

**Assessment of EPBC Act-listed threatened species and communities for projects**

***Suggested information for inclusion in the advice to DPIE***

**Maxwell Underground Coal Mine Project (SSD 9526) EPBC Bilateral Assessment – BCD Assessment**

All section, table, figure and appendix references in this document (below) refer to sections, tables, figures and appendices in the Biodiversity Development Assessment Report (BDAR) submitted with the EIS.

## **1. Identifying MNES**

(a) **Confirm** whether all the EPBC Act-listed threatened species and communities that occur on the project site, or in the vicinity are identified in the EIS. Note which species and/or communities have not been identified.

The Environment Protection and Biodiversity Conservation (EPBC) Act 1999-listed threatened species and communities that occur on the project site or in the vicinity as generated from the Protected Matters Search Tool (15 kilometre radius search dated as July 2018, listed in BDAR references) have been identified in the Maxwell Project Environmental Impact Statement (EIS), notably in Appendix E – Biodiversity Development Assessment Report (BDAR) – Table 7 (Threatened Flora and Fauna Species Known or Predicted to occur in the Locality); and in Attachment A of the BDAR – Maxwell Project Baseline Flora Report – Table 6 (TECs Possibly Occurring Within 20 kilometres of the Study Area).

A copy of the Protected Matters Search Tool results has not been provided by the proponent.

An assessment of the likelihood of each entity occurring has been undertaken and a decision as to whether an assessment of significance is required has been made by the proponent (Section 7 of the BDAR). Three threatened ecological communities (TEC), five flora species and twelve fauna species were considered to have the potential to occur within the above ground construction footprint (clearance area) and the subsidence area (Section 7.2).

Under Section 7.2 the following species were considered not at risk of significant impact because the species were unlikely to be present in the Project area or surrounds, based on targeted surveying or habitat assessment (i.e. lack of):

- Green and Golden Bell Frog;
- Koala;
- New Holland Mouse;
- White-flowered Wax Plant;
- Slaty Red Gum;
- Tarengo Leek Orchid;
- Illawarra Greenhood; and
- Austral Toadflax.

Potential impacts on the following species and communities were assessed in the BDAR:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland;
- Central Hunter Valley Eucalypt Forest and Woodland;
- Hunter Valley Weeping Myall Woodland;
- Pink-tailed Legless Lizard;
- Striped Legless Lizard;
- Swift Parrot;
- Regent Honeyeater;
- Painted Honeyeater;
- Spotted-tailed Quoll;
- Corben's Long-eared Bat;
- Grey-headed Flying-fox; and
- Large-eared Pied Bat.

The Department of the Agriculture, Water and the Environment (DAWE) (EPBC 2018/8287) based on their Environment Reporting Tool and information provided by the Species Profiles and Threats Database (SPRAT), considered that the following matters are possibly at risk of being impacted:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered;
- Central Hunter Valley eucalypt forest and woodland - Critically Endangered;
- Hunter Valley Weeping Myall (*Acacia pendula*) Woodland ecological community - Critically Endangered;
- Regent Honeyeater (*Anthochaera phrygia*) - Critically Endangered;
- Swift Parrot (*Lathamus discolor*) - Critically Endangered;
- Green and Golden Bell Frog (*Litoria aurea*) – Vulnerable;
- Large-eared Pied Bat (*Chalinolobus dwyeri*) – Vulnerable;
- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) – Endangered;
- Corben's Long-eared Bat (*Nyctophilus corbeni*) – Vulnerable;
- Koala (QLD, NSW, ACT) (*Phascolarctos cinereus*) – Vulnerable;
- New Holland Mouse (*Pseudonmys novaehollandiae*) – Vulnerable;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable;
- White-flowered Wax Plant (*Cynanchum elegans*) – Endangered;
- Slaty Red Gum (*Eucalyptus glaucina*) – Vulnerable;
- a leek-orchid (*Prasophyllum* sp. Wybong) - Critically Endangered;
- Illawarra Greenhood (*Pterostylis gibbosa*) – Endangered; and
- Austral Toadflax (*Thesium australe*) – Endangered.

DAWE further refined this list, and suggest the following entities would be significantly impacted by the Project (as per Commonwealth Department of Environment and Energy assessment requirements):

- Central Hunter Valley eucalypt forest and woodland;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland;
- Regent Honeyeater (*Anthochaera phrygia*); and
- Swift Parrot (*Lathamus discolor*).

All the likely four impacted species or TECs listed on the DAWE advice (as per above) have been assessed within the BDAR (Section 7), with a further seven of the possible species (Painted Honeyeater, Spotted-tailed Quoll, Corben's Long-eared Bat, Grey-headed Flying-fox and Large-eared Pied Bat) or newly identified species (\*based on surveys - Pink-tailed Legless Lizard and Striped Legless Lizard) also assessed. The rest of the species were considered unlikely to occur within the development footprint based on targeted surveying and lack of habitat (as per details in Attachment A and B of the BDAR).

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**(b) Comment on whether the Biodiversity Assessment Method (BAM) has been applied to all EPBC Act-listed threatened species and communities that occur on the project site or in the vicinity.**

All entities that were identified as requiring an assessment of significance have been assessed (Section 7.2), comprising:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Central Hunter Valley Eucalypt Forest and Woodland
- Hunter Valley Weeping Myall Woodland
- Pink-tailed Legless Lizard; Striped Legless Lizard
- Swift Parrot
- Regent Honeyeater
- Painted Honeyeater
- Spotted-tailed Quoll
- Corben's Long-eared Bat

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- Grey-headed Flying-fox
- Large-eared Pied Bat)

Impacts to all species or TEC were assessed and impacts that were significant were identified and credit liabilities were determined. The Biodiversity Assessment Method (BAM) has been correctly applied to all EPBC Act-listed threatened species and communities that occur on the project site or in the vicinity. Both species and ecosystem credits have been generated for all EPBC Act-listed threatened species likely to be significantly impacted (as per Tables 34 and 35 of the BDAR). Following is a summary of the application of the BAM to each of the above listed entities.

### White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (DNG) (Section 7.2.1):

The Project will result in the direct clearance of approximately 135.2 hectares of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, comprising predominantly derived grassland (approximately 125.6 hectares – PCT 1606 DNG) and various woodland patches of this community (totalling approximately 9.6 hectares - PCT 1606) (Figures 7a, 7b and 10) (Table 38). The clearance would occur in the short-term for the proposed transport and services corridor as well as the potential Edderton Road Realignment.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The direct clearance of 135.2 hectares of this TEC was considered a significant impact that requires the retirement of 1234 ecosystem credits. These credits will be retired across 2 stages, which is permitted under the BAM.

Additionally, there is approximately 1,239.5 hectares of Box-Gum woodland within the area subject to subsidence (Table 38) of which approximately 1,025 hectares is the DNG form. Subsidence is unlikely to materially impact the native vegetation within the predicted subsidence area as surface cracks would be remediated and potential impacts on trees (dieback or tree fall) is unlikely based on experience and monitoring results from similar underground mining operations elsewhere in the Hunter Valley. BCD supported this assessment but requested DPIE to condition any impacts of unexpected mine subsidence to be assessed in accordance with the BAM and any credits generated be appropriately offset.

### Central Hunter Valley Eucalypt Forest and Woodland (Section 7.2.2):

The Project will result in the direct clearance of Central Hunter Valley Eucalypt Forest and Woodland, comprising various woodland patches of this community (totalling approximately 12.3 hectares – PCT 1604, PCT 1655 and PCT 1691) (Figures 7a, 7b and 10) (Table 38). The DNG component of these PCTs are not considered to be the TEC. The clearance would occur in the short term for the proposed transport and services corridor as well as the potential Edderton Road Realignment.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The direct clearance of 12.3 hectares of this TEC was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 302 ecosystem credits. These credits will be retired across 2 stages, which is permitted under the BAM.

