PROPOSED MOOLARBEN MOD 14 BIOMETRIC VEGETATION TYPE PERFORMANCE AND COMPLETION CRITERIA

Background

Conditions 35B and 35C, Schedule 3 of Moolarben Coal Complex Stage 1 Project Approval 05_0117 (as modified) require Moolarben Coal Operations Pty Ltd (MCO) to develop suitable rehabilitation performance and completion criteria for vegetation communities to demonstrate suitable progress and subsequently retire the residual ecosystem and species credits outlined in Table 12A of the Project Approval.

Conditions 35B and 35C, Schedule 3 of Project Approval 05_0117 (as modified) state:

Rehabilitation Offsets

35B Within 12 months of the commencement of activities under MOD 14, unless otherwise agreed by the Secretary, the proponent must, in consultation with OEH, the Department and DoEE 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 the 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 Figure 8.2 of Appendix 8.*

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.*

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 rich 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 healthy 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.

Conditions 6 to 8 of Commonwealth Approval 2017/7974 state:

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 rehabilition of OC2 and/or OC3, to generate the required number of residual credits specified in Table 12A of Schedule 3.

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.

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 notfiy the **Department** within 30 business days of retiring the credits.

Note: the EPBC Act **protected matters** relevant to the credits in Table 12A of the **NSW Consolidated Project Approvals** are identified in Attachment C.

Attachment C of Commonwealth Approval 2017/7974 is reproduced below and indicates that *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, Large-eared Pied Bat (*Chalinolobus dwyeri*), Swift Parrot (*Lathamus discolor*), Painted Honeyeater (*Grantiella picta*), Corben's Long-eared Bat (*Nyctophilus corbeni*) and Spotted-tail Quoll (*Dasyurus maculatus maculatus*) (SE mainland population) are relevant to HU730 (Plant Community Type [PCT] 618) (73 FBA credits) and Large-eared Pied Bat is relevant to HU910 (PCT1696) (331 FBA credits). The mine rehabilitation will provide foraging habitat for the above listed fauna species.

Attachment C – EPBC Act **protected matters** relevant to the credits in Table 12A of the **NSW Consolidated Project Approvals**

Vegetation Community (PCT / BVT)	Protected Matter	Area cleared	Credits required	Credits Satisfied by Offset Area 2 (Extract)	Gilgal Property Credits (Area)	Residual Credits
Ecosystem Credits						
PCT 281	BGW, LPB	1.5 ha	53	18	35 (5 ha)	-
PCT 618	BGW, LPB, SP, PH, CLB, STQ	3.5 ha	112	39	0	73
PCT 1176	CHVEFW, LPB	2 ha	108	108	0	-
PCT 1606	LPB, SP, PH, CLB, STQ	3 ha	190	40	150 (14 ha)	-
PCT 1629	LPB, SP, PH, CLB, STQ	13 ha	827	416	411 (53 ha)	-
PCT 1661	LPB, SP, PH, CLB, STQ	4 ha	237	33	204 (22.5 ha)	-
PCT 1669	LPB, SP, PH, CLB, STQ	4.5 ha	233	0	233 (27 ha)	-
PCT 1696	LPB	7.5 ha	354	23	0	331
Species Credits						
Regent Honeyeater (*Anthochaera phrygia*)		31 ha	2,371	803	1,568 (221 ha)	-
Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT)		4 ha	94	17	64 (9 ha)	13
Brush-tailed Rock-wallaby		37 ha	960	267	693 (98 ha)	-

BGW = White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

CHVEFW = Central Hunter Valley Eucalypt Forest and Woodland

LPB = Large-eared Pied Bat (*Chalinolobus dwyeri*)

SP = Swift Parrot (*Lathamus discolor*)

PH = Painted Honeyeater (*Grantiella picta*)

CLB = Corben's Long-eared Bat (*Nyctophilus corbeni*)

STQ = Spot-tailed Quoll (*Dasyurus maculatus maculatus*) (SE mainland population)

Completion Criteria - 10 Years After the Completion of Mining Operation

HU730 (PCT618) and HU910 (PCT1696)

The Framework for Biodiversity Assessment (Office of Environment and Heritage [OEH], 2014a) (FBA) 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, the *Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined Land – Released: July 2015* (OEH, 2015) has been used to calculate the credits generated for mine rehabilitation under the FBA. The rehabilitation criteria is 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).

