YANCOAL
兖煤澳大利亚有限公司
MOOLARBEN COAL

BIODIVERSITY AND OFFSET MANAGEMENT PLAN

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Version	Issue Date	Date Approved	Section Modified	Reason for Modification	Review Team
1	Jul 2015	Jul 2015	All	Original Biodiversity Management Plan	Environmental Department
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)	MCO
5	Aug 2020	Sep 2020	1 – 4, 6 – 7, 11 and 13	To reflect approval of Modification 15 (Stage 1) Modification 3 (Stage 2)	MCO
6	Nov 2021	Dec 2021	All	To consolidate State and EPBC 2008/4444 and EPBC 2017/7974 Biodiversity and Offset management plan requirements	MCO

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1.0 INTRODUCTION

The Moolarben Coal Complex an 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).

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). Since the commencement of coal mining operations in 2010, mining activities have occurred within OC1, OC2, OC3, OC4 and UG1 (Figure 2).

1.1 APPROVED MOOLARBEN COAL PROJECT STAGE 1 AND STAGE 2

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 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 Moolarben Coal Complex are undertaken in accordance with Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) approvals EPBC 2007/3297, EPBC 2008/4444, EPBC 2013/6926 and EPBC 2017/7974.

Mining operations and exploration activities at the Moolarben Coal Complex are also conducted in accordance with the requirements of the conditions of Mining Leases (ML) ML1605, ML 1606, ML 1628, ML 1691 and ML 1715 and Exploration Licences (EL) EL6288, EL7073 and EL7074 granted under the *Mining Act 1992*.

1.2 APPROVED MOOLARBEN COAL BIODIVERSITY OFFSET STRATEGY

This Biodiversity and Offset Management Plan (BOMP) incorporates the approved Biodiversity Offset Strategies associated with the NSW Stage 1 Project Approval (05_0117) (as modified), the NSW Stage 2 Project Approval (08_0135) (as modified), and the Commonwealth Approvals (EPBC 2008/4444 and EPBC 2017/7974). The BOMP includes the measures that will be implemented to minimise the biodiversity impacts of the Moolarben Coal Complex and to manage (conserve/revegetate/enhance) remnant vegetation and habitat in MCO Biodiversity Offset Areas (BOAs) in the short, medium and long-term. Performance indicators and completion criteria on evaluating the offset performance with a detailed monitoring program and remedial actions (where required) is also captured in this plan.

The BOAs presented in this BOMP including location and spatial extent have been assessed, approved and endorsed by the State and Commonwealth Departments. This detail is discussed further within Section 4.

1.3 SCOPE AND PURPOSE

This BOMP describes the management of biodiversity across the Operational Land (Moolarben Coal Complex) and the BOAs associated with the above listed Project, EPBC 2008/4444, and EPBC 2017/7974 Approvals. The overarching objectives of the BOMP are to:

a. provide measures and strategies to be implemented during the life of the Moolarben Coal Complex to minimise biodiversity impacts on site (albeit in consideration of the approved impacts); and

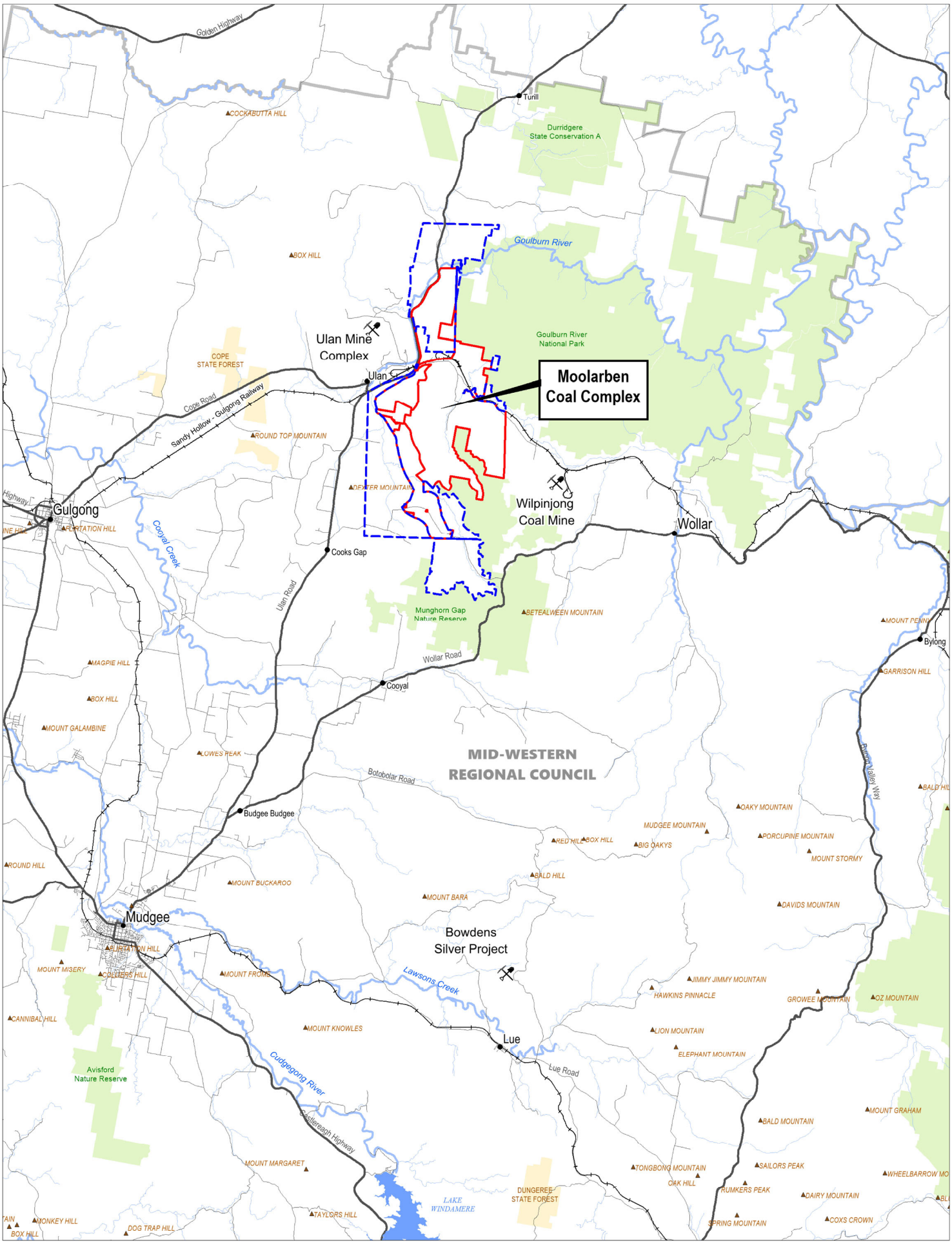
b. enhance and conserve biodiversity values on the approved BOAs.

This BOMP has been prepared by MCO to satisfy the requirements of NSW Stage 1 Project Approval (05_0117) (as modified), the requirements of NSW Stage 2 Project Approval (08_0135) (as modified), and the requirements of the Commonwealth Approvals (EPBC 2008/4444 and EPBC 2017/7974). It should be noted that in addressing both State and Commonwealth requirements, elements of this BOMP will not be relevant to the EPBC Approvals, and others not relevant to NSW Project Approvals. Furthermore, rehabilitation elements of the above-mentioned Project and EPBC Approvals are captured within the Moolarben Coal Complex-wide Rehabilitation Management Plan (RMP). It is not the intention for the BOMP to cover these aspects.

The Vegetation Clearance Protocol and Landscape Management Plan (VCPLMP) required by EPBC 2008/4444 and which outlined pre-clearance survey methods, collection and stockpiling of habitat features and a two-stage clearing protocol is incorporated in this version of the BOMP (Section 3.8).

Background information is provided in relation to the Commonwealth Approvals EPBC 2007/3297, and EPBC 2013/6926. This information is provided for context only. Future revisions of the BOMP will include the requirements of these approvals.

Nothing in this BOMP prohibits the undertaking of any activity approved under the *Environmental Planning and Assessment Act 1979* or the EPBC Act.



Legend

- Exploration Licence Boundary
- Mining Lease Boundary
- LocalGovernmentArea
- National Park / Nature Reserve
- State Forest

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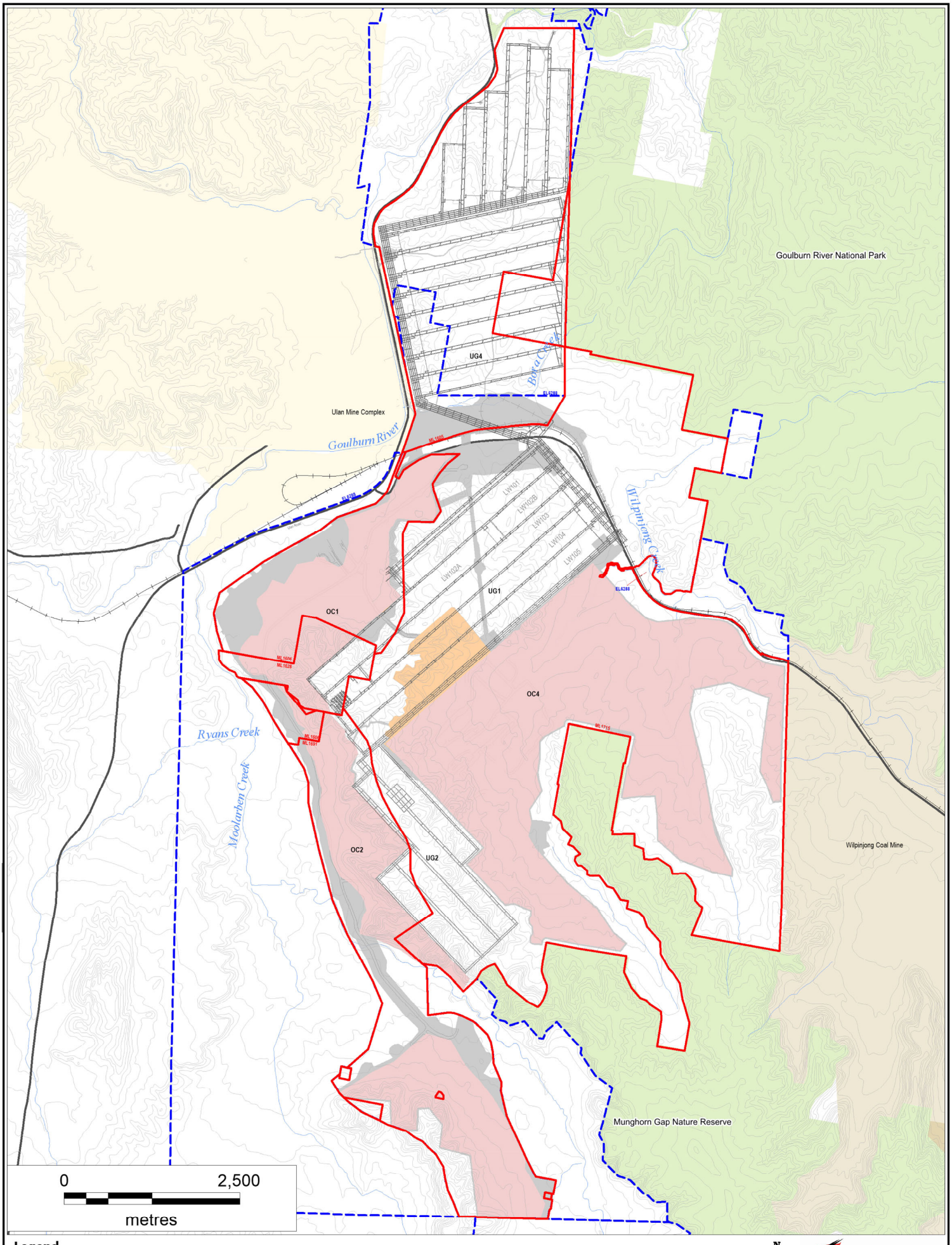
Figure 1
Regional Location

File: O:\1.1 EMS\1.2 Management Plans\Biodiversity Management Plan\Draft\Complex Biodiversity Management Plan Rev 5\Draft\Mapinfo Workspaces\Locality.WOR



Legend

- Exploration Licence Boundary
- Mining Lease Boundary
- Rail Line
- Watercourse
- Contour

Existing / Approved Development

- Open Cut Mining Area
- Underground Workings
- Out of Pit Emplacement
- Surface Infrastructure

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

1.4 STRUCTURE OF THE BOMP

The remainder of the BOMP is structured as follows:

Section 2: Outlines the statutory requirements applicable to this BOMP.

Section 3: OPERATIONAL LAND (MOOLARBEN COAL COMPLEX)

Provides an overview of the existing environment (Section 3.2 – 3.6) and biodiversity management strategies and approach for Operational Land (Section 3.7).

Captures requirements of the VCPLMP (Section 3.8), native seed collection (Section 3.9) and describes the strategy to improve connectivity between existing conservation reserves and large areas of remnant native vegetation within and surrounding the Moolarben Coal Complex (Section 3.10).

Section 4: BIODIVERSITY OFFSET AREAS

Provides an overview of the BOAs, their approval values (Section 4.1) and relevant security mechanism (Section 4.2), descriptions of each BOA (Section 4.3), performance indicators and completion criteria (Section 4.4), management strategies (Section 4.5), and monitoring program (Section 4.6) of the BOAs and risk, controls and contingency measures (Section 4.7).

Section 5: Outlines the roles and responsibilities of relevant personnel relating to the implementation of the BOMP (Section 5.1) and the reporting (Section 5.2), auditing (Section 5.3) and record keeping procedure (Section 5.4).

Section 6: Provides details for the review and improvement of environmental performance process and summarises the performance and review proforma described throughout the BOMP.

Section 7: Outlines a contingency plan should any of the performance measures outlined in this BOMP not be met.

Section 8: Provides the references cited in the BOMP.

Appendix A: Provides a reconciliation of the NSW Project and EPBC Approval requirements.

Appendix B: Bobadeen BOA Cluster Management Plan

Appendix C: Red Hills BOA Cluster Management Plan

Appendix D: Ulan 18 BOA Cluster Management Plan

Appendix E: Dexter Mountain BOA Cluster Management Plan

Appendix F: Onsite BOA Cluster Management Plan

Appendix G: Moolarmoo BOA Cluster Management Plan

Appendix H: Dun Dun BOA Cluster Management Plan

Appendix I: EPBC Approval Biodiversity Offset Figures

Appendix J Provides Baseline Survey Data for Avisford 1 and 2 offsets

2.0 STATUTORY AND LEGAL REQUIREMENTS

MCO's statutory obligations are contained in:

i. the conditions of the NSW Stage 1 Project Approval (05_0117) as modified and NSW Stage 2 Project Approval (08_0135) as modified;

ii. the conditions of the Commonwealth Approvals (EPBC 2007/3297, EPBC 2008/4444, EPBC 2013/6926 and EPBC 2017/7974);

iii. relevant licenses' and permits, including conditions attached to the Environment Protection License and mining leases; and

iv. other relevant legislation.

This Biodiversity and Offset Management Plan (BOMP) has been prepared by MCO to satisfy the requirements of Condition 36 of Schedule 3 of NSW Stage 1 Project Approval (05_0117) (as modified), Condition 39 of Schedule 3 of NSW Project Approval (08_0135) (as modified), and the relevant components of Conditions 2 and 3 of EPBC 2008/4444. Future revision of the BOMP will be prepared to satisfy the requirements of Commonwealth Approvals EPBC 2007/3297, EPBC 2013/6926 and EPBC 2017/7974.

Appendix A provides a summary of the relevant NSW Project and EPBC approval conditions and where they have been addressed in the BOMP.

A summary of the Term of each NSW and Commonwealth approvals has been provided in Table 1.

Table 1: Relevant Approvals and Term

Approval	Relevant Legislation	Expiry
PA05_0117	NSW EP&A Act	31 December 2038*
PA08_0135	NSW EP&A Act	31 December 2038*
2007/3297**	Commonwealth EPBC Act	31 December 2027
2008/4444	Commonwealth EPBC Act	31 December 2065
2013/6926**	Commonwealth EPBC Act	31 December 2064
2017/7974	Commonwealth EPBC Act	31 December 2050

* MCO may carry out mining operations on the site until 31 December 2038. MCO is required to rehabilitate the site and perform additional undertakings to the satisfaction of both the Secretary and DRG. Consequently, this approval will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.
** EPBC Approval 2007/3297 and 2013/6926 requirements to be addressed in future versions of the BOMP.

2.1 BIODIVERSITY OFFSET SECURITY REQUIREMENTS

The security mechanism for each BOA includes legal requirements which the BOA landowner is required to adhere too. As discussed in Section 4.2, a portion of the MCO BOAs have been secured through National Parks Estate, private Conservation Agreements or the NSW Biodiversity Offset Scheme (E.g.

Biodiversity Stewardship Agreements), meaning they are controlled and managed by other parties and their management is not addressed in this BOMP.

The remaining BOAs have been secured by registering on the title of the land a 'Positive Covenant' instrument and a 'Restriction on the Use of Land by a Prescribed Authority' instrument executed under the NSW *Conveyancing Act 1919*.

2.2 CONSULTATION FOR THE PLAN

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), this BOMP has been prepared in consultation with the Department of Planning, Industry and Environment– Biodiversity Conservation Division (BCD).

2.3 APPROVAL OF THE PLAN

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), this plan is to be approved by the DPIE.

3.0 OPERATIONAL LAND (MOOLARBEN COAL COMPLEX)

3.1 LOCATION

The Moolarben Coal Complex is located within the Mid-Western Regional Local Government Area (LGA) with settlement's Cook's Gap and Ulan located in its vicinity (Figure 1). Operational Land (Moolarben Coal Complex) includes areas covered by the Stage 1 and Stage 2 Project Approval boundaries as relevant to approved activities including open cut and underground operations, coal handling and processing facilities and rail transport infrastructure (Figure 2). Several reserves are located in the vicinity, including the Goulburn River National Park (abuts the north-eastern boundary) and Munghorn Gap Nature Reserve (adjoins the south-eastern boundary).

Operational Land (Moolarben Coal Complex) excludes the Onsite BOA, Area 1 (Red Hills) and Area 2 (Moolarben - UG4) BOAs, with the exception of approved operations in these areas. These BOAs are described in Section 4.0.

3.2 OVERVIEW OF THE EXISTING ENVIRONMENT

3.2.1 Bioregions

The Moolarben Coal Complex (Figure 2) is 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^2) and 532 km^2 respectively.

Moolarben Creek is a tributary of the upper Goulburn River catchment and flows along the western side 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.

3.2.2 Climate

The climate near the Moolarben Coal Complex is typical of temperate regions and is characterised by hot dry summers with some thunderstorms and cold winters with frequent frosts. Rainfall occurs through the year with a slightly higher seasonal distribution in summer. Rainfall in the area is variable,

averaging 650 millimetres (mm) per annum at the Gulgong Post Office (approximately 24km away), with the greatest falls typically received in January and lowest falls in April.

Long-term temperature records at the Gulgong Post Office indicate that summer months are hottest with January reaching an average daily temperature of 31 degrees Celsius (°C). While average daily temperatures drop to 14.7°C in the winter month of July. Frosts may occur from mid-April through to September.

Prevailing winds are dominated by south-west winds during the winter months and north-east and easterly winds during the summer months.

3.2.3 Landforms and use

Landforms in the vicinity of the Moolarben Coal Complex primarily comprise low undulating rises, creek flats, sandstone plateaus and low hills. Elevations near Moolarben Coal Complex range from approximately 370 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, quarrying, grazing, conservation reserves and rural settlement.

3.2.4 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.

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 OPERATIONAL LAND - VEGETATION COMMUNITIES

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 (EcoLogical Australia, 2015a) (MOD 11) and for the UG1 Optimisation Modification (ELA, 2015b) (MOD 12). A Biodiversity Assessment Review was undertaken by EcoLogical Australia 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 Moolarben Coal Complex is located in a transitional zone between the western slopes and coastal areas of NSW within the Great Dividing Range (ELA, 2017). Many plant species and communities representative of these areas integrate at this locality and at their range limits (ELA, 2017).

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; Cumberland Ecology, 2012; EMM, 2013; ELA, 2015a, 2015b and 2017).

The Moolarben Coal Complex contains 20 BioMetric vegetation types as outlined below (EcoLogical Australia, 2015b; 2017) and displayed in Figure 3.

- Blakely's Red Gum – Yellow Box grassy open forest or woodland of the New England Tablelands (HU515).
- Blakely's Red Gum – Rough-barked Apple Shrubby Woodland of Central and Upper Hunter (HU910).
- Derived grasslands of the slopes on the Merriwa Plateau (HU671).
- Dwyer's Red Gum low woodland on exposed sandstone ridges of the upper Hunter Valley, Sydney Basin (HU537).

- 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 - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin (HU875).
- Narrow-leaved Ironbark – Grey Gum shrubby woodland on footslopes on the upper Hunter Valley, Sydney Basin (HU574).
- Narrow-leaved Stringybark – Grey Gum shrubby open forest on sandstone ridges of the Sydney Basin (HU843).
- Red Ironbark – Grey Gum – Narrow-leaved Stringybark – Brown Bloodwood shrubby open forest on sandstone ranges of the Sydney Basin (HU883).
- Rough-barked Apple – Coast Banksia shrubby woodland on Warkworth Sands of the central Hunter Valley, Sydney Basin (HU600).
- 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 (HU714).
- 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 - Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley (HU730).
- White Box – Narrow-leaved Ironbark – Blakely's Red Gum Shrubby Open Forest of the Central and Upper Hunter (HU820).
- 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).

EcoLogical Australia (2015b; 2017) developed the Biometric vegetation types based on vegetation survey results and mapping undertaken by Moolarben Biota (2006), Ecovision Consulting (2008), Ecovision Consulting (2009), Cumberland Ecology (2012) and EMM (2013a and b).

