



# BIODIVERSITY MANAGEMENT PLAN

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2	Dec 2015	Jan 2016	Sections 1.1, 1.2 and 2.0 and Figures 2 and 3	To reflect approval of Modification 11 (Stage 1) and Modification 1 (Stage 2)	Environmental Department
3	Aug 2016	Aug 2018	All	To reflect approval of Modification 12 (Stage 1) and Modification 2 (Stage 2)	Environmental Department
4	Aug 2019	Sep 2019	All	To reflect approval of Modification 14 (Stage 1) and Modification 3 (Stage 2)	Environmental Department
5	Aug 2020	Sep 20	1 – 4, 6 – 7, 11 and 13	To Reflect approval of Modification 15 (Stage 1)	MCO

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## 1.0 INTRODUCTION

The Moolarben Coal Complex open cut and underground coal mining operation is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfield of New South Wales (NSW) (Figure 1).

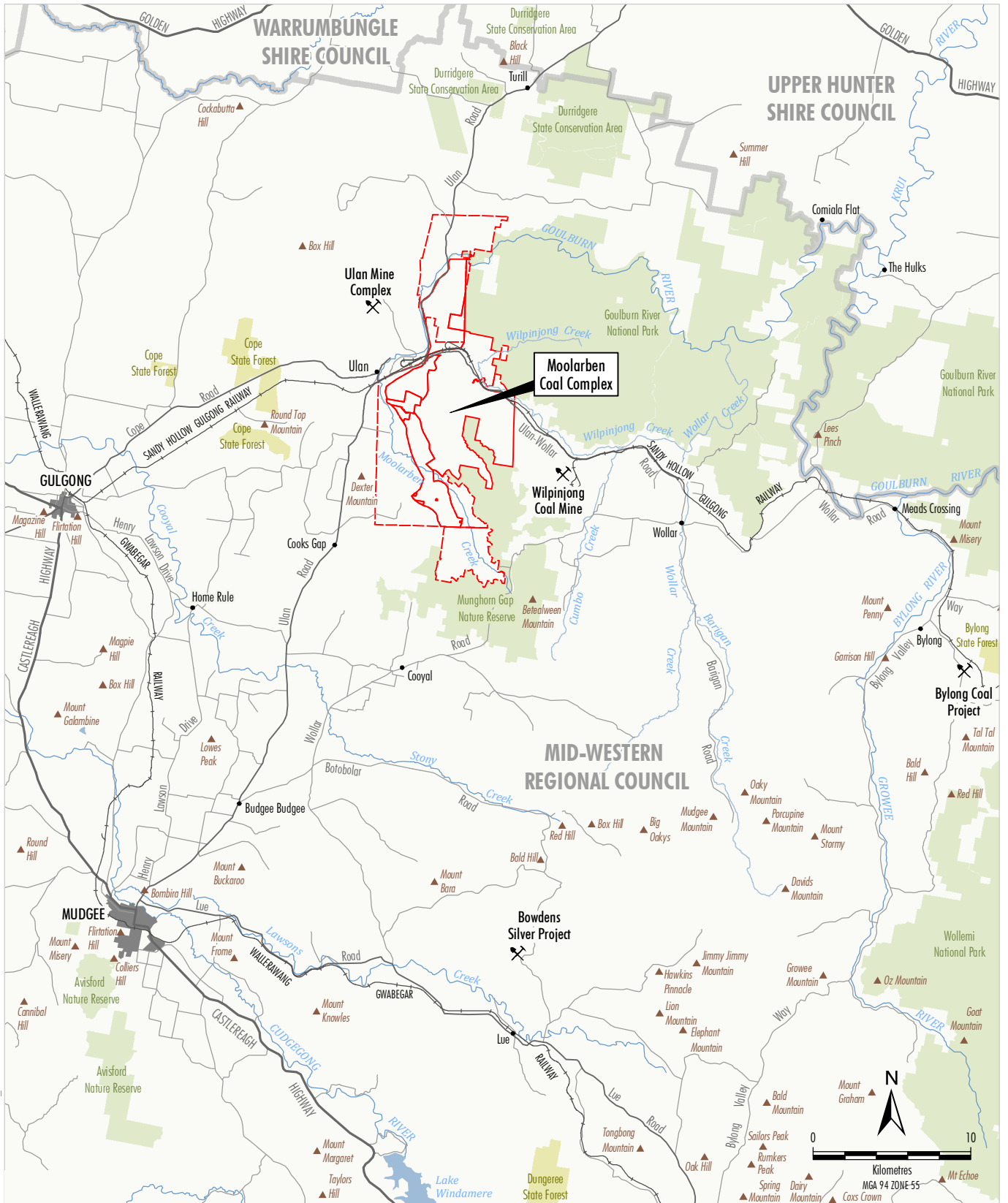
Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Yancoal Moolarben Pty Ltd (YM) and a consortium of Korean power companies). MCO, MCM and YM are wholly owned subsidiaries of Yancoal Australia Limited (Yancoal).

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 and would continue to be carried out in accordance with NSW Project Approval (05\_0117) (Moolarben Coal Project Stage 1) as modified and NSW Project Approval (08\_0135) (Moolarben Coal Project Stage 2) as modified.

Mining operations at the Moolarben Coal Complex are undertaken in accordance with the various approvals under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The current mining operations at the Moolarben Coal Complex are conducted in accordance with the requirements of the conditions of Mining Lease (ML) 1605, ML 1606, ML 1628, ML 1691 and ML 1715 granted under the *Mining Act 1992*.

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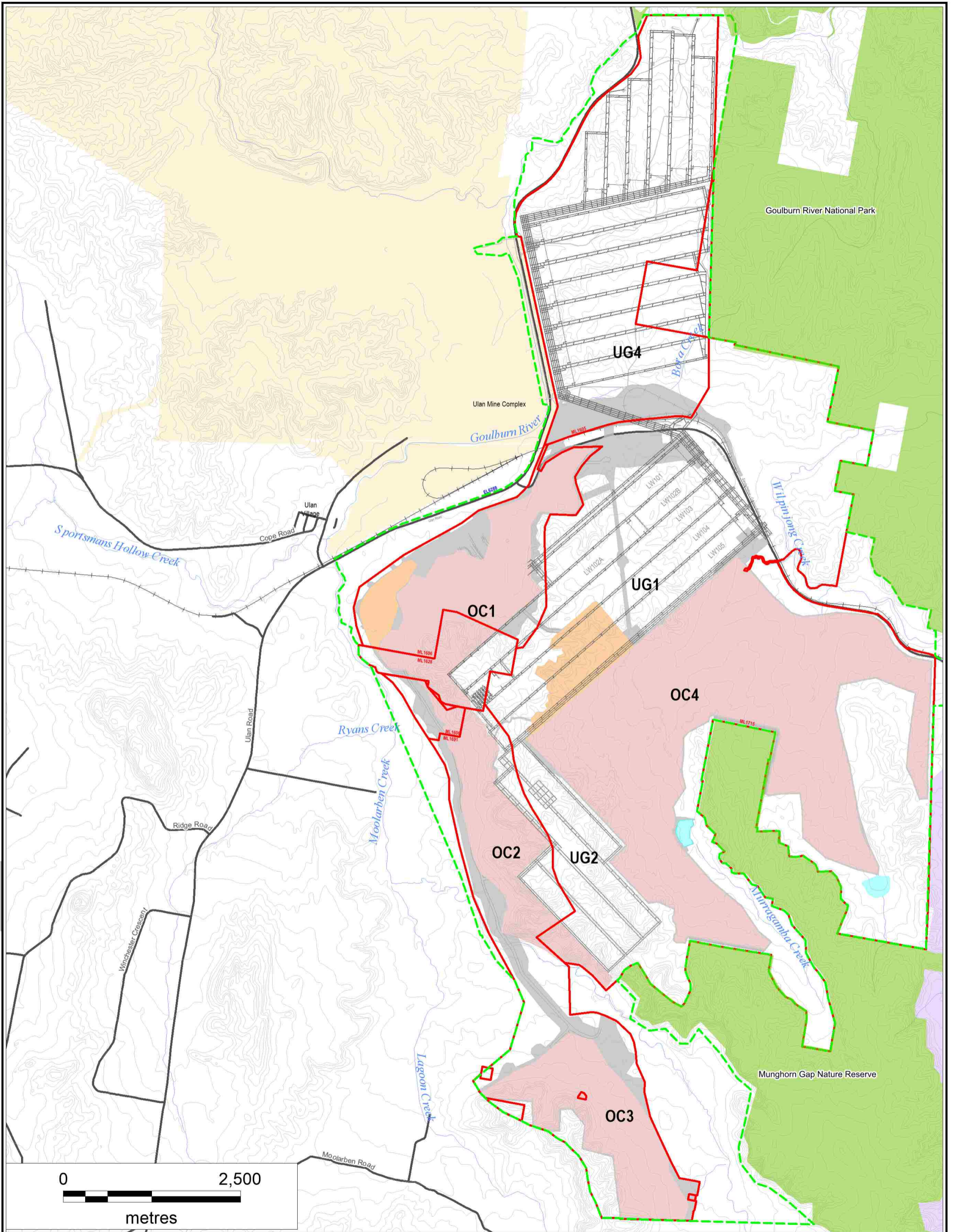
- LEGEND**
- State Forest
  - NSW National Parks and Wildlife Service
  - Local Government Boundary
  - Exploration Licence Boundary
  - Mining Lease Boundary
  - Mining Operation

Source: NSW Land & Property Information (2017); NSW Department of Industry (2017); Office of Environment and Heritage NSW (2017)

  
**MOOLARBEN COAL**  
 MOOLARBEN COAL COMPLEX  
 Regional Location

**Figure 1**





- Legend**
- Mining Lease Boundary
  - Consolidated Project Approval Boundary
  - Rail Line
  - Contour
  - Ulan Mine Complex
  - Wilpinjong Coal Mine

- Existing / Approved Development**
- Open Cut Mining Area
  - Underground Workings
  - Out of Pit Emplacement
  - Surface Infrastructure
  - Clean Water Diversion Dam



**Figure 2**  
**Approved Moolarben Coal Project (Stage 1 and Stage 2)**  
**Indicative General Arrangement**



## 1.1 OPERATIONAL STATUS

The Moolarben Coal Complex comprises four approved open cut mining areas (OC1, OC2, OC3 and OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities) (Figure 2). Since the commencement of coal mining operations in 2010, mining activities have occurred within OC1, OC2, OC3, OC4 and UG1 with mining to progress to other approved mines in the future.

Construction/development and exploration activities are currently focused on works to facilitate open cut mining progression and development and progression of underground mining operations at the Moolarben Coal Complex.

Construction works in support of open cut mining progression include mine infrastructure areas, offices, water management works, coal handling, haul roads, diversions, water storages, and other ancillary works.

Construction works in support of underground mining progression include mine infrastructure areas, materials handling and processing, water management infrastructure and underground mining surface facilities.

## 1.2 SCOPE

This Biodiversity Management Plan (BioMP) has been prepared by MCO (with input from experienced and qualified biodiversity experts [EcoLogical Australia]) to satisfy the requirements of NSW Project Approval (05\_0117) as modified and the requirements of NSW Project Approval (08\_0135) as modified.

The BioMP describes the management of biodiversity at the Moolarben Coal Complex associated with the above listed Project Approvals. The objectives of the BioMP are to provide procedures and strategies to be implemented during the life of the Project to minimise biodiversity impacts on site (albeit in consideration of the approved impacts) and enhance biodiversity values on the offset areas.

In accordance with Condition 13(a), Schedule 2 of the Project Approvals (05\_0117 and 08\_0135), this BioMP is being staged and revisions of the plan will be submitted on a progressive basis.

This version of the BioMP has been prepared to address the management of biodiversity at the Moolarben Coal Complex during on site disturbance activities. Subsequent revisions of this BioMP will incorporate the Biodiversity Offset Strategy requirements under Condition 36, Schedule 3 of Project Approval (05\_0117) and Condition 39, Schedule 3 of Project Approval (08\_0135), including a detailed monitoring program, performance measures, completion criteria and remedial actions (where required).

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This BioMP supersedes relevant portions of the previously approved Stage 1 Landscape Management Plan dated November 2013 (MCO, 2013).

### 1.3 STRUCTURE OF THE BioMP

The remainder of the BioMP is structured as follows:

- Section 2: Outlines the statutory requirements applicable to the BioMP.
- Section 3: Provides an overview of the existing environment at the Moolarben Coal Complex.
- Section 4: Outlines the vegetation clearance protocol for the Moolarben Coal Complex.
- Section 5: Describes the collection and use of locally sourced native seeds and supplementary tubestock planting.
- Section 6: Outlines the revegetation strategy to improve vegetation connectivity.
- Section 7: Describes additional biodiversity management measures for the Moolarben Coal Complex.
- Section 8: Outlines the biodiversity monitoring program at the Moolarben Coal Complex.
- Section 9: Describes the biodiversity offset strategy.
- Section 10: Describes the performance measures and management targets applicable to the management of biodiversity at the Moolarben Coal Complex.
- Section 11: Provides a contingency plan to manage any unprecedented impacts and their consequences.
- Section 12: Outlines the roles and responsibilities of relevant Moolarben Coal Complex site personnel relating to the implementation of the BioMP.
- Section 13: Provides details for the review and improvement of environmental performance process.
- Section 14: Describes the management and reporting of incidents, complaints and non-compliances.
- Section 15: Provides the references cited in the BioMP.
- Appendix A: Provides a reconciliation of the Project Approval requirements.
- Appendix B: Provides a copy of the Moolarben Coal Complex Ground Disturbance Permit.

### 1.4 CONSULTATION FOR THE BioMP

In accordance with Condition 36(a) of Schedule 3 of the Stage 1 Project Approval (05\_0117) and Condition 39(a) of Schedule 3 of the Stage 2 Project Approval (08\_0135), the BioMP has been prepared in consultation with the NSW Office of Environment and Heritage (OEH).

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## 2.0 STATUTORY REQUIREMENTS

MCO's statutory obligations are contained in:

- i. the conditions of the NSW Project Approval (05\_0117) as modified and NSW Project Approval (08\_0135) as modified;
- ii. the conditions of the Commonwealth Approvals (EPBC 2007/3297, EPBC 2013/6926, EPBC 2017/7974 and EPBC 2008/4444);
- iii. relevant licences and permits, including conditions attached to the Environment Protection Licence and mining leases; and
- iv. other relevant legislation.

### 2.1 EP&A ACT PROJECT APPROVAL

The conditions of the NSW Project Approvals (05\_0117 and 08\_0135) relevant to biodiversity management are described in Condition 36, Schedule 3 of the Stage 1 Project Approval (05\_0117) and Condition 39, Schedule 3 of the Stage 2 Project Approval (08\_0135). A comprehensive list of all conditions in the NSW Project Approvals relevant to biodiversity management, and a description of where they are referenced in this BioMP, is provided in Appendix A.

#### 2.1.1 Management Plan Requirements

Condition 3, Schedule 5 of the Stage 1 Project Approval (05\_0117) and Condition 3, Schedule 6 of the Stage 2 Project Approval (08\_0135) outline general management plan requirements that are applicable to the preparation of the BioMP. Table 1 presents these requirements and indicates where they are addressed within this BioMP.

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**Table 1: Management Plan Requirements**

NSW Project Approval Condition	BioMP Section
<p>3. <i>The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:</i></p> <p>(a) <i>detailed baseline data;</i></p> <p>(b) <i>a description of:</i></p> <ul style="list-style-type: none"> <li>• <i>the relevant statutory requirements (including any relevant approval, licence or lease conditions);</i></li> <li>• <i>any relevant limits or performance measures/criteria;</i></li> <li>• <i>the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;</i></li> </ul> <p>(c) <i>a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</i></p> <p>(d) <i>a program to monitor and report on the:</i></p> <ul style="list-style-type: none"> <li>• <i>impacts and environmental performance of the project;</i></li> <li>• <i>effectiveness of any management measures (see c above);</i></li> </ul> <p>(e) <i>a contingency plan to manage any unpredicted impacts and their consequences;</i></p> <p>(f) <i>a program to investigate and implement ways to improve the environmental performance of the project over time;</i></p> <p>(g) <i>a protocol for managing and reporting any:</i></p> <ul style="list-style-type: none"> <li>• <i>incidents;</i></li> <li>• <i>complaints;</i></li> <li>• <i>non-compliances with statutory requirements; and</i></li> <li>• <i>exceedances of the impact assessment criteria and/or performance criteria; and</i></li> </ul> <p>(h) <i>a protocol for periodic review of the plan.</i></p>	<p>Section 3</p> <p>Section 2</p> <p>Section 10</p> <p>Section 10</p> <p>Sections 4 to 10</p> <p>Sections 8 to 10 and 14</p> <p>Section 11</p> <p>Section 13</p> <p>Section 14</p> <p>Section 13</p>

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## 3.0 OVERVIEW OF THE EXISTING ENVIRONMENT

### 3.1 GENERAL LOCATION AND SETTING

The Moolarben Coal Complex is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley. This Bioregion borders both the South Western Slopes and Brigalow Belt South Bioregions and is a transitional zone for flora species; representing plants and communities from the south-east, north-west and western parts of NSW.

Within the Sydney Basin Bioregion the Moolarben Coal Complex is located within the upper Goulburn River and Wollar Creek catchments. These form sub-catchments to the Goulburn River catchment, which is the largest sub-catchment of the Hunter River covering just under one third of the total Hunter River catchment. The upper Goulburn River and Wollar Creek sub-catchments cover areas of approximately 2,455 square kilometres (km<sup>2</sup>) and 532 km<sup>2</sup> respectively.

Moolarben Creek is a tributary of the upper Goulburn River catchment and flows along the western boundary of the Moolarben Coal Complex. Wilpinjong Creek is a tributary of the Wollar Creek catchment and flows along the north-east boundary of the Moolarben Coal Complex into Wollar Creek, before joining the Goulburn River approximately 26 km downstream of the Moolarben Coal Complex.