The completion criteria for HU730 (PCT618) (73 FBA credits) and HU910 (PCT1696) (331 FBA credits) are set in accordance with Section 12.2 of the FBA (OEH, 2014a) that specifies the maximum allowable increase in the site attribute condition scores. This is then directly correlated to the published benchmarks for each BVT (OEH, 2017).

The completion criteria in Table 2-2 is based on the published benchmarks for each BVT (OEH, 2017), however MCO may develop local benchmarks in later years for each BVT in accordance with the FBA and in consultation with the BCD Dubbo office. Representative biometric data would be used to develop the local benchmarks for each BVT. The local benchmark data would be used to confirm/refine the criteria in Table 2-2.

The completion criteria for the BVTs are equivalent to the allowable increase in site attribute condition scores in Table 6 of Section 12.2 of the FBA (Enclosure 3) for each BVT, with exception of tree hollows and overstorey regeneration (no increase assumed) (Table 2-1). Native groundcover attribute condition scores have been chosen based on the minimum allowable future increase (0.5). Based on these attributes, the calculator states that **21.3 hectares** (ha) of mine rehabilitation is required to generate 73 FBA credits of HU730 (PCT618) and **96 ha** of mine rehabilitation is required to generate 331 FBA credits of HU910 (PCT1696).

These completion criteria are primarily for the generation of FBA credits, and MCO reserves the ability to achieve flexible future attribute scores and/or areas provided they can generate the required credits within the allowable completion standards for each PCT as per Table 6 of the FBA Biodiversity Offsets Policy (OEH 2014a).

Table 2-1
Future Attribute Scores

Attributes	Allowable future attribute scores for mine site rehabilitation	Future attribute score
Species richness	0.5 or 1	1
Over-storey cover	0.5 or 1	1
Mid-storey cover	0.5 or 1	1
Native ground cover (grasses)	0.5 or 1	0.5
Native ground cover (shrubs)	0.5 or 1	0.5
Native ground cover (other)	0.5 or 1	0.5
Exotic plant cover	0.5 or 1	1
Number of trees with hollow	0.5	0
Over-storey regeneration	0.5	0
Total length of fallen logs	0.5	0.5

Table 2-2 presents the proposed completion criteria for mine rehabilitation at 10 years after the completion of mining operations.

It is anticipated that the site attribute values for each FBA plot will be averaged in order to determine the site value of a vegetation zone (i.e. failure of one individual plot to achieve all the target criteria will not fail the vegetation zone as natural variation is to be expected) and the Overall Site Value Score (average of plots in a vegetation zone) should be equal to or greater than **13.8** based on *Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined Land – Released: July 2015* (OEH, 2015).

The rehabilitation of PCT618 would include Eucalypt species characteristic of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, and of foraging habitat for the Large-eared Pied Bat (*Chalinolobus dwyeri*), Swift Parrot (*Lathamus discolor*), Painted Honeyeater (*Grantiella picta*), Corben's Long-eared Bat (*Nyctophilus corbeni*) and Spotted-tail Quoll (*Dasyurus maculatus maculatus*) (SE mainland population). The rehabilitation of PCT1696 would include species characteristic of foraging habitat for the Large-eared Pied Bat. A list of Eucalypt species characteristic of PCT618 and PCT1696 can be found in the PCT descriptions in Attachment A.

Koala

The *Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined Land – Released: July 2015* (OEH, 2015) states that **1.8 ha** of mine rehabilitation is required to generate 13 credits for the Koala.

State Environmental Planning Policy (Koala Habitat Protection) *2019* (Koala Habitat Protection SEPP) provides a list of tree species used by the Koala based on *'A Review of Koala Tree Use Across New South Wales'* (Office of Environment and Heritage, 2018). Both HU730 (PCT 618) and HU910 (PCT1696) provide potential habitat for the Koala. Descriptions of PCT618 and PCT1696 have been provided in Attachment A. The following koala food tree species are associated with PCT618:

- *Angophora floribunda*;
- *Eucalyptus albens*;
- *E. blakelyi*;
- *E. crebra*;
- *E. melliodora*;
- *E. moluccana*; and
- *E. tereticornis*.