### Hunter Valley Weeping Myall Woodland (Section 7.2.3):

The Project would not result in the clearance of the Hunter Valley Weeping Myall (*Acacia pendula*) Woodland, as the community will not be directly impacted. As such a significant impact to this community is unlikely. There is 0.4 hectares of Hunter Valley Weeping Myall (*Acacia pendula*) Woodland in the predicted subsidence area (Figure 7a) but it is unlikely that subsidence would affect the viability of these plants. BCD supported this assessment but requested DPIE to condition any impacts of unexpected mine subsidence to be assessed in accordance with the BAM and any credits generated be appropriately offset.

### Pink-tailed Legless Lizard (Section 7.2.4):

This species was recorded in the development footprint. The Project will result in the direct clearance of approximately 38.7 hectares of potential habitat for the Pink-tailed Legless Lizard, represented by 12.5 hectares of rocky areas in PCT 1606 and a 50 m zone (26.2 hectares) around the rocky areas (Figure 17) (Table 39). Rocky areas which provide

potential habitat for the Pink-tailed Legless Lizard also occur adjacent to the development footprint (Figure 17), thus lessening the overall impact to this species. The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment.

In accordance with the criteria set out in the Matters of National Environmental Significance Significant Impact Guidelines 1.1. (DotE 2013) the BDAR assessed that the project would likely have a significant impact on the Pink-tailed Legless Lizard in the short to medium-term, given the Project may reduce the area of occupancy of a population that may represent an 'important population' according to the DotE (2013) given the population is near the limit of the species range.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The direct clearance of 38.7 hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 423 species credits. These credits will be retired across 2 stages, which is permitted under the BAM.

Striped Legless Lizard (Section 7.2.5):

This species was recorded in the development footprint. The Project will result in the direct clearance of approximately 152.8 hectares of known and potential habitat for the Striped Legless Lizard (Figure 18) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.5 hectares) of potential subsidence ponding (Figure 18).

In accordance with the criteria set out in the Matters of National Environmental Significance Significant Impact Guidelines 1.1. (DotE 2013) the BDAR assessed the project would likely have a significant impact on the Striped Legless Lizard in the short to medium-term, given the Project may provide a physical barrier to movement and it may reduce the area of occupancy of a population that may represent an 'important population' according to the DotE (2013) given the population is near the limit of the species range.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The direct clearance of 152.8 hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 1,225 species credits. These credits will be retired across 2 stages, which is permitted under the BAM.

Swift Parrot (Section 7.2.6):

The Project will result in the direct clearance of approximately 25 hectares of potential foraging habitat for the Swift Parrot (Figure 30) (Table 39). This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding habitat) in the Project area (Table 9) based on DPIE 'Important Area Mapping' the species will be offset with ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland forms of PCT 201, 1606, 1655, 1691 and 1692. The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.8 hectares) of potential subsidence ponding (Figure 30). The species has not been recorded in the Project area.

In accordance with the criteria set out in the Matters of National Environmental Significance Significant Impact Guidelines 1.1. (DotE 2013) the BDAR assessed the project could have a significant impact on the Swift Parrot on foraging habitat given that the species has been recorded adjacent to the Project area and there is potential habitat. However, none of the development footprint has been mapped on DPIE 'Important Area Mapping' for Swift Parrot, and as per the BAM this impact is not considered significant.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The removal of potential habitat (not breeding) will be offset through the retirement of ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland forms of PCT 201, 1606, 1655, 1691 and 1692.

Regent Honeyeater (Section 7.2.7):

The Project will result in the direct clearance of approximately 22.2 hectares of potential foraging habitat for the Regent Honeyeater (Figure 31) (Table 39). This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding habitat) mapped in the Project area (Table 9) based on DPIE 'Important Area Mapping' the species will be offset with ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655 and 1691. The clearance areas would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.8 hectares) of potential subsidence ponding (Figure 31). The Regent Honeyeater has not been recorded in the Subject land (Table 7).

In accordance with the criteria set out in the Matters of National Environmental Significance Significant Impact Guidelines 1.1. (DotE 2013) the BDAR assessed the project could have a significant impact on the Regent Honeyeater given potential habitat present. However, none of the development footprint has been mapped on DPIE 'Important Area Mapping' for Regent Honeyeater, and as per BAM this impact is not considered significant.

The BDAR was assessed by BCD to have been conducted correctly and in accordance with the BAM. The removal of potential habitat will be offset through the retirement of with ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655 and 1691.

Painted Honeyeater (Section 7.2.8):

The Project will result in the direct clearance of approximately 25.2 hectares of potential foraging habitat for the Painted Honeyeater (Figure 32) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.8 hectares) of potential subsidence ponding (Figure 32).

The BDAR states '*If the potential foraging habitat in the Biodiversity Assessment Development Footprint is removed, it is likely to be of little consequence to the Painted Honeyeater given there have been no previous records of this bird in the Biodiversity Assessment Development Footprint*'. However, this statement contradicts another account Section 7.2.9 which indicates that the species may have been recorded on site (albeit a historical record) – '*As a single individual was recorded in PCT 1607, it is likely that it was in foraging habitat only, and perhaps an itinerant individual. There is better potential habitat for these species outside the Biodiversity Assessment Development Footprint (e.g. along Saddlers Creek)*'. Nevertheless, this statement still implies that the habitat on site is of limited value for this species. The BDAR concludes that the Project area is unlikely to provide important habitat and as such a significant impact on the Painted Honeyeater is unlikely. BCD supported this conclusion in its assessment of the EIS.

No offset is required for this species based on the above. However, this species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such would be offset through the ecosystem credit retirement, including credits generated for PCT 1607.

Spotted-tailed Quoll (Section 7.2.9):

The Project will result in the direct clearance of approximately 161.1 hectares of potential habitat for the Spotted-tailed Quoll (Figure 33) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 2 ha) of potential subsidence ponding (Figure 33). Potential habitat for this species is widespread (Figure 33). The BDAR concluded that the Project will not likely have a significant impact on the Spotted-tailed Quoll in consideration of the Matters of National Environmental Significance Significant Impact Guidelines 1.1. (DotE 2013), due to extensive areas of similar habitat in the vicinity. BCD supports this conclusion.

No offset is required for this species based on the above. However, this species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such would be offset through the ecosystem credit retirement, as per the credit calculations for the Project (Tables 5 and 17).

Corben's Long-eared Bat (Section 7.2.10):

As described in Section 7.1.2 of the BDAR, Corben's Long-eared Bat may have been recorded in the Project area nearly 20 years ago, but the record is uncertain as the detection method is not known (BDAR Attachment B – Maxwell Project Baseline Fauna Survey Report). Surveys for the project did not record the species.

The Project will result in the direct clearance of approximately 20.9 hectares of potential habitat (and a reduction in tree hollows) for Corben's Long-Eared Bat (Figure 34) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.8 hectares) of potential subsidence ponding (Figure 34).

The BDAR concluded that the Project will not likely have a significant impact on Corben's Long-eared Bat due to the lack of suitable roosting habitat and the lack of positive records. Although BCD supports this conclusion, it is noted that suitable roosting habitat may be on site (i.e. tree hollows), however, similar habitat will likely be offset via retirement of ecosystem credits for PCTs assigned to this species in the Threatened Biodiversity Data Collection (OEH, 2019a).

No offset is required for this species based on the above. However, this species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such would be offset through the ecosystem credit retirement, as per the credit calculations for the Project (Tables 5 and 17).

Grey-headed Flying-fox (Section 7.2.11):

No Grey-headed Flying-fox camps are located within the Project area or surrounds.

The Project will result in the direct clearance of approximately 24.5 hectares of potential foraging habitat for the Grey-headed Flying Fox (Figure 35) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (<0.3 ha) of potential subsidence ponding (Figure 35). This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); given that there is no important breeding habitat (i.e. camps) in the Project area (Table 9) the species will be offset with ecosystem credits calculated for PCTs associated with potential foraging habitat for this species.