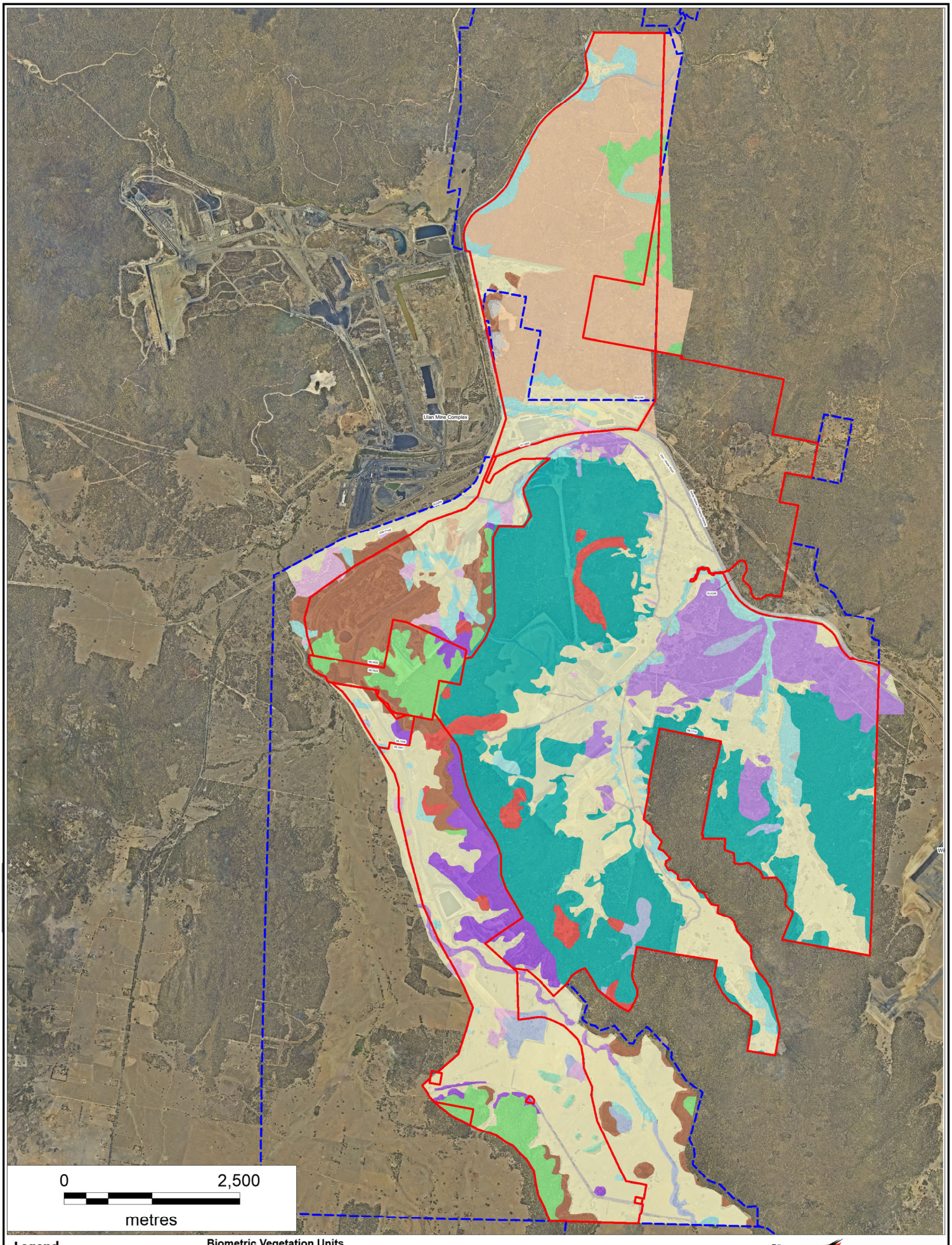


Figure 3
Operational Land Vegetation Communities - BioMetric Vegetation Types

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.
- *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. The Central Hunter Valley Eucalypt Forest and Woodland, listed as a CEEC under the EPBC Act. 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; EMGA Mitchell McLennan, 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 EcoLogical Australia 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 EcoLogical Australia 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.

3.3.4 Priority Weeds

Priority weeds identified at the Moolarben Coal Complex include:

- *Rubus fruiticosus* agg. spp. (Blackberry).
- *Cenchrus spinifex (Spiney Burr grass)*
- *Hypericum perforatum* (St John's Wort).
- *Opuntia* spp. (Prickly Pear).
- *Ailanthus altissima* (Tree of Heaven).
- *Andropogon virginicus* (Whisky Grass).
- *Heliotropium implexa* (Blue Heliotrope).

The Central Tablelands Regional Strategic Weed Management Plan 2017-2022 (LLS 2017) guides control actions and weed priorities at the MCC. Management actions to address pest species are outlined within Section 3.7.5.

3.4 OPERATIONAL LAND - 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; EMGA Mitchell McLennan, 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).

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), EMGA Mitchell McLennan (2013), and EcoLogical Australia (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 BOMP 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[1]	
		TSC Status	EPBC Status
Square-tailed Kite	*Lophoictinia isura*	V	-
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	-
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	-
Powerful Owl	*Ninox strenua*	V	-
White-throated Needletail	*Hirundapus caudacutus*	-	M
Rainbow Bee-eater	*Merops ornatus*	-	M
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-
Speckled Warbler	*Chthonicola sagittata*	V	-
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis*	V	-
Painted Honeyeater	*Grantiella picta*	V	V
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis*	V	-
Hooded Robin (south-eastern form)	*Melanodryas cucullata*	V	-
Gilbert's Whistler	*Pachycephala inornata*	V	-
Rufous Fantail	*Rhipidura fuliginosa*	-	M
Satin Flycatcher	*Myiagra cyanoleuca*	-	M

Common Name	Scientific Name	Conservation Status[1]	
		TSC Status	EPBC Status
Dusky Woodswallow	*Artamus cyanopterus*	V	-
Diamond Firetail	*Stagonopleura guttata*	V	-
Little Eagle	*Hieraaetus morphnoides*	V	-
Cattle Egret	*Ardea ibis*	-	M
Varied Sittella	*Daphoenositta chrysoptera*	V	-
Little Lorikeet	*Glossopsitta pusilla*	V	-
White-fronted Chat	*Epthianura albifrons*	V	-
Scarlet Robin	*Petroica boodang*	V	-
Spotted Harrier	*Circus assimilis*	V	-
Masked Owl	*Tyto novaehollandiae*	V	-
Flame Robin	*Petroica phoenicea*	V	-
Koala	*Phascolarctos cinereus*	V	V
Squirrel Glider	*Petaurus norfolcensis*	V	-
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	V
Little Pied Bat	*Chalinolobus picatus*	V	-
Large Bent-winged Bat	*Miniopterus schreibersii oceanensis*	V	-
South-eastern Long-eared Bat (Greater Long-eared Bat)	(Nyctophilus corbeni) *(Nyctophilus timoriensis)*	V	V
Eastern Cave Bat	*Vespadelus troughtoni*	V	-

Source: Moolarben Biota (2006); Ecovision (2008), EMGA Mitchell McLennan (2013 and ELA (2020).
V = vulnerable; M = migratory.
[1] Conservation status under the BC Act and the EPBC Act (current as at June 2020).
[2] Species listed as Vulnerable under the EPBC Act in June 2015.

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.

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

Management actions to address pest species are outlined within Section 3.7.5.

3.5 OPERATIONAL LAND - 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 OPERATIONAL LAND - 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).

GDE's that are mapped in the vicinity of MCO are predominantly thought to be sourced from:

- shallow or 'perched' groundwater sources,
- constructed aquatic GDE's where groundwater seepages have been intercepted with constructed dams, and
- woodland vegetation in the central and northern part of the MCO area linked with local groundwater (Ecovision 2008).

'The Drip', on the Goulburn River north of the Moolarben Coal Complex, 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' (EMM, 2013). No impacts from the Moolarben Coal Complex are expected on this GDE (Wells Environmental Services, 2006).

The closest high priority groundwater dependent ecosystem listed in the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* is approximately 140 km away and would not be affected by groundwater drawdown from Moolarben Coal Complex operations (HydroSimulations, 2017).

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).

3.7 OPERATIONAL LAND - BIODIVERSITY MANAGEMENT STRATEGIES

3.7.1 Vegetation Management

Vegetation management strategies have been developed for areas within the Stage 1 and Stage 2 Project Boundaries that are outside of:

- the approved major surface disturbance areas (i.e. surface works shown on Figure 2),
- existing BOAs,
- Aboriginal heritage management areas, and
- the control of MCO (e.g. Dronvisa Quarry, Ulan Coal Mining Limited (UCML) land or tenements, linear infrastructure and other easements, crown land and land leased for agricultural purposes).

Various activities associated with the Moolarben Coal Complex are approved to occur outside the approved major disturbance zones, including underground mining and auxiliary mining activities and infrastructure.

A description of the management strategy is provided below.

The management objective is to maintain vegetation structure and species diversity. Actions to be implemented include:

- Control of stock and grazing to promote understory recovery and reduce competition for food with native fauna species. (Note, controlled/strategic grazing may be required for weed control or hazard reduction purposes).

- Management of access and disturbance including installation of fencing, gates and signage (where required) to prevent unauthorised entry/use.
- Management of eroding areas (where required).
- Retaining dead timber (i.e. prevent firewood collection).
- Targeted control of weeds (where required).
- Targeted control of pest animals including foxes, rabbits, goats, wild dogs and pigs.

Further detail on specific management actions is provided in Sections 3.7 - 3.8.

3.7.2 Salinity

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

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

3.7.3 Subsidence

Schedule 4 of the Stage 2 Project Approval (08_0135) includes a specific subsidence impact performance measure for biodiversity. Relevant Extraction Plans for underground mining operations describe the monitoring, management, and remediation (where required) of subsidence impacts.

3.7.4 Erosion

Erosion and sediment controls on MCO operational lands will be managed and designed generally in accordance with the *'Blue Book': Managing Urban Stormwater: Soils and Construction - Volume 1* (EPA. 2004a) and *Managing Urban Stormwater: Soils and Construction - Volume 2E – Mines and Quarries* (EPA, 2004b). Where required the design and operation of erosion and sediment control strategies and techniques will be supplemented with the *International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control* (IECA, 2008) documents.

Erosion and sediment control measures for operational lands are further described in the MCO Surface Water Management Plan.

Potential erosion impacts on biodiversity at the Moolarben Coal Complex will be managed by retaining or reinstating vegetation as required.

3.7.5 Weed and vertebrate pest control

Weed control forms a critical part of restoring natural species composition, diversity and structure of the vegetation communities found across the operational areas. Weed control activities will focus on priority weeds under the *Biosecurity Act 2015*. Specific management controls implemented across the Moolarben Coal Complex consider the recommended controls for individual weed species as outlined within the Department of Primary Industries, NSW WeedWise database (https://weeds.dpi.nsw.gov.au/) and will be guided by the Central Tablelands Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

Regular inspection programs are used to identify and update annual and reactive weed control schedules. Weed control treatments are conducted annually and as required by seasonal conditions that may promote excessive weed growth.

Weed management may incorporate a range of suitable control methods that include:

- Biological control
- Herbicide control
- Land management (including burning)
- Manual control.

Vertebrate pest control will be undertaken in consultation with the Local Land Services (LLS) (in accordance with the requirements of the *Biosecurity Act 2015*) and surrounding landowners as required.

Vertebrate pest control is undertaken as required and may include trapping, baiting and/or shooting.

3.7.6 *Phytophthora cinnamomi* Management

Phytophthora cinnamomi (*P. cinnamomi)* is a key threatening process listed under the EPBC Act and NSW legislation (DoEE, 2018). *P. cinnamomi* is a soil-borne plant pathogen that attacks the roots of susceptible plants, destroying the root system and reducing the ability of the plant to absorb water and nutrients (DoEE, 2018). This causes symptoms referred to as 'dieback' which can lead to plant death (DoEE, 2018).

To help prevent the inadvertent spread of this plant disease, MCO aim to:

- be aware of what plants look like when infected with *P. cinnamomi*,
- provide training or briefings to necessary personnel who are at risk of spreading pathogens and weeds, and
- (where able) limit vehicle access to areas of native vegetation / bushland (DoE, 2015).

3.7.7 Bushfire Management

Bushfire management of operational areas is undertaken in accordance MCO internal processes which have been developed in consultation with the NSW Rural Fire Services.

3.7.8 Management of Grazing and Agriculture

Livestock will be excluded from active operational mining areas, remnant vegetation areas and Aboriginal heritage management areas, unless controlled/strategic grazing is required for hazard reduction or weed management purposes.

Grazing, cultivation and routine agricultural management activities may be undertaken on MCO land by MCO or other parties with prior approval from MCO (e.g. under Rural Licence Agreement).

3.7.9 Access Restrictions

The access to MCO operational areas is restricted by locked gates and visitation is monitored through site induction processes.

3.8 OPERATIONAL LAND - BIODIVERSITY MANAGEMENT APPROACH

3.8.1 Vegetation Clearance Protocols

A Vegetation Clearance Protocol (VCP) has been implemented to minimise impacts on threatened species during native vegetation clearing at the Moolarben Coal Complex. The Vegetation Clearance Protocol is required by EPBC Approval 2008/4444 with key components of the VCP captured in Section 3.8.2-3.8.4 below. 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.*

3.8.2 Delineation of Areas to be Cleared

Delineation of approved native vegetation clearing areas 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.

3.8.3 Pre-clearing Procedure

3.8.3.1 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.

The purpose of the GDP is to:

- clearly identify the area to be disturbed;
- identify any environmentally or culturally (or other) sensitive feature(s) within or adjacent to the area to be disturbed;
- 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, salvage or fauna impact mitigation actions;
- manage heritage in accordance with the Moolarben complex-wide Heritage Management Plan (HMP);
- 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.

3.8.3.2 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 person. 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;
- 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); and
- weed infestations that may need to be managed prior to or during disturbance;

During the pre-clearance surveys targeted searches are undertaken for the threatened flora listed in Section 3.3.3.

3.8.3.3 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:

- 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.

3.8.3.4 Identification of Suitable Release Locations

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

Particular areas/locations within the specified release areas (Figure 4) will be selected based on the fauna to be relocated.

3.8.4 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. The practicality of implementing each strategy is dependent on the characteristics of the habitat feature in question and will be determined by the MCO 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 MCO 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.

3.8.4.1 Timing Considerations

The timing for clearing areas of vegetation will be determined by the MCO 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:

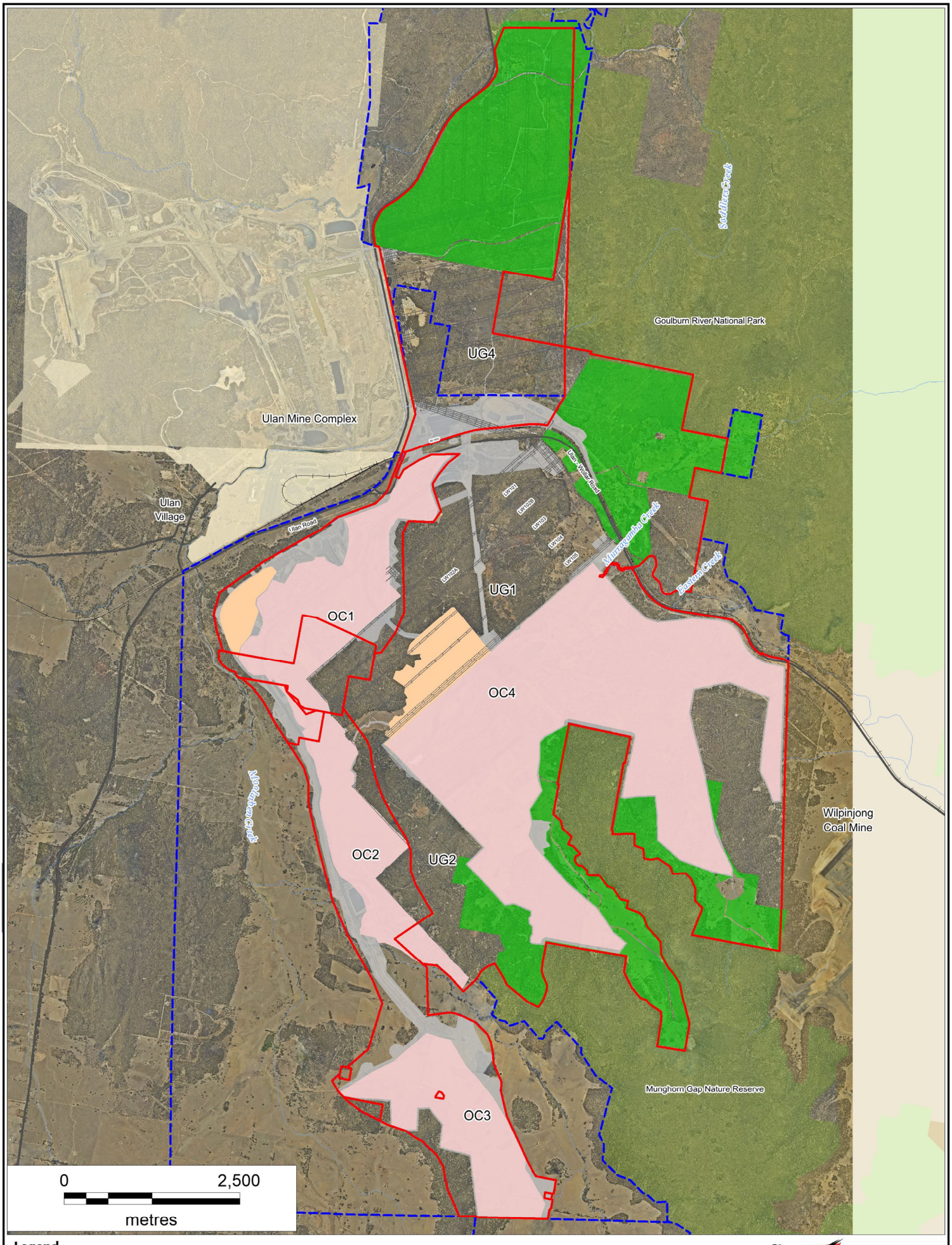
- undertaking clearing on a progressive basis to minimise the active area of disturbance at any one time and to maximise direct placement of topsoil onto rehabilitation areas (where available);
- suitability of area to be cleared for roosting threatened microbats or nesting threatened birds/mammals (i.e. 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 3.8.1. 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 3.8.3 will be implemented (in addition to the strategies described in Section 3.8.4). In either case, the relocation of habitat features (described above) will be undertaken.

3.8.4.2 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, 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.



Legend

- Exploration Licence Boundary
- Mining Lease Boundary
- Rail Line
- Watercourse

Existing / Approved Development

- Open Cut Mining Area
- Underground Workings
- Out of Pit Emplacement
- Surface Infrastructure

- Release Point Areas for Captured Fauna
- Ulan Coal Mine
- Wilpinjong Coal Mine

YANCOAL 兖煤澳大利亚有限公司 MOOLARBEN COAL

Figure 4
Release Points/Areas for Captured Fauna

3.8.4.3 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 3.8.3).

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) 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.

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.

3.8.4.4 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) 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 an appropriately qualified and/or experienced person(s) using accepted techniques.

3.8.4.5 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 Section 3.8 will be applied. In addition, where threatened flora or habitat trees 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 if avoidance and/or delaying are not practicable.

3.9 NATIVE SEEDS AND TUBESTOCK FOR REHABILITATION

The rehabilitation of disturbed onsite areas to forest and woodland will include the use of local native seed (collected onsite and in surrounding areas) where practical and feasible. Species selected for use in onsite rehabilitation is based on the final rehabilitation and land use objectives. Consideration is given to site conditions, including soil type and condition, landform, time of year, climate, water availability and vegetation community establishment outcomes and the best methods of rehabilitation application. Native vegetation established in rehabilitation may be supplemented by tubestock where required.

Seed collection and propagation activities are undertaken in accordance with the requirements of the *FloraBank Guidelines Native Seed Collection Methods* (ATSC & Mortlock, 2000), with additional consideration of (inter alia):

- strategically timed and cost-effective seed collection;
- collection of fruit directly from the plant into collection bags for transfer to drying rooms; and
- maintenance of a seed inventory which records the amount of seed collected and species type.

The seedbank for rehabilitation will be supplemented by commercially available endemic species. Where harvested seeds are not used in direct sowing or production of tubestock it will be stored for future use.

3.10 IMPROVING CONNECTIVITY ON-SITE

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 BOA:

- As far as practicably possible, BOAs have been selected adjacent to existing conservation areas or large tracts of existing proximal native vegetation.
- BOAs will be managed to maintain (for existing good quality vegetated areas) or improve (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 land not required for mining purposes, ongoing agricultural purposes (i.e. farmland operated under an ongoing agricultural lease arrangement), or post-mining agricultural outcomes will be managed to maintain or improve 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 land used to maintain agricultural productivity (as required under state approvals and/or contractual licence arrangements), MCO will investigate opportunities on its land holdings to further enhance native vegetation connectivity (extent and quality) across the landscape. This may include:

- 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).
- Riparian corridor enhancement along fenced off areas of Moolarben and Wilpinjong creeks (on land under MCO control).
- 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.

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.

4.0 BIODIVERSITY OFFSET AREAS

4.1 OVERVIEW OF OFFSETS

There are twenty (20) Biodiversity Offset Areas (BOAs) relevant to the Moolarben Coal Complex. BOAs are parcels of land which have been secured for biodiversity conservation using an appropriate and suitable legal instrument (Section 4.2). The BOAs have been assessed and approved as part of the various NSW and EPBC approvals discussed in Section 1.1 and 1.2.

Table 3 lists all BOAs relevant to the Moolarben Coal Complex, their associated environmental approvals and relevant approval values. The locations of each of the BOAs are shown in Figure 5. For ease of management the BOAs have been placed into management clusters. An overview of each of these management clusters is provided in Section 4.3, with performance indicators, completion criteria, and corresponding monitoring program provided in Sections 4.4 and 4.6 respectively. Management strategies which are relevant to all BOAs are detailed within Section 4.5, with specific management actions for BOAs and their respective values, captured within the individual BOA Cluster Management Plans, provided as Appendices (Appendix B – H).

Information relating to offsets for Commonwealth Approvals EPBC 2007/3297, and EPBC 2013/6926 is provided for context only. Future revisions of the BOMP will include the requirements of these approvals.

4.1.1 Biodiversity Offset Objectives

The objectives for the BOAs are to:

- Secure the tenure of the BOA for long term conservation purposes,
- Add to the existing conservation network and habitat corridors within the wider region,
- Protect existing important areas of identified threatened species and habitat, enhance flora and fauna habitats within the BOAs, including increasing the area of Box Gum Woodland through assisted regeneration and revegetation, and
- Improve the ecological value of the land in the BOA in the medium to long-term.

4.1.2 Approved Biodiversity Offset Strategy

The BOAs presented in this BOMP including location and spatial extent have been assessed, approved and endorsed by the State and Commonwealth Departments. This is reflected by the BOAs being specifically mapped in the relevant approval instruments and described in various assessment reports, for example:

The Director General's Environmental Assessment Report for Stage 1 Project Approval (05_0117) (dated September 2007) included the following statement:

> *"…the DECC has indicated it is satisfied with the assessment, and believes it provides a sound basis for assessing the flora and fauna impacts of the project."*

Additionally, the report also stated (bolding added for emphasis):

> *"The DECC and the Department are satisfied Moolarben has adequately considered the potential flora and fauna impacts of the project, and are of the opinion that the detailed impact assessment provides a sound basis to assess these impacts.* ***The DECC and the Department are also satisfied with Moolarben's proposed offset and rehabilitation strategy, and believe it is an adequate response to mitigate the effects of the project on the biodiversity values of the area.****"*

The Director General's Report for the Stage 1 Project Approval (05_0117) (MOD 9) (dated February 2014) included the following statement (bolding added for emphasis):

> *"The Department is also* ***satisfied that the implementation of the biodiversity offset strategy****, coupled with the rehabilitation strategy,* ***will suitably offset any residual impacts associated with this clearing and improve the conservation value of the region in the medium to long term****."*

Additionally, the Determination Report for the Stage 1 Project Approval (05_0117) (MOD 3) and Stage 2 Project Approval (08_0135) (dated January 2015) states (bolding added for emphasis):

> *"The commission is satisfied that the Project has significant economic benefits, both in terms of regional employment and royalties to the State of NSW. Nonetheless, the proposal will have some adverse effects on the local community living in the vicinity of the mine site. Conditions limiting noise and air quality impacts and providing acquisition and mitigation rights in accordance with the Government's new Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industries will go some way to mitigate these.* ***The site also has significant biodiversity values that are proposed to be offset and the Commission is satisfied that these will be managed to comply with NSW Government's current offset requirements."***

The Assessment Report for Stage 1 Project Approval (05_0117) (MOD 14) and Stage 2 Project Approval (08_0135) MOD 3 states:

> *… the Department and OEH consider that the proposed clearing for the modifications is relatively minor, and that residual impacts can be mitigated through the proposed land-based offset and mine site rehabilitation.*

As outlined above, the BOAs have already been approved and are considered to be acceptable for meeting the biodiversity offset requirements. As such, this BOMP, and information included, is intended to inform management measures and monitoring, not reassess the BOAs themselves.

