



Office of
Environment
& Heritage

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Mr Stephen O'Donoghue
A/Director - Resource Assessments
Department of Planning & Environment
stephen.odonoghue@planning.nsw.gov.au

Dear Steve

Bylong Coal Project SSD 14_6367 – Bilateral Assessment

The Office of Environment and Heritage (OEH) has conducted an assessment of the adequacy of how the Bylong Coal Project has addressed Matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999*.

Attached is OEH's assessment using the supplied guidance template. If you have any questions regarding this matter please contact Terry Mazzer on 02 6883 5302 or email terry.mazzer@environment.nsw.gov.au.

Yours sincerely

PETER CHRISTIE
Regional Manager North West
Regional Operations

Contact officer: TERRY MAZZER
(02) 6883 5302

OEH review of the assessment of EPBC-listed threatened species and ecological communities in the Bylong Coal Project

Application of the Framework for Biodiversity Assessment

Note: OEH review information within the template is supplied in blue text.

Biodiversity information for the Bylong Coal Project has been subject to a number of updates. The EIS (September 2015) examined biodiversity within a study area (10,313 ha) equivalent to Coal Authorisations 287 and 342 and was not required to include information suitable for assessment under the FBA. This was provided in a Biodiversity Assessment Report (BAR) which examined areas within the Project Disturbance Boundary (PDB 754 ha) and Biodiversity Offset Strategy (BOS) (March 2016). A Response to Submissions was submitted by KEPCO to DP&E in April 2016. Further advice was supplied by KEPCO on 8 July 2016.

1. Identify whether or not the Framework for Biodiversity Assessment has been applied to EPBC-listed species and communities. Where the FBA has not been correctly applied, identify the deficiencies that need to be resolved, or refer to other assessment material where this detail is provided.

The FBA has been applied. Some vegetation data was collected in a non-standard method but accepted by OEH as this is a transitional project under the FBA. Sufficient vegetation data has been collected for the assessment of the Project Disturbance Boundary (PDB). Further vegetation data will be required to satisfy minimum requirements of the FBA for offset areas however, this will be collected post-consent.

At the BAR stage the proponent (KEPCO) and OEH (on advice from the Commonwealth Department of Environment (DoE)) differed in the calculation of the amount of derived native grassland (DNG) which conformed to EPBC Act Box Gum Woodland and derived native grassland. This has now been resolved by the further advice supplied by KEPCO on 8 July 2016.

Relevant EPBC-listed threatened species and ecological communities

EPBC-listed Ecological Communities (Vulnerable, Endangered, Critically Endangered)

2. Check that the proponent has considered all EPBC-listed ecological communities occurring on the project area and expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring etc.

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland was considered to be significantly impacted in the EPBC Act referral brief. This Critically Endangered Ecological community (CEEC) community is present within the PDB and considered significantly impacted in the EIS. No other EPBC-listed ecological communities were considered likely to be impacted by the Project.

3. List the **EPBC-listed ecological communities** that will be **significantly impacted** by clearing or disturbance as a result of the development. List the Plant Community Types (PCTs) associated with these ecological communities.

The table below identifies all EPBC-listed ecological communities that will be impacted by the project after avoidance and mitigation measures are implemented.

Significantly impacted EPBC-listed Ecological Community	Associated PCTs	Impacted Area (ha)
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 483 (HU690) - Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley	57.32 ha woodland, 171.03 ha DNG
	PCT 437 (HU732) - Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion	8.20 ha woodland, 14.46 ha DNG

Source this information from the Environmental Impact Statement (EIS). Chapter 5 of the FBA requires that PCTs and their EEC associations are identified. Appendix 7 of the FBA requires that threatened ecological communities are mapped, including those that are EPBC-listed.

The referral brief provided by the Department of the Environment will inform you which ecological communities were found to be significantly impacted at the referral stage.

Note that the proponent may have identified additional communities that will be significantly impacted.

4. Confirm that the identification of PCTs has been appropriate. Confirm that the delineation of the extent of EPBC-listed ecological community has been appropriate. Identify if any of the EPBC-listed ecological communities are "Impacts for Further Consideration".

OEH considers that the PCTs identified in section 3 are appropriate.

Delineation of the Box Gum Woodland and DNG CEEC is appropriate following the further advice supplied by KEPCO on 8 July 2016.

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland was listed as an Impact for Further Consideration in a letter to KEPCO from OEH dated 2 March 2015.