The BDAR concluded that the Project will not likely have a significant impact on Grey-headed Flying Fox due to the lack of a breeding camp and that there are numerous areas of suitable foraging habitat within the surrounds. BCD supported this conclusion.

No offset is required for this species based on the above. However, this species is classified as both an 'Ecosystem / Species Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such foraging habitat would be offset through the ecosystem credit retirement, as per the credit calculations for the Project (Tables 5 and 17).

Large-eared Pied Bat (Section 7.2.12):

No potential roosting habitat for the Large-eared Pied Bat (caves or similar structures) was located within the Project area or surrounds.

The Project will result in the direct clearance of approximately 25 hectares of potential foraging habitat for the Large-eared Pied Bat (Figure 36) (Table 39). The clearance would be required for the proposed mine entry area, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.8 hectares) of potential subsidence ponding (Figure 36).

The BDAR concluded that the Project will not likely have a significant impact on the Large-eared Pied Bat due to the lack of roosting habitat. BCD supports this conclusion.

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The species is a 'species credit' species; so, no offset is required for this species as no suitable roosting habitat will be impacted upon. Though, general foraging and movement habitat will likely be offset through the ecosystem credit retirement, as per the credit calculations for the Project (Tables 5 and 17).

### General:

BCD in its review of the EIS indicated that the BDAR was undertaken correctly and in accordance with the BAM.

Section 7.2 of the BDAR addresses impacts to MNES species and TEC. Apart from the above comments, each species or TEC section has generally included text and addressed the following principles:

- discussion of the likely direct, indirect, cumulative and consequential impacts relevant to MNES;
- description of the quantum and nature of the impacts on the species, the populations and/or the extent of the community (including discussion of the scale of impact in relation to local, regional, state and national populations / habitat);
- discussion of the nature and significance of impacts in the context of any relevant Approved Conservation Advice; and
- details of specific measures to avoid, mitigate and/or offset impacts to relevant MNES.

However, BCD notes that most of the species and TEC assessments are lacking specific detail in relation to following principles:

- statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible; and
- reference to any relevant policies or plans such as Conservation Advice, Recovery Plans and Threat Abatement Plans.

The Project results in a total of 1,952 ecosystem credits (Table 1) and 2,250 species credits (Table 2) that will need to be retired (see below for further breakdown).

*Table 1: Ecosystem Credit Requirements*

PCT	Name	Condition	Credits – Stage 1	Credits – Stage 2	Total Credits
1607	Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter	Moderate	59	0	59
1607	Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter	DNG	9	0	9
1692	Bull Oak grassy woodland of the central Hunter Valley	Moderate	45	0	45
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Moderate	15	0	15
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	DNG	14	26	40
1655	Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	Moderate	21	0	21
1655	Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	Low	0	2	2
1655	Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	DNG	0	24	24
1604	Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter	Moderate	44	0	44
1604	Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter	Low Pasture Rehab	214	0	214
1604	Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter	Low Woodland Rehab	0	0	0
1691	Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Moderate	184	51	235
1691	Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	DNG	6	0	6

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PCT	Name	Condition	Credits Stage 1	Credits Stage 2	Total Credits
1731	Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	Moderate	0	4	4
1606	White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter	Moderate	216	2	218
1606	White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter	DNG	971	45	1016
<b>TOTAL</b>					<b>1952</b>

Table 2: Species Credit Requirements

Species	Credits Stage 1	Credits Stage 2	Total Credits
<i>Aprasia parapulchella</i> (Pink-tailed Legless Lizard)	382	41	423
<i>Delma impar</i> (Striped Legless Lizard)	1126	99	1225
<i>Myotis macropus</i> (Southern Myotis)	9	36	45
<i>Petaurus norfolcensis</i> (Squirrel Glider)	524	33	557
<b>TOTAL</b>			<b>2250</b>

Table 41 of the BDAR provides an explanation on how the BAM was applied to EPBC Act species and communities, and which PCT yield the ecosystem credits for each EPBC entity:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecosystem credits calculated for PCT 1606 (Woodland and DNG).
- Central Hunter Valley Eucalypt Forest and Woodland Ecosystem credits calculated for PCT 1604, 1655 and 1691 (Woodland only).
- Striped Legless Lizard Species credits.
- Pink-tailed Legless Lizard Species credits.
- Swift Parrot ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655, 1691 and 1692.
- Regent Honeyeater ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655 and 1691.

BCD confirms that the minimum number of transects/plots were undertaken for each vegetation zone / PCT (as per Attachment A – Maxwell Project Baseline Flora Survey Report), which is in accordance with the BAM. BCD's review of the EIS also concluded that targeted surveys were undertaken in accordance with BCD survey guidelines (both flora and fauna). Targeted threatened flora surveys were also undertaken during the appropriate season, especial for cryptic species that require flowers or fruits for identification. Table 36 lists the EPBC Act species targeted for surveying; with Table 37 indicating which species were recorded on the Project area during surveys.

The BAM (OEH 2017a) does not require a formal Biodiversity Offset Strategy (BOS) to be presented in a BDAR, however, a Biodiversity Offset Strategy is required to be included in this BDAR in accordance with the SEARs for the EIS. This has been provided in Section 8 (Biodiversity Offset Strategy) of the BDAR. Effectively, this section outlines the potential offset mechanisms available and the potential likelihood of use, ranging from payment into the Biodiversity Conservation Trust, purchase and retirement of open market available biodiversity credits, to establishment of a Biodiversity Stewardship Site.

With respect to MNES matters, the proponent (Malabar) will offset via the retirement of like-for-like biodiversity credits for relevant Commonwealth-listed threatened species and communities as required by the EPBC Act (Section 8.3 of the BDAR), and potentially as well for matters that are not EPBC Act listed. Table 42 (in BDAR) lists the biodiversity credits required to be retired with like-for like biodiversity credits.



(c) In the circumstance where there are EPBC Act-listed species that are not addressed by the BAM (i.e. migratory species) **comment** on whether these species have been assessed in accordance with the SEARs and provide references to where the assessment information is detailed in the EIS.

The Protected Matters Search (as detailed in Table of the BDAR) identified 1 migratory species, the White-bellied Sea-eagle (*Haliaeetus leucogaster*), listed under the EPBC Act as potentially occurring in the locality, however it is unknown whether this search recorded more 'migratory species' than listed, as it appears that Table 7 may only record species that are shown on Figure 13 (Threatened Birds). However, this species was removed off the migratory list in 2015. It currently sits within the 'marine species' provisions of the Act.

Section 2.1 (Literature and Database Review) and Appendix A (Fauna species detected) of Attachment B (of the BDAR) identifies further species on site - Rainbow Bee-eater (*Merops ornatus*), and in the general locality (Saddlers Creek and Mount Arthur mine) - White-throated Needletail (*Hirundapus caudacutus*). The latter is currently listed as 'migratory' on the Act, whilst the Bee-eater was removed from the Act in June 2016 (now under the Marine provisions of the Act). The report further identifies Wedge-tailed Eagle (*Aquila audax*), Black-shouldered Kite (*Elanus axillaris*), Nankeen Kestrel (*Falco cenchroides*), and Masked Lapwing (*Vanellus miles*) as migratory species under the Act. However, these species were removed from the Act prior to 2014; with Nankeen Kestrel added to the 'marine species' provisions of the Act, and the site is not a marine environment.

Although the White-throated Needletail (now listed as 'vulnerable' under the EPBC Act) was recorded adjacent to the Project area, the DAWE referral advice (including the ERT [Environmental Reporting Tool]) did not consider the proposal would significantly impact on this species or other migratory entities, as the proposed action area does not contain important habitat for migratory species, or support a significant population. As such DAWE considers that significant impacts to migratory species are unlikely. Therefore no further assessment is required.

(d) **Verify** that the proponent has expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring, for each listed threatened species and community protected by the EPBC Act referred to in 1(a). Note which species and/or communities have not been addressed in this manner.

An assessment of whether each threatened species and ecological community is likely to occur in the proposal area and whether a subsequent assessment of significance is required has been undertaken in Section 7 of the BDAR.

