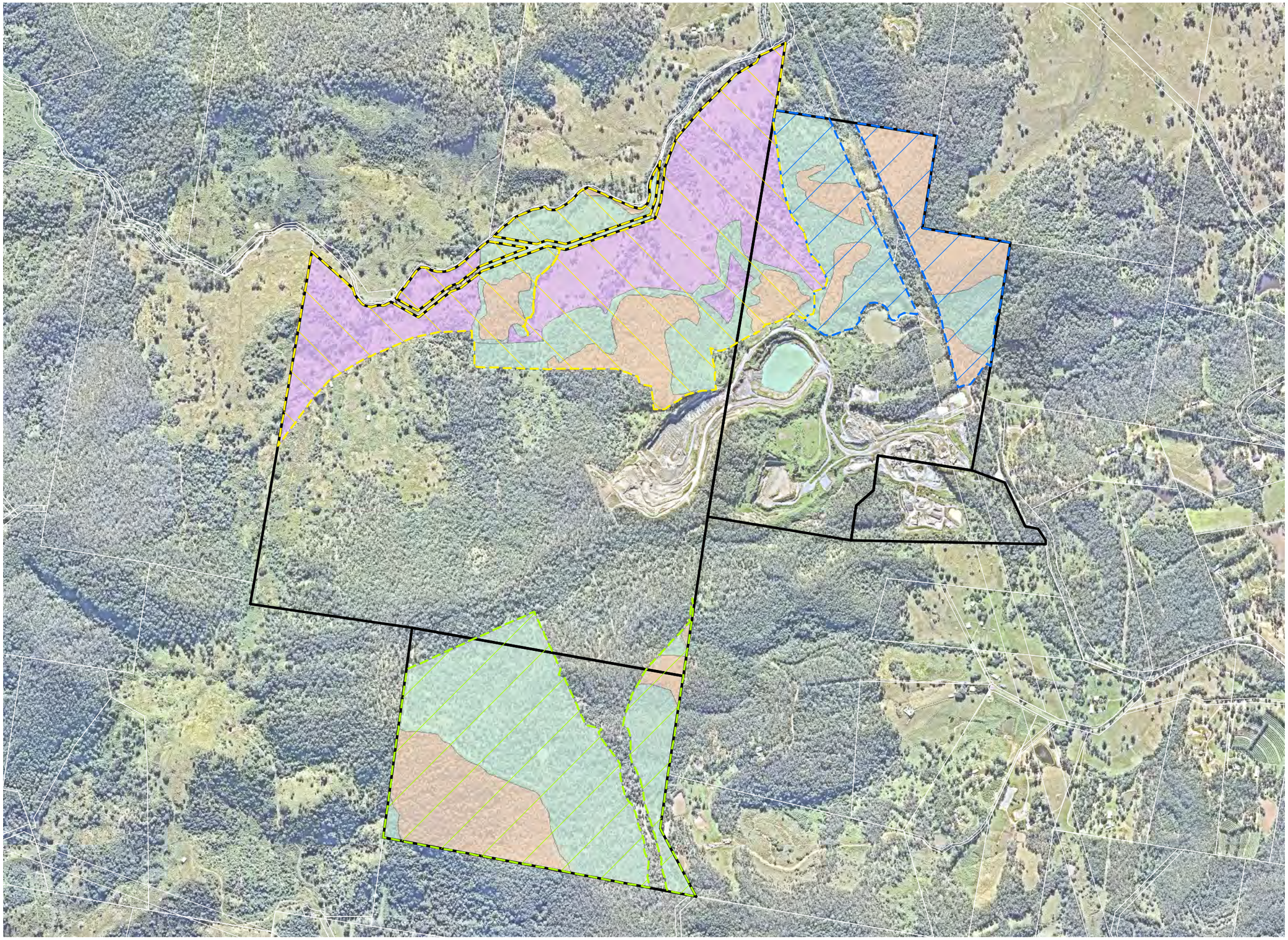
13/07/2022 | 10232 E 01 ACR2 Stage 1 Clearing Extent A

saunders havill group

Boral Resources (Qld) Pty Ltd

Narangba Quarry

2.1. Offset Area - Habitat Management Zones



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Layer Sources

Legend

Qld DCDB

Boral land holdings

Offset staging

Stage 1 [73.6 ha]

Stage 2 [41.1 ha]

Stage 3 [106.1 ha]

Habitat Management Zones

Remnant Vegetation Management Areas (57.9 ha)

Habitat Rehabilitation Areas (101.9 ha)

Habitat Revegetation Areas (62.7 ha)

Issue	Date	Description	Drawn	Checked
A	12/07/2022	Preliminary	TF	KH

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:14,000 @ A3

Address / RPD: 53/RP895391

12/07/2022 | 10232 E 02 1 ACR2 Offset Area HMZ A

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Boral Resources (Qld) Pty Ltd

Narangba Quarry

2.2. Stage 1 Offset - Habitat Management Zones

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Layer Sources

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Legend

Qld DCDB

Boral land holdings

Offset staging

Stage 1 [73.6 ha]

Stage 1 Habitat Management Zones

Remnant Vegetation Management Areas (22.1 ha)

Habitat Rehabilitation Areas (51.5 ha)

Issue	Date	Description	Drawn	Checked
A	12/07/2022	Preliminary	TF	KH

0 100 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

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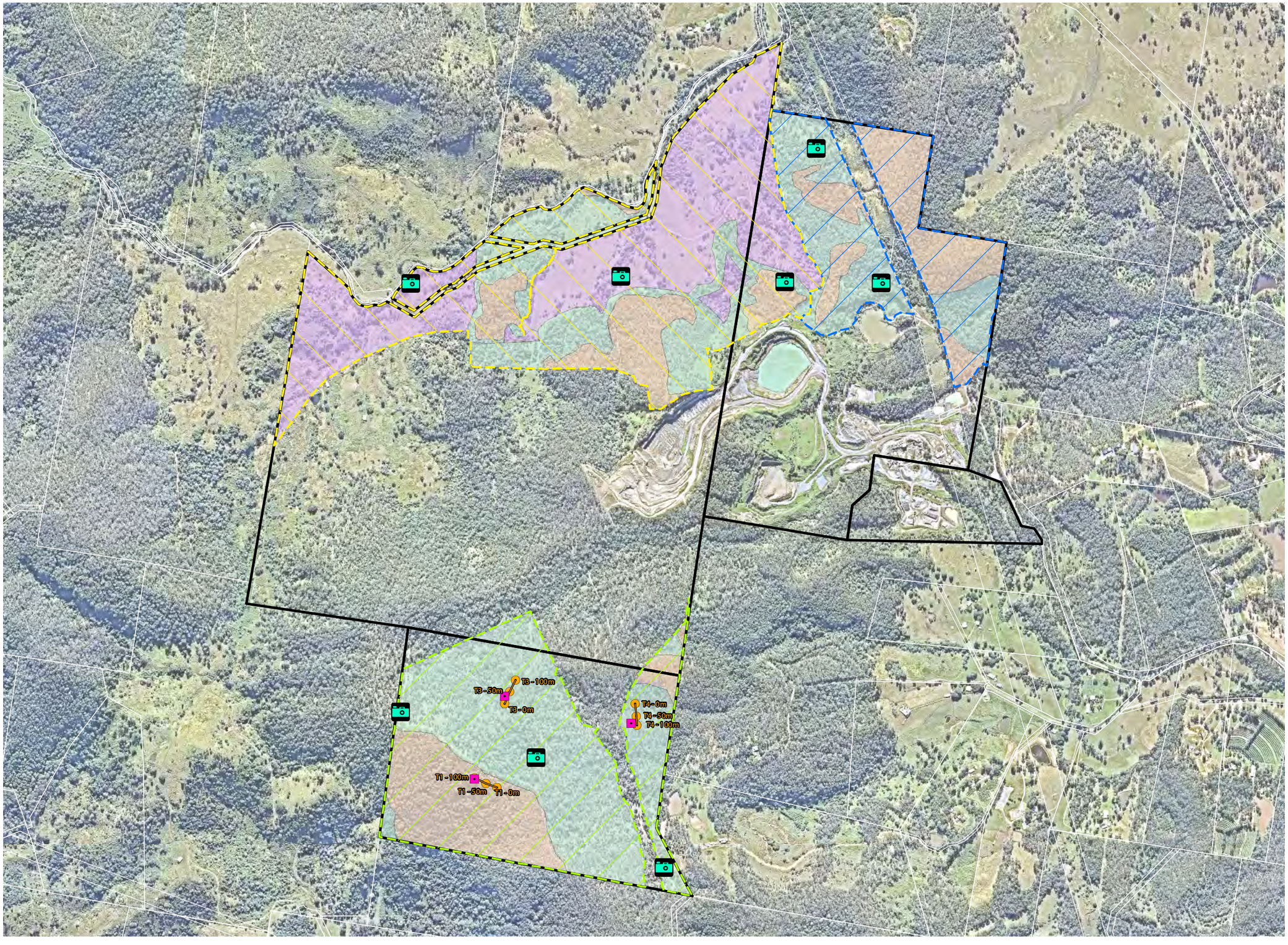
Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

12/07/2022 | 10232 E 02 2 ACR2 Offset Area Stage 1 HMZ A

3. Modified Habitat Quality Transects & Field Effort



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Layer Sources

Legend

- Qld DCDB
- Boral land holdings

Offset staging

- Stage 1 [73.6 ha]
- Stage 2 [41.1 ha]
- Stage 3 [106.1 ha]

Habitat Management Zones

- Remnant Vegetation Management Areas (57.9 ha)
- Habitat Rehabilitation Areas (101.9 ha)
- Habitat Revegetation Areas (62.7 ha)
- Modified habitat quality transects
- Modified habitat quality transects points
- Motion detection camera
- Koala SAT

Issue	Date	Description	Drawn	Checked
A	12/07/2022	Preliminary	TF	KH

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:14,000 @ A3

saunders havill group

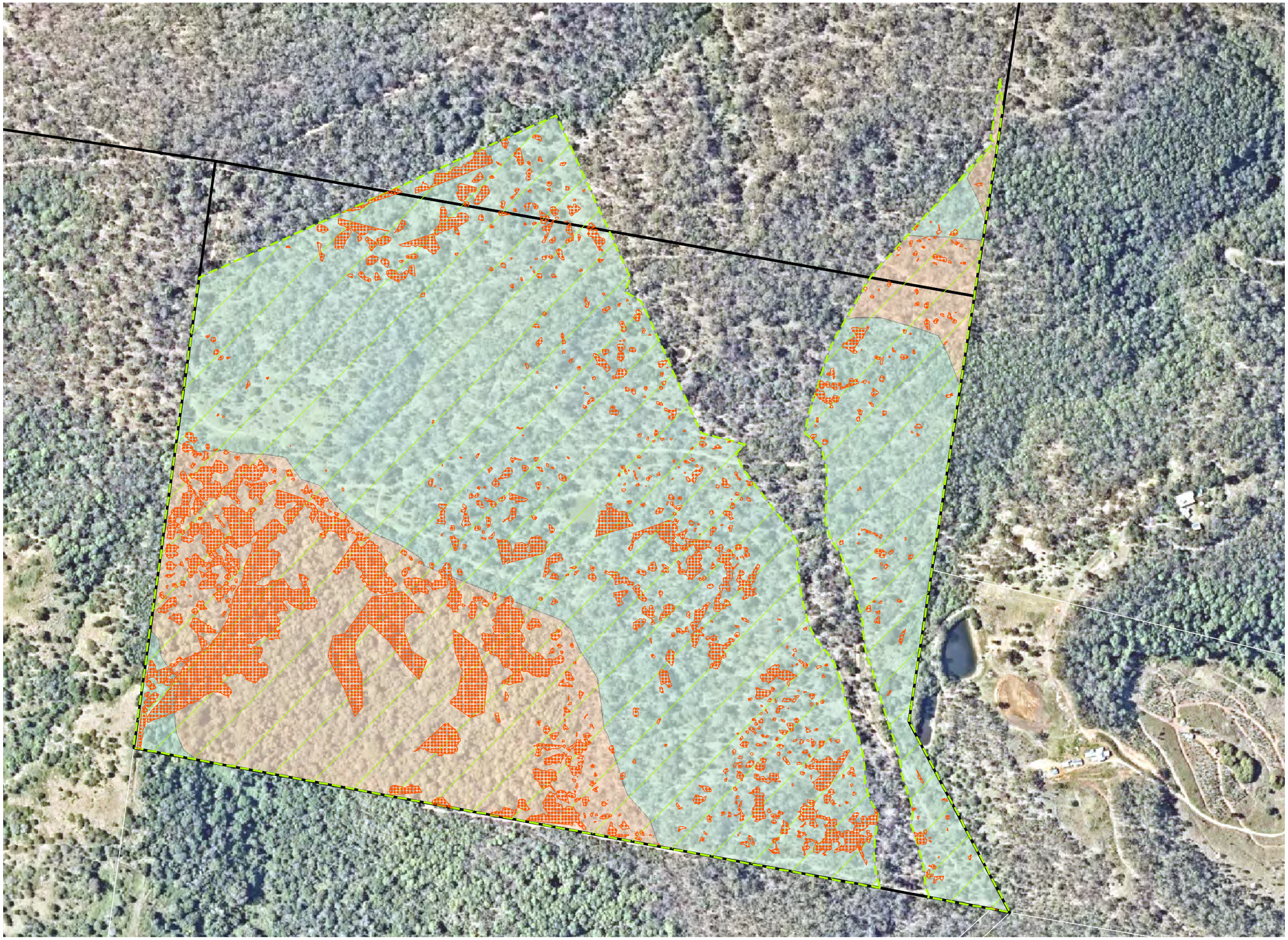
Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

12/07/2022 | 10232 E 03 ACR2 MHQTA

4. Weed Mapping Results



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Layer Sources

Legend

Qld DCDB

Boral land holdings

Offset staging

Stage 1 [73.6 ha]

Stage 1 Habitat Management Zones

Remnant Vegetation Management Areas (22.1 ha)

Habitat Rehabilitation Areas (51.5 ha)

Weed areas

Lantana [9.19 ha]

Issue	Date	Description	Drawn	Checked
B	13/07/2022	Client updates	TF	KH

0 100 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

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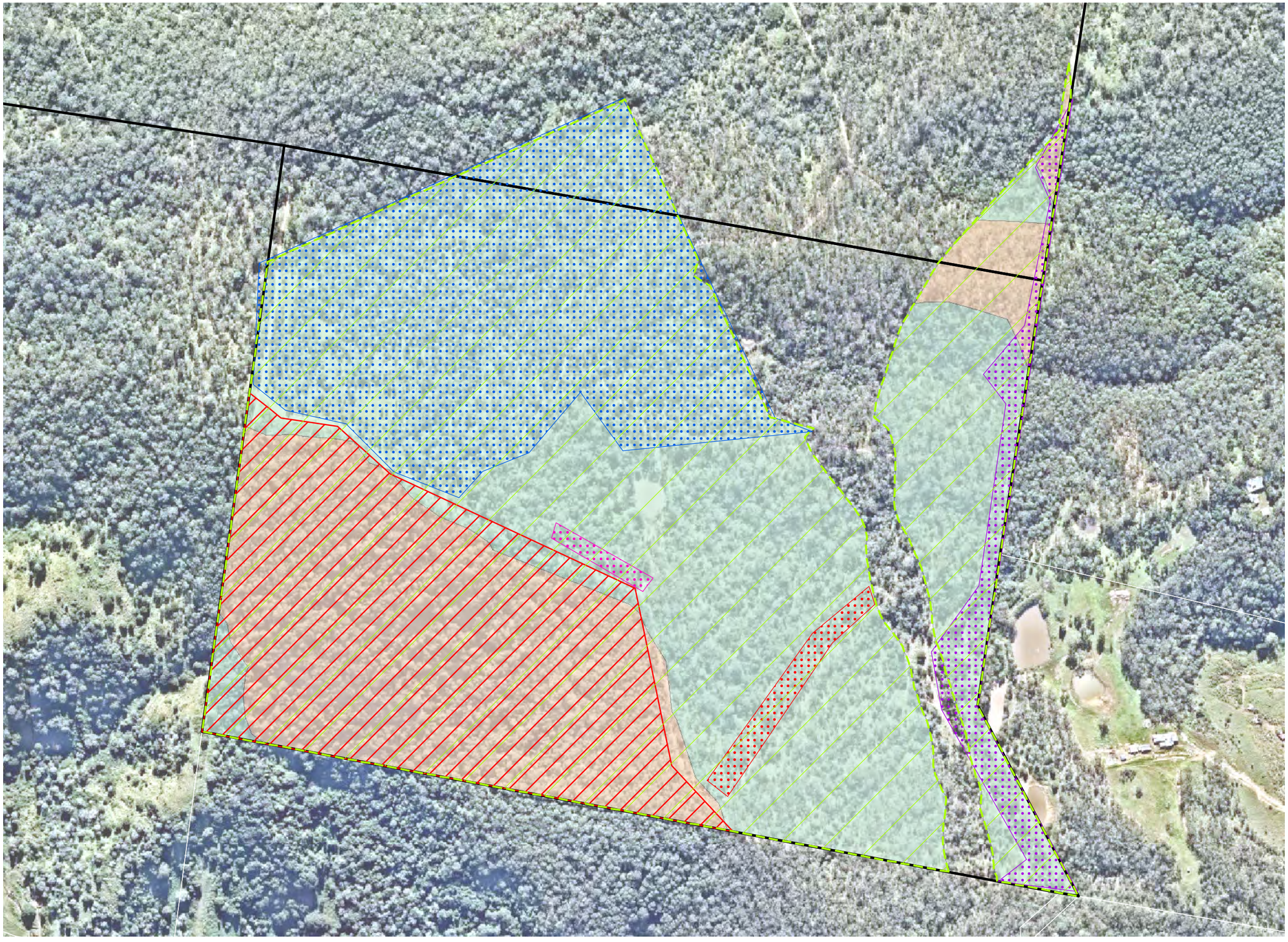
Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

13/07/2022 | 10232 E 04 ACR2 Weed Mapping Results B

5.1. Stage 1 Weed Management Areas



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Layer Sources

Legend

- Qld DCDB
- Boral land holdings

Offset staging

- Stage 1 [73.6 ha]

Rehabilitation Areas

- Remnant Vegetation Management
- Habitat Revegetation

Weed Management Areas

- 2021-2022 Weed Management Area A
- 2021-2022 Weed Management Area B
- 2021-2022 Weed Management Area C
- 2022 Weed Management Area A
- Hazard Zone (No Weed Management)

Issue	Date	Description	Drawn	Checked
A	8/08/2022	Preliminary	TF	KH

0 — 100 — 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

saunders havill group

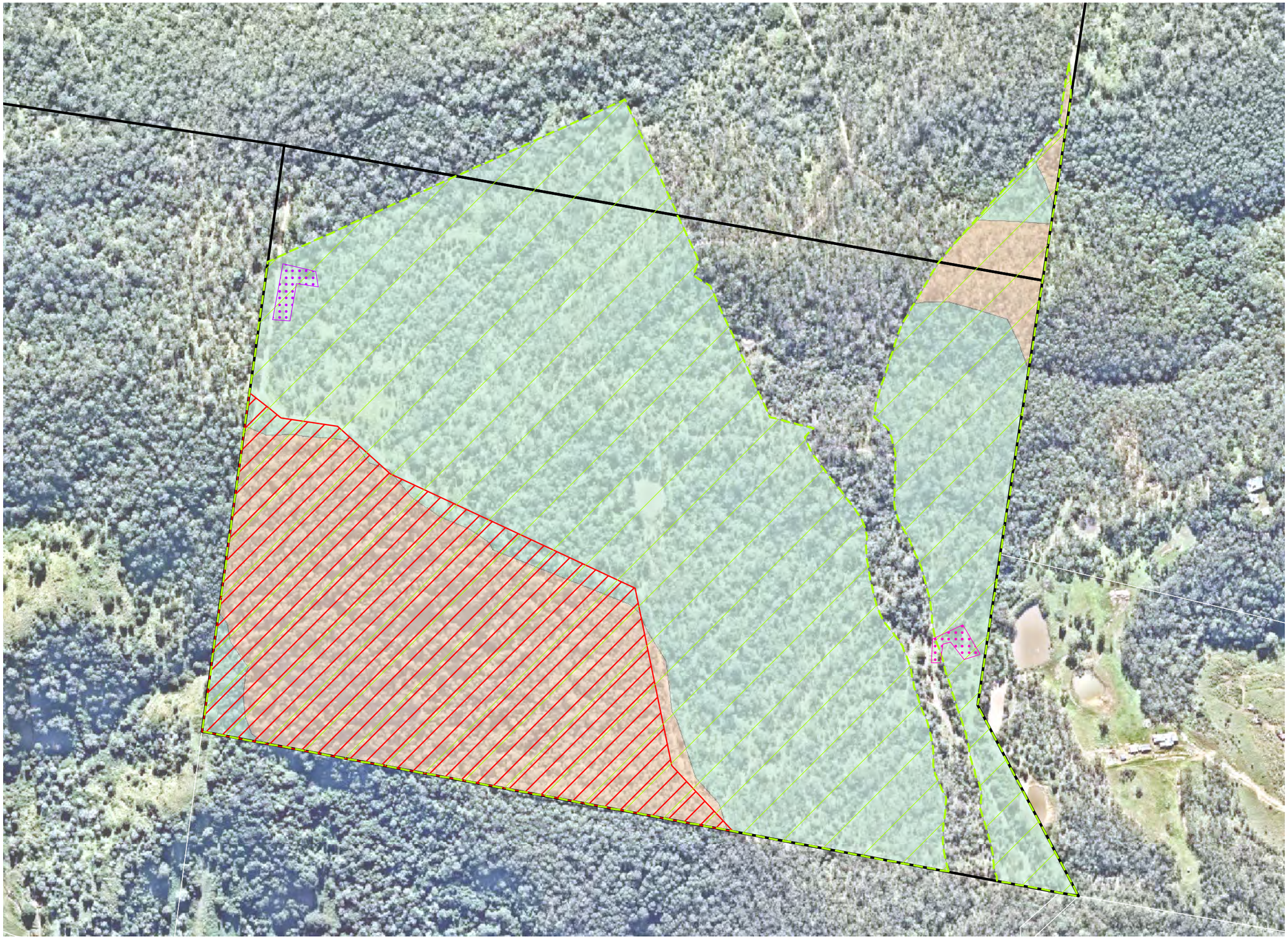
Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

8/08/2022 | 10232 E 05_1 ACR2 Weed Management Areas A

5.2. Stage 1 Planting Areas



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Layer Sources

Legend

- Qld DCDB
- Boral land holdings

Offset staging

- Stage 1 [73.6 ha]

Rehabilitation Areas

- Remnant Vegetation Management
- Habitat Revegetation

Planting Areas

- June 2021 Planting Area
- November 2021 Planting Area
- Hazard Zone (No Weed Management)

Issue	Date	Description	Drawn	Checked
A	8/08/2022	Preliminary	TF	KH

0 — 100 — 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

saunders havill group

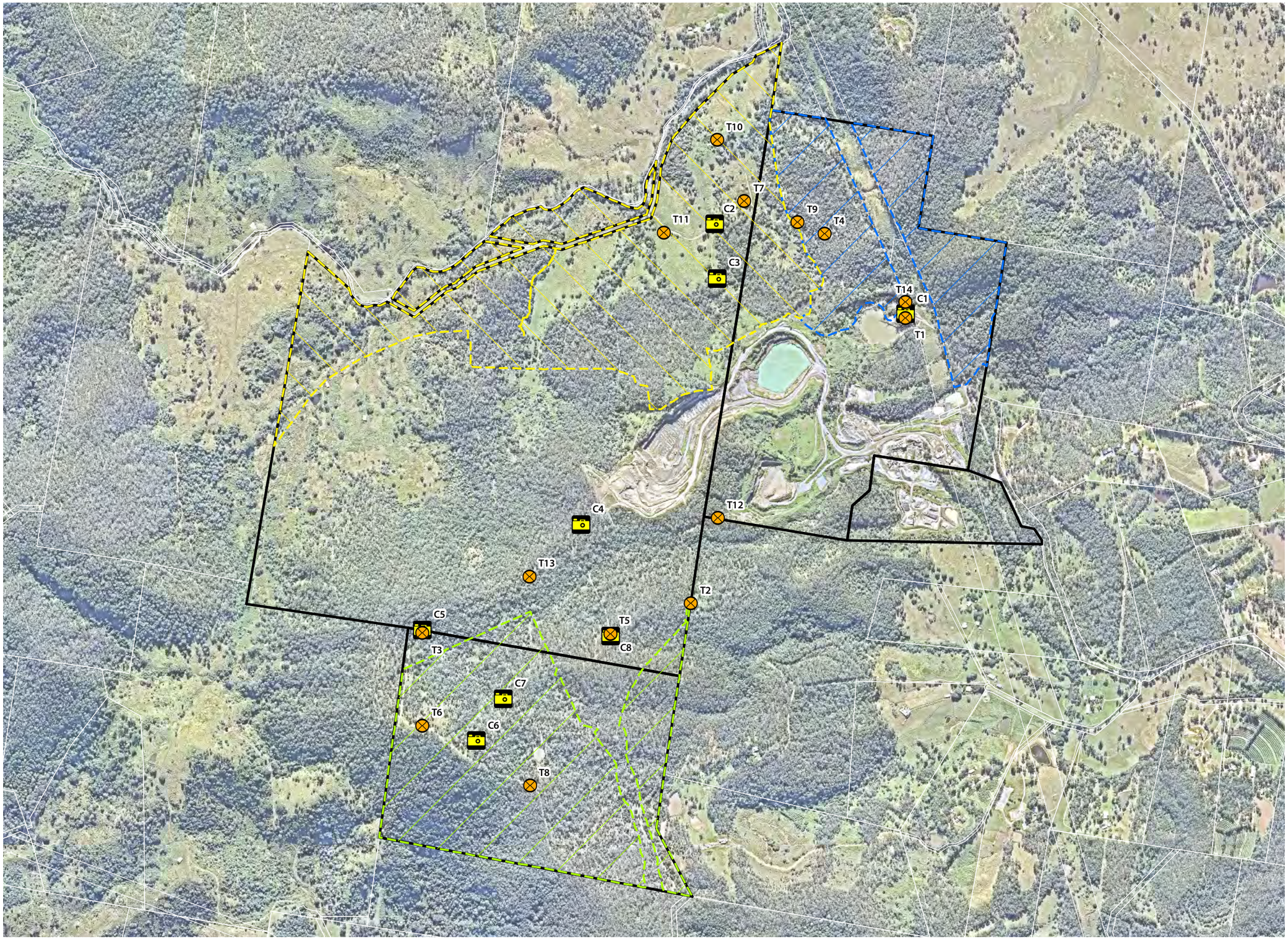
Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

8/08/2022 | 10232 E 05_2 ACR2 Planting Areas A

6. Vertebrate Pest Management Locations



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Layer Sources

Legend

- Qld DCDB
- Boral land holdings
- Camera Trap Locations
- Trap Locations

Offset staging

- Stage 1 [73.6 ha]
- Stage 2 [41.1 ha]
- Stage 3 [106.1 ha]

Issue	Date	Description	Drawn	Checked
A	22/07/2022	Preliminary	TF	KH

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:14,000 @ A3

Address / RPD: 53/RP895391

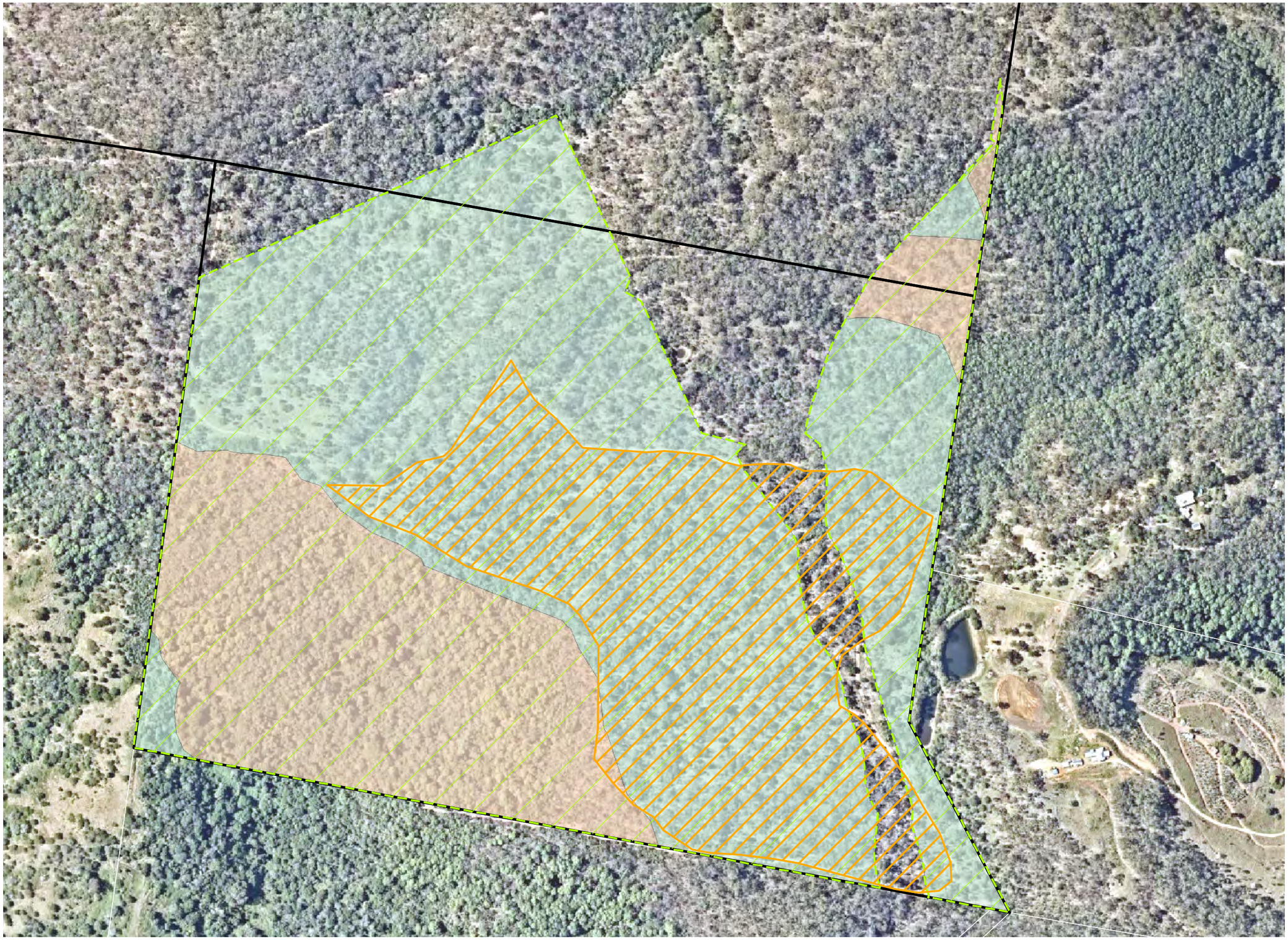
22/07/2022 | 10232 E 06 Pest Management Areas A

saunders havill group

Boral Resources (Qld) Pty Ltd

Narangba Quarry

7. Bushfire Management Area



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Layer Sources

Legend

Qld DCDB

Boral land holdings

Offset staging

Stage 1 [73.6 ha]

Stage 1 Habitat Management Zones

Remnant Vegetation Management Areas (22.1 ha)

Habitat Rehabilitation Areas (51.5 ha)

Bushfire Management Area

Issue	Date	Description	Drawn	Checked
B	12/07/2022	Client updates	TF	KH

0 100 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

saunders havill group

Boral Resources (Qld) Pty Ltd

Narangba Quarry

Address / RPD: 53/RP895391

12/07/2022 | 10232 E 07 ACR2 Bushfire Management Area A

3. EPBC Conditions and Compliance

Table 7 details the Conditions attached to the Narangba OMP Approval (EPBC 2014/7351). Sections 2-5 above provide details on process, steps and methodologies used to achieve the Conditions under the approval.

Table 7: Compliance Audit of EPBC 2014/7351 Conditions for Narangba Quarry

Date of decision	Condition Number / Reference	Condition	Is the Project compliant with this condition?	Evidence / Comments
19/08/2016	**1**	The approval holder must only undertake the action on the project site shown at Appendix A.	Compliant	The area of clearing on-site has occurred only within the Project area. Refer **Plan 1** for clearing locations.
19/08/2016	**2**	The approval holder must not clear more than 52 hectares of Koala habitat on the project site.	Compliant	A total of 2.6 ha of Koala habitat within the project has been cleared since the commencement action in 2020. No additional clearing has occurred within Year 2 Reporting Period.
10/08/2019 (variation)	**3**	To offset the loss of koala habitat, the approval holder must, by the 1 December 2018, submit an Offset Strategy for the Minister's written approval. The Offset Strategy must be consistent with the *EPBC Act Environmental Offsets Policy (2012)*, and must: a) confirm use of the offset area proposed in the preliminary documentation; and/or b) include the details of, and justification for, one or more other proposed offset area/s; and c) detail the process, including for preparation of the Offset Area Management Plan specified in Condition 3A, to ensure the offset area(s) is/are legally secured. The approved Offset Strategy must be implemented.	Compliant	Written approval for the Amended Environmental Offset Strategy was provided by the Minister on 10th August 2019 (refer **Appendix A**).

Date of decision	Condition Number / Reference	Condition	Is the Project compliant with this condition?	Evidence / Comments
10/08/2019 (variation)	**3A**	To offset the loss of koala habitat, the approval holder must submit an Offset Area Management Plan (OAMP) for the Minister's written approval. The OAMP must be prepared in accordance with the Department's Environmental Management Plan Guidelines, and must: a) be consistent with the approved Offset Strategy and the EPBC Act Environmental Offsets Policy (2012); b) include performance and completion criteria to protect koalas and manage koala habitat; c) describe the management measures that will be implemented to achieve and maintain the performance and completion criteria, including discussion of how those measures take into account relevant conservation advice; and d) include a program to monitor (including detecting triggers) and report on the effectiveness of these measures, including triggers and corrective actions, and progress against performance and completion criteria. e) The approval holder must not commence the action until the OAMP is approved by the Minister in writing. The approved OAMP must be implemented.	Compliant	An Offset Management Plan (OMP) was prepared by Saunders Havill Group and submitted on 6th November 2019. The OMP delineates the extent of three (3) management zones which are the 'Remnant Vegetation', 'Habitat Rehabilitation' and 'Habitat Revegetation' zones and details specific management measures to be implemented with each management zone of the offset site. Compliance with the management actions detailed in the OMP are addressed in **Table 3**.
10/08/2019 (variation)	**3B**	The approval holder must legally secure the offset area/s specified in the approved Offset Strategy by 28 February 2020.	Compliant	The Proponent legally secured the offset via a Voluntary Declaration under the *Vegetation Management Act 1999* on the 24th February 2020 (refer **Appendix B**). In accordance with Condition 3B, the offset was legally secured prior to the official commencement of the action on the 12th May 2020.
19/08/2016	**4**	The approval holder must implement the sediment and erosion stormwater management plans, as required under the Queensland *Environmental Protection Act 1994*, Environmental Protection Regulation 2008 and the Environmental Protection (Water) Policy 2009.	Compliant	The Proponent implemented the sediment and erosion stormwater management plans as required, across the operating quarry site throughout the extent of Year 2.
19/08/2016	**5**	Within 20 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	Compliant	The Department was notified on the 4th June 2020 that the action commenced on the 12th May 2020 which is 18 business days after the commencement date. Thus, notification was provided within the 20-day timeframe.

Date of decision	Condition Number / Reference	Condition	Is the Project compliant with this condition?	Evidence / Comments
19/08/2016	**6**	The approval holder must maintain accurate records substantiating all activities and outcomes associated with or relevant to the conditions of approval, including measures taken to implement the management plans and demonstrate the outcomes required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	All records substantiating activities associated with or relevant to the conditions of approval are maintained by the Proponent. If required by the Minister, these records can be made available to allow a third party audit of the Project.
19/08/2016	**7**	Unless otherwise agreed to in writing by the Minister, within three months of every 12 month anniversary of the commencement of the action, the approval holder must publish a report on its website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and details of non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published. Reports must remain published for the life of the approval. The person taking the action must continue to publish this report each year until such time as agreed to in writing by the Minister.	Compliant	The Annual Compliance Report for Year 2 of the approval was published on the website prior to 12 August 2022. Year 1 Annual Compliance report remain accessible via the link below. The website link for the proponent is below: <https://www.boral.com.au/locations/boral-quarries-narangba>
19/08/2016	**8**	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor and audit criteria must be approved by the Minister prior to the commencement of the audit. The audit report must address the approved criteria to the satisfaction of the Minister.	Not applicable	A request for an independent audit of the Project was not made by the Minister during the reporting period.
19/08/2016	**9**	The approval holder may choose to revise a plan approved by the Minister under the conditions without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised plan would not be likely to have a new or increased impact. If the approval holder makes this choice it must: a) notify the Department in writing that the approved plan has been revised and provide the Department with: (i) an electronic copy of the revised plan or program;	Not applicable	The Proponent did not choose to enact this right during the reporting period.

Date of decision	Condition Number / Reference	Condition	Is the Project compliant with this condition?	Evidence / Comments
		(ii) an explanation of the differences between the revised plan or program and the approved plan or program; and (iii) the reasons the person taking the action considers that taking the action in accordance with the revised plan or program would not be likely to have a new or increased impact; b) declare in writing a date on which the revised plan or program will first be implemented by the approval holder. That date of first implementation must be at least 28 days after sub-condition 9a is satisfied.		
19/08/2016	**10**	Condition 9 does not apply if the revisions to the approved plan, include changes to environmental offsets provided under the plan, in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the Minister. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, would, or would not, be likely to have new or increased impacts.	Not applicable	The Proponent did not choose to enact this right during the reporting period.
19/08/2016	**11**	The approval holder may revoke its choice under condition 9 at any time by giving written notice to the Department in which case, commencing on the day after giving such notice, the approval holder must implement the plan previously submitted for approval. If the approval holder revokes the choice to implement a revised plan, without approval under section 143A of the Act, the plan or strategy most recently approved by the Minister must be implemented.	Not applicable	The Proponent did not choose to enact this right during the reporting period.
19/08/2016	**12**	If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the revised plan would be likely to have a new or increased impact, then: a) condition 9 does not apply, or ceases to apply, in relation to the revised plan; and b) the approval holder must implement the plan previously submitted for approval and approved by the Minister. To avoid any doubt, this condition does not affect any operation of conditions 9 and 10 in the period before the day the notice is given. At the time of giving the notice the Minister may also notify that for	Not applicable	The Proponent did not choose to enact this right during the reporting period.