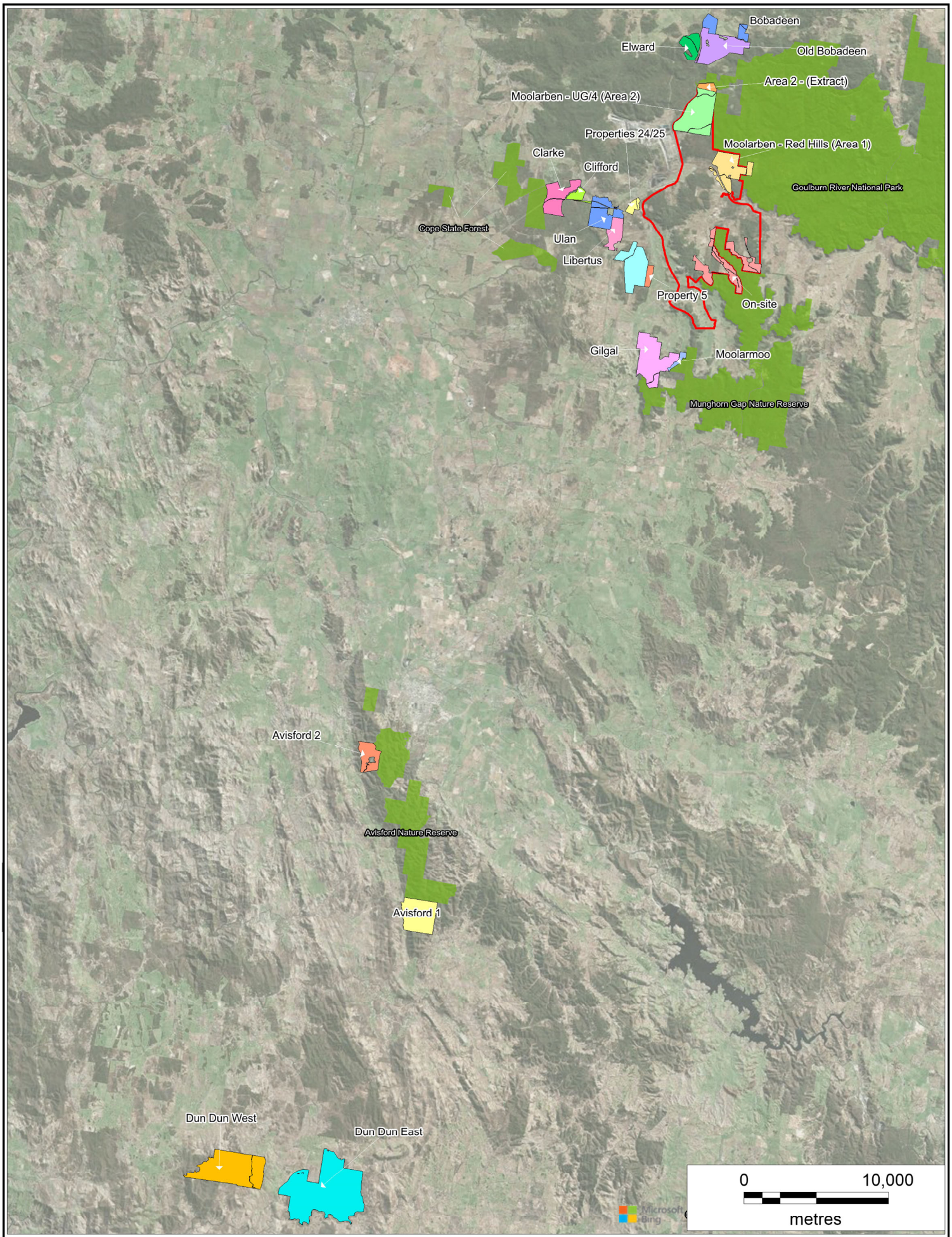
4.1.3 Location and Bioregions

All BOAs are located proximal to the Moolarben Coal Complex at Ulan and in the surrounding region (i.e. proximal to Mudgee) (Figure 5). The offset properties add value to the existing NSW reserve system by enhancing its size, biodiversity, connectivity and opportunity for wildlife movement corridors. The

revegetation of areas within the offset properties will also improve regional and local connectivity and wildlife movement corridors, as well as delivering a medium to long term gain of woodland / forest vegetation.

All Stage 1 BOAs as well as Ulan 18, Onsite, Libertus and Old Bobadeen are located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley (Department of the Environment and Energy [DEE], 2016). The remaining southern BOAs are located in the NSW South Western Slopes Bioregion. These bioregions are a transitional zone for flora species; representing plants and communities from the south-east, north-west and western parts of NSW.

The BOAs within the Sydney Basin Bioregion, are located within the upper Goulburn River catchment. The Goulburn River catchment is the largest sub-catchment of the Hunter River covering just under one third of the total Hunter River catchment (of 22,000 km^2). The BOAs within the South-Western Slopes Bioregion are located within the Macquarie-Bogan catchment (of 74,800 km^2).



Legend

- Colliery Holding Boundary
- National Park / State Forest / Nature Reserve

Moolarben Offset Properties

- Avisford 1
- Avisford 2
- Bobadeen
- Clarke
- Clifford
- Dun Dun East
- Dun Dun West
- Elward
- Gilgal
- Libertus
- Dexter Mountain
- Red Hills (Area 1)
- UG/4 (Area 2)
- Moolarmoo
- Old Bobadeen
- On-site
- Properties 24/25
- Property 5
- Ulan

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Figure 5
Moolarben Coal Complex
Biodiversity Offset Areas

4.1.4 Approval Values

The relevant approval values for each NSW State and Commonwealth BOA including Commonwealth protected matters are summarised in Table 3 and described in the individual BOA descriptions (Section 4.3). In the context of Commonwealth values, protected matter(s) are those protected under a controlling provision in Part 3 of the EPBC Act. With regard to the State values, these refer to key NSW State-listed species / communities determined by the NSW Threatened Species Scientific Committee, which is established under the NSW *Biodiversity Conservation Act 2016* (BC Act).

Approval values for more contemporary biodiversity offsets are expressed as credits. These supplementary offsets are those which have been identified through a 'like for like' assessment methodology, where biodiversity credits of the same Plant Community Type (PCT) are assessed for impacts and proposed as the offsets (OEH, 2014b). Credits have been determined in accordance with *Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects* (OEH, 2014), or the *Biodiversity Assessment Method* (as at 1 October 2019). Table 4 details the environmental approval, offset locations and required credits associated with MCO.

As detailed in the footnotes of Condition 34A of NSW Stage 1 Project Approval (05_0117) and restated through Table 4, 'Like-for-Like' credit options were present in the relevant Modification Environmental Assessment (EA) in accordance with the NSW Biodiversity Conservation Regulation 2017. The PCT substitutes identified as 'Offset Options' within the credit calculator output for the relevant PCTs were within the NSW rules for 'Like for Like" and as such the use of these offset options are applicable for both the NSW Stage 1 PA 05_0117 and EPBC 2017/7974.

In addition, residual credits listed in Table 4 will be addressed through rehabilitation offsets which are discussed further within Section 4.2.5.

Where the retiring of ecosystem credits equivalent to 3.25 ha for Area 2 (Moolarben) UG4 is required, this must be carried out in accordance with the Biodiversity Offsets Scheme of the BC Act.

Further detail on the relevant security mechanisms and retiring of credits is outlined in Section 4.2 below.

Table 3: Summary of MCO Biodiversity Offset Approval Values

Environmental Approval	BOA Management Cluster	Offset Area / Property	Total Required Offset Area (ha)*	Enhance existing vegetation (ha) (Native and EEC)	Regenerate / Revegetate vegetation (ha) (Native and EEC)	EPBC Approval Values
NSW Stage 1 EPBC 2007, EPBC 2013 and EPBC 2017						
NSW Stage 1 and EPBC 2007	Red Hills Cluster	Area 1 (Sydney Basin) Red Hills	351	1285	201	As identified in EPBC 2007 approval, the key Commonwealth-listed species/communities include: • White Box-Yellow Box-Blakely's Red Gum Grass Woodland and Derived Native Grassland.
NSW Stage 1 and EPBC 2007 and 2017	Red Hills Cluster	Area 2 (Moolarben) UG 4 (including Extract Area 2)	642			
NSW Stage 1 and EPBC 2007	National Parks Estate	*Area 2 (Moolarben – UG4) Transferred to National Park and State Conservation Area*	*56*			
NSW Stage 1 and EPBC 2007	Dexter Mountain Cluster	Area 3 (Property 6) Dexter Mountain	443			
EPBC 2007	National Parks Estate	*Area 1 (Sydney Basin – Red Hills) Transferred to National Parks Estate*	*(130)* *			
NSW Stage 1 and EPBC 2013	Ulan 18 Cluster	Clarke	332	332	-	As identified in EPBC 2013 approval, the key Commonwealth-listed species/communities include: • White Box-Yellow Box-Blakely's Red Gum Grass Woodland and Derived Native Grassland • Large-eared Pied Bat (*Chalinolobus dwyeri*) • South-eastern Long-eared Bat (*Nyctophilus corbeni*) • Regent Honeyeater (*Anthochaera phrygia*) • Swift Parrot (*Lathamus discolor)* • Spotted-tailed Quoll (*Dasyurus maculatus maculatus*) • Koala (*Phascolarctos cinereus*)
NSW Stage 1 and EPBC 2013	Ulan 18 Cluster	Clifford	81	81		
NSW Stage 1 and EPBC 2013	Bobadeen Cluster	Elward	170	170		
NSW Stage 1 and EPBC 2013	Dexter Mountain Cluster	Property 5	65	65		
NSW Stage 1 and EPBC 2013	Bobadeen Cluster	Bobadeen (West and East)	167	167		
NSW Stage 1 0nly	Moolarmoo Cluster	Moolarmoo	44	44	-	
NSW Stage 1 Only	Ulan 18 Cluster	Properties 24 and 25	63	63		
Total NSW Stage 1 EPBC 2007, EPBC 2013 and EPBC 2017			***2,414***	***2,207***	***201***	
NSW Stage 2 and EPBC 2008						
NSW Stage 2 and EPBC 2008	Onsite Cluster	Onsite Offset	471	471	199	As identified in EPBC 2008 approval, the key Commonwealth-listed species/communities include: • White Box-Yellow Box-Blakely's Red Gum Grass Woodland and Derived Native Grassland • Large-eared Pied Bat (*Chalinolobus dwyeri*) • South-eastern Long-eared Bat (*Nyctophilus corbeni*) • Regent Honeyeater (*Anthochaera phrygia*) • Swift Parrot (*Lathamus discolor*) • Spotted-tailed Quoll *(Dasyurus maculatus maculatus*)
NSW Stage 2 and EPBC 2008	Bobadeen Cluster	Old Bobadeen	490	490	409	
NSW Stage 2 and EPBC 2008	Ulan 18 Cluster	Libertus	178	178	22	
NSW Stage 2 and EPBC 2008	Ulan 18 Cluster	Ulan 18	339	339	178	
NSW Stage 2 and EPBC 2008	Dun Dun Cluster	Dun Dun East	1,776	1,776	380	
NSW Stage 2 and EPBC 2008	Dun Dun Cluster	Dun Dun West	959	959	307	
NSW Stage 2 and EPBC 2008	National Parks Estate	Avisford 1	402	402	7	
NSW Stage 2 and EPBC 2008	Conservation Agreement	Avisford 2	208	208	-	
Total NSW Stage 2 and EPBC 2008			***4,823***	***4,823***	***1,502***	
Total MCO Offsets			***7,237***	***7,030***	***1,703***	

* A total land parcel of 203 ha was transferred to the National Parks Estate fulfilling Condition 1 (a) of EPBC 2007/3297. Not included in total required offset ha.

Table 4: Summary of MCO Biodiversity Offset Credits

Environmental Approval	Management Cluster	Offset Area / Property	Credits Required		Hectare Equivalent (ha)	Residual Credits	Credit Retirement Hectare Equivalent (ha)
NSW Stage 1 and EPBC 2017 *	Gilgal BSA	Gilgal	Ecosystems				
			PCT281, PCT1606, PCT1660[1], PCT479[2] PCT1176[3]	1033	121.5	-	
			PCT618	73	-	73	
			Species				
			Regent Honeyeater	1568	221	-	
			Koala	64	9	13	
			Brush-tailed Rock Wallaby	693	98	-	
NSW Stage 1 **	N/A	Not applicable, requires retirements of credits – not location specific. Refer to Section 4.2.5.1.	Ecosystems				
			PCT281, PCT479, PCT1711	111	-	-	
			Species				
			Gang-Gang Cockatoo	9	-	-	
			Glossy-Black Cockatoo	9	-	-	
			Large-eared Pied Bat	135	-	-	
			Eastern Cave Bat	135	-	-	
			Tylophora linearis	29	-	-	
NSW Stage 1	Red Hills Cluster	Area 2 (Moolarben) UG 4	Ecosystems				
			PCT 281	-	-	-	0.75
			PCT 479	-	-	-	2.5

[1] As per Condition 34A of Stage 1 Project Approval (05_0117), 'Under the FBA offsetting option rules PCT 1660 can be used to offset impacts on *PCT 1629 Narrow-leaved Stringybark – Grey Gum shrubby open forest on sandstone ridges of the Sydney Basin.'*

[2] As per Condition 34A of Stage 1 Project Approval (05_0117), 'Under the FBA offsetting option rules PCT 479 can be used to offset impacts on *PCT 1661 Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin*.'

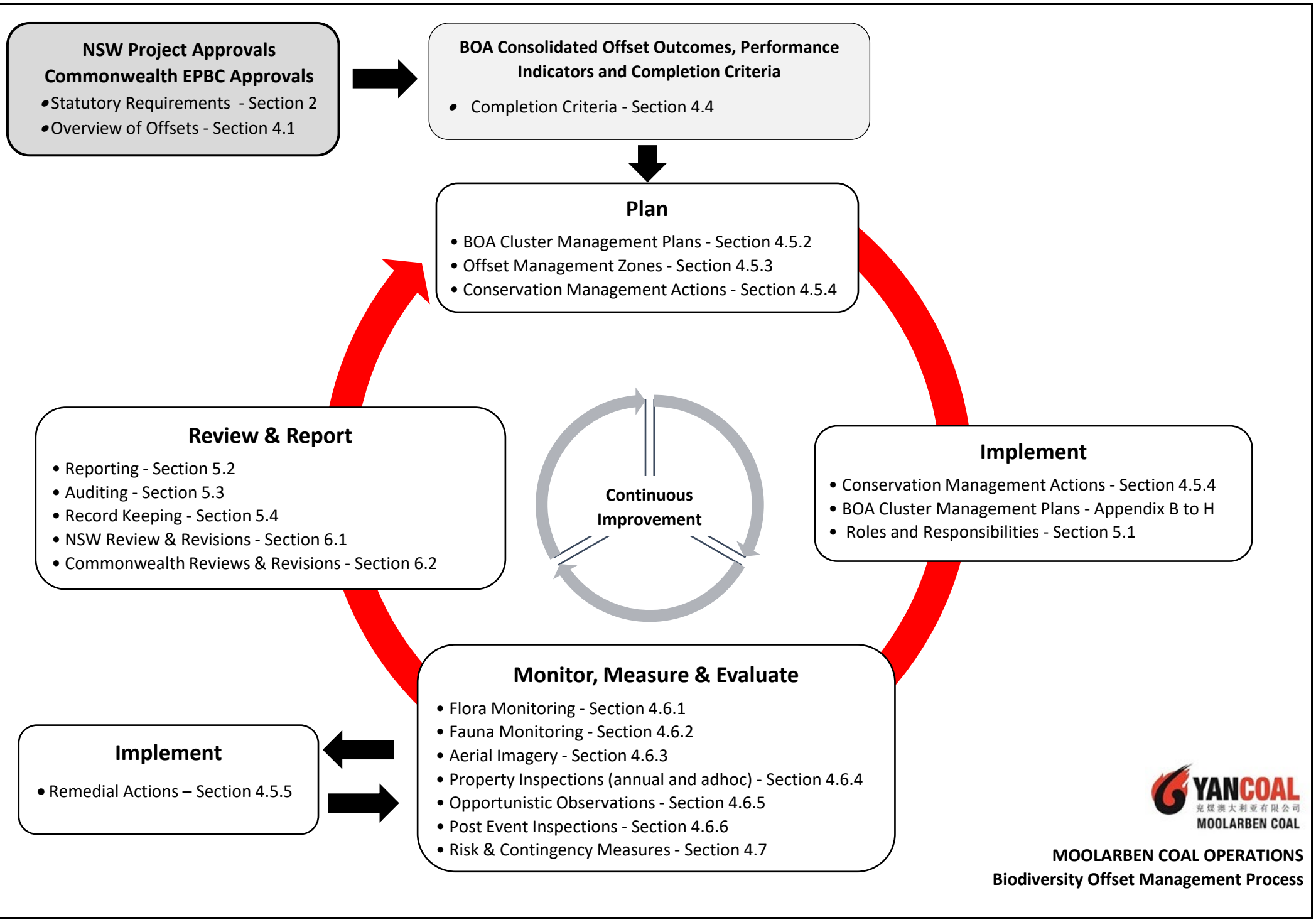
[3] As per Condition 34A of Stage 1 Project Approval (05_0117), 'Under the FBA offsetting option rules PCT 1176 can be used to offset impacts on *PCT 1669 Red Ironbark - Grey Gum - Narrow-leaved Stringybark - Brown Bloodwood shrubby open forest on sandstone ranges of the Sydney Basin.'*

*The credits associated with this line item 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 offsets', 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.

**The credits associated with this line item have been calculated in accordance with the *Biodiversity Assessment Method* (as at 1 October 2019).

4.1.5 Biodiversity Offset Management Process

The overarching approach to BOA management is based on a continuous improvement approach consistent with the remainder of the operation. For BOAs the process stems from the developed BOA consolidated offset outcomes, performance indicators and completion criteria (Section 4.4). Figure 6 demonstrates how each of the key steps associated with managing the BOAs (i.e. 'Plan', 'Implement', 'Monitor, Measure & Evaluate' and 'Review & Report') are integrated with the specific management, monitoring and reporting elements outlined in the BOMP and the individual BOA Cluster Management Plans. For ease of reference, specific section references have been included in the management process diagram.



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MOOLARBEN COAL OPERATIONS
Biodiversity Offset Management Process

4.2 OFFSET SECURITY AND MANAGEMENT

Each BOA will be secured and managed for long-term biodiversity conservation in accordance with appropriate and suitable legal instruments. Security mechanisms applicable to MCO BOAs include:

- Positive and Restrictive Covenants;
- Transfer to the National Parks Estate;
- Conservation Agreements; and
- Biodiversity Offsets Scheme Credits - Biodiversity Stewardship Agreement.

The management and security mechanisms for each approval and associated BOA are provided in Table 5.

Table 5: Security Mechanism and Management Instrument

Environmental Approval	Area	BOA Management Cluster	Security Mechanism	Management
NSW Stage 1 and EPBC 2007	Area 1 (Sydney Basin)	Red Hills Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2007	Portion of Area 1 (Sydney Basin)	National Parks Estate	NP Estate	NPWS*
NSW Stage 1 and EPBC 2007 and 2017	Area 2 (Moolarben)	Red Hills Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2007	Portion of Area 2 (Moolarben)	National Parks Estate	NP Estate & SCA	NPWS*
NSW Stage 1 and EPBC 2007	Area 3 (Property 6)	Dexter Mountain Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2013	Clarke	Ulan 18 Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2013	Clifford	Ulan 18 Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2013	Elward	Bobadeen Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2013	Property 5	Dexter Mountain Cluster	Covenants	BOMP
NSW Stage 1 and EPBC 2013	Bobadeen (West and East)	Bobadeen Cluster	Covenants	BOMP
NSW Stage 1 0nly	Moolarmoo	Moolarmoo Cluster	Covenants	BOMP
NSW Stage 1 Only	Properties 24 and 25	Ulan 18 Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Onsite Offsets	Onsite Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Old Bobadeen	Bobadeen Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Libertus	Ulan 18 Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Ulan 18	Ulan 18 Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Dun Dun East	Dun Dun Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Dun Dun West	Dun Dun Cluster	Covenants	BOMP
NSW Stage 2 and EPBC 2008	Avisford 1	National Parks Estate	NP Estate	NPWS**
NSW Stage 2 and EPBC 2008	Avisford 2	Conservation Agreement	Conservation Agreement***	
NSW Stage 1 and EPBC 2017	OC2/3 Rehabilitation	Rehabilitation	Rehabilitation Management Plan	
NSW Stage 1 and EPBC 2017	Gilgal	Gilgal BSA	Biodiversity Stewardship Agreement	

* To be managed by NPWS in accordance with the Goulburn River National Park and Munghorn Gap Nature Reserve Plan of Management ((NSW National Parks and Wildlife Service)

** To be managed by NPWS in accordance with the Avisford Nature Reserve (ANR) Plan of Management (NSW National Parks and Wildlife Service)
*** Refer Section 4.2.3

4.2.1 Covenants

Sixteen (16) BOAs described in this BOMP owned by the Moolarben Joint Venture parties have been secured by registering on the title of the land a 'Positive Covenant' instrument and a 'Restriction on the Use of Land by a Prescribed Authority' instrument executed under section 88 E(3) of the NSW *Conveyancing Act 1919*.

The Positive and Restrictive Covenants include positive obligations on the landholder and restrictions on land use for the BOAs. These obligations have been considered in the preparation of the BOMP and all BOAs which are covered by these covenants will be managed in accordance with this BOMP.

The positive obligations on the landholder and restrictions on land use endure beyond the achievement of completion criteria and the term of the NSW and Commonwealth approvals.

4.2.2 National Parks Estate

A 203 ha portion of Area 1 (Sydney Basin) was transferred into the National Parks Estate in 2010 and is managed by OEH (now DEES) and National Parks and Wildlife Service (NPWS) as part of the Goulburn River National Park. As above, the NPWS control the management of this land and it is therefore not included in this BOMP.

A 23 ha portion of Area 2 offset surrounding the “Drip” has been transferred to the National Parks Estate for inclusion in the Goulburn River National Park and further 33 ha being included in the Goulburn River State Conservation Area. The security of this land is in accordance with the Drip Deed, signed on 5 March 2015 by Moolarben Joint Venture parties, the NSW Minister for the Environment, and the Chief Executive of OEH. The NPWS control the management of the Goulburn River National Park and the Goulburn River State Conservation Area and these areas are therefore not included in this BOMP.

Avisford 1 was transferred into the National Parks Estate in 2017 consistent with environmental assessment of the Stage 2 Project assessed and approved as part of NSW Project Approval 08_0135 and EPBC 2008/4444. The reservation of the Avisford 1 Offset lands as part of the Avisford Nature Reserve under section 30A(1)(f) of the *National Parks and Wildlife Act* 1974 was gazetted in October 2019 providing for management and protection during and beyond the period of approvals. The requirement to manage that land now resides with the NSW agency responsible for protecting and conserving biodiversity values in perpetuity, as required by the *National Parks and Wildlife Act 1974.* The NSW NPWS manages the Avisford 1 offset as part of the Avisford Nature Reserve.