Landforms in the vicinity of the Moolarben Coal Complex primarily comprise low undulating rises, creek flats, sandstone plateaus and low hills. Elevations in the vicinity of Moolarben Coal Complex range from approximately 370 metres (m) Australian Height Datum (AHD) at the Goulburn River National Park (GRNP) to the north-east to approximately 600 m AHD at the Munghorn Gap Nature Reserve (MGNR) to the south-east of the Moolarben Coal Complex.

Land use in the vicinity of the Moolarben Coal Complex is characterised by a combination of coal mining, grazing, conservation reserves and rural settlement.

### 3.2 GEOLOGY AND SOILS

Soil landscapes are mapped across the Moolarben Coal Complex area in the *Soil Landscapes of Dubbo 1:250,000 Sheet* (Murphy and Lawrie, 1998). Four key soil landscapes have been mapped in the Moolarben Coal Complex area, namely Ulan, Lees Pinch, Bald Hill and Munghorn Plateau.

The Ulan soil landscape is largely found on the valley floor, the Lees Pinch and Munghorn Plateau soil landscapes are located on the slopes and ridgelines of the surrounding hills and plateaus, whilst the Bald Hill soil landscape is restricted to isolated tertiary basalt flow remnants.

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Occasional conglomerate outcrops referred to as ‘hard caps’ are associated with ‘tertiary channels’, which occur as localised hills throughout the valley floor. Soils of the valley floor consist of narrow alluvium along the major creek lines. Soils of the lower and central midslopes are generally derived from Permian age sandstone, conglomerate and clay stone, with the upper slopes often characterised by Triassic age sandstone. The Ridgelines tend to have poor soil fertility due to the underlying Triassic geological formation (Narrabeen Sandstones). Basaltic rocky outcrops occur in some areas.

### 3.3 FLORA

Detailed Ecological Impact Assessments were prepared by Moolarben Biota (2006) and Ecovision (2008) for Stages 1 and 2 of the Moolarben Coal Project respectively. An Ecological Impact Assessment was also undertaken in 2012 for the Moolarben Coal Project Stage 1 Modification 9 Environmental Assessment (EA) (EMM, 2013).

Flora and Fauna Impact Assessments were undertaken in 2015 as part of the Moolarben Coal Complex OC4 South-West Modification (ELA, 2015a) (MOD11) and for the UG1 Optimisation Modification (ELA, 2015b) (MOD 12). A Biodiversity Assessment Review was undertaken by ELA in 2017 as part of the Moolarben Coal Complex Open Cut Optimisation Modification (ELA, 2017) (MOD 14). Further studies were completed in 2019 as part of the Moolarben Coal UG4 Ancillary Works Modification (ELA, 2019) (MOD15).

#### 3.3.1 Vegetation Communities

The general vegetation patterns across the landscape comprise cleared and disturbed paddocks on the valley flats, with fragmented patches of remnant vegetation, predominantly Rough-barked Apple Forests and Box and Red Gum Woodlands. The latter of these also occurs on adjacent lower slopes in similarly fragmented patches, while isolated patches of Grassy Box Woodlands are found on scattered basalt outcrops. Both Rough-barked Apple Forests and Box and Red Gum Woodlands also occur as linear tracts of woodlands along Murragamba, Eastern and Wilpinjong creeks. Box Ironbark shrubby vegetation communities occur further upslope, with the ridges and upper slopes dominated by Ironbark and/or Cypress Pine Forests, Scribbly Gum Woodlands, and occasional patches of low Dwyer’s Red Gum Woodland (Moolarben Biota, 2006; Ecovision, 2008; EMM, 2013; ELA, 2015a, 2015b and 2017).

The Moolarben Coal Complex contains 13 BioMetric vegetation types, including (Moolarben Biota, 2006; Ecovision, 2008; EMM, 2013):

- Blakely’s Red Gum – Yellow Box grassy open forest or woodland of the New England Tablelands (HU515).
- Dwyer’s Red Gum low woodland on exposed sandstone ridges of the upper Hunter Valley, Sydney Basin (HU537).

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- Grey Box – Narrow-leaved Ironbark shrubby woodland on hills of the Hunter Valley, North Coast and Sydney Basin (HU551).
- Grey Gum – Narrow-leaved Stringybark – ironbark woodland on ridges of the upper Hunter Valley, Sydney Basin (HU552).
- Narrow-leaved Ironbark – Grey Gum shrubby woodland on footslopes on the upper Hunter Valley, Sydney Basin (HU574).
- Rough-barked Apple – Coast Banksia shrubby woodland on Warkworth Sands of the central Hunter Valley, Sydney Basin (HU600).
- Rough-barked Apple – Silvertop Stringybark – Ribbon Gum shrub/grass open forest on hills of the southern Nandewar Bioregion (HU603).
- Rough-barked Apple grassy open forest on valley flats of the North Coast and Sydney Basin (HU605).
- Scribbly Gum – Brown Bloodwood woodland of the southern Brigalow Belt South (HU608).
- Slaty Box – Grey Gum shrubby woodland on footslopes of the upper Hunter Valley, Sydney Basin (HU618).
- White Box – Narrow-leaved Ironbark open forest on hills of the central Hunter Valley, Sydney Basin (HU653).
- White Box – Yellow Box grassy woodland on basalt slopes in the upper Hunter Valley, Brigalow Belt South (HU654).
- Derived grasslands of the slopes on the Merriwa Plateau (HU671).

Disturbed land/vegetation is more extensive than the above vegetation types at the Moolarben Coal Complex, consisting of cleared forest and woodland communities, including areas of early regrowth and regenerating shrub lands. All disturbed land/vegetation is regarded as highly disturbed due to previous clearing, earthworks, mining, weed invasions and pasture management.

### 3.3.2 Threatened Ecological Communities

Three threatened ecological communities have been recorded at the Moolarben Coal Complex (Moolarben Biota, 2006; Ecovision, 2008; Cumberland Ecology, 2012; EMM, 2013; ELA, 2015a, 2015b, 2017 and 2019):

- *White Box – Yellow Box – Blakely’s Red Gum Woodland and Derived Native Grassland*, listed as an Endangered Ecological Community (EEC) under the NSW *Threatened Species Conservation Act, 1995* (TSC Act) and Critically Endangered Ecological Community under the EPBC Act (herein referred to as the Box Gum Woodland EEC). This community has been recorded within both the surface disturbance and underground mining areas at the Moolarben Coal Complex.

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- *Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions*, listed as an EEC under the TSC Act. This community has been recorded in the underground mining areas at the Moolarben Coal Complex.
- *Central Hunter Valley Eucalypt Forest and Woodland*, listed as a CEEC under the EPBC Act. This community has been recorded within both the surface disturbance and underground mining areas at the Moolarben Coal Complex. This CEEC was listed in May 2015 and does not apply to the approved Stage 1 and Stage 2 mining operations pursuant to section 158A of the EPBC Act.

### 3.3.3 Threatened Flora Species

Five threatened flora species have been recorded at the Moolarben Coal Complex, including (Moolarben Biota, 2006; Ecovision, 2008; EMM, 2013):

- *Diuris tricolor* (Pine Donkey Orchid) – vulnerable under the TSC Act.
- *Eucalyptus cannonii* (Capertee Stringybark) – vulnerable under the TSC Act.
- *Eucalyptus scoparia* (Wallangarra White Gum) – endangered under the TSC Act and vulnerable under the EPBC Act.
- *Leucochrysum albicans* var *tricolor* (Hoary Sunray) – endangered under the EPBC Act.
- *Pomaderris queenslandica* (Scant Pomaderris) – endangered under the TSC Act and vulnerable under the EPBC Act.
- *Tylophora linearis* – vulnerable under the TSC Act.

In accordance with the Stage 1 Project Approval (05\_0117), additional targeted spring surveys for the Pine Donkey Orchid (*Diuris tricolor*) were undertaken by ELA in September, October and November 2013 in potential habitat areas within Open Cut 1 and Open Cut 2 extension areas.

Flowering of the species was confirmed (by inspecting known locations/occurrence outside of the disturbance area) prior to undertaking the targeted searches in areas of suitable habitat (grassy areas within Dry Sclerophyll Forest often with Cypress Pine or Ironbark's with sandy soils, either on flats or small rises).

The Pine Donkey Orchid (*Diuris tricolor*) was not recorded during the targeted searches. It was concluded by ELA that the potential for additional occurrences (other than those already known) of the Pine Donkey Orchid (*Diuris tricolor*) at the Moolarben Coal Complex was low.

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### 3.3.4 Weeds

Listed weeds identified at the Moolarben Coal Complex include:

- *Ailanthus altissima* (Tree of Heaven).
- *Andropogon virginicus* (Whisky Grass).
- *Heliotropium implexa* (Blue Heliotrope).
- *Hypericum perforatum* (St John’s Wort).
- *Onopordum acanthium* subsp. *acanthium* (Scotch Thistle).
- *Opuntia* spp. (Prickly Pear).
- *Rubus fruticosus* agg. spp. (Blackberry).

All of the above weeds were declared weeds under the former NSW *Noxious Weeds Act 1993* with the exception of Whisky Grass, which is a declared environmental weed.

## 3.4 TERRESTRIAL FAUNA

As described in Section 3.3, detailed ecological impact assessments were prepared for Stage 1 and Stage 2 (including subsequent modifications) of the Moolarben Coal Project.

### 3.4.1 Fauna Habitat

A range of broad fauna habitat classes occur within the Moolarben Coal Complex, including (Moolarben Biota, 2006; Ecovision, 2008; EMM, 2013):

- Woodland and open forest dominated by eucalypt species of dry sclerophyll environs.
- Open to dense shrublands.
- Sparse to open groundcovers dominated by grasses and woody herbs of dry environs.
- Semi-permanent to ephemeral open/closed depression dominated by a mix of native and exotic sedges and herbs.
- Exotic grasses and herbs of disturbed cleared environs.

These habitat classes contain numerous microhabitat features. Tree hollows are present within the woodland and open forest habitat located on the midslopes, whilst fallen timber is a more limited microhabitat feature and mainly occurs on steeper slopes. Flowering trees and shrubs are particularly abundant across the ridge tops. Isolated rock outcrops and bush rock, isolated accumulations of water and ephemeral to semi-permanent streams and pools of water are other microhabitat features noted across the Moolarben Coal Complex (Moolarben Biota, 2006; Ecovision, 2008).

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### 3.4.2 Threatened and Migratory Fauna Species

Across the Moolarben Coal Complex, a total of 32 threatened and/or migratory fauna species, consisting of eight mammal species (including six microbat species) and 26 bird species have been recorded by Moolarben Biota (2006), Ecovision (2008) and EMM (2013) and ELA (2015 and 2017).. These threatened species are listed in Table 2. Other threatened species were assessed and offset as part of the various impact assessments relevant to the Moolarben Coal Complex however the BioMP focuses on those species recorded as they are more likely to be encountered during the life of the mine.

**Table 2: Threatened and Migratory Fauna Species Recorded at the Moolarben Coal Complex**

Common Name	Scientific Name	Conservation Status <sup>1</sup>	
		TSC Status	EPBC Status
Square-tailed Kite	<i>Lophoictinia isura</i>	V	-
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V	-
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	V	-
Powerful Owl	<i>Ninox strenua</i>	V	-
White-throated Needletail	<i>Hirundapus caudacutus</i>	-	M
Rainbow Bee-eater	<i>Merops ornatus</i>	-	M
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V	-
Speckled Warbler	<i>Chthonicola sagittata</i>	V	-
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V	-
Painted Honeyeater	<i>Grantiella picta</i>	V	V
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V	-
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	V	-
Gilbert's Whistler	<i>Pachycephala inornata</i>	V	-
Rufous Fantail	<i>Rhipidura fuliginosa</i>	-	M
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	-	M
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V	-
Diamond Firetail	<i>Stagonopleura guttata</i>	V	-
Little Eagle	<i>Hieraaetus morphnoides</i>	V	-
Cattle Egret	<i>Ardea ibis</i>	-	M
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V	-
Little Lorikeet	<i>Glossopsitta pusilla</i>	V	-
White-fronted Chat	<i>Epthianura albifrons</i>	V	-
Scarlet Robin	<i>Petroica boodang</i>	V	-
Spotted Harrier	<i>Circus assimilis</i>	V	-
Masked Owl	<i>Tyto novaehollandiae</i>	V	-
Flame Robin	<i>Petroica phoenicea</i>	V	-
Koala	<i>Phascolarctos cinereus</i>	V	V
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-

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Common Name	Scientific Name	Conservation Status <sup>1</sup>	
		TSC Status	EPBC Status
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V	-
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V
Little Pied Bat	<i>Chalinolobus picatus</i>	V	-
Large Bent-winged -bat	<i>Miniopterus schreibersii oceanensis</i>	V	-
South-eastern Long-eared Bat (Greater Long-eared Bat)	<i>Nyctophilus corbeni</i> <i>(Nyctophilus timoriensis)</i>	V	V
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	V	-

Source: Moolarben Biota (2006); Ecovision (2008), EMM(2013 and ELA (2020).

V = vulnerable; M = migratory.

<sup>1</sup> Conservation status under the BC Act and the EPBC Act (current as at June 2020).

For the purpose of determining relevant management strategies, these species have been grouped as follows:

- Woodland birds.
- Owls.
- Arboreal mammals.
- Hollow dwelling bats.
- Cave dwelling bats.

No threatened fauna populations are present at the Moolarben Coal Complex.

### 3.4.3 Pest Fauna Species

Ecological assessments undertaken within the Moolarben Coal Complex have identified 13 pest species, including nine mammals and four birds as follows:

- Fox (*Vulpes vulpes*).
- Dog (*Canis familiaris*).
- Feral Cat (*Felis catus*).
- Rabbit (*Oryctolagus cuniculus*).
- Brown Hare (*Lepus capensis*).
- Pig (*Sus scrofa*).
- Goat (*Capra hircus*).
- Fallow Deer (*Dama dama*).
- House Mouse (*Mus musculus*).
- House Sparrow (*Passer domesticus*).
- Common Blackbird (*Turdus merula*).

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- Common Starling (*Sturnus vulgaris*).
- Spotted Dove (*Streptopelia chinensis*).

### 3.5 AQUATIC FAUNA

Most of the creeks and drainages in the Moolarben Coal Complex area are ephemeral or intermittent. Literature reviews and aquatic ecology studies undertaken at the Moolarben Coal Complex indicate that there are no threatened aquatic plants, fish or macroinvertebrate species or populations (as listed under EPBC Act or under the NSW *Fisheries Management Act 1994*) listed or found in the upper Goulburn River (Ecovision, 2008).

### 3.6 GROUNDWATER DEPENDENT ECOSYSTEMS

There are two types of Groundwater Dependent Ecosystem (GDEs): ecosystems that are dependent in whole or in part on water reserves held in the ground; and those dependent on the surface expression of groundwater (Eamus et al., 2006).

'The Drip', on the Goulburn River north of UG4, represents the only significant seep/spring GDE within the locality, with native vegetation reliant on this surface expression of water evident within the cliff line of 'The Drip'. No impacts from the Moolarben Coal Complex are expected on this GDE (Wells Environmental Services, 2006).

Other GDEs throughout the Moolarben Coal Complex include springs and groundwater seeps in creek valleys that support a variety of non-threatened plant species including sedges, Narrow-leaved Goodenia, Sundews and Bladderwort. A subset of other vegetation is also thought to be linked to local aquifers, and as such could be classified as a GDE. Similarly, evidence of shallow water tables (pools and soaks) along the Murragamba, Eastern and Wilpinjong creeks likely support riparian tree cover (Wells Environmental Services & Coffey Natural Systems, 2009).

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## 4.0 VEGETATION CLEARANCE PROTOCOL

A Vegetation Clearance Protocol (VCP) has been implemented to minimise impacts on threatened species during native vegetation clearing at the Moolarben Coal Complex. The VCP has been developed in consideration of the Roads and Traffic Authority (2011) guideline titled *Biodiversity Guidelines – Protecting and Managing Biodiversity on RTA Projects*. Key components of the VCP are outlined below.

A flow diagram showing a graphical representation of the VCP is provided on Figure 3.

### 4.1 DELINEATION OF AREAS TO BE CLEARED

Delineation of approved native vegetation clearing area will be achieved via a two-step process:

- Step 1 – the approved Moolarben Coal Complex disturbance boundary will be digitally captured and displayed within the site survey and GIS databases. This data will be made available either digitally or in map format to inform and guide mine planning, vegetation clearing, land preparation and mine rehabilitation activities.
- Step 2 – where native vegetation clearing at the Moolarben Coal Complex is to be carried out on a campaign basis, then prior to each clearing campaign the area to be cleared will be identified and marked out.

Digital and or map data will be provided to relevant site personnel and contractors to inform the required (campaign) clearing extents for pre-clearance survey, fauna management, habitat salvage, topsoil and weed and pest management.

### 4.2 PRE-CLEARING PROCEDURE

#### 4.2.1 Ground Disturbance Permit

MCO has implemented a Ground Disturbance Permit (GDP) process that must be completed prior to disturbance of topsoil and vegetation being carried out on site. The GDP provides an internal check against all relevant approvals and management actions that may be required to be obtained and/or implemented prior to carrying out the clearing or ground disturbance activities. A copy of the current GDP form is provided in Appendix B (note the internal GDP form may be amended from time to time as required).