Date of decision	Condition Number / Reference	Condition	Is the Project compliant with this condition?	Evidence / Comments
		a specified period of time that condition 9 does not apply for one or more specified plans required under the approval.		
19/08/2016	**13**	Conditions 9, 10 and 11 are not intended to limit the operation of section dated 143A of the EPBC Act which allows the approval holder to submit a 19/08/2016 revised plan or strategy to the Minister for approval.	Not applicable	The Proponent did not choose to enact this right during the reporting period.
19/08/2016	**14**	The approval holder must report any contravention of the conditions of this approval to the Department within 2 business days of the approval holder becoming aware of the contravention.	Compliant	No incidents have occurred within the Year 2 reporting period. A minor clearing incident occurred in the Year 1 reporting period and was reported by Boral to the Department.
19/08/2016	**15**	If, at any time after 5 years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minister.	Not applicable	The action commenced on 12th May 2020; therefore, this condition is not applicable.
19/08/2016	**16**	Unless otherwise agreed to in writing by the Minister, the approval holder must publish all management plans and reports, referred to in these conditions of approval on its website. Each management plan must be published on the website within one month of being approved by the Minister or submitted under condition 9a. All published reports must remain on website for the life of the approval unless otherwise agreed to in writing by the Minister.	Compliant	The approved Management Plans detailed within the referral conditions were uploaded within 1 month of being approved. The conditioned plans include the Offset Management Plan (OMP) and the Offsets Strategy were uploaded prior to the commencement of the action. The website link for the proponent is below: <https://www.boral.com.au/locations/boral-quarries-narangba>

4. Non-compliances

4.1. Weed Management

The OMP states that all WONS will be treated within 12 months of the commencement of each stage of clearing for the Action. As detailed in **Section 2.4, Table 3**, management of WONS was not able to be completed across the entirety of the Stage 1 Offset area. Management of WONS was not able to be completed within the 'Remnant Vegetation' management area due to safety concerns in accessibility and current issues with addressing these concerns without degrading the structural integrity of the steep slope, by developing access tracks in strategic locations across it. This, in conjunction with a prolonged and extreme wet season, which reduced the window of suitable conditions for potential works to be carried out, constrained the ability to complete weed treatment within the remnant areas onsite. At present, an option to provide safe, effective access to these areas during dry weather, to allow personnel to carry weed treatment equipment and successfully treat weeds in the area, while maintaining the integrity of the landform, is being developed to integrate into onsite management.

While a large area of WONS has been treated this is not 100%, therefore, this is identified as a minor non-compliance under the requirements of the OMP.

The current bushland regeneration contractors, Phoenix Environmental Services, have had discussions with Boral about the approach for weed management within the remnant portion of the Stage 1, with proposed spraying to occur within these areas.

5. Appendices

Appendix A
EPBC Approval Conditions (EPBC 2014/7351)

Appendix B
Offset Area Voluntary Declaration Package

Appendix C
Written Notification of Commencement of Action

Appendix D
Weed Management Plan

Appendix E
Vertebrate Pest Management Plan

Appendix F
Bushfire Management Plan

Appendix G
Koala Habitat Management Plan

Appendix H
Year 2 Contractor Reports

Appendix A

EPBC Approval Conditions (EPBC 2014/7351)

Approval

Narangba Quarry Expansion, Raynbird Road, Narangba, Queensland (EPBC 2014/7351).

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Boral Resources (QLD) Pty Limited
proponent's ACN (if applicable)	ACN: 009 671 809
proposed action	Fifty six hectare (56 ha) expansion of the existing Narangba Quarry, including clearing of 52 ha of vegetation. The quarry expansion site is located on Raynbird Road, 18 km south of Caboolture; as described in the referral received by the Department on 30 September 2014 [See EPBC Act referral 2014/7351].

DECISION to approve:

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approve

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 18 August 2076.

Decision-maker

name and position	James Barker Assistant Secretary Assessments (Qld, Tas, Vic) and Sea Dumping Branch
signature	
date of decision	19/8/2016

Conditions attached to the approval

1. The **approval holder** must only undertake the **action** on the **project site** shown at Appendix A.

2. The **approval holder** must not clear more than 52 hectares of **koala habitat** on the **project site**.

3. The **approval holder** must submit an Offset Management Plan for the **Minister's** written approval. The Offset Management Plan must:
   a. be consistent with the offset proposed in the **preliminary documentation** and the **EPBC Act Environmental Offsets Policy (2012)**;
   b. include a description of the management measures that will be implemented for the protection of koala and **koala habitat**, including discussion of how measures outlined take into account relevant conservation advice;
   c. include a program to monitor and report on the effectiveness of these measures, and progress against performance and completion criteria; and
   d. outline the process to obtain the legal mechanism for securing the offset area into conservation within 2 years of this approval.

   The **approval holder** must not **commence** the action until the Offset Management Plan is approved by the **Minister** in writing. The approved Offset Management Plan must be implemented.

4. The **approval holder** must implement the sediment and erosion and stormwater management plans, as required under the Queensland *Environmental Protection Act 1994*, *Environmental Protection Regulation 2008* and the *Environmental Protection (Water) Policy 2009*.

General

5. Within 20 days after the **commencement** of the **action**, the **approval holder** must advise the **Department** in writing of the actual date of **commencement**.

6. The **approval holder** must maintain accurate records substantiating all activities and outcomes associated with or relevant to the conditions of approval, including measures taken to implement the management plans and demonstrate the outcomes required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department**'s website. The results of audits may also be publicised through the general media.

7. Unless otherwise agreed to in writing by the **Minister**, within three months of every 12 month anniversary of the **commencement** of the **action**, the **approval holder** must publish a report on its website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and details of non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. Reports must remain published for the life of the approval. The person taking the action must continue to publish this report each year until such time as agreed to in writing by the **Minister**.

8. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor and audit criteria must be approved by the **Minister** prior to the commencement of the audit. The audit report must address the approved criteria to the satisfaction of the **Minister**.

9. The **approval holder** may choose to revise a plan approved by the **Minister** under the conditions without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the **action** in accordance with the revised plan would not be likely to have a **new or increased impact**. If the **approval holder** makes this choice it must:

    a. notify the **Department** in writing that the approved plan has been revised and provide the **Department** with:

        i. an electronic copy of the revised plan or program;

        ii. an explanation of the differences between the revised plan or program and the approved plan or program; and

        iii. the reasons the person taking the action considers that taking the action in accordance with the revised plan or program would not be likely to have a **new or increased impact**;

    b. declare in writing a date on which the revised plan or program will first be implemented by the **approval holder**. That date of first implementation must be at least 28 days after sub-condition 9a. is satisfied.

10. Condition 9 does not apply if the revisions to the approved plan, include changes to environmental offsets provided under the plan, in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the **Minister**. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, would, or would not, be likely to have **new or increased impacts**.

11. The **approval holder** may revoke its choice under condition 9 at any time by giving written notice to the **Department** in which case, commencing on the day after giving such notice, the **approval holder** must implement the plan previously submitted for approval. If the **approval holder** revokes the choice to implement a revised plan, without approval under section 143A of the Act, the plan or strategy most recently approved by the **Minister** must be implemented.

12. If the **Minister** gives a notice to the **approval holder** that the **Minister** is satisfied that the taking of the **action** in accordance with the revised plan would be likely to have a **new or increased impact**, then:

    a. condition 9 does not apply, or ceases to apply, in relation to the revised plan; and

    b. the **approval holder** must implement the plan previously submitted for approval and approved by the **Minister**.

    To avoid any doubt, this condition does not affect any operation of conditions 9 and 10 in the period before the day the notice is given.

At the time of giving the notice the **Minister** may also notify that for a specified period of time that condition 9 does not apply for one or more specified plans required under the approval.

13. Conditions 9, 10 and 11 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the **approval holder** to submit a revised plan or strategy to the **Minister** for approval.

14. The **approval holder** must report any contravention of the conditions of this approval to the **Department** within 2 business days of the **approval holder** becoming aware of the contravention.

15. If, at any time after 5 years from the date of this approval, the **approval holder** has not substantially **commenced** the **action**, then the **approval holder** must not substantially **commence** the **action** without the written agreement of the **Minister**.

16. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans and reports, referred to in these conditions of approval on its website. Each management plan must be published on the website within one month of being approved by the **Minister** or submitted under condition 9a. All published reports must remain on website for the life of the approval unless otherwise agreed to in writing by the Minister.

Definitions

Action: the Narangba Quarry Expansion project as referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC 2014/7351)

Approval holder: the person to whom the approval is granted or any person acting on their behalf, or to whom the approval is transferred under section 145B of the **EPBC Act**.

Commence/commencement: The clearing of vegetation or construction of any infrastructure, excluding fences and signage, associated with the proposed action.

Department: The Australian Government Department or any other agency administering the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) from time to time.

EPBC Act: the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Environmental Offsets Policy (2012): the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (October 2012), or subsequent revision, including the Offset Assessment Guide.

Koala habitat: forest or woodland with two or more **known koala food tree species**, OR one food tree species that alone accounts for >50% of the vegetation in the relevant strata. Habitat that is threats, such as dogs and vehicle strike, removed. As described in *EPBC Act referral guidelines for the vulnerable koala (combined populations of Qld, NSW and the ACT).* Commonwealth of Australia, 2014.

Known koala food tree species: species of trees whose leaves are consumed by koalas. Koala food trees can generally be considered to be those of the following genus: *Angophora*, *Corymbia*, *Eucalyptus*, *Lophostemon* and *Melaleuca*. Note that food tree species may vary spatially and temporally and information specific to local area is likely to be most accurate. For lists of koala food tree species refer to the scientific literature or QLD Department of

Environment and Heritage protection koala habitat webpage: www.ehp.qld.gov.au/wildlife/koalas/koala-ecology.html

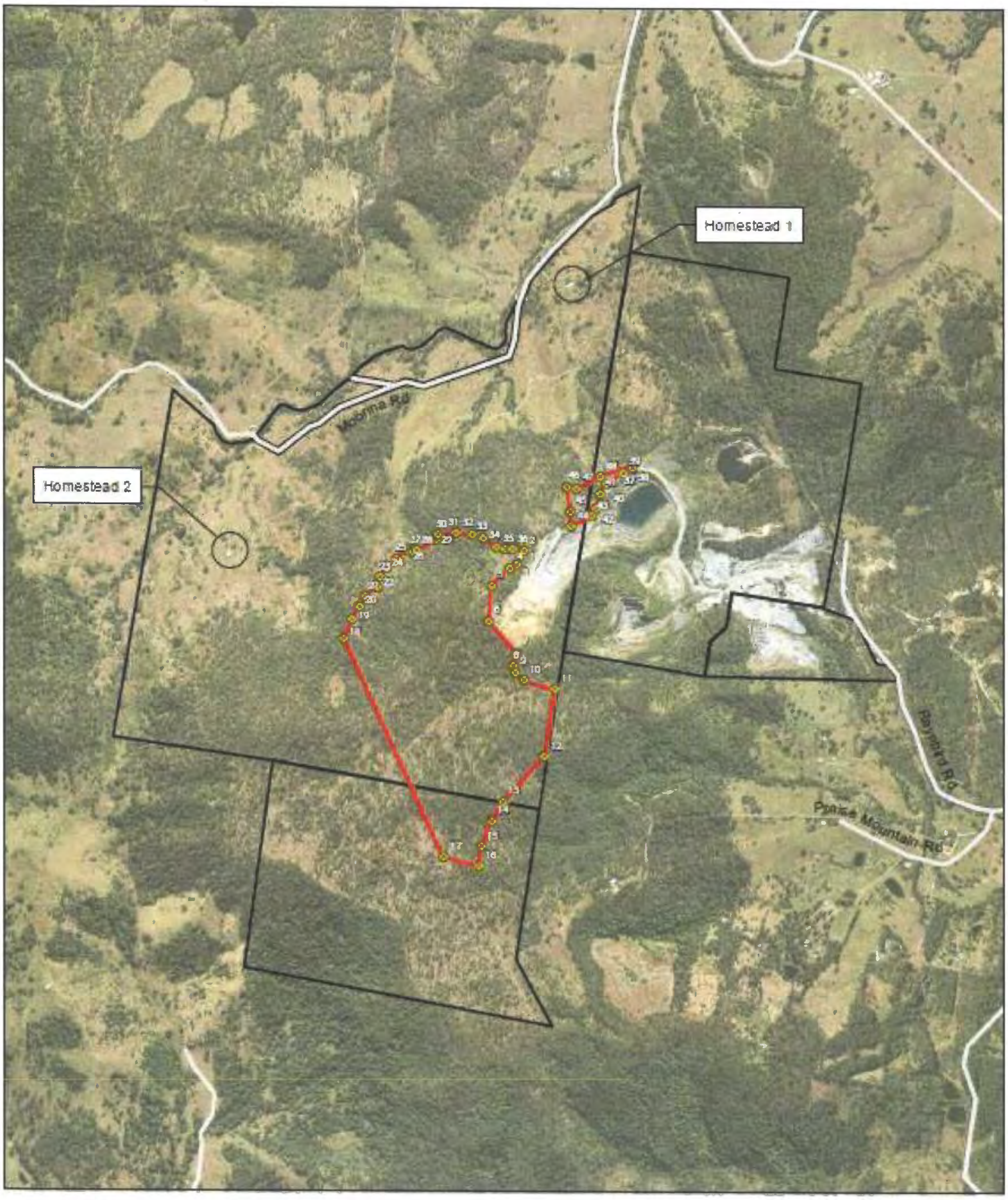
Minister: the **Minister** administering the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and includes a delegate of the **Minister**.

New or increased impact: A new or increased impact on any matter protected by the controlling provisions for the action, when compared the environmental impact or risk resulting from implementing to the plan, that has been approved by the Minister.

Preliminary documentation: *Narangba Quarry Expansion, EPBC Act Preliminary Documentation Submission* (March 2016). Saunders Havill Group on behalf of Boral Resources (Qld) Pty Ltd. As provided to the Department of the Environment.

Project site: Lot 1 on RP167435, Lot 53 on RP895391, Lot 139 on SL10320 and Lot 93 on SP193378 Raynbird Road, Narangba, Queensland as displayed in Appendix A.

Appendix A



Legend

Quarry Site DCDB

Project referral area

Figure 2 *Project Referral Area*

File ref. 7139E Figure 2 Referral Area C
Date 28/07/2016
Project Narangba Quarry Extension

0 100 200 400 m

Scale (A4) 1:20,000 [GDA 1994 MGA Z56]

BORAL

saunders havill group

Layer Sources: DCDB (DNRM 2013), Aerial (Q&O Globe 2012)

Australian Government
Department of the Environment and Energy

VARIATION OF CONDITIONS ATTACHED TO APPROVAL
Narangba Quarry Expansion, Raynbird Road, Narangba, Queensland (EPBC 2014/7351)

This decision to vary conditions of approval is made under section 143 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

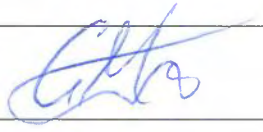
Approved action

Person to whom the approval is granted	Boral Resources (QLD) Pty Limited ABN: 009 671 809
Approved action	Fifty six hectare (56 ha) expansion of the existing Narangba Quarry, including clearing of 52 ha of vegetation. The quarry expansion site is located on Raynbird Road, 18 km south of Caboolture; as described in the referral received by the Department on 30 September 2014 [See EPBC Act referral 2014/7351].

Variation

Variation of conditions attached to approval	The variation is: Delete conditions 3 and 3A attached to the approval and substitute with conditions 3 and 3A specified in the table below. Add new condition 3B specified in table below. Delete the definition for Koala habitat attached to the approval and substitute with the definition for Koala habitat specified in the table below.
Date of effect	This variation has effect on the date the instrument is signed

Person authorised to make decision

Name and position	Gregory Manning Assistant Secretary Assistant (WA, SA, NT) & Post Approvals Branch
Signature	
Date of decision	10 August 2019

Date of decision	Definitions attached to approval
Original dated 19/08/2016	**Commence/commencement:** The clearing of vegetation or construction of any infrastructure, excluding fences and signage, associated with the proposed action.
Original dated 19/08/2016	**Department:** The Australian Government Department or any other agency administering the *Environment Protection and Biodiversity Conservation Act 1999* (*Cth*) from time to time.
Variation dated 24/08/2018	**Environmental Management Plan Guidelines** means the *Environmental Management Plan Guidelines* (2014), or subsequent revision. Available at www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.
Original dated 19/08/2016	**EPBC Act:** the *Environment Protection and Biodiversity Conservation Act 1999 (Cth).*
Original dated 19/08/2016	**EPBC Act Environmental Offsets Policy (2012):** the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (October 2012),* or subsequent revision, including the Offset Assessment Guide.
As varied on the date this instrument was signed	**Koala habitat:** forest or woodland with two or more **known koala food tree species**, OR one food tree species that alone accounts for >50% of the vegetation in the relevant strata. **Koala habitat** does not include habitat that is subject to threats, such as dogs and vehicle strike. As described in EPBC Act referral guidelines for the vulnerable koala (combined populations of Qld, NSW and the ACT). Commonwealth of Australia, 2014.
Original dated 19/08/2016	**Known koala food tree species:** species of trees whose leaves are consumed by koalas. Koala food trees can generally be considered to be those of the following genus: *Angophora, Corymbia, Eucalyptus, Lophostemon* and *Melaleuca*. Note that food tree species may vary spatially and temporally and information specific to local area is likely to be most accurate. For lists of koala food tree species refer to the scientific literature or QLD Department of Environment and Heritage protection koala habitat webpage: www.ehp.qld.gov.au/wildlife/koalas/koala-ecology.html
Variation dated 24/08/2018	**Legally secured** means placing on the land title, for the duration of the impact of the **action**, a voluntary declaration under the *Vegetation Management Act 1999 (Qld).*
Original dated 19/08/2016	**Minister:** the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* and includes a delegate of the **Minister**.
Original dated 19/08/2016	**New or increased impact:** A new or increased impact on any matter protected by the controlling provisions for the action, when compared the environmental impact or risk resulting from implementing to the plan that has been approved by the Minister.
Original dated 19/08/2016	**Preliminary documentation:** *Narangba Quarry Expansion, EPBC Act Preliminary Documentation Submission* (March 2016). Saunders Havill Group on behalf of Boral Resources (Qld) Pty Ltd. As provided to the Department of the Environment.
Original dated 19/08/2016	**Project site:** Lot 1 on RP167435, Lot 53 on RP895391, Lot 139 on SL10320 and Lot 93 on SP193378 Raynbird Road, Narangba, Queensland as displayed in Appendix A.

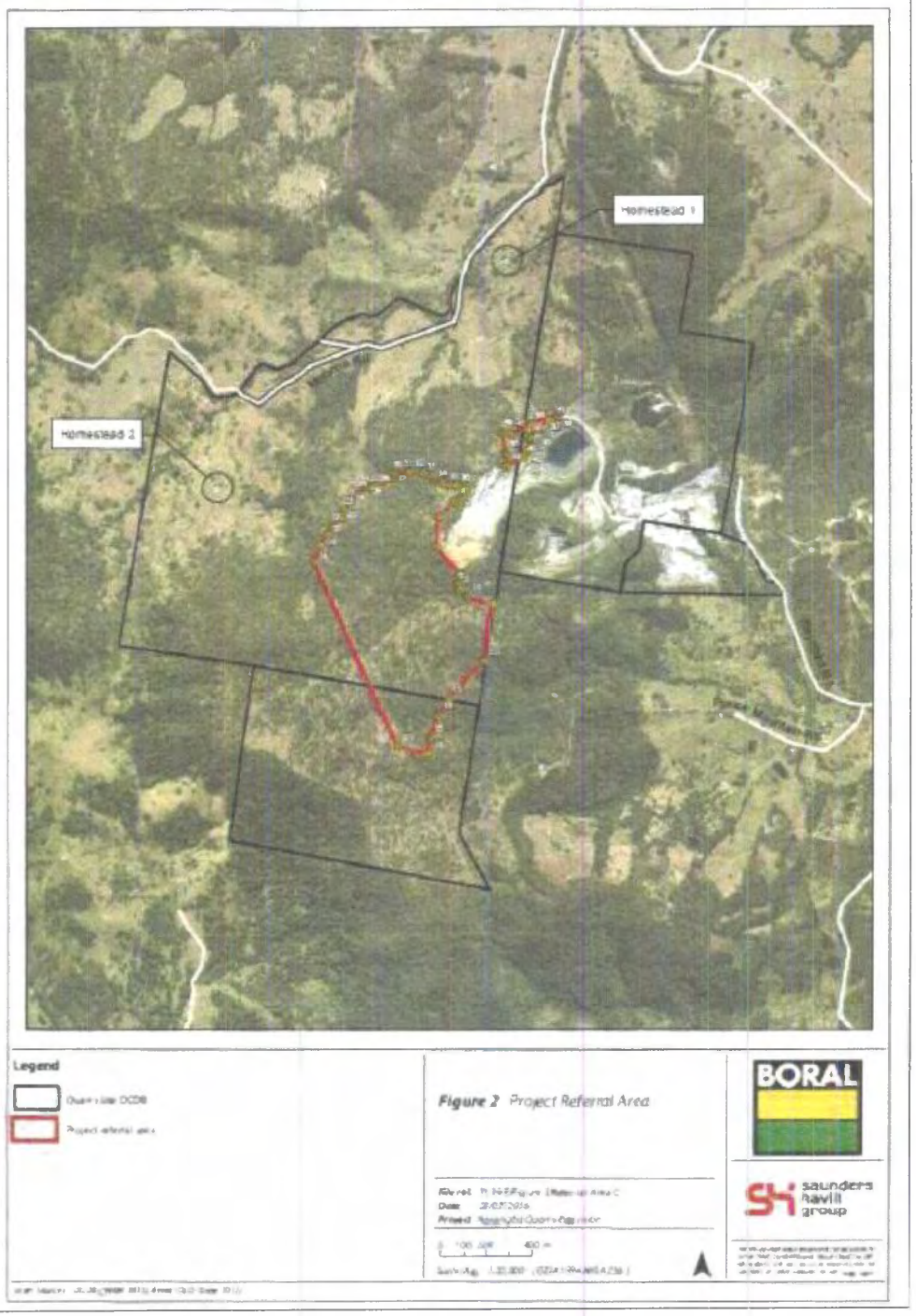
Date of decision	Conditions attached to approval
Original dated 19/08/2016	1. The **approval holder** must only undertake the **action** on the **project site** shown at Appendix A.
Original dated 19/08/2016	2. The **approval holder** must not clear more than 52 hectares of **koala habitat** on the **project site**.
As varied on the date this instrument was signed	3. To offset the loss of **koala habitat**, the **approval holder** must, by 1 December 2018, submit an Offset Strategy for the **Minister's** written approval. The Offset Strategy must be consistent with the ***EPBC Act Environmental Offsets Policy (2012)***, and must: a) confirm use of the offset area proposed in the **preliminary documentation**; and/or b) include the details of, and justification for, one or more other proposed offset area/s; and c) detail the process, including for preparation of the Offset Area Management Plan specified in Condition 3A, to ensure the offset area(s) is/are **legally secured**. The approved Offset Strategy must be implemented.
As varied on the date this instrument was signed	3A. To offset the loss of **koala habitat**, the approval holder must submit an Offset Area Management Plan (OAMP) for the **Minister's** written approval. The OAMP must be prepared in accordance with the **Department's Environmental Management Plan Guidelines**, and must: a) be consistent with the approved Offset Strategy and the **EPBC Act Environmental Offsets Policy (2012)**; b) include performance and completion criteria to protect koalas and manage koala habitat; c) describe the management measures that will be implemented to achieve and maintain the performance and completion criteria, including discussion of how those measures take into account relevant conservation advice; and d) include a program to monitor (including detecting triggers) and report on the effectiveness of these measures, including triggers and corrective actions, and progress against performance and completion criteria. The **approval holder** must not **commence** the action until the OAMP is approved by the **Minister** in writing. The approved OAMP must be implemented.
As varied on the date this instrument was signed	3B. The **approval holder** must **legally secure** the offset area/s specified in the approved Offset Strategy by 28 February 2020.
Original dated 19/08/2016	4. The **approval holder** must implement the sediment and erosion and stormwater management plans, as required under the *Queensland Environmental Protection Act 1994, Environmental Protection Regulation 2008 and the Environmental Protection (Water) Policy 2009.*
Original dated 19/08/2016	5. Within 20 days after the **commencement** of the **action**, the **approval holder** must advise the **Department** in writing of the actual date of **commencement**.

Date of decision	Conditions attached to approval
Original dated 19/08/2016	6. The **approval holder** must maintain accurate records substantiating all activities and outcomes associated with or relevant to the conditions of approval, including measures taken to implement the management plans and demonstrate the outcomes required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department**'s website. The results of audits may also be publicised through the general media.
Original dated 19/08/2016	7. Unless otherwise agreed to in writing by the **Minister**, within three months of every 12 month anniversary of the **commencement** of the action, the **approval holder** must publish a report on its website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and details of non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. Reports must remain published for the life of the approval. The person taking the action must continue to publish this report each year until such time as agreed to in writing by the **Minister**.
Original dated 19/08/2016	8. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor and audit criteria must be approved by the **Minister** prior to the commencement of the audit. The audit report must address the approved criteria to the satisfaction of the **Minister**.
Original dated 19/08/2016	9. The **approval holder** may choose to revise a plan approved by the **Minister** under the conditions without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the **action** in accordance with the revised plan would not be likely to have a **new or increased impact**. If the **approval holder** makes this choice it must: a) notify the **Department** in writing that the approved plan has been revised and provide the **Department** with: i) an electronic copy of the revised plan or program; ii) an explanation of the differences between the revised plan or program and the approved plan or program; and iii) the reasons the person taking the action considers that taking the action in accordance with the revised plan or program would not be likely to have a **new or increased impact**; b) declare in writing a date on which the revised plan or program will first be implemented by the **approval holder**. That date of first implementation must be at least 28 days after sub-condition 9a.is satisfied.
Original dated 19/08/2016	10. Condition 9 does not apply if the revisions to the approved plan, include changes to environmental offsets provided under the plan, in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the **Minister**. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, would, or would not, be likely to have **new or increased impacts**.

Date of decision	Conditions attached to approval
Original dated 19/08/2016	11. The **approval holder** may revoke its choice under condition 9 at any time by giving written notice to the **Department** in which case, commencing on the day after giving such notice, the **approval holder** must implement the plan previously submitted for approval. If the **approval holder** revokes the choice to implement a revised plan, without approval under section 143A of the Act, the plan or strategy most recently approved by the **Minister** must be implemented.
Original dated 19/08/2016	12. If the **Minister** gives a notice to the **approval holder** that the **Minister** is satisfied that the taking of the **action** in accordance with the revised plan would be likely to have a **new or increased impact**, then: a) condition 9 does not apply, or ceases to apply, in relation to the revised plan; and b) the **approval holder** must implement the plan previously submitted for approval and approved by the **Minister**. To avoid any doubt, this condition does not affect any operation of conditions 9 and 10 in the period before the day the notice is given. At the time of giving the notice the **Minister** may also notify that for a specified period of time that condition 9 does not apply for one or more specified plans required under the approval.
Original dated 19/08/2016	13. Conditions 9, 10 and 11 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the **approval holder** to submit a revised plan or strategy to the **Minister** for approval.
Original dated 19/08/2016	14. The **approval holder** must report any contravention of the conditions of this approval to the **Department** within 2 business days of the **approval holder** becoming aware of the contravention.
Original dated 19/08/2016	15. If, at any time after 5 years from the date of this approval, the **approval holder** has not substantially **commenced** the **action**, then the **approval holder** must not substantially **commence** the **action** without the written agreement of the **Minister**.
Original dated 19/08/2016	16. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans and reports, referred to in these conditions of approval on its website. Each management plan must be published on the website within one month of being approved by the **Minister** or submitted under condition 9a. All published reports must remain on website for the life of the approval unless otherwise agreed to in writing by the **Minister**.

Date of decision	Definitions attached to approval
Original dated 19/08/2016	**Action:** the Narangba Quarry Expansion project as referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC 2014/7351)
Original dated 19/08/2016	**Approval holder:** the person to whom the approval is granted or any person acting on their behalf, or to whom the approval is transferred under section 145B of the **EPBC Act.**

Date of decision	**Annexure A**
Original dated 19/08/2016	



Appendix B

Offset Area Voluntary Declaration Package

Author: D Hinz
Ref number: 2020/010206
Unit: Natural Resource Assessment
Phone: (07) 4531 8513

Queensland Government

Department of
Natural Resources, Mines and Energy

26 February 2020

Andrew Lyndon
Level 6, 88 Musk Avenue,
KELVIN GROVE QLD 4059

Dear Andrew

Re: Declaration over part of lots 53 RP895391, 93 SP193378, 139 SL10320 & 1 RP167435– Moreton Bay Regional Council – as an area of high nature conservation value

This is to advise you that a declaration, on the above lot, has been made—consistent with your application—by the Department of Natural Resources Mines and Energy (DNRME) on 24 February 2020.

A copy of each of the following documents is attached for your records:

- Declared area notice
- Offset management plan – 6 November 2019 Job No. 7139 Quarry Expansion for lots 53 RP895391, 93 SP193378, 139 SL10320 & 1 RP167435
- Declared area map 2020/010206
- Property Map of Assessable Vegetation PMAV 2020/010207 showing the declared area as a Category A area

If a registered owner requires additional copies of these documents, they can be purchased at any DNRME Customer Service Centre.

Please note, that in accordance with the declaration, you may be required to conduct management of the declared area, monitoring of the condition of the declared area, and reporting on the condition of the declared area. Please refer to the declaration documents for the specifics regarding such requirements.

This declaration will be noted on the property titles of the declared area and is binding on current and future owners.

If you wish to discuss this matter further, please contact me on telephone number (07) 4531 8513 quoting the above reference number.

Yours sincerely

David Hinz
Natural Resource Management Officer, Vegetation Management

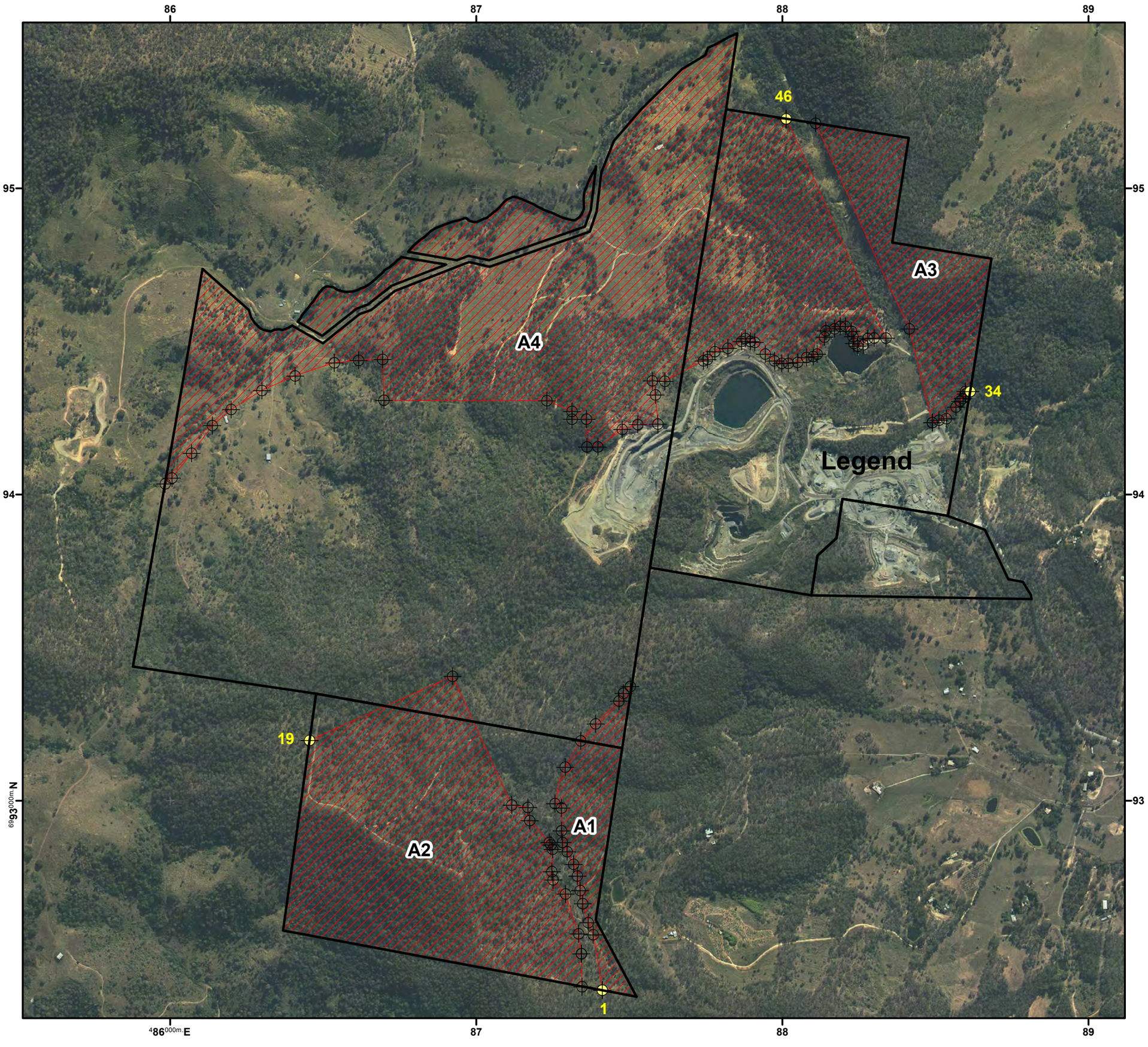
PO Box 789, 30 Nicholson Street
Dalby Qld 4405
Telephone (07) 4531 8501
Facsimile (07) 4531 8548
Website www.dnrm.qld.gov.au
ABN 59 020 847 551

Declared Area Map

2020/010206

LOT on PLAN
53 RP895391, 93 SP193378,
139 SL10320 & 1 RP167435

Queensland Government



0 100 200 300 400 500 600 700 800
Meters

Scale: 1:12000
(original size A3)

LEGEND

- Declared Area reference start points
- Property boundary
- Declared Area

N

Notes:

Property boundary provided by Department of Natural Resources, Mines and Energy
The property boundaries shown on this plan are approximate only. They are not an accurate representation of the legal boundaries.

Labelled Category B areas indicate a change in Regional Ecosystem classification as a result of detailed assessment.

Map Information:
Horizontal Datum: GDA 1994
Projection: Universal Transverse Mercator - Zone 56

Map Prepared by: DGH
Department of Natural Resources, Mines and Energy
PO Box 589, Dalby, Qld, 4405

Map Preparation Date: 07/02/2020

Property Map of Assessable Vegetation

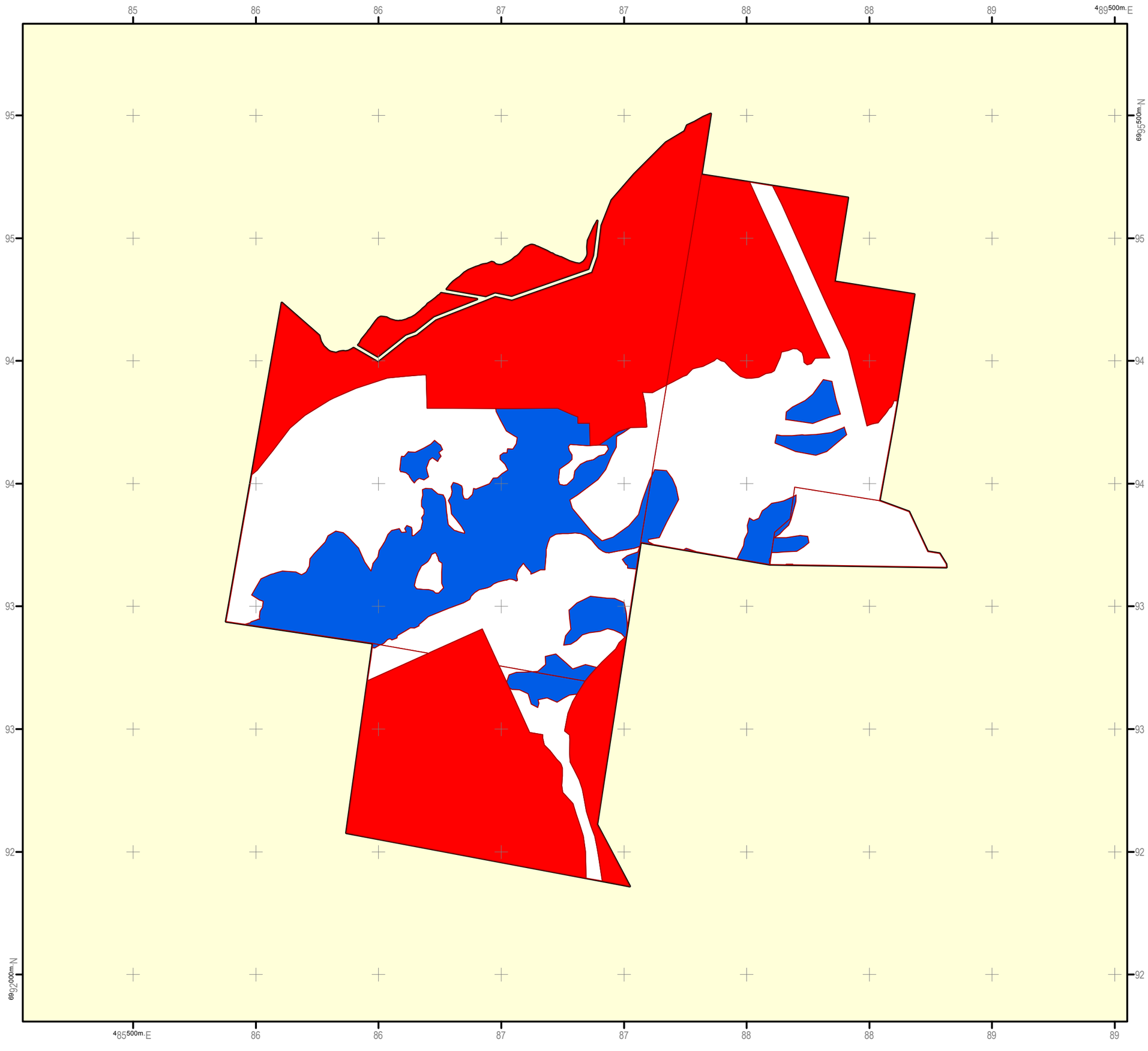
PMAV 2020/010207

LOT on PLAN

139SL10320, 1RP167435, 53RP895391, 93SP193378

Sheet 1 of 1

Queensland Government



0 200 400 600 800

m

Scale: 1:15000

(original size A3)

N

LEGEND

- Subject Lot(s)
- Area to which the PMAV does not apply

Vegetation Category Area

- Category A area
- Category B area
- Category X area

Notes:

Property boundaries provided by Department of Natural Resources, Mines and Energy.
The property boundaries on this plan are a spatial representation of the property boundaries.
They are not the legal property boundaries and are subject to change as more accurate information becomes available.
The PMAV does not move with changes to the property boundaries.

Labelled Category B areas indicate a change in Regional Ecosystem classification as a result of detailed assessment.

Map Information:
Horizontal Datum: GDA 1994
Projection: Universal Transverse Mercator - Zone 56

This PMAV replaces PMAV 2015/005356 under Section 20D(1) of the *Vegetation Management Act 1999*.

Signed for the Chief Executive of the Department of Natural Resources, Mines and Energy by:

Name: Kellie Bryant

Title: Senior Natural Resource Management Officer

Signature:

Date: 24 February 2020

Map Prepared by: DGH

Department of Natural Resources, Mines and Energy
PO Box 589, Dalby, Qld, 4405

Map Preparation Date: 07/02/2020

Appendix C

Written Notification of Commencement of Action

Amy Westman

From: Lyndon, Andrew <andrew.lyndon@boral.com.au>
Sent: Thursday, 4 June 2020 2:00 PM
To: postapproval@environment.gov.au
Cc: Sam Maynard; Russel Wilson
Subject: Fwd: Tree clearing
Attachments: image001.jpg; image002.jpg; EPBC Approval-notice-conditions.pdf

Attention Zoe Lee

Dear Zoe

We refer to the EPBC Act Approval for the Boral Narangba Quarry, QLD with reference number 2014/7351 (Attached).

As per condition 5 of the approval we would like to confirm that clearing commenced 12 May 2020. We were uncertain whether the 20 day notification period applied to business days or every day of the week because there is inconsistency throughout the approval and the term days or business days are not defined in the approval. We have interpreted the period to apply to business days however please contact me if you have any questions or concerns.