Threatened species

5. Check that the proponent has considered all the EPBC-listed species in the project area and expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring etc.

The EIS and BAR have considered all EPBC Act listed species known or considered potentially present within the Project Disturbance Boundary (PDB) (see Appendix 1).

The Department of Environment referral brief considered 14 species likely to be impacted by the Bylong Coal Project. Species in bold were considered significantly impacted at the referral stage.

Homoranthus darwinioides

Not recorded in EIS study area. Formal assessment of significance not carried out in EIS as considered not present. FBA assessment did not identify the species as requiring species credits.

<i>Ozothamnus tessellatus</i>	Recorded within the EIS study area and on the edge of the subsidence area. EIS states not significantly impacted. FBA assessment did not identify the species as requiring species credits.
<i>Prostanthera discolor</i>	Not recorded in EIS study area. EIS states not significantly impacted. FBA assessment did not identify the species as requiring species credits.
<i>Tylophora linearis</i>	Recorded within EIS study area, PDB altered to avoid population. EIS states not significantly impacted. FBA assessment did not identify the species as requiring species credits.
<i>Zieria ingramii</i>	Not recorded within 70 km of EIS study area. Formal assessment of significance not carried out in EIS as considered not present. FBA assessment did not identify the species as requiring species credits.
Regent Honeyeater	Not recorded in EIS study area but assumed present in EIS. EIS states significantly impacted. FBA assessment requires species credits.
Swift Parrot	Wildlife Atlas record just to east of EIS study area. Assessment of significance concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality. FBA assessment deals with this species as an ecosystem credit species.
Spotted-tailed Quoll	Wildlife Atlas record within EIS study area. EIS states not significantly impacted. FBA assessment deals with this species as an ecosystem credit species.
Large-eared Pied Bat	Recorded within EIS study area including close to the PDB. Assessment of significance concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality. FBA assessment requires species credits.
Corben's Long-eared Bat	Recorded within EIS study area. EIS states not significantly impacted. FBA assessment deals with this species as an ecosystem credit species.
New Holland Mouse	Recorded within EIS study area in Offset Area 1. Assessment of significance concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality. FBA assessment deals with this species as an ecosystem credit species.
Brush-tailed Rock-wallaby	Recorded within EIS study area. Assessment of significance concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality. FBA assessment requires species credits.
Pink-tailed Worm-lizard	Not recorded in EIS study area. EIS states not significantly impacted. FBA assessment did not identify the species as requiring species credits.
Broad-headed Snake	Not recorded in EIS study area. EIS states not significantly impacted. FBA assessment did not identify the species as requiring species credits.

6. List the **EPBC-listed threatened species** that are likely to be significantly impacted by the development. These are the relevant species.

Significantly impacted EPBC-Threatened Species
Regent Honeyeater – considered significantly affected in the EIS.
Large-eared Pied Bat - Assessment of significance in the EIS concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality. FBA assessment requires species credits. However, in OEH's opinion there is the potential for subsidence to impact breeding or roosting cave habitat if present. If this was to occur then this may be a significant impact.
New Holland Mouse - Assessment of significance in the EIS concludes that the project will result in the direct loss of potential habitat but considers the species to remain viable within the locality.

7. List the significantly impacted EPBC- listed threatened species that are classified as “ecosystem credit species” for the purposes of the FBA.

EPBC-listed Threatened Species	Associated PCTs
New Holland Mouse	The EIS lists the following PCTs as habitat for the New Holland Mouse.
	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes (113.9 ha)
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (13 ha)

List the significantly impacted EPBC- listed threatened species that are classified as “species credit species” for the purposes of the FBA.

EPBC-listed Threatened Species	Targeted survey results
Regent Honeyeater	Not found during surveys. Presence assumed due to records in the locality eg Wollar, Mt Penny area, Goulburn River National Park.
Large-Eared Pied Bat	Several individuals recorded within the EIS study area but outside the PDB.

8. Identify if any of the EPBC- listed species are “Impacts for Further Consideration”.

The Regent Honeyeater was identified as an Impact for Further Consideration in a letter to KEPCO from OEH dated 2 March 2015.