The purpose of the GDP is to:

- clearly identify the area to be disturbed;
- identify any environmentally or culturally (or other) sensitive feature(s) (refer to Section 3 of the GDP – Appendix B) within or adjacent to the area to be disturbed;

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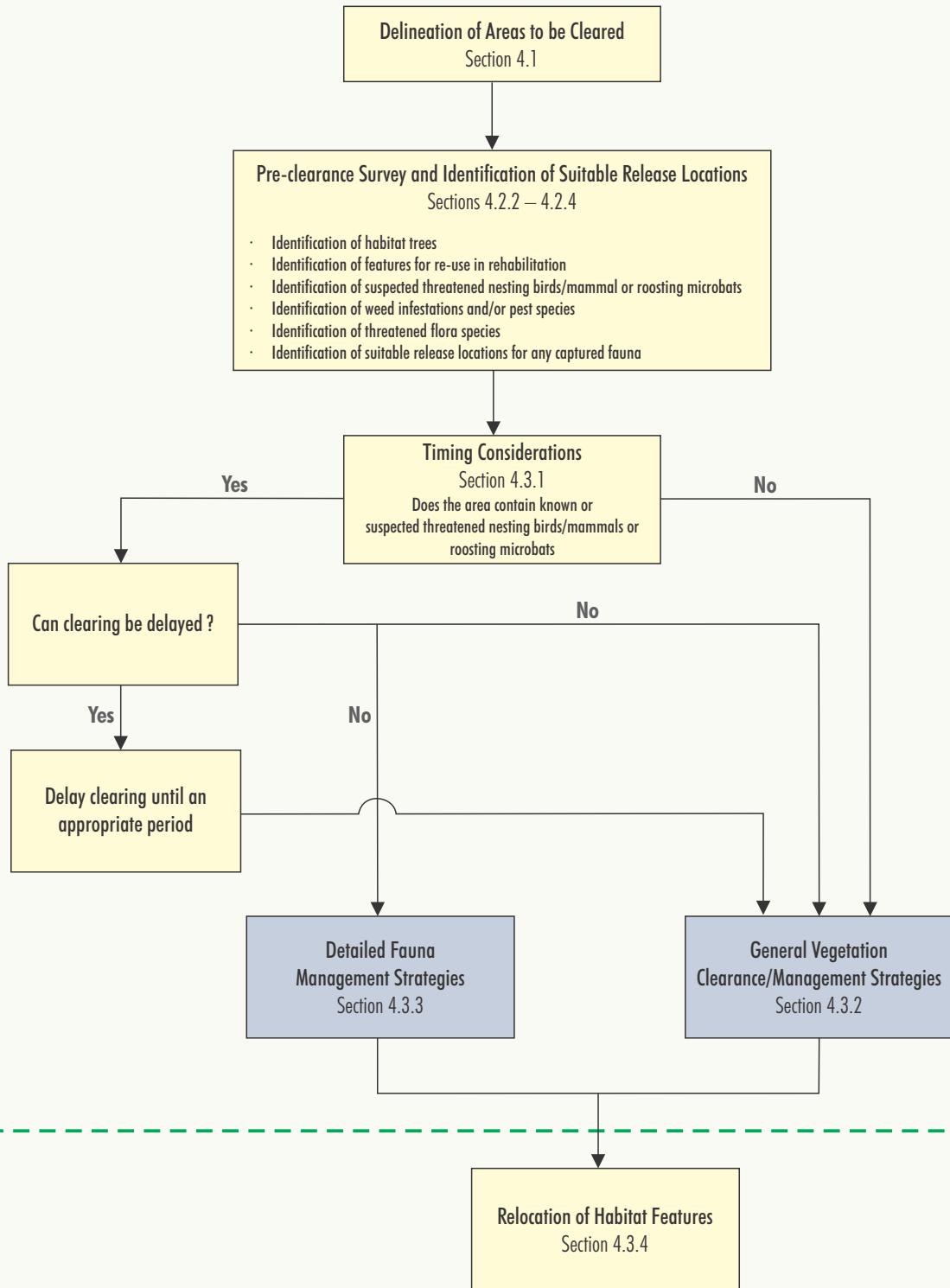
- initiate appropriate actions where special management measures may be required for those identified environmentally or culturally (or other) sensitive feature(s), such as pre-clearance surveys or fauna impact mitigation actions;
- check that all appropriate approvals and management actions are in place prior to carrying out the disturbance; and
- provide an auditable record of actions undertaken to allow disturbance to proceed.

A GDP will be completed by the relevant Project Manager and approved by the MCO Environment and Community Manager (or delegate) prior to any clearing activities (including for each clearing campaign) commencing at the Moolarben Coal Complex.

All contractors undertaking works at the Moolarben Coal Complex will be made aware of the GDP process through various mechanisms including site inductions and toolbox meetings.

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## GROUND DISTURBANCE PERMIT PROCESS



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MOOLARBEN COAL COMPLEX  
Vegetation Clearance Protocol

Figure 3

#### 4.2.2 Pre-clearance Survey

In conjunction with the GDP process and prior to native vegetation clearing at the Moolarben Coal Complex, a pre-clearance survey will be conducted by an appropriately trained and suitably qualified ecologist. The objective of the pre-clearance survey is to identify:

- potential habitat features located within proposed disturbance areas (such as hollows [e.g. habitat for threatened woodland birds, owls, arboreal mammals and bats]) that may require special management during clearing;
- habitat features (such as hollows [e.g. habitat for threatened woodland birds, owls, arboreal mammals and bats] and bushrock) that can be salvaged (where practicable) for reuse in rehabilitation areas or in adjoining non-disturbed native vegetation areas (Section 4.2.3);
- actively nesting threatened birds or mammals and/or suspected active microbat roosts that may require active management prior to or during disturbance to minimise impacts on threatened fauna species (e.g. woodland birds, owls, arboreal mammals and hollow dwelling bats);
- weed infestations that may need treatment prior to or during disturbance; and
- pest species that may require control prior to disturbance.

During the pre-clearance surveys targeted searches are undertaken for the threatened flora listed in Section 3.3.3 (e.g. Pine Donkey Orchid [*Diuris tricolor*]) within areas of potential habitat. Where practicable, the surveys will be undertaken in consideration of seasonality. However, mine planning may not always allow for delays to clearing works due to waiting for ideal survey timing.

#### 4.2.3 Habitat Features

Trees containing features with the potential to provide significant habitat (i.e. numerous suitable hollows) for nesting threatened birds or hollow dwelling bats and/or arboreal mammals (e.g. Squirrel Glider) will be clearly marked as habitat trees and retained for reuse wherever practicable.

Where practical and feasible, habitat features such as large hollows and bushrock identified during the pre-clearance surveys will be salvaged and stockpiled for reuse in rehabilitation areas or relocated to adjoining areas of remnant vegetation. Remaining tree limbs, stumps, shrubs and other woody vegetation may be mulched or used in whole or in part in rehabilitation areas.

Where practical and feasible, salvaged habitat features will be reused in native vegetation rehabilitation areas, as follows:

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- Stag trees – hollow bearing timber for vertical placement within rehabilitation for woodland birds, owls, arboreal mammals and hollow dwelling bats, and bark retained timber for microbats.
- Coarse rocky/woody debris – horizontal placement of hollow logs or small piles of timber and rocks creating cavities for habitat by small ground dwelling mammals and reptiles placed for inter-connectivity across rehabilitation areas.
- Habitat trees and non-habitat trees used generally as coarse woody debris.

#### 4.2.4 Identification of Suitable Release Locations

MCO has identified several potential release points/areas for captured fauna. These are shown on Figure 4 and include nearby biodiversity offsets that adjoin either the Goulburn River National Park or the Munghorn Gap Nature Reserve.

Particular areas/locations within the specified release areas (Figure 4) will be selected based on the outcomes of the pre-clearance survey.

### 4.3 CLEARING PROCEDURE AND MANAGEMENT STRATEGIES

A number of management strategies are available to MCO to minimise impacts of ground disturbance on fauna during clearing activities. Mine planning will consider the staging of clearing and scheduling of clearing works with consideration to impacts on threatened species (Section 4.3.1). The practicality of implementing each strategy is dependent on the characteristics of the habitat feature in question and will be determined by the Environment and Community Manager (or delegate) prior to or during clearing. The implementation of specific management actions will be determined on a case-by-case basis by the Environment and Community Manager (or delegate) with input from suitably qualified and/or experienced person(s) where necessary. Examples of possible management strategies to be considered are provided below.

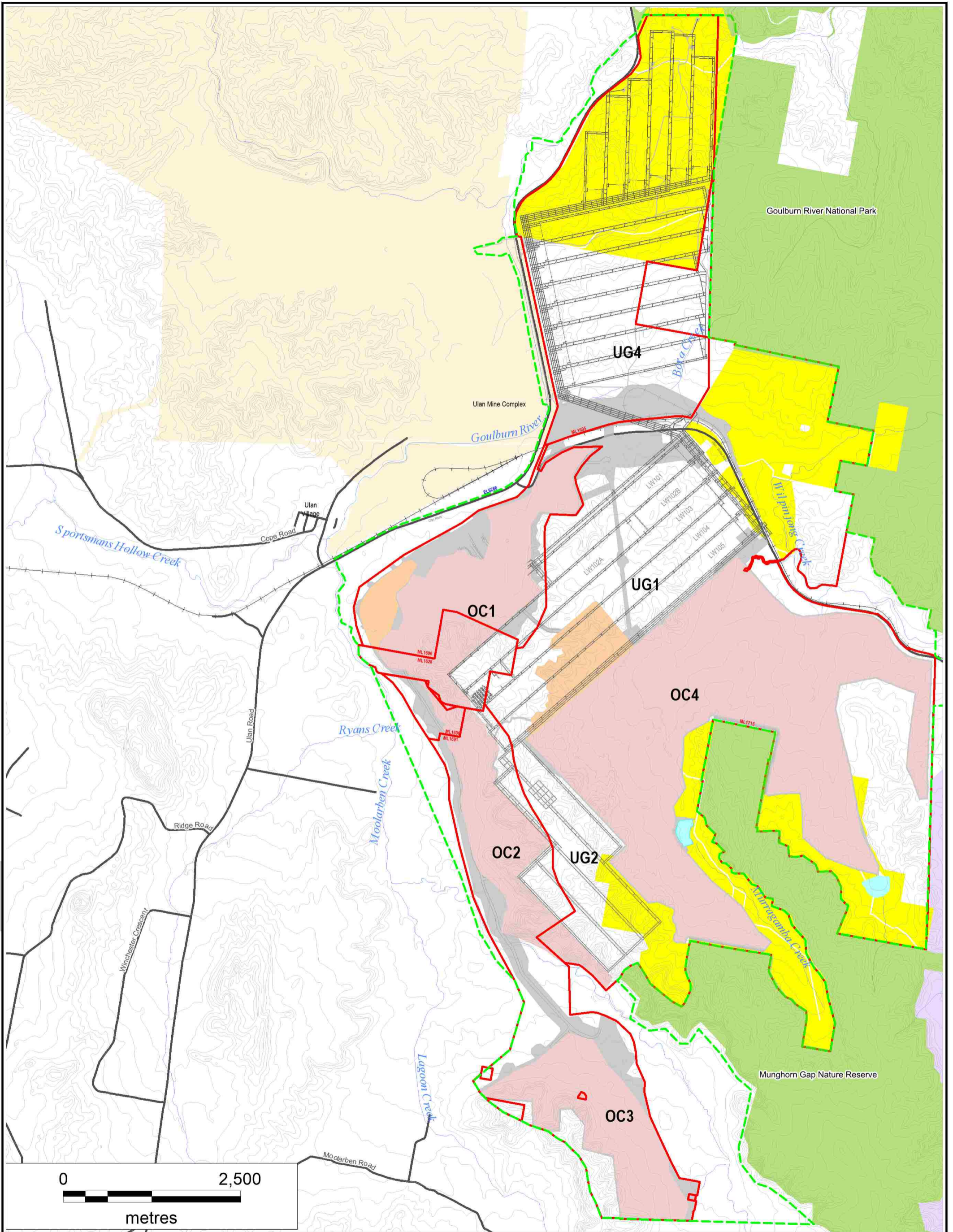
#### 4.3.1 Timing Considerations

The timing for clearing areas of vegetation will be determined by the Environment and Community Manager (or delegate) in consultation with mine planners and with input from a suitably qualified and/or experienced person(s). Timing will be determined on a case-by-case basis in consideration of:

- undertaking clearing on a progressive basis to minimise the active area of disturbance at any one time and to maximise direct placement of topsoil onto rehabilitation areas (where available);

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- Legend**
- Mining Lease Boundary
  - Consolidated Project Approval Boundary
  - Rail Line
  - Contour
  - Ulan Mine Complex
  - Wilpinjong Coal Mine

- Existing / Approved Development**
- Open Cut Mining Area
  - Underground Workings
  - Out of Pit Emplacement
  - Surface Infrastructure
  - Clean Water Diversion Dam

- Release Point / Area for Captured Fauna



**Figure 4**  
**Release Points / Areas for Captured Fauna**



- suitability of area to be cleared for roosting threatened microbats or nesting threatened birds/mammals (i.e. does it contain potential roosting or nesting habitat [at the time of proposed clearing] for relevant threatened woodland birds, owls, microbats and arboreal mammals);
- pre-clearance surveys identifying suspected roosting threatened microbats or nesting threatened birds/mammals;
- mine scheduling constraints that may not allow clearing to be delayed to avoid winter, spring and summer breeding/hibernating periods;
- outcomes of pre-clearance surveys and subsequent advice from appropriately qualified and/or experienced persons regarding development of appropriate management strategies for threatened flora and/or fauna relevant to the area to be cleared; and
- experience from past clearing campaigns (e.g. recent experience from contracted ecologists is that microbats are easier to locate, capture and relocate during cooler months, compared to warmer months when they are more active and fly away during clearing activities exposing themselves to predation).

If no threatened species are recorded or considered likely to be present (at the time of the proposed clearing), then clearing will be undertaken in accordance with the general strategies described in Section 4.3.2. If suspected roosting threatened microbats or nesting threatened birds/mammals are recorded or considered likely to be present (at the time of the proposed clearing) and clearing cannot be delayed, then the management described in Section 4.3.3 will be implemented (in addition to the strategies described in Section 4.3.2). In either case, the relocation of habitat features (described in Section 4.2.3) will be undertaken.

#### 4.3.2 General Vegetation Clearance/Management Strategies

In any area designated for clearing, non-habitat vegetation will be cleared first with identified habitat trees (i.e. containing numerous hollows suitable for nesting birds or roosting microbats) left standing to encourage the self-relocation of fauna that may be inhabiting the habitat tree. Where practical and feasible, habitat trees left standing will be shaken (under appropriate supervision) to encourage fauna (e.g. squirrel glider) to relocate.

Habitat trees in a particular area will not be felled for at least 24 hours following the felling of surrounding non-habitat trees. Felling of habitat trees will be carried out under the supervision of a person suitably qualified and/or experienced in fauna handling, with the appropriate licences, and once felled will be left undisturbed (other than ensuring the hollow opening is not blocked) for a further 24 hours to enable fauna to relocate.

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### 4.3.3 Detailed Fauna Management Strategies

Where threatened fauna is observed using a particular habitat feature during pre-clearance surveys (and where threat abatement is not possible) an attempt will be made to either promote self relocation (e.g. shaking a tree to encourage threatened birds, bats and mammals to move to an alternate tree) or capture and release the fauna species (e.g. in relation to bats and mammals) into a suitable proximal undisturbed area (Section 4.2.4).

Some examples of fauna management strategies that will be considered (as appropriate) are described below. All management strategies that involve handling of fauna will be carried out under the supervision of the Environment and Community Manager (or delegate) by an appropriately qualified and/or experienced person(s) (who is also licensed) using accepted techniques and subject to safety considerations.

#### *Nesting Birds*

The following strategies will be employed in relation to habitat trees with confirmed nesting threatened birds:

- If the nest is active, the fledglings will be collected (where safe to do so) and cared for by a wildlife carer for subsequent release; or
- if the nest is inactive (i.e. no young):
  - the tree will be cleared within two weeks following the confirmation that the nest is inactive; or
  - the tree will be re-inspected immediately prior to clearing; or
  - the nest will be removed from the tree to minimise the chance of the nest becoming active prior to clearance.

#### *Arboreal Mammals*

The following strategies will be employed in relation to habitat trees with confirmed nesting threatened arboreal mammals:

- Habitat trees with confirmed or suspected nesting threatened mammals will be managed by:
  - shaking the tree with machinery prior to clearing to encourage arboreal mammals to move to an alternative site;
  - soft pushing the tree to the ground with the objective of causing minimal impact to the roost;
  - inspecting the felled tree to confirm whether for mammals have exited the tree and relocate where appropriate; and
  - leaving the felled tree overnight to allow any remaining mammals time to exit.

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### *Hibernating, Roosting and/or Breeding Microbats*

The following strategies will be employed in relation to habitat trees with suspected or confirmed hibernating, roosting and/or nesting threatened microbats:

- Habitat trees with suspected or confirmed bat roosts will be managed by:
  - shaking the tree with machinery prior to clearing to encourage bats to move to an alternative site;
  - soft pushing the tree to the ground with the objective of causing minimal impact to the roost;
  - preferentially positioning the tree on the ground so the entrance to the hollow faces upwards (i.e. so bats are able to exit);
  - inspecting the felled tree to confirm whether bats have exited the tree; and
  - leaving the felled tree overnight to allow any remaining bats time to exit.
- If a bat roost containing a maternity colony (young bats) or hibernating microbats is found during inspection of the felled tree, the following will be undertaken:
  - If the roost is located in a portion of the tree that is not able to be relocated, the bat fauna will be collected and temporarily stored in a cool location for release at night.
  - If the roost is located in a portion of the tree able to be relocated:
    - The cavity opening will be temporarily blocked with a piece of cloth.
    - The section of the tree will be removed.
    - Adults and young captured leaving the roost will be placed within the roost.
    - The ends of the extracted tree section and cavity openings will be temporarily blocked during transportation.
    - Collected roost and bat fauna will be temporarily stored in a cool location.
    - Prior to dusk the roost will be positioned within an appropriate release location above the ground with a freefall of approximately 1-3 m.
    - The roost to be checked the following morning for success of adult retrieval of young.
    - In the case of unsuccessful adult retrieval of young then the juvenile bats will be assessed by a veterinarian or experienced wildlife carer.

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#### 4.3.4 Relocation of Habitat Features

Some threatened species are known to utilise a network of nests/roosts, rather than being fixed to one nest/roost. Hence there is potential to relocate known nests/roosts to proximal suitable habitat in non-disturbance areas (e.g. active rehabilitation areas or an appropriate release location [Section 4.2.4]) when the nest/roost is unoccupied by the threatened species. Where it is practical to relocate nests/roosts then this will be carried out under the supervision of the Environment and Community Manager (or delegate) by an appropriately qualified and/or experienced person(s) (who is also licensed) using accepted techniques.