Kind regards

ANDREW LYNDON
Planning & Development Manager - BLPG (Qld)

Telephone: (07)38677603
Mobile: 0401893232
Email: Andrew.Lyndon@boral.com.au

Boral Land and Property Group
Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
www.boral.com.au

---------- Forwarded message ---------
From: **Castle, Nicholas** <nicholas.castle@boral.com.au>
Date: Thu, 4 Jun 2020 at 11:29
Subject: Tree clearing
To: Andrew Lyndon <andrew.lyndon@boral.com.au>

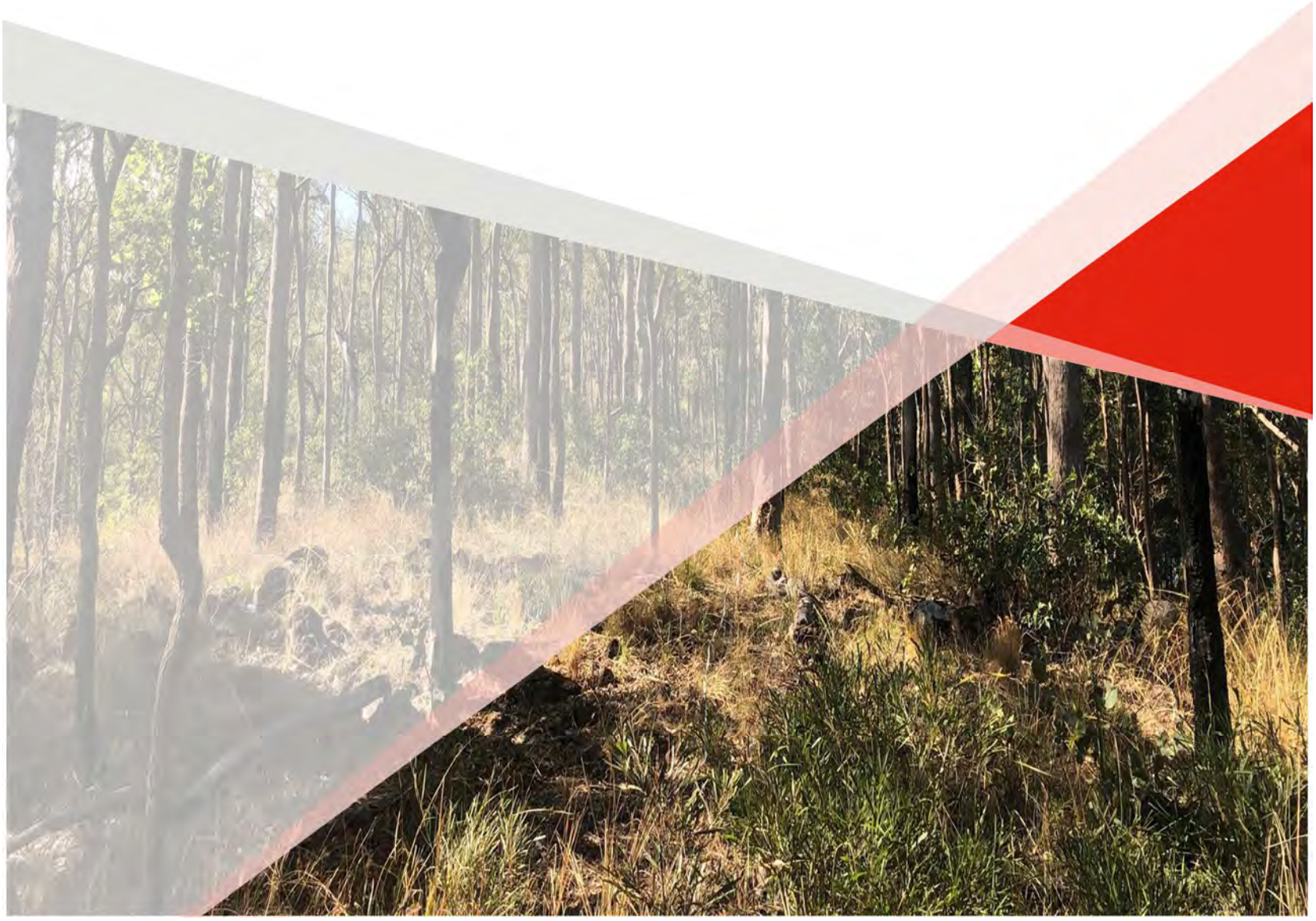
Hi Andrew,

The tree clearing commenced on the 12th May directly after nest box removal.

Nick

Appendix D

Weed Management Plan



Weed Management Plan - Summary

Offset Management Plan – Stage 1

Raynbird Road, Narangba
Prepared for Boral Resources Pty Ltd

saunders havill group

Weed Management Plan – Stage One Offsets

Objectives and Management Measures

Completion criteria for the Stage One offset site are as follows:

- WONS reduced to less than 10% of baseline levels.
- Baseline weed mapping will be conducted before the weed removal program is initiated. Weed mapping is then to be conducted annually and reported in the Annual Compliance Report (ACR).
- Weed management within Stage 1 offset areas will commence within 12 months of the action commencing with remnant status to be achieved after 10 years.

Management measures for the control of WONS, specifically Lantana will include:

- All identified WONS will be treated within 12 months of the commencement of each stage of clearing for the quarry extension.
- A suitably qualified bush regeneration contractor will be engaged to undertake the necessary weed control.
- Control of infestations will utilise techniques that avoid disturbance to surrounding areas.
- WONS, and other high-risk weeds, will be monitored annually until they are not detected, at which point monitoring will be carried out every 2 years until they are consistently identified at densities less than 10% of the baseline infestation.

Timeline of OMP processes

Timing	Event
6-months post-commencement	Specific treatment techniques developed
Within 12-months post-commencement	Weed Management Plan developed
	All identified WONS will be treated within 12 months of the commencement of each stage of clearing for the quarry extension
Annually	WONS, and other high-risk weeds, will be monitored annually until they are not observed, at which point monitoring will be carried out every 2 years until they are consistently identified at densities less than 10% of the baseline infestation
General	Control of infestations will utilise techniques that avoid disturbance to surrounding areas.
	A suitably qualified bush regeneration contractor will be engaged to undertake the necessary weed control.

Weed Management

Stage one of the OMP is the first of a three-stage offset, located almost entirely on Lot 93 on SP193378. Stage one of the offsets site accounts for approximately 73.7 ha of this total offset area.

The Offsets Management strategy (OMS) which underpinned the OMP, outlined a detailed approach to the management of weeds, specifically Weeds of National Significance (WONS) onsite, involving strategic division of habitat into three management categories. Stage One of the Offsets site contains two of these categories including (1) habitat rehabilitation and (2) remnant vegetation management. As detailed in the OMS, the areas that are identified as suitable for habitat rehabilitation are those that are not mapped as remnant vegetation, but still retain relatively intact vegetation with high potential to return to quality habitat. These areas in their existing state are degraded due to weed invasion or past land uses requiring clearing of the ground layer.

Remnant vegetation management areas are those identified as remnant vegetation are those areas of existing vegetation mapped under the *Vegetation Management Act 1999* (VMA) as remnant. These areas were observed as having the potential to experience some disturbance from surrounding land uses, understorey clearing and/or weed invasion. Remnant vegetation management areas account for 57.9 ha of the total offset site and habitat rehabilitation management areas account for 15.8ha across Stage One (**Figure 1**). **Figure 2** presents the baseline weed mapping results for the Stage One offsets area, mapped in September 2020. This Plan provides recommendations for guiding weed management onsite in regard to the achieving the objectives set out in the Offsets Management Plan. Details on the roles and responsibilities, monitoring processes and risk management supporting weed management within the offsets area are provided for reference within this onsite management plan.

Figure 1 – Narangba Offsets site Stages and habitat management

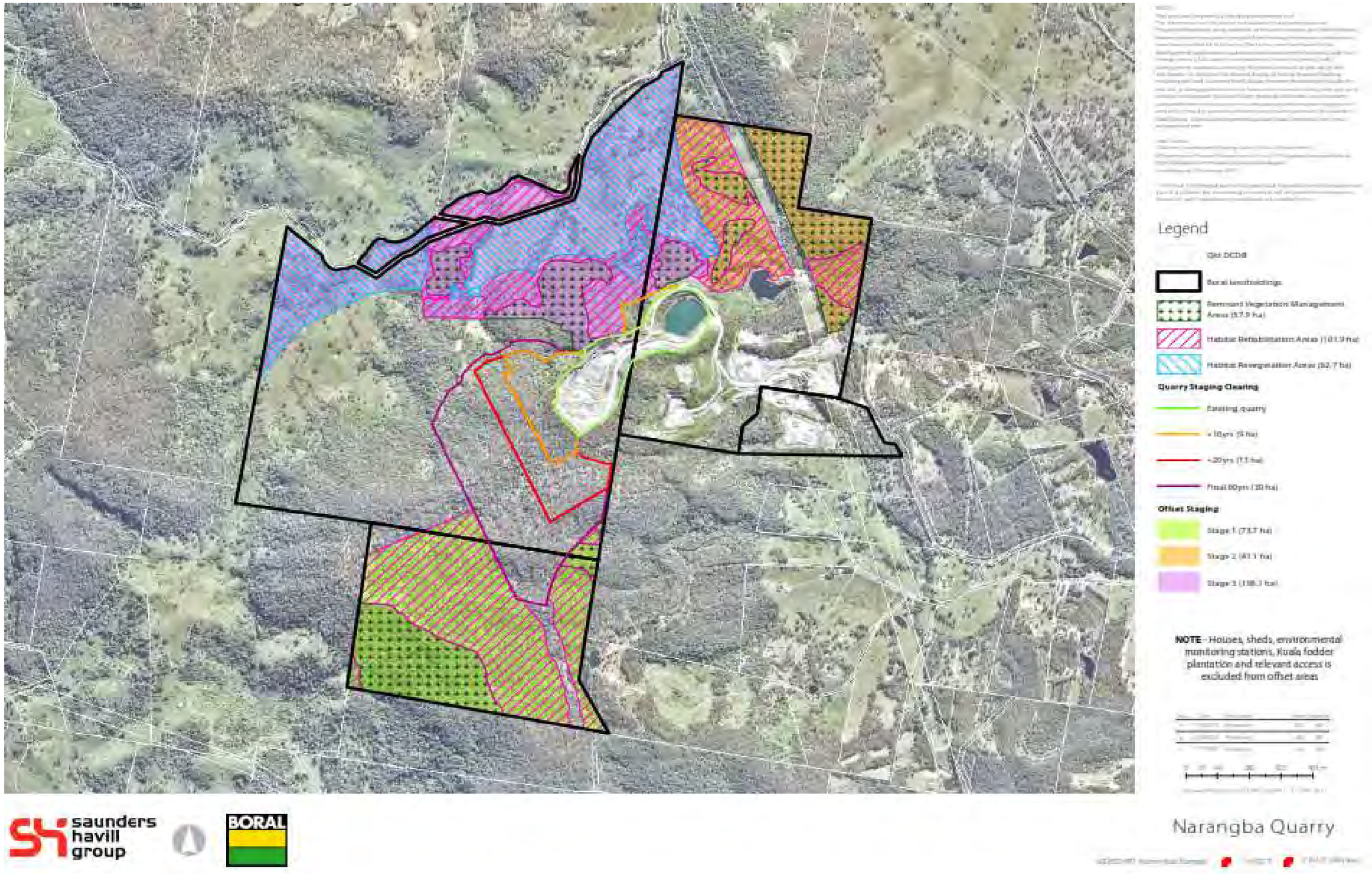
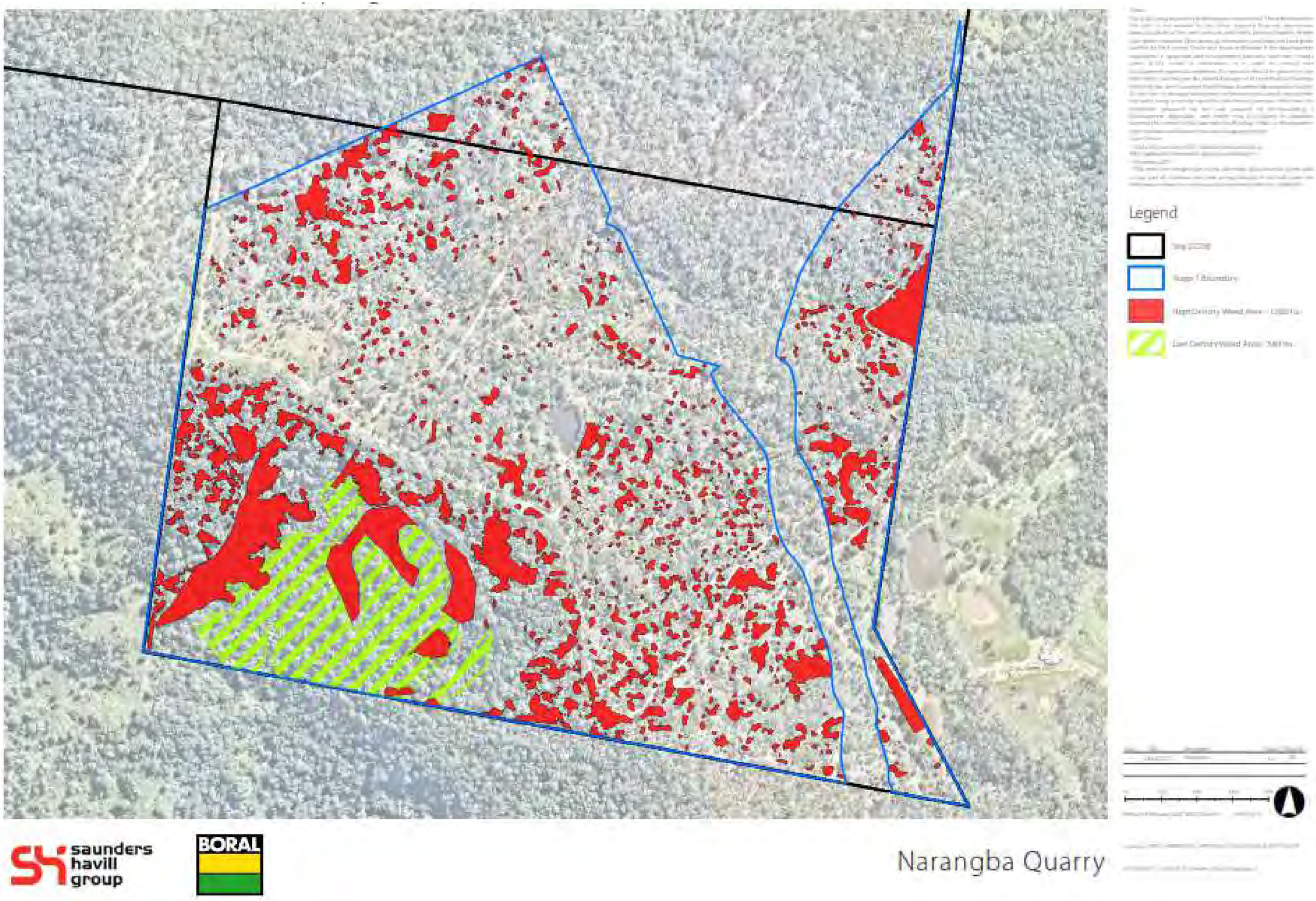
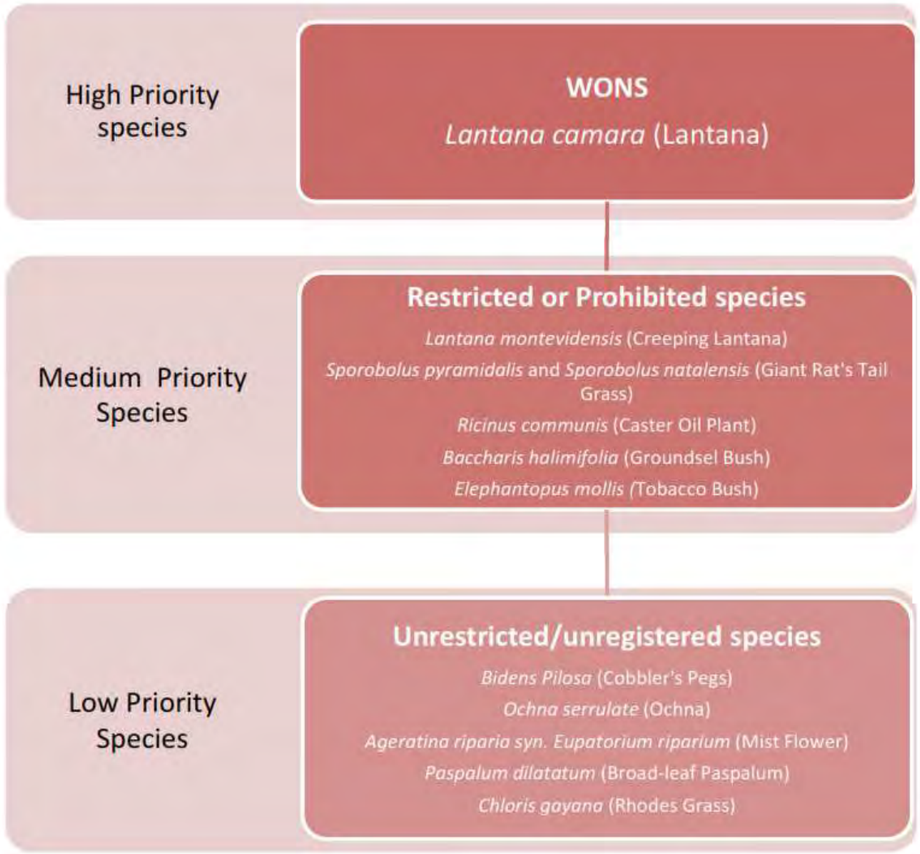


Figure 2 – Baseline Weed Mapping across Stage One



Hierarchy of weed management – Stage One



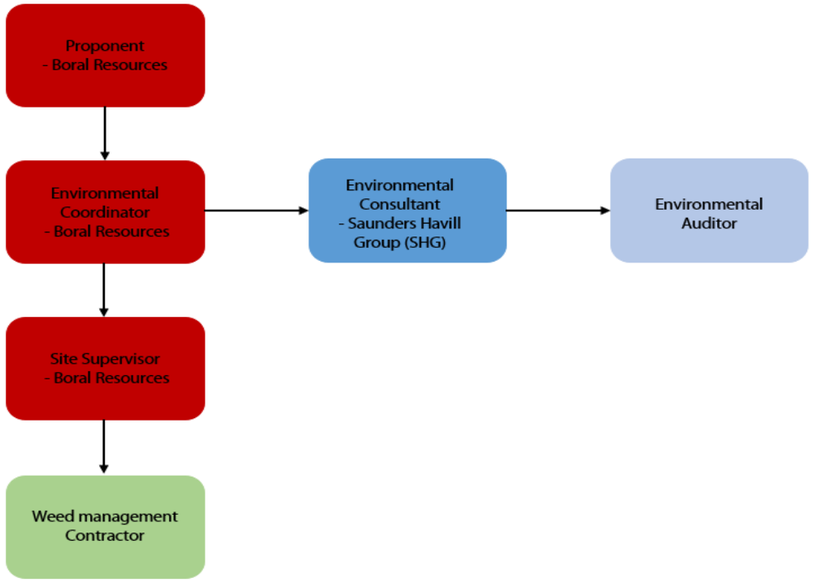
Control methods to be utilised within the offset site for treatment of Lantana camara

Infestation extent	Control Option: Physical	Mechanical	Chemical
Low infestation (individual plants, small area)	Hand removal	Not suitable	Spot spray or cut and paste small infestations
Moderate infestation (Multiple plants, moderate total area)	Not suitable	Slasher, brush cutter, hedger, stick-rake, etc. Increased disturbance from this method will likely result in significant germination of target weed species. Follow up treatment would be required. Not suitable for areas susceptible to erosion such as waterways or steep slopes.	More significant infestations may need to utilise high volume spraying devices to ensure suitable coverage and chemical uptake.
High infestation (Many plants, large area)	Not suitable		

Control methods for weed management

Control method	Process	Use	Advantages	Disadvantages
Cut and paste	technique involves cutting the stem at ground level and then paint the open cut with suitable herbicide. Herbicide needs to be applied within 15 seconds of the cut or risk the plant not absorbing the chemical.	woody weeds (Lantana, Ochna, etc) and vines that are actively growing and not stressed.	accurate application of herbicide to target species reducing the likelihood of impacting native species in proximity	time consuming/labour intensive
Foliar spray (High volume and spot spray	herbicide is diluted and sprayed over the target species which is absorbed through the leaves	used for grasses, herbs and shrubs (up to shoulder height) that are actively growing and not stressed	utilises a high-volume spray (such as a quick spray) for use on large infestations or using handheld applicators for more targeted spraying (spot spray). can be quickly applied to multiple weed species, grasses, shrubs, herbs, etc. allowing for larger areas to be treated	off target damage can be high particularly if weather conditions are not optimal. good coverage of herbicide on the target species can be difficult if the infestation is particularly dense or foliage is not at optimal growth stage
Cut and spray regrowth	involves large infestations of lantana being slashed, either by machinery or hand help power tolls (brush cutter, hedger, etc) and then left to regrow. Regrowth and new shoots are then foliar sprayed	Large infestations of woody weeds (e.g. lantana)	Minimises the area requiring spray treatment (allowing for more direct application) while simultaneously improving the rate of uptake by the plant and leading to more successful treatment	**Timing of follow-up spray** - If sprayed prematurely then uptake of herbicide will be insufficient to kill target weeds. If time between initial treatment and follow up is too long, then the infestation will return to its original form

Chain of Responsibility



Identified Roles

Role	Nominated Person	Company	Contact ph./details
Proponent/ Project Coordinator	Paul West	Boral	0401 896 115
Environmental Coordinator	Matthew Allan	Boral	0466 405 885
Administering Authority	DAWE Compliance Monitoring Branch	DAWE	EPBCMonitoring@awe.gov.au
Site Supervisor	Quarry Manager	Boral	TBA
Site Contractor	TBA	TBA	TBA
Environmental Auditor	TBA	TBA	TBA

Roles and Responsibilities

Role	Responsibilities	Timeframe
Proponent/Project Coordinator	Liaise regularly with Environmental coordinator	As required, ongoing.
	Ensure ACR is published to Boral website by 12th August	Annually
Environmental Coordinator	Coordinate and liaise with Environmental Consultant	As required, ongoing.
	Oversee onsite work and ensure sufficient data is available to achieve annual compliance	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
	Provide data for annual compliance to environmental consultant	As required, ongoing.
	Report non-compliance events within 2 business days of detection	As required
Site Supervisor	Coordinate weed management contractor	Annually, ongoing.
	Ensure periodic inspection of site works is completed	As required, ongoing.
	Ensure sufficient data is collected to inform compliance reporting	As required, ongoing.
	Liaise with Environmental Coordinator regularly	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
Site Contractor	Complete weed management (specifically WONS) works as specified under the OMP and as directed by Site Supervisor and Environmental Coordinator	Annually, ongoing. Restoration practices to be suitable documented and data and photographs provided to Site Supervisor
Environmental Consultant	Coordinate annual EPBC monitoring (weed presence and density, comparison with previous years results)	Annually until WONS presence not recorded, then every 2-years subsequently
	Prepare and coordinate EPBC annual compliance reporting	Published to Boral website by **12th August** each year
Environmental Auditor	Complete auditing of requirements conditioned under the EPBC approval	As required

Monitoring

Monitoring of weed infestations across the Stage One offsets area will be conducted annually by suitably qualified ecologists to provide data for systematic analysis required to determine the ongoing success of the WMP under the OMP. Monitoring will be conducted in **September** each year to ensure that the timing remains consistent and aligns with the baseline assessment. This annual monitoring will be conducted until WONS are not observed, at which point monitoring will be carried out every 2 years until WONS are consistently identified at densities less than 10% of the baseline infestation.

Periodic visual inspections of treated locations will take place following management onsite. Inspections will occur at the discretion of Boral, with the aim of minimising chance of regrowth following initial treatment. Details will be provided by onsite weed management contractors, to Boral's environmental coordinator who will initiate plans for supplementary weed control/management during suitable conditions, where necessary. The following measures will be utilised during monitoring events:

- GPS locate the presence of weeds either via a GPS waypoint or where a large weed infestation is present, create a GPS polyline and walk the extent of the infestation.
- On a field datasheet, detail the time of year of the monitoring event, list of observed WONS, photo location and direction and notes of any notable positive and/or negative changes in weed density and coverage.
- Carry the previous year's weed survey mapping, field datasheet and photos for noting changes in weed infestations and densities.
- Transfer GPS data to the necessary programs to generate weed survey mapping extent and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring purposes.

Corrective Actions

- Where unplanned fires or flooding occurs during the monitoring interval, any negative impacts to ecological score will be noted and compared to unaffected monitoring sites of previously the same quality and resulting potential weed infestations following disturbance will be managed to ensure the weed control completion criteria are achieved.

Risk Assessment

A risk assessment of the potential contraindicative events which may occur during implementation of the WMP are outlined in the Table below. These events detail issues which may arise, negatively affecting the improvement of habitat onsite, through the increase or encroachment of WONS.

Objective	Contraindicative event	Likelihood	Consequence	Risk level	Trigger	Contingency	Associated events
Reduce WONS density to ≤10% baseline levels	Some WONS not treated throughout Stage One	Possible	High	Moderate	Annual Compliance Monitoring (weed density mapping) indicates an increase in weed density across Stage One	Audit and revision of weed management plan and consider increase in frequency of weed management. Revision of seasonal timing and frequency of weed treatment across Stage One.	Annual weed monitoring
Reduce WONS density to ≤10% baseline levels	Increase in Weeds of National Significance (WoNS) infestation impacting on ecological function and habitat quality score improvement across Stage One	Unlikely	Minor	Low	Annual Compliance Monitoring indicates a decrease or lack of increase in habitat score specifically due to WONS component	Cause of WONS infestation identified (e.g. external infestation present with seed travelling along drainages). Remediation actions - mapping of new infestation, revision of current control methods, revision and reassessment of frequency of current monitoring actions	Annual weed monitoring
Reduce WONS density to ≤10% baseline levels	Infrequent follow up to weed treatment leading to increase in density of WONS	Possible	High	Medium	Mismanagement of weed treatment timing	Audit and revision of weed management plan and consider increase in frequency of weed management. Revision of seasonal timing and frequency of weed treatment across Stage One.	Monthly contractor updates; Annual compliance report; annual weed mapping
educe WONS density to ≤10% baseline levels	High rainfall year causing site inaccessibility and leading to extended exclusion of weed treatment across site	Possible	Minor	Moderate	Exclusion from Stage One for greater than 2 months of the year	Revision of timeline of management across the year. Renew objective to achieve 80% WONS treatment across site by end of October each year.	Monthly contractor updates

Appendix E

Vertebrate Pest Management Plan

Vertebrate Pest Management Plan – Stage One Offsets

Objectives and Management Measures

Management measures for the control of feral or unwanted domestic dogs across the offset area include:

- Baseline and ongoing pest monitoring, including motion activated cameras and scat analysis (where necessary), to identify evidence of feral or unwanted dogs (and other pest species):
    - Development of a property wide feral animal management program specifying techniques (e.g., trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised, to be completed within 12 months of commencement of the action.
- Where practical and appropriate, participate cooperatively in pest management planning and implementation with local land managers (i.e., government departments, local governments, and utility providers) to ensure effective pest management in the locality of the offset area.
- Installation of appropriate signage informing the area is under feral control.

As the management of feral and pest species can only be achieved at a landscape level, management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension.

Annual pest monitoring and outcomes will be detailed in the ACR. The ACR will contain details on detected pests, control efforts, and total trapped/baited individuals during the given management period and identified trends of the population of pest animals within the offset area.

Timeline of OMP processes

Timing	Event
Within 12-months post-commencement	Baseline monitoring of entire offset site completed
	Management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension
	Development of a property wide feral animal management program specifying techniques (e.g., trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised
Annually	Vertebrate pests (specifically wild dogs and koala predators), will be monitored annually until they are not observed for three consecutive years.
General	Installation of appropriate signage informing the area is under feral control
	Where practical and appropriate, participate cooperatively in pest management planning and implementation with local land managers
	GPSs will be used to record the location of pest animals present during regular monitoring and incidental detection. Feral dogs, cats and foxes are of high concern due to their known impact on koala and potential presence via notable tracks or scats will be recorded
	Where pest animal presence is detected, targeted trapping and baiting programs will be implemented on completion of the monitoring program
	Field datasheet detailing the time of the monitoring event, observed pest animal scats or tracks, photo location and notes of any evidence of positive and/or negative changes in pest animal occurrence
	Comparison of current and previous year's data, with photographic changes in pest animal occurrences
	Transfer GPS data to spatial data programs to generate pest animal occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes.

Vertebrate Pest Management

Stage one of the OMP is the first of a three-stage offset, located almost entirely on Lot 93 on SP193378. Stage one of the offsets site accounts for approximately 73.7 ha of this total offset area. As the management of feral and pest species can only be achieved at a landscape level, management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension. This management will be ongoing until completion criteria detailed within the OMP are met under the EPBC approval conditions, being that dogs or evidence of dog presence must not be detected on the offset area for a period of three years.

The control and prevention of invasive animal incursions is to be undertaken in accordance with the relevant legislation (such as the Commonwealth *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015* and the Queensland *Biosecurity Act 2014*) incorporating control of pest animals by suitably qualified pest management contractors using approved ethical methods. Applicable legislation is detailed within the full VPMP. Any required hazardous materials must be handled and stored in accordance with the material's safety data sheets and the Approved Code of Practice for the Storage and Handling of Dangerous Goods. Pest animal control is to be undertaken in a humane manner with details of all annual pest monitoring reported and included in the Annual Compliance Report (ACR).

Baseline monitoring with remote-triggered cameras was undertaken in 2020, with **Figure 1** detailing the locations of cameras. **Figure 2** shows the proposed updated monitoring site locations, using adaptive management (or "learning by doing"), which are recommended to increase detections of pests onsite from 2021 onwards in consideration of low detection rates in 2020.

This Plan provides recommendations for guiding vertebrate pest management onsite in regard to the achieving the objectives set out in the Offsets Management Plan. Details on the roles and responsibilities, monitoring processes and risk management supporting vertebrate pest management within the offsets area are also included within this onsite reference plan.

Figure 1 – Camera monitoring sites across offsets site in 2020

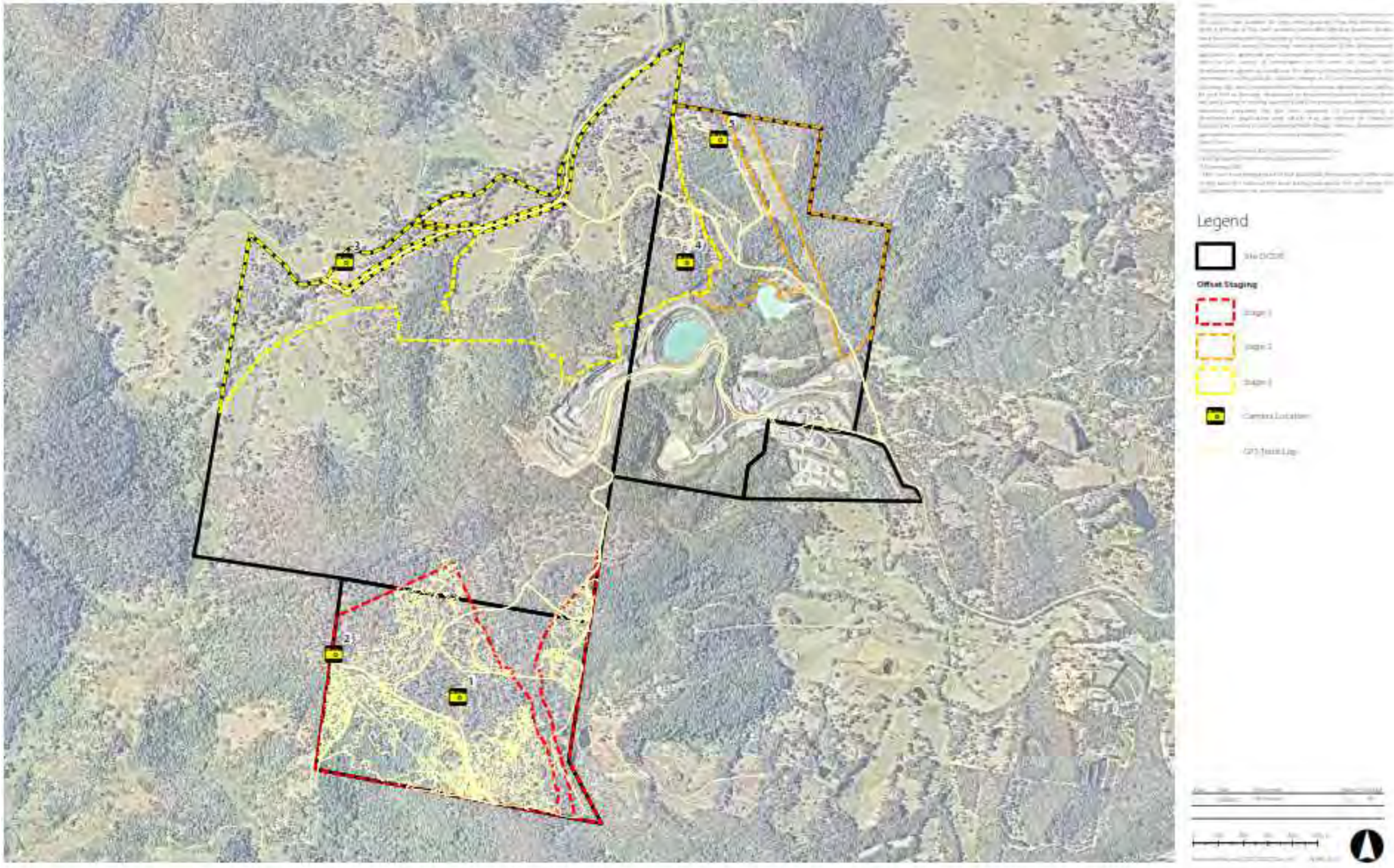
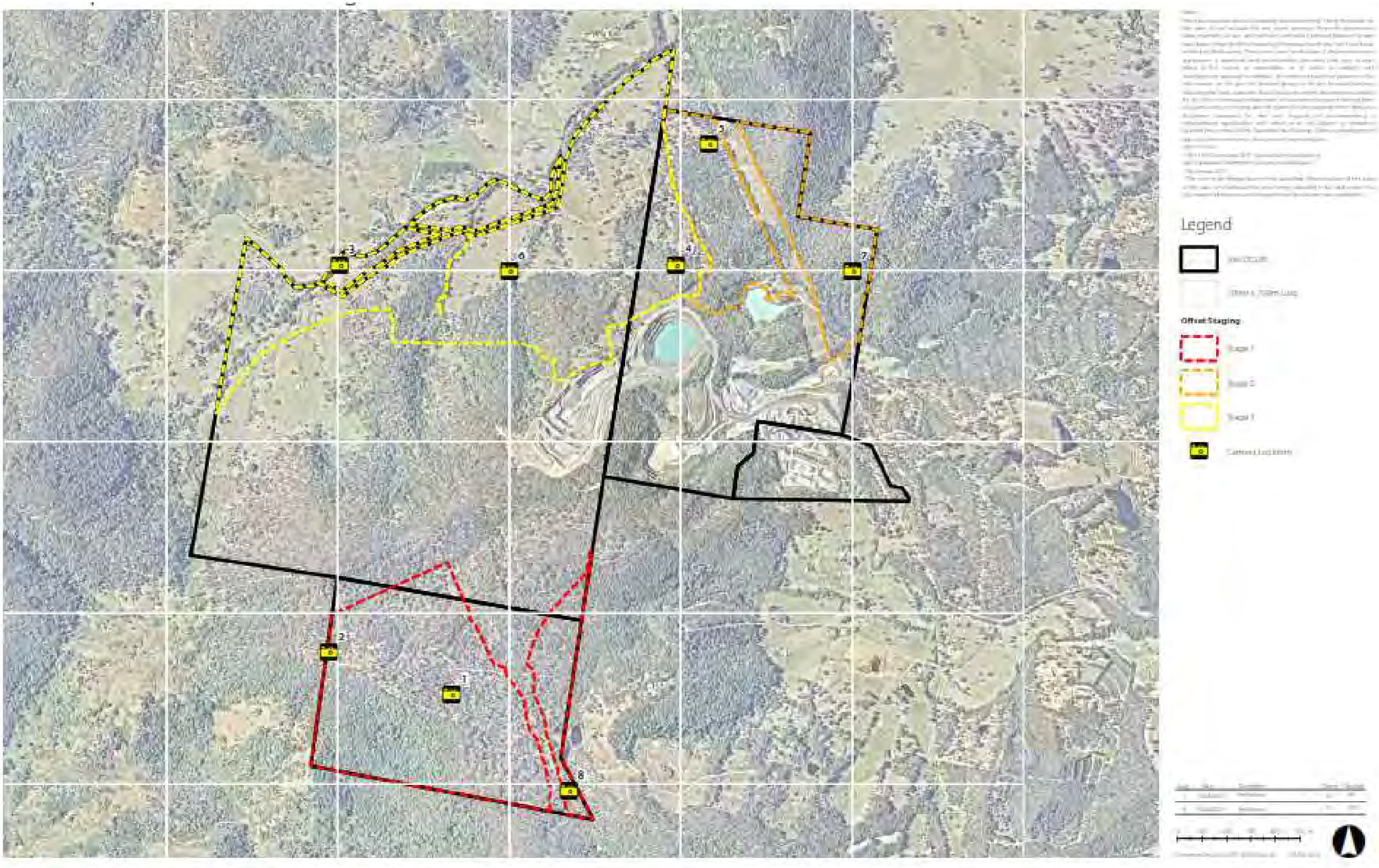
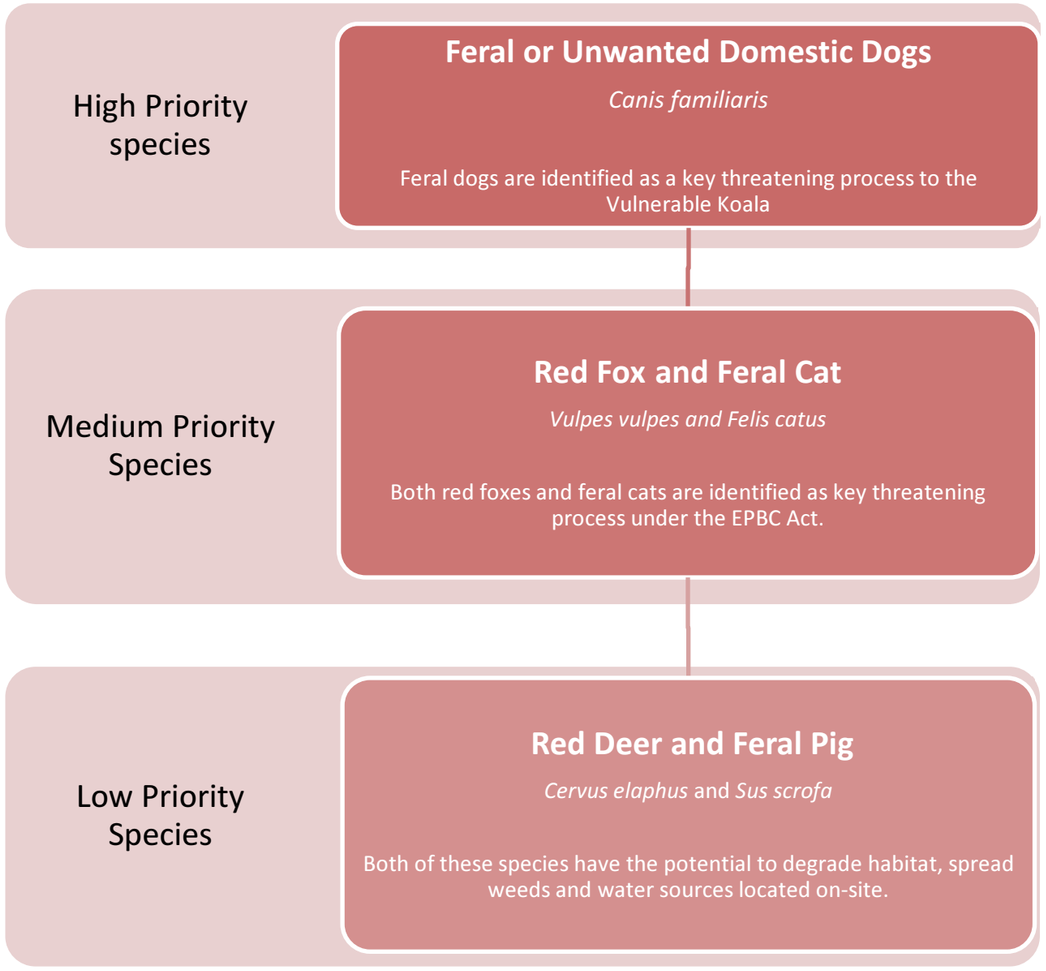


Figure 2. Proposed camera monitoring sites across offsets site – 2021 onwards



Hierarchy of vertebrate pest management – Stage One



Recommended control methods for pest species

Scientific Name	Common Name	Baiting	Fencing	Shooting	Trapping
Canis familaris	Feral Dog	Y	Y	Y	Y
Cervus elaphus	Red Deer	N	Y	Y	Y
Felis catus	Feral Cat	Y	Y	Y	Y
Sus scrofa	Feral Pig	Y	Y	Y	Y
Vulpes vulpes	Red Fox	Y	Y	Y	Y

*Y – Recommended, N- not recommended by the Queensland Government.