Measures to avoid and minimise impacts

9. Comment on whether or not the EIS identifies measures to avoid and minimise impacts on the significantly impacted (relevant) species and communities. Section 8 of the FBA requires that proponents detail these efforts and commitments in the EIS. Make a summary statement as to whether or not all avoid and minimise measures can be considered to benefit relevant EPBC-listed species and communities. Identify any measures specifically targeted at a single or a particular grouping of relevant EPBC- listed species and communities. Comment on the adequacy of measures to avoid and minimise impacts. Provide references to sections and page numbers in the EIS.

Section 5 of the Biodiversity Assessment Report (BAR) lists direct and indirect impacts and outlines measures taken to avoid or minimise impacts. The measures discussed are largely general in nature and not specific to species and communities. Specific measures include:

- modifications to the development footprint to reduce the extent of impacts to Box Gum Woodland and Regent Honeyeater habitat; and
- a redesigned overburden emplacement area to avoid a population of *Tylophora linearis*.

Impact assessment

Ecological Communities (Vulnerable, Endangered, Critically Endangered)

10. Check that an analysis of the impacts has been undertaken on each of the relevant EPBC-listed ecological communities.

Significantly impacted EPBC-listed ecological communities	Brief statement of the nature and extent of impact
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	<p>OEH calculates the area of Box Gum Woodland and DNG to be removed as 251.01 ha (65.52 woodland and 185.49 ha DNG). The further advice supplied by KEPCO on 8 July 2016 stated the area as being approximately 249 ha. This minor difference is due to small differences in mapping.</p> <p>There are minimal opportunities to avoid this direct impact as this area is largely located within proposed open cut or overburden emplacement areas. Analysis is included in 6.2.2 of BAR.</p> <p>Indirect effects relating to the subsidence area are examined in Appendix B of the BAR.</p> <p><i>[Insert comments in relation to the nature and extent of the impact i.e. A total of 21 ha of Box Gum Woodland will be cleared. Confirm whether or not the EIS includes an analysis of the direct and indirect impacts to this species and reference the section/pages in the EIS.]</i></p>

11. Summarise the impacts calculated for Plant Community Types associated with EPBC- listed ecological communities. These impacts are the direct impacts to vegetation that remain following the application of measures to avoid and minimise impact. This is referred to by the Commonwealth as a residual significant adverse impact and requires an offset.

Appendix 7 of the FBA requires that the area and condition of PCTs are tabulated. The 'Impact summary' as described by Appendix 7 requires that the EIS document the number of ecosystem credits required for each vegetation zone.

EPBC-listed ecological community	Veg Zone (Unit)	PCT	Area	Current Site Value	Credits required
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	2 (6a1 part)	PCT 437 (HU732) - Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion	4.18	89.58	307
	3 (6a1 part)	PCT 437 (HU732)	4.02	43.75	157
	5 (7a1)	PCT 483 (HU690) - Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley	57.32	68.23	3,289
	14 (6a1 DNG)	PCT 437 (HU732) DNG	5.99	19.79	126
	15 (6a2 DNG)	PCT 437 (HU732) DNG	7.61	11.98	0
	16 (6a3 DNG)	PCT 437 (HU732) DNG	0.86	10.94	0
	17 (7a1 DNG)	PCT 483 (HU690) DNG	68.09	18.75	1,380
	18 (7a2 DNG)	PCT 483 (HU690) DNG	102.94	16.15	0
TOTAL			251.01		5,259

Threatened species

12. Check that an analysis of the impacts has been undertaken on each of the relevant EPBC-listed threatened species.

Significantly impacted EPBC-listed Threatened Species	Brief statement of the nature and extent of impact
e.g. Spot-tailed Quoll	<i>[Insert comments in relation to the nature and extent of the impact i.e. A total of 300 ha of foraging habitat for the Spot-tailed Quoll will be cleared. Confirm whether or not the EIS includes an analysis of the direct and indirect impacts to this species and reference the section/pages in the EIS.]</i>
Regent Honeyeater	In the further advice supplied on 8 July 2016 (Table 1), KEPCO state that the Project will remove 184.12 ha of Regent Honeyeater habitat requiring 14,177 species credits. OEH considers that 3.7 ha of this is not Regent Honeyeater habitat because these areas lack key feed species and are isolated from other suitable habitat. OEH's calculations indicate that the project will remove 180.4 ha of habitat which equates to 13,892 species credits. OEH has made similar adjustments to the amount of