As part of the dedication process, a Financial Impact Statement (FIS) was prepared by the NPWS which outlined the initial and ongoing management costs for the Avisford 1 offset area land. This FIS was paid

by MCO to the NPWS at the time of the land transfer. The management costs included costs associated with staffing; fire management; infrastructure maintenance; planning, reporting and monitoring; pest and weed management; cultural heritage management; biodiversity management and threatened species conservation; and land rehabilitation and restoration.

The current version of the *Avisford Nature Reserve Plan of Management* (ANRPoM) implemented by the NPWS includes management actions that aim to "*Better environmental outcomes for native vegetation, biodiversity, land, rivers and coastal waterways*". The ANRPoM identifies threats to the values, desired outcomes and strategies to achieve the outcomes, including "Implement measures included in recovery plans for threatened species", as well as strategies for the management of fire, erosion and introduced plant and animal species. The ANRPoM protects the site describing that "no operations may be undertaken within Avisford Nature Reserve except in accordance with the plan".

The reservation of Avisford 1 and management actions are considered to satisfy several conditions relating to outcomes of biodiversity offsets as outlined in Section 4.4. As the NPWS control the management of this land, the offset liability is deemed to have been met and it is therefore not included in this BOMP.

4.2.3 Conservation Agreement

Avisford 2 is privately owned and has had a Conservation Agreement established and registered over the property since 2016. The Conservation Agreement is a contract between the landowner and the NSW Minister administering the NPW Act, to manage Avisford 2 to restore and protect the Conservation Values. The Conservation Agreement shall operate in perpetuity (i.e. beyond the duration of the approvals). The Conservation Agreement requires the landowner to undertake ongoing tasks aimed at biodiversity management and conservation. These include (for example) weed and feral animal control, maintenance of access tracks and boundary fences and fire control. The Conservation Agreement also includes restrictions on activities that may be undertaken within the Avisford 2 area, such as "any act of omission that may harm any native fauna, native plans, their habitats, cultural heritage or geo-heritage in the Conservation Area or the Conservation Values. The Conservation Agreement also requires an ongoing monitoring and reporting program whereby the landowner reports to BCD/NPWS on the progress and status of biodiversity management.

A key requirement as outlined in the Avisford 2 offset area Conservation Agreement is to "*managed to restore and protect the Conservation Values*", which is considered to address the enhance and regenerate requirements and satisfy conditions relating to outcomes of biodiversity offsets as detailed further in Section 4.4. The management of this land is specified by the legal instrument and is therefore not included in this BOMP.

4.2.4 Biodiversity Offsets Scheme Credits - Biodiversity Stewardship Agreement

Biodiversity credits are a biodiversity offset mechanism as detailed by the *NSW Biodiversity Offsets Policy for Major Projects 2014* (OEH, 2014b) which sets out the process for determining biodiversity offset requirements. Biodiversity credits required to be secured are detailed in Conditions 34A, 35E and 35F, Schedule 3 of the Project Approval 05_0117 and EPBC 2007/7974 Condition 2.

Credits are to be secured (retired) on Gilgal under a Biodiversity Stewardship Agreement (BSA) to satisfy Condition 34A, Schedule 3 of Project Approval 05_0117, and EPBC 2017/7974 Condition 2. Credits are to be secured in accordance with Project Approval 05_0117 Schedule 3 Condition 35A and EBCC 2017/7974 Condition 3, unless agreed in writing by the Secretary of the DPIE and the Minister of the DAWE. Credits have been calculated in accordance with the *Framework for Biodiversity Assessment of the NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014) and may need to be converted to reasonably equivalent 'biodiversity credits' if the credits are retired in accordance with the Biodiversity Offsets Scheme of the BC Act.

Credits required by Project Approval 05_0117 Schedule 3 Conditions 35E and 35F, are to be secured under the Biodiversity Offsets Scheme in accordance with Project Approval 05_0117 Schedule 3 Condition 34A and EBCC 2017/7974 Condition 3 unless agreed in writing by the Secretary of the DPIE and the Minister of the DAWE.

A BSA is a legally binding agreement that will operate in perpetuity over a parcel of land (i.e. Gilgal) and provide for the permanent protection and management of biodiversity (BCT, 2017). All management and associated monitoring that may apply to a site subject to a BSA include (but not limited to) control of weed and pest species, management of grazing for conservation, management of human disturbance and revegetation or supplementary planting activities. Management and monitoring requirements will be detailed in the BSA. As the management of Gilgal (and any other BSA areas) are specified by the legal BSA instrument, it is not included in this BOMP.

4.2.5 Rehabilitation Offsets

In accordance with Conditions 35B and 35C, Schedule 3 of the Stage 1 Project Approval (05_0117), and Part A, Condition 6, of EPBC 2017/7974, MCO are required to develop suitable rehabilitation performance and completion criteria for the vegetation communities to be established in the rehabilitated OC2 and / or OC3 landforms to generate the residual ecosystem and species credits for Koala listed in Table 12A of Stage 1 Project Approval (05_0117).

The Framework for Biodiversity Assessment (FBA) (OEH, 2014a) underpins the *NSW Biodiversity Offsets Policy for Major Projects 2014* and sets out the process for determining the biodiversity offset requirements. In accordance with the FBA, MCO have developed suitable rehabilitation performance and completion criteria which will enable the generation of the required residual ecosystem and species credits through mine rehabilitation. The performance and completion criteria are based on Biometric

Vegetation Types (BVTs) in line with the *Mine Rehabilitation Fact Sheet and Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined Land – Released: July 2015* (OEH, 2015) which is based on BVTs.

HU730 and HU910 are the Biometric Vegetation Types (BVTs) used in the FBA (OEH, 2014a). These BVTs were converted to Plant Community Types (PCT618 and PCT1696) in the Department of Planning and Environment (DPE) Modification Assessment Report (DPE, 2019) as displayed in Table 12A of Schedule 3 of Stage 1 Project Approval (05_0117). The performance and completion criteria were prepared in consultation with the NSW DPIE, NSW DPIE - BCD and the Commonwealth DAWE and approved by DPIE in July 2020.

4.2.5.1 Retiring Residual Credits

As outlined in Part A, Condition 8, of EPBC 2017/7974 and Condition 35D, Schedule 3 of the Stage 1 Project Approval (05_0117), residual credits may be retired earlier then the specific timeframe in Condition 35C by other mechanisms under the BC Act, in place of mine rehabilitation. Additionally, should the mine rehabilitation not meet the performance and completion criteria within the timeframes approved by DPIE, MCO must retire the relevant number of credits to offset the related impact.

Retiring credits can occur under the Biodiversity Offsets Scheme in the BC Act and can achieved by:

- purchasing existing biodiversity credits, and/or
- creating new credits by establishing a land-based offset area.

MCO will consider the retirement of credits in line with the above requirements should the need arise.

4.3 BIODIVERSITY OFFSET AREA DESCRIPTIONS

The sixteen (16) BOAs covered by this BOMP have been placed into 7 BOA Clusters (Table 5 and Figure 7) to improve management and minimise the administrative burden of the individual BOA's. Each of the 7 BOA Clusters has its own BOA Cluster Management Plan as provided in Appendices B to H.

The following section provides a summary of each of the BOA clusters. EPBC Approval figures for EPBC 2008/4444, EPBC 2013/6926 and EPBC 2017/7974 which support the BOA cluster summaries have been provided in Appendix I. Approval figures for Avisford 1 and Avisford 2 are also included in Appendix I.

4.3.1 Baseline Surveys and Condition

A summary description of the baseline survey results, and condition of each BOA has been captured in the respective BOA Cluster Management Plans. This data describes the initial vegetation mapping and the condition of Box Gum Woodland for each BOA. As the majority of these properties were acquired by MCO for conservation prior to finalisation of Commonwealth approvals, some of the ecological gains on the properties had been achieved prior. An overview of the conservation management actions undertaken across the BOAs is provided in Section 4.5.4.

As discussed in Section 4.2, Avisford 1, Avisford 2, Gilgal, a portion of Area 1 and a portion of Area 2 are subject to security mechanisms with their own associated management requirements and their management is therefore not discussed further in this BOMP or BOA Cluster Management Plans. A summary of the baseline survey data for Avisford 1 and 2 is been provided in Appendix J.

4.3.2 Bobadeen BOA Cluster

The Bobadeen BOA Cluster consists of Old Bobadeen BOA, Bobadeen (East and West) BOAs, and Elward BOA. The cluster has a total offset area of 827 ha and is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 1 Mod 9 and EPBC 2013/6926 Biodiversity Offset Strategy incorporating Bobadeen (East and West) and Elward is provided in the *Moolarben Coal Project Stage 1 Optimisation Modification Ecological Assessment* (EMM, 2013) and *Moolarben Coal Project Stage 1 – Optimisation Modification Project Biodiversity Offset Strategy and Proposed Offset Package* (ELA, 2013) with additional detail relating to EPBC 2013/6926 provided in the *Moolarben Coal Project Stage 1 Optimisation Modification - Preliminary Documentation (EPBC 2013/6926) Appendix C Threatened Species Habitat and Community Condition and EPBC Offset Calculator Tool Inputs and Results* (ELA, 2014).

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy incorporating Old Bobadeen is provided in the *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy* (Cumberland Ecology, 2012),

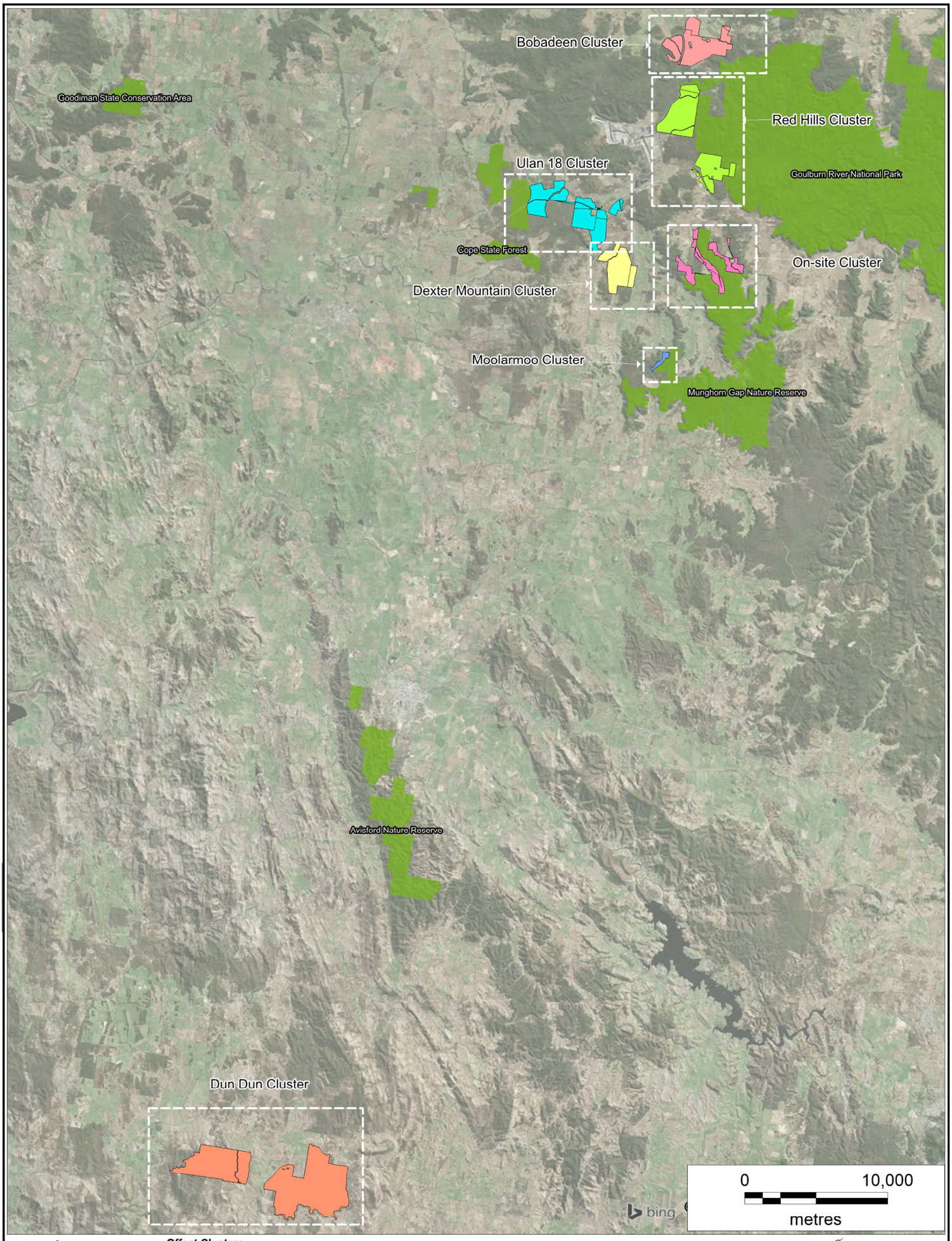
*Moolarben Stage 2 Offset Strategy – Summary (*Cumberland, Ecology 2012) and *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy Additional Fauna and Flora Surveys* (Cumberland Ecology, 2014).

Bobadeen (West and East) and Elward BOAs form part of the Stage 1 and EPBC 2013/6926 Biodiversity Offset Strategy and Old Bobadeen forms part of the Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy. The BOAs were included due to their ecological values and connectivity to the south and east with adjacent conservation areas. The EPBC Matters of National Significance (MNES) for each individual BOA have been summarised below in Table 6 with relevant EPBC figures provided in Appendix I.

Further detail including vegetation communities and key management works of the individual BOAs within this cluster are provided in the Bobadeen BOA Cluster Management Plan (Appendix B), with consolidated offset outcomes described in Section 4.4.

Table 6: Bobadeen BOA Cluster MNES Summary

Aspect	BC Act Status	EPBC Act Status	Elward	Bobadeen (East & West)	Old Bobadeen
White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and DNG	EEC	CEEC	✓	✓	✓
Large-eared Pied Bat (*Chalinolobus dwyeri)*	V	V	✓	✓	✓
South-eastern Long-eared Bat (*Nyctophilus corbeni*)	V	V	✓	✓	✓
Aspect	**BC Act Status**	**EPBC Act Status**	**Elward**	**Bobadeen (East & West)**	**Old Bobadeen**
Regent Honeyeater (*Anthochaera phrygia*)	CE	CE	✓	✓	✓
Swift Parrot (*Lathamus discolor*)	E	CE	✓	✓	✓
Spotted-tailed Quoll (*Dasyurus maculatus maculatus*)	V	E	✓	✓	✓
Koala (*Phascolarctos cinereus*)	V	V	✓	✓	N/A



Legend

National Park / State Forest / Nature Reserve

Offset Clusters

- Bobadeen Cluster
- Dexter Mountain Cluster
- Dun Dun Cluster
- Moolarmoo Cluster
- On-site Cluster
- Red Hills Cluster
- Ulan 18 Cluster

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Figure 7
Moolarben Coal Complex
Biodiversity Offset Area Clusters

4.3.3 Red Hills BOA Cluster

The Red Hills BOA Cluster consists of Area 1 (Sydney Basin – Red Hills) BOA and Area 2 (Moolarben – UG4) BOA. The cluster has a total offset area of 993 ha and is located adjacent to the Goulburn River National Park in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 1 and EPBC 2007/3297 Biodiversity Offset Strategy incorporating Area 1 and Area 2, is provided in the *Moolarben Coal Project: Flora, Fauna and Aquatic Ecology* (Moolarben Biota, 2006).

Area 1 and Area 2 BOAs form part of the Stage 1, EPBC 2007/3297 and EPBC 2017/7974 Biodiversity Offset Strategy. The BOAs were included due to their ecological values and connectivity to the adjacent conservation areas. The EPBC Matters of National Significance (MNES) for the Red Hills Biodiversity Areas Cluster includes White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and the associated Derived Native Grassland.

Further detail including vegetation communities and key management works of the individual BOAs within this cluster are provided in the Red Hills BOA Cluster Management Plan (Appendix C), with consolidated offset outcomes described in Section 4.4.

4.3.4 Ulan 18 BOA Cluster

The Ulan 18 BOA Cluster is located within the Sydney Basin Bioregion and consists of the Clarke, Clifford, Properties 24 and 25, Libertus and Ulan BOAs. The cluster has a total offset area of 993 ha and is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 1 Mod 9 and EPBC 2013/6926 Biodiversity Offset Strategy incorporating Clarke, Clifford and Properties 24 and 25 is provided in the *Moolarben Coal Project Stage 1 Optimisation Modification Ecological Assessment* (EMM, 2013) and *Moolarben Coal Project Stage 1 – Optimisation Modification Project Biodiversity Offset Strategy and Proposed Offset Package* (ELA, 2013) with additional detail relating to EPBC 2013/6926 provided in *Moolarben Coal Project Stage 1 Optimisation Modification - Preliminary Documentation (EPBC 2013/6926) Appendix C Threatened Species Habitat and Community Condition and EPBC Offset Calculator Tool Inputs and Results* (ELA, 2014).

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy incorporating Libertus and Ulan 18 is provided in the *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy* (Cumberland Ecology 2012), *Moolarben Stage 2 Offset Strategy – Summary (*Cumberland Ecology, 2012) and *Moolarben Coal*

Project Stage 2 Biodiversity Offset Strategy Additional Fauna and Flora Surveys (Cumberland Ecology, 2014).

Clarke and Clifford BOAs form part of the Stage 1 and EPBC 2013/6926 Biodiversity Offset Strategy, Properties 24 and 25 forms part of the Stage 1 and Libertus and Ulan 18 BOAs form part of the Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy. The BOAs were included due to their ecological values, extensive areas of well-connected woodland and proximity to existing conservation areas. The EPBC Matters of National Significance (MNES) for Libertus, Ulan 18, Clarke and Clifford BOAs have been summarised below in Table 7 with relevant EPBC figures provided in Appendix I.

Further detail including vegetation communities and key management works of the individual BOAs within this cluster are provided in the Ulan 18 BOA Cluster Management Plan (Appendix D), with consolidated offset outcomes described in Section 4.4.

Table 7: Ulan 18 BOA Cluster MNES Summary

Aspect	BC Act Status	EPBC Act Status	Clarke	Clifford	Libertus	Ulan 18
White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and Derived Native Grassland	EEC	CEEC	✗	✓	✓	✓
Large-eared Pied Bat (*Chalinolobus dwyeri)*	V	V	✓	✓	✓	✓
South-eastern Long-eared Bat *(Nyctophilus corbeni)*	V	V	✓	✓	✓	✓
Regent Honeyeater *(Anthochaera phrygia)*	CE	CE	✓	✓	✓	✓
Swift Parrot *(Lathamus discolor)*	E	CE	✓	✓	✓	✓
Spotted-tailed Quoll (*Dasyurus maculatus maculatus)*	V	E	✓	✓	✓	✓
Koala *(Phascolarctos cinereus)*	V	V	✓	✓	N/A	N/A

4.3.5 Dexter Mountain BOA Cluster

The Dexter Mountain BOA Cluster is located within the Sydney Basin Bioregion and consists of the Area 3 (Property 6 – Dexter Mountain) and Property 5. The cluster has a total offset area of 508 ha and is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

The Environmental Assessment Report (Wells Environmental Services, 2006) completed as part of the Stage 1 Project Approval (05_0117) recognised the locality of Area 3 with the Area included as part of the offset strategy in the Modification 7 assessment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 1 Mod 9 and EPBC 2013/6926 Biodiversity Offset Strategy incorporating Property 5 is

provided in the *Moolarben Coal Project Stage 1 Optimisation Modification Ecological Assessment* (EMM, 2013) and *Moolarben Coal Project Stage 1 – Optimisation Modification Project Biodiversity Offset Strategy and Proposed Offset Package* (ELA, 2013) with additional detail relating to EPBC 2013/6926 provided in *Moolarben Coal Project Stage 1 Optimisation Modification - Preliminary Documentation (EPBC 2013/6926) Appendix C Threatened Species Habitat and Community Condition and EPBC Offset Calculator Tool Inputs and Results* (ELA, 2014).

Area 3 and Property 5 form part of the Stage 1, EPBC 2007/3297 and 2013/6926 Biodiversity Offset Strategies. These BOAs were included due to their ecological values, ability to create linkages to enhance biodiversity and proximity to existing conservation areas. The EPBC Matters of National Significance (MNES) for these BOAs have been summarised in Table 8 with relevant EPBC figures provided in Appendix I.

Further detail including vegetation communities and key management works of the individual BOAs within this cluster are provided in the Dexter Mountain BOA Cluster Management Plan (Appendix E), with consolidated offset outcomes described in Section 4.4.

Table 8: Dexter Mountain BOA Cluster MNES Summary

Aspect	BC Act Status	EPBC Act Status	Area 3 (Dexter Mountain)	Property 5
White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and Derived Native Grassland	EEC	CEEC	✓	✓
Large-eared Pied Bat (*Chalinolobus dwyeri)*	V	V	×	✓
South-eastern Long-eared Bat *(Nyctophilus corbeni)*	V	V	×	✓
Regent Honeyeater *(Anthochaera phrygia)*	CE	CE	×	✓
Swift Parrot *(Lathamus discolor)*	E	CE	×	✓
Spotted-tailed Quoll *(Dasyurus maculatus maculatus)*	V	E	×	✓
Koala *(Phascolarctos cinereus)*	V	V	×	✓

4.3.6 Onsite BOA Cluster

The Onsite BOA Cluster is located in the Sydney Basin Bioregion and includes the Onsite BOA. The cluster has a total offset area of 471 ha and is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy incorporating the Onsite BOA is provided in the *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy* (Cumberland Ecology, 2012),

*Moolarben Stage 2 Offset Strategy – Summary (*Cumberland Ecology 2012) and *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy Additional Fauna and Flora Surveys (*Cumberland Ecology, 2014).

The Onsite BOA forms part of the Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy. This BOA was included due to its ecological values and proximity to the Munghorn Gap Nature Reserve. The EPBC Matters of National Significance (MNES) for this BOA have been summarised in Table 9 with relevant EPBC figures provided in Appendix I.

Further detail including vegetation communities and key management works within this cluster are provided in the Onsite BOA Cluster Management Plan (Appendix F), with consolidated offset outcomes described in Section 4.4.

Table 9: Onsite BOA Cluster MNES Summary

Aspect	BC Act Status	EPBC Act Status	On-site
White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and Derived Native Grassland	EEC	CEEC	✓
Large-eared Pied Bat *(Chalinolobus dwyeri)*	V	V	✓
South-eastern Long-eared Bat *(Nyctophilus corbeni)*	V	V	✓
Regent Honeyeater *(Anthochaera phrygia)*	CE	CE	✓
Swift Parrot *(Lathamus discolor)*	E	CE	✓
Spotted-tailed Quoll *(Dasyurus maculatus maculatus)*	V	E	✓
Koala *(Phascolarctos cinereus)*	V	V	N/A

4.3.7 Moolarmoo BOA Cluster

The Moolarmoo BOA Cluster consists of the Moolarmoo BOA and has a total offset area of 44 ha. The cluster is located in the north-west corner of the Sydney Basin Bioregion at the western end of the Hunter Valley and within the upper Goulburn River catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 1 Mod 9 Biodiversity Offset Strategy incorporating Moolarmoo is provided in the *Moolarben Coal Project Stage 1 Optimisation Modification Ecological Assessment* (EMM, 2013) and *Moolarben Coal Project Stage 1 – Optimisation Modification Project Biodiversity Offset Strategy and Proposed Offset Package* (ELA, 2013).