Feral species confirmed on-site

Scientific Name	Common Name	*Biosecurity Act 2014* Category
Canis familiaris	Feral Dog	3, 4, 6
Cervus elaphus	Red Deer	3, 4, 6
Felis catus	Feral Cat	3, 4, 6
Sus scrofa	Feral Pig	3, 4, 6
Vulpes vulpes	Red Fox	3, 4, 5, 6

Vertebrate Pest Management Methods

Control method	Process	Advantages	Disadvantages
Baiting	It is important that when the baits are placed on-site that they reduce the likelihood of non-target species ingesting the bait. There are distance requirements and exclusions zones when using 1080 poison. Baits are not to be laid: - Within 5m of fenced boundary; - Within 20m of permanent or flowing water bodies; - Within 50m of the centreline of a declared road; - Within 150m of a dwelling.	cost effective, effective in reducing dog numbers.	can affect non-target species, requires qualified, trained officer to deploy and manage program onsite, primary threat to spot-tailed quoll.
Fencing	Fencing of areas of habitat where target pest species can be excluded effectively from an area.	highly effective where fully fenced areas can be installed and maintained.	labour-intensive and costly.

Control method	Process	Advantages	Disadvantages
Trapping	Specialised traps are set in the evening and checked after dawn the following morning, with any target pest species trapped, subsequently destroyed.	Species specific, with traps specialised to target different species and animal sizes. Non-target animals can be subsequently released unharmed.	labour-intensive and costly.
Shooting	vertebrate pests are typically trapped and shot onsite, or in large or remote locations, aerial shooting techniques may be utilised.	Can be effective when used in conjunction with other trapping methods.	health and safety concerns, highly trained and licensed officer required to conduct shooting program.

Trapping

Trapping is considered an effective tool when managing smaller pest animal populations, however, is very labour intensive. Department of Agriculture and Fisheries (DAF) recommended two types of traps for the management of feral dogs, with leg-hold traps now considered inhumane and less selective. Traps should be strategically placed along known wild dog pads or activity areas, with potential lures having potential to increase the effectiveness of traps. Traps must be set at the end of each day and checked the following morning. **This method is highly recommended for use on the Narangba Offsets site**.

Foot-hold traps:

Foot-hold traps are selected to match the foot size of the selected animal. The trap is designed to catch the animal across the tougher padded area of the foot. The objective of foot-hold traps is to hold the animal firmly at the foot but reduced the potential damage. Jaws of foot-holds can be rubber padded, offset, or laminated. These traps are considered effective in the control of feral dogs while reducing non-target animals captures and limiting animal welfare conditions.

Collarum™ neck restraint:

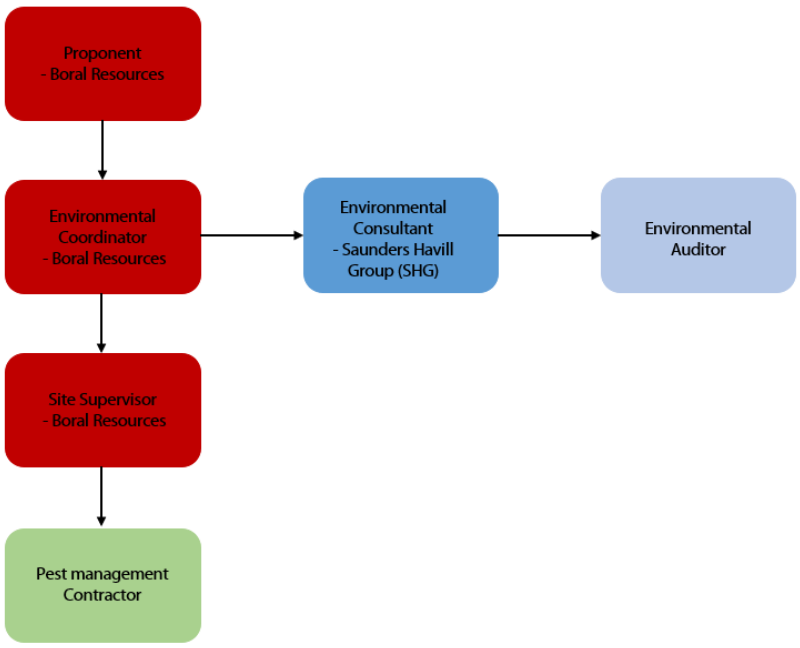
The Collarum™ neck restraint is also a recommended trap by DAF, however, requires a high level of training. While this type of trap is considered humane, the public may not be able to distinguish it from a snare, causing public concern.

The chosen contractor will implement a Predator Trapping Program at the Boral Offset Site. The trapping schedule will incorporate the following:

- Deployment of camera traps onsite to determine optimal trap placement;
- Subsequent trap deployment and monitoring of traps;
- Provision of pest management data to Boral representatives (Environmental Coordinator)

Data collated during the trapping events will be used to compare against previous numbers of vertebrate pests and reported within the Annual Compliance Report.

Chain of Responsibility



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Role	Nominated Person	Company	Contact ph./details
Proponent/ Project Coordinator	Paul West	Boral	0401 896 115
Environmental Coordinator	Matthew Allan	Boral	0466 405 885
Administering Authority	DAWE Compliance Monitoring Branch	DAWE	EPBCMonitoring@awe.gov.au
Site Supervisor	Quarry Manager	Boral	TBA
Site Contractor	TBA	TBA	TBA
Environmental Auditor	TBA	TBA	TBA

Roles and Responsibilities

Role	Responsibilities	Timeframe
Proponent/Project Coordinator	Liaise regularly with Environmental coordinator	As required, ongoing.
	Ensure ACR is published to Boral website by 12th August	Annually
Environmental Coordinator	Coordinate and liaise with Environmental Consultant	As required, ongoing.
	Oversee onsite work and ensure sufficient data is available to achieve annual compliance	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
	Provide data for annual compliance to environmental consultant	As required, ongoing.
	Report non-compliance events within 2 business days of detection	As required
Site Supervisor	Coordinate pest management contractor	Annually, ongoing.
	Ensure periodic inspection of site works is completed	As required, ongoing.
	Ensure sufficient data is collected to inform compliance reporting	As required, ongoing.
	Liaise with Environmental Coordinator regularly	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
Site Contractor	Complete vertebrate pest management (specifically dogs, but in accordance with the hierarchy of pests) works as specified under the OMP and as directed by Site Supervisor and Environmental Coordinator	Annually, ongoing. Pest Management practices to be suitably documented and data, report and photographs provided to Site Supervisor.
Environmental Consultant	Coordinate annual EPBC monitoring (vertebrate pest presence, comparison with previous year's results)	Annually until vertebrate pest presence not detected for three years.
	Prepare and coordinate EPBC annual compliance reporting	Published to Boral website by **12th August** each year
Environmental Auditor	Complete auditing of requirements conditioned under the EPBC approval	As required

Monitoring

To achieve optimal results, camera trap locations should be used repeatedly in a systematic approach, installed at the same locations during annual monitoring events. During baseline assessments (2020), the camera traps (except for one), were successful in identifying both native and introduced fauna species.

To analyse the camera trap locations, a square grid was overlayed on the offset site (approximately 700 x 700m). This provides rough indication of mean home range of wild dogs, as home range for the species has been found to vary substantially with differing environmental factors.

During the baseline studies, five cameras were installed however, using the adaptive management framework and aligning with the grid-based approach, an additional three cameras will be installed across the offsets site in subsequent years, potentially one within each offsets stage. For locations for ongoing monitoring across the site refer to **Figure 2**.

The following pest animal monitoring methodology will be implemented:

- GPSs will be used to record the location of pest animals present during regular monitoring and incidental detection. Feral dogs, cats and foxes are of high concern due to their known impact on koala and potential presence via notable tracks or scats will be recorded.
- Field datasheet detailing the time of the monitoring event, observed pest animal scats or tracks, photo location and notes of any evidence of positive and/or negative changes in pest animal occurrence.
- Comparison of current and previous year's data, with photographic changes in pest animal occurrences.

- Transfer GPS data to spatial data programs to generate pest animal occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes.
- Where pest animal presence is detected, targeted trapping and baiting programs will be implemented on completion of the monitoring program.

Risk Assessment

A risk assessment of the potential contraindicative events which may occur during implementation of the VPMP are outlined in the Table below. These events detail issues which may arise, negatively affecting the improvement of habitat for koala onsite, through the increase of known vertebrate pests onsite, or the establishment of new pests.

Objective	Contraindicative event	Likelihood	Consequence	Risk level	Trigger	Contingency	Associated events
Remove vertebrate pests (specifically koala predators – wild dogs and foxes) from offsets site	Annual pest management delayed due to weather or unpredicted event	Possible	Minor	Moderate	Annual Compliance Monitoring (pest monitoring) indicates an increase in detection rates of vertebrate pests across the site.	Audit and revision of vertebrate pest management plan and consider change in timing of pest management. Revision of seasonal timing and frequency of pest monitoring and management events.	Annual vertebrate pest monitoring; onsite reports of vertebrate pests
Decrease and remove vertebrate pests (specifically koala predators – wild dogs and foxes) from offsets site	Increase in detection rates of vertebrate pest species impacting on ecological function and habitat quality score improvement across Stage One.	Unlikely	Minor	Low	Annual Compliance Monitoring indicates an increase in detection rates of vertebrate pests across the offsets site.	Reassessment of frequency of current monitoring and pest management events	Annual vertebrate pest monitoring; onsite reports of vertebrate pests
Remove vertebrate pests (specifically koala predators – wild dogs and foxes) from offsets site	Infrequent follow up to pest trapping event due to unpredicted weather event, leading to animals remaining in traps for more than one night.	Unlikely	High	Medium	Exclusion from one or more trap site locations for more than a single night, due to unpredicted weather event.	Revision of timeline of management across the year to exclude wet and/or storm season. Review protocol and process with pest management contractor.	Onsite weather updates; short- and long-term weather forecasts; pest contractor report
Remove vertebrate pests (specifically koala predators – wild dogs and foxes) from offsets site	High rainfall year causing site inaccessibility and leading to extended exclusion of vertebrate pest management across site	Possible	Minor	Medium	Exclusion from one or more offsets Stages for greater than 3 months of the year	Revision of timeline of management across the year. Renew objective to achieve pest monitoring and management outside of wet season October each year.	Onsite weather updates

Appendix F

Bushfire Management Plan

Bushfire management plan

Narangba Quarry | Queensland | Offset sites
Prepared for Boral Resources (Queensland) Pty Limited | 28 July 2021

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Bushfire management plan

Final

Report 21041 | Boral Resources (Queensland) Pty Limited | 28 July 2021

Prepared by Robert Janssen

Position Managing principal

Signature 

Date 28 July 2021

Document control

Version	Date	Prepared by	Reviewed by
Draft	22 May 2021	R. Janssen	Boral Resources (Queensland) Pty Limited
Draft_V1	12 July 2021	R. Janssen	Boral Resources (Queensland) Pty Limited
Final	28 July 2021	R. Janssen	LEC

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Table of contents

Contents

Figures

Appendix

1 Introduction

Land and Environment Consultants Pty Ltd (**LEC**) was engaged by Boral Resources (Queensland) Pty Limited (**Boral**) to prepare a bushfire management plan (**BMP**) for the offset area at Narangba Quarry, located at Raynbird Road, Narangba (**the site**).

The offset area was established as a condition of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) approval for the Narangba Quarry expansion project. The Narangba Quarry expansion project was referred under the EPBC Act on 11 November 2014 and subsequently declared a 'controlled action' requiring assessment by 'preliminary documentation' pursuant to section 18 and 18A (listed threatened species and communities) (EPBC Act reference 2014/7351). The trigger for the controlled action was due to potential impacts on *Phascolarctos cinereus* (the Koala), which is listed as 'vulnerable' under the EPBC Act.

Condition 3a of the EPBC Act approval required the preparation of an offset management plan (**OMP**) for the offset area (SHG 2019).

Management action 4 of the OMP requires a BMP to be prepared for the offset area 'for the purpose of protecting the offset area from high intensity fires as well as for conducting ecological burns with the aim to enhance biodiversity in line with the Queensland regional ecosystem description database fire management guidelines'.

1.1 Scope

The scope of this BMP is limited to the offset area on the offset area plan at Appendix 1.

The OMP requires the BMP to identify management measures for the control of bushfires across the offset area including:

- Installation of firebreaks and access tracks.
- Annual inspection and maintenance of firebreaks and access tracks.
- Prescribed burning undertaken in consultation with, and under the guidance of the Queensland Rural Fire Brigade (**RFB**) and in compliance with the Queensland *Fire and Emergency Services Act 1990* (**FES Act**).
- Use of domestic livestock or other methods to reduce fuel loads in the event that a fire risk professional, eg representative of the Queensland Rural Fire Brigade, and a suitably qualified person deem that conditions are not suitable for an ecological burn and that grazing is appropriate to manage a high level of fire risk. Level of risk (and any need to repeat this grazing cycle) is to be reassessed by the aforementioned professional following the grazing event.

In addition to the above requirements, the OMP requires landscape level bushfire management to be carried out over the entire offset area within 12 months of commencing stage 1 of the Narangba Quarry expansion project and for the BMP to include a mechanism for regular review of fire breaks, access tracks, fuel loads and outcomes of prescribed burns or other management techniques such as use of domestic livestock.

This BMP does not supersede the bushfire hazard assessment and management plan that was prepared for the Narangba Quarry expansion project (BPA 2019) which provides a range of bushfire protection measures that are required for compliance with the bushfire hazard area performance or

acceptable outcomes of the Moreton Bay Regional Council Planning Scheme 2016 *Extractive industry zone code.*

1.2 Legislative requirements

Bushfire management operations by Boral and Boral's contractors are governed by the FES Act.

Section 62 of the FES Act requires Boral and/or Boral's contractors to apply to a fire warden (orally or in writing) for a permit to light a fire on any land.

Section 67 of the FES Act requires Boral and Boral's contractors to take all reasonable steps to extinguish or control unauthorised fire on the site and as soon as practical, report the existence and location of the fire to a fire officer or a fire warden.

Bushfire management operations could be subject to other Commonwealth and Queensland legislation relating to environment, heritage and workplace health and safety, including:

- EPBC Act;
- Commonwealth *Aboriginal and Torres Strait Island Heritage Protection Act 1984;*
- Queensland *Mining and Quarrying Safety and Health Act 1999*;
- Queensland *Planning Act 2017*;
- Queensland *Nature Conservation Act 1992*;
- Queensland *Vegetation Management Act 1999* (**VM Act**); and
- Queensland *Heritage Act 1992*.

1.3 Boral's requirements

Bushfire management measures are to be performed in accordance with Boral's health, safety and environment policies, procedures and standards, including:

- Health Safety Environment and Quality Standard – Emergency Preparedness and Response;
- Site Emergency Response Plan; and
- Site Induction.

1.4 Responsibility

Boral is responsible for the implementation of this BMP.

1.5 Review

To mitigate the risk of unplanned fire causing degradation of habitat quality in the offset area, the OMP requires the management measures in this BMP to be reviewed in the event of an unplanned fire adversely impacting the offset area.

'Adverse impacts' are not defined in the OMP but could mean, for example, management areas that are to be protected from fire are burnt and areas of active rehabilitation or revegetation are damaged.

1.6 BMP outline

This BMP includes the following sections:

- An introduction (this section).
- Description of the offset area.
- Description of the bushfire characteristics of the site.
- Bushfire management strategy.
- Works program.
- Review and evaluation.

2 Offset area

This chapter describes the offset area which includes remnant vegetation and areas requiring either rehabilitation or revegetation to provide suitable habitat for Koala usage.

The location of management areas and staging of rehabilitation or revegetation works is identified on the staging plan at Appendix 2.

2.1 Offset management areas

The OMP identifies 3 management areas across the offset area which are explained as follows:

- Remnant vegetation management area – areas identified as remnant vegetation are those areas of existing vegetation mapped under the VM Act as remnant. These areas were observed as having potential to still be disturbed from surrounding land uses, understorey clearing and/or weed invasion.
- Habitat rehabilitation area – areas identified as being currently degraded in some way through disturbance and/or weed invasion. Works are to be undertaken within these zones to improve the condition including weed management, natural regeneration, seeding and infill planting as required.
- Habitat revegetation area – areas identified as being mostly devoid of vegetation , where grazing and other agricultural practices occurred in the past, or are currently occurring. These areas require significant planting and on-ground works to establish vegetation communities reflective of the nearby remnant vegetation.

2.2 Offset area staging

The OMP identifies that the offset area will be delivered in 3 stages which coincide with the staging of the Narangba Quarry expansion project. Each stage of the offset area, ie stages 1-3, is shown on the staging plan at Appendix 2 and will indicatively commence in 10 years, 20 years and 40+ years, respectively. Notwithstanding the staging of the offset area, bushfire management will be carried out over the entire offset area.

2.3 Koala habitat improvement

Management measures in this BMP must support key actions of the OMP that will improve koala habitat values within the offset area. Considerations for the BMP in relation to the key actions of the OMP include:

- Remnant vegetation management areas - management measures will not result in the clearing of remnant vegetation, for example, new fire trails or fire breaks will not be established in remnant vegetation and grazing as a method of fuel hazard reduction will not occur.
- Habitat rehabilitation areas – management measures will be tailored to compliment investments into assisted regeneration including the seeding or planting of endemic canopy tree species. Grazing as a method of fuel hazard reduction will not occur in habitat rehabilitation areas.
- Habitation revegetation areas – management measures will seek to protect habitat revegetation areas from fire unless fire is being used as a tool to benefit natural regeneration. Grazing as a method of fuel hazard reduction will not occur in areas where revegetation has occurred.

2.4 Risk assessment

The OMP includes a risk assessment which identifies that ‘unplanned fire causing degradation of habitat quality through the loss of native plant diversity and abundance within the offset area’ is a medium level risk to ‘maintaining or improving habitat quality’ in the offset area.

3 Bushfire analysis

This chapter provides an analysis of the bushfire characteristics of the offset area.

3.1 Vegetation

Appendix 3 provides a summary of recommended fire regimes for the vegetation (QG 2021) and potential fuel loads (QFES 2019) for vegetation which occurs within the offset area based on regional ecosystem (**RE**) classifications.

REs which occurs within the offset area are shown on Figure 3.1 and recommended fire intervals for REs are shown on Figure 3.2.

3.2 Fire weather

The fire danger season at the Narangba Quarry starts in July, peaks in September and begins to fall in November, but will remain elevated until consistent summer rainfall occurs. Typically, the worst fire weather conditions will be experienced during the fire danger season when the wind direction is from the west.

Forest Fire Danger Index (**FFDI**) values represent the chance of a fire starting, its rate of spread, its intensity and the difficulty of suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long and short-term drought effects. The severe fire weather map in Catalyst (QFES 2021) indicates the 5% annual exceedance probability FFDI for Narangba Quarry is 56.

Fire danger ratings (**FDR**) are based on the forecast weather conditions, ie FFDI, and other risk factors and give advice about the level of bushfire threat on a day. An FFDI of 56 correlates with a 'severe' FDR and will be associated with hot, dry and windy conditions. If a fire starts and takes hold under these conditions, it will be difficult to control in the remnant vegetation management areas and habitat rehabilitation areas.

3.3 Landscape slope

The landscape slope of the offset area is varied and ranges from plains to steep hills. In general, remnant vegetation management areas are aligned with steep hills, habitat rehabilitation areas are aligned with undulating land and rolling hills and habitat revegetation areas are aligned with plains and undulating land.

Landscape slope has a significant effect on the rate of spread and intensity of a fire, whereby a fire burning on 10° of upslope will have double the rate of spread and intensity of a fire burning on flat land.

3.4 Bushfire hazard areas

In Queensland, bushfire hazard areas are identified on the basis of landscape slope, vegetation type (as a surrogate for fuel load) and fire weather severity (Leonard et al., 2014). Spatial data for each of these attributes is used to calculate potential fire-line intensity, which is the basis for delineating bushfire hazard areas as follows:

- Very high potential fire line intensity > 40,000 kilowatts/m (**kW/m**).

- High potential fire line intensity 20,000-40,000 kW/m.
- Medium potential fire line intensity 4,000-20,000 kW/m.
- Non bushfire hazard areas < 4,000kW/m.

The bushfire prone area map for the offset area is presented in Figure 3.3 and indicates that remnant vegetation management areas are high to very high potential bushfire intensity areas (except for areas of RE 12.11.10/12.11.3 and RE 12.12.16), habitat rehabilitation areas are medium to high potential bushfire intensity areas and habitat revegetation areas are a non-bushfire prone hazard class.

3.5 Fire history

The fire history map in Catalyst (QFES 2021) indicates that there have been no fires within the offset area during the past 10 years. Therefore, habitat values of remnant vegetation management areas and habitat rehabilitation areas are potentially at risk due to inappropriate fire regimes, ie to long since the last fire.

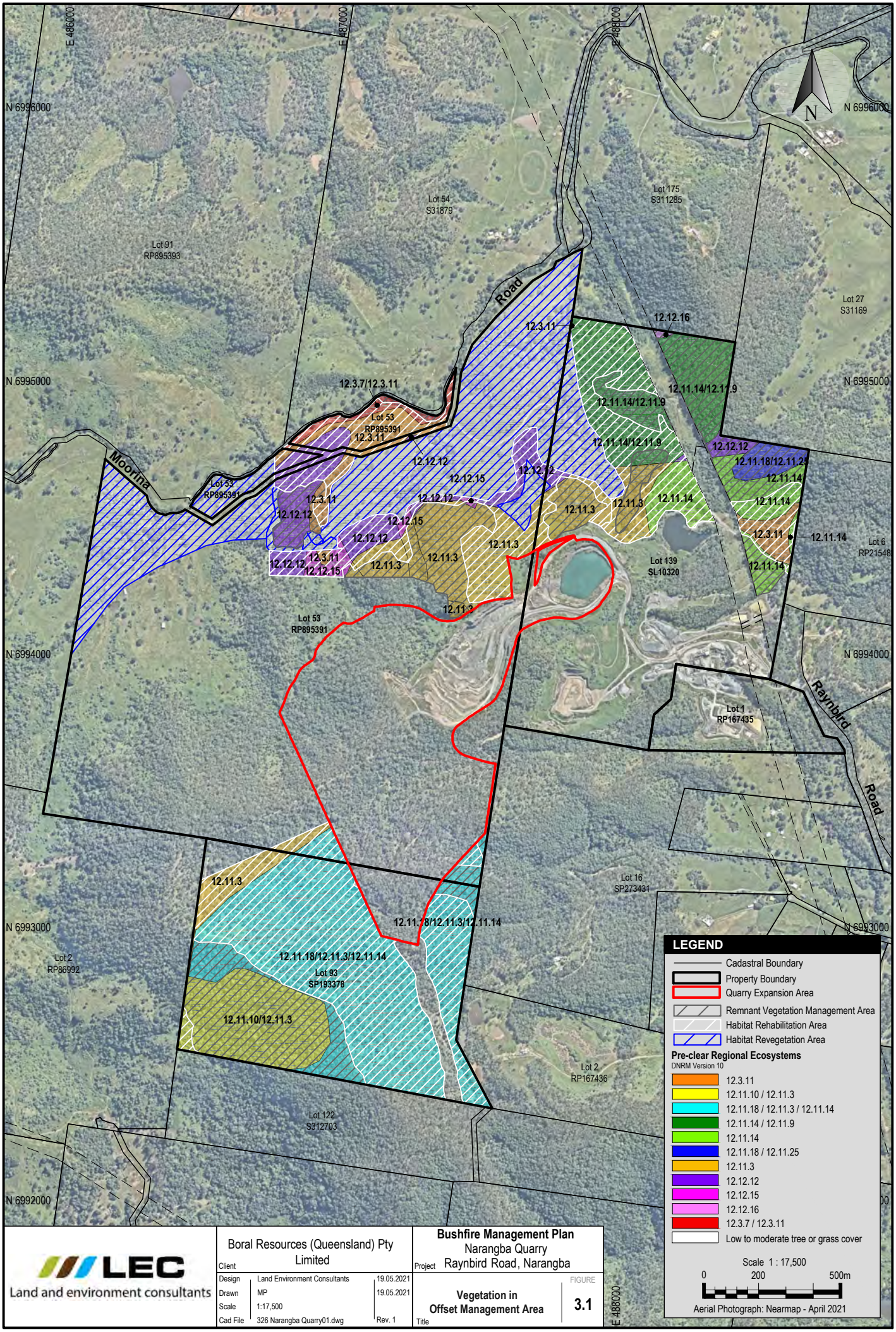
3.6 Vehicle access for bushfire management

Vehicle access tracks within the offset area are trafficable by 4wd vehicles.

There is no vehicle access to the offset area on the east side of the Powerlink easement or along the offset area boundary in the south-west corner of the site.

3.7 Water supply for bushfire management

There are numerous water supply points within the site which could be used for bushfire management.



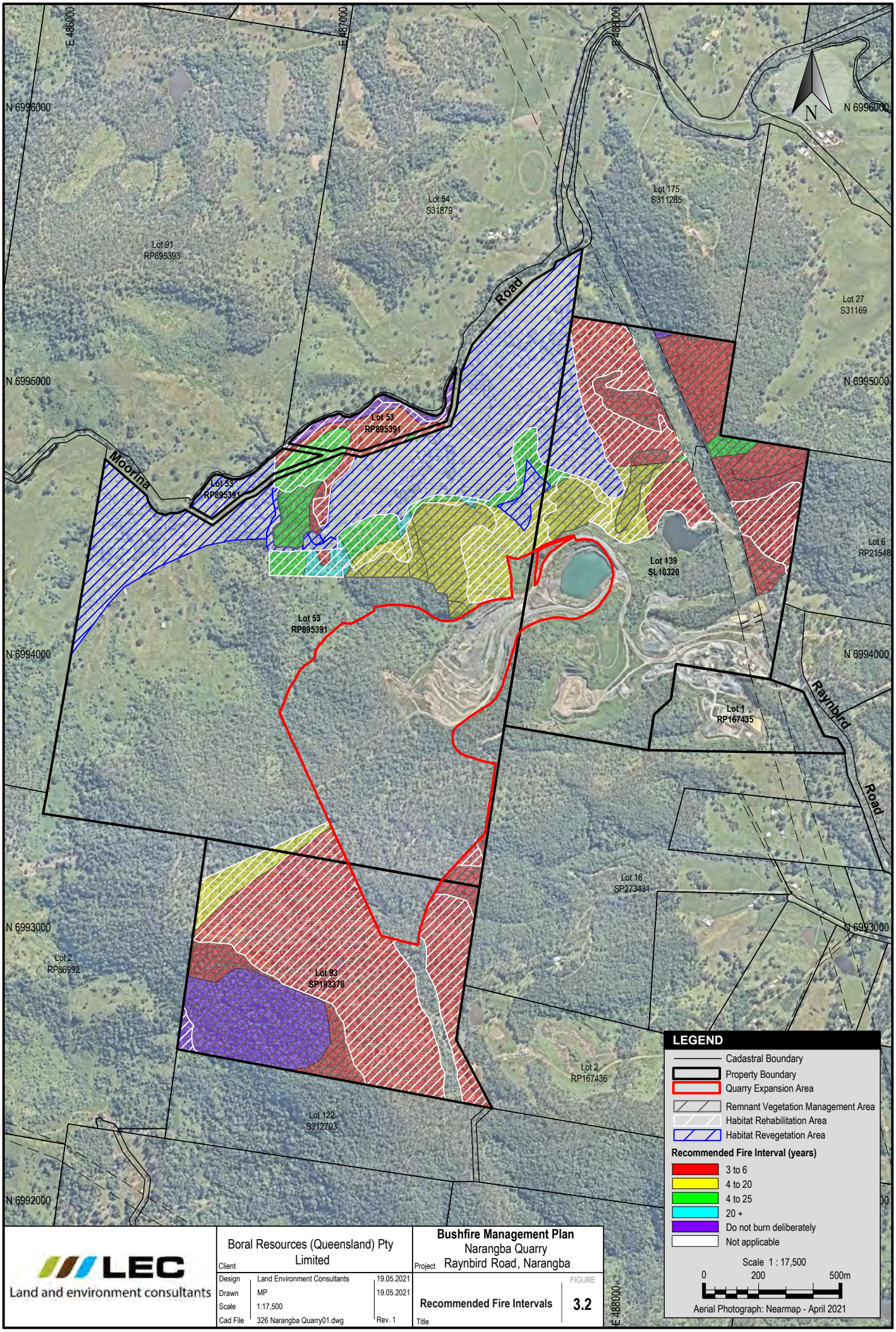
LEC Land and environment consultants

Client	Boral Resources (Queensland) Pty Limited	
Design	Land Environment Consultants	19.05.2021
Drawn	MP	19.05.2021
Scale	1:17,500	
Cad File	326 Narangba Quarry01.dwg	Rev. 1

Bushfire Management Plan
Narangba Quarry
Project Raynbird Road, Narangba

Vegetation in Offset Management Area
Title

FIGURE **3.1**



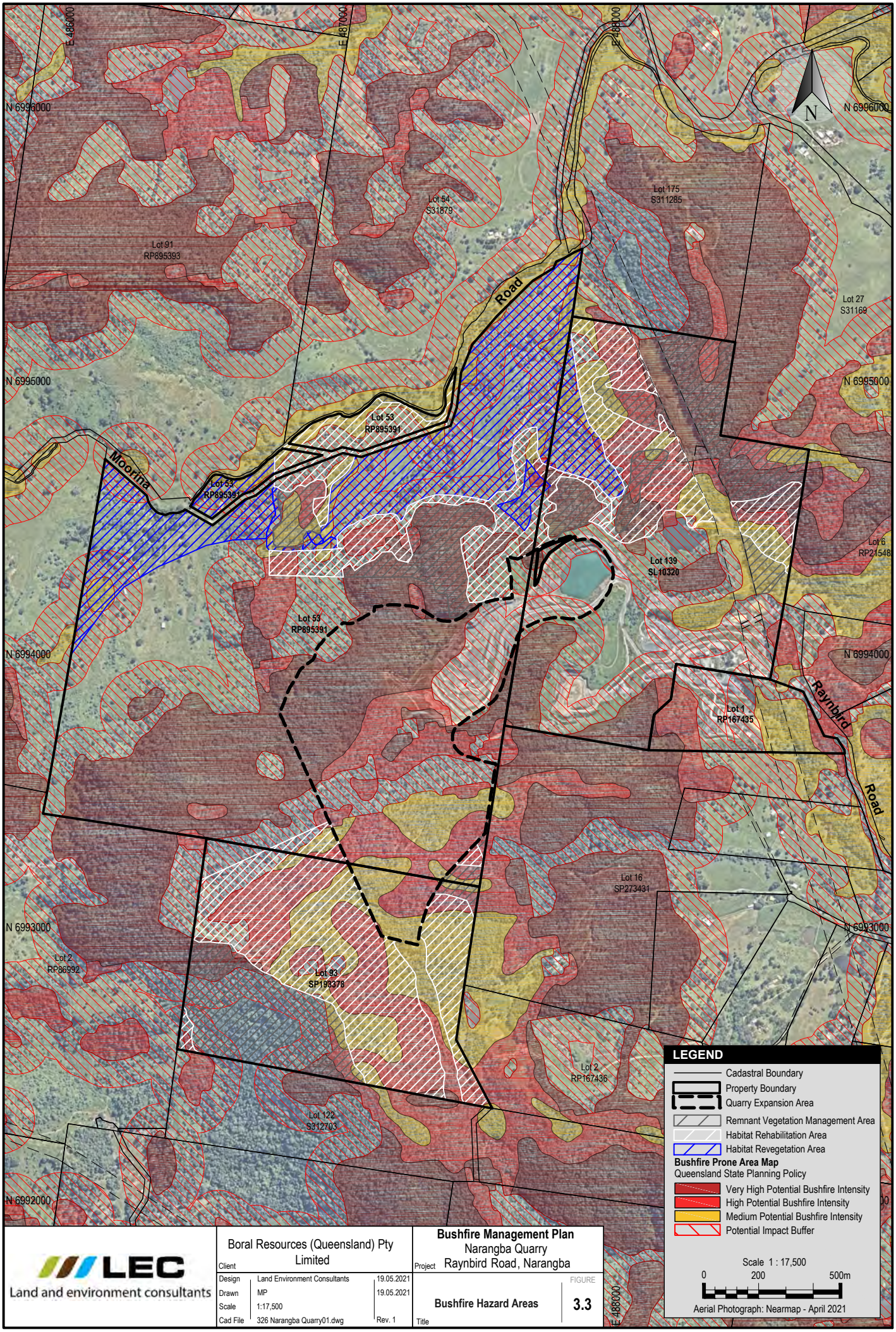
LEC
Land and environment consultants

Client	Boral Resources (Queensland) Pty Limited	
Design	Land Environment Consultants	19.05.2021
Drawn	MP	19.05.2021
Scale	1:17,500	
Cad File	326 Narangba Quarry01.dwg	Rev. 1

Bushfire Management Plan
Narangba Quarry
Project Raynbird Road, Narangba

Title **Recommended Fire Intervals**

FIGURE **3.2**



LEC
Land and environment consultants

Client	Boral Resources (Queensland) Pty Limited	
Project	**Bushfire Management Plan** Narangba Quarry Raynbird Road, Narangba	
Design	Land Environment Consultants	19.05.2021
Drawn	MP	19.05.2021
Scale	1:17,500	
Cad File	326 Narangba Quarry01.dwg	Rev. 1
Title	**Bushfire Hazard Areas**	FIGURE 3.3

4 Bushfire management strategy

This chapter provides the bushfire management strategy for the 3 management areas within the offset area.

4.1 Fire breaks

Fire breaks will be established and maintained around rehabilitation works within the habitat revegetation areas.

Fire breaks are low fuel hazard areas that are cleared and maintained to slow or stop the progress of a fire, or to perform burning operations. They will be 6-10 metres (**m**) wide and established by clearing woody vegetation and slashing or ploughing. There width can be reduced to 4 m over a short distances, ie nominally 20 m in length, where site features prevent a 6-10 m wide fire break from being established. Subsequent maintenance will be required annually in May or June, ie prior to the annual fire danger season .

Fire breaks will continue to be maintained around rehabilitation works within the habitat revegetation areas until the ecological consultant undertaking the habitat quality monitoring advises Boral that the rehabilitation works have reached a state of maturity which can tolerate fire.

4.2 Access tracks

Access tracks shown on Figure 4.1 and located outside of the operational areas of the quarry, will be inspected and maintained annually in May/June or as otherwise required to implement bushfire management operations. Maintenance will seek to ensure that access tracks are easily trafficable by 4wd vehicles and safe to perform bushfire management operations.

Access track maintenance will include:

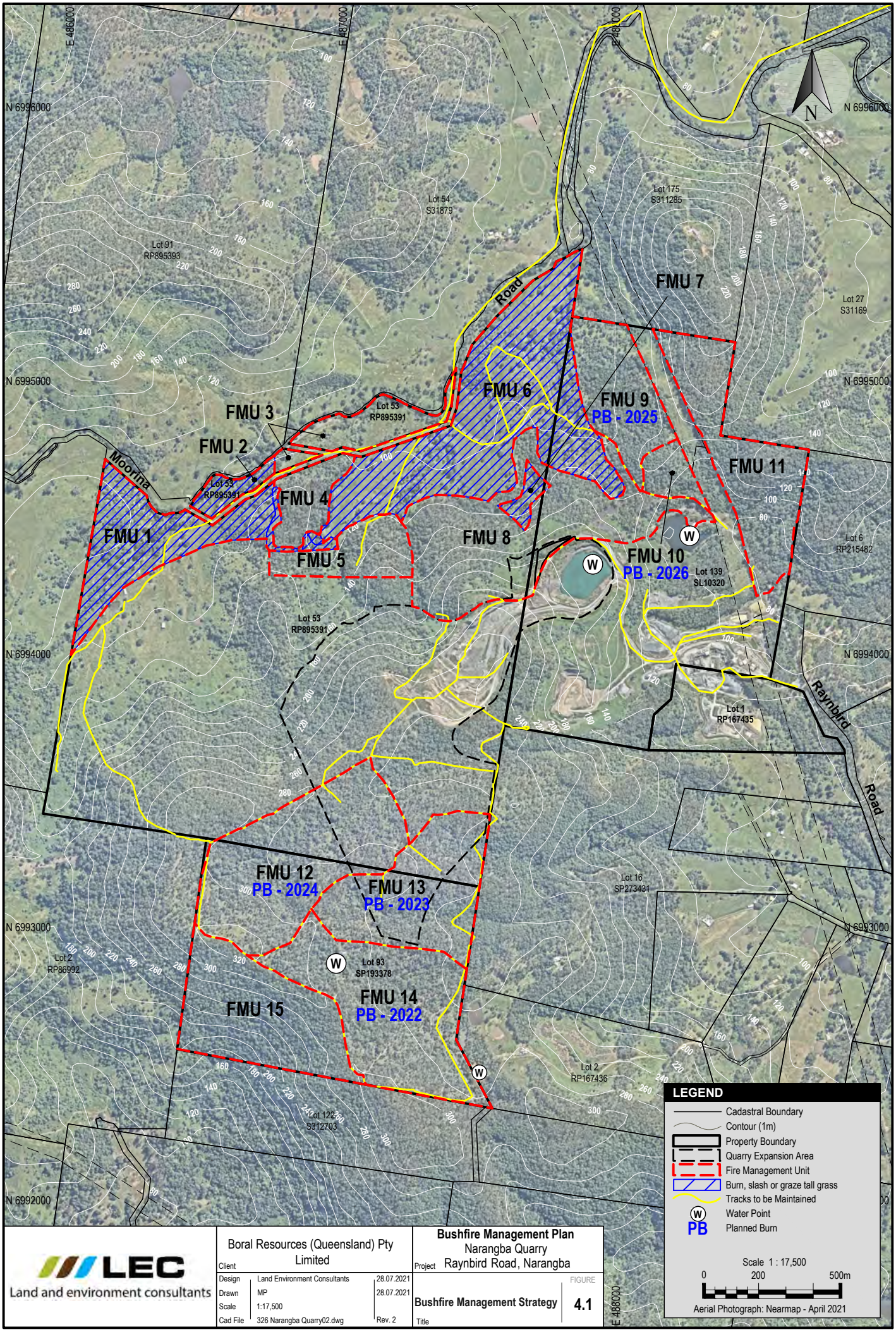
- slashing tall grass within the vehicle surface and 1 m wide verges (relevant to access tracks located in the grassy plains of the site);
- clearing woody regrowth and fallen trees and branches from the vehicle surface and 1 m wide verges;
- removing low overhanging branches which are < 4 m above the vehicle surface; and
- repairing the vehicle surface when its condition hinders efficient access and egress, eg washouts, etc.