#### 4.4 ANCILLARY INFRASTRUCTURE

Where clearing is required for approved ancillary infrastructure (e.g. access tracks, water management structures, installation of monitoring equipment, etc.), the procedures described in Sections 4.1 to 4.3 will be applied. In addition, where threatened flora or habitat trees (Section 4.2.3) are present, the design and implementation of the ancillary works will consider:

- avoidance (i.e. if the location of the works is flexible);
- delaying works until the habitat tree is no longer in use (e.g. fledglings have left the nest or are old enough to be cared for by a wildlife carer); and
- implementing fauna management strategies (Section 4.3) if avoidance and/or delaying are not practicable.

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## 5.0 COLLECTION AND USE OF LOCALLY SOURCED NATIVE SEEDS AND SUPPLEMENTARY TUBESTOCK PLANTING

### 5.1 NATIVE VEGETATION SEEDING

As described in the Rehabilitation Management Plan, the rehabilitation of disturbed areas will be based on the use of local provenance seed, where practical and feasible. Various techniques exist for seeding and planting of rehabilitation areas and have been investigated during the early years of rehabilitation at the Moolarben Coal Complex, with the best techniques being carried through for ongoing use. Consideration is given to site conditions, including soil type and condition, landform, time of year, climate, water availability and vegetation community establishment outcomes and also the best methods of rehabilitation application. Rehabilitation at the Moolarben Coal Complex is described in detail in the Rehabilitation Management Plan.

Species selected for use in rehabilitation and native revegetation areas are based on existing native vegetation types within proximal areas and the final rehabilitation and land use objectives for the Moolarben Coal Complex. Native seed used in these areas is primarily of local provenance including seed collected on site and in surrounding areas, where feasible.

Seed collection and propagation activities are undertaken in accordance with the requirements of the Florabank Guidelines (2000), with additional consideration of (*inter alia*):

- Progressive collection of native seed to augment revegetation resources.
- Strategically timed and cost effective seed collection – a seed collection calendar.
- Collection of fruit directly from the plant into collection bags for transfer to drying rooms.
- Maintenance of a seed inventory which records the amount of seed collected, species type and treatment and propagation specifications.
- Gaining consent of the land owner and/or manager where seed is required to be collected on land not owned or managed by MCO.

To avoid the spread of weeds and exotic species, seed collection will only be carried out for native species. The seedbank will be supplemented by commercially available material from endemic native species.

Harvested seeds not used in direct sowing or production of tubestock will be stored for future use on rehabilitation areas. Storage and management of seed stocks will be done according to best practice so as to maintain seed viability. This may include:

- Storage of seed in paper or calico bag.

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- Labelling of seed collection and storage bags with relevant details (e.g. species and collection and storage dates).
- Maintenance of a seed inventory which will record the amount of seed collected, species type and treatment and propagation specifications.

Native vegetation seed will be sown simultaneously with pasture species when appropriate, preferably in the warmer months between late September and March. Sowing will occur as soon as possible after seedbed preparation to optimise the conditions for germination prior to surface crust development.

Native vegetation establishment relies on initial establishment of local pioneer species to condition the soil for successive plant regeneration. These include wattles and grass species known to occupy disturbed environments throughout the local area.

## 5.2 TUBESTOCK PLANTING

Native vegetation establishment in rehabilitation and native revegetation areas may be supplemented with tubestock, where required (note native vegetation seeding and tubestock planting is confined to rehabilitation areas and non-mine disturbed degraded areas with a native vegetation end use objective). Where practical and feasible, tubestock will be propagated in a local nursery from locally sourced seed. Tubestock planting will generally be undertaken in spring and autumn when weather conditions are optimised for vegetation establishment, however opportunistic rehabilitation and assisted native regeneration will be undertaken in summer and winter months if areas become available and prevailing weather conditions are favourable. Only frost tolerant species are planted in winter to avoid frost damage to newly planted tubestock.

Species selection will be designed to promote the development of forest and woodland with structured understorey, mid-storey and tree canopy coverage. This will increase overall biodiversity values and promote survival of these vegetation types in the post-mining landscape. In order to enhance vegetation connectivity, species of the target vegetation communities will be seeded and planted adjacent or close to similar vegetation communities where possible.

Further detail on tubestock planting is provided in the Rehabilitation Management Plan.

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## 6.0 STRATEGIES TO MANAGE VEGETATION ONSITE AND IMPROVE VEGETATION CONNECTIVITY

MCO has implemented the following strategy to improve connectivity between existing conservation reserves and large areas of remnant native vegetation within and surrounding the Moolarben Coal Complex, including enhancing connectivity between the MGNR, GRNP and MCO's existing Dexter Mountain biodiversity offset:

- As far as practicably possible, biodiversity offset areas have been selected adjacent to existing conservation areas or large tracts of existing proximal native vegetation.
- Offset areas will be managed to conserve (for existing good quality vegetated areas) or enhance (for degraded native vegetation areas) native vegetation and biodiversity outcomes.
- Areas of native vegetation cleared for mining purposes will be rehabilitated with native vegetation species that existed prior to clearing to enhance native vegetation cover post-mining.
- MCO owned land not required for mining purposes, ongoing agricultural purposes (i.e. farm land operated under an ongoing agricultural lease arrangement), or post-mining agricultural outcomes will be managed to maintain (for existing vegetated areas) or improve (for degraded native vegetation areas) the extent of native vegetation and fauna habitat in the landscape.

Native vegetation rehabilitation and regeneration areas will target a mosaic of Box Gum Woodland, Sedimentary Ironbark Forest and Grassy Woodland communities. Box Gum Woodland associations will be targeted at species consistent with *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.

Notwithstanding the constraints on MCO owned land used to maintain agricultural productivity (as required under state approvals and/or contractual lease arrangements), MCO will investigate opportunities on its land holdings to further enhance native vegetation connectivity (extent and quality) across the landscape. This may include:

- Fencing and exclusion of stock from larger vegetation remnants on its land leased to agricultural users (note in some cases stock may not be able to be excluded due to the need/use of vegetation patches as shade for stock, etc.).
- Revegetation of areas not required for agricultural purposes with local native species characteristic of the surrounding area and supplementary tube stock planting (if necessary).
- Fencing and exclusion of stock along strategic and/or degraded sections of Moolarben and Wilpinjong creeks (on land under MCO control).

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- Riparian corridor enhancement along fenced off areas of Moolarben and Wilpinjong creeks (on land under MCO control).
- Habitat augmentation in vegetation remnant and revegetation areas.
- Creation of new areas/patches of trees in consultation with leasees in areas not critical to their agricultural enterprises.
- Earthworks to restore effective drainage;
- Ripping of compacted areas;
- Application of soil ameliorants to improve soil condition and plant regeneration potential;
- Weed and pest control on vegetation remnants and revegetation areas.
- Fire management of vegetation patches.

Note that a number of the above investigative actions (where considered practical and feasible to implement) would need to be undertaken in consultation with and the agreement of the lessee.

The implementation of these measures would lead to improved connectivity between the MGNR and GRNP and proximal areas of intact native vegetation (such as Dexter Mountain) by improving or creating “stepping stones” and refuges for mobile fauna such as birds and mammals.

In addition to the above, vegetation management zones have been developed for areas within the Stage 1 and Stage 2 Project Boundaries that are outside of approved major surface disturbance areas (i.e. those surface works shown on Figure 2)<sup>1</sup>, biodiversity offset areas, Aboriginal heritage management areas and areas outside the control of MCO (e.g. Dronvisa Quarry, UCML land or tenements, linear infrastructure and other easements, crown land and land leased for agricultural purposes). These onsite vegetation management zones are shown on Figure 5 and are based on existing vegetation and habitat condition, and final land use objectives.

Various activities associated with the Moolarben Coal Complex are approved to occur within these zones (e.g. ancillary infrastructure, Section 4.4) however the precise location of these works is not known. Therefore the management zone mapping is to be used as a guide to assist management planning/implementation and not as a boundary of disturbance versus no disturbance.

A description of the management strategy to be applied to each zone is provided below. Further detailed description of management actions is provided in Section 7. Associated monitoring for these

<sup>1</sup> Management Zone 3 (Land Subject to Agricultural License) includes land within the approved major surface disturbance area (i.e. OC3) as this land is subject to an agricultural license prior to surface works commencing in this area. Once surface disturbance has occurred in this area the Rehabilitation Management Plan will guide management rather than this document.

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measures is described in Section 8 and a table outlining management measures, monitoring, management targets and potential corrective actions is provided in Section 10.

### **Vegetation Management Zone 1 – Forest/Woodland**

The primary management objective of this zone is to maintain vegetation structure and species diversity. Management actions to be implemented in this zone include:

- Control of stock and grazing to promote understorey recovery and reduce competition for food with native fauna species. (Note controlled/crash grazing may be required for weed control or hazard reduction purposes).
- Management of human access and disturbance including installation of fencing, gates and signage (where required) to prevent unauthorised entry/use.
- Stabilising and remediating eroding areas (where required).
- Retaining dead timber (i.e. prevent fire wood collection).
- Targeted control of noxious and environmental weeds (where required).
- Targeted control of feral animals including foxes, rabbits, goats, wild dogs and pigs.

Further detail on specific management actions is provided in Section 7. Associated monitoring for these measures is described in Section 8 and a table outlining management measures, monitoring, management targets and potential corrective actions is provided in Section 10.

### **Management Zone 2 – Grassland/Regenerating Woodland**

Management Zone 2 requires implementation of management actions to enable natural or assisted regeneration of previously cleared woodland in areas to improve native species richness and structural diversity (albeit excluding areas to be retained for future agricultural production). Management actions to be implemented in this zone include:

- Control of stock and grazing to promote understorey recovery and reduce competition for food with native fauna species. (Note use of controlled/crash grazing may be required for weed control or hazard reduction purposes).
- Weed control.
- Vertebrate Pest control (i.e. targeted control of foxes, rabbits, goats, feral cats, wild dogs and pigs).
- Access control (to prevent unauthorised entry/use).
- Direct seeding and revegetation with tube stock planting to assist regeneration where required.

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Seeding and revegetation of these areas will be undertaken generally according to the measures described in Section 5 and the Moolarben Coal Complex Rehabilitation Management Plan.

Further detail on specific management actions is provided in Section 7. Associated monitoring for these measures is described in Section 8 and a table outlining management measures, monitoring, management targets and potential corrective actions is provided in Section 10.

### **Management Zone 3 – Land Subject to Agricultural License**

Management Zone 3 includes land that has an existing license(s) for the ongoing use of the land for agricultural purposes. This land is therefore managed in accordance with the conditions of the existing license(s). Notwithstanding, MCO periodically will review the licenses and relevant conditions with the aim of ensuring consistency between the management of remnant vegetation within this zone and Zones 1 and 2.

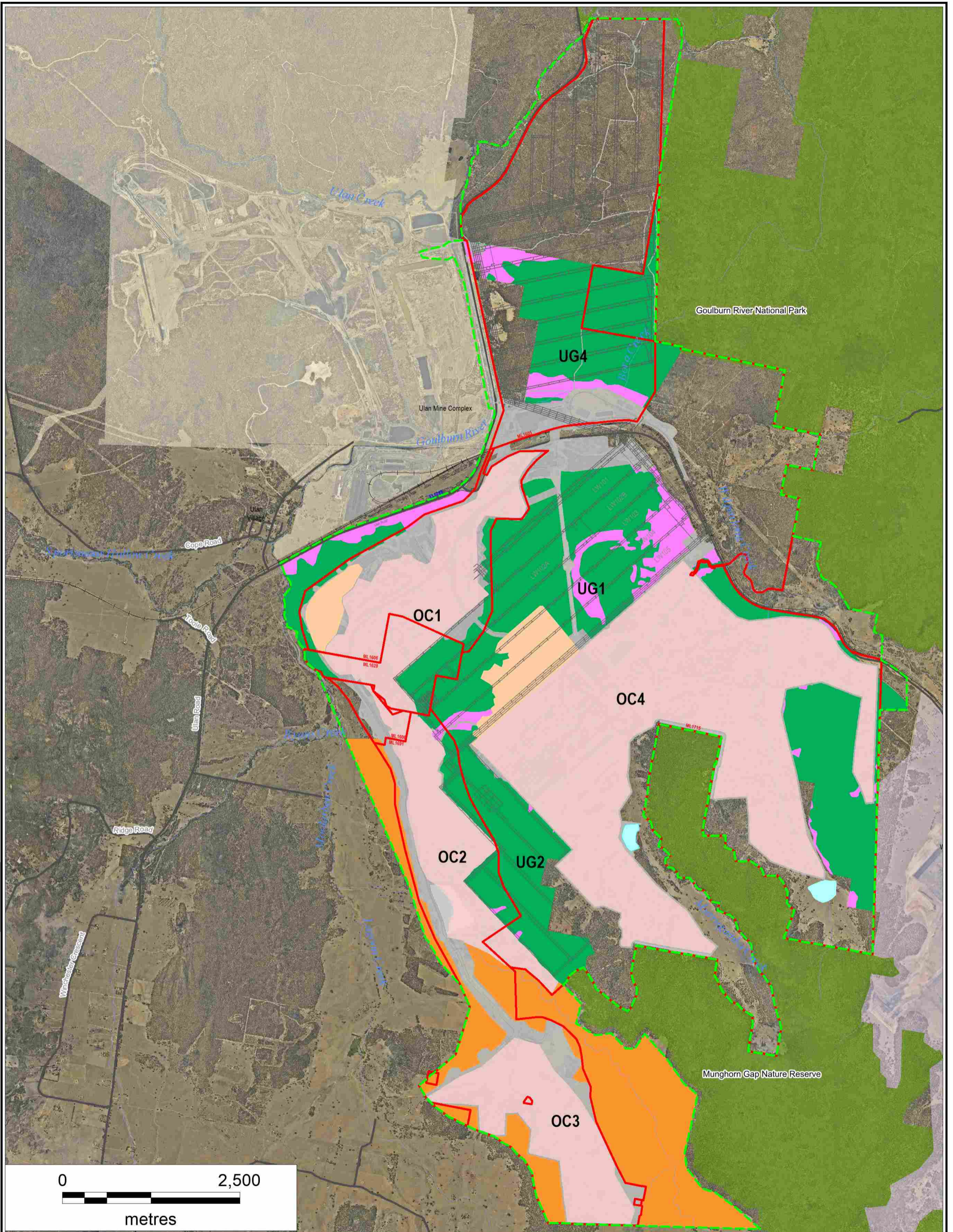
As described in Section 7.6, grazing and agricultural practices will be undertaken so as to not overstock the property, having regard to seasonal conditions, with reasonable measures put in place where appropriate to prevent environmental damage (e.g. soil erosion).



















Any grazing or agricultural activities will be undertaken on existing suitably cleared farming land, and will not involve the additional clearing of remnant native vegetation.

Further detail on specific management actions is provided in Section 7. Associated monitoring for these measures is described in Section 8 and a table outlining management measures, monitoring, management targets and potential corrective actions is provided in Section 10.

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<b>Legend</b>		<b>Existing / Approved Development</b>	<b>Vegetation Management Zones</b>	  兖州煤业澳大利亚有限公司 MOOLARBEN COAL	
	Mining Lease Boundary				Zone 1
	Consolidated Project Approval Boundary				Zone 2
	Rail Line				Zone 3
	Ulan Mine Complex				
	Wilpinjong Coal Mine				
					
					
					

**Figure 5**  
**Indicative Onsite Vegetation Management Zones**



## 7.0 ADDITIONAL BIODIVERSITY MANAGEMENT MEASURES

This section describes the management measures that will be implemented across the Moolarben Coal Complex. Included in this section are measures specific to the vegetation management zones described in Section 6. Relevant to these measures, Section 8 describes the required monitoring and a table outlining management measures, monitoring, management targets and potential corrective actions is provided in Section 10.

### 7.1 REHABILITATION OF ENVIRONMENTAL BUNDS

MCO has established environmental bunds on the western side of OC1 and OC2. The OC1 environmental bund and has been rehabilitated with Box Gum Woodland and Sedimentary Ironbark Forest species and the OC2 environmental bund has been rehabilitated with sterile non-invasive cover crop or pasture species, consistent with the rehabilitation objectives for these landforms/domains.

The ongoing rehabilitation and/or monitoring of the environmental bunds will be incorporated into the rehabilitation programme for the Moolarben Coal Complex. A detailed description of the rehabilitation objectives and procedures, including relevant performance and completion criteria, for the environmental bunds is provided in the Moolarben Coal Complex Rehabilitation Management Plan.

### 7.2 MANAGEMENT OF SALINITY

Soils at the Moolarben Coal Complex are generally non-saline, however there is some occurrence of saline discharge from soils within OC3 and OC4, with tests showing low to moderate salinity levels (Wells Environmental Services, 2006; Wells Environmental Services & Coffey Natural Systems, 2009).

The Moolarben Coal Complex Rehabilitation Management Plan describes the selective stockpiling of soils according to type and salinity, and appropriate species selection for rehabilitation purposes (e.g. use of salt tolerant species where applicable).

Erosion and sediment control will be conducted in accordance with the Moolarben Coal Complex Water Management Plan.

Potential salinity impacts on biodiversity at the Moolarben Coal Complex will be managed by retaining vegetation outside of the disturbance areas where practicable and revegetation of drainage lines.

Some land within OC1 forms part of the Salinity Offset Management Plan area operated by Ulan Coal Mine in conjunction with the Bobadeen Irrigation Scheme under Environment Protection Licence 394. MCO will comply with its Statement of Commitments under the Project Approval (05\_0117) in the event that the Moolarben Coal Complex reduces the capacity for the removal of salt.