The Moolarmoo BOA forms part of the Stage 1 Biodiversity Offset Strategy. This BOA was included due to the ecological values of the area and proximity to adjacent native forest and the Munghorn Gap Nature Reserve. Further detail including vegetation communities and key management works within

this cluster are provided in the Moolarmoo BOA Cluster Management Plan (Appendix G), with consolidated offset outcomes described in Section 4.4.

4.3.8 Dun Dun BOA Cluster

The Dun Dun BOA Cluster, located within the NSW South West Slopes Bioregion, consists of the Dun Dun East and Dun Dun West. The cluster has a total offset area of 2735 ha and is within the Macquarie-Bogan catchment.

A detailed description including flora and fauna surveys, and mapping of vegetation communities of the approved Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy incorporating the Dun Dun BOAs is provided in the *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy* (Cumberland Ecology 2012), *Moolarben Stage 2 Offset Strategy – Summary (*Cumberland Ecology, 2012) and *Moolarben Coal Project Stage 2 Biodiversity Offset Strategy Additional Fauna and Flora Surveys* (Cumberland Ecology, 2014).

The Dun Dun BOAs form part of the Stage 2 and EPBC 2008/4444 Biodiversity Offset Strategy. These BOAs were included due to their ecological values and size. The EPBC Matters of National Significance (MNES) for Dun Dun East and Dun Dun West BOAs have been summarised below in Table 10 with relevant EPBC figures provided in Appendix I.

Further detail including vegetation communities and key management works within this cluster are provided in the Dun Dun BOA Cluster Management Plan (Appendix H), with consolidated offset outcomes described in Section 4.4.

Table 10: Dun Dun BOA Cluster MNES Summary

Aspect	BC Act Status	EPBC Act Status	Dun Dun East	Dun Dun West
White Box - Yellow Box - Blakey's Red Gum Grassy Woodland and Derived Native Grassland	EEC	CEEC	✓	✓
Aspect	**BC Act Status**	**EPBC Act Status**	**Dun Dun East**	**Dun Dun West**
Large-eared Pied Bat *(Chalinolobus dwyeri)*	V	V	✓	✓
South-eastern Long-eared Bat *(Nyctophilus corbeni)*	V	V	✓	✓
Regent Honeyeater *(Anthochaera phrygia)*	CE	CE	✓	✓
Swift Parrot *(Lathamus discolor)*	E	CE	✓	✓
Spotted-tailed Quoll (*Dasyurus maculatus maculatus)*	V	E	✓	✓
Koala *(Phascolarctos cinereus)*	V	V	×	×

4.4 BIODIVERSITY OFFSET AREA OUTCOMES AND COMPLETION CRITERIA

MCO is required to satisfy several conditions relating to outcomes of biodiversity offsets across the NSW Stage 1 Project Approval (05_0117), Stage 2 Project Approval (08_0135) and four Commonwealth approvals (EPBC 2007/3297, EPBC 2008/4444, EPBC 2013/6926 and EPBC 2017/7974). Although the wording of these conditions differ slightly between each of the approvals, they often refer to the same outcome and in turn, have the same performance and completion criteria. As such, these offset outcomes have been consolidated and grouped to allow consistent terms to be used in this BOMP. Table 11 outlines the three key groupings of the Consolidated Offset Outcomes for the BOAs.

Table 11: Consolidated Offset Outcomes

Consolidated Offset Outcome	Offset Outcomes Required in State and Commonwealth Approvals*
Enhance Existing Vegetation	• ***enhance*** and conserve Box Gum Woodland EEC.[1, 2] • ***enhance*** and conserve existing native vegetation.[1, 3,] • ***enhance*** existing vegetation (native vegetation).[1, 2, 6] • ***enhance*** existing vegetation (Box Gum Woodland EEC).[1, 2] • ***improve*** ecological communities.[4, 5]
Revegetate/Regenerate	• ***revegetate*** disturbed land to Box Gum Woodland EEC.[1, 3] • ***revegetate*** cleared land to native vegetation.[1, 3] • ***regenerate*** existing grassland to forest/woodland.[2] • detail ***revegetation and regeneration*** strategies on the offset areas.[4, 5]
Conserve Native Vegetation	• **conserve** Box Gum Woodland EEC.[1] • enhance and ***conserve*** Box Gum Woodland EEC. [1, 2] • enhance and ***conserve*** existing native vegetation. [1, 3] • ***secure*** the lands identified as the *Offset Areas*.[4, 5, 6] • provide appropriate long-term ***security*** for the offset areas.[1, 2] • ***protect*** these offset areas from development in the long term.[3] • ***transfer*** 130 ha of Box Gum Woodland EEC to the National Parks Estate.[3]

*Note: bold text indicates terms within State and Commonwealth Approvals relating to the consolidated offset outcomes.

1 NSW Stage 1 – (05_0117)
2 NSW Stage 2 – (08_0135)
3 EPBC Stage 1 – EPBC 2007/3297
4 EPBC Stage 1 (MOD 9) – EPBC 2013/6926
5 EPBC Stage 2 – EPBC 2008/4444
6 EPBC Stage 1 (MOD 15) - EPBC 2017 / 7974

The terms used in the above Consolidated Offset Outcomes will herein be used in this BOMP to describe performance indicators and completion criteria for the BOAs. For Enhance Existing Vegetation and Revegetate / Regenerate Consolidated Offset Outcome, performance indicators and completion criteria have been developed and categorised according to the target broad native vegetation type or vegetation community required by the State and Commonwealth Approvals to be enhanced or revegetated/regenerated or conserved.

Table 12 details the performance indicators and completion criteria for each target vegetation category associated with these two Consolidated Offset Outcomes groups. For clarity, Table 12 is structured as follows:

1. Consolidated Offset Outcome 1 – Enhance Existing Vegetation
    a. Native Vegetation: *Woodland / Forest*
    a. Derived Native Grassland: *Woodland / Forest Native Vegetation*
    b. Box Gum Woodland EEC: *Woodland Form*
    b. Box Gum Woodland EEC: *Derived Native Grassland Form*
2. Consolidated Offset Outcome 2 – Revegetate / Regenerate
    a. Cleared land to Native Vegetation
    b. Disturbed land to Box Gum Woodland EEC
    c. Existing Grassland to Forest / Woodland

As the native vegetation (including Box Gum Woodland EEC) broadly includes areas of woodland/forest as well as derived native grasslands (DNG), performance indicators and completion criteria differ between the two vegetation forms. As such, performance indicators and completion criteria have been developed for each vegetation form (e.g. Woodland/Forest Form and DNG form). Footnotes have been included in Table 12 where relevant to provide further descriptions of specific terminology.

Table 12 also includes management triggers for each performance indicator and completion criteria which are based on the risks and contingency measures as described in Section 4.7. Should the management triggers listed in Table 12 be realised, then the following contingency measures will be implemented (where applicable):

- Investigate and identify the causes of the management trigger and as appropriate:
    - increase frequency of monitoring of affected areas; and
    - develop and implement strategies to correct the cause of the management trigger (e.g. additional targeted HTE and vertebrate pest management); and
    - conduct supplementary planting with direct seeding and / or tube stock
    - review and revise BOA Cluster Management Plan Conservation Actions and Monitoring Schedules to implement and monitor the effectiveness of corrective actions.

Contingency measures are additional to on-going adaptive management.

Table 12: BOA Consolidated Offset Outcomes with Performance Indicators and Completion Criteria

Offset Outcome		Performance Indicator	Management Trigger	Completion Criteria
1. Enhance Existing Vegetation	**a) Native Vegetation:** *Woodland/ Forest*	At 6 yearly intervals, commencing in 2022, the dominant tree species of existing Woodland/Forest Native Vegetation communities are healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate that dominant native tree species are not healthy and/or have not developed by comparison to the previous interval.	By 31 December 2065[#], natural regeneration of dominant native trees species in existing Woodland/Forest Native vegetation is healthy and developing[1], as demonstrated by: ○ the structure of dominant native tree species is multigenerational and represents multiple regeneration events; and ○ dominant native tree species are flowering and seeding.
	a) Native Vegetation: *Derived Native Grassland form*	At 3 yearly intervals, commencing in 2022, natural and/or assisted regeneration of overstorey species within existing native grassland areas is occurring, and the overstory species are healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate that dominant native tree species are not healthy and/or have not developed by comparison to the previous interval.	By 31 December 2065[#], natural and / or assisted regeneration of overstory species is capable of providing habitat (foraging and / or roosting) for woodland birds and bats, and is healthy and developing[1], as demonstrated by: ○ the overstory structure is multigenerational and represents multiple regeneration events; and ○ overstory species are flowering and seeding
	b) Box Gum Woodland EEC:	At 6 yearly intervals, commencing in 2022, % shrub cover is trending to less than 30%.	Monitoring results indicate that shrub cover is not trending to less than 30%.	By 31 December 2065[#], shrub cover has been maintained below 30% (Excluding areas of like for like EEC offsets under the NSW Project Approval).

Offset Outcome		Performance Indicator	Management Trigger	Completion Criteria
	Woodland form	At 6 yearly intervals, commencing in 2022: • Box Gum Woodland overstorey species are healthy and developing[1] by comparison to the previous interval; and • shrub and groundcover species that are representative of Box Gum Woodland EEC (or like for like vegetation community[4]) are healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate that Box Gum Woodland overstory species and representative shrub and groundcover species are not healthy and/or have not developed by comparison to the previous interval.	By 31 December 2065[#], natural regeneration of Box Gum Woodland overstory species and representative shrub and groundcover species is healthy and developing[1], as demonstrated by: • vegetation structure is multigenerational and represents multiple regeneration events; and • overstory, shrub and groundcover species are flowering and seeding.
	b) Box Gum Woodland EEC: *Derived Native Grassland form*	At 3 yearly intervals, commencing in 2022, natural and / or assisted regeneration of overstorey species within existing Box Gum Woodland EEC Derived Native Grassland areas is occurring, and the overstory species are healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate that: ○ overstory species are not naturally regenerating; and/or ○ are not healthy and/or have not developed by comparison to the previous interval.	By 31 December 2065[#], natural and or assisted regeneration of Box Gum Woodland overstory species and representative shrub and groundcover species is healthy and developing[1], as demonstrated by: • vegetation structure is multigenerational and represents multiple regeneration events; and • overstory, shrub and groundcover species are flowering and seeding and, • areas are capable of providing habitat (e.g. foraging and/or roosting) for woodland birds and bats.

Offset Outcome		Performance Indicator	Management Trigger	Completion Criteria
		At 3 yearly intervals, commencing in 2022, shrub cover % is trending downwards towards 30%.	Monitoring results indicate that shrub cover is not trending downward toward 30%.	Shrub cover does not exceed 30% (excluding like for like vegetation communities).
2. Revegetate / Regenerate	**a) Cleared land to Native Vegetation**	Within 18 months of planting, survival rates are no less than 80%.	At 18 months from planting, survival rates are less than 80%.	By 31 December 2065[#], areas vegetated to native vegetation: • comprise native vegetation communities that are characteristic of the target vegetation communities in the applicable Assisted Regeneration Planting Plan; and • include Regent Honeyeater and Swift Parrot and Koala feed trees[2, 3]; and • are self-sustaining as demonstrated by evidence of flowering/seed set and seeding/sapling growth; and • are capable of providing habitat (foraging and/or roosting) for woodland birds and bats.
		At 6 yearly intervals, commencing in 2022, revegetated native vegetation is healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate revegetated native vegetation is not healthy and/or has not developed by comparison to the previous interval.	
	b) Existing grassland to Woodland / Forest	Within 18 months of planting, survival rates are no less than 80%.	Within 18 months of planting, survival rates are no less than 80%.	By 31 December 2065[#], grassland areas vegetated to forest/woodland communities: • comprise native vegetation communities that are characteristic of the target vegetation communities in the applicable Assisted Regeneration Planting Plan; and • include Regent Honeyeater and Swift Parrot and Koala feed trees[2, 3]; and
		At 6 yearly intervals, commencing in 2022: ○ revegetated forest/woodland communities within former grassland areas is healthy and developing[1] by comparison to the previous interval; and	Monitoring results indicate: ○ revegetated forest/woodland communities within former grassland areas is not healthy and/or has not developed by comparison to the previous interval; and	

Offset Outcome		Performance Indicator	Management Trigger	Completion Criteria
		○ key mid-storey and overstorey species of each targeted forest/woodland community are present.	○ the absence of key mid-storey and overstorey species of each targeted forest/woodland community	• are self-sustaining as demonstrated by evidence of flowering/seed set, seeding/sapling growth; and • are capable of providing habitat (foraging and/or roosting) for woodland birds and bats.
	c) Disturbed land to Box Gum Woodland EEC	Within 18 months of planting, survival rates are no less than 80%.	At 18 months from planting, survival rates are less than 80%.	By 31 December 2065#, areas vegetated to native vegetation, areas revegetated to Box Gum Grassy woodland meet or are trending towards the criteria for a Box Gum Grassy Woodland ecological community listed under the EPBC Act, as described in the Commonwealth Department of the Environment and Heritage's (2006) *EPBC Act Policy Statements White Box-Yellow Box-Blakely's Red Gum grassy woodlands and derived native grasslands* flowchart.
		At 6 yearly intervals, commencing in 2022: ○ White Box, Yellow Box or Blakeley's Red Gum species and three to four native understory species (excluding grasses) as listed in the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community Species List* (DEH, 2006) are present; and ○ revegetated Box Gum Grassy Woodland vegetation is healthy and developing[1] by comparison to the previous interval.	Monitoring results indicate: ○ the absence of White Box, Yellow Box or Blakeley's Red Gum species and three to four native understory species (excluding grasses) as listed in the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community Species List* (DEH, 2006); and/or ○ the revegetated Box Gum Grassy Woodland is not healthy and/or has not developed by comparison to the previous interval.	

It should be noted that the long-term security mechanisms registered on the title of the offset area lands will endure beyond the expiry date of EPBC Approval 2008/4444 (i.e. 31 December 2065).

[1] Healthy and developing is a condition based on positive trending ecological monitoring data (or homogenous trending data for indicators that have reached desired condition) collected generally in accordance with the BioBanking Assessment Method (OEH 2014) and Biodiversity Assessment Method (OEH 2017b). Refer to Section 4.6.1 for further detail.

[2] Regent Honeyeater and Swift Parrot feed trees within relevant areas of the EPBC 2013/6926 and EPBC 2008/4444 Offsets.

[3] Koala feed trees within relevant areas of EPBC 2013/6926 Offsets.

[4] The approved NSW Stage 1 Project Approval includes like for like vegetation community offsets for White-box Yellow Box Grassy Woodland. In these cases, representative species of the like for like community are required.

4.4.1 Achievement of Completion Criteria

Following the achievement of all completion criteria associated with a specific area and/or offset, a report will be provided to the DPIE and/or DAWE which demonstrates the fulfilment of obligations and commitments for the relevant area.

Offset areas will continue to be managed beyond the satisfaction of the completion criteria in accordance with the security mechanism conditions and relevant BOMP revisions.

4.5 BIODIVERSITY OFFSET MANAGEMENT

4.5.1 Overview of Management

MCO have combined the managed BOAs into 7 BOA Clusters to minimise the administrative burden and improve management. Each of the 7 BOA Clusters has its own BOA Cluster Management Plan as described in Section 4.5.2. Within each cluster there are two management zones as described in Section 4.5.3 and conservation management actions targeted for each zone as described in Section 4.5.4.

4.5.2 BOA Cluster Management Plans

BOA Cluster Management Plans provide the management framework for a specific cluster of BOAs with the aim to conserve and enhance conservation values through the implementation of conservation management actions. These management plans describe the site context, offset outcomes, conservation management actions, monitoring and completion criteria for all BOAs covered by that specific cluster.

As described in Section 4.2, the offset areas transferred to the National Parks Estate or subject to a Conservation Agreement or BSA will not be captured within the BOA Cluster Management Plans.

4.5.3 Offset Management Zones

Two distinct zones of management based on pre-existing vegetation, habitat condition, and management needs have been identified for all BOAs. Each offset management (OM) zone has strategic management objectives which have informed the development of relevant conservation management actions necessary to enhance the overall ecological values in the long-term.

The management zones relevant to each of the BOA cluster are provided in the respective BOA Cluster Management Plans. A description of the conservation management actions applicable to each zone is provided below.

As described in Section 4.2, the offset areas transferred to the National Parks Estate or subject to a Conservation Agreement or BSA will not be subject to the management zones or management measures described in this section.

4.5.3.1 Offset Management Zone 1 (OM Z1)

Offset Management Zone 1 (OM Z1) is characterised by intact vegetation in generally good condition. The primary management objective of OM Z1 is to enhance existing vegetation by maintaining vegetation structure and species diversity by managing threats.

Management actions of OM Zone 1 are:

- management of human access and disturbance through installation and maintenance of boundary fencing (where required), gates, locks and signage,
- exclusion of stock grazing (excluding strategic grazing),
- provide training or briefings to necessary personnel who are at risk of spreading pathogens and weeds,
- establishment or maintenance of fire breaks and/or access tracks,
- seed collection and propagation,
- implementation of targeted weed and pest management activities,
- environmental monitoring, and
- stabilising and remediating of eroding areas associated with tracks and historic farm dams.

4.5.3.2 Offset Management Zone 2 (OM Z2)

Offset Management Zone 2 (OM Z2) includes areas of native grassland, exotic grassland and previously cleared areas. The primary management objective of OM Z2 is to improve natural or assisted regeneration towards self-sustaining vegetation communities.

OM Z2 will be guided by two principles:

- natural regeneration management, and
- assisted natural regeneration/revegetation management.

Management actions of OM Z2 include:

- management of human access and disturbance through installation and maintenance of boundary fencing (where required), gates, locks and signage,
- exclusion of stock grazing (excluding strategic grazing),
- provide training or briefings to necessary personnel who are at risk of spreading pathogens and weeds,
- environmental monitoring,
- implementation of targeted weed and pest management activities to continue to encourage natural regeneration of vegetation,
- seed collection and propagation,
- direct seeding for re-establishment of native vegetation,

- stabilising and remediating of eroding areas associated with tracks and historic farm dams, and
- revegetation with tube stock planting to assist regeneration.

As vegetation communities within OM Z2 progress towards self-sustaining vegetation communities following natural and assisted regeneration/revegetation, corresponding management actions will evolve. As such, areas of OM Z2 may transition to OM Z1 and will be managed accordingly.

4.5.4 Conservation Management Actions

The following sections provide supporting context relevant to specific key management areas across all BOAs. Individual conservation management actions as they relate to a BOA (e.g. Heritage survey at Dun Dun, regeneration activities at Bobadeen) have been detailed further in their respective BOA Cluster Management Plans (see Section 4.5.2) (Appendices B to H).

Conservation management actions adopt passive and active restoration approaches to protect and enhance the biodiversity values across the BOAs. Passive restoration involves encouraging the natural regeneration of a plant community using minimal management intervention. These practices support the inherent resilience of the current plant communities. The following passive restoration techniques apply to the management of the BOAs:

- weed control,
- vertebrate pest control,
- management of access and stock,
- seed collection,
- retention of regrowth and remnant native vegetation, and
- erosion control.

Active restoration refers to direct land management interventions to restore areas that have demonstrated limited capacity to naturally regenerate. The following active restoration techniques apply to the BOAs:

- management of grazing for conservation (strategic grazing),
- management of fire for conservation,
- provision of naturally scarce habitat features, and
- assisted regeneration of vegetation communities.

These conservation management actions relate to undertaking specific tasks and monitoring for the continued protection, conservation and maintenance of the BOAs.

4.5.4.1 Weed Control

Weed control forms a critical part of enhancing the natural species composition, diversity and structure of the vegetation communities found across the BOAs. Weed control activities will focus on species that are priority weeds under the *Biosecurity Act 2015* and High Threat Exotic (HTE) species. Specific management controls implemented across the BOAs consider the recommended controls for individual weed species as outlined within the Department of Primary Industries, NSW WeedWise database (https://weeds.dpi.nsw.gov.au/) and will be guided by the Central Tablelands Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

Inspection programs are used to identify and update annual and reactive weed control schedules. Weed control treatments are conducted annually and as required by seasonal conditions that may promote excessive weed growth.

Weed management may incorporate a range of suitable control methods that include:

- Biological control,
- Herbicide control,
- Land management (including burning), and / or
- Manual control.

4.5.4.2 Vertebrate Pest Control

Pest animal control will be undertaken where vertebrate pest species threaten the enhancement of offset areas. Controls will be undertaken in consultation with the Local Land Services (LLS) (in accordance with the requirements of the *Biosecurity Act 2015*) and surrounding landowners as required.

Vertebrate pest control is undertaken as required based on property inspections and monitoring program observations and may include trapping, baiting and/or shooting.

4.5.4.3 *Phytophthora cinnamomi* Management

Phytophthora cinnamomi (*P. cinnamomi)* is a key threatening process listed under the EPBC Act and NSW legislation (DoEE, 2018). *P. cinnamomi* is a soil-borne plant pathogen that attacks the roots of susceptible plants, destroying the root system and reducing the ability of the plant to absorb water and nutrients (DoEE, 2018). This causes symptoms referred to as 'dieback' which can lead to plant death (DoEE, 2018).

To help prevent the inadvertent spread of this plant disease, MCO aim to:

- be aware of what plants look like when infected with *P. cinnamomi*,
- provide training or briefings to necessary personnel who are at risk of spreading pathogens and weeds,
- limit access to areas of BOAs and
- wash down equipment from known areas of infestation (DoE, 2015).

4.5.4.4 Access and Stock Management

Unauthorised access to the BOAs will be prohibited. This will reduce the risk of disturbance to vegetation and regenerating or revegetated areas, weed dispersal, fauna habitat disturbance, illegal firewood collection and illegal rubbish dumping. Measures will be implemented to limit access to these areas to authorised personnel only.

Livestock will be excluded from BOAs, except where used for strategic grazing to promote regeneration, control weeds, and reduce excessive fire fuel loads (Section 4.5.4.5).

Access tracks will be provided and maintained for management, monitoring and for fire management.

Access will be provided to third parties such as National Parks and Wildlife Service, Crown Lands and Easement holders in accordance with the relevant agreements.

4.5.4.5 Strategic Grazing

Strategic grazing is a management tool which may be used to promote regeneration, control weeds, and reduce excessive fire fuel loads within BOAs. If strategic grazing activities are to be conducted within the BOAs, a specific strategic grazing program will be developed in consultation with a suitably qualified person with experience in strategic grazing for controlling weeds, improving conservation values or reducing fire risk.

Specific grazing programs will adhere to the guiding principles outlined in *A Guide to Managing Box Gum Grassy Woodlands* (Rawlings et. al. 2010) which include:

- knowing the objective and keeping it simple (develop strategic grazing plan),
- managing for patchiness,
- avoiding grazing during flowering and seeding of targeted native species.
- maintaining average groundcover above 90%; and
- preventing grazing of seedlings.

4.5.4.6 Native Seed Collection and Propagation

If revegetation of a BOA is required, local seed (collected onsite and in surrounding areas) will be targeted for collection and use in seeding BOAs. Seed collection will occur in suitable areas when viable seed is available. Supplementation of seed supply with commercially available endemic species may be required when local seed is unavailable.

Where tube stock is required for revegetation works, it will be propagated from seed collected or purchased. Seed collected for tube stock propagation will be done by personnel who are experienced in the propagation of native species.

4.5.4.7 Fire Management

Fire management encompasses both bushfire management and fire for conservation. MCO will prepare a Bush Fire Management Plan (BFMP) in consultation with local Rural Fire Service (RFS) for BOAs which will outline bushfire controls and emergency response actions with consideration of MCO internal processes. The BFMP will be reviewed and updated where necessary to include any additional fire management procedures applicable to managing the BOAs.