Outcomes of the assessment are:

- *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (DNG)* - the Project will result in the direct clearance of approximately 135.2 hectares of this TEC. The direct clearance of 135.2 hectares of this TEC was considered a significant impact that requires the retirement of 1234 ecosystem credits.
- *Central Hunter Valley Eucalypt Forest and Woodland* - the Project will result in the direct clearance of various woodland patches of this TEC totalling approximately 12.3 hectares. The direct clearance of 12.3 hectares of this TEC was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 302 ecosystem credits.
- *Hunter Valley Weeping Myall Woodland* - the Project will not result in the clearance of the Hunter Valley Weeping Myall (*Acacia pendula*) Woodland, as the community will not be directly impacted. No offset is required.
- *Pink-tailed Legless Lizard* - the Project will result in the direct clearance of approximately 38.7 hectares of potential habitat for this species. The direct clearance of 38.7 hectares of this this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 423 species credits.
- *Striped Legless Lizard* - the Project will result in the direct clearance of approximately 152.8 hectares of known and potential habitat for the Striped Legless Lizard (Figure 18) (Table 39). The direct clearance of 152.8

hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 1,225 species credits.

- *Swift Parrot* - the Project will result in the direct clearance of approximately 25 hectares of potential foraging habitat for the Swift Parrot (Figure 30) (Table 39). This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding) in the Project area (Table 9) based on DPIE 'Important Area Mapping', the species will be offset with ecosystem credits calculated for PCTs associated with potential foraging habitat for this species. The impact was assessed as not significant.
- *Regent Honeyeater* - the Project will result in the direct clearance of approximately 22.2 hectares of potential foraging habitat for the Regent Honeyeater (Figure 31) (Table 39). This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding) in the Project area (Table 9) based on DPIE 'Important Area Mapping', the species will be offset with ecosystem credits calculated for PCTs associated with potential foraging habitat for this species. The impact was assessed as not significant.
- *Painted Honeyeater* - the Project will result in the direct clearance of approximately 25.2 hectares of potential foraging habitat for the Painted Honeyeater (Figure 32) (Table 39). The Project area is unlikely to provide important habitat and as such a significant impact on the Painted Honeyeater is unlikely. This species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such would be offset through the ecosystem credit retirement.
- *Spotted-tailed Quoll* - the Project will result in the direct clearance of approximately 161.1 hectares of potential habitat for the Spotted-tailed Quoll (Figure 33) (Table 39). The Project will not likely have a significant impact on the Spotted-tailed Quoll in consideration of the Matters of National Environmental Significance Significant Impact Guidelines 1.1, due to extensive areas of similar habitat in the vicinity (DotE 2013). This species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such foraging and movement habitat would be offset through the ecosystem credit retirement.
- *Corben's Long-eared Bat* - the Project will result in the direct clearance of approximately 20.9 hectares of potential habitat (and a reduction in tree hollows) for this species (Figure 34) (Table 39). The Project will not likely have a significant impact on Corben's Long-eared Bat due to the lack of suitable roosting habitat and the lack of positive records. This species is classified as an 'Ecosystem Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such would be offset through the ecosystem credit retirement.
- *Grey-headed Flying-fox* - the Project will result in the direct clearance of approximately 24.5 hectares of potential foraging habitat for the Grey-headed Flying Fox (Figure 35) (Table 39). No camps occur on or within the vicinity of the Project area. The Project will not likely have a significant impact on Grey-headed Flying Fox due to the lack of a breeding camp and that there are numerous areas of suitable foraging habitat within the surrounds. This species is classified as both an 'Ecosystem / Species Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a) and as such foraging habitat would be offset through the ecosystem credit retirement.
- *Large-eared Pied Bat* - the Project will result in the direct clearance of approximately 25 hectares of potential foraging habitat for the Large-eared Pied Bat (Figure 36) (Table 39). The Project will not likely have a significant impact on the Large-eared Pied Bat due to the lack of roosting habitat. The species is a 'species credit' species; and no offset is required for this species as no suitable roosting habitat is being impacted upon. Though, general foraging and movement habitat will likely be offset through the ecosystem credit retirement.

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(e) **Identify** where further information from the proponent is critical to the assessment of MNES particularly in relation to mapping Table 1 (A), analysis of impacts Table 1 (F) and Table 2 (F), avoidance, mitigation and offsetting, and 6.

Further information was sought during the BAM assessment (i.e. exhibition of the EIS), with respect to:

- (i) impacts to biodiversity caused by the proposed centralised gas management infrastructure
- (ii) impacts to threatened biodiversity due to remediation of mine subsidence cracks

- (iii) unexpected mine subsidence detected under the Subsidence Monitoring Program and Biodiversity Management Plan requires the impacts assessed in accordance with the BAM and any credits generated should be appropriately offset
  - (iv) active management of plants that may out-compete pine donkey orchid is applied to *Diuris tricolor* enclosed area
  - (v) impacts to vegetation growing in Saddlers Creek and Saltwater Creek streambeds is assessed.
- These matters were adequately addressed in the Response to Submissions (RTS).
- 

## **2. Assessment of the relevant impacts**

All EPBC Act-listed species and/or communities that the Commonwealth consider would be significantly impacted (as noted in the referral documentation) should be assessed and offset. These are referred to as relevant impacts.

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(a) **Verify** [by ticking the following boxes]:

- ✓ the nature and extent of all the relevant impacts has been described
- ✓ measures to avoid and mitigate have been described
- ✓ an appropriate offset for any residual adverse significant impact has been determined.

DoE determined that the following threatened species and TEC are likely to be significantly impacted:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Central Hunter Valley eucalypt forest and woodland
- Regent Honeyeater (*Anthochaera phrygia*)
- Swift Parrot (*Lathamus discolor*).

The BDAR identified two other species of MNES that would be likely to be significantly impacted:

- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*).

*White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (DNG)* - the Project will result in the direct clearance of approximately 135.2 hectares of this TEC. The direct clearance of 135.2 hectares of this TEC was considered a significant impact that requires the retirement of 1234 ecosystem credits.

*Central Hunter Valley Eucalypt Forest and Woodland* - the Project will result in the direct clearance of various woodland patches of this TEC totalling approximately 12.3 hectares. The direct clearance of 12.3 hectares of this TEC was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 302 ecosystem credits.

*Pink-tailed Legless Lizard* - the Project will result in the direct clearance of approximately 38.7 hectares of potential habitat for this species. The direct clearance of 38.7 hectares of this species' habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 423 species credits.

*Striped Legless Lizard* - the Project will result in the direct clearance of approximately 152.8 hectares of known and potential habitat for the Striped Legless Lizard (Figure 18) (Table 39). The direct clearance of 152.8 hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 1,225 species credits.

Two other 'credit species' under the BC Act were found to be significantly impacted by the proposal and requiring credits to be retired: Southern Myotis and Squirrel Glider. However, these species are not listed on the EPBC Act.

Although, advice documents from DAWE suggested that the proposal may have a significant impact on Regent Honeyeater and Swift Parrot, the BDAR and EIS adequately showed that the impact to these entities would not be significant. BCD noted that these species are both classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding) in the Project area (Table 9) based on DPIE 'Important Area Mapping' no species credits are required to be retired and they would be offset with ecosystem credits calculated for PCTs associated with potential foraging habitat for these species.

A BOS was submitted with the BDAR and is in accordance with the BAM. The Project results in a total of 1,952 ecosystem credits (1,536 credits relevant to MNES TEC) and 2,250 species credits (1,648 credits relevant to MNES) that will need to be retired. Section 8 of the BDAR outlines the potential offset mechanisms available and the potential likelihood of use, ranging from payment into the Biodiversity Conservation Trust, purchase and retirement of open market available biodiversity credits, and establishment of a Biodiversity Stewardship Site. Though, with respect to MNES matters, the proponent (Malabar) has indicated that offsetting will be the retirement of like-for-like biodiversity credits for relevant Commonwealth-listed threatened species and communities, and potentially as well for matters that are not EPBC Act listed. Table 42 (in the BDAR) lists the biodiversity credits required to be retired with like-for like biodiversity credits.