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## 7.3 WEED AND PEST ANIMAL CONTROL

### 7.3.1 Weed Control

A weed control program will be implemented to limit the spread and colonisation of both noxious and environmental weeds at the Moolarben Coal Complex. The weed control program relevant to vegetation management zones 1, 2 and 3 (Section 6) will consist of:

- completion of visual baseline survey and GIS mapping of weed extent;
- identification of (as part of visual baseline survey) weed species present within mapped extent;
- annual inspections of MCO owned lands to identify areas requiring the implementation of weed management measures;
- consultation with neighbouring land owners and relevant government stakeholders regarding regional weed management strategies;
- implementation of appropriate weed management measures which may include mechanical removal, application of approved herbicides and biological control;
- control of noxious weeds identified on MCO owned land in accordance with the relevant NSW Department of Primary Industries control category and the relevant regional weed management plan;
- annual inspections and maintenance of topsoil stockpiles;
- identification of weed infestations adjacent to or within the proposed disturbance area during preclearance surveys;
- follow-up inspections to assess the effectiveness of the weed management measures implemented and the requirement for any additional management measures; and
- minimising the potential for establishment of new weeds by minimising the transport of weed species (e.g. limiting vehicle access and minimising stock access).

Introduced plants have the potential to out-compete native species, to alter habitat and affect land use (agricultural or recreational). Under the NSW *Noxious Weeds Act 1993*, MCO has a statutory responsibility to prevent the spread of noxious weeds. Further, there are also a number of weed species (particularly introduced perennial grasses) which are not listed under the *Noxious Weeds Act 1993* but are a significant concern in regard to the long-term viability of the Box Gum Woodland EEC and have been listed as a Key Threatening Process (OEH, 2015). The consideration of these species will be incorporated into any weed management and control program.

All weed control will be completed in consideration of the NSW *Pesticides Act 1999*.

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### 7.3.2 Pest Animal Control

Pest animal control will be undertaken in consultation with the Hunter Local Land Services (in accordance with the requirements of the NSW *Local Land Services Act 2013*) and surrounding landowners as required. Activities undertaken at the Moolarben Coal Complex may include (but not necessarily limited to):

- A focus on those species which are known to impact the native flora and fauna. Key target species will include feral cat, wild dog, feral pig, feral goat, wild rabbit, red fox, fallow deer and feral birds (particularly the Noisy Miner [invasive native species]).
- Monitoring the activity of feral animals at the Moolarben Coal Complex using a range of measures including opportunistic sightings, track counts on sand-pads and motion sensor cameras. This will be incorporated in the flora and fauna monitoring programs undertaken annually in autumn.
- Using a range of appropriate pest control measures to minimise collateral damage to native animals (e.g. the destruction of rabbit burrows, feral cat and goat trapping and baiting of foxes and wild dogs, goats and pigs).
- Follow-up inspections to assess the effectiveness of control measures implemented and the requirement for any additional control measures. This will be incorporated in the flora and fauna monitoring programs undertaken in autumn.

## 7.4 SURFACE WATER MANAGEMENT AND EROSION CONTROL

Erosion and migration of sediment from disturbance areas into adjacent vegetation has the potential to facilitate weed invasion through the introduction of weed seeds and nutrients that favour weed species. This potential impact will be avoided through the implementation of appropriate erosion and sediment control measures that will be prescribed in the Moolarben Coal Complex Water Management Plan.

The Moolarben Coal Complex Water Management Plan (and/or the Moolarben Coal Complex Rehabilitation Management Plan) will include measures such as:

- stabilisation of areas of bare soil by re-vegetating as soon as practicable with appropriate stabilising vegetation including local native plants where appropriate; and
- control of sediment by installation of erosion fences (or other appropriate measure) around construction works where necessary, prior to commencement of any earthworks to avoid potentially nutrient and seed rich run-off entering neighbouring areas of vegetation.

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## 7.5 TOPSOIL MANAGEMENT

Topsoil stripping and stockpiling or direct re-spreading of the soil resource will be undertaken in a progressive manner following the mine sequence. Details on the management of topsoil are provided in the Moolarben Coal Complex Rehabilitation Management Plan.

Where practicable, the following management practices will be implemented to improve the available soil resource for use in rehabilitation:

- Soil types will be blended to improve the overall quality and quantity of the existing soil resource.
- Vehicular traffic on soils to be stripped and on soils sensitive to structural degradation will be minimised.
- Loaders and trucks will be preferentially used wherever practicable during stripping to minimise structural degradation of the soil.
- Soil stockpiles will be kept as low as possible with large surface area where practicable.
- Soil stockpiles will be managed to reduce weed growth.
- Long-term soil stockpiles will be located outside of mine disturbance areas.
- Long-term soil stockpiles will be ripped, harrowed and revegetated with grass species.
- Soil stockpiles will be assessed for weeds, scalped or removed if necessary and then ripped prior to reinstatement.
- Application of appropriate (type and quantity) soil amendments and fertilisers (e.g., sodic and dispersive soils will be treated with gypsum or lime, as required, where they are to be used on exposed surface areas).

The application of these measures will assist preservation and improve overall soil health, reduce soil loss and weed growth and ultimately assist in re-establishing native vegetation on rehabilitation areas.

## 7.6 MANAGEMENT OF GRAZING AND AGRICULTURE

Livestock will be excluded from active operational mining areas, remnant vegetation areas within vegetation management zones 1 and 2, biodiversity offset and Aboriginal heritage management areas, unless controlled/crash grazing is required for hazard reduction or weed management purposes.

Grazing, cultivation and routine agricultural management activities may be undertaken on MCO owned land by MCO or other parties with prior approval from MCO (e.g. under licence). Grazing and agricultural practices will be undertaken so as to not overstock the property, having regard to seasonal

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conditions, with reasonable measures put in place where appropriate to prevent environmental damage (e.g. soil erosion).

Any grazing or agricultural activities will be undertaken on existing suitably cleared farming land, and will not involve the additional clearing of remnant native vegetation.

## 7.7 ACCESS RESTRICTIONS

Vehicles can strike native fauna causing injury or death. Vehicle access to the mine site will be limited to authorised personnel only. Consistent with MCO policy, speed limits will be imposed on all vehicles using the mine roads and tracks.

Further, damage by vehicles can result in the compaction of soil (which can reduce the infiltration of water into the soil and restrict root growth, and consequently reduce natural regeneration), the spread of weeds and disturbance to vegetation. In order to reduce the degree of disturbance to the rehabilitation areas, measures will be put in place to limit access to these areas by authorised personnel only. Measures will include installation of signage denoting authorised access only and access security on all gates (e.g. locks).

## 7.8 BUSHFIRE MANAGEMENT

The aim of fire management from a biodiversity perspective is to manage fire in a manner that prevents loss or degradation of biodiversity over time. Use of fire as hazard reduction or ecological management tool will be guided by the following principles:

- Identification of minimum and maximum inter-fire periods to provide species and communities with an adequate inter-fire period to regenerate and to not compromise biodiversity through removing the regenerative stimulus provided by fire. For the remnant native vegetation communities at the Moolarben Coal Complex, a decline in ecosystem function is expected if successive fires occur less than 8 years apart. Further, decline in ecosystem function is predicted if no fire occurs for more than 40 years (DECC, 2008). Therefore, a regime which varies fire timing within these thresholds across the communities' distribution is desirable.
- Identification of habitat and communities requiring exclusion of fire.
- Maintenance of a diversity of fire regimes through a pattern of 'mosaic burning' where only a small proportion of any vegetation community and/or remnant area is subject to the same fire regime.
- Varying the inter-fire period within the minimum and maximum thresholds at any given point so that individual species are neither advantaged nor disadvantaged by a homogenous fire regime.

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- Consideration of the precautionary principle to prescribed burning which may include undertaking studies into the effects of fire on species and communities
- Completion of an annual assessment of fire breaks to minimise the frequency and extent of unplanned fires.
- Monitoring changes in species composition and habitat elements post-burning is essential so that fire regimes are maintaining or improving remnant quality, rather than contributing to further degradation.

MCO will also comply with any reasonable request from the NSW National Parks and Wildlife for access/fire management relating to the GRNP and/or MGNR.

### 7.8.1 Identification of Ignition Sources

Bushfire ignition sources include natural occurrences such as lightning strikes, while other occurrences include sparks from powerlines and human ignition sources. Possible on-site ignition sources also include sparks and fire from machinery, fuel storage areas, and hot work practices (welding, etc.).

Fire bans, as determined by the Rural Fire Service, will be adhered to by all personnel and will be enforced by MCO. Potential ignition sources such as those resulting from hot work practices including welding and cutting will be restricted where possible to workshop areas or within active parts of the mine where vegetation is non-existent. If this is not possible due to the remoteness of the location all due care and caution will be employed to minimise the potential for fire ignition, including requiring appropriate fire control equipment to be on hand.

### 7.8.2 Control Measures

MCO maintains water carts with fire fighting equipment capable of extinguishing fire outbreaks. This fire fighting equipment, together with graders and bulldozers used for mining, provides effective bushfire fighting capability. In addition, responsiveness is enhanced by emergency preparedness training for mine-site personnel.

Firebreaks where required will be established around the Moolarben Coal Complex to prevent the spread of bushfires onto or from adjacent properties. These firebreaks will be inspected annually for adequacy.

Where the creation and maintenance of proposed firebreaks has the potential to interact with Aboriginal heritage sites or archaeologically sensitive areas these activities will be undertaken in accordance with the Moolarben Coal Complex Heritage Management Plan. Any incident of unplanned bushfire will be reported directly to the Site Supervisor who will initiate an emergency response. If required, the Cooks Gap Rural Fire Service will be notified.

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### 7.8.3 Preventative Measures

A number of mechanical methods may be used to achieve a reduction in fuel levels. Such methods include mowing, slashing, ploughing and manual removal. In addition, crash grazing by livestock can reduce fuel loads. The requirement for fuel reduction measures will be assessed annually.

A network of roads surrounding and traversing the operations will be maintained to allow access for fire fighting trucks, so that all areas of the Moolarben Coal Complex may be accessed.

Ready access will be maintained for vehicles to engage in water extraction at dams on site or at defined water fill points. Outlets should be compatible with fire fighting equipment.

MCO has committed to working with the neighbouring mines and the Cooks Gap Rural Fire Service to periodically review and improve bushfire management plans for the local region.

### 7.8.4 Monitoring

A bushfire management inspection will be undertaken annually of vegetated areas. Inspections will be undertaken prior to the bushfire season and appropriate actions taken, as necessary, to provide for fuel levels to be maintained at a minimum.

MCO will liaise with the Cooks Gap Rural Fire Service as required, so that both parties are aware of fires in and adjoining the area of the Moolarben Coal Complex. All fires identified on or near the Moolarben Coal Complex will be immediately reported to the Environment and Community Manager and the General Manager. Fire weather conditions will be monitored regularly by MCO.

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## 8.0 BIODIVERSITY MONITORING PROGRAM

The objective of biodiversity monitoring is to evaluate the vegetation and fauna habitat condition at the Moolarben Coal Complex (including recovery and or enhancement of native vegetation) and to identify appropriate management actions to be applied, where required. Note that monitoring of mine rehabilitation areas is described in the Rehabilitation Management Plan. Biodiversity monitoring relating to the vegetation management zones includes noxious and environmental weed monitoring and vertebrate pest monitoring. This monitoring will be used to measure success against the short, medium and long term targets described in Section 10 (Table 4) and also the need for corrective actions (also described in Section 10 [Table 4]).

The biodiversity monitoring program will be updated in a subsequent revision of this plan to include monitoring against the biodiversity offset area performance measures and completion criteria following finalisation of biodiversity offset strategy (Section 1.2).

### 8.1 MONITORING OF NOXIOUS AND ENVIRONMENTAL WEEDS

Monitoring of noxious and environmental weeds will be undertaken across the Moolarben Coal Complex, as described in Section 7.3.1, and would include:

- Baseline assessment as described in Section 7.3.1.
- Visual follow-up inspections for weeds undertaken annually in spring to assess the effectiveness of the weed management measures implemented and the requirement for any additional management measures.
- Visual inspections for weeds on the topsoil stockpiles.
- Identification of weed infestations adjacent to or within the proposed disturbance area during preclearance surveys.

Monitoring for noxious and environmental weeds will also be undertaken opportunistically and will inform weed management measures.

### 8.2 MONITORING OF VERTEBRATE PESTS

As described in Section 7.3.2, monitoring of the activity of feral animals at the Moolarben Coal Complex will be undertaken using a range of measures including opportunistic sightings, track counts on sandpads and motion sensor cameras (where appropriate). This will be incorporated in the flora and fauna monitoring programs undertaken annually in autumn.

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### 8.3 MONITORING OF ACCESS

Monitoring of fencing (including gates and locks) and signage would be undertaken annually as well as opportunistically. Maintenance would be undertaken as required.

### 8.4 MONITORING OF REHABILITATION

Monitoring of rehabilitation areas at the Moolarben Coal Complex will be undertaken and is described in the Moolarben Coal Complex Rehabilitation Management Plan.

### 8.5 MONITORING OF POTENTIAL SUBSIDENCE IMPACTS

Monitoring of potential subsidence impacts on native vegetation will be undertaken to determine compliance against the performance measure described in Section 10. As described in Section 10, details of the monitoring program will be included in relevant Extraction Plans (or subsequent staged revisions of this plan), including how the performance measures will be met. The monitoring program will include the collection of detailed baseline data to measure potential subsidence impacts against.

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## 9.0 BIODIVERSITY OFFSET STRATEGY

The Moolarben Coal Complex Biodiversity Offset Strategy will be incorporated in a subsequent revision of this BioMP (Section 1.2).

The Biodiversity Offset Strategy will describe the measures that will be implemented to minimise the biodiversity impacts of the Moolarben Coal Complex and to manage remnant vegetation and habitat in offset areas in the short, medium and long-term. The strategy will also include detailed performance and completion criteria for evaluating the performance of these measures and triggering any remedial action (where necessary).

The Biodiversity Offset Strategy will also include a program to monitor and report on the effectiveness of these measures, monitor progress against the detailed performance and completion criteria and will identify the potential risks to the successful implementation of the biodiversity offset strategy (including a description of the contingency measures that will be implemented to mitigate against these risks).

The objectives of the strategy and management measures include:

- enhancing the quality of existing vegetation and fauna habitat;
- restoring native vegetation and fauna habitat on the biodiversity offset areas through natural regeneration, targeted vegetation establishment (i.e. through direct seeding and/or tube stock planting) and where available/practicable the introduction of naturally scarce fauna habitat features (where necessary);
- utilising salvaged resources from within the approved disturbance area (including vegetative, soil resources) for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area (where practicable);
- managing any potential conflicts between the proposed restoration works in the biodiversity areas and any Aboriginal heritage values (both cultural and archaeological);
- managing salinity;
- controlling weeds and feral pests;
- controlling erosion;
- managing grazing and agriculture on site;
- controlling access; and
- bushfire management.

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MCO will ensure that the Biodiversity Offset Strategy provides suitable habitat for all the threatened fauna species confirmed and identified as being potentially present in the disturbance areas.

MCO will incorporate management measures to ensure that the regeneration of vegetation within the offset areas is focused on the re-establishment of flora species typical of the *White Box Yellow Box Blakely's Red Gum Woodland* as defined under the TSC Act and *White Box Yellow Box Blakely's Red Gum Grassy Woodland* as defined under the EPBC Act.

Further, MCO will work with the Department of Crown Lands to identify and implement reasonable and feasible regeneration of vegetation on Crown lands in the vicinity of Pyramul Creek immediately to the south of the 'Dun Dun East' biodiversity offset area.

MCO will make suitable arrangements to provide for the appropriate long term security of the offset areas.

The Biodiversity Offset Strategy would be prepared in accordance with the requirements described in Schedule 3 of the Project Approvals (05\_0117 and 08\_0135), and as presented in Appendices 8 and 7 of those Project Approvals respectively.

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## 10.0 PERFORMANCE MEASURES

Condition 3 of Schedule 5 of the Stage 1 Project Approval (05\_0117) and Condition 3 of Schedule 6 of the Stage 2 Project Approval (08\_0135) require all management plans to include relevant limits or performance measures/criteria and the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures.

Condition 36 of Schedule 3 of (05\_0117) and Condition 39 of Schedule 3 of (08\_0135) also require performance and completion criteria to be established for evaluating the performance of the biodiversity offset strategy and triggering remedial action where necessary. Performance and completion criteria for the biodiversity offset areas will be described in a subsequent revision of this plan following finalisation of the biodiversity offset strategy (Section 1.2).

Schedule 4 of the Stage 2 Project Approval (08\_0135) includes a specific subsidence impact performance measure for biodiversity. This performance measure is presented in Table 3 below.

**Table 3: Biodiversity Performance Measures**

Feature	Performance Measure
Threatened species, threatened populations, or endangered ecological communities	Negligible subsidence impacts or environmental consequences <sup>1</sup>

<sup>1</sup> Consistent with Stage 2 Project Approval (08\_0135).

Relevant Extraction Plans for underground mining operations or subsequent staged revisions of this plan will describe how the performance measure listed in Table 3 will be met.

In addition and separate to the performance measures and completion criteria for offset areas and subsidence, Table 4 presents a summary of the management measures described in Sections 6 and 7 and the associated short, medium and long term performance targets for each measure (as they relate to the three vegetation management zones described in Section 6). The monitoring described in Section 8 is also summarised in Table 4 and will be used to assess performance against the targets. Table 4 also provides potential corrective actions to be undertaken if the targets are not met.

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**Table 4: Management Actions and Performance Targets**

Management Aspect	Action	Short Term Target (Years 1-3)	Medium Term Target (Years 6-9)	Long Term Target (Complex Completion)	Potential Corrective Action
Environmental Bunds	In accordance with the measures detailed in the Moolarben Coal Complex Rehabilitation Management Plan.				
Salinity	In accordance with the measures detailed in the Moolarben Coal Complex Rehabilitation Management Plan and Water Management Plan.				
Weed Management	Baseline weed survey and mapping	Complete baseline weed survey and mapping in spring in Year 1 (Zones 1 and 2). Complete baseline weed survey and mapping of Zone 3 by Year 2 in spring. Review and revise mapping (as required) every 2 years (Zones 1 and 2).	Review and revise mapping (as required) every 2 years (Zones 1 and 2).	Weed surveys and mapping completed.	
	Develop targeted weed control program	Target weed control areas identified based on weed mapping (Zones 1 and 2). Appropriate weed control methods identified based on weed species present. Consider requirements of NSW <i>Pesticides Act, 1999</i> . Revise program based on results of annual follow-up inspections and/or revised mapping.	Revise program based on results of annual follow-up inspections and/or revised mapping.	Weed control program developed and implemented.	