4.3 Prescribed burning

To assist with assigning bushfire management actions, the offset area has been divided into fire management units (**FMUs**) which are shown on Figure 4.1 and described in Table 4.1. Where possible, the boundaries of FMUs have been aligned with existing access tracks which will provide containment lines for performing prescribed burns. As a result, some of the FMUs cover land outside of the offset area but all are within the boundaries of the site.

Prescribed burning will be undertaken to achieve fuel hazard reduction, ecological outcomes and to assist with rehabilitation or restoration works. However, it should be noted that prescribed burning is not recommended for all FMUs. Where prescribed burning is recommended for an FMU, it must be

planned to support key actions of the OMP which are outlined in Chapter 2 and based on the recommended fire regimes for regional ecosystems which are provided in Appendix 3.



LEC
Land and environment consultants

Client	Boral Resources (Queensland) Pty Limited	Project	**Bushfire Management Plan** Narangba Quarry Raynbird Road, Narangba
Design	Land Environment Consultants	28.07.2021	
Drawn	MP	28.07.2021	
Scale	1:17,500		FIGURE
Cad File	326 Narangba Quarry02.dwg	Rev. 2	**Bushfire Management Strategy** 4.1
			Title

Table 4.1 Fire management units

FMU	Offset management areas	Regional ecosystems	Notes
FMU 1	Habitat revegetation area	N/A	Prescribed burning is permissible for fuel hazard reduction and to assist with the implementation of rehabilitation or restoration works. Fuel hazard reduction should occur if there are uniform levels of tall grass cover, ie a subjective assessment which determines that there is greater than 30 % coverage of grass which is over 0.5 m tall. Revegetation works within FMU 1 must be protected from fire.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 2	Habitat revegetation area	N/A	Prescribed burning is permissible for fuel hazard reduction and to assist with the implementation of rehabilitation or restoration works. Fuel hazard reduction should occur if there are uniform levels of tall grass cover, ie a subjective assessment which determines that there is greater than 30 % coverage of grass which is over 0.5 m tall. FMU 3 and revegetation works within FMU 2 must be protected from fire.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 3	Habitat rehabilitation area	RE 12.3.7/12.3.11, RE 12.3.11 and RE 12.12.12	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 3 must be protected from fire. Recommended fire intervals range from 3-6 years for RE 12.3.11 and 4-25 years for RE 12.12.12. Do not deliberately burn vegetation fringing the watercourse along the north boundary of FMU 3, ie RE 12.3.7/12.3.11.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 4	Remnant vegetation management area and habitat rehabilitation area	RE 12.3.11 and RE 12.12.12	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 4 must be protected from fire. Recommended fire intervals range from 3-6 years for RE 12.3.11 and 4-25 years for RE 12.12.12.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 5	Remnant vegetation management area and habitat rehabilitation area	RE 12.3.11, RE 12.11.3, RE 12.12.12 and RE 12.12.15	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 5 must be protected from fire. Recommended fire intervals range from 3-6 years for RE 12.3.11, 4-20 years for RE 12.11.3, 4-25 years for RE 12.12.12 and 20+ years for RE 12.12.15.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 6	Habitat revegetation area	N/A	Prescribed burning is permissible for fuel hazard reduction and to assist with the implementation of rehabilitation or restoration works. Fuel hazard reduction should occur if there are uniform levels of tall grass cover, ie a subjective assessment which determines that there is greater than 30 % coverage of grass which is over 0.5 m tall. Revegetation works within FMU 6 must be protected from fire.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 7	Habitat revegetation area	N/A	Prescribed burning is permissible for fuel hazard reduction and to assist with the implementation of rehabilitation or restoration works; otherwise allow to burn with FMU 7 if rehabilitation or restoration works have not commenced. If restoration works have commenced in FMU 7, they must be protected from fire.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 8	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.3, RE 12.11.14, RE 12.12.12 and RE 12.12.15	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 8 must be protected from fire. Recommended fire intervals range from 3-6 year for RE 12.11.14, 4-20 years for RE 12.11.3, 4-25 years for RE 12.12.12 and 20+ years for RE 12.12.15.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 9	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.14/12.11.9	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 9 must be protected from fire. The recommended fire interval for RE 12.11.14/12.11.9 is 3-6 years.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 10	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.14, RE 12.11.14/12.11.9 and RE 12.11.3	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 10 must be protected from fire. Recommended fire intervals range from 3-6 years for RE 12.11.14 and RE 12.11.14/12.11.9 and 4-20 years for RE 12.11.3.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 11	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.14/12.11.9, RE 12.11.18/12.11.5, RE 12.11.14, RE 12.3.11 and RE 12.12.12	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 11 must be protected from fire. There are no access tracks that can be used to perform burning operations. Therefore, it is recommended that FMU 11 is allowed to burn with the adjoining landscape if site neighbours in this area wish to undertake a prescribed burn. Recommended fire intervals range from 3-6 years for RE 12.11.14, RE 12.11.14/12.11.9, RE 12.11.18/12.11.25 and RE 12.3.11 and 4-25 years for RE 12.12.12.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 12	Habitat rehabilitation area	RE 12.11.3 and RE 12.11.18/12.11.3/12.11.14	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 12 must be protected from fire. Recommended fire intervals range from 3-6 years for RE 12.11.18/12.11.3/12.11.14 and 4 -20 years for RE 12.11.3.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 13	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.18/12.11.3/12.11.14	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 13 must be protected from fire. Prescribed burn planning in FMU 13 must include a note advising that FMU 15 is sensitive to fire and requires protection from unplanned ignitions. The recommended fire interval for RE 12.11.18/12.11.3/12.11.14 is 3-6 years.

FMU	Offset management areas	Regional ecosystems	Notes
FMU 14	Habitat rehabilitation area	RE 12.11.18/12.11.3/12.11.14	Prescribed burning is permissible for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. Rehabilitation or restoration works in FMU 14 must be protected from fire. Prescribed burn planning in FMU 14 must include a note advising that FMU 15 is sensitive to fire and requires protection from unplanned ignitions. The recommended fire interval for RE 12.11.18/12.11.3/12.11.14 is 3-6 years.
FMU	**Offset management areas**	**Regional ecosystems**	**Notes**
FMU 15	Remnant vegetation management area and habitat rehabilitation area	RE 12.11.10/12.11.3 and RE 12.11.18/12.11.3/12.11.14	Prescribed burning is not permitted in FMU 15. The majority of FMU 15 consists of fire sensitive vegetation being RE 12.11.10/12.11.3.

The OMP requires 'prescribed burning to be undertaken in consultation with, and under the guidance of the RFB and in compliance with the FES Act. The RFB is a voluntary organisation and there is no guarantee that RFB volunteers will be available for consultation or to provide guidance and resources for the implementation of prescribed burns. Therefore, reliance on the RFB is considered a risk to the implementation of this BMP and the improvement of koala habitat values within the offset area.

To mitigate the abovementioned risk, Boral will engage a contractor (**burn contractor**) to plan and implement the prescribed burns and hazard reduction burns recommended in this BMP. To comply with the OMP requirements, the burn contractor will be responsible for liaising with the RFB regarding the planning and implementation of prescribed burns and for inviting the RFB to participate in prescribed burn operations.

If Boral is unable to engage a suitable burn contractor, they should seek the assistance of the RFB to plan and implement the prescribed burns and hazard reduction burns recommended in this BMP.

4.3.1 Burn plan

The burn contractor (or the RFB and Boral) will prepare a burn plan for each prescribed burn or hazard reduction burn. The burn plan will be reviewed and approved by Boral prior to its implementation. A burn plan should contain the following elements (as a minimum):

- a statement of burn objectives;
- an operations map of the area;
- prescriptions or limits for fuel and weather conditions;
- ignition patterns and techniques;
- identification of assets and values within the burn area that require protection and measures for their protection;
- resourcing requirements;
- health and safety issues (for burn personal, quarry staff and the public);

- notifications; and
- guidance on implementation.

4.3.2 Compliance with the FES Act

The burn contractor (or Boral) will also be responsible for obtaining a permit to light a fire from a fire warden and for taking all reasonable steps to contain a prescribed burn or hazard reduction burn within containment lines (as detailed in the burn plan).

The information in the burn plan will be required by the fire warden to issue a permit to light a fire.

4.3.3 Appraisal

The burn contractor will prepare a brief appraisal report for each prescribed burn or hazard reduction burn which includes a map of the burn area and evaluates the outcomes of the burn against the planned objectives, lessons learnt and continuous improvement.

If the burn is done by the RFB then Boral must retain the details of the burn, eg location, date, objectives, burn intensity, weather conditions, etc.

4.4 Other methods of hazard reduction

Other methods of hazard reduction will be applied to grassland areas within habitat revegetation areas, ie FMU 1-2 and FMU 6-7, if prescribed burning for fuel hazard reduction is not feasible.

4.4.1 Mechanical hazard reduction

Mechanical hazard reduction, ie slashing or ploughing, is the preferred strategy for fuel hazard reduction within habitat revegetation areas that have uniform levels of tall grass cover. It can also be used within revegetation work areas if required.

4.4.2 Use of domestic livestock for hazard reduction

Domestic livestock will only be used for fuel hazard reduction within parts of the habitat revegetation areas that have no revegetation works.

Temporary fencing will be used to contain domestic livestock and they will be monitored and immediately removed from remnant vegetation management areas, habitat rehabilitation areas and revegetation work areas within habitat revegetation areas if they escape.

The use of domestic livestock for fuel hazard reduction is a relatively slow process when compared to hazard reduction burning or mechanical hazard reduction. If domestic livestock are to be used for fuel hazard reduction, they must be released into the target area several months prior to the onset of the annual fire danger season in late July.

4.5 Monitoring

4.5.1 Fuel hazard monitoring

Fuel hazard monitoring will be undertaken within habitat revegetation areas, ie FMU 1-2 and FMU 6-7, once consistent summer rainfall has occurred. It will determine if these FMUs have uniform levels

of tall grass cover and require fuel hazard reduction. As stated in Table 4.1, uniform levels of tall grass cover means greater than 30 % coverage of grass which is over 0.5 m tall.

Fuel hazard monitoring is not required within remnant vegetation management areas and habitat rehabilitation areas, ie FMU 3-5 and FMU 8-15, for the purpose of identifying areas requiring prescribed burns. Prescribed burning within these FMUs will be based on the recommended fire regimes for the vegetation communities which occur within them and fire history data. Notwithstanding, the burn contractor will undertake fuel hazard monitoring within these FMUs when preparing a burn plan.

4.5.2 Fire history records

Boral will maintain records of prescribed burns, hazard reduction burns (including burn contractor appraisals) and unplanned fires within the offset area and broader site. This information can then be consolidated for review and preparation of the next BMP in 5 years.

Information required includes:

- spatial data of the fireground including areas within containment lines which did not burn;
- type of fire, eg prescribed burn, unplanned fire, etc
- year of fire;
- season;
- intensity, eg low, medium, high, etc;
- strategy, eg aim of burn, ignition strategy; and
- issues.

5 Works program

The works program for the implementation of this BMP is provided in Table 5.1 and will be updated after 5 years, ie 2026.

Table 5.1 Works program

Action	Responsibility	Timing/frequency	Notes
Administration			
Engage a burn contractor or the RFB to implement prescribed burns and hazard reduction burns scheduled in this works program.	Boral	October 2021	The successful burn contractor should have demonstrated experience implementing prescribed burning programs, eg prescribed burning programs within Department of Defence training areas.
Review works program	Boral	In the event of an unplanned fire adversely impacting the offset area or 2026.	Refer to Chapter 6.
Fire breaks and access tracks			
Establish and maintain fire breaks around rehabilitation works within	Boral	Annually in May/June or as otherwise required to	Refer to Section 4.1 for fire break standards.

Action	Responsibility	Timing/frequency	Notes
the habitat revegetation areas.		implement the bushfire management operations.	
Inspect and maintain access tracks located outside of the operational areas of the quarry.	Boral	Annually in May/June or as otherwise required to implement bushfire management operations.	Refer to Section 4.2 for access track standards.
Prescribed burns in remnant vegetation management areas and habitat rehabilitation areas			
Prescribed burn FMU 14	Burn contractor	2022	Prescription for prescribed burn should be in accordance with recommended fire regimes for RE 12.11.18/12.11.3/12.11.14 in Appendix 3.
Prescribed burn FMU 13	Burn contractor	2023	Prescription for prescribed burn should be in accordance with recommended fire regimes for RE 12.11.18/12.11.3/12.11.14 in Appendix 3.
Prescribed burn FMU 12	Burn contractor	2024	Prescription for prescribed burn should be in accordance with recommended fire regimes for RE 12.11.3 and RE 12.11.18/12.11.3/12.11.14 in Appendix 3.
Prescribed burn FMU 9	Burn contractor	2025	Prescription for prescribed burn should be in accordance with recommended fire regimes for RE 12.11.14/12.11.9 in Appendix 3.
Prescribed burn FMU 10	Burn contractor	2026	Prescription for prescribed burn should be in accordance with recommended fire regimes for RE 12.11.14, RE 12.11.14/12.11.9 and RE 12.11.3 in Appendix 3.
Delivery of burn plan to Boral for review and approval (unless the burn is to be done by the RFB).	Burn contractor	Annually, December	Refer to Section 4.3.1 for burn plan specifications
Consultation with local RFB regarding implementation of burn plan.	Burn contractor	Annually, January.	-
Obtain permit to light a fire.	Burn contractor	Annually, prior to prescribed burn.	A copy of the approved burn plan is to be provided to the fire warden.
Deliver appraisal report and prescribed burn data.	Burn contractor	Annually, within 8 weeks of the prescribed burn.	Refer to Section 4.3.3 for requirements.
Hazard reduction in habitat revegetation areas			
Implement fuel hazard reduction within areas of FMU 1-2 and FMU 6-7 that	Burn contractor (burns) or	March-June or as otherwise required to implement	Refer to Section 4.3 for hazard reduction burn specifications and

Action	Responsibility	Timing/frequency	Notes
have uniform levels of tall grass cover.	Boral (mechanical or domestic livestock)	bushfire management operations.	Section 4.4 for use of mechanical or domestic livestock methods.
Monitoring			
Fuel hazard monitoring within habitat revegetation areas FMU 1-2 and FMU 6-7.	Boral	Annually, after consistent summer rainfall	Refer to Section 4.5.1 for monitoring method.
Maintain a fire history records	Boral	From January, 2022	Refer to Section 4.5.2 for fire history database specifications

6 Review and evaluation

Review and evaluation of this BMP will be undertaken in the event of an unplanned fire adversely impacting the offset area or after 5 years, ie 2026.

The review and evaluation will consider the appraisal of prescribed burns, analysis of fire history data and annual compliance reports for the offset area which will detail the outcomes and recommendations of weed management, feral and pest fauna species management and koala habitat monitoring within the offset area.

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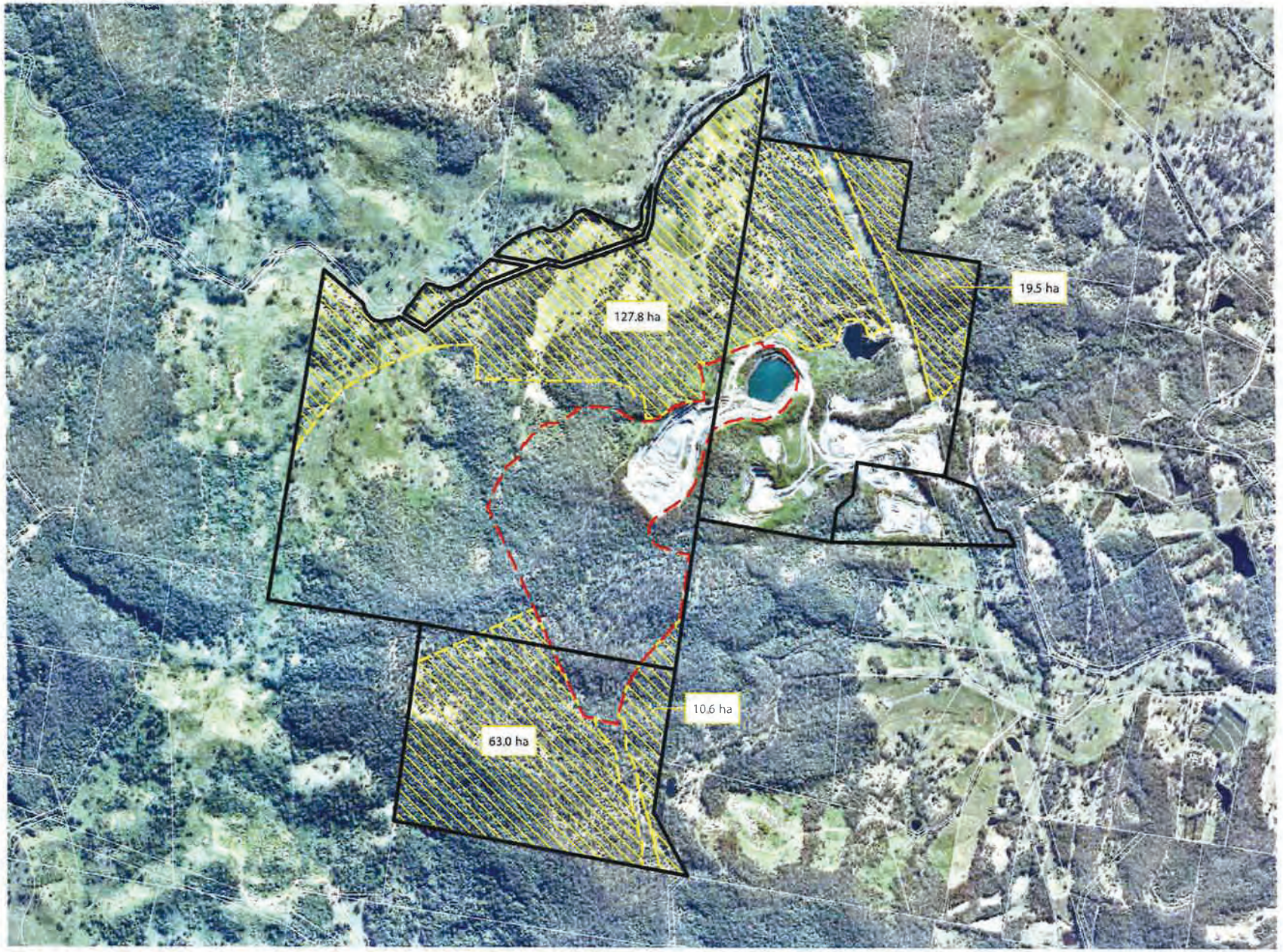
Appendix 1 Offset area

1. Offset Area



Legend

Qld DCDB

Boral landholdings

Impact site

Amended offset area (220.9ha)

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

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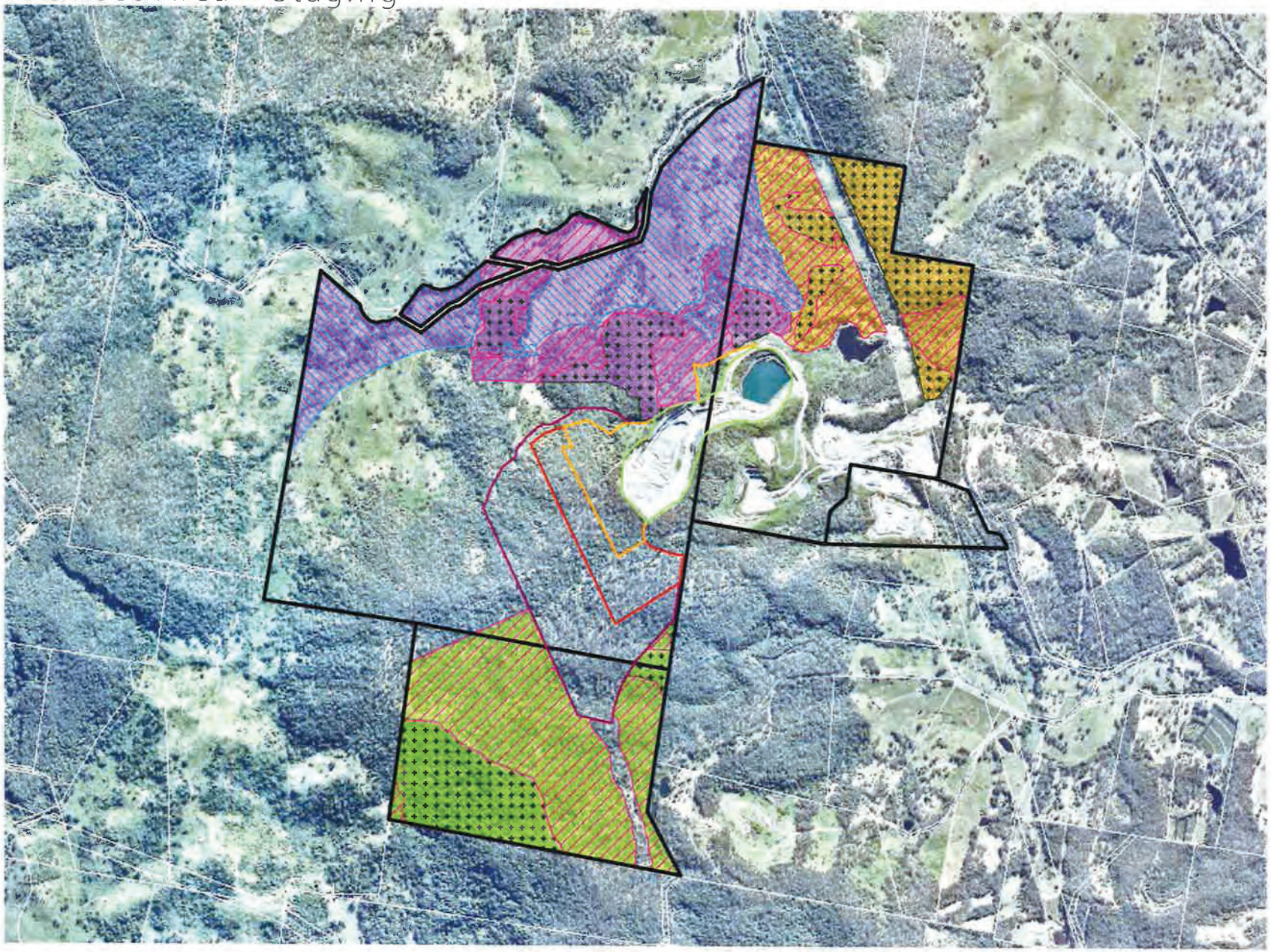
BORAL

Narangba Quarry

Appendix 2 Offset area staging

3. Offset Area - Staging



Legend

Qld DCDB

Boral landholdings

Remnant Vegetation Management Areas (57.9 ha)

Habitat Rehabilitation Areas (101.9 ha)

Habitat Revegetation Areas (62.7 ha)

Quarry Staging Clearing

Existing quarry

+10yrs (9 ha)

+20yrs (13 ha)

Final 60yrs (30 ha)

Offset Staging

Stage 1 (73.7 ha)

Stage 2 (41.1 ha)

Stage 3 (106.1 ha)

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

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Narangba Quarry

Appendix 3 Recommended fire regimes

Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
	Remnant vegetation management area (Remnant vegetation)		
Regional Ecosystem (**RE**) 12.3.11 *Eucalyptus tereticornis* +/- E. *siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast (**RE 12.3.11**)	SEASON: Summer to late-autumn INTENSITY: Low INTERVAL: 3-6 years STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.	16	Does not occur in combination with other REs
RE 12.11.3 *Eucalyptus siderophloia*, E. *propinqua* +/- E. *microcorys*, *Lophostemon confertus*, *Corymbia intermedia*, E. *acmenoides* open forest on metamorphics +/- interbedded volcanics (**RE 12.11.3**)	SEASON: Summer to winter INTENSITY: Plan for low to moderate. Unplanned occasional high intensity wildfire will occur. INTERVAL: 4-8 years maintains a healthy grassy system. 8-20 years for shrubby elements of understorey. STRATEGY: Aim for 40-60% mosaic burn. Needs disturbance to maintain RE structure (eucalypt overstorey with open understorey of predominantly non-rainforest species). Any moist sclerophyll that is relatively open with a mixture of grasses and shrubs should be a priority for fire management to retain RE structure. ISSUES: Frequent fire is needed to maintain understorey integrity, keeping more mesic species low in the profile of the understorey so that other species can compete. A grassy system is especially important for species such as the eastern bristlebird and its habitat. It is essential that wildfires are not the sole	24.2	Occurs on its own and sub-dominant in other RE combinations

Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
	source of fire in this ecosystem. High intensity fires occur periodically through time, however frequent low to moderate intensity fires will create the disturbance required to keep the understorey diverse. A follow-up burn soon after a high intensity wildfire can be considered to reduce germinating mesic species. This 'of concern' RE may contain a high number of rare and threatened plant species, eg *Acomis acoma*, *Corchorus cunninghamii*, *Marsdenia coronata* and *Sophora fraseri*, which require appropriate fire management.		
RE 12.11.9 *Eucalyptus tereticornis* subsp. *tereticornis* or E. *tereticornis* subsp. *basaltica* open forest on metamorphics +/- interbedded volcanics, usually on ridges, crests and upper slopes (**RE 12.11.9**)	SEASON: Summer to winter INTENSITY: Plan for low to moderate. Unplanned occasional high intensity wildfire will occur. INTERVAL: 4-8 years maintains a healthy grassy system. 8-20 years for shrubby elements of understorey. STRATEGY: Aim for 40-60% mosaic burn. Needs disturbance to maintain RE structure (eucalypt overstorey with open understorey of predominantly non-rainforest species). ISSUES: Occurs on exposed ridges and crests but soils are heavy and retain moisture. May contain heath species in understorey. Frequent fire is needed to maintain understorey integrity, keeping more mesic species low in the profile of the understorey so that other species can compete. A grassy system is especially important for species such as the eastern bristlebird and its habitat. It is essential that wildfires are not the sole source of fire in this ecosystem. High intensity fires occur periodically through time, however frequent low to moderate intensity fires will create the disturbance required to keep the understorey diverse. A follow-up burn soon after a high intensity wildfire can be considered to reduce germinating mesic species. This 'of	24.2	Occurs sub-dominant in one RE combination

Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
	concern' RE may contain a high number of rare and threatened plant species which require appropriate fire management.		
RE 12.11.10 Notophyll vine forest +/- *Araucaria cunninghamii* on metamorphics +/- interbedded volcanics (**RE 12.11.10**)	STRATEGY: Do not burn deliberately. Protection relies on broad-scale management of surrounding country. May need active protection from wildfire in extreme conditions or after prolonged drought. Planned burns should not create a running fire into vine forest. Ensuring conditions of good soil moisture and moisture of litter in surrounding communities will limit fire behaviour/intensity. ISSUES: Fire sensitive and not normally flammable. Some preliminary work suggests rainforest seedling germination from planned burning activities will assist the establishment of seedlings in newly burnt areas, especially due to smoke. There may be issues with lantana and other weeds from fire and other disturbance. Remnants may be limited by frequent fire at the margins; this requires further research.	3.5	Occurs dominant in one RE combination
RE 12.11.14 *Eucalyptus crebra*, E. *tereticornis*, *Corymbia intermedia* woodland on metamorphics +/- interbedded volcanics (**RE 12.11.14**)	Same as RE 12.3.11	14.4	Occurs on its own and both dominant and sub-dominant in other RE combinations
RE 12.11.18 *Eucalyptus moluccana* woodland on metamorphics +/- interbedded volcanics (**RE 12.11.18**)	Same as RE 12.3.11 and RE 12.11.14	14.4	Occurs dominant in RE combinations
RE 12.11.25 *Corymbia henryi* and/or *Eucalyptus fibrosa* subsp. *fibrosa* +/- E. *crebra*, E. *carnea*, E. *tindaliae* woodland on metamorphics +/- interbedded volcanics (**RE 12.11.25**)	SEASON: Summer to winter INTENSITY: Low to moderate INTERVAL: 4-25 years	18	Occurs sub-dominant in one RE combination

Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
	STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics.		
RE 12.12.12 *Eucalyptus tereticornis*, *Corymbia intermedia*, E. *crebra* +/- *Lophostemon suaveolens* woodland on Mesozoic to Proterozoic igneous rocks (**RE 12.12.12**)	Same as RE 12.11.25	17.2	Does not occur in combination with other REs
RE 12.12.16 Notophyll vine forest on Mesozoic to Proterozoic igneous rocks (**RE 12.12.16**)	Same as RE 12.11.10	3.5	Does not occur in combination with other REs
	Habitat rehabilitation areas (Non-remnant vegetation)		
Regional ecosystem (**RE**) 12.3.7 *Eucalyptus tereticornis, Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland (**RE 12.3.7**)	STRATEGY: Avoid intentionally burning this fringe vegetation. Burn surrounding ecosystems in conditions that would minimise fire incursion. ISSUES: Protection relies on broad-scale management of surrounding country. However, fire exclusion is not necessary. *Casuarina cunninghamiana* is sensitive to fire and germination after fire is typically low. Triggers unrelated to fire appear to maintain a healthy ecosystem. Issues with lantana and other weeds may result from fire and other disturbance.	11.6	Occurs dominant in one RE combination
Pre-clearing RE 12.3.11		As above	Same as RE 12.3.11

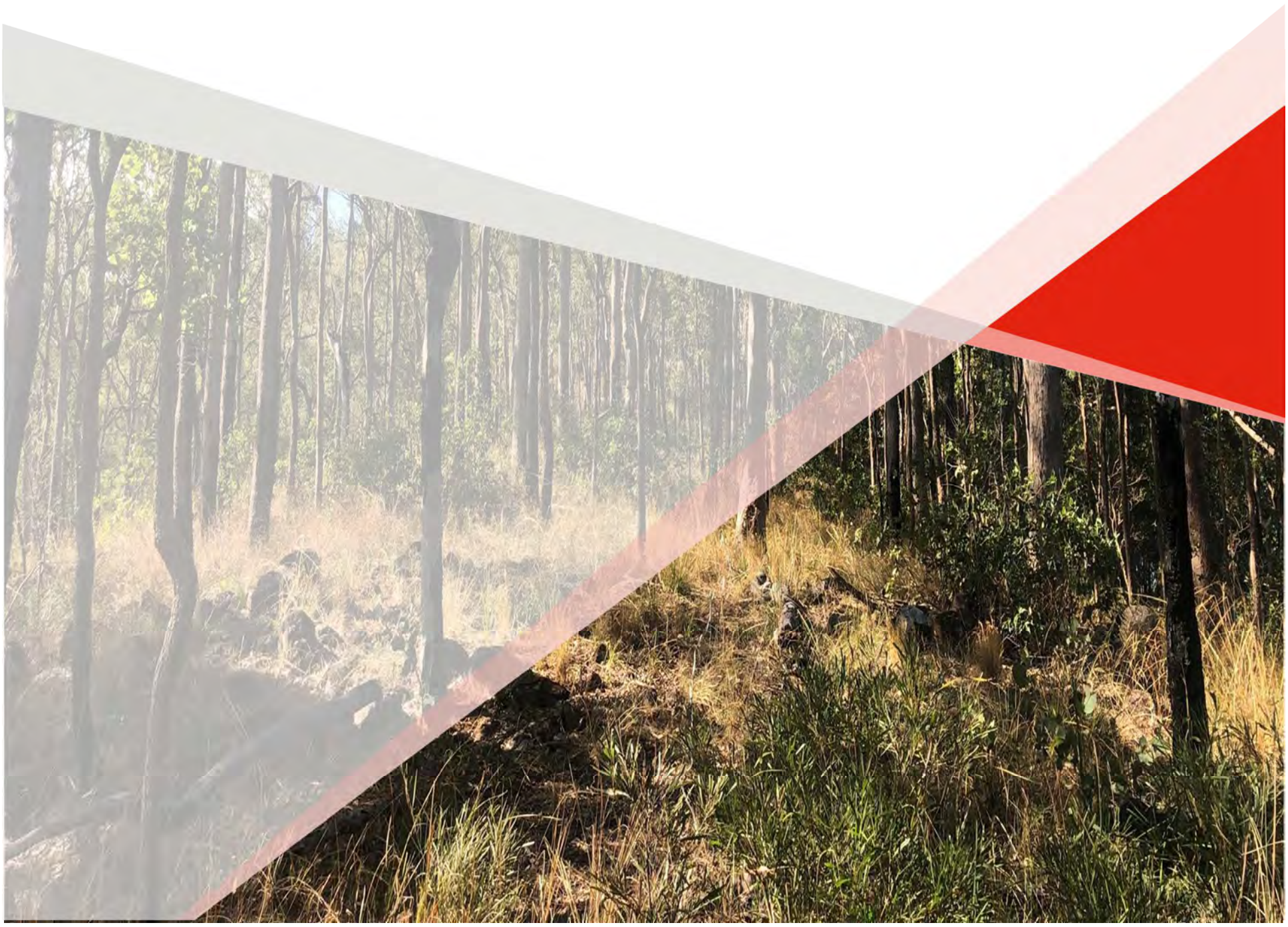
Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
Pre-clearing RE 12.11.3	STRATEGY: Do not burn sections of the 'habitat rehabilitation areas' that have been seeded or planted unless the rehabilitation has reached a mature state that is deemed to be able to withstand a fire. Otherwise, implement fire regimes as listed for remnant vegetation above.		Same as RE 12.11.3
Pre-clearing RE 12.11.9			Same as RE 12.11.9
Pre-clearing RE 12.11.14			Same as RE 12.11.14
Pre-clearing RE 12.11.18			Same as RE 12.11.18
Pre-clearing RE 12.12.12			Same as RE 12.12.12
Pre-clearing RE 12.12.15 *Corymbia intermedia* +/- *Eucalyptus propinqua*, E. *siderophloia*, E. *microcorys*, *Lophostemon confertus* open forest on Mesozoic to Proterozoic igneous rocks (**RE 12.12.15**)	SEASON: Late summer to autumn INTENSITY: Moderate to high INTERVAL: Minimum 20 years, maximum unknown, requiring further research. STRATEGY: Do not burn sections of the 'habitat rehabilitation areas' that have been seeded or planted unless the rehabilitation has reached a mature state that is deemed to be able to withstand a fire. Otherwise, aim for 40-60% mosaic burn. Needs disturbance to maintain RE structure (eucalypt overstorey, rainforest dominated but mixed species understorey). It is unlikely that mosaic burns will be achievable because fire would most likely be of higher intensity, ie likely to be a wildfire, and is only likely to occur at long intervals (at least 20+ years) during prolonged dry periods. In exceptional circumstances, different localities containing this ecosystem could be burnt to ensure a continuum of habitat availability across the broader landscape. Using this strategy maximises the probability of spatial mosaics in the landscape. ISSUES: Frequent fire is needed to maintain understorey integrity, keeping more mesic species low in the profile of the understorey so that other species can compete. It is essential that wildfires are not the sole source of fire in this ecosystem. High intensity fires occur periodically through time, however	35	Does not occur in combination with other REs

Vegetation	Recommended fire regime[1, 2]	Potential fuel load (t/ha)[3]	Notes
	frequent low to moderate intensity fires will create the disturbance required to keep the understorey diverse. A follow-up burn soon after a high intensity wildfire can be considered to reduce germinating mesic species. This RE may contain a high number of rare and threatened plant species which require appropriate fire management. Operationally there will be many areas of wet sclerophyll that cannot be safely burnt, and will only burn in wildfire. There is evidence that suggests that infrequent high intensity fires sustain the eucalypt overstorey. Wet sclerophyll has been shown to be a moving ecotone between vine forest and moist/dry sclerophyll.		
	Habitat revegetation areas		
Cleared land consisting of low to moderate tree or grass cover that will be subject to revegetation	STRATEGY: Do not burn sections of the 'revegetation areas' that have been planted unless the revegetation has reached a mature state that is deemed to be able to withstand a fire.	5-8 (prior to revegetation reaching a mature state)	Land which has been previously cleared of vegetation

Notes 1 Queensland Government regional ecosystem descriptions accessed online at https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions, 12 May 2021
2 When planning fuel hazard reduction burns use minimum fire 'interval' for remnant and non-remnant REs
3 *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire'* (QFES 2019)

Appendix G

Koala Habitat Management Plan



Koala Habitat (Rehabilitation) Management Plan - Summary

Offset Management Plan – Stage 1

Raynbird Road, Narangba
Prepared for Boral Resources Pty Ltd

Koala habitat Rehabilitation Plan – Stage One Offsets

Overall Objectives

Completion criteria for the Stage One offset site are as follows:

- WONS reduced to less than 10% of baseline levels.
- Offset zones reach the habitat quality scores identified in the Amended Offsets Strategy (values below) within 10 years of commencement of action:
    - Remnant areas improve from a habitat quality score of 7/10 to 8/10
    - Rehabilitation and revegetation areas improve from a habitat quality score of 6/10 to 8/10
    - Koala habitat quality will be assessed using the modified habitat quality assessment method detailed in the Amended Offsets Strategy.

      Any alternate methodology would require prior agreement between Boral and DAWE.
- Dogs or evidence of dog presence are not detected on the offset area for a period of three years.
- Koala habitat quality remains at target values (7/10 – remnant areas, 6/10 – rehabilitation areas) or better for two consecutive five-year monitoring events.