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(b) **Note** if information in relation to any of these boxes has not been provided for any relevant EPBC Act-listed species and communities.

BCD considers that the 'Assessment of MNES' in the BDAR is adequate but notes there is some missing information in regard to threatened species and TECs. The following information was not provided:

- whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
- is the assessment consistent with or need to reference any relevant policies or plans such as Conservation Advice, Recovery Plans and Threat Abatement Plans;

However the provision of the above information for MNES threatened species and TECs is unlikely to change the outcome of the assessments for any of the MNES entities.

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(c) There may be listed threatened species and communities for which the proponent will claim that the impact will be **not** significant in accordance with the *EPBC Act Significant Impact Guidelines*. Please **provide** advice for cases where OEH disagrees with this finding.

Not applicable. BCD is satisfied with the assessment of MNES provided the BDAR.

(d) Provide references to where specific lists or tables are detailed in the EIS

## **EIS**

- Appendix E – Biodiversity Development Assessment Report
- Table 2.2 – Overview of Approach to Cumulative Impact Assessment - Terrestrial Biodiversity, pg. 2-24
- Table 6-4 – Summary of Potential Subsidence Consequences, pg. 6-11
- Section 6.7 – Terrestrial Ecology, pg. 6-62
- Figure 6-14 – Vegetation Mapping - Maxwell Underground, pg. 6-64
- Figure 6-15 – Vegetation Mapping - Maxwell Infrastructure, pg. 6-65
- Table 6-9 – Mapped Vegetation Communities, pg. 6-66
- Figure 6-16 – Threatened Flora Species / Endangered Populations, pg. 6-69
- Figure 6-17 – Species Credit Species Relevant to the Project, pg. 6-70
- Figure 6-18 – Threatened Species Listed under the EPBC Act, pg. 6-71
- Table 6-10 – Project Ecosystem Credit Requirements, pg. 6-75
- Table 6-11 – Project Species Credit Requirements, pg. 6-76
- Table 6-12 – Application of the BAM to EPBC Act Listed Threatened Species and Communities, pg. 6-77
- Table 6-13 – Measures to Mitigate and Manage Potential Impacts, pg. 6-78
- Table 6-14 – Biodiversity Offset Strategy for the Maxwell Infrastructure, pg. 6-80
- Table 9-5 – Principles of Ecologically Sustainable Development - EPBC Act and Protection of the Environment Administration Act, 1991, pg. 9-22

## **Appendix E (to EIS) – Biodiversity Development Assessment Report**

- Table ES-1 – Threatened Ecological Communities, pg. 11
- Table ES-2 – Credit Requirements, pg. 13
- Figure 1 – Regional Location, pg. 15
- Figure 2 – Project General Arrangement, pg. 16
- Figure 3 – Biodiversity Assessment Development Footprint, pg. 18
- Figure 4 – Commonwealth Action Area Footprint, pg. 19
- Figure 7a – Vegetation Mapping - Maxwell Underground, pg. 27
- Figure 7b – Vegetation Mapping - Maxwell Infrastructure, pg. 28
- Figure 8a – Vegetation Integrity Plot Locations - Biodiversity Assessment Development Footprint Stage 1, pg. 29
- Figure 8b – Vegetation Integrity Plot Locations - Biodiversity Assessment Development Footprint Stage 1, pg. 30
- Table 2 – Plant Community Type Data - Stage 1, pg. 31
- Table 3 – Threatened Ecological Communities - Stage 1, pg. 33
- Figure 9 – Threatened Ecological Communities Listed under the BC Act, pg. 34
- Figure 10 – Threatened Ecological Communities Listed under the EPBC Act, pg. 35
- Table 4 – Vegetation Integrity Score Detail - Stage 1, pg. 37
- Table 5 – Ecosystem Species from the BAM Credit Calculator - Stage 1, pg. 38
- Table 6 – Species Credit Species for Assessment - Stage 1, pg. 40
- Figure 11 – Threatened Flora Species / Endangered Populations, pg. 43
- Figure 12 – Threatened Reptiles and Amphibians, pg. 44
- Figure 13 – Threatened Birds, pg. 45
- Figure 14 – Threatened Mammals, pg. 46
- Figure 15 – Threatened Bats, pg. 47
- Table 7 – Threatened Flora and Fauna Species Known or Predicted to occur in the Locality, pg. 48
- Table 8 – Flora Species Credit Species – Geographic Constraints, pg. 53
- Table 9 – Species Credit Species Habitat Constraints - Stage 1, pg. 54
- Figure 16 – Species Credit Species Relevant to the Project, pg. 58
- Table 10 – Species Credit Species Requiring Survey and Timing - Stage 1, pg. 59
- Table 11 – Species Credit Species Presence – Stage 1, pg. 64
- Figure 17 – Pink Tailed Legless Lizard Species Polygon, pg. 65



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- Figure 18 – Striped Legless Lizard Species Polygon, pg. 66
- Table 12 – Summary of the Ecosystem Credit Requirements - Stage 1, pg. 71
- Table 13 – Summary of the Species Credit Requirements - Stage 1, pg. 71
- Figure 21 – Location Map - Biodiversity Assessment Development Footprint Stage 2, pg. 73
- Figure 22 – Vegetation Integrity Plot Locations - Biodiversity Assessment Development Footprint Stage 2, pg. 74
- Table 14 – Plant Community Type Data - Stage 2, pg. 75
- Table 15 – Threatened Ecological Communities - Stage 2, pg. 76
- Table 16 – Vegetation Integrity Score Detail - Stage 2, pg. 77
- Table 17 – Ecosystem Species from the BAM Credit Calculator - Stage 2, pg. 78
- Table 18 – Species Credit Species for Assessment – Stage 2, pg. 79
- Table 19 – Species Credit Species Habitat Constraints - Stage 2, pg. 81
- Table 20 – Species Credit Species Requiring Survey and Timing - Stage 2, pg. 84
- Table 21 – Species Credit Species Presence - Stage 2, pg. 87
- Table 22 – Summary of the Ecosystem Credit Requirements - Stage 2, pg. 88
- Table 23 – Summary of the Species Credit Requirements - Stage 2, pg. 89
- Table 24 – Native Vegetation Clearance Summary, pg. 91
- Table 25 – Threatened Ecological Community Clearance Summary, pg. 92
- Table 26 – Threatened Species Habitat Clearance Summary, pg. 93
- Table 27 – Native Vegetation within the Subsidence Area, pg. 97
- Table 28 – Threatened Ecological Communities within the Subsidence Area, pg. 99
- Table 29 – Measures to Mitigate and Manage Impacts, pg. 119
- Table 30 – Unavoidable Loss of Box-Gum Woodland and Derived Native Grassland, pg. 123
- Figure 26 – Serious and Irreversible Impact Entities, pg. 124
- Table 31 – Amounts of Box-Gum Woodland Mapped within two Assessment Areas, pg. 126
- Table 32 – Box-Gum Woodland Communities Mapped for the Sydney Basin Bioregion, Hunter Sub-region, pg. 126
- Figures 27a – Areas Requiring Offset, pg. 131
- Figures 27b – Areas Requiring Offset, pg. 132
- Table 34 – Project Ecosystem Credit Requirements, pg. 137
- Table 35 – Project Species Credit Requirements, pg. 138
- Table 36 – EPBC Act Species and Communities Targeted for Survey, pg. 139
- Table 37 – Threatened Species listed under the EPBC Act Recorded During Surveys, pg. 142
- Table 38 – Threatened Ecological Communities listed under the EPBC Act Recorded During Surveys, pg. 144
- Table 39 – Threatened Fauna Habitat Clearance Summary, pg. 147
- Figure 30 – Swift Parrot Potential Habitat, pg. 157
- Figure 31 – Regent Honeyeater Potential Habitat, pg. 159
- Figure 32 – Painted Honeyeater Potential Habitat, pg. 161
- Figure 33 – Spotted-tailed Quoll Potential Habitat, pg. 163
- Figure 34 – Corben’s Long-eared Bat Potential Habitat, pg. 165
- Figure 35 – Grey-headed Flying-fox Potential Habitat, pg. 167
- Figure 36 – Large-eared Pied Bat Potential Habitat, pg. 169
- Table 40 – Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act, pg. 171
- Table 41 – Application of the BAM to EPBC Act Species and Communities, pg. 177
- Table 42 – Biodiversity Credits Required to be Retired with Like-For-Like Biodiversity Credits, pg. 181
- Table 43 – Biodiversity Credits That Could be Retired in Accordance with the Variation Rules, pg. 183