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Management Aspect	Action	Short Term Target (Years 1-3)	Medium Term Target (Years 6-9)	Long Term Target (Complex Completion)	Potential Corrective Action
	Implement weed control	Weed control undertaken at appropriate time of year and with techniques suitable to weed species identified in baseline mapping and follow-up inspections (Zones 1 and 2).	Weed control undertaken at appropriate time of year and with techniques suitable to weed species identified in baseline mapping and follow-up inspections (Zones 1 and 2).  No recruitment of new weed species (Zones 1 and 2).  Decline in weed extent (Zones 1 and 2).  Weed species and extent stable or declining in Zone 3 (subject to agricultural licence conditions)	Appropriate weed control implemented.  No recruitment of new weed species (Zones 1 to 3).  Decline in weed extent (Zones 1 to 3).	Revise weed control program to increase frequency of control.  Revise weed control program to undertake additional targeted control for any weed species not responding to current controls.  Undertake additional consultation with agricultural licensees.
	Annual weed follow-up inspections	Annual weed follow-up inspections completed in spring.	Annual weed follow-up inspections completed in spring.		
	Agricultural licences review.	Review conditions relevant to weed control in Zone 3 agricultural licenses by Year 2. with aim to have consistent weed management/control.	Amend agricultural licenses during licence renewal to incorporate appropriate/consistent weed control.	Agricultural licence renewed to incorporate appropriate/consistent weed control.	Undertake additional consultation and licence review if required.
Pest Control	Baseline pest survey	Complete baseline pest survey in autumn in Year 1 (Zones 1 and 2).  Complete baseline pest survey and mapping of Zone 3 by Year 2 in autumn.	Baseline pest survey completed.	Baseline pest survey completed.	

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Management Aspect	Action	Short Term Target (Years 1-3)	Medium Term Target (Years 6-9)	Long Term Target (Complex Completion)	Potential Corrective Action
	Develop targeted pest control program	Appropriate pest control methods identified based on pest species present. Consider requirements of <i>Local Land Services Act, 2013</i> . Revise program based on results of annual follow-up inspections.	Revise program based on results of annual follow-up inspections.	Pest control program developed and implemented.	
	Implement pest control	Pest control undertaken at appropriate time of year and with techniques suitable to pest species identified in baseline survey and follow-up inspections (Zones 1 and 2). Consultation undertaken with agricultural licensees where appropriate.	Pest control undertaken at appropriate time of year and with techniques suitable to pest species identified in baseline survey and follow-up inspections. Decline in pest animal activity (Zones 1 and 2). Pest animal activity stable or declining in Zone 3 (subject to agricultural licence conditions).	Appropriate pest control implemented. Decline in pest animal activity (Zones 1 to 3).	Revise pest control program to increase frequency of control. Revise pest control program to undertake additional targeted control for any pest species not responding to current controls. Undertake additional consultation with agricultural licensees.
	Annual follow-up pest inspections	Annual autumn follow-up pest inspections.	Annual autumn follow-up pest inspections.		
	Agricultural licences review.	Review conditions relevant to pest control in Zone 3 agricultural licenses by Year 2 with aim to have consistent pest management/control.	Amend agricultural licenses during licence renewal to incorporate appropriate/consistent pest control.	Agricultural licence renewed to incorporate appropriate/consistent pest control.	Undertake additional consultation and licence review if required.
Surface Water Management and Erosion	In accordance with the measures detailed in the Moolarben Coal Complex Water Management Plan.				
Topsoil	In accordance with the measures detailed in the Moolarben Coal Complex Rehabilitation Management Plan.				

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Management Aspect	Action	Short Term Target (Years 1-3)	Medium Term Target (Years 6-9)	Long Term Target (Complex Completion)	Potential Corrective Action
Grazing and Agriculture	Stock management	Exclude stock from remnant vegetation areas and operational mining areas (Zones 1 and 2) (unless controlled/crash grazing is required for hazard reduction or weed management purposes). Maintain accurate stocking records.	Exclude stock from remnant vegetation areas and operational mining areas (Zones 1 and 2) (unless controlled/crash grazing is required for hazard reduction or weed management purposes). Maintain accurate stocking records.	Stock absent from remnant vegetation areas and operational mining areas (Zones 1 and 2) (unless controlled/crash grazing is required for hazard reduction or weed management purposes).	Remove stray stock as required.
	Agricultural licences review	Review conditions attached to agricultural licenses by Year 2 with aim to have appropriate grazing and agriculture management (i.e. no clearing of remnant vegetation, remediate soil erosion, no overstocking) to achieve long term targets (Zone 3).	Amend agricultural licenses during licence renewal to incorporate appropriate/consistent agriculture management measures.	Sustainable agricultural use of land retained for agriculture (Zone 3).	Additional consultation with neighbouring landowners regarding joint control programs. Augment agricultural license conditions as appropriate.
Access	Access restriction	Inspect and map fences, gates and internal access tracks, including, fences and tracks to be managed and redundant fences and tracks to be removed/remediated in year 1. Install signage and security (e.g. locks) where required by Year 2. Unauthorised access restricted (all zones).	Annual fencing and signage inspection completed and maintenance undertaken as required. Unauthorised access restricted (all zones). Remediation of redundant access tracks undertaken.	Access controlled by end land owner or manager (all zones).	Review site access protocols and security.

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Management Aspect	Action	Short Term Target (Years 1-3)	Medium Term Target (Years 6-9)	Long Term Target (Complex Completion)	Potential Corrective Action
Bushfire	Bushfire management	<p>Review existing Bushfire Management Plan and revise if necessary (all zones).</p> <p>Complete annual assessment of existing fire breaks (Zones 1 and 2) and implement recommendations.</p> <p>Comply with any reasonable request from NPWS for access/fire management relating to the GRNP and/or MGNR (all zones).</p> <p>Review conditions attached to agricultural licenses with aim to have appropriate management to achieve long term targets (Zone 3).</p>	<p>Complete annual assessment of existing fire breaks (Zones 1 and 2) and implement recommendations.</p> <p>Comply with any reasonable request from NPWS for access/fire management relating to the GRNP and/or MGNR (all zones).</p> <p>Review conditions attached to agricultural licenses with aim to have appropriate management to achieve long term targets (Zone 3).</p>	<p>Bushfire management undertaken in accordance with Bushfire Management Plan.</p> <p>Minimise the potential for long term loss or degradation of biodiversity from bushfire (all zones).</p>	<p>Additional consultation with neighbouring landowners and NPWS regarding joint control programs.</p>

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## 11.0 CONTINGENCY PLAN

In the event a performance measure detailed in Section 10 has not been met or is considered to have been exceeded, MCO will implement the following Contingency Plan:

- The Environment and Community Manager will report the exceedance to the General Manager within 24 hours of assessment completion.
- MCO will report the exceedance of the performance measure to the DPIE and DPIE-Biodiversity Conservation Division (BCD) as soon as practicable after MCO becomes aware of the exceedance.
- MCO will identify an appropriate course of action with respect to the identified impact(s), in consultation with specialists and relevant agencies, as necessary. For example, identification of proposed contingency measure(s) and a program to review the effectiveness of the contingency measures. Contingency measures will be developed in consideration of the specific circumstances of the exceedance and the assessment of environmental consequences.
- MCO will submit the proposed course of action to the DPIE for approval.
- MCO will implement the approved course of action to the satisfaction of the DPIE.
- MCO will report the exceedance of the performance measure and the success of the approved course of action as a component of the Annual Review (Section 13).

Examples of contingency measures/controls that relate to the subsidence performance measure listed in Section 10 include:

- Subsidence monitoring provides timely provision of data relating to impact of subsidence.
- Contingency budgetary allocation for remedial works associated with subsidence.
- Filling of minor cracks with appropriate material (e.g. soil or mulch) to avoid the creation of drainage channels.
- Re-grading of isolated depressions or highpoints and revegetation.
- Revegetation and monitoring.
- Additional monitoring.

As described in Section 10, relevant Extraction Plans for underground mining operations or subsequent revisions of this plan will describe in further detail how the subsidence related performance measure listed in Table 3 will be met.

Further contingency measures for offset areas will be described in a subsequent revision of this plan following approval of long-term security of biodiversity offset areas (Section 1.2).

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## 12.0 ROLES AND RESPONSIBILITIES

Table 5 summarises the key responsibilities of relevant Moolarben Coal Complex site personnel relating to the implementation of this BioMP.

**Table 5: BioMP Responsibilities**

Position	Responsibilities
General Manager	Take overall leadership and responsibility for compliance with all environmental approvals
	Provide adequate resourcing (personnel and financial) to enable full implementation of the BioMP
	Approve subsequent revisions of the BioMP
Environment and Community Manager	Report any land related incidents in accordance with legal requirements
	Identify land management risks and budget for sufficient resources to effectively manage those risks
	Effectively implement the Ground Disturbance Permit procedure
	Approve Ground Disturbance Permits
	Provide training to all employees and contractors in environmental awareness, legal responsibilities and land management methods
	Restrict access to rehabilitation areas
	Oversee communication of conditions of approval to relevant site personnel and contractors
	Oversee implementation of the BioMP
	Oversee all regulatory reporting in relation to the BioMP
	Coordinate relevant reviews of the BioMP
Environment and Community Coordinator(s)	Coordinate implementation of the BioMP
	Coordinate regulatory reporting in relation to the BioMP
	Coordinate progressive site rehabilitation as final landforms become available
	Check Ground Disturbance Permits are effectively completed by relevant site personnel or contractors and approved by the Environment and Community Manager prior to surface disturbance
	Evaluate results of monitoring programs and longer trends and where appropriate advise Environment and Community Manager of changes to management measures and controls
	Participate in site planning sessions so that adequate time is scheduled to implement pre-clearance surveys and vegetation clearance protocols
	Coordinate internal and external reporting on the performance of land management and rehabilitation
	Coordinate pre-clearance surveys
	Coordinate implementation of fauna impact mitigation actions
	Coordinate native seed collection
	Coordinate monitoring of rehabilitation and revegetation areas
	Coordinate weed and pest control for rehabilitation and revegetation areas (where required)
Project Manager	Delineate areas to be cleared/disturbed
	Complying with requirements of the Ground Disturbance Permit
	Implement vegetation clearance procedure
	Implement fauna habitat salvage strategies
	Implement topsoil management strategies

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## 13.0 ANNUAL REVIEW AND IMPROVEMENT OF THE BIODIVERSITY MANAGEMENT PLAN

### 13.1 ANNUAL REVIEW

In accordance with Condition 4, Schedule 5 and Condition 4, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively) MCO will conduct an Annual Review of MCO operations prior to 31 March each year.

This Annual Review will specifically address the following aspects of Condition 4, which directly relate to biodiversity:

- Include a comprehensive review of the monitoring results and complaints records of MCO operations over the previous calendar year, which includes a comparison of these results against the:
  - relevant statutory requirements, limits or performance measures/criteria;
  - monitoring results of previous years; and
  - relevant predictions in the EA.
- Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance.
- Identify any trends in the monitoring data over the life of the project.
- Identify any discrepancies between the predicted and actual impacts of MCO operations, and analyse the potential cause of any significant discrepancies.

The Annual Review will be made publicly available on the Moolarben Coal website in accordance with Condition 11, Schedule 5 and Condition 11, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively).

### 13.2 BIODIVERSITY MANAGEMENT PLAN REVIEW

In accordance with Condition 5, Schedule 5 and Condition 5, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively) this BioMP will be reviewed, and if necessary, revised to the satisfaction of the Secretary, within 3 months of the submission of:

- (a) An Annual Review in accordance with Condition 5, Schedule 5 and Condition 5, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively);
- (b) An incident report in accordance with Condition 7, Schedule 5 and Condition 7, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively);
- (c) An audit in accordance with Condition 9, Schedule 5 and Condition 9, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively); and
- (d) Any modification to the conditions of the Project Approvals.

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This BioMP will be made publically available on the Moolarben Coal website, in accordance with Condition 11, Schedule 5 and Condition 11, Schedule 6 of the Project Approvals (05\_0117 and 08\_0135, respectively).

## 14.0 REPORTING SYSTEMS

Biodiversity monitoring and management is reported as part of the Annual Review described in Section 13.1.

In accordance with Condition 3, Schedule 5 and Condition 3, Schedule 6 of the NSW Project Approvals (05\_0117 and 08\_0135, respectively), MCO has developed protocols for managing and reporting:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

These protocols are described in detail in the Environmental Management Strategy.

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## 15.0 REFERENCES

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<http://www.environment.nsw.gov.au/resources/protectedareas/0852npestplan.pdf>
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- EcoLogical Australia (ELA) (2015a) *MCO OC4 South West Modification – Flora and Fauna Impact Assessment*, prepared for Moolarben Coal Operations
- EcoLogical Australia (ELA) (2015b) *Moolarben Coal Complex – UG1 Optimisation Modification – Flora and Fauna Impact Assessment*, prepared for Moolarben Coal Operations.
- EcoLogical Australia (ELA) (2017) *Moolarben Coal Complex – Open Cut Optimisation Modification – Biodiversity Assessment Review and Biodiversity Offset Strategy*, prepared for Moolarben Coal Operations Pty Ltd.
- EcoLogical Australia (ELA) (2019), *Moolarben Coal Complex – UG4 Ancillary Works Modification - Biodiversity Development Assessment Report*, prepared for Moolarben Coal Operations Pty Ltd.
- Ecovision (2008) *Ecological Impact Assessment – Stage 2 of the Moolarben Coal Project*.
- EMGA Mitchell McLennan (EMM) (2013) *Ecological Assessment – Moolarben Coal Project Stage 1 Optimisation Modification*.
- Florabank (2000) *Flora Bank Guideline 1 - Native seed storage for revegetation*.  
*Florabank Guideline 2 - Basic methods for drying, extraction and cleaning native plant seed*.  
*Florabank Guideline 3 - Improving on basic native seed storage*.  
*Florabank Guideline 4 - Keeping records on native seed*.  
*Florabank Guideline 5 - Seed collection from woody plants for local revegetation* .  
*Florabank Guideline 6 - Native seed collection methods*.  
*Florabank Guideline 7 - Seed production areas for woody native plants*.  
*Florabank Guideline 8 - Basic germination and viability tests for native plant seed*.  
*Florabank Guideline 9 - Using native grass seed in revegetation*.  
*Florabank Guideline 10 - Seed collection ranges for revegetation*.
- Moolarben Biota (2006) *Moolarben Coal Project Flora, Fauna and Aquatic Ecology Assessment*.
- Moolarben Coal Operations Pty Ltd (2013) *Landscape Management Plan Stage 1*. Reviewed November 2013.
- Moolarben Coal Operations Pty Ltd (2015) *Moolarben Coal Complex UG1 Optimisation Modification Environmental Assessment*.
- Murphy and Lawrie (1998) *Soil Landscapes of the Dubbo 1:250,000 Sheet*.

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Office of Environment and Heritage (2015) *Key threatening processes*.

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Accessed: March 2015.

Roads and Traffic Authority (2011) guideline titled *Biodiversity Guidelines – Protecting and Managing Biodiversity on RTA Projects*

Wells Environmental Services (2006) *Moolarben Coal Project Environmental Assessment Report*.

Wells Environmental Services & Coffey Natural Systems (2009) *Moolarben Coal Project Stage 2 Environmental Assessment Report*. Moolarben Coal Mines Pty Ltd.