Timeline of OMP processes

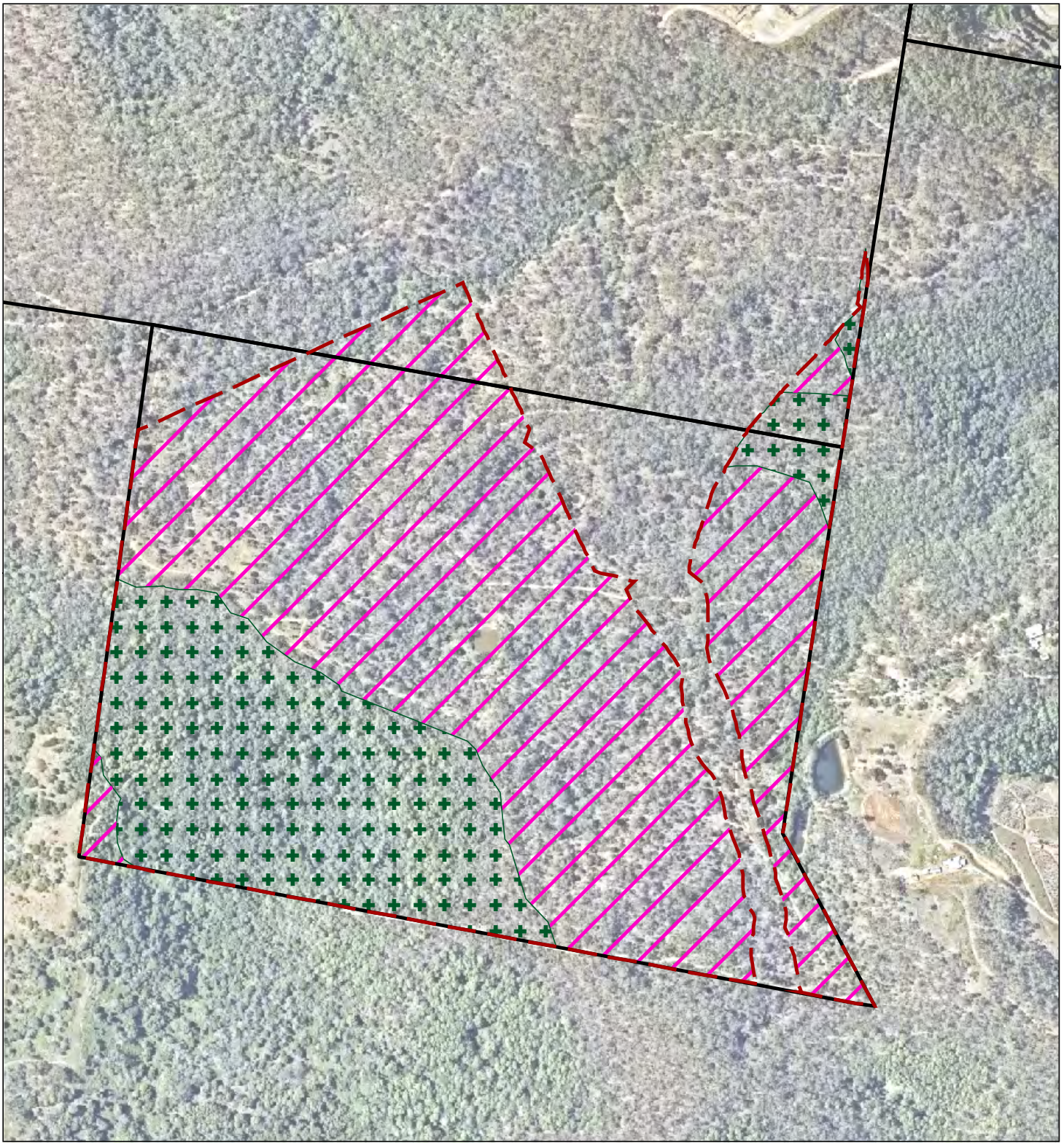
Timing	Event
6-months post-commencement	Rehabilitation Plan developed
12-months post-commencement	Restoration practices (seeding, natural regeneration, supplementary planting) to have commenced
	Habitat Quality monitoring to have been completed - baseline values maintained
	Supplementary planting survival rate is 90% at 12-months post-planting
Annual for initial 3-years post-commencement	Complete habitat quality monitoring
5-years post-commencement	Habitat quality shows signs of improvement from baseline scores – planting success rate above 90%
Every 5-years from year 3 post-commencement	Complete habitat quality monitoring
General	Areas allowed to regenerate will display signs of native vegetation regrowth at rates expected for those species

Koala Habitat Rehabilitation

Stage one of the OMP is the first of a three-stage offset, located almost entirely on Lot 93 on SP193378. Stage one of the offsets site accounts for approximately 73.7 ha of this total offset area.

The Offsets Management strategy (OMS) which underpinned the OMP, outlined a detailed approach to the management of koala habitat onsite, involving strategic division of habitat into three management categories. Stage One of the Offsets site contains two of these categories including (1) habitat rehabilitation and (2) remnant vegetation management. As detailed in the OMS, the areas that are identified as suitable for habitat rehabilitation are those that are not mapped as remnant vegetation, but still retain relatively intact vegetation with high potential to return to quality habitat. These areas in their existing state are degraded due to weed invasion or past land uses requiring clearing of the ground layer.

Remnant vegetation management areas are those identified as remnant vegetation are those areas of existing vegetation mapped under the *Vegetation Management Act 1999* (VMA) as remnant. These areas were observed as having the potential to experience some disturbance from surrounding land uses, understorey clearing and/or weed invasion. Remnant vegetation management areas account for 57.9 ha of the total offset site and habitat rehabilitation management areas account for 15.8ha across Stage One (**Figure 1**). Page three of this Plan details recommendations for guiding the restoration process onsite in regard to the achieving the objectives set out in the Offsets Management Plan. Pages four and five provide detail on the roles and responsibilities, monitoring processes and risk management supporting habitat rehabilitation on



Legend

- Site DCDB
- Stage 1
- Remnant vegetation management area (Stage 1: 22.1 ha)
- Habitat rehabilitation area (Stage 1: 51.5 ha)

Figure 1

Stage 1 Habitat Management Areas

File ref. 10232 E Figure 4 KMP Stage 1 A
Project *Narangba Quarry*

0 50 100 200 300 *m*

Scale (A4): 1:8,000 [GDA 1994 MGA Z56]

N

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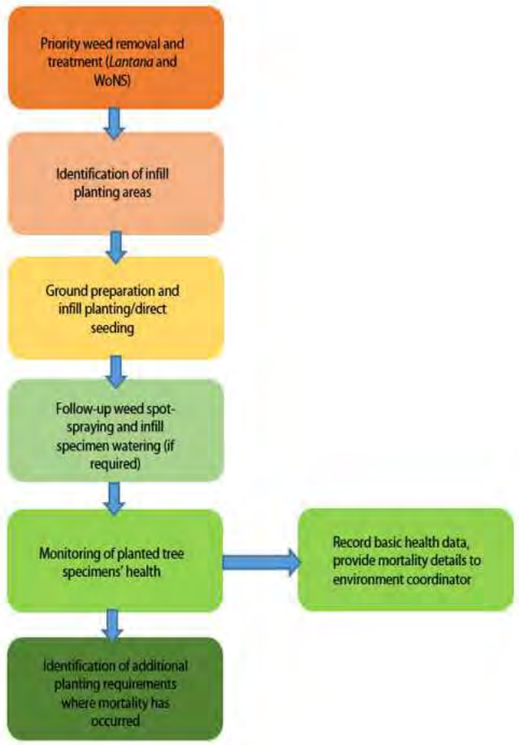
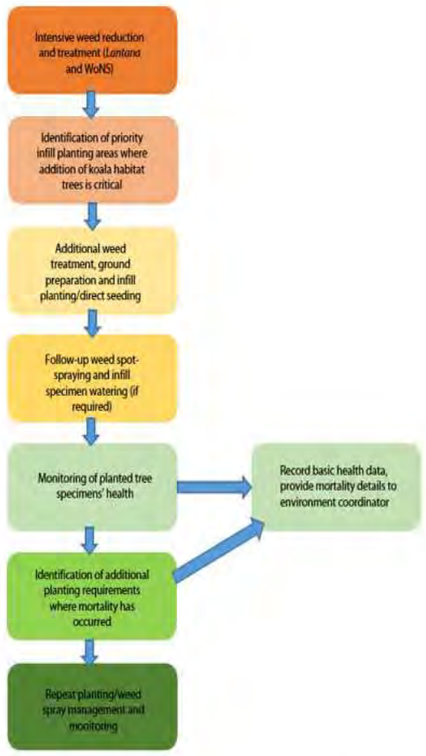
Recommended site restoration process – Stage One



Remnant vegetation management process



Habitat Rehabilitation management process

Recommended target species for inclusion within restoration regime

Regional Ecosystem	Species	Strata	Koala habitat tree (Y/N)	Koala food tree (preferred)	Minimum spacing	Dominant species onsite
12.11.18/12.11.14	*Eucalyptus tereticornis*	Canopy	Y	Y	1.5m	Y
12.11.18	*Corymbia citriodora*	Canopy	Y		1.5m	Y
12.11.18	*Eucalyptus moluccana*	Canopy	Y	Y	1.5m	
12.11.18/12.11.3a	*Eucalyptus siderophloia*	Canopy	Y		1.5m	
12.11.18/12.11.14	*Eucalyptus crebra*	Canopy	Y		1.5m	
12.11.3a	*Eucalyptus propinqua*	Canopy	Y		1.5m	
12.11.18/12.11.14	*Angophora leiocarpa*	Canopy	Y		1.5m	
12.11.3a	*Allocasuarina torulosa*	Subcanopy			1.5m	Y
12.11.18	*Alphitonia excelsa*	Subcanopy			1.5m	Y
12.11.3a	*Lophostemon confertus*	Canopy/Subcanopy	Y		1.5m	

Targeted Regional Ecosystems for onsite restoration

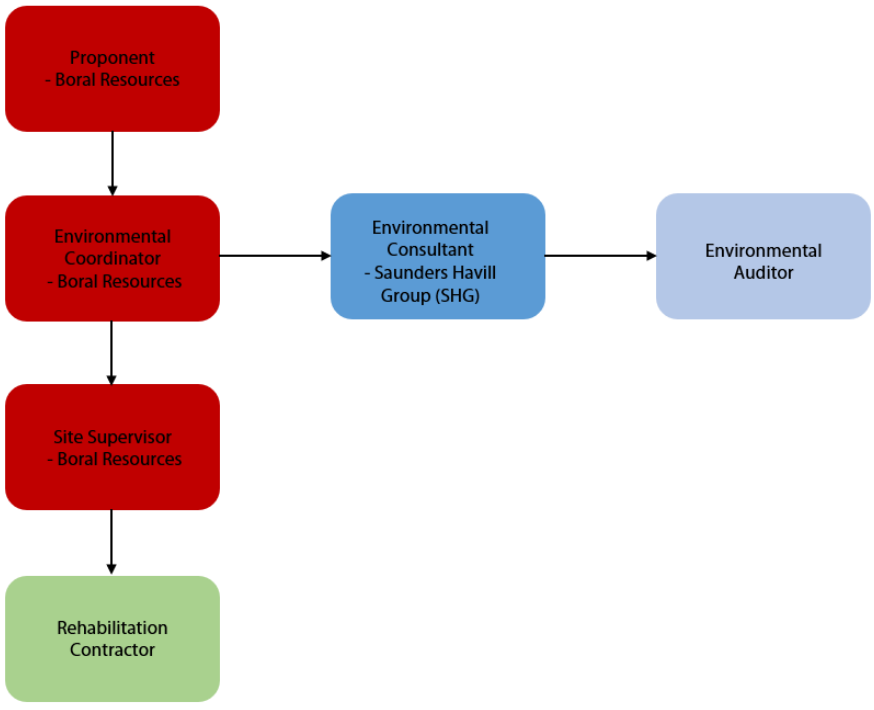
Regional Ecosystem	Structure category	Description
Least Concern RE12.11.18	Sparse	*Eucalyptus moluccana* woodland +/- *Corymbia citriodora* subsp. *variegata*, *E. tereticornis*, *E. siderophloia* or *E. crebra*, *E. longirostrata*, *C. intermedia*, *E. carnea*. Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. Occurs as scattered occurrences in a range of topographic positions from ridgetops to lower slopes. (BVG1M: 13d)
Least Concern RE12.11.3	Mid-dense	*Eucalyptus siderophloia* and *E. propinqua* open forest +/- *E. microcorys*, *Lophostemon confertus*, *Corymbia intermedia*, *E. biturbinata*, *E. acmenoides*, *E. tereticornis*, *E. moluccana*, *Angophora leiocarpa*, *Syncarpia verecunda* with vine forest species and *E. grandis* or *E. saligna* in gullies. *Eucalyptus pilularis* and *E. tindaliae* sometimes present e.g. mid D'Aguilar Range, Conondale Range. Occurs predominantly on hills and ranges of Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. (BVG1M: 9a)
Of Concern RE12.11.14	Sparse	*Eucalyptus crebra*, *E. tereticornis*, *Corymbia intermedia* grassy woodland. Other species including *Eucalyptus melanophloia*, *Corymbia clarksoniana*, *C. erythrophloia*, *C. tessellaris*, *E. siderophloia*, Angophora spp. May be present in low densities or in patches. Mid-layer generally sparse but can include low trees such as *Vachellia bidwillii*, *Capparis spp.*, *Dodonaea triquetra*, *Alphitonia excelsa* and *Xanthorrhoea spp.* Occurs on mid and lower slopes on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. (BVG1M: 13c)

Land Zone 11

The prevailing landform is Land Zone 11, described below:

Metamorphosed rocks, forming ranges, hills and lowlands. Primarily lower Permian and older sedimentary formations which are generally moderately to strongly deformed. Includes low- to high-grade and contact metamorphics such as phyllites, slates, gneisses of indeterminate origin and serpentinite, and interbedded volcanics. Soils are mainly shallow, gravelly Rudosols and Tenosols, with Sodosols and Chromosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.

Chain of Responsibility



Identified Roles

Role	Nominated Person	Company	Contact ph./details
Proponent/ Project Coordinator	Paul West	Boral	0401 896 115
Environmental Coordinator	Matthew Allan	Boral	0466 405 885
Administering Authority	DAWE Compliance Monitoring Branch	DAWE	EPBCMonitoring@awe.gov.au
Site Supervisor	Quarry Manager	Boral	TBA
Site Contractor	TBA	TBA	TBA
Environmental Auditor	TBA	TBA	TBA

Roles and Responsibilities

Role	Responsibilities	Timeframe
Proponent/Project Coordinator	Liaise regularly with Environmental coordinator	As required, ongoing.
	Ensure ACR is published to Boral website by 12th August	Annually
Environmental Coordinator	Coordinate and liaise with Environmental Consultant	As required, ongoing.
	Oversee onsite work and ensure sufficient data is available to achieve annual compliance	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
	Provide data for annual compliance to environmental consultant	As required, ongoing.
	Report non-compliance events within 2 business days of detection	As required
Site Supervisor	Coordinate rehabilitation contractor	Annually, ongoing.
	Ensure periodic inspection of site works is completed	As required, ongoing.
	Ensure sufficient data is collected to inform compliance reporting	As required, ongoing.
	Liaise with Environmental Coordinator regularly	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
Site Contractor	Complete rehabilitation and restoration works as specified under the OMP and as directed by Site Supervisor and Environmental Coordinator	Annually, ongoing. Restoration practices to be suitable documented and data and photographs provided to Site Supervisor
Environmental Consultant	Coordinate annual EPBC monitoring (MHQA)	**Annually - 2020 to 2023** **Five-yearly** from **2024**
	Prepare and coordinate EPBC annual compliance reporting	Published to Boral website by **12th August** each year
Environmental Auditor	Complete auditing of requirements conditioned under the EPBC approval	As required

Monitoring

Monitoring of permanent transects established during baseline habitat quality score assessments within the Koala offset area will be conducted annually (for the first three years) by suitably qualified ecologists to provide data for systematic analysis required to determine the initial success of the KHMP. Monitoring will be conducted in September. This standardised monitoring will be conducted every five years following this initial three-year phase.

Visual inspections of planting sites will take place following direct seeding and planting onsite. Inspections will occur at a minimum, in accordance with those set out in the Table below. Inspection of new planting and seeding sites will include general health check of specimens, any weed encroachment or herbivory impacts and record any loss of individual plantings. Details will be provided to Boral's environmental coordinator who will initiate plans for supplementary plantings during suitable conditions.

Event	Timeframe	
	Initial	Long-term
Planted site	Regular visual inspection for mortality	quarterly (first year); annually thereafter
Direct seeded site	Regular visual inspection for mortality	quarterly (first year); annually thereafter
MHQT site	Annually (initial three years)	every 5 years

Corrective Actions

- If habitat quality scores are not showing improvement, at year 5, rehabilitation techniques will be reviewed by an independent, suitably qualified ecological consultant and alternate techniques recommended and implemented.
- Where koala habitat rehabilitation has a success rate below 90% at year 5, the active regeneration measures will be repeated once. If the success rate remains below 90% techniques will be reviewed by an independent, suitably qualified ecological consultant and alternate techniques recommended and implemented in consultation with DAWE.

Risk Assessment

A risk assessment of the potential contraindicative events which may occur during implementation of the KHMP are outlined in the Table below. These events detail issues which may arise, negatively affecting the increase in koala habitat quality (measured by the koala habitat quality score).

Objective	Contraindicative event	Likelihood	Consequence	Risk level	Trigger	Contingency	Associated events
Increase koala habitat quality score	Increase in introduced vertebrate pest species impacting on ecological function and habitat quality score improvement across Stage One.	Unlikely	Minor	Low	Annual Compliance Monitoring (evidence via remote-triggered cameras) indicates an increase in frequency of detection of non-native koala predator and pest vertebrate	Audit and revision of vertebrate pest species management plan and consider increase in frequency of monitoring and/or trapping. Revision of seasonal timing and frequency of trapping across Stage One and entire Offset Area.	Annual vertebrate pest monitoring and trapping
Increase koala habitat quality score	Increase in Weeds of National Significance (WoNS) infestation impacting on ecological function and habitat quality score improvement across Stage One.	Unlikely	Minor	Low	Annual Compliance Monitoring indicates a decrease or lack of increase in habitat score specifically due to WONS component	Cause of WONS infestation identified (e.g. external infestation present with seed travelling along drainages) Remediation actions - mapping of new infestation, revision of current control methods, revision and reassessment of frequency of current monitoring actions	Annual weed monitoring
Increase koala habitat quality score	Unmanaged burn escalation.	Possible	High	Medium	Uncontrolled prescribed fire outbreak	Burning onsite is to be strictly by prescription only. The Offsets site Fire Management Plan (FMP) outlines the suitable prescription for fire management in each vegetation type in conjunction with fuel load levels, seasonal timing and suitable weather conditions. Tailored firebreaks will be maintained as a component of this FMP, which aims to provide protection from external sources of fire in addition to contain fires within the Offsets Area. Where a fire event negatively impacts habitat within the Offsets Area, the FMP and associated practices will be audited and updated to identify critical changes in fire management practice. Reviews will be conducted at the discretion of Boral in conjunction with critical stakeholders and fire management consultants.	Annual monitoring for fuel loads and fire breaks.
Increase koala habitat quality score	Wildfire affecting Stage One	Possible	Severe	Medium	Wildfire occurrence onsite	Burning onsite is to be strictly by prescription only. The Offsets site Fire Management Plan (FMP) outlines the suitable prescription for fire management in each vegetation type in conjunction with fuel load levels, seasonal timing and suitable weather conditions. Tailored firebreaks will be maintained as a component of the FMP, which aims to provide protection from external sources of fire in addition to contain fires within the Offsets Area. Where a fire event negatively impacts habitat within the Offsets Area, the FMP and associated practices will be audited and updated to identify critical changes in fire management practice. Reviews will be conducted at the discretion of Boral in conjunction with critical stakeholders and fire management consultants.	Annual monitoring for fuel loads and fire breaks. Annual fire management and prescription burn planning.
Increase koala habitat quality score	Extended drought (greater than 2 years).	Possible	Medium	Low	Declared drought for a period exceeding two consecutive years.	Revision of current and planned fire breaks in consultation with suitable external contractor and removal of grazing reduces the potential impact of drought.	Annual fire monitoring Ongoing weather monitoring

Objective	Contraindicative event	Likelihood	Consequence	Risk level	Trigger	Contingency	Associated events
							Soil and erosion monitoring on Quarry site (indicative of offsets site)
	Decrease in vegetation across the site due to incorrectly planned clearing for fire or access management.	Rare	Minor	Low	Unplanned vegetation clearing within Stage One	Accurate mapping and GIS enabled tools for contractors maintaining vegetation clear zones adjacent to offset areas. If additional vegetation clearing to what is specified in the respective management	Boral Quarry site access planning Annual fire monitoring Firebreak maintenance events
	Not achieving projected timeframe for koala habitat quality score improvement due to low planting survivorship	Possible	Medium	Medium	Planting rate mortality of greater than 10% in any one year	Detailed planting records kept; frequent monitoring of planted sites in initial pre-establishment phase; supplementary watering if required; spot spraying of weeds if required; ongoing regular inspections of planting and rehabilitation sites; identification of supplementary planting when required	Regular weed management Fire management and prescriptions burns Pest management and trapping

Appendix H

Year 2 Contractor reports

S27 – C OPERATIONAL PRESCRIBED BURN PLAN

BURN NAME	Boral_HRB_1.22	**Lot/Plan/s No.** (all approvals obtained) ☒ Yes	93/SP193378
Burn No.	1.22		
Location	Narangba	**Road Segment No.**	
LGA	MBRC	**Proposed Timing**	March - June
Permit Number		**Actual Date**	

Prescribed Burn Planner	Ben Tidey	January 2022
	Name & position	Signature & date
Approved By	Joshua Bull Director	
	Name & position	Signature & date
Incident Controller (to sign on day of burn)		
	Name & position	Signature & date

ATTACHMENTS	
☒ Burn permit (Mandatory)	☒ Map of notified residents
☒ Burn map (Mandatory)	☒ Media advice
☒ Complexity Rating (Mandatory)	☐ Risk assessment
☒ Veg & Habitat Map	☒ Contingency map/s
☐ Traffic management plan	☐ Other (if so what)

SITUATION (SMEACS)

PLANNING

SITE CHARACTERISTICS (refer to Operational Burn Map)

Area to be treated	26.3 Ha	Percentage aim	40 - 60%	Last Fire	10+ years	Complexity Rating	63 (CR-2)
Description of site (Topography, slope and aspect)	Area being burnt is Fire Management Unit (FMU) 14 as detailed in Bushfire Management Plan – Narangba Quarry – Offset sites 28/07/2021 Steep open forest, North East facing with multiple drainage Lines Rocks scattered through the burn area, walking may be difficult due to terrain and amount of rocks in some areas. Site has a mix of grassy to shrubby understorey. Predominantly surface and near surface fuel driven fire with some shrubby connectivity.						
Fauna/Flora of site Significant (Identify protection actions)	Koala - undertake assessment of trees prior to the burn for Koalas in the burn area. Treat any trees with Koalas present to minimise fire intensity in the vicinity. Follow SOP Burning in Koala Habitat.						

Adelotus brevis,
tusked frog
NCA Status: V
In cavities, under debris (logs, stones) in subtropical vine forest, tall open moist forest, heaths, Melaleuca swamp and pasturelands near puddles and streams.

Ninox strenua
powerful owl
NCA Status: V

Regional ecosystem details for 12.11.18

VMA Class: Least Concern

Short Description: Eucalyptus moluccana woodland

Fire Management Guidelines:

SEASON: Summer to late-autumn.

INTENSITY: Low.

INTERVAL: 3-6 years.

STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics.

ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.

Regional ecosystem details for 12.11.3

VMA Class: Least Concern

Short Description: Eucalyptus siderophloia, E. propinqua +/- E. microcorys, Lophostemon confertus, Corymbia intermedia, E. acmenoides open forest

Fire Management Guidelines:

SEASON: Summer to winter.

INTENSITY: Plan for low to moderate. Unplanned occasional high intensity wildfire will occur.

INTERVAL: 4-8 years maintains a healthy grassy system. 8-20 years for shrubby elements of understorey.

STRATEGY: Aim for 40-60% mosaic burn. Needs disturbance to maintain RE structure (eucalypt overstorey with open understorey of predominantly non-rainforest species). Any moist sclerophyll that is relatively open with a mixture of grasses and shrubs should be a priority for fire management to retain RE structure.

ISSUES: Frequent fire is needed to maintain understorey integrity, keeping more mesic species low in the profile of the understorey so that other species can compete. A grassy system is especially important for species such as the eastern bristlebird and its habitat. It is essential that wildfires are not the sole source of fire in this ecosystem. High intensity fires occur periodically through time, however frequent low to moderate intensity fires will create the disturbance required to keep the understorey diverse. A follow-up burn soon after a high intensity wildfire can be considered to reduce germinating mesic species. This 'of concern' RE may contain a high number of rare and threatened plant species (e.g., Acomis acoma, Corchorus cunninghamii,

	Marsdenia coronata and Sophora fraseri) which require appropriate fire management. ***Regional ecosystem details for 12.11.14*** VMA Class: Of Concern Short Description: Eucalyptus crebra, E. tereticornis, Corymbia intermedia woodland **Fire Management Guidelines:** SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.
FUEL CHARACTERISTICS	
Vegetation type (General description of vegetation & fuel type, height, fuel variability)	Open Grassy to Shrubby Forest ☒ Habitat trees protected, (action) Rake around prior or during burn
Vegetation management act class	☐ Not of Concern ☒ Least Concern ☒ Of Concern ☐ Vulnerable ☐ Endangered
Overall fuel hazard score	☐ Low ☐ Mod ☒ High ☒ V. High ☐ Extreme 15-18t/Ha

ASSET PROTECTION

Infrastructure assets	Asset Types	Asset	Protection actions
(Identify all constructed assets and any associated protection actions)	Tree Plantings Economic	Rural residential properties Fencing	Ensure vehicle available to reduce intensity/active fire as required. Slow movement of fire by ignition pattern to reduce intensity around tenure boundary.
Social/cultural (List actions)	N/A Use chance find protocol		

Control lines Refer to Operational Map Type Description **A** – Heavy appliance (Urban fire truck or water tanker etc…) **B** – Medium appliance (Echo or Isuzu etc…) **C** – 4WD vehicle access (Land Cruiser or Patrol etc...)	Name of control line	Location	Type (A - B)
	Low Track Track	Point AF – G	B 5M
	Southern Trail	G – E	B 4M
	Top trail	D - A	B 5M
	North Road	A – AF	B 5M
	Internal Dam trail	AC -C	C - 4M

D – Walking trail or UTV			
Contingency control lines (Identify where a breach of containment could possibly occur. List fallback lines in the event of a breakout)	Escape under planned burn conditions to the North will burn into Quarry land and towards other internal fire trails. To the South and West moves into steep south facing slopes, fire likely to back down slopes very slow. Eastern side, multiple fire trails available through adjoining property. Tree plantings along eastern side Within the quarry estate there are multiple trails that can be used as containment lines as required.		

MISSION

Aim & Objectives (Outline the general intent of the proposed burn and the specific objectives. Consider fuel load, fuel structure & mosaic effect)	**Objective:** 1. Prescribed burning is for ecological outcomes and to assist with the implementation of rehabilitation or restoration works. 2. 40- 60% burnt area to create age class diversity 3. Target dry ridge lines first 4. Reduce overall fuel hazard across the burnt area 5. Reduce lantana infestations where possible 6. Maintain Casuarina seed trees where possible. 7. FMU15 is sensitive to fire and requires protection from unplanned ignition.
Expected duration of burn/Timeline	8 hour implementation and containment Ongoing mopup till safe (2 days)

EXECUTION

PREFFERED FIRE/FUEL PARAMETERS

Weather conditions	Max temperature	30°	Max wind speed & preferred direction	24km SE	Min RH Max RH	30% 95%
Flame height	1 – 2 m (average)		Scorch Height:	3-8m (average)		
Other guidelines (List any weather and fuel moisture conditions which will prohibit or restrict burning	Good soil moisture with native grass clumps having moist root systems. SEQ Bioregion Planned Burn Guidelines					
	Max fire danger index	High	Max KBDI	>120		
Suggested Ignition Method	☒ Ground ☐ Aerial ☐ Slingshot ☐ Other (if other what)					

Ignition pattern (Describe the ignition method and sequence of lighting) (Procedure may be modified on the day of the burn, based on conditions and test burn)	Spot and or line ignition to meet objectives. Detailed ignition pattern will be dependent on atmospheric and site conditions on the day. Ignitions of the ridge lines allowing fire to back down is preference

SUGGESTED RESOURCES

Machinery/plant items	Fireland	Council	QFRS-R	QPWS	Other/Who
Category Number	3 X LA				
Totals:					

Specialist personnel (List function & name)	Minimum of one senior staff experienced in moisture gradient burning to be in attendance
Contingency resources (List additional resources required if breakout occurs)	Additional FC light attacks and crew. Boral heavier plant - Local Contractor. Notification of spot over to Boral Operations within 5 min, stating - Location - Size - Will it be contained/containable - Resources - Possible impact if uncontained A second call be made within 10min advising what procedures need to occur from a fire response perspective if the fire is not contained. Discussion with Boral Opeartions to occur on future management of fire.

Water points (Refer to operational map) (Describe the type e.g. hydrant, dam, static etc. & the location/s-grid reference).	Type	Location
	Dam	Point AC
	Dam	AH (only in event of fire escape)

Smoke management (Describe what may be affected and the strategies to reduce the risk of adverse affects)	Multiple rural residential around burn area residential area – Undertake operations with suitable atmospheric conditions, wind speed and direction to limit smoke impacts. Ideally lower wind speed to allow smoke to lift and disperse Neighbor notifications being undertaken by Boral
Traffic management (Describe traffic arrangements. Identify responsibility e.g. SES, agency or other)	N/A

PRE-BURN PREPARATION

Works required (Describe works required to be completed prior to burn e.g. control line construction/maintenance)	Undertake hazard tree assessment and implement mitigation actions as determined. Rake habitat trees Assess containment lines for suitability given site conditions. (Day of)	
Planned works inspected & completed (Verify that planned works have been completed) (Note any works not completed to agreed standard)	Comments:	
	Name & position	Signature & date

ADMINISTRATION

Assembly area (Refer to Operational Burn Map) (Describe the location)	Point AC Staging area.
Catering (Describe location, time and supplier)	Vehicles have provisions, main meals to be arranged as required
Fuel (Describe location and type)	N/A

NEIGHBOUR & LAND OWNER NOTIFICATIONS

☒ **Firecom must** be notified prior to lighting up, and at the completion of the day. (3215 0789)
☐ All land owners **must** give consent for works to be carried out on their land.
☒ 72 hours notice **must** be given to adjoining land owners/occupiers.

Agency / Neighbour	Contact No.	Advised Date / Time	Notes
Boral TBA			

Patrol (outline patrol responsibilities, timeframe & resources)	Till burn is safe to leave, follow up patrols as required till fire declared out.
Other (Include any other logistical arrangements)	Briefing from Boral for operations around Quarry Inductions for site

COMMAND AND COMMUNICATIONS

ORGANISATIONAL STRUCTURE & COMMUNICATIONS	
Fire command	Network/Channel FC1
Fire-ground	Network/Channel FC1/VHFxx
Aviation	Network/Channel

Position	Name	Call Sign	Channel/s	Mobile
Incident controller	TBA			
☐**Sector** ☐ **Crew leader** Name TBA	TBA			
☐**Sector** ☐ **Crew leader** Name TBA				
☐**Sector** ☐ **Crew leader** Name TBA				
☐**Sector** ☐ **Crew leader** Name TBA				
☐**Sector** ☐ **Crew leader** Name				
Safety advisor				
Contingency communications (Describe arrangements if radio network fails)	**UHF 17**			

SAFETY	
Crew briefing (Prior to lighting up all personnel are to be briefed using the **SMEACS**)	Mine Shafts Vehicle movements on steep sections G - E Operating Boral equipment
Incidents	All incidents or near misses should be immediately reported to the IC and recorded in the Incident Log
Hazardous materials (Description of materials)	None known ☐ Area excluded ☐ Material removed
Escape routes (list location) refer to operational burn map	All trails are all suitable for escape
Safe areas (list locations) refer to operational burn map	As per briefing

ADDITIONAL HAZARDS	
Hazard	Control measures
Steep Country	Briefing
Uneven and steep tracks	Briefing, Trained drivers

BRIEFING UNDERTAKEN		
Date	Time	Incident Controller's signature (IC)

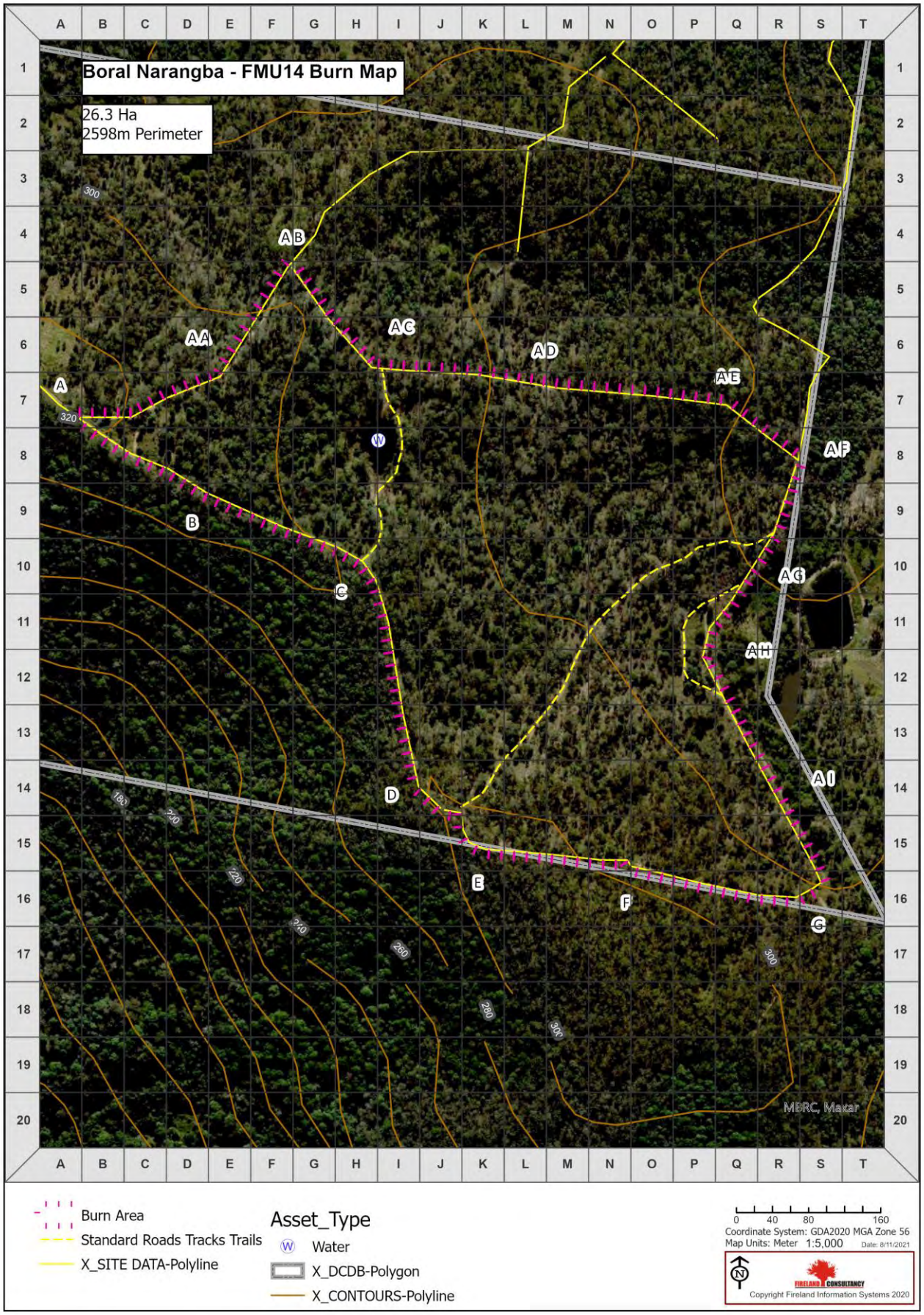
INCIDENT CONTROLLER HANDOVER BRIEFING			
Date	Time	Outgoing IC signature	Incoming IC name & signature

DEBRIEFING UNDERTAKEN		
Date	Time	Incident controller's signature (IC)

SAFETY BRIEFING

PERSONAL SAFETY	BRIEFED
Site specific hazards – rubbish, power lines, etc…	☐
Procedures if serious hazard identified – asbestos, car tyres or gas bottles	☐
Ensure all PPE is worn by those involved	☐
Fire behavior expected and weather conditions	☐
Potential trouble points	☐
Lighting patterns and direction	☐
Location of water points, escape routes and assembly/staging locations	☐
Communication and command structure	☐
First aid and evacuation points	☐
Use the buddy system	☐
Identify overhead hazards, stags, hollow trees & hang ups	☐
Report progress at designated times	☐
Take extreme care not to light below other lighting crews	☐
Always work down slope	☐
SMOKE MANAGEMENT	
Potential trouble locations – particular roads	☐
Traffic procedures	☐
Smoke hazard signage locations	☐
PLANT & EQUIPMENT	
Briefing of any specialty equipment	☐
Drive to the conditions	☐
Head lights and flashing lights turned on when operating on the fireground	☐
Park, refill and pass in safe areas, (use turn around's when possible	☐
Working around plant	☐
FATIGUE & HEAT STRESS	
Schedule adequate breaks	☐
Ensure crews have access to drinking water	☐
Brief crews on signs of heat stress and controls	☐
OTHER	
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐

Briefing conducted by		
	Name & position	Signature & date


Boral Narangba - FMU14 Burn Map
26.3 Ha
2598m Perimeter
A
AA
AB
AC
AD
AE
AF
AG
AH
AI
B
C
D
E
F
G
W
300
320
180
200
220
240
260
280
300
280
300
MBRC, Maxar
Burn Area
Standard Roads Tracks Trails
X_SITE DATA-Polyline
Asset_Type
Water
X_DCDB-Polygon
X_CONTOURS-Polyline
0 40 80 160
Coordinate System: GDA2020 MGA Zone 56
Map Units: Meter 1:5,000
Date: 8/11/2021
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13/09/2021

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28/06/2022

28/06/2022

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28/06/2022

28/06/2022

Permit to Light Fire

F 372101

Queensland Government

The applicant for this permit acknowledges that he/she has made full disclosure of all orders, notices, notifications or restrictions currently affecting the land the subject of this permit, to the issuing fire warden at the time of making the application. The requirement to make disclosure is one of the conditions upon which this permit is issued.

I, SHAUNE TOOHEY in charge of the Chief Fire Warden District Brisbane.

Rural Fire Service Area / Fire Warden's District, hereby grant to: David Hartzer of Boral Quarry FMU 14

of: Rajnbird Road (Street address), Narangba (Suburb/Town/Locality), 4504 (Postcode), Ph; 0447 431 727

a Permit to Light Fire in the open on the following Lot No (s) and Plan No (s) Lot 93 SP193378 (Must be provided)

also known as: Boral Quarry Rajnbird Road, Narangba. (Address)

for the specific purpose of: hazard mitigation, debris removal, weed control, pasture management, other Hazard Mitigation.

Subject to the following conditions:

1. A firebreak sufficient to prevent the spread of fire is to be in place. **For this permit,** breaks are to be: slashed, mown, bare earth, natural, or _____ and to a width of: 3 metres.
2. The fire is not to be lit if the wind is, or is forecast to be of a strength and / or direction to cause the spread of the fire beyond the planned boundary of the fire or, cause smoke to be a nuisance to a neighbour. **For this permit,** the fire is not to be lit if the wind is forecast to exceed 24 kph and / or is blowing from the West
3. There must be enough capable persons and equipment in attendance (see Note 1 below) to control the fire and prevent it's spread beyond the planned boundary of the fire. For this permit, there are to be 3 capable persons and the following equipment on site and in close attendance on the fire: 3 x Firefighting Capable Vehicles.
4. If the fire (or smoke) is likely to affect a road, precautions must be taken as follows: Smoke signs to be erected along Rajnbird Road.
5. The fire must not be lit before / after 7 am / pm or between _____ and _____.
6. To avoid nuisance and unnecessary QFES responses, the permit holder **must** notify Firecom on **1800** 0 1 7 0 2 9 immediately prior to lighting the fire.
7. The local Fire Station / Rural Fire Brigade must be notified prior to lighting. The contact details for the brigade are: Narangba RFS: 0488 057 757
8. The permit holder **must** have a copy of the permit in their possession before lighting and until the fire is out.
9. After burning, the perimeter **must** be made safe and the fire patrolled until there is no longer any risk of the fire escaping.
10. Other conditions: Firecom to be notified on 1800 017029 everyday fire is active.