The following koala food tree species are associated with PCT1696:

- *A. floribunda*;
- *E. blakelyi; and*
- *E. crebra.*

With respect to the establishment of FBA species credits for the Koala (13 FBA credits), the Overstorey Completion Criteria for HU730 (PCT618) and HU910 (PCT1696) is applicable. 1.8 ha of mine rehabilitation in either PCT618 or PCT1696 will meet the definition of *highly suitable koala habitat*, and achieve the required species credits in table 12A. The *Koala Habitat Protection Guideline* (March 2020) defines *highly suitable koala habitat* as sites where *15% or greater of the total number of trees within any PCT are the regionally relevant species of those listed in Schedule 2* [of the Koala Habitat Protection SEPP].

The following sampling method would be used to identify *highly suitable koala habitat* as per the *Koala Habitat Protection Guideline* (March 2020):

> *Quadrats can be selected within each PCT either randomly or along a selected transect. Quadrats need to be of sufficient size to enable a minimum of at least 20 trees to be counted (at least 20 x 20 metres) and of sufficient number to allow a robust statistical determination of the percentage of tree species present in the lower, mid and upper stratum. The number and size of quadrats chosen will depend on the size of the site and the vegetation present*
>
> *…*
>
> *Results of the sampling within each PCT must be shown separately and not summed for the overall site.*
>
> *..*
>
> *Notes about the vegetation survey:*
>
> - *A "tree" is taken to be a plant with a diameter at breast height over bark (DBHOB) of 10 cm or greater.*
> - *Appendix A of this Guideline provides a list of the tree species as per Schedule 2 of the SEPP.*
> - *Only the trees listed for the relevant region must be surveyed for.*
> - *The calculation of the percentage of tree species must be completed within each vegetation community present on the site area and not averaged or totalled across the site. A result of 15% or greater in any individual vegetation community meets the definition of highly suitable koala habitat.*

Koala use trees for the relevant Koala Management Area (KMA) are listed in Appendix A of the *Koala Habitat Protection Guideline: Implementing the State Environmental Planning Policy (Koala Habitat Protection) 2019* (Department of Planning, Industry and Environment [DPIE], 2020).

Table 2-2
Completion and Performance Criteria – Relevant Attributes

Attribute (OEH, 2017)	BVT	Native Plant Species Richness (No. species)		Native Over Storey Cover MIN-MAX (%)*		Native Mid-Storey Cover MIN-MAX (%)		Native Ground Cover Grass MIN-MAX (%)		Native Ground Cover Shrubs MIN-MAX (%)		Native Ground Cover Other MIN-MAX (%)		Number Trees With Hollows	Total Length Fallen Logs (m)	
BVT Benchmark (OEH, 2017)	HU730 (PCT618)	41		15-40		5-20		30-50		5-10		20-40		3	5	
	HU910 (PCT1696)	41		15-40		5-20		30-50		5-10		20-40		3	5	
Completion Criteria Allowable Future Attribute Score Increases Relative to Benchmark (After OEH, 2014b, 2015)		1		1		1		0.5		0.5		0.5		0	0.5	
		>50%		>25<200%		>25<200%		>10<25%, or >200%		>10<25%, or >200%		>10<25%, or >200%		N/A	>25%	
MCO Criteria	BVT	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.		Comp.	Perf.
	HU730 (PCT618)	20.5	10.25	3.75-80	1.88-40	1.25-40	1-20	3-100	1.5-50	0.5-20	0.25-10	2-80	1-40	N/A	1.25	1
	HU910 (PCT1696)	20.5	10.25	3.75-80	1.88-40	1.25-40	1-20	3-100	1.5-50	0.5-20	0.25-10	2-80	1-40		1.25	1

* The rehabilitation of PCT618 would include flora species characteristic of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, and of foraging habitat for the Large-eared Pied Bat (*Chalinolobus dwyeri*), Swift Parrot (*Lathamus discolor*), Painted Honeyeater (*Grantiella picta*), Corben's Long-eared Bat (*Nyctophilus corbeni*) and Spotted-tail Quoll (*Dasyurus maculatus maculatus*) (SE mainland population). The rehabilitation of PCT1696 would include species characteristic of foraging habitat for the Large-eared Pied Bat.