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## APPENDIX A: PROJECT APPROVAL RECONCILIATION

**Table A-1: Stage 1 Project Approval (05\_0117) Requirements**

NSW Project Approval Condition			BioMSection																																	
<p><b>Biodiversity Offset Strategy</b></p> <p>34. The Proponent shall implement the biodiversity offset strategy for the project summarised in Table 12, and shown conceptually in Appendix 8, to the satisfaction of the Secretary.</p> <p><b>Table 12: Summary of Biodiversity Offset Strategy</b></p> <table border="1"> <thead> <tr> <th>Area</th> <th>Offset Type</th> <th>Minimum Size Hectares</th> </tr> </thead> <tbody> <tr> <td>Area 3 Property 6</td> <td>Conserve: • 6 ha of existing EEC  Enhance and conserve: • 2.6 ha of regenerating EEC</td> <td>8.6</td> </tr> <tr> <td>Areas 1, 2 and 3 Properties 6, 10, 12, 13, 14 and 15</td> <td>Enhance existing vegetation: • 1282 ha of native vegetation  Revegetate: • 48 ha of existing disturbed land to EEC</td> <td>1330</td> </tr> <tr> <td>Area 1 Properties 12, 13, 14 and 15</td> <td>Revegetate: • 153 ha of cleared land to native vegetation</td> <td>153</td> </tr> <tr> <td>Clark</td> <td>Enhance existing vegetation: • 300 ha of existing native vegetation • 32 ha of EEC</td> <td>332</td> </tr> <tr> <td>Clifford</td> <td>Enhance existing vegetation: • 19 ha of native vegetation • 62 ha of EEC</td> <td>81</td> </tr> <tr> <td>Elward</td> <td>Enhance existing vegetation: • 146 ha of native vegetation • 24 ha of EEC</td> <td>170</td> </tr> <tr> <td>Property 5</td> <td>Enhance existing vegetation: • 40 ha of native vegetation • 25 ha of EEC</td> <td>65</td> </tr> <tr> <td>Properties 24 and 25</td> <td>Enhance existing vegetation: • 59 ha of native vegetation • 4 ha of EEC</td> <td>63</td> </tr> <tr> <td>Bobadeen</td> <td>Enhance existing vegetation: • 8 ha of native vegetation • 159 ha of EEC</td> <td>167</td> </tr> <tr> <td>Moolarmoo</td> <td>Enhance existing vegetation: • 25 ha of native vegetation • 19 ha of EEC</td> <td>44</td> </tr> </tbody> </table> <p>Note: The EEC referred to in this table is the White Box Yellow Box Blakely's Red Gum Woodland as defined under the BC Act and White Box Yellow Box Blakely's Red Gum Grassy Woodland as defined under the EPBC Act.</p>			Area	Offset Type	Minimum Size Hectares	Area 3 Property 6	Conserve: • 6 ha of existing EEC  Enhance and conserve: • 2.6 ha of regenerating EEC	8.6	Areas 1, 2 and 3 Properties 6, 10, 12, 13, 14 and 15	Enhance existing vegetation: • 1282 ha of native vegetation  Revegetate: • 48 ha of existing disturbed land to EEC	1330	Area 1 Properties 12, 13, 14 and 15	Revegetate: • 153 ha of cleared land to native vegetation	153	Clark	Enhance existing vegetation: • 300 ha of existing native vegetation • 32 ha of EEC	332	Clifford	Enhance existing vegetation: • 19 ha of native vegetation • 62 ha of EEC	81	Elward	Enhance existing vegetation: • 146 ha of native vegetation • 24 ha of EEC	170	Property 5	Enhance existing vegetation: • 40 ha of native vegetation • 25 ha of EEC	65	Properties 24 and 25	Enhance existing vegetation: • 59 ha of native vegetation • 4 ha of EEC	63	Bobadeen	Enhance existing vegetation: • 8 ha of native vegetation • 159 ha of EEC	167	Moolarmoo	Enhance existing vegetation: • 25 ha of native vegetation • 19 ha of EEC	44	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>
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<p><b>Supplementary Biodiversity Offset Strategy</b></p> <p>34A. The Proponent shall implement the supplementary biodiversity offset strategy for the project as summarised in Table 12A, and shown conceptually in Appendix 8A, to the satisfaction of the Secretary.</p>			<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>																																	

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NSW Project Approval Condition				BioMSection
<i>Table 12A. Summary of Supplementary Biodiversity Offset Strategy</i>				
<i>Gilgal property credit type</i>	<i>Credits required</i>	<i>Gilgal property credits (area)</i>	<i>Residual Credits</i>	
<b>Ecosystem Credits</b>				
PCT 281 <sup>1</sup> Rough-barked Apple – red gum – Yellow Box Woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	35	35 (5 ha)	-	
PCT 618 <sup>1</sup> White Box – Grey Box – red gum – Rough-barked Apple grassy woodland on rick soils on hills in the upper Hunter	73	0	73	
PCT 1606 White Box – Narrow-leaved Ironbark – Blakely’s Red Gum shrubby open forest of the central and upper Hunter	150	150 (14 ha)	-	
PCT 1660 <sup>2</sup> Narrow-leaved Ironbark heathy woodland on sandstone ranges of the Sydney Basin and Brigalow Belt South	411	411 (53 ha)	-	
PCT 479 <sup>3</sup> Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	204	204 (22.5 ha)	-	
PCT 1176 <sup>4</sup> Slaty Box - Grey Gum shrubby woodland on footslopes of the upper Hunter Valley, Sydney Basin Bioregion	233	233 (27 ha)	-	
PCT 1696 Blakely's Red Gum - Rough-barked Apple shrubby woodland of central and upper Hunter	331	0	331	
<b>Total</b>	<b>1,437</b>	<b>1,033 (121.5 ha)</b>	<b>404</b>	
<b>Species Credits</b>				
Regent Honeyeater	1,568	1,568 (221 ha)	-	
Koala	77	64 (9 ha)	13	
Brush-tailed Rock Wallaby	693	693 (98 ha)	-	
<p><sup>1</sup> Listed as or meets the criteria for <i>White Box-Yellow Box-Blakely’s Red Gum Woodland EEC</i> under the BC Act and <i>White Box-Yellow Box-Blakely’s Red Gum Grassy Woodland and Derived Native Grassland CEEC</i> under the EPBC Act.</p> <p><sup>2</sup> Under the FBA offsetting option rules PCT 1660 can be used to offset impacts on PCT 1629 <i>Narrow-leaved Stringybark – Grey Gum shrubby open forest on sandstone ridges of the Sydney Basin.</i></p> <p><sup>3</sup> Under the FBA offsetting option rules PCT 479 can be used to offset impacts on PCT 1661 <i>Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin.</i></p> <p><sup>4</sup> Under the FBA offsetting option rules PCT 1176 can be used to offset impacts on PCT 1669 <i>Red Ironbark - Grey Gum - Narrow-leaved Stringybark - Brown Bloodwood shrubby open forest on sandstone ranges of the Sydney Basin.</i></p> <p><i>Note: The credits in Table 12A have been calculated in accordance with Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and may need to be converted to reasonably equivalent ‘biodiversity credits’, within the meaning of the BC Act, if the credits are to be retired in accordance with the Biodiversity Offsets Scheme of the BC Act.</i></p>				

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NSW Project Approval Condition	BioMSection																								
<p><b>Long Term Security Offset</b></p> <p>35. By the end of June 2015, unless otherwise agreed by the Secretary, the Proponent shall make suitable arrangements to provide appropriate long-term security for the offset areas in Table 12 in perpetuity, in consultation with BCD and to the satisfaction of the Secretary.</p> <p><i>Note: The preferred mechanisms for the provision of long-term conservation security are via Biobanking Arrangements and additions to the BCD Estate.</i></p>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)																								
<p>35A. By 30 September 2021, the Proponent shall make an application to secure the credits associated with the areas of the Gilgal property identified in Table 12A under a Biodiversity Stewardship Agreement, unless otherwise agreed by the Secretary.</p>	To be completed in accordance with Condition 35A timeframes																								
<p>35E. Within two years of the determination of Modification 15, unless otherwise agreed by the Secretary, the Proponent must retire the biodiversity credits specified in Table 12B below in accordance with the Biodiversity Offsets Scheme of the BC Act.</p> <p><i>Table 12B Summary of Supplementary Biodiversity Offset Strategy (MOD 15)</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Biodiversity Credit Type</th> <th style="text-align: center;">Credits required<sup>2</sup></th> </tr> </thead> <tbody> <tr> <td colspan="2"><b>Ecosystem Credits</b></td> </tr> <tr> <td>PCT 281<sup>1</sup> Rough-barked Apple – red gum – Yellow Box Woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.</td> <td style="text-align: center;">42</td> </tr> <tr> <td>PCT 479<sup>3</sup> Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion</td> <td style="text-align: center;">59</td> </tr> <tr> <td>PCT 1711 <i>Tantoon – Lepryodia leptocaulis</i> on shrubland on sandstone drainage lines of the Sydney Basin</td> <td style="text-align: center;">10</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: center;"><b>111</b></td> </tr> <tr> <td colspan="2"><b>Species Credits</b></td> </tr> <tr> <td>Gang-gang Cockatoo</td> <td style="text-align: center;">9</td> </tr> <tr> <td>Glossy-black Cockatoo</td> <td style="text-align: center;">9</td> </tr> <tr> <td>Large-eared Pied Bat</td> <td style="text-align: center;">135</td> </tr> <tr> <td>Eastern Cave Bat</td> <td style="text-align: center;">135</td> </tr> <tr> <td><i>Tylophora linearis</i></td> <td style="text-align: center;">26</td> </tr> </tbody> </table> <p><sup>1</sup> Portions of this community are listed as or meets the criteria for White Box-Yellow Box-Blakely's Red Gum Woodland EEC under the BC Act and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act.</p> <p><sup>2</sup> The credits listed in Table 12B have been calculated in accordance with the Biodiversity Assessment Method (as at 1 October 2019).</p>	Biodiversity Credit Type	Credits required <sup>2</sup>	<b>Ecosystem Credits</b>		PCT 281 <sup>1</sup> Rough-barked Apple – red gum – Yellow Box Woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	42	PCT 479 <sup>3</sup> Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	59	PCT 1711 <i>Tantoon – Lepryodia leptocaulis</i> on shrubland on sandstone drainage lines of the Sydney Basin	10	<b>Total</b>	<b>111</b>	<b>Species Credits</b>		Gang-gang Cockatoo	9	Glossy-black Cockatoo	9	Large-eared Pied Bat	135	Eastern Cave Bat	135	<i>Tylophora linearis</i>	26	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
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PCT 281 <sup>1</sup> Rough-barked Apple – red gum – Yellow Box Woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	42																								
PCT 479 <sup>3</sup> Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	59																								
PCT 1711 <i>Tantoon – Lepryodia leptocaulis</i> on shrubland on sandstone drainage lines of the Sydney Basin	10																								
<b>Total</b>	<b>111</b>																								
<b>Species Credits</b>																									
Gang-gang Cockatoo	9																								
Glossy-black Cockatoo	9																								
Large-eared Pied Bat	135																								
Eastern Cave Bat	135																								
<i>Tylophora linearis</i>	26																								
<p>35F. Within two years of the determination of Modification 15, unless otherwise agreed with the Secretary, the Proponent must retire ecosystem credits equivalent to the 3.25 ha area of surface disturbance activities approved under Modification 15 located within Offset Area 2 and include at least:</p> <p>(a) 0.75 hectares of PCT 281 - Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion<sup>1</sup>; and</p> <p>(b) 2.5 hectares of PCT 479 - Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion.</p>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)																								

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<p><i>The retirement of ecosystem credits must be carried out in accordance with the Biodiversity Offsets Scheme of the BC Act.</i></p> <p><i>Note 1: Portions of this community is listed as or meets the criteria for White Box-Yellow Box-Blakely's Red Gum Woodland EEC under the BC Act and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act.</i></p>	
<p><b>Biodiversity Management Plan</b></p> <p>36. <i>The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:</i></p>	
<p>(a) <i>be prepared in consultation with BCD and be submitted to the Secretary for approval by 31 March 2015;</i></p>	Section 1.4
<p>(b) <i>describe the short, medium, and long term measures that would be implemented to:</i></p> <ul style="list-style-type: none"> <li>• <i>manage the remnant vegetation and habitat on the site and in the offset areas;</i></li> </ul>	Sections 1.2, 4, 5, 6, 7, 8 and 9
<ul style="list-style-type: none"> <li>• <i>minimise biodiversity impacts of the project; and</i></li> </ul>	Sections 4, 5, 6 and 7
<ul style="list-style-type: none"> <li>• <i>implement the biodiversity offset strategy described in Table 12, including detailed performance and completion criteria;</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<p>(c) <i>include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy described in Table 12, and triggering remedial action (if necessary);</i></p>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<p>(d) <i>include a detailed description of the measures that would be implemented for:</i></p> <ul style="list-style-type: none"> <li>• <i>enhancing the quality of existing vegetation and fauna habitat;</i></li> </ul>	Sections 4, 5, 6 and 7
<ul style="list-style-type: none"> <li>• <i>restoring native vegetation and fauna habitat on the biodiversity offset areas through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary);</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>• <i>maximising the salvage of resources within the approved disturbance area - including vegetative, soil and cultural heritage resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area;</i></li> </ul>	Sections 4.2.3 and 7.5
<ul style="list-style-type: none"> <li>• <i>rehabilitating the environmental bunds on site as soon as practicable and maintaining the landscaping on the bunds once it has been established;</i></li> </ul>	Section 7.1
<ul style="list-style-type: none"> <li>• <i>collecting and propagating seed;</i></li> </ul>	Section 5
<ul style="list-style-type: none"> <li>• <i>minimising the impacts on fauna on site, including undertaking pre-clearance surveys;</i></li> </ul>	Sections 4.2 and 4.3
<ul style="list-style-type: none"> <li>• <i>managing any potential conflicts between the proposed restoration works in the biodiversity areas and any Aboriginal heritage values (both cultural and archaeological);</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>• <i>managing salinity;</i></li> </ul>	Section 7.2
<ul style="list-style-type: none"> <li>• <i>avoid and mitigate the spread of <i>Phytophthora cinnamomi</i> (<i>P.cinnamomi</i>) with consideration of actions identified in the relevant abatement plan;</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>• <i>controlling weeds and feral pests;</i></li> </ul>	Section 7.3
<ul style="list-style-type: none"> <li>• <i>controlling erosion;</i></li> </ul>	Sections 7.4 and 7.5
<ul style="list-style-type: none"> <li>• <i>managing grazing and agriculture on site;</i></li> </ul>	Section 7.6
<ul style="list-style-type: none"> <li>• <i>controlling access; and</i></li> </ul>	Section 7.7

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NSW Project Approval Condition	BioMSection
<ul style="list-style-type: none"> <li><i>bushfire management;</i></li> </ul>	Section 7.8
(e) <i>include a seasonally-based program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;</i>	Sections 1.2, 8 and 9
(f) <i>identify the potential risks to the successful implementation of the biodiversity offset strategy described in Table 12, and include a description of the contingency measures that would be implemented to mitigate against these risks; and</i>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
(g) <i>include details of who would be responsible for monitoring, reviewing, and implementing the plan</i>	Section 12
<p><b>Conservation Bond</b></p> <p>37. <i>By 30 June 2015, unless otherwise agreed by the Secretary, the Proponent shall lodge a Conservation Bond with the Department to ensure that the biodiversity offset strategy described in Table 12 is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan. The sum of the bond shall be determined by:</i></p> <ul style="list-style-type: none"> <li><i>(a) calculating the full cost of implementing the biodiversity offset strategy described in Table 12 (other than land acquisition costs); and</i></li> <li><i>(b) employing a suitably qualified quantity surveyor to verify the calculated costs, to the satisfaction of the Secretary.</i></li> </ul> <p><i>If the offset strategy described in Table 12 is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Secretary, the Secretary will release the bond.</i></p> <p><i>If the offset strategy described in Table 12 is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Secretary will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.</i></p> <p>Notes:</p> <ul style="list-style-type: none"> <li><i>Existing bonds which have been paid for the Redhills, Area 1, Area 2 and Area 3 biodiversity offset areas remain current and are satisfactory to fulfill the requirements of this condition for those areas;</i></li> <li><i>Alternative funding arrangements for long-term management of the Biodiversity Offset Strategy, such as provision of capital and management funding as agreed by BCD as part of a Biobanking Agreement or transfer to conservation reserve estate can be used to reduce the liability of the conservation and biodiversity bond, and</i></li> <li><i>The sum of the bond may be reviewed in conjunction with any revision to the biodiversity offset strategy.</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<p><b>Appendix 3 – Statement of Commitments</b></p> <p><b>(12) Ecology</b></p> <p><i>Moolarben will enter into such arrangements as may be required by the Secretary to provide for ecological offsets as proposed in the Environmental Assessment, Preferred Project Report, subsequent modification applications and as may be required by any conditions of project approval for the Moolarben Coal Project.</i></p>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<p><b>Appendix 3 – Statement of Commitments</b></p> <p><b>Biodiversity</b></p> <ul style="list-style-type: none"> <li><i>Where possible, construction works in areas of known and potential threatened woodland species habitat will be avoided during their breeding cycle.</i></li> </ul>	Section 4.3.1
<ul style="list-style-type: none"> <li><i>Pre-clearing fauna surveys will be undertaken prior to ground clearing disturbance.</i></li> </ul>	Sections 4.2, 4.3 and 4.4
<ul style="list-style-type: none"> <li><i>One of two hollow bearing trees within the rail loop alignment will be retained (where possible).</i></li> </ul>	Section 4.2.3

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<ul style="list-style-type: none"> <li>• <i>Tree hollows and other habitat features will be salvaged for use as compensatory habitat, in rehabilitation areas.</i></li> </ul>	Section 4.2.3
<ul style="list-style-type: none"> <li>• <i>The cleared area along the mining lease boundary will be rehabilitated and revegetated to enable cleared EEC to re-establish.</i></li> </ul>	Refer to Rehabilitation Management Plan
<ul style="list-style-type: none"> <li>• <i>Disturbed areas not required for ongoing access and maintenance will be rehabilitated. Endemic species will be used to supplement natural vegetation regeneration, where required.</i></li> </ul>	Sections 5 and 6
<ul style="list-style-type: none"> <li>• <i>Groundcover will be maintained to minimise the risk of soil erosion, wherever practicable. Feral animals, weeds and pests will be controlled.</i></li> </ul>	Sections 7.4 and 7.5
<ul style="list-style-type: none"> <li>• MCO further commits to: <ul style="list-style-type: none"> <li>- <i>Undertake a detailed flora and fauna inventory and mapping of the vegetation types and threatened species for properties proposed to offset the clearing impacts of the Open Cut 1 and Open Cut 2 extension areas.</i></li> <li>- <i>Manage offset and rehabilitation areas in accordance with a Rehabilitation and Offset Management Plan (ROMP or equivalent plan) to improve biodiversity outcomes.</i></li> <li>- <i>Provide adequate funds to implement the management measures described in the ROMP.</i></li> <li>- <i>Implement the management actions specific to each property and report annually on the implementation of the plan to relevant stakeholders.</i></li> <li>- <i>Arrange for the independent review of the adequacy and implementation of the ROMP every three years.</i></li> <li>- <i>Provide long-term security of offset areas through an appropriate mechanism (such as a conservation covenant) agreed to with relevant stakeholders.</i></li> <li>- <i>Provide an alternative secure offset property of at least equivalent biodiversity value where long-term security of a nominated offset property is not achievable.</i></li> <li>- <i>Investigate potential roosting sites for bat activity on properties proposed to offset the impacts of Open Cut 1 and Open Cut 2 extension areas.</i></li> <li>- <i>Investigate use of artificial roosting sites for microbat habitat augmentation where offset areas are determined not to have sufficient roosting habitat.</i></li> </ul> </li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>- <i>Carry out targeted spring surveys for Diuris Tricolor in potential habitat areas within Open Cut 1 and Open Cut 2 extension areas. Where Diuris Tricolor plants are identified in disturbance areas, these will be translocated to suitable offset property habitat areas consistent with the monitoring and reporting requirements of the Australian Network for Plant Conservation translocation guidelines (ANPC, 2004).</i></li> </ul>	Section 3.3.3
<ul style="list-style-type: none"> <li>- <i>Review land use history of Derived Native Grassland offset areas (including, where possible, cultivation, fertiliser application, soil nutrient levels and ground cover species) to inform appropriate management and performance and completion criteria. Where monitoring indicates these areas are not recovering as expected within the first five years of management alternative management measures will be investigated.</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>- <i>Maintain existing third party access arrangements on offset properties, where required.</i></li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>- <i>Progressive rehabilitation of disturbed areas and re-use of habitat features (e.g. hollow logs, rocks) in rehabilitation areas to minimise the habitat resource competition in adjoining conservation reserves.</i></li> </ul>	Section 4.2.3