Fire for conservation can influence plant species diversity and abundance, is a tool for biomass control and can complement strategic grazing (Rawlings et al, 2010). Key guiding factors should be considered when undertaking fire for conservation are the elements of a fire regime, managing for patchiness and landscape context (Rawlings et at, 2010). Should a prescribed burn be conducted on BOAs a specific conservation burn plan developed in consultation with a suitably qualified person with experience in fire management for conservation. Planned burns may be undertaken in conjunction with the NPWS or other adjacent landholders. Conservation burn plans will consider the desired fire regime, constraints and conditions at the time of the proposed burn.

4.5.4.8 Waste Management

Waste will be removed from identified areas within the BOAs, including any waste generated as part of the conservation management works. Waste may include internal fences for removal, remnant waste from prior landowners and waste generated from management works, such as packaging, containers and general rubbish.

4.5.4.9 Heritage Management

All BOAs which are within the Moolarben Coal Complex Project Approval footprint being the Onsite BOA Area 2 (Moolarben - UG4) and Area 1 (Red Hills), are subject to the Moolarben complex-wide Heritage Management Plan (HMP). The Moolarben complex-wide HMP has been developed to manage Aboriginal and historic heritage across the Moolarben Coal Complex and outlines the management processes and mitigation measures across the site, consistent with the requirements of the Stage 1 and Stage 2 Project Approvals.

A number of Aboriginal cultural surveys and assessments have previously been undertaken across the Moolarben Coal Complex and surrounding areas. MCO has established and maintains an Aboriginal Archaeological Sites Database. The database is based on the archaeological surveys and assessments undertaken at the Moolarben Coal Complex including within some BOAs.

For BOAs outside of the Moolarben Coal Complex Project Approval footprint where conservation management actions or other approved activities (Section 4.5.6) may result in ground disturbance, MCO will exercise due diligence in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water NSW, 2010).

4.5.4.10 Habitat Features

The BOAs include extensive areas of remnant vegetation with large numbers of habitat features. BOA regeneration areas will be assessed to identified areas with a scarcity of natural habitat features for Spotted-tailed Quoll (Dasyurus maculatus maculatus), threatened bird species and microbats. Supplementary habitat features will be guided by the outcomes of the assessment of scarcity and included the BOA Cluster Management Plans.

4.5.4.11 Assisted Regeneration/Revegetation

Assisted regeneration/revegetation works will be undertaken within the OM Z2 areas of the BOAs to complement the natural regeneration already present. OM Z2 will generally be regenerated to a combination of White Box Yellow Box Blakely's Red Gum Woodland and White Box Yellow Box Blakely's Reg Gum Grassy Woodland and native vegetation consistent with the consolidate offsets outcome for the location.

Assisted regeneration works include a combination of direct seeding and plantings to support natural regeneration. Methods and timing will be varied dependent on conditions including climatic influences site conditions and progression of natural regeneration.

Assisted regeneration planting plans will be progressively developed for each of the relevant BOAs which aligns with the 2 (c) Consolidated Offset Outcomes requirement (being revegetate / regenerate existing grassland to forest / woodland). Planting plans will identify additional areas where assisted regeneration works will occur and the targeted species.

Planting plans will be reviewed based on monitoring results and climatic conditions and adapted as appropriate. 18 months after planting a post planting survival assessment will be completed and where survival rates are less than 80%, supplementary planting will be undertaken. Supplementary planting will provide an allowance for later natural thinning and senescence.

4.5.5 Remedial Actions

Should it be recognised through monitoring that the offsets are not trending towards performance indicators and completion criteria, adaptative management will be adopted. The conservation management actions for the BOAs will be reviewed and remedial works will be undertaken as required for the specific circumstances. Remedial actions may include:

- additional targeted monitoring,
- seeking input from a suitably qualified person or organisation,
- review of physical security measures,
- implement additional targeted weed and pest control measures,
- amendment to/extension of assisted regeneration programs, and / or
- review and revision (where required) of the BOMP (Section 6.0).

4.5.6 Other Approved Activities

A portion of the approved BOAs are also subject to approved impacts associated with existing mining tenements, easements or approved areas of impact. As such, these activities will continue to be conducted in the BOAs. These activities may include:

- operation, maintenance or repair of infrastructure and easements (e.g. maintenance of safe clearance zones around powerlines, NSW National Parks and Wildlife Easements for Access),
- environmental monitoring (e.g. undertaking environmental monitoring surveys and studies, installation and maintenance of groundwater bores, installation and maintenance surface water sampling locations or management infrastructure).
- carrying out bushfire management works (e.g. establishment or maintenance of fire breaks, access tracks etc.),
- approved impacts and remediation work (e.g. approved underground mining subsidence impact to Onsite and Area 2 (Moolarben) UG4 BOAs including subsidence monitoring and remediation works),
- prospecting operations within mining or exploration tenements (including drilling),
- installation or maintenance of stock proof and boundary fences, and
- rehabilitation or remediation required in respect of the above activities.

Any vegetation clearance which may be required with regards to the above listed activities will be kept to a practical minimum and comply with any approval constraints associated with that activity and (where able) adhere to the Moolarben Coal Complex Biodiversity Management Approach outlined in Section 3.8.

4.6 BIODIVERSITY OFFSET MONITORING PROGRAM

The BOA monitoring program associated with the BOAs is designed to support conservation actions and evaluate outcomes against performance indicators and completion criteria for each of the consolidated offset outcomes. Monitoring includes ecological monitoring (flora and fauna), aerial imagery, property inspections and post event inspections. The monitoring program assists with the adaptive management approach to achieving the required objectives.

Monitoring methodologies are provided in this section, with further detail and demonstration of linkages to conservation management actions and completion criteria provided in the individual BOA Cluster Management Plans.

BOA ecological monitoring (flora and fauna) is conducted to assess the change in vegetation condition over time, inform conservation management actions and the scope and frequency of monitoring required in successive years for the specific BOA areas (Sections 4.6.1 and 4.6.2). Flora and fauna monitoring will be undertaken by suitability qualified and experienced personnel. Aerial imagery will be used to record vegetation over a broad scale and timeframe (Section 4.6.3). Property and opportunistic inspections of BOAs will be carried out to detect other factors that may be contributing to vegetation and land disturbance in these areas and inform conservation management actions (Section 4.5.4). Additional monitoring will be undertaken follow events such as bushfires and floods (Section 4.6.6).

If the monitoring program identifies required changes to the scope and frequency of monitoring, the findings will be reported in the annual report (Section 5.2) and included in subsequent revisions of this BOMP. The BOA Cluster Management Plans do not require formal approval to enable revisions to the cluster specific monitoring programs.

4.6.1 Flora Monitoring

Flora monitoring will be focused on identifying evidence of natural regeneration and assisted regeneration/revegetation and self-sustaining vegetation communities. Monitoring will include plots with transects undertaken generally in accordance with the BioBanking Assessment Method (OEH 2014c) and Biodiversity Assessment Method (OEH 2020), with additional data also recorded as required to address the completion criteria relevant to each consolidated offset outcome.

Floristic monitoring will be undertaken in permanent plots that have been set (or will be established) based on the consolidated offset outcomes. Table 13 provides the flora monitoring program and frequency.

Table 13: Flora Monitoring Summary

Method	Detail	Frequency / Extent

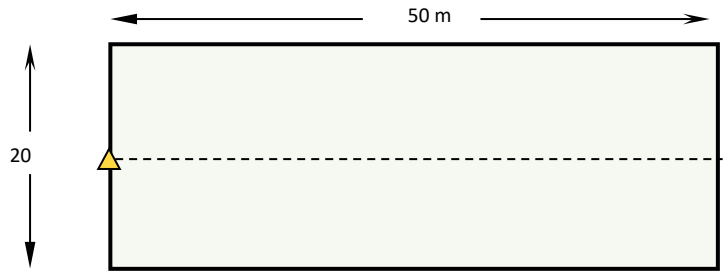
Monitoring Plot	• 50 m x 20 m plot (Figure 8)[1].
	• one 50 m transect running through the centre of the 50 m x 20 m plot (Figure 8)[1].
	• Marking start and end of the 50m transect with GPS coordinates.[2]
	• Photo monitoring taken from the start of the 50 m transect.[2]
	• Collection of Biometric data within the 50 m x 20 m plot including:
	  ○ cover of native tree, mid-storey and groundcover stratum and exotic species, including HTE species;
	  ○ stem size class;
	  ○ percentage of bare ground, litter, rocks, cryptograms.[1, 3]
	• Additional recording of observations of:
	  ○ vegetation regeneration;
	  ○ flowering and seeding;
	  ○ feed trees; and
	  ○ other aspects including vertebrate pest presence.
		Frequency of monitoring and number of monitoring plots as per specific BOA Cluster Management Plan

[1] Generally in accordance with Biodiversity Assessment Method (DPIE, 2020).

[2] Generally in accordance with Biodiversity Conservation Trust Ecological Monitoring Manual (Biodiversity Conservation Trust, 2020).

[3] Generally in accordance with BioBanking Assessment Methodology (OEH, 2014c).

Figure 8 Plot Design



(△ photo monitoring point, ---------- Transect)

4.6.2 Fauna Monitoring

Fauna monitoring will be undertaken to target key fauna indicator species. Trends in species diversity and numbers assist demonstrating a trajectory towards self-sustaining vegetation communities and the transition of derived native grasslands to woodland communities. Although fauna monitoring will be undertaken, the occurrence of fauna species will not be used to indicate success at the offset.

Birds and microbats are regularly a focus of monitoring surveys and are analysed as an indicator of the development or persistence of habitat structure. Analysis will be undertaken at the species level and for the total assemblage of bird and bat species recorded within the BOAs during monitoring. This analysis is intended to demonstrate the transition of open/DNG areas to woodland/forest areas within the BOAs; providing addition evidence of the achievement of relevant consolidated offset outcomes.

Fauna monitoring methods will be consistent with industry standards, scientifically robust and repeatable for future programs. All fauna monitoring locations will be established based on the consolidated offset outcomes.

Table 14 provides the minimum fauna survey methods to be applied in the monitoring.

Table 14: Fauna Monitoring Methods

Method	Detail	Frequency
Bat detection	Anabat recordings to identify microbat species occurring on site. 2 nights at each site.	As per specific BOA Cluster Management Plan
Bird survey	Timed, fixed area surveys for diurnal birds, observing and listening. 2 surveys per site (AM and PM).	As per specific BOA Cluster Management Plan

The results of monitoring will be analysed, comparing progression towards performance indicators and completion criteria with previous results. A summary of monitoring result will be reported in accordance with Section 5.0.

4.6.3 Aerial Imagery

Aerial imagery will be captured to record the changes in vegetation over a broad scale and timeframe. Analysis of the imagery will include progresses of plantings and natural regeneration including representative transects reviewed to assess the extent of DNG and woodland communities.

4.6.4 Property Inspections

Property inspections of BOA Clusters will be undertaken biannually and in response to bushfires or other climatic events to inform conservation management actions. Monitoring will include:

- BOA gate and fencing condition,
- track and fire trail condition,
- presence of rogue stock,
- erosion,
- evidence of unauthorised access (E.g. collection of firewood, hunting, waste dumping etc.),
- grazing pressure of vertebrate pest species, and
- opportunistic observations of pest and weed presence.

4.6.5 Opportunistic Observations

In addition to the biannual property inspections, opportunistic observations of the BOAs will be undertaken by MCO personnel multiple when implementing the various conservation management actions. For example, observations would be undertaken during implementation of weed and pest control campaigns; fire trail and fire break maintenance campaigns; and boundary fence inspections; and when assisting specialists conduct the ecological monitoring program.

4.6.6 Post Event Inspections

In the event of an unplanned major natural event (i.e. bushfire, flood, disease outbreak etc.) an assessment of impacted areas will be undertaken. Detail of the inspection/monitoring will be developed based on nature of event. The assessment will be used to determine appropriate responses. Post assessment conservation management actions may include:

- review and revision (where necessary) of monitoring of the area,
- supplementary planting via direct seeding and / or tube stock planting as required,
- targeted weed control measure, and / or
- property maintenance.

4.7 RISKS & CONTINGENCY MEASURES

This section describes the potential risks to the successful implementation of this BOMP and to provide a description of the controls and contingency measures that would be implemented to mitigate these risks.

MCO's biodiversity offset management program incorporates consideration of unpredicted impacts. MCO has undertaken a qualitative risk assessment to assess the potential consequences of unpredicted impacts to the BOAs.

The methodology used for the risk assessment was in accordance with MCO's Risk Management Standard, which follows the general principles of ISO 31000:2009 Risk Management (Standards Australia), including:

- establish the context for the risk assessment process,
- identify risks and potential impact,
- analyse risks, and
- evaluate risks to determine the necessary controls for mitigation.

Table 15 outlines the key identified potential risks to successful implementation of the plan, control measures that mitigate these risks and contingencies measures. An assumption that experienced and qualified personnel are undertaking the works onsite and in BOAs has been applied to the entire risk assessment. Additionally, an adaptive management approach will be used to allow for implementing a mitigation measure while learning which measure is most effective in achieving the required outcome of controlling the risk.

Risks outlined in Table 15 consider the Consolidated Offset Outcomes (i.e. to enhance, revegetate / regenerate and conserve) (Table 11) and the associated performance indicators and completion criteria (Table 12) as outlined in Section 4.4

In addition to contingency measures specified in Table 15, the following will be implemented when any trigger is realised:

- Conduct the following as required/informed by routine monitoring/post event inspections/routine property inspections:
    - review and revise (if necessary) frequency of monitoring of the affected area;
    - supplementary planting via direct seeding and / or tube stock planting;
    - property maintenance (e.g. fix fences/gates damaged by bushfire).
    - Extend regeneration program timeframe for affected areas
- Review and revise (if required), individual BOA Cluster Management Plan Conservation Actions and Monitoring Schedule.

Table 15: Biodiversity Offset Areas Risk Source, Controls and Identified Risk Level

Objective	Risk(s)	Management Measures	Triggers for Contingency action	Contingency Measures
Protect existing important areas of identified threatened species and habitat, enhance flora and fauna habitats within the BOAs.	Degradation / loss of native vegetation due to uncontrolled bushfire, severe and/or prolonged drought, major storm events, frost events, disease and/or insect attack.	• Bush Fire Management Plan prepared in consultation with local RFS for BOAs, with management and response to follow MCO internal processes. • (When required) Conservation burns for hazard reduction, including low intensity low level mosaic burning or strategic grazing. • Monitoring of BOAs including property and post event inspections. • Adaptive management of planting process considering climatic conditions including scheduling of assisted regeneration works to avoid drought periods.	• Loss of remnant, revegetated or regenerating vegetation. • Failed revegetation/regeneration due to stochastic events. • Ecological monitoring program results indicate the affected area is unlikely to recover naturally from prolonged drought or fire damage. • Monitoring results indicate performance indicator(s) at table 12 are not achieved/have not been maintained. • Increased active erosion.	• Conduct post event inspection of affected areas to assess severity of damage to area and requirement for intervention measures. • Seek advice from suitably qualified person and/or Local Land Services (LLS). • Foraging and/or roosting
Improve the ecological value of the land in the BOA in the medium to long-term.	Suppression of revegetation/ regeneration due to increased HTE species infestations resulting from: - failure to adequately control existing infestations on-site; or - unauthorized/uncontrolled access; and - incursions from adjacent properties.	• HTE monitoring and control program. • Visual inspections/cleaning of vehicles entering sensitive areas to mitigate risk of HTE and priority species dispersal. • Restricted access in BOAs. • Limit traffic to designated tracks throughout BOAs.	• Monitoring results indicate performance indicator(s) at table 12 are not achieved/have not been maintained and HTE species are identified as a cause. • At 2026 cover (%) is greater than or equal to 66% HTE species at any monitoring site. • At 2031 cover (%) is greater than or equal to 33% HTE species at any monitoring site. • At 2065 cover (%) is greater than or equal to 15% HTE species at any monitoring site.	Additional targeted HTE species control measures.
	Vertebrate pest species prejudice attainment of performance indicators and/or completion criteria.	• Targeted vertebrate pest control program. • Participation in regional control programs in consultation with Local Land Services (LLS).	• Loss of remnant, revegetated or regenerating vegetation. • Failure of revegetation/regeneration due to grazing pressure. • Monitoring results indicate performance indicator(s) at table 12 are not achieved/have not been maintained and vertebrate pests are identified as a cause. • Presence of rogue stock in BOAs • Damage to stock exclusion fencing	• Use of grazing deterrents such as plant tubes to protect seedlings. • Targeted vertebrate pest species control programs. • Removal of rogue stock. • Fenceline integrity inspection to determine point of access • Repair or improve fencing as required.
	Degradation / loss of native vegetation due to overgrazing by stock.	• Fencing of BOAs to prevent stock entering BOA (excluding strategic grazing). • Active management of stock where strategic grazing implemented. • Management of native grazing pressure as required. • Monitoring of BOAs including property inspections.		
	Degradation / loss of native vegetation from unauthorised entry.	• Fencing and securing BOAs, with property inspections and maintenance program implemented. • Locked gates and signage at access points. • Limit traffic to designated tracks in BOA.	Unauthorised access to BOAs	• Review adequacy of security measures and access restrictions and revise/update if required. • Fenceline and gate integrity inspection to determine point of access.
Improve the ecological value of the land in the BOA in the medium to long-term.	Failure to meet performance targets and completion criteria relating to Box Gum Woodland (Table 12)	• Species list reflective of target vegetation community. • Use of local seed and/or seedlings as available. • Seed bank stock rotation. • Use of experienced/licensed seed propagating facility. • Maintain suppliers of seed for key native species. • Adaptive management of planting process considering monitoring results including supplementary planting as required.	• Delay to Assisted Regeneration Planting program. • Loss of remnant, revegetated or regenerating vegetation. • Evidence of revegetation/regeneration failure. • Monitoring results indicate performance indicator(s) at table 12 are not achieved/have not been maintained and species composition is identified as a cause.	Review and revision (if required) of species used for assisted regeneration.
	Failure to meet performance targets and completion criteria for threatened species habitat (Table 12).			
Improve the ecological value of the land in the BOA in the	Insufficient provision and allocation of resources including limited availability of contractors, specialists, consultants and/or equipment to undertake land management works.	• Establish and maintain up to date list of available vendors across multiple Yancoal sites. • Monitoring of BOAs.	Assisted Regeneration delayed greater than 2 years.	• Source additional suppliers or alternative specialists and / or consultants. • Extend regeneration program timeframe for affected areas.

Objective	Risk(s)	Management Measures	Triggers for Contingency action	Contingency Measures
medium to long-term.				
Protect existing important areas of identified threatened species and habitat, enhance flora and fauna habitats within the BOAs.	Unforeseen and unapproved impact to vegetation communities on the land above approved underground mines due to subsidence.	• Subsidence monitoring in accordance with approved management plans. • Subsidence predictions and impacts to BOA considered by existing approvals. • Existing list of available vendors across multiple Yancoal sites. • Adaptive management of planting process considering monitoring results including supplementary planting as required.	Assisted Regeneration delayed greater than 2 years.	• Remedial works associated with subsidence impacts undertaken in accordance with approved management plans (if required). • Extend regeneration program timeframe for affected areas.

5.0 REPORTING AND DOCUMENTATION REQUIREMENTS

5.1 ROLES AND RESPONSIBILITIES

Table 16 summarises key responsibilities of relevant site personnel relating to the implementation of this BOMP.

Table 16: BOMP Responsibilities

Position	Tasks
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 BOMP
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
	Provide training to all relevant employees and contractors in environmental awareness, legal responsibilities and land management methods.
	Restrict access to BOAs
	Oversee communication of conditions of approval to relevant site personnel and contractors
	Oversee implementation of the BOMP
	Oversee all regulatory reporting in relation to the BOMP
	Coordinate relevant reviews of the BOMP with input from suitably qualified and experience persons
Environment and Community Advisor	Coordinate implementation of the BOMP
	Coordinate regulatory reporting in relation to the BOMP
	Coordinate assisted regeneration/revegetation in BOAs
	Coordinate monitoring program for the BOAs
	Evaluate results of monitoring programs and longer trends and where appropriate recommend changes to monitoring and/or management
	Coordinate internal and external reporting on the performance of land management within BOAs
	Coordinate seed collection for revegetation works within the BOAs
	Coordinate weed and pest control programs within the BOAs
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

5.2 REPORTING

5.2.1 NSW 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 by 31 March each year or as otherwise agreed by the Secretary.

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 NSW Project Approvals (05_0117 and 08_0135, respectively) following approval by relevant government agencies.

5.2.2 NSW Reporting

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 (where relevant to the NSW Project Approvals):

- 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 MCO Environmental Management Strategy.

In accordance with Schedule 3 Condition 37 of the Stage 2 Project Approval (08_0135), MCO will at the request of OEH (now BCD) provide detailed vegetation mapping and survey data associated with its Stage 2 BOA lands to be conserved in perpetuity.

5.2.3 Commonwealth Compliance and Performance Reporting

A compliance report will be prepared as per Condition 10 of EPBC Approval 2008/4444 and Condition 21 of EPBC 2017/7974.

The Annual Commonwealth Compliance report will include reporting on the effectiveness of biodiversity offset management measures, and progress against the performance and completion criteria associated with EPBC Approval 2008/4444 offsets and will:

- Include a review of the monitoring results over the previous calendar year, which includes a comparison of these results against the:
    - Performance indicators and completion criteria, and
    - monitoring results of previous years.
- 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.

The Report will be published on the MCO website by 31 March for the preceding calendar year. Documentary evidence showing proof of the date of publication will be provided to the DAWE at the same time that the compliance report is published. In accordance with EPBC 2017/7974, Condition 21, sensitive ecological data will be excluded from compliance reports published on the website, and provided with a full compliance report to the DAWE within five business days of the publication.

5.2.4 Commonwealth Non-Compliance Reporting

In accordance with Commonwealth Approvals EPBC 2008/4444 Condition 11 and EPBC 2017/7974 Condition 22, MCO will notify the Department in writing of any non-compliance with the conditions or non-compliance with the commitments made in plans that relate to protected matters. The notification must be given no later than two business days after becoming aware of the non-compliance. The notification must specify:

a. the condition which is or may be in breach, and

b. a short description of the non-compliance.

In accordance with Commonwealth Approvals EPBC 2017/7974 Condition 23, MCO will provide to the Department the details of any non-compliance with the conditions or commitments made in plans that

relate to protected matters no later than ten business days after becoming aware of the non-compliance, specifying:

a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future,

b. the potential impacts of the non-compliance and

c. the method and timing of any remedial action that will be undertaken by the approval holder.

5.3 AUDITING

5.3.1 NSW Auditing

MCO is required to commission and pay the full cost of an Independent Environmental Audit, as specified in Condition 9, Schedule 5 of Stage 1 Project Approval (05_0117) and Condition 9, Schedule 6 of Project Approval (08_0135). The required timing of the Independent Environmental Audit is specified in Condition 9, Schedule 5 of Stage 1 Project Approval (05_0117) and Condition 9, Schedule 6 of Project Approval (08_0135) (unless the Secretary of the DPIE directs otherwise). The Independent Environmental Audit is to be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary of the DPIE. The Audit report is to submit to the Secretary, together with a response to any recommendations contained in the Audit in accordance with requirements of Condition 10, Schedule 5 of Stage 1 Project Approval (05_0117) and Condition 10, Schedule 6 of Project Approval (08_0135).