### **Attachment A (to the BDAR) – Maxwell Project - Baseline Flora Report**

- Table ES-1 – Threatened Ecological Communities Recorded across the Study Area, pg. 5
- Section 7 – Methods, pg. 21
- Table 6 – TECs Possibly Occurring Within 20 km of the Study Area, pg. 27
- Table 8 – Threatened Flora Species Potentially Occurring in the Study Area, pg. 32
- Table 12 – PCT Assignment, pg. 43

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- Table 13 – Vegetation Communities Mapped across the Study Area Grouped by Formation, pg. 45
- Figure 12 – Generic Vegetation Communities Mapped across the Southern Study Area, pg. 47
- Figure 13 – Generic Vegetation Communities Mapped across Maxwell Infrastructure, pg. 48
- Table 14 – TEC Assignment, pg. 49
- Figure 15 – Threatened Ecological Communities Commonwealth EPBC Act, pg. 52
- Appendix 4 – Community Profiles

### **Attachment B (to the BDAR) – Maxwell Project - Baseline Fauna Report**

- Table 1 – Threatened Fauna Species Known or Predicted to occur in the Locality, pg. 8
- Section 2 – Methods, pg. 11
- Figure 4 – Fauna Survey Sites, pg. 18
- Figure 5 – Bat Survey Sites, pg. 19
- Figure 6 – Amphibian Survey Sites, pg. 20
- Table 4 – Habitat Constraints Identified in the Threatened Biodiversity Data Collection, pg. 24
- Table 11 – ‘Species Credit’ Threatened Bats and their Habitats: NSW Survey Guide for the Biodiversity Assessment Method (OEH, 2018), pg. 33
- Table 15 – Summary of Survey Techniques and Effort Used at Each Site within the Study Area, pg. 45
- Table 16 – Targeted Searches for Conservation Significant Fauna Species, pg. 47
- Figure 7a – Broad Fauna Habitat Types - Maxwell Underground, pg. 57
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- Table 17 – Threatened Fauna Species Recorded During this Study, pg. 62
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- Figure 9 – Threatened Birds, pg. 65
- Figure 10 – Threatened Mammals, pg. 66
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- Figure 12 – Species Credit Species Relevant to the Study Area, pg. 68
- Figure 13 – Threatened Species Listed under the EPBC Act, pg. 69
- Figure 14 – Pink-tailed Legless Lizard Species Polygon, pg. 71
- Figure 15 – Striped Legless Lizard Species Polygon, pg. 74
- Figure 16 – Painted Honeyeater Potential Habitat, pg. 80
- Figure 18 – Grey-headed Flying Fox Potential Habitat, pg. 87
- Figure 20 – Swift Parrot Potential Habitat, pg. 96
- Figure 21 – Spotted-tailed Quoll Potential Habitat, pg. 98

Attachment C (to the BDAR) – BAM Biodiversity Credit Report - Stage 1 Biodiversity Assessment Development Footprint.

Attachment D (to the BDAR) – BAM Biodiversity Credit Report - Stage 2 Biodiversity Assessment Development Footprint.

Attachment E (to the BDAR) – BAM Biodiversity Credit Report (Like for Like) - Stage 1.

Attachment F (to the BDAR) – BAM Biodiversity Credit Report (Like for Like) - Stage 2.

Attachment G (to the BDAR) – BAM Biodiversity Credit Report (Variations) - Stage 1.

Attachment H (to the BDAR) – BAM Biodiversity Credit Report (Variations) - Stage 2.

Attachment I (to the BDAR) – Biodiversity Payment Summary Report - Stage 1.

Attachment J (to the BDAR) – Biodiversity Payment Summary Report - Stage 2.

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**Table 1 Impact Summary Relevant EPBC Act – listed Ecological Communities (refer to section 3)**

A	B	C	D	E		F	G
EPBC Act -listed EEC	Y/N	PCTs	Y/N/co mment	Ha	Credits	Comment	Relevant page numbers in the EIS
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered	Y	PCT1606: White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter – moderate	Y	135.2	1234	N/A.	EIS – Main Report: pgs. 6-63-6-65 & 6-74-6-77.  Appendix E – BDAR: pgs. 11, 27-28, 31, 33, 35, 71, 75-76, 88, 91-93, 97, 99, 123-29, 137, 144, 147, 149-50, 171, 177 & 181.  Attachment A (BDAR): pgs. 42-3, 45, 49-50, 54 & Appendix 4.  Attachment C-J (credit reports).
		PCT1606: White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter – moderate – DNG					
Central Hunter Valley Eucalypt Forest and Woodland - Critically Endangered	Y	PCT 1604: Narrow-leaved Ironbark – Grey Box - Spotted Gum shrub – grass woodland of the central and lower Hunter	Y	12.3	302	N/A.	EIS – Main Report: pgs. 6-64-6-65 & 6-75-6-77.  Appendix E – BDAR: pgs. 11, 27-28, 31, 33, 35, 75-76, 91-93, 99, 124, 137-38, 144-45, 150-51, 172, 177 & 181.  Attachment A (BDAR): pgs. 45-46, 49-50, 54-55 & Appendix 4.  Attachment C-J (credit reports).
		PCT 1655: Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter Valley and Sydney Basin					
		PCT 1691: Narrow-leaved Ironbark – Grey Box Grassy Woodland of the central and upper Hunter					
Hunter Valley Weeping Myall ( <i>Acacia pendula</i> ) Woodland ecological community - Critically Endangered	Y	PCT 116: Weeping Myall - Coobah - Scrub Wilga shrubland of the Hunter Valley	Y	0	0	There is 0.4 hectares of Hunter Valley Weeping Myall ( <i>Acacia pendula</i> ) Woodland in the predicted subsidence area but it is unlikely that subsidence would affect the viability of these plants; hence no significant impact.	EIS – Main Report: pgs. 6-64, 6-66, 6-69 & 6-77.  Appendix E – BDAR: pgs. 27, 29, 35, 93, 97, 99-100, 117, 124, 144-45 & 152.  Attachment A (BDAR): pgs. 43, 46, 49, 53-55 & Appendix 4.

(A) List the relevant EPBC Act listed ecological communities that will be significantly impacted in accordance with the referral documentation.



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- (B) **Verify** that there is evidence in the EIS that listed EEC and species habitat has been mapped in accordance with relevant listing guidelines (Yes/No).  
*Proponents are required by the SEARs to ensure that EPBC-listed communities are mapped in accordance with EPBC Act listing criteria. It is important that any derived native grassland components of an EPBC listed EEC are included in the mapping of native vegetation extent.*
- (C) **List** the Plant Community Types (PCTs) associated with the ecological communities in accordance with Chapter 5 of the BAM.
- (D) **Confirm** that the identification of PCTs has been correct (Yes/No) and comment if not correct.
- (E) **Record** the area of impact (ha) and credits required.
- (F) **Comment** on the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the EEC. Note whether further information might be required.
- (G) **Cite** relevant page numbers for details provided the EIS and Appendices for each EEC.