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**Table A-2: Stage 2 Project Approval (08\_0135) Requirements**

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<p><b>Biodiversity Offset Strategy</b></p> <p>30. The Proponent shall implement the biodiversity offset strategy for the project summarised in Table 15 and shown conceptually in Appendix 7 to the satisfaction of the Secretary.</p> <p><b>Table 15: Summary of the Biodiversity Offset Strategy</b></p> <table border="1"> <thead> <tr> <th>Area</th> <th>Offset Type</th> <th>Minimum Size hectares (ha)</th> </tr> </thead> <tbody> <tr> <td>Dun Dun East</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>1368 ha of native vegetation</li> <li>408 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>380 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>1776</b></td> </tr> <tr> <td>Dun Dun West</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>837 ha of native vegetation</li> <li>122 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>307 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>959</b></td> </tr> <tr> <td>Avisford 1</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>300 ha of native vegetation</li> <li>102 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>7 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>402</b></td> </tr> <tr> <td>Avisford 2</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>203 ha of native vegetation</li> <li>5 ha of EEC</li> </ul> </td> <td style="text-align: center;"><b>208</b></td> </tr> <tr> <td>Ulan 18</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>291 ha of native vegetation</li> <li>48 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>178 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>339</b></td> </tr> <tr> <td>Onsite Offset</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>420 ha of native vegetation</li> <li>51 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>199 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>471</b></td> </tr> <tr> <td>Old Bobadeen</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>90 ha of native vegetation</li> <li>400 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>409 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>490</b></td> </tr> <tr> <td>Libertus</td> <td>Enhance existing vegetation:                             <ul style="list-style-type: none"> <li>160 ha of native vegetation</li> <li>18 ha of EEC</li> </ul>                             Regenerate:                             <ul style="list-style-type: none"> <li>22 ha of existing grassland to forest/woodland</li> </ul> </td> <td style="text-align: center;"><b>178</b></td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> <li>To identify the areas referred to in Table 15, see the applicable figures in Appendix 7;</li> <li>The amount of native vegetation includes forest/woodland and grassland but excludes woodland and grassland EECs. The combined total of native vegetation and EEC on each property equates to the minimum size available as an offset;</li> <li>The amount of grassland available for regeneration includes sparsely vegetated woodland; and</li> <li>The strategy includes the regeneration of existing grassland areas within each offset to woodland communities.</li> </ul>	Area	Offset Type	Minimum Size hectares (ha)	Dun Dun East	Enhance existing vegetation: <ul style="list-style-type: none"> <li>1368 ha of native vegetation</li> <li>408 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>380 ha of existing grassland to forest/woodland</li> </ul>	<b>1776</b>	Dun Dun West	Enhance existing vegetation: <ul style="list-style-type: none"> <li>837 ha of native vegetation</li> <li>122 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>307 ha of existing grassland to forest/woodland</li> </ul>	<b>959</b>	Avisford 1	Enhance existing vegetation: <ul style="list-style-type: none"> <li>300 ha of native vegetation</li> <li>102 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>7 ha of existing grassland to forest/woodland</li> </ul>	<b>402</b>	Avisford 2	Enhance existing vegetation: <ul style="list-style-type: none"> <li>203 ha of native vegetation</li> <li>5 ha of EEC</li> </ul>	<b>208</b>	Ulan 18	Enhance existing vegetation: <ul style="list-style-type: none"> <li>291 ha of native vegetation</li> <li>48 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>178 ha of existing grassland to forest/woodland</li> </ul>	<b>339</b>	Onsite Offset	Enhance existing vegetation: <ul style="list-style-type: none"> <li>420 ha of native vegetation</li> <li>51 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>199 ha of existing grassland to forest/woodland</li> </ul>	<b>471</b>	Old Bobadeen	Enhance existing vegetation: <ul style="list-style-type: none"> <li>90 ha of native vegetation</li> <li>400 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>409 ha of existing grassland to forest/woodland</li> </ul>	<b>490</b>	Libertus	Enhance existing vegetation: <ul style="list-style-type: none"> <li>160 ha of native vegetation</li> <li>18 ha of EEC</li> </ul> Regenerate: <ul style="list-style-type: none"> <li>22 ha of existing grassland to forest/woodland</li> </ul>	<b>178</b>	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>
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<p><b>Regeneration Areas</b></p> <p>31. The Proponent shall ensure that the regeneration of vegetation within the specified areas of the biodiversity offset strategy is focused on the re-establishment of flora species typical of the White Box Yellow Box Blakely's Red Gum Woodland as defined under the TSC Act and White Box Yellow Box Blakely's Red Gum Grassy Woodland as defined under the EPBC Act.</p>	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>																											

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32. <i>The Proponent shall use its best endeavours to work with the DoI Lands and Water to identify and implement any reasonable and feasible regeneration of vegetation on Crown lands in the vicinity of Pyramul Creek immediately to the south of the 'Dun Dun East' biodiversity offset area.</i>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<b>Habitat for Threatened Fauna Species</b> 34. <i>The Proponent shall ensure that the biodiversity offset strategy provides suitable habitat for all the threatened fauna species confirmed and identified as being potentially present in the disturbance areas.</i> <i>Note: The threatened fauna species confirmed and identified as being potentially present in the disturbance areas are listed in Appendix 7.</i>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<b>Vegetation Information System Mapping Data</b> 37. <i>At the request of OEH, the Proponent shall provide OEH with detailed vegetation mapping and survey data associated with its lands to be conserved in perpetuity in accordance with this approval. This information is to be provided free of charge.</i>	MCO would provide vegetation mapping and survey data at the request of the OEH (now BCD).
<b>Long Term Security of Biodiversity Offsets</b> 38. <i>By the 31 December 2015, unless the Secretary agrees otherwise, the Proponent shall make suitable arrangements to protect the offset areas in Table 12 in perpetuity, in consultation with OEH and to the satisfaction of the Secretary.</i> <i>Note: The preferred mechanisms for the provision of long-term conservation security are via Biobanking Arrangements and additions to the OEH Estate.</i>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<b>Biodiversity Management Plan</b> 39. <i>The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:</i>	Section 1.4
(a) <i>be prepared in consultation with OEH, and submitted to and approved by the Secretary prior to the commencement of any development on site;</i>	
(b) <i>describe the short, medium, and long term measures that would be implemented to:</i> <ul style="list-style-type: none"> <li>• <i>manage the remnant vegetation and fauna habitat on the site; and</i></li> <li>• <i>implement the biodiversity offset strategy;</i></li> <li>• <i>integrate the implementation of the biodiversity offset strategy to the greatest extent practicable with the rehabilitation of the site;</i></li> </ul>	Sections 1.2, 4, 5, 6, 7, 8 and 9
(c) <i>include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and triggering remedial action (if necessary);</i>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
(d) <i>include a detailed description of the measures that would be implemented over the next 3 years for:</i> <ul style="list-style-type: none"> <li>• <i>enhancing the quality of existing vegetation and fauna habitat in the biodiversity offset areas;</i></li> <li>• <i>creating native vegetation and fauna habitat in the biodiversity offset areas and rehabilitation area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary);</i></li> <li>• <i>maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity offset areas or rehabilitation area;</i></li> <li>• <i>collecting and propagating seed;</i></li> </ul>	Sections 4, 5, 6 and 7
	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
	Section 4.2.3 and 7.5
	Sections 5

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<ul style="list-style-type: none"> <li>protecting vegetation and fauna habitat outside the approved disturbance area on-site;</li> </ul>	Sections 4, 5, 6 and 7
<ul style="list-style-type: none"> <li>minimising the impacts on fauna on site, including undertaking pre-clearance surveys;</li> </ul>	Sections 4.2 and 4.3
<ul style="list-style-type: none"> <li>managing any potential conflicts between the proposed enhancement works in the biodiversity offset strategy areas and any Aboriginal heritage values (both cultural and archaeological) in these areas;</li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
<ul style="list-style-type: none"> <li>managing salinity;</li> </ul>	Section 7.2
<ul style="list-style-type: none"> <li>controlling weeds and feral pests;</li> </ul>	Section 7.3
<ul style="list-style-type: none"> <li>controlling erosion;</li> </ul>	Section 7.4 and 7.5
<ul style="list-style-type: none"> <li>managing grazing and agriculture on site;</li> </ul>	Section 7.6
<ul style="list-style-type: none"> <li>controlling access; and</li> </ul>	Section 7.7
<ul style="list-style-type: none"> <li>bushfire management;</li> </ul>	Section 7.8
(e) include a seasonally-based program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;	Sections 1.2, 8 and 9
(f) identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate against these risks; and	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)
(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	Section 12
<p><b>Conservation Bond</b></p> <p>40. By 31 December 2015, the Proponent shall lodge a Conservation Bond with the Department to ensure that the biodiversity offset strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan. The sum of the bond shall be determined by:</p> <p>(a) calculating the full cost of implementing the biodiversity offset strategy (other than land acquisition costs); and</p> <p>(b) employing a suitably qualified quantity surveyor to verify the calculated costs, to the satisfaction of the Secretary.</p> <p>If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Secretary, the Secretary will release the bond.</p> <p>If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Secretary will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>Alternative funding arrangements for long-term management of the Biodiversity Offset Strategy, such as provision of capital and management funding as agreed by OEH as part of a Biobanking Agreement or transfer to conservation reserve estate can be used to reduce the liability of the conservation and biodiversity bond, and</li> <li>The sum of the bond may be reviewed in conjunction with any revision to the biodiversity offset strategy.</li> </ul>	To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)

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NSW Project Approval Condition	BioMP Section				
<p><b>SUBSIDENCE</b></p> <p><b>Performance Measures – Natural and Heritage Features</b></p> <p>1. The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 18, to the satisfaction of the Secretary.</p> <p>Table 18: Subsidence Impact Performance Measures</p> <p>....</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #e0e0e0;">Biodiversity</th> </tr> </thead> <tbody> <tr> <td style="width: 50%;">Threatened species, threatened populations, or endangered ecological communities</td> <td style="width: 50%;">Negligible subsidence impacts or environmental consequences</td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> <li>The locations of the features referred to in Table 18 are shown in Appendix 4.</li> <li>The Proponent will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this approval.</li> <li>Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.</li> <li>The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of this approval.</li> </ul>	Biodiversity		Threatened species, threatened populations, or endangered ecological communities	Negligible subsidence impacts or environmental consequences	<p>Section 10</p>
Biodiversity					
Threatened species, threatened populations, or endangered ecological communities	Negligible subsidence impacts or environmental consequences				
<p><b>Appendix 3 – Statement of Commitments</b></p> <p><b>Ecology</b></p> <p>30. MCM will implement the ecological management and mitigation measures described in the PPR and subsequent supporting documents.</p>	<p>Sections 1.2, 4, 5, 6, 7, 8 and 9</p>				
<p>31. MCM will establish the Biodiversity Offset Strategy as described in the PPR and subsequent supporting documents to initially maintain and ultimately improve ecological values.</p> <p>Where ownership or the controlling interest of any proposed offset property is not able to be held by MCM it will either provide an alternate property of equal biodiversity value as a replacement, or make other such alternate arrangements as agreed to with relevant regulators.</p> <p>Management of offset properties for conservation purposes will be described in a Rehabilitation Offset Management Plan (or equivalent).</p>	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>				
<p>32. MCM will implement appropriate security mechanisms to ensure that offset areas and rehabilitated areas (at the completion on mining) are protected in the long-term.</p>	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>				
<p>33. MCM will continue to consult with OEH on the inclusion of relevant Moolarben owned properties into the existing Avisford Nature Reserve.</p>	<p>To be addressed in subsequent revision of BioMP (Sections 1.2 and 9)</p>				

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## APPENDIX B: MOOLARBEN COAL COMPLEX GROUND DISTURBANCE PERMIT

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ENV GDP. -

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## Ground Disturbance Permit

*This Permit applies to all ground disturbing works of vegetated areas undertaken by, or on behalf of MCO. A separate Excavation Permit is required for approval to disturb UG services/power/communication lines etc.*  
**This GDP must be completed & approved by the Environment & Community Delegate prior to any disturbance works taking place.**

Section 1- Project Description <i>(Project Manager to complete)</i>			
<b>Project Manager:</b> (Name and Role)		<b>Phone #</b>	
<b>Brief description of works required and location (the Project):</b>			
<b>Estimated Project Dates</b>	Start:	End:	
Has the Project Manager been trained in the GDP Procedure?		Yes	No
Have the below been provided to E&C Dept?			
Area of proposed disturbance (dxf, shp, tab, KML, GPX file)		Yes	No Na
Progressive Works Schedule (sequence and extent of disturbance)		Yes	No Na
Proposed location for storage of topsoil and cleared vegetation		Yes	No Na
Erosion and Sediment Control Plan		Yes	No Na
Has the area been clearly delineated (fenced, pegged or marked with tape)? <i>Work cannot commence until the approved area has been clearly delineated</i>		Yes	No Na
Details (Name/Date)			
Section 2 - Assessments <i>(Attach Reports if required) (E&amp;C to complete)</i>			
Has a Preclearance Survey been carried out?		Yes	No Na
<b>Name/Date/Report</b>			
Has an archaeological survey in accordance with section 5.8.2 of the HMP been carried out?		Yes	No Na
<b>Name/Date/Report</b>			
Section 3 - Supporting Information <i>(Attach Plans if required) (E&amp;C to complete)</i>			
	Checked?	Date	Initial
Area of proposed disturbance			
Project Approval/ Disturbance Limit/MOP/ML/EL/BOA/Land Ownership boundaries			
Current land ownership (MCO, private, Crown, Easements, National Parks etc.)			
Location of any endangered species & protected vegetation communities (EEC)			
Location of heritage sites and management status (Archaeological & European)			
Location of any creeks or water bodies			
Section 4 - Approval Checklist <i>(E&amp;C to complete)</i>			
Are the proposed works within land owned or managed by MCO? <i>If No, attach Landowner Access Agreement</i>		Yes	No
Does any agency or member of the public need to be considered or contacted?		Yes	No N/A
Are the works within the Project Approval, EPL12932, ML, Approved MOP or EL boundary or Biodiversity Offset Area? <i>Circle each as relevant</i>		Yes	No N/A
<b>Approval Name/Date:</b>			
Section 4 - Approval Checklist <i>(Cont'd) (E&amp;C to complete)</i>			

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Are the proposed works to be undertaken in accordance with an additional regulatory approval? E.g. ESF4, Construction, Water Licence, MWRC approval	Yes	No
<b>Approval Name/Date:</b>		
Has a site inspection been completed by the E&C Department?	Yes	No N/A
Name:	Date:	
Findings:		
Will the proposed works impact any of the following?: (If yes, attach approval or management controls)		
• Threatened species, endangered populations or an EEC	Yes	No
• A regulated exclusion or buffer zone? E.g. National Park, Crown Land, infrastructure easements, rural licence etc.	Yes	No
• Aboriginal Archaeological sites	Yes	No
• European Heritage sites	Yes	No
• Creeks or water bodies	Yes	No
• MCO Biodiversity Offset or Conservation areas.	Yes	No
• Potentially Contaminated Sites	Yes	No
• Environmental monitoring sites	Yes	No
• Rehabilitation	Yes	No
• Other	Yes	No
Comments:		
<b>Section 5 - Disturbance Control Requirements (E&amp;C to complete)</b>		
Erosion and Sediment Controls to be installed prior to disturbance?	Yes	No N/A
Vegetation clearing to be undertaken in accordance with VCLMP/BioMP?	Yes	No N/A
Works to be cleared progressively. Disturbance area to be minimised where possible?	Yes	No N/A
Is removal of habitat trees and presence of a fauna-catcher required?	Yes	No N/A
Tree hollows, woody debris and rock to be retained where possible?	Yes	No N/A
Topsail to be removed?	Yes	No N/A
Topsail Type 1: _____, Depth to remove: _____ mm, Stockpile Location: _____		
Topsail Type 2: _____, Depth to remove: _____ mm, Stockpile Location: _____		
Buffers required (E.g. heritage sites fenced)?	Yes	No N/A
Rehabilitation works required? (Detail type and timing below)		
Yes	No	N/A
Proposed Rehabilitation Completion Date: ____/____/____		
Other Controls:	N/A	
<b>NOTE 1:</b> No heritage sites are to be disturbed. If Archaeological site(s) are discovered (Aboriginal or European) stop all works <b>immediately</b> and notify the Environment and Community Manager.		
<b>NOTE 2:</b> If injured Fauna is discovered stop all works <b>immediately</b> and notify the E&C Coordinator.		

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**Section 6 - Approval** *(Environment & Community Manager or Delegate to complete)*

Version:	Position:	Name:	Signature:	Date:
1				

**Section 7 - Acceptance** *(Project Manager to complete)*

Version:	Position:	Name:	Signature:	Date:
1	Project Manager			

*By signing the Acceptance, you will implement all conditions outlined in this GDP. Works outside the scope of this GDP require approval from the E&C delegate. The original GDP should be provided to the E&C Department on signing.*

**Section 8 - Variation Approval** *(Environment & Community Manager or Delegate to complete)*

Version:	Variation Description:	Approved By:	Signature:	Date:
2				
3				
4				

**Section 9 - Variation Acceptance** *(Project Manager to complete)*

Version:	Position:	Name:	Signature:	Date:
2	Project Manager			
3				
4				

*A copy of this GDP must be available on the job site at all times. All personnel involved in the job must be familiar with the GDP and attachments. An electronic, signed copy of the GDP is held on the Common Drive (U:).*

**Section 10 - Closure** *(Project Manager to complete)*

Version:	GDP Inspection?	E&C Delegate:	Date:	Project Manager:	Date:
ALL					

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