Attribute (OEH, 2017)	Exotic Plant Cover (% of total cover)		Overall Site Value Score (OEH, 2015) (average of plots in vegetation zone)	
Completion Criteria Allowable Future Attribute Score Increases Relative to Benchmark (After OEH, 2014b, 2015)	1		13.8	
	<45%			
MCO Criteria	Comp.	Perf.	Comp.	Perf.
All Relevant BVTs	<45%	<50%	13.8	6.9

Comp. = Completion Criteria

Perf. = Performance Criteria

Performance Criteria - 10 Years Post Landform Establishment

The performance criteria in Table 2-2 have generally been developed on the basis of approximately 50% of a minimum completion criterion or up to two times of a maximum completion criteria.

Where the derived minimum criteria was less than one percent but greater than 0.5%, the criteria was generally rounded to 1%. Where the calculated maximum criteria was greater than 100%, it was reduced to 100%.

Table 2-2 presents the proposed performance criteria for mine rehabilitation at 10 years after landform establishment. With respect to the establishment of Koala species credits, the relevant criteria at 10 years is suitable progress against the Native Over-storey Performance Criteria presented in Table 2-2.

It is anticipated that the site attribute values for each FBA plot will be averaged in order to determine the site value of a vegetation zone (i.e. failure of one plot to achieve all the target criteria will not fail the vegetation zone) and the average Overall Site Value Score (average of plots in a vegetation zone) should be equal to or greater than **6.9** based on *Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined Land – Released: July 2015* (OEH, 2015).

Interim Performance Criteria- Every Three Years Post Landform Establishment

MCO proposes to track performance of BVT rehabilitation by conducting the following monitoring:

Years 1 to 10	Landform Function Analysis (LFA) and drone/aerial surveillance for any material areas of vegetation establishment failure.
Years 3 to 5	Single FBA plot in each BVT (randomly selected).
Years 6 to 9	FBA plots required in accordance with the vegetation zone size (i.e. 4 plots in 21.3 ha of HU730 [PCT618] and 5 plots in 96 ha of HU910 [PCT1696] in order to assess the performance against the Year 10 criteria). The number of plots will be reviewed annually, and revised as necessary, based on the review anomalies between plot data, LFA and aerial/drone surveys.

This approach will provide for the early detection of any material areas of rehabilitation failure, track progress against the performance and completion criteria and allow for the implementation of corrective measures as detailed in the Mining Operations Plan (MCO 2019a), where this may be required.

LFA plots comprise ecosystem functionality at the soil landscape level in terms of the landscape's ability to retain water and nutrients within the system. In terms of LFA, a soil landscape on the trajectory toward self-sustainability (in context of vegetation cover and soil stability) would have:

- A high Landscape Organisation Index (LOI). That is, a low number of bare soil patches (interpatches) between obstruction components (patches) in the soil landscape, which would affect wind and water movement and the introduction and transportation of resources into and out of the system.
- High Soil Surface Assessment indices, indicating that the site had favourable nutrient, infiltration and stability characteristics.

LFA monitoring is undertaken annually as part of the existing Rehabilitation Management Plan (MCO 2019b). Sites are selected randomly within the desired vegetation type, where a 50 m transect is laid down-slope. Monitoring sites are established within 24 months of the rehabilitation areas being seeded. LFA monitoring methods would be undertaken in accordance with those described in the existing Rehabilitation Management Plan (MCO 2019b).

MCO will apply the following Interim performance criteria every three years following landform establishment in the Rehabilitation Plan (Mining Operations Plan) (MCO 2019a):

- Soil/growth medium must have been applied.
- Seeding must have been conducted for the target BVT.
- LFA monitoring results show an improvement trend after 6 years following landform establishment.
- Rehabilitation remedial works must be being implemented in accordance with the Rehabilitation Management Plan (Mining Operations Plan), where annual monitoring indicates remediation works are required.

Notes

The proposed performance and completion criteria would be subject to change over the life of the operation based on increased knowledge and feedback from monitoring. Any changes would be based on the findings of the rehabilitation monitoring against these initial criteria, in consultation with BCD and the Department of Agriculture, Water and Environment (DAWE), and to the satisfaction of the Secretary.

The proposed criteria have been prepared in consideration of the potential for typically variable local climatic conditions and the progress of rehabilitation on-site under differing climatic sequences. In the case of a very long and serious drought event that largely precludes revegetation establishment, MCO may consult with the Secretary to seek a reasonable extension to the achievement of performance criteria status of any relevant landform establishment campaigns, in accordance with Condition 35C, Schedule 3 the Project Approval (05_0117) (as modified).