This permit covers the period from: 27/04/22 to 1/8/22 ***Note: If the fire is not out when the Permit expires, the Fire warden must be contacted***

Date: 27/4/22. Signed: _____ (Fire Warden)

Note 1. Persons must be physically and mentally capable to combat the fire and be close enough to take immediate action.

White - original Yellow - duplicate

CSO 011 RFS00006 09/20A

HAZARD REDUCTION NOTIFICATION

This is to notify residents and businesses that Fireland Consultancy is planning to undertake planned burn operations as part of hazard reduction activities at the Boral Quarry facility at Narangba.

Burn operations are conducted to reduce the risk of bushfires on their property and to private properties that surround the area.

Location:	**Narangba – Raynbird Road (Boral Quarry)**		
Date:	Between 1st of May and 30th of July 2021, depending on weather conditions.	**Time Proposed/Duration:**	1 Day/Night
Areas that may be affected are:	Smoke will be visible in the area for the duration of operations. This will include parts of Narangba, Moorina, Kings Scrub, Rush Creek and Kurwongbah		

If you require any further information or wish to be placed on the notification register, please register at **www.fireland.com.au** - **Smoke Notification**.

You can also use the QR code below to access the smoke notification registration page.

Narangba Offset Yearly Report

Areas Worked

Restoration and rehabilitation works for 2021/2022 year were planned following density mapping results carried out by Saunders Havill .

Zone A-reh was identified as having the largest density of *Lantana camara* therefore the majority of removal works have been in this area. This zone also has the largest rehabilitation ability due to large open areas, one such area was planted out in September 2021. The plantation consists of 100 mixed canopy and shrub species found in the area; no groundcover species were required as native grasses are present within the area

Zone B-reh is situated along two gorge areas which run into neighbouring property, these areas are not safe working environments so after consultation with Boral Environmental Advisers, the decision was made to high volume spray these areas with a broadleaf selective herbicide. This method allowed personnel to maintain their safety whilst achieving high density die off.

Zone C-reh has had some works completed in relation to density mapping however as this is the zone identified for a maintenance burn, minimal work has been done in this area.

Zone D-rem still continues to be a problem area in regard to personnel safety. Phoenix is awaiting a site visitation by Boral Environmental Advisors to view the hazards related to the zone and budgeting costs associated with the chosen method of chemical controls.

Plantation A

In October 2021 a natural clearing in Zone A-reh was rehabilitated with 100 trees, shrubs and ground covers (see blow table) from the approved planting list. Maintenance of the plantation is carried out on a 'as needed' basis as the surrounding environment largely consist of native grasses. Circles are brush cut around the plants to reduce competition and gain easy access for inspections.

Figure 1 A Plantation November 2021

Figure 2 Plantation Maintenance

Quantity	Species
20	Allocasuaarina torulosa
10	Corymbia citriodora
10	Eucalyptus propinqua
10	Eucalyptus tereticornis
10	Lophostemon confertus
20	Acacia fimbriata
10	Dianella longifolia
10	Lomandra longifolia

Table 1 Selected Species

As at June 2022 there has been 7 trees replaced due to disturbance in recent months due to cattle.

Plantation B

Zone B-reh was planted out in June 2021. It contains 40 mixed species of Eucalyptus and Casuarina species, these were replacements for previously planted trees which had been removed by neighbours unintentional dam construction

Figure 4 Plantation B June 2021

Figure 3 Plantation Maintenance

Quantity	Species
10	Allocasuaarina torulosa
10	Corymbia citriodora
10	Eucalyptus tereticornis
10	Lophostemon confertus

Table 2 Selected Species

As at June 2022, 3 trees have perished due to cattle destruction in recent months. See images below of guards and stakes snapped or removed completely, trees stripped of leaves, entire trees removed from holes and hoof prints.

Risks and Hazards

Daily risk assessments are carried out in planned work areas of the Offset. Major risks include- Slips, trips and falls, Chemical Exposure, Animal incidents, Weather and Heavy machinery traffic.

Ticks are a daily threat, as is the population of feral animals residing in the area – wild dogs, pigs and deer. Stray cattle also pose a problem not just in the fact they have unpredictable behaviour but also that they cause damage to the plantations.

Highlights

June 2021- Planting of Zone B-reh, 40 trees

August 2021- Pair of Glossy Black Cockatoo's sighted feeding in offset zones A, B & C, along with the Old Dairy Sep

- Koala spotted in Offset D

September 2021- Flock of 5 Glossy Blacks Cockatoo's observed feeding throughout the offset and Old Dairy

November 2021- Planting of Zone A-reh, 100 trees

April 2022- Feral Animal trapping undertaken, unfortunately no wild dogs captured however 2 foxes were caught

Chemical Used

Chemical utilised in Offset zones A-D May 2021-2022

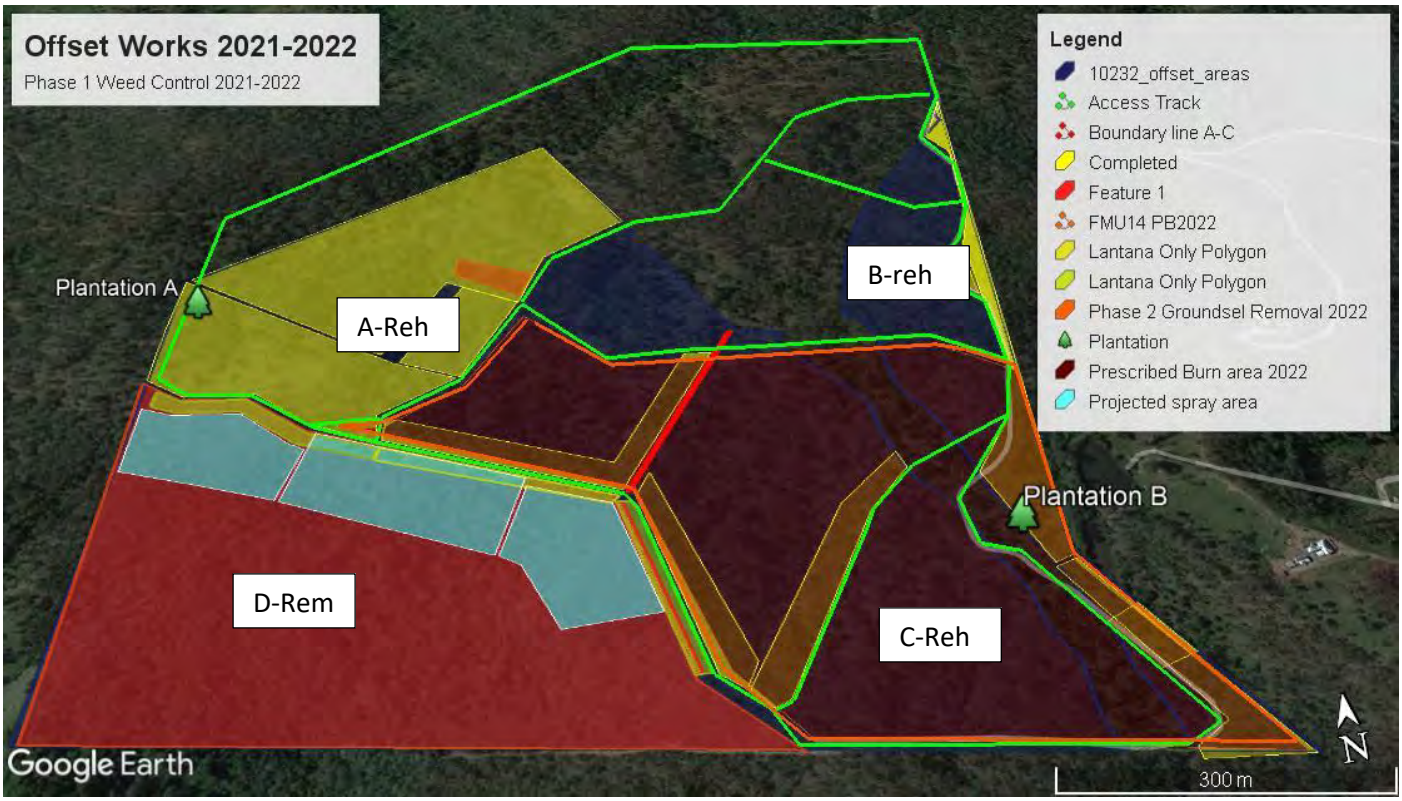
Narangba Herbicide Distribution Table

Chemicals Used	Total Quantity Applied on Site	Area Treated/Weeds Targeted
Glyphosate Herbicide	82,350ml (82.35L) applied onsite	High Volume Spraying: Roadside Spraying Targeting all weed life and lantana and groundsel on track edges
Metsulfuron Herbicide	309.5 grams applied to site	Cut Stump Technique – Zone A, B, C & D 50/50 mix glyphosate
Penetrate	16.6 L	

Completed Works

Phase 1 of the weed management plan in Zone A has been completed, small sections of Phase 2 recently carried out. Zone B-reh has had 90% of phase 1 completed, Zone C has had minimal work completed due to the forthcoming prescribed burn. Once this has been completed, all lantana control efforts will be moved into this zone to carry out Phase 1 & 2.

Zone D- rem has had site tours by new management is regards to access and safety concerns. New control methods have been developed by Saunders Havill utilising chemical however selective herbicides will need to be used in this method and such herbicides are quite expensive.

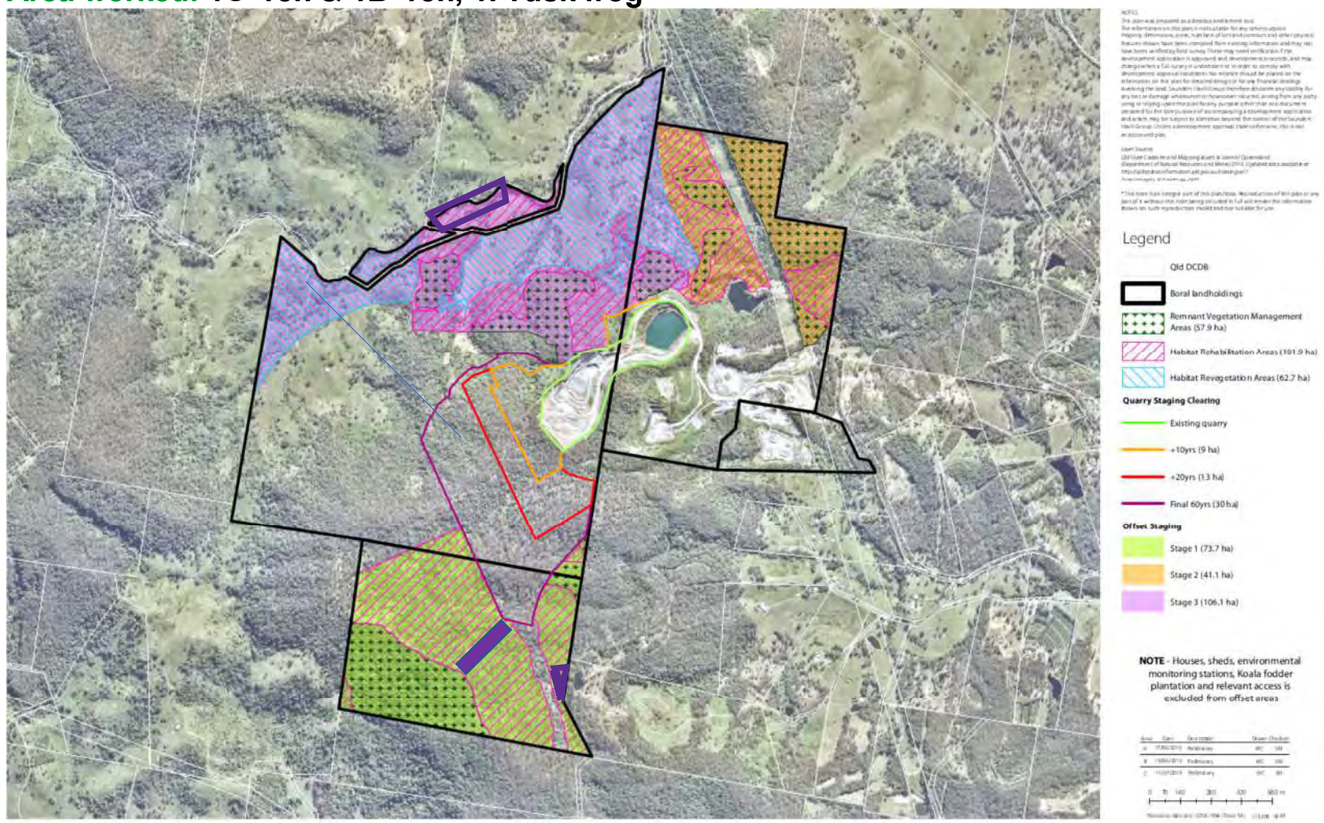


zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: 1C- reh & 1B- reh, 1I Tusk frog



Summary of works complete

Month: June 2021
Report date: 11/7/2021
Number of work days completed: 7 labour days

Area	Notes
Offset B	**Manual Cut stump lantana and groundsel out of rehab area where plantation of planted (Species list below). Mulch placed around new trees and watered**
Offset C	**Manual cut stump removal of lantana along access track within Offset C boundary line and 20 metres width**
1I	**Manual removal of weeds within tree gaurds of Tusk Frog Rehab area**

Issues/ incidents/ comments: 7 out of 10 labour days for the month completed due to 2 blast days being held within Junes contracted hours. 1 day scheduled RDO for contracted staff

- Offset B rehab plantation area has large infestation of Senna pendula (Easter cassia) along with targeted lantana and groundsel
- Offset C has many larger clumps of well established lantana bushes requiring long periods of time to control
- 1I tree gaurds damaged by public and feral pests since last maintained

Next months work

- Offset B rehab plantation (1), spray weed barrier rings around new trees
- Water new trees as needed and control any current weed infestations
- Offset B prepare plantation area (2) for planting within the next 3 months
- Offset B removal of 80% of all lantana
- Offset C push a further 10m into rehab zone

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	1200ml	Cut stump

Photos

1I tusk frog rehab planting

Offset C-rehab lantana

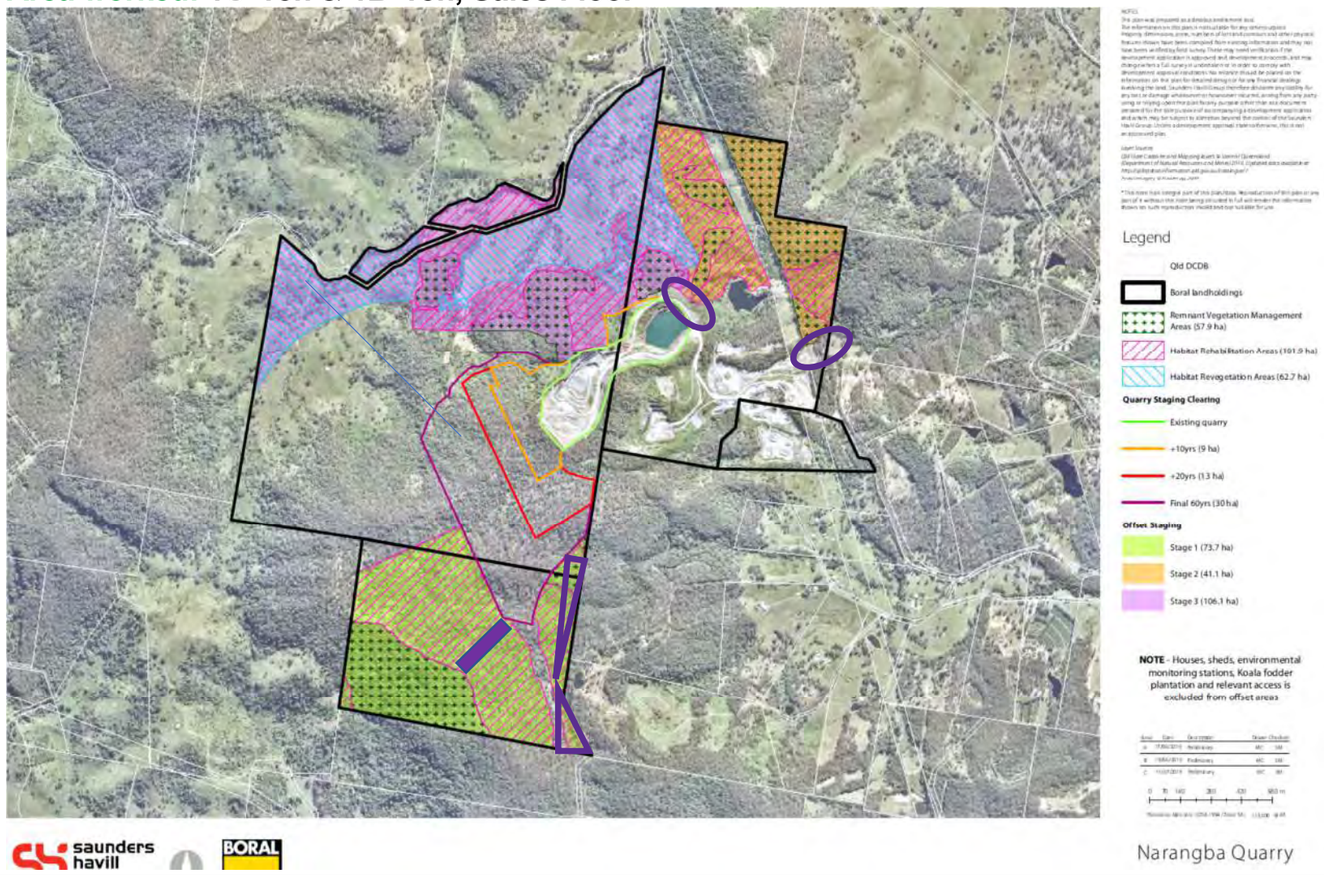
Offset B-rehab new planting

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: 1C- reh & 1B- reh, Sales Floor



Summary of works complete

Month: July 2021
Report date: 30/7/2021
Number of work days completed: 21 labour days

Area	Notes
Offset B	Manual Cut stump lantana down fenceline to access tracks and spray out unaccessible gullies Water plantation trees and spray rings around for weed control
Offset C	Manual cut stump removal of lantana along access track within Offset C boundary line
1l Tusk Frog	Brush cut plantation zone and spray weed control rings
Sales Floor	Spray weeds around crib, office, lab, workshop and amenities block. Manual weed crib room garden
Front Entry	Mow, brush cut & spray rings around trees in front entry garden
Outside Road	Spray water fill point and around weather station

Issues/ incidents/ comments:

- Offset B rehab plantation watered every second day, trees faring well. Gullies sprayed out to be checked in September for successfulness
- Front entry triangle had illegal dumping in maintance zone
- Outside Road weather station- brushcutting suggested for snake safety

Next months work

- Offset B rehab plantation (1), water regularly
- Offset B prepare plantation area (2) for planting within the next 3 months
- Offset C push a further 20m into rehab zone
- Sed Basin A Singapore daisy control and run off drain weed maintance
- Possible Sed Basin C weed controlled, run off vine controlled

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	1200ml	Cut stump

Photos

1l tusk frog brush cut

Front gargen cut & sprayed

Sales floor weed control

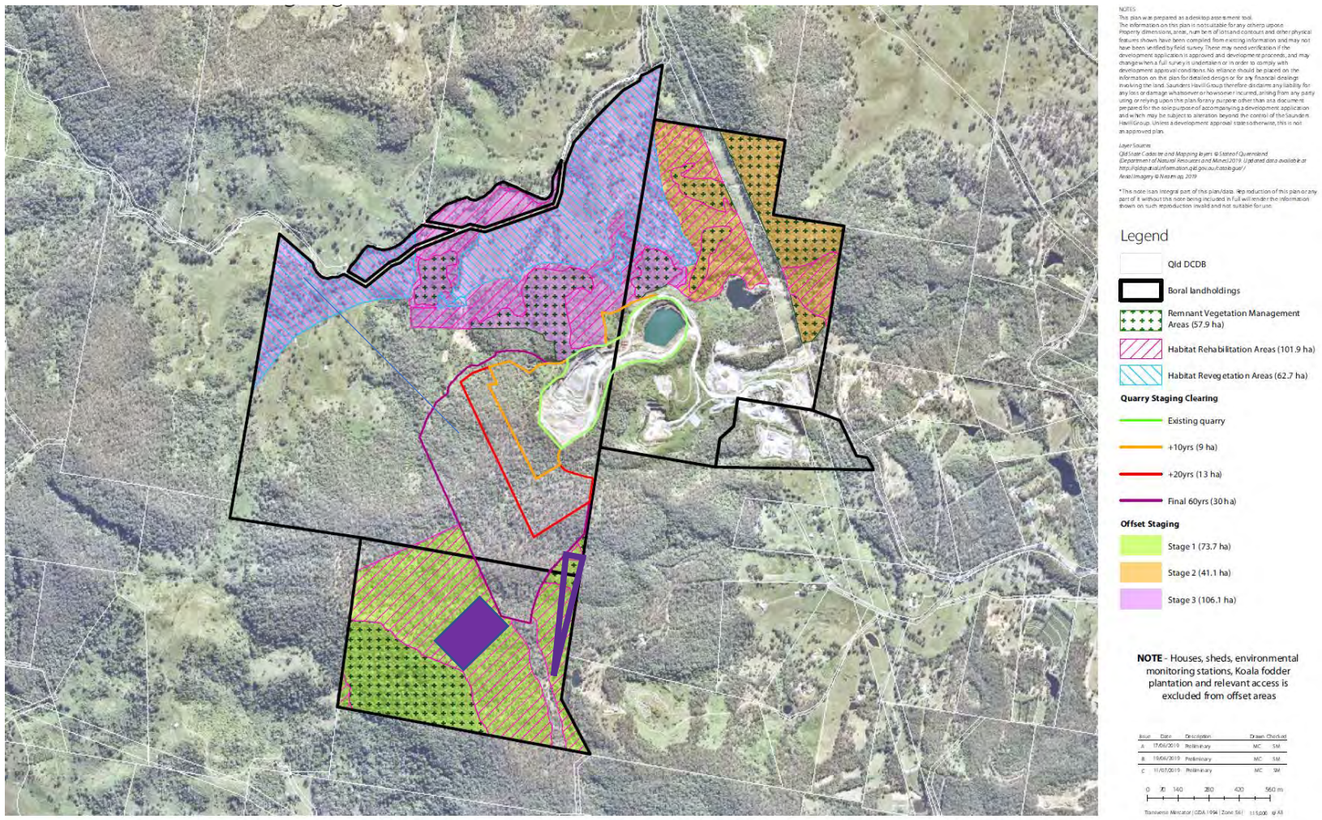
Offset C lantana bushes

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: 1C- reh & 1B- reh



Summary of works complete

Month: August 2021
Report date: 30/7/2021
Number of work days completed: 21 labour days

Area	Notes
Offset B	Manual Cut stump lantana Water plantation trees and re-stake & guard due to cattle damage
Offset C	Manual cut stump removal of lantana, pushing further in from last months works

Issues/ incidents/ comments:

- Offset B rehab plantation watered every second day, damage from stray cattle. One tree leaves eaten off and two needing new stakes, multiple guards knocked off.
- Gullies sprayed out in July have proven to be largely successful in killing inaccessible lantana mass
- Offset C has larger growth patches of lantana pressent
- Glossy Black pair (male & female) sighted and video recorded feeding in Offset B. the pair were sighted every day for one week
- First koala spotted in the Offset Area, D-rem section

Next months work

- Offset B rehab plantation (1), water regularly
- Offset B prepare plantation area (2) for planting within the next 3 months
- Offset C push a further 20m into rehab zone
-

Chemicals used

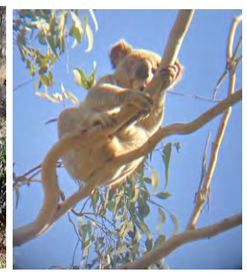
Chemical used	Quanity	Purpose
Glyphosate	5,000ml	Cut stump

Photos

Offset C before & after (1)

Offset C before & after (2)

Koala in Offset D



Offset B lantana spray

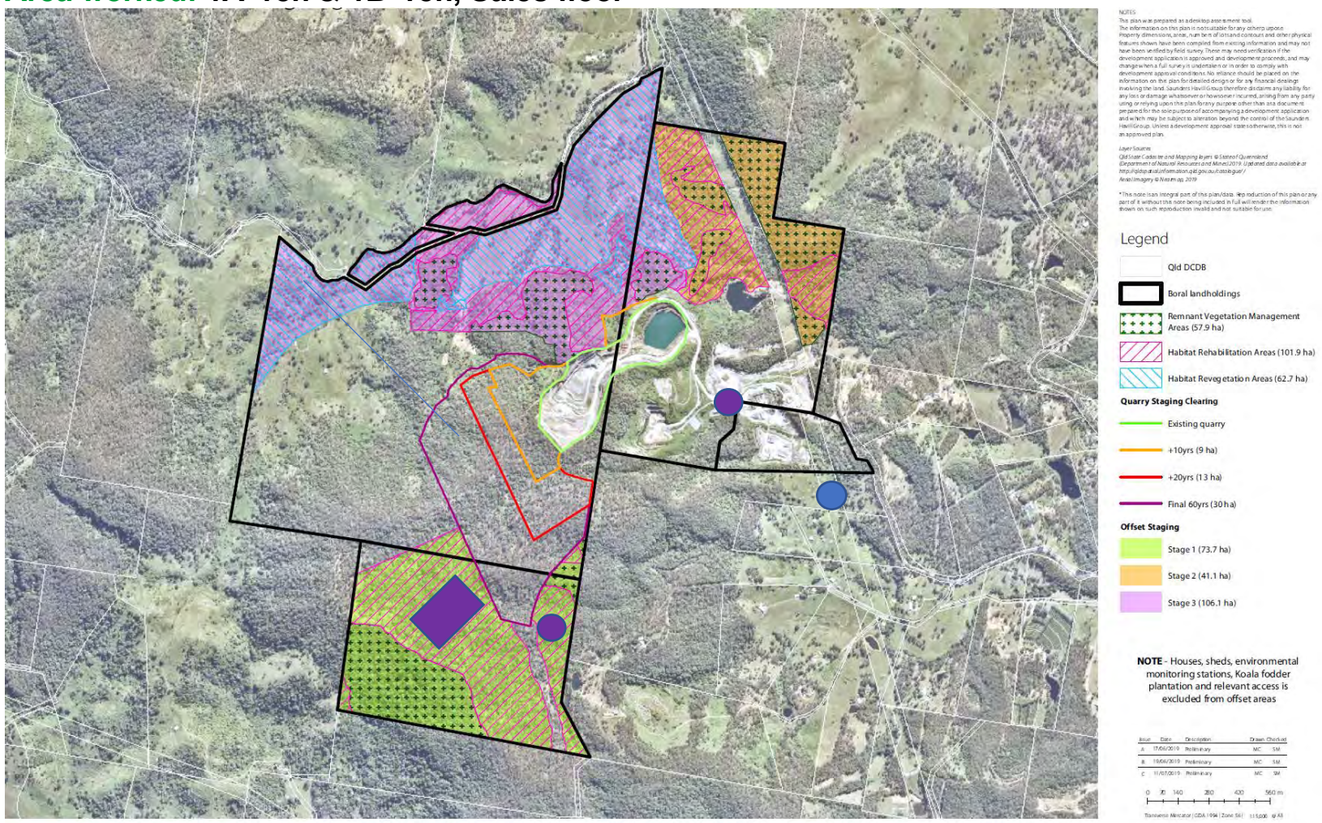
Cattle damage

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: 1A- reh & 1B- reh, Sales floor



Summary of works complete

Month: September 2021
Report date: 710/2021
Number of work days completed: 255 labour hours

Area	Notes
Offset B	Water plantation trees
Offset A	Manual cut stump removal of lantana, pushing further in from last months works
1I	Check on trees and access track (Needs spraying for thistle & tobacco plant)
Sales floor	Brush cut bund walls for weed control & safety. Maintenance request for hedge trimming of workshop pathway

Issues/ incidents/ comments:

- Offset B rehab plantation watered regularly, 3 trees appear to be struggling
- Nuisance cattle have increased in number and are in multiple sections of the quarry including rehab zones
- Glossy Black Cocaktoo flock sighted, up to 3 females and 5 males
- Brown's Creek (Allen Willet's section) washed down aggregate removed from creek bed
- Increased chemical use reflective of larger patches of lantana

Next months work

- Offset B rehab plantation (1), water regularly
- Offset A prepare plantation area (2) for planting within the next 3 months
- Spray fire break in Offset B
- Koala Plantation on Moorina Rd needs to be maintained to discourage public access (to be done before December break)

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	9,200ml	Cut stump

Photos

Large multi-stemmed Ptaches

Lantana Removal

Aggregate cleared out of Brown's Creek

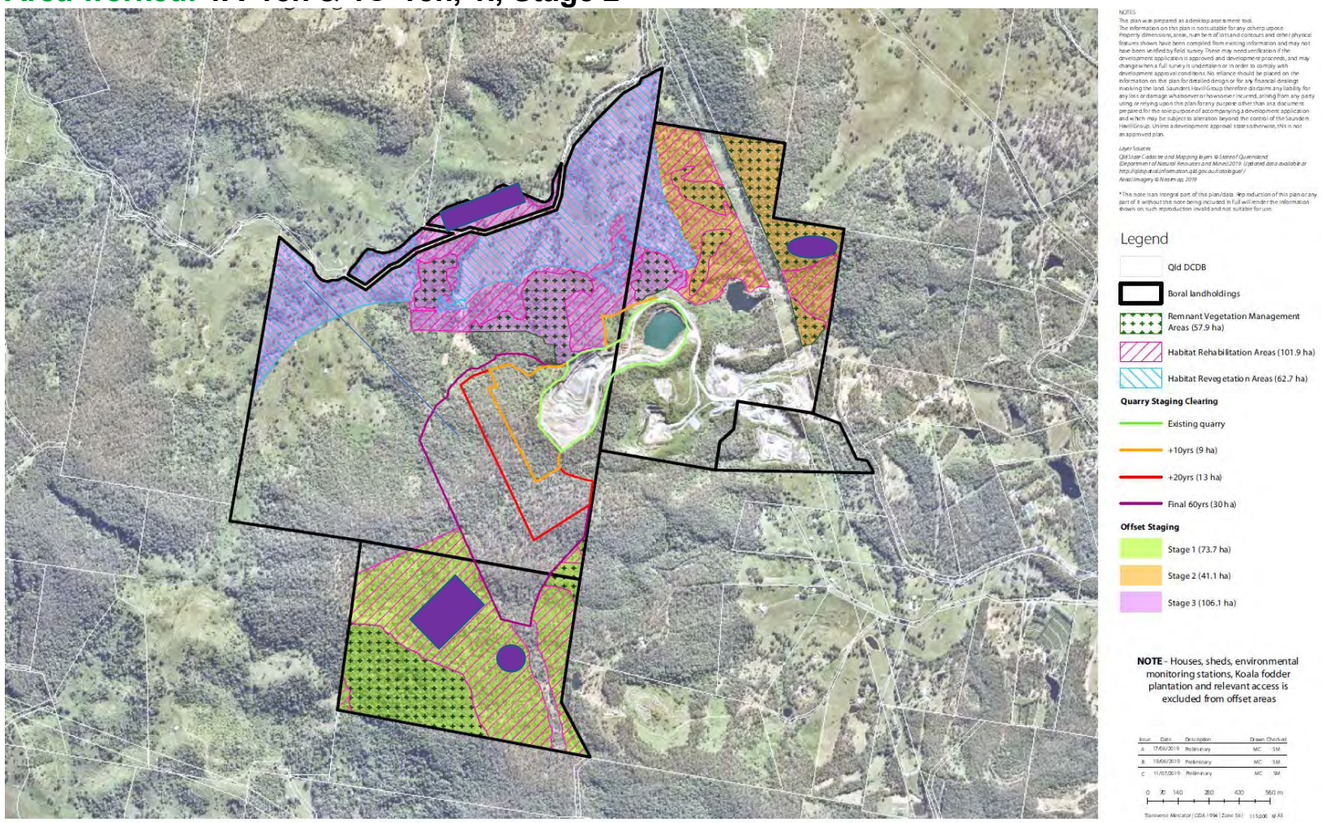
Hedge required trimming

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: 1A- reh & 1C- reh, 1I, Stage 2



Summary of works complete

Month: November 2021
Report date: 21/12/2021
Number of work days completed: 215 labour hours
Rained out: 40 hrs

Area	Notes
Offset C	Manual cut stump removal of lantana, pushing further into A offset bounday
Offset A	100 rehabilitaion trees planted, the majority being koala feed trees, some Glossy Black Cockatoo feed trees and native shrubs. Manual cut stump removal of lantana, pushing further in from last months works
1I	Access track sprayed for thistle & tobacco plant. Supervision of ETS drill & fill of 42 platation trees under powerlines
Stage 2 (E)	Manual and cut stump removal of lantana

Issues/ incidents/ comments:

- Offset A new plantation unable to be mulched due to rain and wet terrain for machinery
- Offset B rehab plantation 3 trees that were struggling have become healthy again and have strong growth
- 1I new environmental weed identified in area- Mexican Poppy
- Stage 2 Rehab, zone E works started due to unsafe access tracks in Offset Area. Lantana requires spraying due to density in gully area, however rainy weather led us to manually remove the bushes on the outer edges of the gully, gaining easier access to the mass within the gully.

Next months work

- Offset A rehab plantation (1), water as needed
- Offset B plantation to be slashed
- Stage 2 (E) high volume spray
- Spray fire break in Offset B
- Offset access tracks to be sprayed
- Koala Plantation on Moorina Rd needs to be maintained to discourage public access
- Gates on public access areas to be chained and locked

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	6,700ml	Cut stump

Photos

1I ETS tree removal

Offset A plant prep

New Offset A plantation

Lantana removal (cutting into access base)

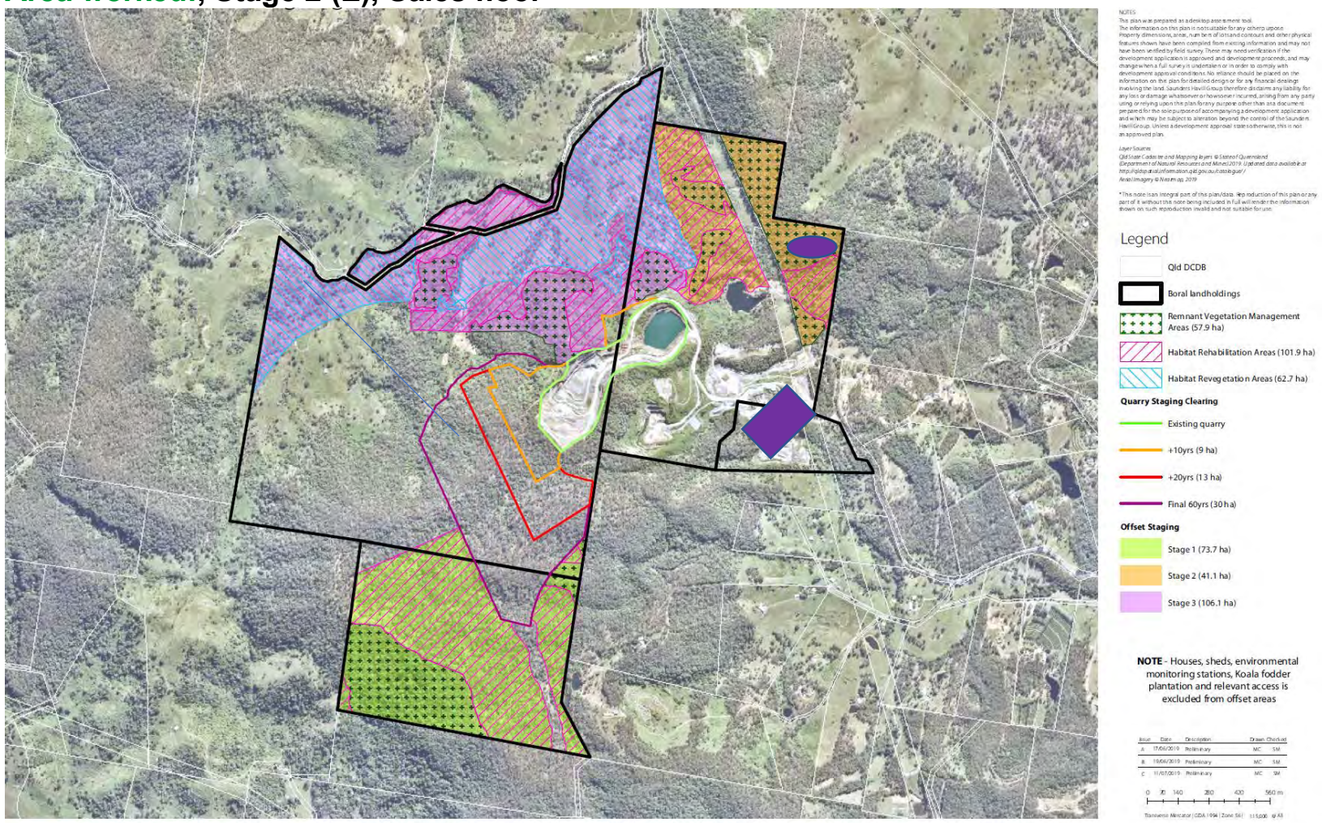
Tracks to spray

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked:, Stage 2 (E), Sales floor



Summary of works complete

Month: December 2021
Report date: 23/12/2021
Number of work days completed: 18 labour hours
Rained out: 0 hrs

Area	Notes
Stage 2 Reh	Manual and cut stump removal of lantana, clearing access to larger mass
Sales floor	Spray around crushing plant, office and workshop

Issues/ incidents/ comments:

- Stage 2 Rehab, zone E: rehab works carried out due to unsafe access tracks in Offset Area. Lantana requires high volume spraying due to density, however rainy weather led us to manually remove the bushes on the outer edges of the gully, leading to easier access to the mass within the gully for when weather is better
- Manager requested check for remaining cattle in 'J' zone after a compliance to remove was served to neighbours
- Vehicle lost traction on stage 2 access tracks (2/12/21) and was not able to be recovered until track dried out (6/12/21). Incident report filed and contractor unable to access site until cleared to re-enter by Boral Management. Still awaiting clearance for 2022

Next months work

- Offset D area assessed
- Offset A rehab plantation (1), water as needed
- Offset B plantation to be slashed
- Stage 2 (E) high volume spray
- Spray fire break in Offset B
- Offset access tracks sprayed
- Koala Plantation on Moorina Rd needs to be slashed to discourage public access
- Sediment Dams & drains sprayed

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	200ml	Cut stump
Glyphosate	3000ml	High Volume
Metsulfuron	30g	High Volume
Wetter	30ml	

Photos

Clearing edge of gully of lantana

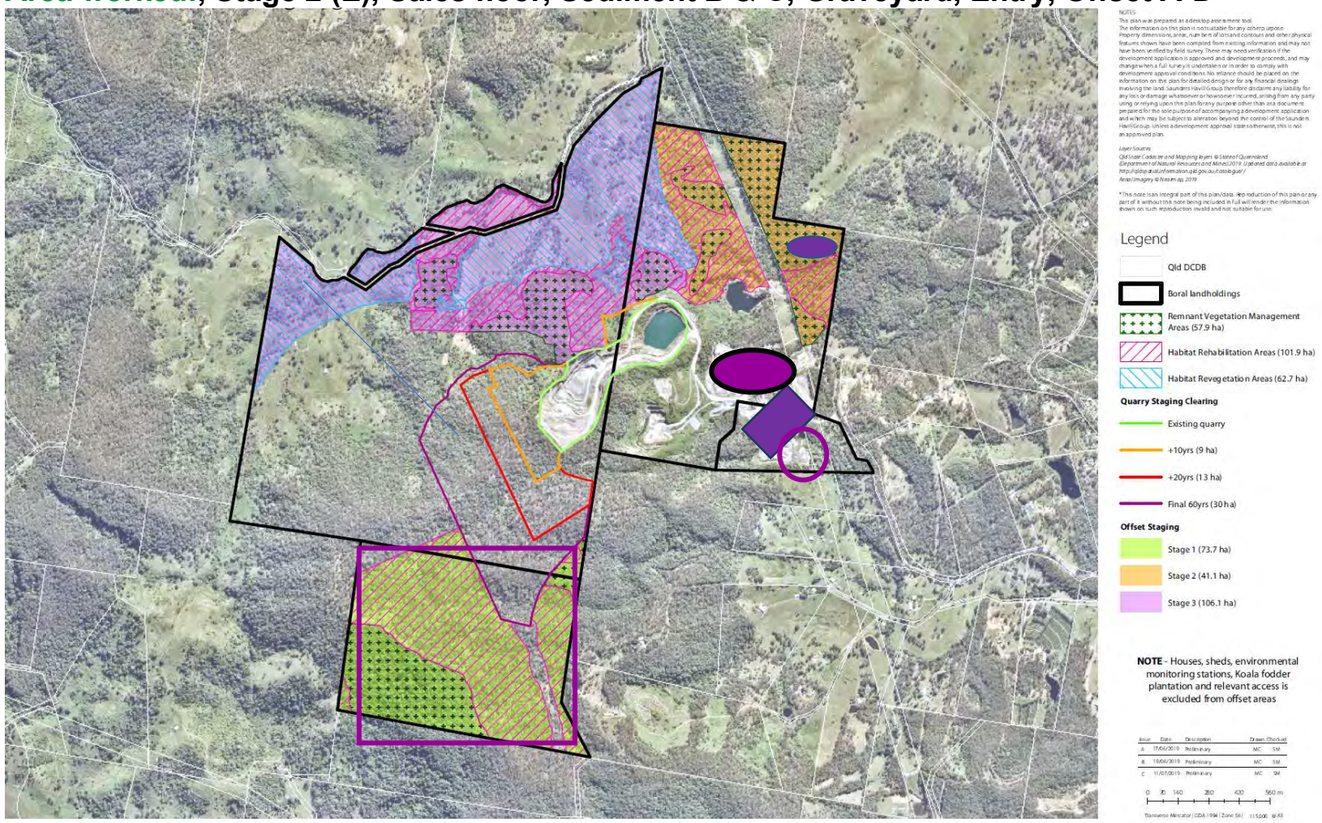
High volume spray of crushing plant, office and surrounds

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked:, Stage 2 (E), Sales floor, Sediment B & C, Graveyard, Entry, Offset A-D



Summary of works complete

Month: January 2022
Report date: 07/03/2022
Number of work days completed: 255 labour hours
Rained out: 94 hrs

Area	Notes
Stage 2 Reh	Manual and cut stump removal of lantana, phase 1 weed management plan
Sales floor	Bund walls in sales and blending plant brushcut and sprayed rings around planted trees. Back pack spray for weeds around office buildings, cribb, workshop, heavy machinery parking area and crushing stairs
Front Office Garden	Backpack spray annuals and hand pull nutgrass.
Sediment B	Brush cut around pump station and walk way
Graveyard	High volume spray storage area and track
Offset A-D	High volume spray all access tracks

Issues/ incidents/ comments:

- Stage 2 Rehab, zone E: rehab works carried out due to unsafe access tracks in Offset Area. Lantana requires high volume spraying due to density, however rainy weather led us to manually remove the bushes on the outer region
- High volume spray access tracks in Offset areas due to high grass/weed growth from increased rainfall
- Overall tidy up of sales/office area
- High volume spray of Sediment B to clear pump and weeds from drainage areas & walk throughs. Invasive Fire Weed Plant located in Sed B workshop area, disposed of as per biosecurity guidelines.