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**Table 2 Impact Summary Relevant EPBC Act – listed Species (refer to section 4)**

\***NOTE:** DoE Referral Document only listed two species of MNES that may be significantly impacted: Regent Honeyeater and Swift Parrot, whilst the BDAR identified two other species of MNES that would be significantly impacted: Pink-tailed Legless Lizard and Striped Legless Lizard. Additionally, the BDAR assessed five other species (Painted Honeyeater, Spotted-tailed Quoll, Corben's Long-eared Bat, Grey-headed Flying Fox and Large-eared Pied Bat), finding that the Project would unlikely result in a significant impact. BCD confirmed that these species have been assessed correctly and in accordance with the BAM and associated guidelines.

A	B	C	D	E		F	G
Threatened species (listed under the EPBC Act)	Credit Type (SC/EC)	Record PCTs associated with ecosystem credits	Y/N/Comment	Hectares (total species habitat)	Credits (total species habitat)	Comment	Relevant page numbers in the EIS and Appendices
Pink-tailed Legless Lizard	Species	N/A.	Y	38.7	423	Detected within the Project area during baseline fauna surveys.	EIS – Main Report: pgs. 6-68, 6-70-6-71, 6-73 & 6-76-6-77.  Appendix E – BDAR: pgs. 11, 13, 44, 49, 54, 58, 61, 63-65, 69, 71, 81, 87, 89, 93, 111-112, 138, 142, 147, 152-53, 174, 177 & 181.  Attachment B (BDAR): pgs. 8, 24, 43, 47, 63-64 & 70-71.  Attachment C-J (credit reports).
Striped Legless Lizard	Species	N/A	Y	152.8	1225	Detected within the Project area during baseline fauna surveys.	EIS – Main Report: pgs. 6-68, 6-70-6-71, 6-73 & 6-76-77.  Appendix E – BDAR: pgs. 11, 13, 44, 49, 54, 58, 61, 63-64, 66, 69, 71, 81, 87, 89, 93, 111-112, 138, 142, 147, 153-55, 172, 177 & 181.  Attachment B (BDAR): pgs. 8, 24, 43, 48, 63-64, 70 & 72-74.  Attachment C-J (credit reports).
Swift Parrot	Species / Ecosystem	PCT 201: Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion PCT 1606: White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter	N/A.	N/A.	N/A.	This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding)	EIS – Main Report: pgs. 6-68, 6-71 6-76-6-77.  Appendix E – BDAR: pgs. 12, 45, 50, 55, 81, 147, 155-56, 175, 177 & 181.

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A	B	C	D	E		F	G
Threatened species (listed under the EPBC Act)	Credit Type (SC/EC)	Record PCTs associated with ecosystem credits	Y/N/Comment	Hectares (total species habitat)	Credits (total species habitat)	Comment	Relevant page numbers in the EIS and Appendices
		PCT 1655: Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter Valley and Sydney Basin PCT 1691: Narrow-leaved Ironbark – Grey Box Grassy Woodland of the central and upper Hunter PCT 1692: Bull Oak Grassy Woodland of the central Hunter Valley				in the Project area (Table 9) based on DPIE 'Important Area Mapping' the species will be offset with ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655, 1691 and 1692.	Attachment B (BDAR): pgs. 8, 13, 24, 51, 65, 108 & 150.
Regent Honeyeater	Species / Ecosystem	PCT 201: Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion PCT 1606: White Box - Narrow-leaved Ironbark - Blakely's Red Gum shrubby open forest of the central and upper Hunter PCT 1655: Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter Valley and Sydney Basin PCT 1691: Narrow-leaved Ironbark – Grey Box Grassy Woodland of the central and upper Hunter	N/A.	N/A.	N/A.	This species is classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding) in the Project area (Table 9) based on DPIE 'Important Area Mapping' the species will be offset with ecosystem credits calculated for PCTs associated with potential habitat for this species, namely the woodland form of PCT 201, 1606, 1655 and 1691.	EIS – Main Report: pgs. 6-76-6-77.  Appendix E – BDAR: pgs. 12, 50, 55, 82, 147, 158, 160, 176-177 & 181.  Attachment B (BDAR): pgs. 9, 24, 27-28, 52, 103, 108 & 151.

- (A) **List** the relevant threatened species that will be significantly impacted in accordance with the referral documentation.
- (B) **Record** whether the relevant threatened species is classified as “species credit species” of ecosystem credit species for the purposes of the BAM.
- (C) **List** the PCTs associated with the ecosystem credit species.
- (D) **Verify** that the habitat polygons for MNES have been mapped appropriately representing the foraging and/or breeding habitat for the species that will be impacted by the development.
- (E) **Record** the area of impact (ha) and credits required. For impacts associated with ecosystem credit species identify the total credit requirements associated with the cleared PCTs identified as habitat for the species.
- (F) **Comment** on the adequacy of the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the species. Note if further information is required.
- (G) **Cite** relevant page numbers for details provided in the EIS and Appendices for each threatened species.

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### 3. Avoid, mitigate and offset

**Comment** on whether or not the EIS identifies measures to avoid and minimise impacts on the relevant EPBC Act-listed threatened species and communities. Section 8 of the BAM requires that proponents detail these efforts and commitments in the EIS. Identify gaps in the discussion on measures to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS.

#### EIS

Section 6.7.3 of the EIS identifies measures to avoid and minimise impacts, based on the outcomes of baseline survey work.

The proponent (Malabar) states they are committed to developing the Project solely as an underground mining operation; noting that underground mining methods significantly reduce environmental impacts, including vegetation and habitat disturbance, in comparison to open cut mining methods.

In addition to the use of underground mining methods, the Project elements have been located and designed to avoid or minimise impacts to vegetation and habitat disturbance and fauna species through:

- the use of the substantial existing Maxwell infrastructure (including the CHPP and rail loop), limiting the requirement to develop new infrastructure;
- locating the mine entry area predominantly within an area of derived native grassland rather than woodland (i.e. an area with a lower vegetation integrity score);
- reducing the disturbance footprint required for the mine entry area (Section 9.2.2);
- locating multiple infrastructures within the same transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (a site access road, a covered overland conveyor, power supply and other ancillary infrastructure and services);
- the emplacement of CHPP reject material from coal processing within existing mine voids left behind by previous mining activities at Maxwell Infrastructure;
- considering and avoiding the location of records of threatened flora species for the location of the mine entry area (i.e. the Pine Donkey Orchid [*Diuris tricolor*] – Figure 6-16);
- the use, once established, of a covered overland conveyor, rather than trucks, to transport longwall ROM coal from the mine entry area to the existing Maxwell Infrastructure (reducing the risk of vehicle strike);
- incorporating the continued rehabilitation of previous mining disturbance areas at Maxwell Infrastructure, and eventual relinquishment of areas not required to support the Project; and
- incorporating woodland and rocky area components in the final land use following decommissioning and rehabilitation of Project.

Apart from avoid and minimise, the Project will also incorporate many mitigation measures to reduce adverse impacts to biodiversity. Table 6-13 (in Section 6.7.4 of the EIS) details measures to mitigate and manage the following potential impacts:

- *Displacement of Fauna* – presence of a trained ecological or licensed wildlife handler;
- *Clearance Impacts on Native Vegetation and Habitat* – vegetation clearance protocol, mine site rehabilitation and revegetation, salvage and re-use of material for habitat enhancement within the mine site rehabilitation, site induction of important vegetation / species and habitat features and use of defined tracks to access sites to minimise the disturbance of soils / vegetation;
- *Subsidence Impacts on Native Vegetation and Habitat* – remediation of surface cracks;
- *Indirect Impacts on Native Vegetation and Habitat* – feral animal management, weed management and bushfire management;
- *Vehicle Strike* – fencing and speed limits.

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The Proponent (Malabar) have also stated they would erect a livestock-proof fence (i) around a 20 m buffer from the Hunter Valley Weeping Myall (*Acacia pendula*) Woodland/*Acacia pendula* population in the Hunter Catchment (Figure 6-16), and (ii) around a 20 m buffer from the *Diuris tricolor* records (Figure 6-16). Both these areas will be managed (e.g. weed control) and the areas will be signed 'Environmental Protection Area'.