5.3.2 Commonwealth Auditing

In accordance with Condition 12 of EPBC 2008/4444 an independent audit against the relevant approval conditions must be undertaken upon the direction of the Commonwealth Minister for the Environment and a report submitted to the Minister. The independent auditor to be used is to be approved by the Minister for the Environment prior to the audit commencing. Audit criteria to be used will be agreed to by the Minster for the Environment and be audited against the criteria identified to the satisfaction of the Minister

In accordance with Condition 24 of EPBC 2017/7974, an independent audit of compliance with the relevant approval conditions must be conducted as requested in writing by the Commonwealth Minister for the Environment. In accordance with Condition 24 of EPBC 2017/7974, for each independent Audit, MCO will:

- provide the name and qualifications of the independent auditor and the draft audit criteria to the DAWE,
- only commence the Independent audit once the audit criteria have been approved in writing by the DAWE,

- submit an audit report to the DAWE within the timeframe specified in the approved audit criteria, and
- publish the audit report on the Moolarben Website within ten business days of receiving the DAWE approval of the audit report and keep the audit report published on the website until the end date of this approval.

5.4 RECORD KEEPING

MCO will maintain accurate records of all activities associated with the conditions of EPBC Approvals 2008/4444, and 2017/7974. Records to be kept include measures that have been taken to implement this BOMP.

In accordance with the condition of EPBC Approvals 2008/4444, and 2017/7974 MCO will make these records available to the DAWE when requested.

6.0 MANAGEMENT PLAN REVIEW AND PROCESS IMPROVEMENT

6.1 NSW REVIEWS AND REVISIONS

In accordance with Condition 5, Schedule 5 and Condition 5, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively) this BOMP 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.

The MCO Environment and Community Manager (or delegate) will be responsible for the implementation of the BOMP as well as the implementation of any revisions of the BOMP.

6.2 COMMONWEALTH REVIEWS AND REVISIONS

This BOMP will be reviewed and, where necessary, updated as required or following a request from the Commonwealth Minister of the Environment to update the BOMP.

MCO may revise the BOMP approved by the Minister under Condition 10 of EPBC 2017/7974, or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised BOMP would not be likely to have a new or increased impact.

In accordance with Condition 29 of EPBC 2017/7974, if MCO revises the BOMP without submitting it for approval by DAWE, MCO will:

a) notify DAWE in writing that the approved action management plan has been revised and provide DAWE with:

- an electronic copy of the revised BOMP,
- an explanation of the differences between the approved action management plan and the revised BOMP,
- the reasons MCO considers that taking the action in accordance with the revised BOMP would not be likely to have a new or increased impact and
- written notice of the date on which MCO would implement the revised BOMP.

If the Commonwealth Minister gives a notice to MCO that the Minister is satisfied that the taking of the action in accordance with the revised BOMP would be likely to have a new or increased impact, then MCO must implement the BOMP specified by the Commonwealth Minister in the notice.

In accordance with Condition 14 of EPBC 2008/444 if the Commonwealth Minister believes that it is necessary or desirable for the better protection of the listed threatened species and ecological communities to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or management strategies approved pursuant to paragraphs 1, 2, and 3, and submit the revised plan, report or strategy for the Minister's approval. In the event such a request is received, MCO will revise the plan, report or strategy and submit to DAWE for approval. Approval may also be required from other NSW Government agencies.

6.3 MANAGEMENT PLAN PUBLICATION

This BOMP 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) and Condition 3 of EPBC Approval EPBC 2008/4444.

The BOMP will be published within 20 Business days of being approved by both the DPIE and DAWE. MCO will exclude or redact sensitive ecological data from the plans published on the website or issued publicly on the advice of the DAWE.

This BOMP will also be made available to the Commonwealth Minister on request as required by Condition 7 of EPBC Approval 2008/4444.

7.0 CONTINGENCY PLAN

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

- The MCO 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 other relevant agencies 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 5.2.1).

Examples of contingency measures/controls that relate to the subsidence performance 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 3.7.3, 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 the NSW Project Approvals will be met.

8.0 REFERENCES

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APPENDIX A: RELEVANT PROJECT AND EPBC APPROVALS RECONCILIATION

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

<table>
<tr><th>NSW Project Approval Condition</th><th>BOMP Section</th></tr>
<tr><td>

Biodiversity Offset Strategy

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.

Table 12: Summary of Biodiversity Offset Strategy

<table>
<tr><th>Area</th><th>Offset Type</th><th>Minimum Size Hectares</th></tr>
<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[e]</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>
</table>

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.

</td><td>Section 4.0 and Individual BOA Cluster Management Plans</td></tr>
<tr><td>

Supplementary Biodiversity Offset Strategy

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.

</td><td>Sections 4.0 and 4.2.4</td></tr>
</table>

NSW Project Approval Condition	BOMP Section

Table 12A. Summary of Supplementary Biodiversity Offset Strategy

Gilgal property credit type	*Credits required*	*Gilgal property credits (area)*	*Residual Credits*
Ecosystem Credits			
PCT 281[1] 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[1] 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[2] Narrow-leaved Ironbark heathy woodland on sandstone ranges of the Sydney Basin and Brigalow Belt South	411	411 (53 ha)	-
PCT 479[3] 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[4] 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
Total	**1,437**	**1,033 (121.5 ha)**	**404**
Species Credits			
Regent Honeyeater	1,568	1,568 (221 ha)	-
Koala	77	64 (9 ha)	13
Brush-tailed Rock Wallaby	693	693 (98 ha)	-

[1] 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.

[2] Under the FBA offsetting option rules PCT 1660 can be used to offset impacts on PCT *1629 Narrow-leaved Stringybark – Grey Gum shrubby open forest on sandstone ridges of the Sydney Basin.*

[3] Under the FBA offsetting option rules PCT 479 can be used to offset impacts on PCT 1661 *Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin.*

[4] Under the FBA offsetting option rules PCT 1176 can be used to offset impacts on PCT 1669 *Red Ironbark - Grey Gum - Narrow-leaved Stringybark - Brown Bloodwood shrubby open forest on sandstone ranges of the Sydney Basin.*

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.

NSW Project Approval Condition	BOMP Section
Long Term Security Offset *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.* *Note: The preferred mechanisms for the provision of long-term conservation security are via Biobanking Arrangements and additions to the BCD Estate.*	Section 4.2
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.	Section 4.2.4
35B. Within 12 months of the commencement of activities under MOD 14, unless otherwise agreed by the Secretary, the proponent must, in consultation with BCD, the Department and DAWE and to the satisfaction of the Secretary, develop suitable rehabilitation performance and completion criteria for the vegetation communities to be established in the rehabilitated OC2 and/or OC3 landforms to generate the residual ecosystem and species credits for Koala listed in Table 12A. *The performance and completion criteria must include consideration of the effect of climatic conditions, such as drought, the NSW Biodiversity Offsets Policy for Major Projects 2014 and the associated Fact sheet: Mine Site Rehabilitation (OEH, 2014).* *Notes:* *• The rehabilitation offset performance and completion criteria form a component of the Rehabilitation Management Plan required under condition 69 of this schedule.* *• The indicative final rehabilitation areas are shown in Appendix 8.*	Section 4.2.5
35C. If at the end of 10 years after landform establishment in OC2 and/or OC3, unless otherwise agreed by the Secretary, the rehabilitation does not meet the performance and completion criteria in condition 35B to the satisfaction of the Secretary, the Proponent must retire the relevant number of residual credits listed in Table 12A under other mechanisms provided by the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the Secretary. *Notes:* *• Landform establishment is a recognised stage of rehabilitation when the final land shape has been developed prior to growth medium development and ecosystem development.* *• As landform establishment stage will progressively occur across the mine site, the performance criteria for new areas progressing into the landform establishment stage will need to be assessed by the Secretary on a regular basis, for example every 3 years, to determine whether the requirements of the condition are being met.* *• In accordance with the NSW Biodiversity Offsets Policy for Major Projects, additional biodiversity credits can be generated for the ongoing management of the rehabilitation area to ensure its biodiversity values are continually improved. Any additional credits could be secured through a Biobanking Agreement and used to offset future developments.*	Section 4.2.5
35D. Notwithstanding the requirements in conditions 35B and 35C, the Proponent may retire the residual credits listed in Table 12A earlier than the specified timeframe in condition 35C by other mechanisms under the BC Act in place of rehabilitation, to the satisfaction of the Secretary.	Section 4.2.5
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. *Table 12B Summary of Supplementary Biodiversity Offset Strategy (MOD 15)*	Section 4.2.4

NSW Project Approval Condition	BOMP Section
<table><tr><th>*Biodiversity Credit Type*</th><th>*Credits required*[2]</th></tr><tr><td colspan="2">***Ecosystem Credits***</td></tr><tr><td>PCT 281[1] 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>42</td></tr><tr><td>PCT 479[3] 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>59</td></tr><tr><td>PCT 1711 *Tantoon – Lepryodia leptocauclis* on shrubland on sandstone drainage lines of the Sydney Basin</td><td>10</td></tr><tr><td>**Total**</td><td>**111**</td></tr><tr><td colspan="2">Species Credits</td></tr><tr><td>Gang-gang Cockatoo</td><td>9</td></tr><tr><td>Glossy-black Cockatoo</td><td>9</td></tr><tr><td>Large-eared Pied Bat</td><td>135</td></tr><tr><td>Eastern Cave Bat</td><td>135</td></tr><tr><td>*Tylophora linearis*</td><td>26</td></tr></table> [1] *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.* [2]. *The credits listed in Table 12B have been calculated in accordance with the Biodiversity Assessment Method (as at 1 October 2019).*	
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: *(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[1]; and* *(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.* *The retirement of ecosystem credits must be carried out in accordance with the Biodiversity Offsets Scheme of the BC Act.* *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.*	Section 4.2.4
Biodiversity Management Plan *36. The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:* *(a) be prepared in consultation with BCD and be submitted to the Secretary for approval by 31 March 2015;*	This BOMP & Section 2.2
(b) describe the short, medium, and long- term measures that would be implemented to: • *manage the remnant vegetation and habitat on the site and in the offset areas;*	Sections 1.3, 3.0, 4.0 and Individual BOA Cluster Management Plans
• *minimise biodiversity impacts of the project; and*	Section 3.0

NSW Project Approval Condition	BOMP Section
• *implement the biodiversity offset strategy described in Table 12, including detailed performance and completion criteria;*	Sections 4.0 and Individual BOA Cluster Management Plans
(c) *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);*	Sections 4.4, 4.5.4, 4.5.5 and 4.7
(d) *include a detailed description of the measures that would be implemented for:* • *enhancing the quality of existing vegetation and fauna habitat;*	Sections 3.7, 4.5 and Individual BOA Cluster Management Plans
• *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);*	Sections 4.5, 4.5.2, 4.5.4 and Individual BOA Cluster Management Plans
• *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;*	Sections 3.8.3 and 3.8.4
• *rehabilitating the environmental bunds on site as soon as practicable and maintaining the landscaping on the bunds once it has been established;*	Refer to MCO Rehabilitation Management Plan
• *collecting and propagating seed;*	Sections 3.9, 4.5.4 and Individual BOA Cluster Management Plans
• *minimising the impacts on fauna on site, including undertaking pre-clearance surveys;*	Sections 3.8
• *managing any potential conflicts between the proposed restoration works in the biodiversity areas and any Aboriginal heritage values (both cultural and archaeological);*	Section 4.5.4 and Individual BOA Cluster Management Plans
• *managing salinity;*	Section 3.7.2
• *avoid and mitigate the spread of Phytophthora cinnamomi (P. cinnamomi) with consideration of actions identified in the relevant threat abatement plan*	Sections 3.7.6 & 4.5.4 and Individual BOA Cluster Management Plans
• *controlling weeds and feral pests;*	Section 3.7.5 & 4.5.4
• *controlling erosion;*	Section 3.7.4 & 4.5.4.
• *managing grazing and agriculture on site;*	Section 3.7.8 & 4.5.4.
• *controlling access; and*	Section 3.7.9 & 4.5.4.
• *bushfire management;*	Section 3.7.7 & 4.5.4.
(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;*	Section 4.6, 5.2 and Individual BOA Cluster Management Plans

NSW Project Approval Condition	BOMP Section
(f) 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	Section 4.4 and 4.7
(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan	Section 5.1
Appendix 3 – Statement of Commitments ***(12) Ecology*** *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.*	Section 4.2
Appendix 3 – Statement of Commitments ***Biodiversity***	
• *Where possible, construction works in areas of known and potential threatened woodland species habitat will be avoided during their breeding cycle.*	Section 3.8.4
• *Pre-clearing fauna surveys will be undertaken prior to ground clearing disturbance.*	Section 3.8.3
• *One of two hollow bearing trees within the rail loop alignment will be retained (where possible).*	Section 3.8
• *Tree hollows and other habitat features will be salvaged for use as compensatory habitat, in rehabilitation areas.*	Sections 3.8.3
• *Groundcover will be maintained to minimise the risk of soil erosion, wherever practicable. Feral animals, weeds and pests will be controlled.*	Section 3.7
• MCO further commits to: - *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.*	Section 4.3 and Individual BOA Cluster Management Plans
- *Manage offset and rehabilitation areas in accordance with a Rehabilitation and Offset Management Plan (ROMP or equivalent plan) to improve biodiversity outcomes.*	This BOMP and MCO Rehabilitation Management Plan
- *Implement the management actions specific to each property and report annually on the implementation of the plan to relevant stakeholders.*	Sections 4.5.4 and 5 and Individual BOA Cluster Management Plans
- *Provide long-term security of offset areas through an appropriate mechanism (such as a conservation covenant) agreed to with relevant stakeholders.*	Section 4.2
- *Provide an alternative secure offset property of at least equivalent biodiversity value where long-term security of a nominated offset property is not achievable.*	Section 4.2
- *Investigate potential roosting sites for bat activity on properties proposed to offset the impacts of Open Cut 1 and Open Cut 2 extension areas.*	Section 4.5.4.10
- *Investigate use of artificial roosting sites for microbat habitat augmentation where offset areas are determined not to have sufficient roosting habitat.*	Section 4.5.4.10
- *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).*	Section 3.3.3

NSW Project Approval Condition	BOMP Section
- *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.*	Section 4.4 and Individual BOA Cluster Management Plans
- *Maintain existing third party access arrangements on offset properties, where required.*	Section 4.5.4.4 and Individual BOA Cluster Management Plans

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

<table>
<tr><th>NSW Project Approval Condition</th><th>BOMP Section</th></tr>
<tr><td>

Biodiversity Offset Strategy

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.

Table 15: Summary of the Biodiversity Offset Strategy

<table>
<tr><th>Area</th><th>Offset Type</th><th>Minimum Size hectares (ha)</th></tr>
<tr><td>Dun Dun East</td><td>Enhance existing vegetation:
• 1368 ha of native vegetation
• 408 ha of EEC
Regenerate:
• 380 ha of existing grassland to forest/woodland</td><td>1776</td></tr>
<tr><td>Dun Dun West</td><td>Enhance existing vegetation:
• 837 ha of native vegetation
• 122 ha of EEC
Regenerate:
• 307 ha of existing grassland to forest/woodland</td><td>959</td></tr>
<tr><td>Avisford 1</td><td>Enhance existing vegetation:
• 300 ha of native vegetation
• 102 ha of EEC
Regenerate:
• 7 ha of existing grassland to forest/woodland</td><td>402</td></tr>
<tr><td>Avisford 2</td><td>Enhance existing vegetation:
• 203 ha of native vegetation
• 5 ha of EEC</td><td>208</td></tr>
<tr><td>Ulan 18</td><td>Enhance existing vegetation:
• 291 ha of native vegetation
• 48 ha of EEC
Regenerate:
• 178 ha of existing grassland to forest/woodland</td><td>339</td></tr>
<tr><td>Onsite Offset</td><td>Enhance existing vegetation:
• 420 ha of native vegetation
• 51 ha of EEC
Regenerate:
• 199 ha of existing grassland to forest/woodland</td><td>471</td></tr>
<tr><td>Old Bobadeen</td><td>Enhance existing vegetation:
• 90 ha of native vegetation
• 400 ha of EEC
Regenerate:
• 409 ha of existing grassland to forest/woodland</td><td>490</td></tr>
<tr><td>Libertus</td><td>Enhance existing vegetation:
• 160 ha of native vegetation
• 18 ha of EEC
Regenerate:
• 22 ha of existing grassland to forest/woodland</td><td>178</td></tr>
</table>

Notes:

- *To identify the areas referred to in Table 15, see the applicable figures in Appendix 7;*
- *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;*
- *The amount of grassland available for regeneration includes sparsely vegetated woodland; and*
- *The strategy includes the regeneration of existing grassland areas within each offset to woodland communities.*

</td><td>Section 4.0 and Individual BOA Cluster Management Plans</td></tr>
</table>

NSW Project Approval Condition	BOMP Section
Regeneration Areas *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.*	Section 4.4, 4.5.4 and Individual BOA Cluster Management Plans
32. The Proponent shall use its best endeavours to work with the CLD 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.	Dun Dun BOA Cluster Management Plan
Habitat for Threatened Fauna Species *34. 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.* *Note: The threatened fauna species confirmed and identified as being potentially present in the disturbance areas are listed in Appendix 7.*	Section 4.0 and Individual BOA Cluster Management Plans
Vegetation Information System Mapping Data *37. 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.*	Section 5.2.2
Long Term Security of Biodiversity Offsets *38. 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.* *Note: The preferred mechanisms for the provision of long-term conservation security are via Biobanking Arrangements and additions to the OEH Estate.*	Section 4.2
Biodiversity Management Plan *39. The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:* *(a) be prepared in consultation with OEH, and submitted to and approved by the Secretary prior to the commencement of any development on site;*	This BOMP and Section 2.2
(b) describe the short, medium, and long term measures that would be implemented to: • *manage the remnant vegetation and fauna habitat on the site; and*	Sections 1.3, 3.0, 4.0 and Individual BOA Cluster Management Plans
• *implement the biodiversity offset strategy;*	Section 4.0 and Individual BOA Cluster Management Plans
• *integrate the implementation of the biodiversity offset strategy to the greatest extent practicable with the rehabilitation of the site;*	This BOMP and MCO Rehabilitation Management Plan
(c) include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and triggering remedial action (if necessary);	Sections 4.4, 4.5.4, 4.5.5 and 4.7
(d) include a detailed description of the measures that would be implemented over the next 3 years for: • *enhancing the quality of existing vegetation and fauna habitat in the biodiversity offset areas;*	Section 4.5 and Individual BOA Cluster Management Plans

NSW Project Approval Condition	BOMP Section
• *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);*	Sections 3.8.3, 3.8.4, 4.5 and Individual BOA Cluster Management Plans and MCO Rehabilitation Management Plan
• *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;*	Section 3.8.3 and 3.8.4
• *collecting and propagating seed;*	Sections 3.9 and 4.5.4, Individual BOA Cluster Management Plans and Rehabilitation Management Plan
• *protecting vegetation and fauna habitat outside the approved disturbance area on-site;*	Section 3.8
• *minimising the impacts on fauna on site, including undertaking pre-clearance surveys;*	Section 3.8
• *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;*	Section 4.5.4 and Individual BOA Cluster Management Plans
• *managing salinity;*	Sections 3.7.2
• *controlling weeds and feral pests;*	Sections 3.7.5 and 4.5.4
• *controlling erosion;*	Sections 3.7.4 and 4.5.4
• *managing grazing and agriculture on site;*	Sections 3.7.8 and 4.5.4
• *controlling access; and*	Sections 3.7.9 and 4.5.4
• *bushfire management;*	Sections 3.7.7 and 4.5.4
(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;	Section 4.6 and Individual BOA Cluster Management Plans
(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	Section 4.4 and 4.7
(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	Section 5.1
SUBSIDENCE ***Performance Measures – Natural and Heritage Features*** *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.*	Section 3.7.3 and Extraction Plan.

<table>
<tr><th>NSW Project Approval Condition</th><th>BOMP Section</th></tr>
<tr><td>

Table 18: Subsidence Impact Performance Measures

....

<table>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Threatened species, threatened populations, or endangered ecological communities</td><td>Negligible subsidence impacts or environmental consequences</td></tr>
</table>

Notes:

- *The locations of the features referred to in Table 18 are shown in Appendix 4.*
- *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.*
- *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.*
- *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.*

</td><td></td></tr>
<tr><td>

Appendix 3 – Statement of Commitments

Ecology

30. MCM will implement the ecological management and mitigation measures described in the PPR and subsequent supporting documents.

</td><td>Sections 3.0 and 4.0</td></tr>
<tr><td>

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.

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.

Management of offset properties for conservation purposes will be described in a Rehabilitation Offset Management Plan (or equivalent).

</td><td>This BOMP</td></tr>
<tr><td>*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.*</td><td>Section 4.2</td></tr>
<tr><td>*33. MCM will continue to consult with OEH on the inclusion of relevant Moolarben owned properties into the existing Avisford Nature Reserve.*</td><td>Section 4.2</td></tr>
</table>

Table A-4 provides a summary of the conditions of EPBC 2008/4444 relevant to management of the Biodiversity Offset Areas (BOAs) with reference to where in the BOMP the relevant requirements have been addressed.