Next months work

- Offset D area assessed
- Offset A rehab plantation (1), Brush cut
- Offset B plantation to be slashed
- Stage 2 (E) high volume spray
- Spray fire break in Offset B
- Koala Plantation on Moorina Rd needs to be slashed to discourage public access
- Sediment Dam A & drains sprayed

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	3000ml	High Volume
Metsulfuron	1,047.75g	High Volume
Wetter	7500ml	

Photos

Office garden sprayed out

Before & after brushcutting bund walls in sales

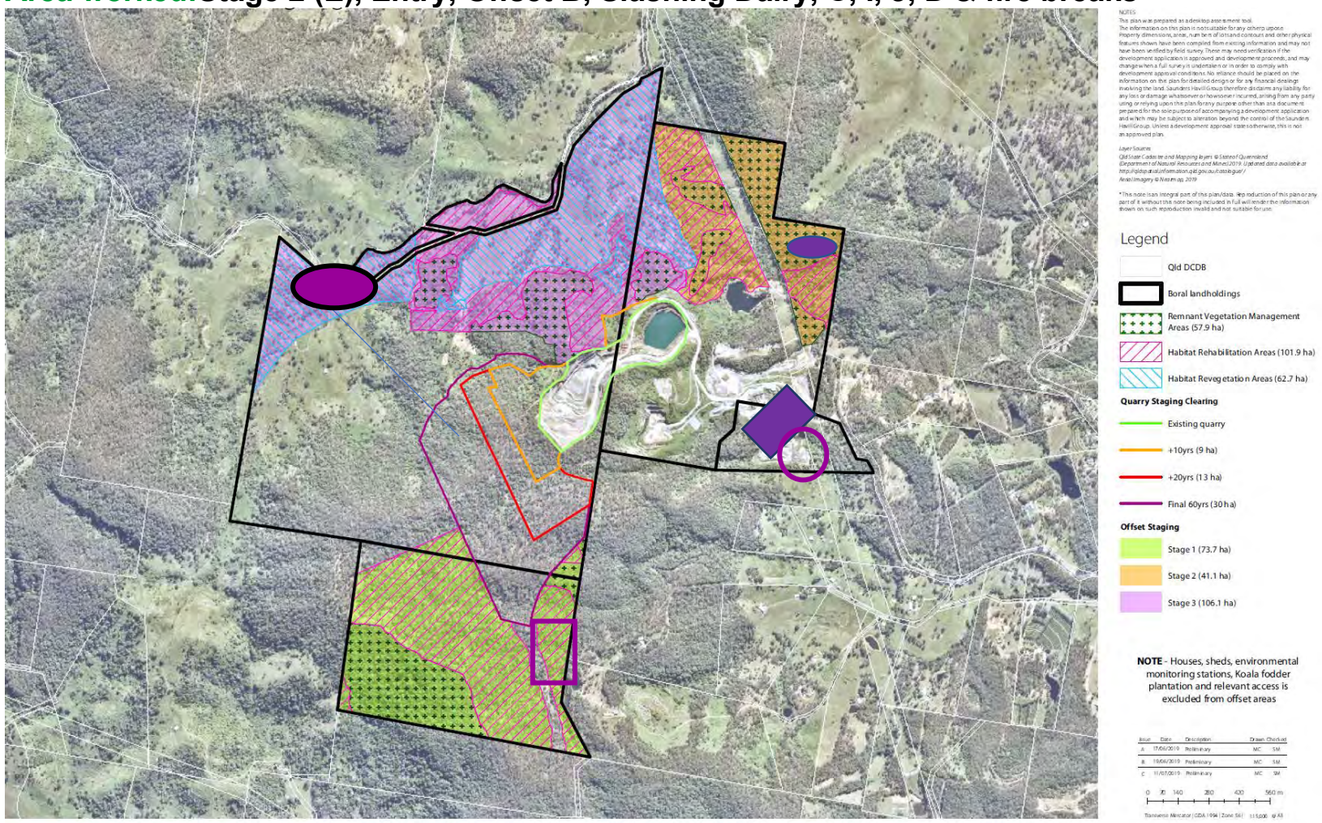
Fire weed- WONs

zero|one|ten

REHABILITATION REPORT NARANGBA QUARRY

21/01/2020, verision 1

Area worked: Stage 2 (E), Entry, Offset B, Slashing Dairy, C, I, J, D & fire breaks



Summary of works complete

Month: Feburary 2022
Report date: 29/03/2022
Number of work days completed: 255 labour hours

Area	Notes
Stage 2 Reh	Manual and cut stump removal of lantana, phase 1 weed management plan. Trial high volume spray
Slashing	Dairy Road to storage shed, koala fenceline, "C" dust track for Saros, "I", "J" & "D" track, stage 2 access roads and fire break Browns creek
Front Garden	Brush cut front garden in preparation for CEO visit. Curtaining of vines from trees- managers request
Diary/Koala	Back pack spray entrance and brush cut fenceline and gate. Public has cut gate to gain access
Offset B	Brushcut plantation

Issues/ incidents/ comments:

- Due to more rain the offset was only able to be accessed for two days of the month
- Stage 2 Rehab, zone E: cut stump and access roads slashed
- Browns Creek boundary slashed and back pack sprayed. Remaining area needs to dry out before slasher can maintain boundary and weir.
- Front garden, entry and carpark garden maintained for site inspections
- Offset B plantation brush cut around immediate area of trees. Site needs to dry out to extend the slash zone and fire break which will require high voume spraying once completed
- Consultation services requested for site visits from Surveyor marking out new pit extension clearing area
- Flagging tape erected to define clearing boundary to offset to establish a parking pad

Next months work

- Offset D area herbicide decision
- Offset A rehab continue boundary lantana removal
- Offset B plantation to be slashed & fire break
- Stage 2 (E) high volume spray trial success check
- Koala Plantation on Moorina Rd needs to be slashed to discourage public access

Chemicals used

Chemical used	Quanity	Purpose
Glyphosate	900ml 100ml	Cut Stump Backpack
Glyphosate	6000ml	High Volume
Metsulfuron	32g	High Volume
Wetter	3000ml	

Photos

Front garden brush cut

Before & after Dairy access road and fenceline

Saros dust monitoring track slashed

Biodiversity AUSTRALIA

SUSTAINABLE PARTNERSHIPS
DEDICATED TO ACHIEVING
ECOLOGICAL AND ECONOMICAL BALANCE

LEADING THE WAY
IN ENVIRONMENTAL
MANAGEMENT

FERAL ANIMAL MONITORING & MANAGEMENT PROGRAM: CANID CONTROL

NARANGBA QUARRY

June 2022

Contents

Document Control Page

Version Control

Version	Purpose	Author	Reviewed / approved by	Date
0.1	Draft	Jessica Hobart	Karl Robertson	10/06/2022
1.0	Final	Jessica Hobart	Karl Robertson	15/06/2022

Distribution Control

Copy	Purpose	Method	Issued to:	Name	Date
1.0	Issue	Electronic	Boral	Megan McKinney	16/06/2022

Project Number: BSQ5257

Our Document Reference: BSQ5257-BBSQ-REP-Boral-NarangbaQuarryCanidManagement-rev0.1

1. Introduction

Biodiversity Australia Pty Ltd (Bio Aus) was contracted by Boral to conduct Vertebrate Pest Management at Narangba Quarry. Biodiversity Australia was engaged to assess and manage wild dogs (*Canis lupus familiaris*) within the site. As such, a monitoring and control program were undertaken during which, the management of wild dogs was the focus of feral animal control. The report contains the methodology and results of these survey and control works. This report also contains valuable post-monitoring results that will inform management strategies during future feral animal programs.

1.1 Objectives

The objectives of the project were to:

- Establish the approximate size of the feral canid populations within Narangba Quarry;
- Reduce the number of feral canids within Narangba Quarry through trapping and humane euthanasia; and
- Provide data-based recommendations for future pest animal management at Narangba Quarry.

1.2 Site Location and Description

The Narangba Quarry is located on Raynbird Road, Narangba, 37km north of Brisbane and northwest of the Narangba Township (Figure 1). Boral's landholdings cover an area of 469.8 hectares. Approximately 50ha are occupied by quarry operations and 420ha are buffer land. The site is surrounded by state forest, with established and under construction housing estates to the east. Agricultural properties lie to the south-east. Management efforts were focused within areas stipulated within *Vertebrate Pest Management Plan* (2020).

The site itself is predominantly open eucalypt woodland and open forests. The subject site is dominated by Northern Grey Ironbark (*Eucalyptus siderophloia*) and Grey Gum (*Eucalyptus propinqua*) within the canopy. Other species present include Tallowwood (*Eucalyptus microcorys*), Brush Box (*Lophostemon confertus*) and Forest Red Gum (*Eucalyptus tereticornis*).

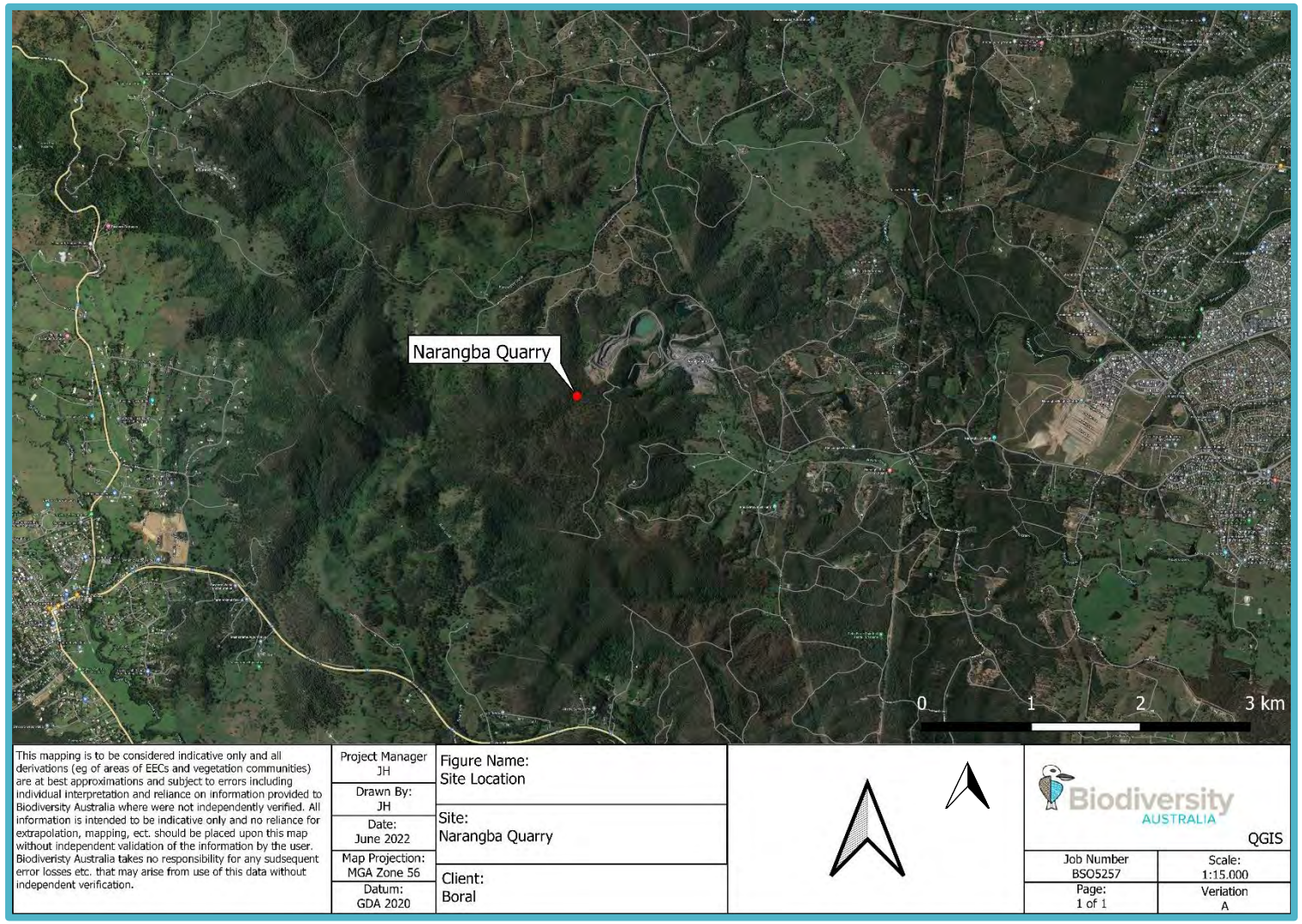


Figure 1: Site Location

1.3 Target Species

1.3.1 Wild dog (*Canis lupus familiaris*)

The term wild dog encapsulates any wild-living dogs including dingoes, feral dogs and hybrids. Dingoes were initially brought to Australia by Asian seafarers, approximately 4000 years ago (Glen et al., 2007). Domestic dogs then arrived in Australia as domestic pets of European settlers. It was from here that domestic dogs escaped to or were released into the wild. It is not possible to distinguish between pure dingoes and hybrids purely by colour or appearance. To determine this, DNA tests can be conducted using hair follicles or the ear tips of humanely killed wild dogs.

Wild dogs cause significant damage to the agricultural industry through their predation on livestock and are a restricted invasive animal under the *Biosecurity Act 2014.* They preferentially feed on small and medium-sized mammals, including native mice, dunnarts, bandicoots and wallabies, but they will prey upon a variety of native and exotic animals, including insects, kangaroos and livestock. They are implicated in the decline of several native species. As opportunistic feeders they may also enter sites where human activity has made food easily available, such as rubbish disposal areas.

Control methods for wild dogs include baiting, trapping, exclusion fencing, shooting and the use of guard animals. Donkeys and alpacas are often used to ward off wild dogs on cattle or sheep farms.

2. Methodology

All trapping methodologies followed the standards set out in the Standard Operating Procedure, as produced by Pest Smart – Invasive Animals CRC (Sharp, 2012). All Narangba Quarry standard protocols were followed and adhered to throughout the control period. Biodiversity Australia ensured to check in with Narangba Quarry staff upon arrival each day throughout the management period and as required whilst moving through gates as outlined by Narangba Quarry in their protocols.

2.1 Pre-Trapping Monitoring Period

Fourteen consecutive days of pest animal monitoring with remote surveillance cameras was undertaken with the aim of identifying wild dog travel routes. Eight pre-approved locations were utilised, as stipulated within the *Vertebrate Pest Management Plan* (2020).

Passive infrared (PIR) camera traps were installed in selected areas, mapped using a GIS system, and given a unique identifier (Figure 2). They were installed on the 13th of April 2022 and left in place for fourteen days. Camera outputs were formally assessed at the end of the monitoring period, and the following data collected:

- Species;
- Number of animals seen;
- Sex of animals (where this could be determined);
- Direction of travel and activity observed;
- Camera trap number; and
- Time of day.

2.2 Trapping Period

A canid trapping program was conducted over a fourteen-day period at Narangba Quarry. This occurred following the fourteen-day camera trapping period. Traps were installed in selected areas and mapped using a GIS system (Figure 3).

Traps were set on the 26th of April 2022 and collected on the 9th of May. During this time Biodiversity Australia assessed the traps on a daily basis and serviced them when required.

Because weather conditions play a considerable role in the success of dog trapping programs, record of the weather conditions, humidity, temperature and wind speed & direction were recorded each day Biodiversity Australia attended site (Appendix A).

Wild canids often traverse well defined paths along topographic features, and it is expected that wild dogs and foxes will frequent established paths on a regular basis for the ease of travel these provide. Scent lures were placed with traps near these paths to attract wild canids. The interaction between the placement of traps/lures and the direction of wind was given careful consideration in order to ensure that scents of lures were blown across expected wild dog travel routes.

The following data was collected for all pest animals captured:

- Species;
- Sex;
- Date of capture;
- Location, including GPS coordinates of capture location;
- Trap type;
- Method of euthanasia; and
- Pictures of animals prior to and post euthanasia.

2.2.1 Trap preparation

Before use, traps were cleaned and treated with a tannin and wax solution to remove any scent and to give the traps a protective coating of wax. At this point, each individual trap was tested to ensure that all parts were accounted for, intact, and functioning properly.

2.2.2 Soft jaw trap installation

Soft jaw (SJ) traps were strategically placed, in order to minimise the exposure of trapped individuals to harsh conditions such as direct sunlight. Once traps were positioned in a shallow hole in the ground, the trap was then anchored and set. The Biodiversity Australia team member ensured that surrounding debris did not interfere with the spring mechanism.

A lure or attractant was placed in a location of high canid activity, aiming to provoke an investigation. The trap was placed at a pre-determined distance and bearing from the lure in the expectation that the target animal would step in that spot resulting in a capture. A mixture of artificial and natural lures were used.

2.2.3 Trap monitoring

Each trap was checked every morning for animal welfare purposes. Throughout the process additional baits/scent lures were laid in or around traps as was deemed necessary by Biodiversity Australia staff.

2.2.4 Euthanasia

The appropriate firearm and ammunition were used to ensure an instant lethal shot. For a wild dog a smaller calibre rifle such as a .22 rimfire or .22 magnum rimfire with hollow/soft point ammunition is recommended. Each shot was taken at a safe distance, once the animals were settled and still.

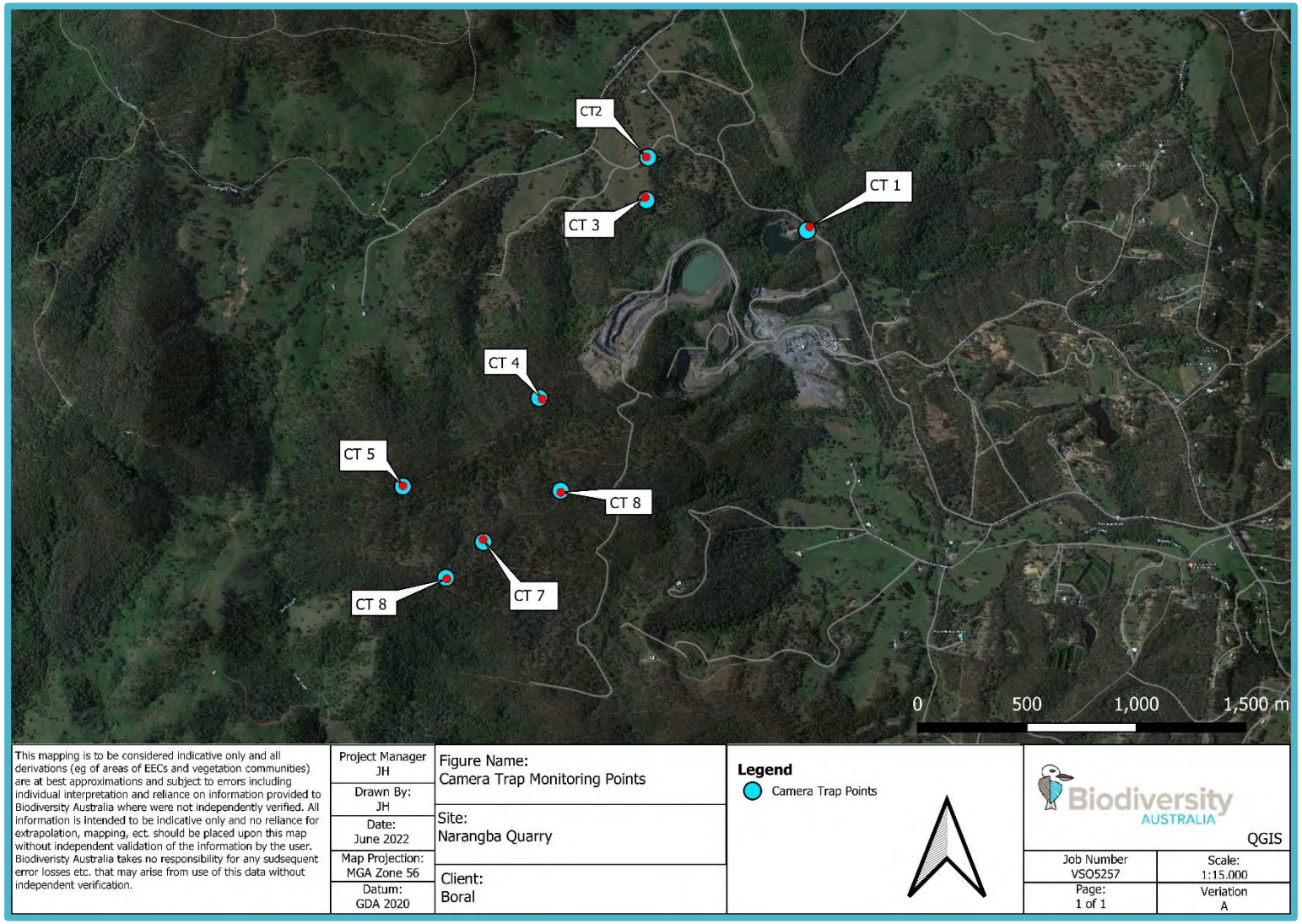


Figure 2: Camera Trap Locations

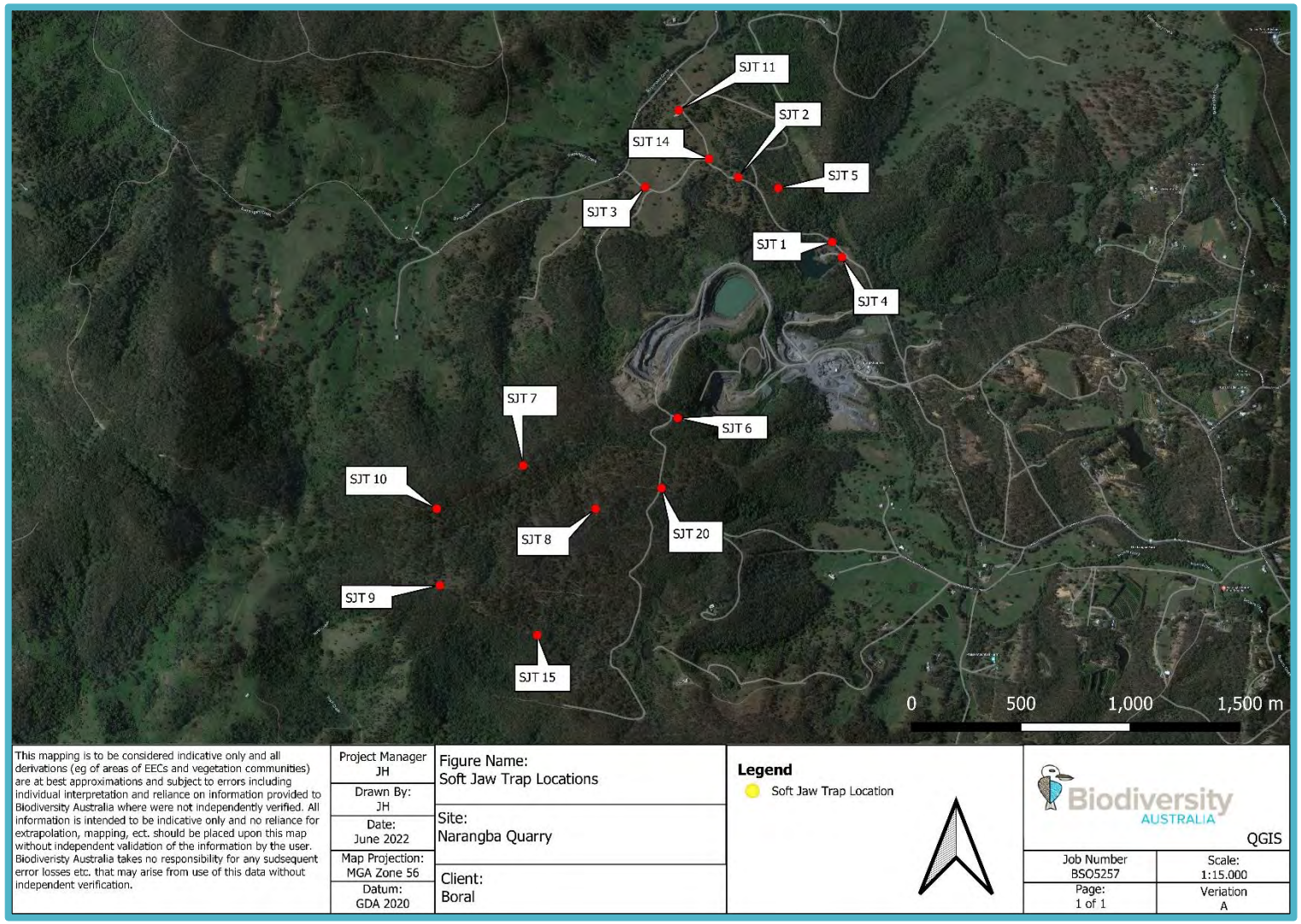


Figure 3: Soft Jaw Trap Locations

2.2.5 Bycatch

The below procedures were followed when a non-target species was caught in the SJ traps.

- Native – injured: Transport to a local carer or Wildcare;
- Native – not injured: Release; and
- Pest/Non-native: Humanely euthanise.

2.2.6 Analysis

The interaction between the placement of traps and the direction of the wind was given careful consideration to ensure expected wild dog travel routes were given adequate exposure to the scents of lures accompanying traps. For example, if a trap was positioned to the western side of an expected dog travel route, wind blowing in an eastwardly direction would expose the scent of the lure to the travel route. As such, all days wind was blowing in an eastward wind direction would be considered when calculating the percentage of management days the scent of the trap was exposed to dog travel routes. Weather data for the duration of the trapping period is contained in Appendix A.

In order to calculate the percentage of management days that lures were exposed to dog travel routes, the percentage of management days that wind blew in each direction (north, south, east, west etc.) recorded was calculated (Figure 3). The number of days that each lure's scent was blown towards paths was then calculated.

3. Results

3.1 Pre-Works Monitoring

PIR camera monitoring at Narangba captured images of dogs, foxes, hares and cats (Figure 4). Non-target feral species were also observed within the monitoring event including one (1) bull.

It was not possible to determine the sex of the feral species observed. All individuals observed were adults.

A total of seventeen (17) wild dogs were photographed. These were captured on CT 2, 4, 5, 6, 7 & 8. All dogs photographed were adults. Individuals were able to be deciphered due to unique markings that were observed (Photo Plate 1, 2 & 3).

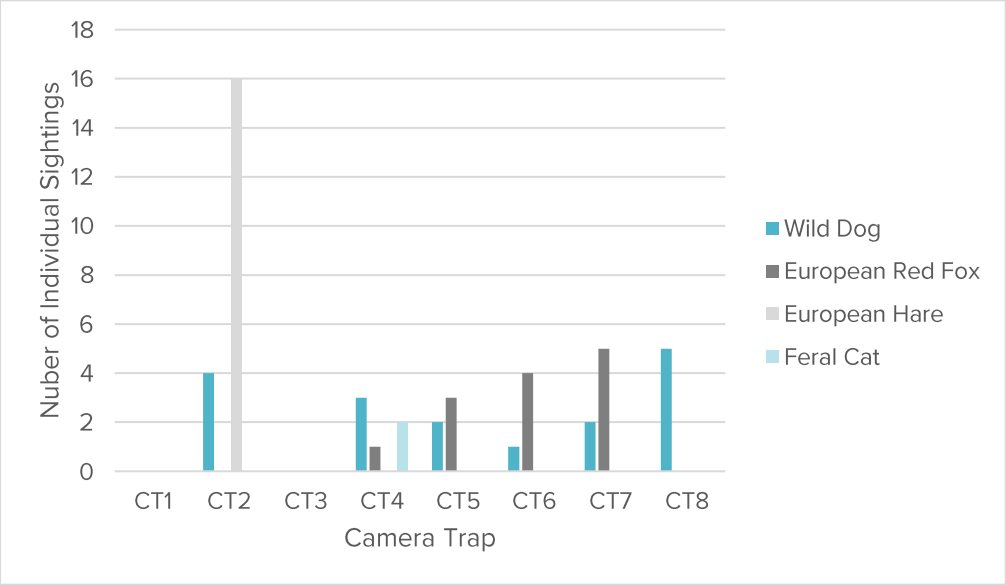


Figure 4: Number of Camera Captured Individuals at each Camera Trap Location

Photo Plate 1: Wild Dog Caught on CT2

Photo Plate 2: European Hare Caught on CT2

Photo Plate 3: Feral Cat Caught on CT4

3.1.1 Opportunistic Sightings

Opportunistic sightings are included within this report to provide information on the types and species of animals that have the potential to cross property boundaries.

Wallabies and Kangaroos were recorded on CT2 to CT8. Multiple brush Turkeys, Australian Magpies and Laughing Kookaburras were also observed. No other native species or non-target feral species were recorded during the pre-trapping monitoring period. Table 1 summarises opportunistic sightings at Narangba Quarry during this period.

Table 1: Opportunistic sightings across the management period at Narangba Quarry.

Species Common Name	Scientific Name	Observation Type
Australian Magpie	*Gymnorhina tibicen*	Observed on camera traps
Brush Turkey	*Alectura lathami*	Observed on camera traps
Eastern Grey Kangaroo	*Macropus giganteus*	Observed on camera traps
	Dacelo novaeguineae	Observed on camera traps
Whip-tail Wallaby	*Macropus parryi*	Observed on camera traps

3.1.2 Calculated Relevant Abundance Frequency

Calculated Relevant Abundance is provided within this report to give insight into the wild dog abundance onsite, compared to the other species abundance that was found throughout the monitoring period.

The calculated relative abundance is calculated by dividing the total number of a species caught on camera, by the total number of monitoring points over the fourteen-day monitoring period. Table 2 summaries the calculated relevant abundance of the target species caught on camera onsite.

Table 2: Opportunistic sightings across the management period at Narangba Quarry.

Species	Total Number Recorded	Number of Monitoring Points	Calculated Relative Abundance
Wild Dog	17	112	0.152
European Red Fox	13	112	0.116
European hare	16	112	0.143
Feral Cat	2	112	0.018

3.2 Trapping

Canid trapping activities resulted in the capture and euthanasia of one wild dog, two European red foxes and one European hare.

Table 2 summarises the captures. Photographs of the captured canids can be viewed in Appendix B.

Other observations of note while the traps were in place included:

- Trap 11 was uncovered by birds on 04/05/2022 so required resetting,
- Some lures were dissolved by rain and had to be refreshed due to rain events.

Table 3: Summary of individuals caught in traps, including target and "other" species.

Date of capture	Trap Number	Species common name	Scientific name	Count
29/04/2022	5	European hare	*Lepus europaeus*	1
01/05/2022	7	European red fox	*Vulpes vulpes*	1
04/05/2022	4	European red fox	*Vulpes vulpes*	1
07/05/2022	5	Wild dog	*Canis familiaris*	1

3.2.1 Trap Exposure

Placement of traps relative to paths was given careful consideration by Biodiversity Australia to ensure that dogs would have adequate access and exposure to traps to increase efficacy of the control program. The objective was to ensure that the trap was downwind of the lure for the greatest period of time. During the trapping period the wind was most frequently calm. On the days when the wind blew, it blew most frequently from the east-south-east. Throughout the trapping period, heavy rainfall occurred with little wind, resulting in the decrease of scent from the lures. Traps situated south of a path received the least amount of exposure during the control period (36%), whereas traps situated on the northern sides of the path received the highest amount of exposure (50%) (Table 3). It should be noted that these percentages are estimates to help gauge exposure of each trap to expected areas of dog traffic.

Table 4: Percentage of control days that scents of lures at each trap were exposed to nearby tracks (rounded to the nearest 5%).

Trap Number	Trap Position (relative to path)	% of Management Days Trap Scents were Exposed to Dog Traffic Areas
1	N	50%
2	N	50%
3	N	50%
4	N	50%
5	N	50%
6	N	50%
7	N	50%
8	W	57%
9	N	50%
10	W	57%
11	W	57%
12	S	36%
13	N	50%
14	S	36%
Average exposure (% of management days):		**49.5%**

3.2.2 Trap Disturbances

Trap disturbances can help to give an indication of animal activity in the area. Over the duration of the trapping period, there were 5 recorded trap disturbances (Table 4). Two of these trap disturbances was attributed to the capture of a European red fox, and one was attributed to the capture of a wild dog. All three of the captures occurred at different soft jaw traps.

Table 5: Trap disturbances noted over the duration of the wild canid trapping period.

Dates of disturbances	Trap ID	Species	Sex	Age	Result	Count
27/04/2022	1	-	-	-	Trap triggered; lure not moved	0
	7	Red-necked wallaby	-	Adult	Trap triggered, capture	1
29/04/2022	2	European hare	-	Adult	Trap triggered, capture	1
01/05/2022	7	European red fox	M	Adult	Trap triggered, capture	1
	4	European red fox	F	Adult	Trap triggered, capture	1
07/05/2022	5	Wild Dog	M	Adult	Trap triggered, capture	1
					Total captures	**5**

4. Discussion

Camera monitoring captured images of seventeen (17) wild dogs, sixteen (16) hares, thirteen (13) foxes and two (2) cats. Opportunistic monitoring also captured; one (1) bull and multiple wallabies, kangaroos, magpies and kookaburras. These were spread relatively evenly across the site and not concentrated in any one location.

During the wild canid control period one wild dog (male) was captured and successfully removed from Narangba Quarry. Two foxes (male and female) and one hare were also removed.

Heavy rain during the trapping period may have reduced the effectiveness of some traps, by dissolving lures and exposing trap jaws. This also created inaccessible areas for the field staff to access. Human interference in the way of road grading occurred throughout the entire site also. This was predicted to have reduced the overall effectiveness of the monitoring and trapping program.

5. Recommendations

Although Biodiversity Australia's management efforts resulted in the successful capture of two foxes and one wild dog and one hare, the wild canid population at Narangba Quarry requires ongoing management and application of the knowledge gained throughout this program.

The following recommendations are suggested for future control works to increase success of the feral animal management program:

- Focus control events around times of peak activity or when target species are more likely to respond to lures;
- Management to occur within appropriate timeframes and during times of less frequent activity within the base to minimise site disturbance and possible animal dispersal.
- Grading of roads should not occur throughout monitoring and trapping periods.

6. References

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Appendix A

Weather data for the duration of the trapping period

Date	Min Temp. ^{0}C	Max Temp. ^{0}C	Rainfall per day mm	9am			3pm		
				Temp.	%	Wind Direction	Temp.	%	Wind Direction
26/04/2022	16.9	22.5	2.0	18.0	96	SW	22.2	68	E
27/04/2022	17.9	25.8	0.2	20.3	95	SW	24.6	64	E
28/04/2022	18.9	25	0.2	23	75	ESE	24.6	73	ESE
29/04/2022	19.3	25.9	0.6	23.4	83	SSW	24.6	70	ESE
30/04/2022	19.2	26	0.2	22.9	93	SW	24.9	68	ESE
01/05/2022	18.5	23.6	0	21.6	88	SSW	22.2	79	SSW
02/05/2022	18.3	24.9	0.2	21.9	75	S	23.5	57	SSE
03/05/2022	16.1	24.6	0	20.7	71	SSW	23.3	68	ESE
04/05/2022	16.9	25.3	0.2	21.6	78	SSW	23.8	71	ESE
05/05/2022	18.7	27.6	0	21.9	92	WSW	24.7	79	NE
06/05/2022	20.9	28.1	0.2	21.5	98	SW	24.5	81	E
07/05/2022	18.4	25.4	12	20.9	80	SW	23.3	82	SSE
08/05/2022	16.9	21.8	38.8	18.3	91	SSW	21.4	84	SSE
09/05/2022	17.3	19.7	4.8	17.6	99	S	17.4	99	S

Appendix B

Warning:

Distressing images of deceased animals on the following pages. Reader discretion is advised.

Figure 5: Adult European Hare captured at Narangba Quarry on the 29th April 2022

Figure 6: Adult European Fox captured at Narangba Quarry on the 1st May 2022

Figure 7: Adult European Fox captured at Narangba Quarry on the 4th May 2022

Figure 8: Adult Wild Dog captured at Narangba Quarry on the 7th May 2022