### **Appendix E – BDAR**

Section 5.1. of the BDAR specifically addresses the avoid and minimise aspects of the Project that are relevant MNES. It lists the measures as identified in the EIS and outlined above.

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**Comment** on the adequacy and feasibility of measures to avoid and minimise impacts. Identify inadequacies where further efforts could be made to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS that discuss avoidance and mitigation measures relevant to EPBC Act-listed species and communities.

See discussion above for comments on avoid and minimise measures, and details of mitigation. BCD did not identify any inadequacies where further efforts could be made to avoid and minimise.

The project has been subject to many changes to development footprint, and the proposed construction / corridor footprint (as outlined above), which include the avoidance and minimisation to areas of significant biodiversity (as outlined above). Specific measures will be implemented during the construction phase that aim to mitigate or minimise impacts (as outlined above). It is expected that the detailed design will reduce the impacts to PCTs and habitat, particularly with regards to the siting of construction infrastructure and ancillary works.

### **4. Offsetting**

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(a) **Verify** [by ticking the following boxes] that the offsets proposed to address impacts to EPBC-listed threatened species and communities are in accordance with the requirements under the EPBC Act.

- ✓ An appropriate offset for any residual adverse significant impact has been determined.
- ✓ Proposed offsets for EECs provide a like for like outcome i.e. proponents have identified PCTs attributed to the specific threatened ecological community being impacted.
- ✓ Proposed offsets have been determined using the BAM

If offsets have not been determined in accordance with the BAM, Planning is required to discuss the proposed approach with the Commonwealth as soon as possible.

A BOS was submitted with the BDAR and is in accordance with the BAM. The Project results in a total of 1,952 ecosystem credits (1,536 credits relevant to MNES TEC) and 2,250 species credits (1,648 credits relevant to MNES) that will need to be retired. Section 8 of the BDAR outlines the potential offset mechanisms available and the potential likelihood of use, ranging from payment into the Biodiversity Conservation Trust, purchase and retirement of open market available biodiversity credits, and establishment of a Biodiversity Stewardship Site. With respect to MNES matters, the proponent (Malabar) has indicated that offsetting will be the retirement of like-for-like biodiversity credits for relevant Commonwealth-listed threatened species and communities, and potentially as well for matters that are not EPBC Act listed. Table 42 (in BDAR) lists the biodiversity credits required to be retired with like-for like biodiversity credits.

Specific offsetting requirements for MNES matters are as follows:

*White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (DNG)* - the direct clearance of 135.2 hectares of this TEC was considered a significant impact that requires the retirement of 1234 ecosystem credits.

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*Central Hunter Valley Eucalypt Forest and Woodland* - the direct clearance of 12.3 hectares of this TEC was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 302 ecosystem credits.

*Pink-tailed Legless Lizard* - the direct clearance of 38.7 hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 423 species credits.

*Striped Legless Lizard* - the direct clearance of 152.8 hectares of this species habitat was considered a significant impact (i.e. reduced extent and some fragmentation) that requires the retirement of 1,225 species credits.

Although, advice documents from DAWE suggested that the proposal may have a significant impact on Regent Honeyeater and Swift Parrot, the BDAR and EIS adequately showed that the impact to these entities would not be significant. BCD noted that these species are both classified as an 'Ecosystem / Credit Species' in the Threatened Biodiversity Data Collection (OEH 2019a); however, given that there is no important habitat (i.e. breeding) in the Project area (Table 9) based on DPIE 'Important Area Mapping' no 'species credits' are required to be retired and they would be offset with ecosystem credits calculated for PCTs associated with potential foraging habitat for these species.

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### 5. **Comment** on whether the information and data relied upon for the assessment have been appropriately referenced in the EIS. Comment on the validity of the sources of information and robustness of the evidence.

The information and data used in the assessment has been appropriately referenced, and the sources of information are valid.

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**Table 3 Summary of Offset Requirements**

A	B	C	D	E	F
Threatened species or EEC (listed under the EPBC Act)	Credits required as calculated by the BAM	Credits generated from offsets in remnant vegetation	Credits generated from offsets proposed by other means	Comment on the proposed offsets.	Relevant page numbers in the EIS and Appendices
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered	1234 ecosystem	0	0	A BOS was submitted with the BDAR and is in accordance with the BAM. The Project results in a total of 1,952 ecosystem credits (1,536 credits relevant to MNES TEC) and 2,250 species credits (1,648 credits relevant to MNES) that will need to be retired. Section 8 of the BDAR outlines the potential offset mechanisms available and the potential likelihood of use, ranging from payment into the Biodiversity Conservation Trust, purchase and retirement of open market available biodiversity credits, and establishment of a Biodiversity Stewardship Site. With respect to MNES matters, the proponent (Malabar) has indicated that offsetting will be the retirement of like-for-like biodiversity credits for relevant Commonwealth-listed threatened species and communities, and potentially as well for matters that are not EPBC Act listed. Table 42 (in BDAR) lists the biodiversity credits required to be retired with like-for like biodiversity credits.	<p><b>EIS:</b></p> <ul style="list-style-type: none"> <li>Table 6-10 - Project Ecosystem Credit Requirements, pg. 6-75</li> <li>Table 6-11 - Project Species Credit Requirements, pg. 6-76</li> <li>Appendix E - BDAR</li> </ul> <p><b>Appendix E - BDAR:</b></p> <ul style="list-style-type: none"> <li>Table ES-2 - Credit Requirements, pg. 13</li> <li>Table 12 - Summary of the Ecosystem Credit Requirements - Stage 1, pg. 71</li> <li>Table 13 - Summary of the Species Credit Requirements - Stage 1, pg. 71</li> <li>Table 22 - Summary of the Ecosystem Credit Requirements - Stage 2, pg. 88</li> <li>Table 23 - Summary of the Species Credit Requirements - Stage 2, pg. 89</li> <li>Table 34 - Project Ecosystem Credit Requirements, pgs. 137-38</li> <li>Table 34 - Project Species Credit Requirements, pg. 138</li> <li>Table 42 - Biodiversity Credits Required to be Retired with Like-For-Like Biodiversity Credits, pg. 182</li> <li>Table 43 - Biodiversity Credits That Could be Retired in Accordance with the Variation Rules, pg. 183</li> <li>Attachment C-J (credit reports)</li> </ul>
Central Hunter Valley eucalypt forest and woodland - Critically Endangered	302 ecosystem	0	0		
Pink-tailed Legless Lizard	423 species	0	0		
Striped Legless Lizard	1225 species	0	0		
Swift Parrot, Regent Honeyeater, Painted Honeyeater, Spotted-tailed Quoll, Corben's Long-eared Bat, Grey-headed Flying Fox and Large-eared Pied Bat	1952 ecosystem	0	0		

- (A) **List** the relevant threatened species or ecological community included in the proposed offset package (these are the listed species and communities that will be significantly impacted in accordance with the *EPBC Act Significant Impact Guidelines 1.1*). Identify any relevant species or ecological communities which have not been included in the proposed offset package.
- (B) **List** the total credit requirement identified by the BAM for impacted listed threatened species and ecological community. For EECs and ecosystem credit species this is the sum of the credits generated by PCTs associated.

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- (C) **Identify** the total number of required credits which are proposed to be retired through conserving and managing remnant / mature vegetation.
- (D) **Identify** the number of credits proposed to be met through other methods allowable under the BAM, such as rehabilitation of impacted areas or regrowth vegetation.
- (E) **Comment** on the adequacy of the proposed offset in meeting requirements of the BAM and the EPBC Act. In particular is there a reasonable argument for a shortfall in credits required for MNES and/or non-compliance with like-for like? Are the offsets proposed by means other than protection of remnant vegetation adequate?
- (F) **Reference** the relevant page numbers from the EIS and Appendices for each threatened species and community.