Conclusion

MCO considers that the proposed performance and completion criteria for HU730 (PCT618), HU910 (PCT1696) and the Koala are consistent with the requirements of the FBA (OEH, 2014a), NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014b) and the associated *Mine Rehabilitation Fact Shee*t and *Calculator for FBA Section 12.2: Generating Biodiversity Credits for Ecological Rehabilitation of Previously Mined land – Released: July 2015* (OEH, 2015) and represent appropriate targets within this framework in accordance with Project Approval 05_0117 (as modified). The satisfaction of the completion criteria will satisfy the residual Ecosystem and Species Credits described in Table 12 A of Project Approval 05_0117.

Key References:

Department of Planning and Environment (2019). *Moolarben Coal Mine (05_0117 MOD 14 and 08_0135 MOD 3): Modification Assessment Report*.

Department of Planning, Industry and Environment (2020). *Koala Habitat Protection Guideline: Implementing the State Environmental Planning Policy (Koala Habitat Protection) 2019*.

Moolarben Coal Operations Pty Ltd (2019a). *Mining Operations Plan (January 2017 – January 2019*).

Moolarben Coal Operations Pty Ltd (2019b). *Rehabilitation Management Plan*.

Office of Environment and Heritage (2014a) *Framework for Biodiversity Assessment.* NSW *Biodiversity Offsets Policy for Major Projects.*

Office of Environment and Heritage (2014b) NSW *Biodiversity Offsets Policy for Major Projects.* State of NSW and Office of Environment and Heritage.

Office of Environment and Heritage (2015) *Calculator for Framework for Biodiversity Assessment (FBA) section 12.2: Generating biodiversity credits for ecological rehabilitation of previously mined land - Released: July 2015.*

Office of Environment and Heritage (2017). *Archived BioMetric and Threatened Species Profiles Datasets.* Website: http://www.environment.nsw.gov.au/projectslbiometric-dataset.htm [Accessed April 2020].

Office of Environment and Heritage (2018). *A review of koala tree use across New South Wales*. Website: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Native-animals/review-of-koala-tree-use-across-nsw-180385.pdf [Accessed April 2020].

Key Definitions (After OEH, 2014a):

Broad condition state: are areas of the same BVT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same BVT into a vegetation zone for the purpose of determining the site value score.

Native ground cover: all native vegetation below 1 m in height, including all such species native to NSW (i.e. not confined to species indigenous to the area).

Native ground cover (grasses): native ground cover contains all native vegetation below 1 m in height and includes all species native to NSW (i.e. it is not confined to species indigenous to the area). Native ground cover (grasses) refers specifically to native grasses.

Native ground cover (other): native ground cover contains all native vegetation below 1 m in height and includes all species native to NSW (i.e. it is not confined to species indigenous to the area). Native ground cover (other) refers to non-woody native vegetation (vascular plants only) <1 m that is not grass (e.g. herbs, ferns).

Native ground cover (shrubs): native ground cover contains all native vegetation below 1 m in height and includes all species native to NSW (i.e. it is not confined to species indigenous to the area). Native ground cover (shrubs) refers to native woody vegetation <1 m.

Native mid-storey cover: native mid-storey contains all vegetation between the over-storey stratum and a height of 1 m (typically tall shrubs, under-storey trees and tree regeneration) and including all species native to NSW (i.e. native species not local to the area can contribute to mid-storey structure).

Native over-storey cover: native over-storey is the tallest woody stratum present (including emergent) above 1 m and including all species native to NSW (i.e. native species not local to the area can contribute to over-storey structure). In a woodland community the over-storey stratum is the tree layer, and in a shrubland community the over-storey stratum is the tallest shrub layer. Some vegetation types (e.g. grasslands) may not have an over- storey stratum.

Native plant species richness: the number of different native vascular plant species that are characteristic of a BVT.

Regeneration: the proportion of over-storey species characteristic of the BVT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.

Site attributes: the matters assessed to determine site value. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.

Site value: the condition of native vegetation assessed for each vegetation zone against the benchmark for the BVT.

Vegetation zone: a relatively homogenous area of native vegetation that is the same BVT and broad condition state.