Table A-4: Relevant EPBC 2008/4444 Approval Conditions

EPBC 2008/4444 Requirement	BOMP Section
2) *To mitigate the impacts of the proposal on the Large-eared Pied Bat, Southern Long-eared Bat, Regent Honeyeater, Swift Parrot and the Spotted-tail Quoll, the approval holder must prepare and submit, prior to the proposed date of commencement of the action, a mine site Vegetation Clearance Protocol and Landscape Management plan (VCPLMP) for the Minister's written approval. The VCPLMP must;*	Section 3.8 and this BOMP
d. *Delineate areas to be cleared, describe pre-clearance survey methods, specify actions to minimise fauna impacts and detail vegetation clearance procedures.*	Sections 3.8.2, 3.8.3 and 3.8.4
e. *Require collection and stockpiling of habitat features important to threatened fauna species for reinstatement in rehabilitation areas.*	Sections 3.8.3 and 3.8.4
f. *Require use of native, locally sourced seed for propagation for rehabilitation activities.*	Section 3.9
g. *Specify a two stage clearing protocol where non-habitat trees are cleared 24 hours prior to any habitat trees are cleared, to encourage fauna to move out of an area.*	Section 3.8.4
3) *To compensate for the loss of 123.3 hectares of the White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 902 hectares of habitat for **EPBC listed threatened species**, the approval holder must submit, by 1 September 2021, a Biodiversity Offset Management Plan (BOMP) for the **Minister's** written approval. The **BOMP** must:*	This BOMP
a. *include offset attributes, shapefiles, textual descriptions and maps that clearly define the location and boundaries of the offset areas specified at Figure 1-7 of Schedule 2;*	Provided separately.
b. *include a survey, and describe the condition of, the offset areas specified at Figures 1-7 of Schedule 2, immediately prior to them being managed as offset areas;*	Section 4.3, Appendix J and Individual BOA Cluster Management Plans
c. *for offset areas shown at Figures 1-3 and 6-7 of Schedule 2:*	
(i) *specify strategies and management actions that will improve the quality of WBGW and habitat for **EPBC Act listed threatened species***	Section 4.5 and Individual BOA Cluster Management Plans
(ii) *include timeframes for management actions;*	Sections 4.4 and Individual BOA Cluster Management Plans
(iii) *specify performance and completion criteria for achieving (i) above, for evaluating effectiveness of the management of the offset areas, and criteria for triggering remedial action;*	Sections 4.4, 4.5.4, 4.5.5 and 4.7
(iv) *include a program to detect trigger criteria and monitor and report on the effectiveness of management actions, and progress against the performance and completion criteria;*	Section 4.6, 4.7 and 5.2

EPBC 2008/4444 Requirement	BOMP Section
(v) describe potential risks to achieving the plan's objectives, measures that will be implemented to mitigate against these risks and remedial actions that will be implemented if defined trigger criteria are detected; and	Section 4.4, 4.5.5 and 4.7
(vi) detail of who will be responsible for monitoring, reviewing and implementing the BOMP.	Section 5.1
*d. for offset areas shown at Figures 4 and 5 of Schedule 2, explain how management of the offset areas will ensure the quality of WBGW and habitat for **EPBC Act listed threatened species** in the offset areas will be improved and protected for the period of the approval.*	Section 4.2.2 and 4.2.3
*If, after 1 December 2021, the **Minister** informs the approval holder that the submitted BOMP (required by 1 September 2021) is not suitable for approval, the **Minister** may, after 1 February 2022, approve a version of the BOMP revised by the **Department**.*	Noted
*The approved BOMP must be published on the approval holder's internet web site, within 1 month of being approved by the **Minister** and remain so published for the period of approval. The approval holder must implement the BOMP approved by the **Minister** in writing.*	Section 6.3
4). To compensate for the loss of 123.3 hectares of the White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 902 hectares of habitat for EPBC listed threatened species, within 24 months of the date of this approval, the approval holder must secure the lands identified as the Offset Areas at Schedule 2 (Figures 1-7) of this notice as a biodiversity offset by a legal instrument under relevant nature conservation legislation on the title of the land. This instrument must: *a. provide for the protection of the land in perpetuity;* *b. prevent any future development activities, including mining and mineral extraction;* *c. ensure the active management of the land; and* *d. be provided to the Department within 3 months of it being issued, as evidence of compliance with this condition.*	Section 4.2
*9) The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to these conditions of approval, including measures taken to implement the **BOMP** and **VCPLMP**, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.*	Section 5.4
10) The approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and VCLMP as specified in the conditions, by 31 March for the preceding calendar year. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published.	Section 5.2.3
*11) Non-compliance with any of the conditions of this approval must be reported to the **Department** within 2 business days of becoming aware of the non-compliance.*	Section 5.2.4

EPBC 2008/4444 Requirement	BOMP Section
*12) Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the **commencement** of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.*	Section 5.3.2
*13) If the **approval holder** wishes to carry out any activity otherwise than in accordance with the Plan as specified in the conditions, the **approval holder** must submit to the **Department** for the **Minister's** written approval a revised version of that Plan. The **approval holder** must not **commence** the varied activity until the **Minister** has approved the varied Plan in writing. The **Minister** will not approve a varied Plan unless the revised Plan would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised Plan, that Plan must be implemented in place of the Plan originally approved.*	Section 6.2
*14) If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the **Minister** may request that the **approval holder** make specified revisions to the Plan specified in the conditions and submit the revised Plan for the **Minister's** written approval. The **approval holder** must comply with any such request. The revised approved Plan must be implemented. Unless the **Minister** has approved the revised Plan then the **approval holder** must continue to implement the Plan originally approved.*	Section 6.2

Table A-6 provides a summary of the conditions of EPBC 2017/7974 relevant to management of biodiversity offset areas with reference to where in the BOMP the relevant requirements have been addressed.

Table A-6: Relevant EPBC 2017/7974 Approval Conditions

EPBC 2017/7974 Requirements	BOMP Section
2) The approval holder must comply with Condition 34A of Schedule 3 of the NSW Consolidated Project Approvals to implement the supplementary offset strategy, by retiring the required number of credits specified in Table 12A.	Section 4.2.4 and 4.2.5
3) The approval holder must comply with Conditions 35A of the NSW Consolidated Project Approvals to secure the credits and/or area at the Gilgal Offset Area (as identified at Attachment B) under a Biodiversity Stewardship Agreement, unless otherwise agreed in writing by the Minister. The approval holder may seek agreement from the Minister to use an alternative mechanism to secure the credits and/or area, subject to the additional rules at Condition 20. The approval holder must submit a copy of the Biodiversity Stewardship Agreement to the Minister within ten business days of an agreement being made.	Section 4.2
4) The approval holder must provide for the long-term security of the Area 2 (extract) offset area as identified at Attachment B, by 30 June 2020. The approval holder must submit details of the security mechanism to the Minister within ten business days of the mechanism being made.	Section 4.2
5) The approval holder must enhance existing native vegetation in the Area 2 (extract) offset area, in accordance with the biodiversity offset strategy required by Condition 34 of the NSW Consolidated Project Approvals, and in accordance with the Biodiversity Management Plan required by Condition 36 of Schedule 3 of the NSW Consolidated Project Approvals.	This BOMP, Section 4.4, 4.5 and Red Hills BOA Cluster Management Plan
6) The approval holder must comply with Condition 35B of Schedule 3 of the NSW Consolidated Project Approvals to develop suitable rehabilitation performance and completion criteria for the rehabilitation of OC2 and/or OC3, to generate the required number of residual credits specified in Table 12A of Schedule 3.	Section 4.2.5
7) Unless the approval holder retires the residual credits in accordance with Condition 8, the approval holder must undertake progressive rehabilitation of OC2 and OC3, so as to meet the rehabilitation performance and completion criteria developed in accordance with Condition 6, and in accordance with an approved Rehabilitation Management Plan. The approval holder must also comply with Condition 35C of Schedule 3 of the NSW Consolidated Project Approvals to retire the residual credits if the performance and completion criteria are not achieved in the specified timeframe in Condition 35C, subject to the additional rules at Condition 20.	Section 4.2.5
8) The approval holder may retire the residual credits earlier than the specified timeframe in Condition 35C in accordance with Condition 35D of Schedule 3 of the NSW Consolidated Project Approvals, subject to the additional rules at Condition 20. If the approval holder chooses to retire credits early, the approval holder must notify the Department within 30 business days of retiring the credits.	Section 4.2.5
9) The approval holder must comply with Condition 36 of Schedule 3, and Conditions 3 and 5 of Schedule 5, of the NSW Consolidated Project Approvals to prepare and implement a Biodiversity Management Plan for the Moolarben Coal Project.	This BOMP
10) The Biodiversity Management Plan implemented in accordance with Condition 9 must be approved by the Department as adequately providing for the management of protected matters on the site and in the offset areas.	Section 2.3

EPBC 2017/7974 Requirements	BOMP Section
17) The approval holder must maintain accurate and complete compliance records	Sections 5.2 and 5.4
19) The approval holder must: *a. Submit the Biodiversity Management Plan electronically to the Department for approval by the Minister.* *b. Publish each plan on its website within 20 business days of the date the plan is approved by the Minister and/or Secretary.* *c. Exclude or redact sensitive ecological data from plans published on its website or provided to a member of the public.*	Sections 2.3 and 6.3
20) The approval holder must use one or a combination of the following methods to retire the credits required for protected matters: *a. Retire like-for-like biodiversity credits within the meaning of the Biodiversity Conservation Act 2016 (NSW).* *b. Make payments into an offsets fund that has been developed by the NSW Government and that has been endorsed by the Minister. The financial contribution or payments into an offset fund must be determined by converting biodiversity credits to an equivalent dollar value through the NSW offsets payment calculator. The approval holder must submit evidence to the Minister of any payments, within ten business days of the payment being made.* *c. Fund a biodiversity conservation action within the meaning of the Biodiversity Conservation Act 2016 (NSW). The financial contribution to biodiversity conservation actions must be determined by converting biodiversity credits to an equivalent dollar value through the NSW offsets payment calculator. The approval holder must submit to the Minister evidence of any payments within ten business days of the payment being made.*	Sections 4.2.4
21) The approval holder must prepare a compliance report each year. The timing for preparing the compliance report must be consistent with the requirements of Condition 4 of Schedule 5 of the NSW Consolidated Project Approvals, or otherwise in accordance with an annual date that has been agreed in writing by the Department. The approval holder must: *a. Publish each compliance report on its website within one month of being approved by the Secretary.* *b. Notify the Department by email that a compliance report has been published on its website within five business days of the date of publication.* *c. Exclude or redact sensitive ecological data from compliance reports published on its website.* *d. Where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within five business days of publication.*	Section 5.2.3
22) The approval holder must notify the Department in writing of any non-compliance with the conditions or non-compliance with the commitments made in plans that relate to protected matters. The notification must be given no later than two business days after becoming aware of the non-compliance. The notification must specify: *a. The condition which is or may be in breach.* *b. A short description of the non-compliance.*	Section 5.2.4

EPBC 2017/7974 Requirements	BOMP Section
23) The approval holder must provide to the Department the details of any non-compliance with the conditions or commitments made in plans that relate to protected matters no later than ten business days after becoming aware of the non-compliance, specifying: *a. Any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future.* *b. The potential impacts of the non-compliance.* *c. The method and timing of any remedial action that will be undertaken by the approval holder.*	Section 5.2.4
24) The approval holder must ensure that independent audits of compliance with the conditions are conducted as requested in writing by the Minister.	Section 5.3.2
25) For each independent audit, the approval holder must: *a. Provide the name and qualifications of the independent auditor and the draft audit criteria to the Department.* *b. Only commence the independent audit once the audit criteria have been approved in writing by the Department.* *c. Submit an audit report to the Department within the timeframe specified in the approved audit criteria.*	Section 5.3.2
26) The approval holder must publish the audit report on its website within ten business days of receiving the Department's approval of the audit report and keep the audit report published on its website until the end date of this approval.	Section 5.3.2
27) The approval holder may, at any time, apply to the Minister for a variation to the Biodiversity Management Plan approved by the Minister under condition 10, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the EPBC Act.	Section 6.2
28) The approval holder may revise the Biodiversity Management Plan approved by the Minister under condition 10, or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised Biodiversity Management Plan would not be likely to have a new or increased impact.	Section 6.2
29) If the approval holder revises the Biodiversity Management Plan without submitting it for approval, the approval holder must: *a. notify the Department in writing that the approved action management plan has been revised and provide the Department with:* *i. An electronic copy of the revised Biodiversity Management Plan.* *ii. An explanation of the differences between the approved action management plan and the revised Biodiversity Management Plan.* *iii. The reasons the approval holder considers that taking the action in accordance with the revised Biodiversity Management Plan would not be likely to have a new or increased impact.* *iv. Written notice of the date on which the approval holder will implement the revised Biodiversity Management Plan.*	Section 6.2

EPBC 2017/7974 Requirements	BOMP Section
30) If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the revised Biodiversity Management Plan would be likely to have a new or increased impact, then: *a. Condition 28 does not apply, or ceases to apply, in relation to the revised Biodiversity Management Plan.* *b. The approval holder must implement the Biodiversity Management Plan specified by the Minister in the notice.*	Section 6.2
31) At the time of giving the notice under condition 30, the Minister may also notify that for a specified period of time, condition 28 does not apply for one or more specified action management plans.	Section 6.2

Table A-6: General Management Plan Conditions

Stage 1 Project Approval (05_0117) Requirement	BOMP Section
Schedule 5	
Management Plan Requirements *3. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:*	
a) *detailed baseline data;*	Sections 3.2 – 3.6, Sections 4.1, 4.3 and Individual BOA Cluster Management Plans
b) *a description of:*	
• *the relevant statutory requirements (including any relevant approval, licence or lease conditions);*	Section 2.0 and Appendix A
• *any relevant limits or performance measures/criteria;*	Section 4.4
• *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;*	Section 4.4
c) *a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;*	Sections 2.0, 3.0, 4.0, 5.0, 6.0, 7.0 and Individual BOA Cluster Management Plans
d) *a program to monitor and report on the:*	
• *impacts and environmental performance of the project*	Section 4.6 and 5.2
• *effectiveness of any management measures (see c above);*	Section 4.6 and 5.2
e) *a contingency plan to manage any unpredicted impacts and their consequences;*	Section 7.0
f) *program to investigate and implement ways to improve the environmental performance of the project over time;*	Sections 4.1.5 and 6.0
g) *a protocol for managing and reporting any:*	
• *incidents;* • *complaints;* • *non-compliances with statutory requirements; and* • *exceedances of the impact assessment criteria and / or performance criteria*	Section 5.2 and MCO Environmental Management Strategy
h) *a protocol for periodic review of the plan.*	Section 6.1

PA 08_0135 Requirement	BOMP Section
Schedule 5	
Management Plan Requirements *3. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:*	
a. *detailed baseline data;*	Sections 3.2 – 3.6, Sections 4.1, 4.3 and Individual BOA Cluster Management Plans
b. *a description of:*	
• *the relevant statutory requirements (including any relevant approval, licence or lease conditions);*	Section 2.0 and Appendix A
• *any relevant limits or performance measures/criteria;*	Section 4.4
• *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;*	Section 4.4
c. *a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;*	Sections 2.0, 3.0, 4.0, 5.0, 6.0, 7.0 and Individual BOA Cluster Management Plans
d. *a program to monitor and report on the:*	
• *impacts and environmental performance of the project*	Sections 4.6 and 5.2
• *effectiveness of any management measures (see c above);*	Sections 4.6 and 5.2
e. *a contingency plan to manage any unpredicted impacts and their consequences;*	Section 7.0
f. *program to investigate and implement ways to improve the environmental performance of the project over time;*	Sections 4.1.5 and 6.0
g. *a protocol for managing and reporting any:*	
• *incidents;* • *complaints;* • *non-compliances with statutory requirements; and* • *exceedances of the impact assessment criteria and / or performance criteria*	Section 5.2 and MCO Environmental Management Strategy
h. *a protocol for periodic review of the plan.*	Section 6.1

APPENDIX B: BOBADEEN BOA CLUSTER MANAGEMENT PLAN

APPENDIX C: RED HILLS BOA CLUSTER MANAGEMENT PLAN

APPENDIX D: ULAN 18 BOA CLUSTER MANAGEMENT PLAN

APPENDIX E: DEXTER MOUNTAIN BOA CLUSTER MANAGEMENT PLAN

APPENDIX F: ONSITE BOA CLUSTER MANAGEMENT PLAN

APPENDIX G: MOOLARMOO BOA CLUSTER MANAGEMENT PLAN

APPENDIX H: DUN DUN BOA CLUSTER MANAGEMENT PLAN

APPENDIX I: EPBC APPROVAL 2007/3297, 2008/4444, 2013/6926 and 2017/7974 FIGURES

APPENDIX J: AVISFORD 1 AND 2 BASELINE SURVEY DATA

Avisford 1 Biodiversity Offset Area

Location Description:

The Avisford 1 BOA is located in the NSW South Western Slopes Bioregion within the Macquarie -Bogan catchment. It is located adjacent to the Avisford Nature Reserve. The western boundary runs along a four-wheel-drive track with the eastern and southern boundaries bordering on neighbouring properties and the northern boundary along the Avisford Nature Reserve (Figure 5).

Baseline Survey Data:

Vegetation mapping has been undertaken across the BOA, with initial mapping completed during 2011 and 2012 (Cumberland Ecology, 2012) and confirmed in 2013 (Cumberland Ecology, 2014), the latter specifically targeting the Box Gum Woodland EEC community (both woodland and DNG). Website links to the baseline survey reports are provided in Section 8 or are available on request.

All BOAs were initially mapped into broad vegetation associations (consistent with the former NSW Office of Environment and Heritage [OEH] vegetation types) as displayed in Figure J1.

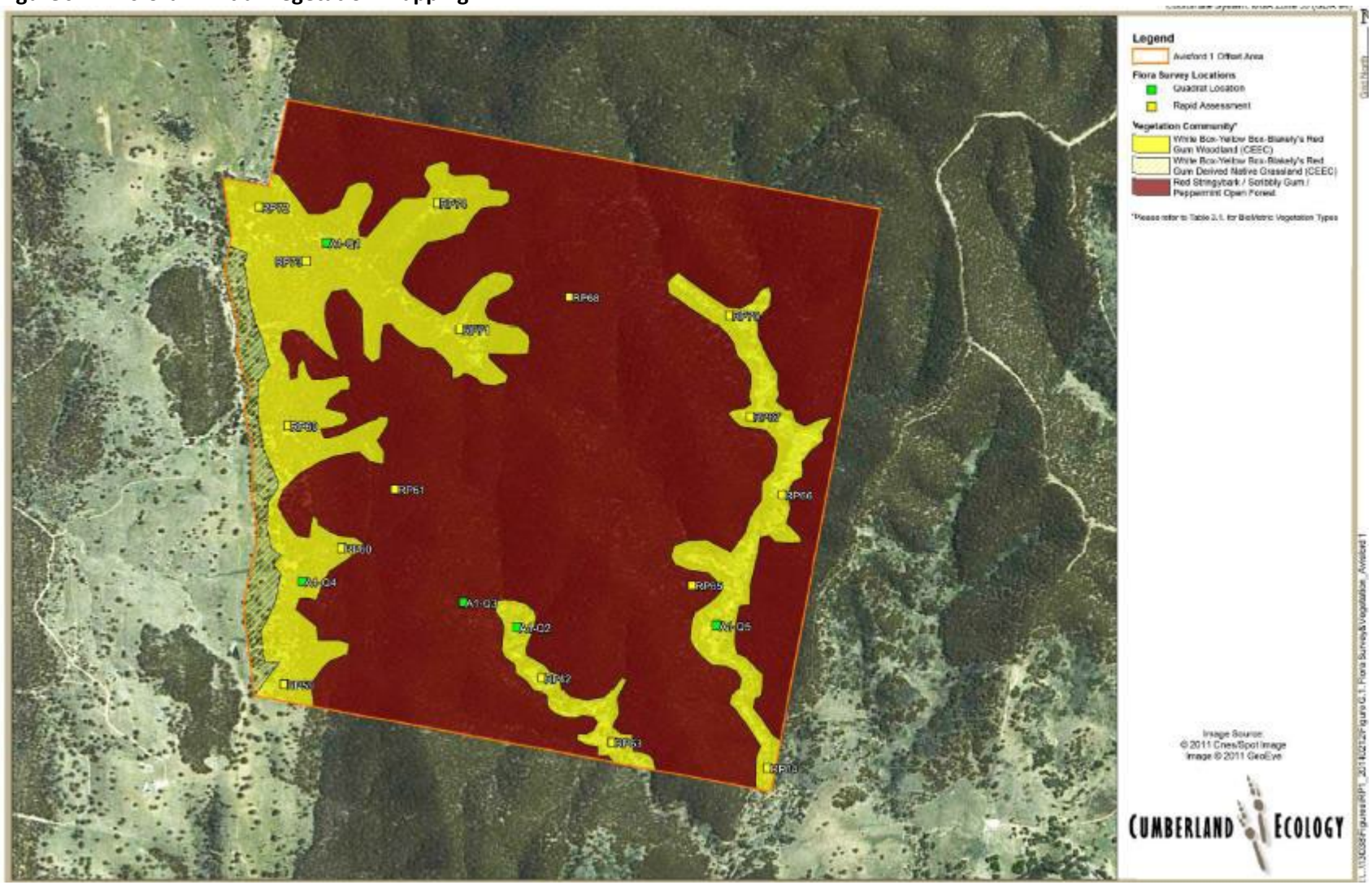
Two Box Gum Woodland vegetation zones have been identified within the Avisford 1 BOA; one zone identified as derived native grassland (DNG) and another zone as remnant woodland. The Avisford 1 BOA consists of approximately 11.7 ha of DNG and 115.2 ha of regenerating and remnant woodland. The DNG has been previously grazed by stock and the understorey consists of predominately grasses less palatable to stock including *Aristida spp*., *Eragrostis spp.* and *Juncus spp.* No exotic trees or shrubs have been recorded in either the remnant woodland or DNG. The woodland form within the Avisford 1 BOA differentiated from the DNG form with the presence of a canopy structural layer and associated habitat elements including hollow-bearing trees and fallen logs.

The Box Gum Woodland within the Avisford 1 BOA is characterised by:

- A canopy dominated by White Box, Blakely's Red Gum and Yellow Box, with projected foliage cover ranging from 20% to 35% (average of 28%); associated canopy species include Red Stringybark, *Eucalyptus microcarpa* (Inland Grey Box) and *Eucalyptus rossii* (Inland Scribbly Gum).
- A predominantly grassy understorey, dominated by native perennial grasses including Purple Wiregrass, Three-awned Speargrass, *Austrostipa spp*. (Speargrasses), Weeping Grass and *Poa sieberiana subsp. sieberiana.*
- Ground cover (including herbs, sedges and rushes) ranging from 40% to 95% projected foliage cover, and a consistently low (5-10%) shrub cover.

- High native species richness, ranging from 27 to 53 species per plot. Native species comprised an average of 80% of total species richness in each plot. Each plot contained at least three 'important species' (DEH, 2006); in total, 18 important species were recorded, including *Ajuga australis* (Austral Bugle); *Asperula conferta* (Common Woodruff); *Craspedia variabilis*; *Daucus glochidiatus* (Native Carrot); *Desmodium varians* (Slender Tick-trefoil); *Dianella revoluta (*Blueberry Lily); *Glycine clandestina*; *Glycine tabacina; Goodenia hederacea* (Forest Goodenia); *Hardenbergia violacea* (False Sasparilla); *Hibbertia obtusifolia* (Hoary Guinea Flower); *Hypericum gramineum* (Small St John's Wort); *Indigofera adesmiifolia* (Tick Indigo); *Poranthera microphylla; Pultenea microphylla; Ranunculus lappaceus* (Common Buttercup); S*tackhousia monogyna* (Creamy Candles) and *Viola betonicifolia*.
- Generally low exotic species cover, with exotic ground cover ranging from 1% to 15%.
- The presence of habitat elements including hollow-bearing trees, feed trees (flowering trees and trees containing mistletoe), and large woody debris.

Figure J1: Avisford 1 Initial Vegetation Mapping



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Avisford 2 Biodiversity Offset Area

Location Description:

The Avisford 2 BOA is located in the NSW South Western Slopes Bioregion within the Macquarie -Bogan catchment. This BOA is privately owned land with a Conservation Agreement established on the property. The property is situated approximately 4 km directly south west of the township of Mudgee (Figure 5). The Conservation Agreement excludes the area surrounding the Owner's private residence, associated rural infrastructure and access road.

Baseline Survey Data:

Vegetation mapping has been undertaken across the BOA, with initial mapping completed during 2011 and 2012 (Cumberland Ecology, 2012) and confirmed in 2013 (Cumberland Ecology, 2014), the latter specifically targeting the Box Gum Woodland EEC community (both woodland and DNG). Website links to the baseline survey reports are provided in Section 8 or are available on request.

All BOAs were initially mapped into broad vegetation associations (consistent with the former NSW Office of Environment and Heritage [OEH] vegetation types) as displayed in Figure J2.

One Box Gum Woodland vegetation zone has been identified within the Avisford 2 BOA, which comprises approximately 4.72 ha of Box Gum Woodland.

The Avisford 2 BOA contains approximately 213 ha of remnant woodland, dominated by Stringybark species, with Scribbly Gums occurring along the ridge lines and Rough-barked Apple dominating the valleys, with some historical evidence of clearing within the valleys. A sparse understorey is present in most areas of the site, with the only areas containing a dense small tree and shrub stratum being the valley floor vegetation communities, and some south-facing hill sides. Numerous tree hollows of varying size occur across the site, due mainly to the presence of the Scribbly Gum (Cumberland Ecology, 2012).

Figure J2: Avisford 2 Initial Vegetation Mapping