	<p>habitat within offset areas within section 19 of this document.</p> <p>Section 5.1 of BAR lists direct (vegetation removal) and indirect impacts of the proposal but there is no specific discussion relating to the Regent Honeyeater. Section 7.2.4 of the EIS lists indirect impacts to biodiversity in general but there is no analysis of their potential impact on the Regent Honeyeater.</p>
Large-eared Pied Bat	<p>The BAR states that 56.00 ha, which equates to 728 species credits, of breeding habitat occurs within the PDB which will be removed (Table 6.4).</p> <p>The BAR includes an assessment of the subsidence area using a modified FBA methodology in an attempt to quantify the effect of surface cracking, cliff falls and changes to hydrology caused by subsidence. OEH believes that this fails to address the potential impact of the loss of possible cave roost sites, the impact of which would be of much greater importance than can be measured this way. In the further advice supplied on 8 July 2016 (page 11) KEPCO have committed to avoid impacts on cliff C5 (in addition to C1, C3 and C4 avoided in the EIS) and to conduct bat monitoring at potential roosts subject to subsidence. OEH is satisfied that these measures are appropriate.</p> <p>Section 5.1 of BAR lists direct (vegetation removal) and indirect impacts of the proposal but there is no specific discussion relating to the Large-Eared Pied Bat. Section 7.2.4 of the EIS lists indirect impacts but there is no analysis of their impact on the Large-eared Pied Bat.</p>
New Holland Mouse	<p>The New Holland Mouse was not recorded within the PDB. The EIS (Appendix J, Table 6.7) indicates that approximately 125 ha (OEH 127 ha) of suitable habitat will be removed and that a further 3,016 ha of suitable habitat remains within the study area.</p> <p>OEH calculates that approximately 1,608 ha of suitable habitat occurs within the proposed offset areas (section 18).</p>

- 13.** Summarise the impacts that have been calculated for Plant Community Types associated with EPBC- listed threatened species that are “ecosystem credit species” for the purposes of the FBA. These impacts are the direct impacts to vegetation that remain following the application of measures to avoid and minimise impact. This is referred to by the Commonwealth as a residual significant adverse impact and requires an offset.

EPBC-listed Threatened Species	Associated PCT	Condition score	Area	Ecosystem Credits required
Swift Parrot	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (Vegetation unit 9)	72.00	13	784
Total			13	784
New Holland Mouse	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes (Vegetation unit 7b)	69.11	70.5	4,091

	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes (Vegetation unit 13)	62.67	39.7	2,112
	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes (Vegetation unit 18)	73.11	3.7	228
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (Vegetation unit 9)	72.00	13	784
Total			127	7,215
Spotted-tailed Quoll	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes (Vegetation unit 13)	62.67	39.7	2,112
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (Vegetation unit 9)	72.00	13	784
Total			52.7	2,896
Corben's Long-eared Bat	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (Vegetation unit 9)	72.00	13	784
Total			13	784

14. Summarise the impacts have been calculated for EPBC- listed species that are “species credit species” for the purposes of the FBA. These impacts are the direct impacts to habitat that remain following the application of measures to avoid and minimise impact. This is referred to by the Commonwealth as a residual significant adverse impact and requires an offset.

Species	Area	Credits required
Regent Honeyeater	180.4*	13,892*
Brush-tailed Rock-wallaby	26.45	688
Large-eared Pied Bat	56.00	728
*OEH calculations (see section 12 of this document)		

Indirect impacts

15. Comment on whether or not the EIS assesses indirect impacts. Comment on the completeness of the analysis of impacts. Comment on whether or not indirect impacts are appropriately managed by the ‘avoid and minimise’ measures. Make a summary statement as to whether indirect impacts are likely to add to residual significant adverse impacts. If there are residual significant adverse impacts resulting from indirect impacts additional offsets may be required.

Section 5.1 of the BAR lists indirect impacts. Section 7.2.4 of the EIS lists indirect impacts and s 7.2.5 lists general mitigation measures to limit some of these indirect impacts. Further detail is given in s6.2 of Appendix J of the EIS. There is no attempt to quantify the impact of effects or mitigation measures.

Offset package

Ecological Communities

16. Summarise the proposed offsets for EPBC- listed EECs, located within remnant vegetation.

EPBC-listed ecological community	Veg Unit	Associated PCTs	Area	Credits generated
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	6a1	PCT 437 (HU732) - Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion	138.38	2,162
	7a1	PCT 483 (HU690) - Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley	514.77	6,096
	DNG6(1)	PCT 437 (HU732) DNG	75.27	992
	DNG7(1)	PCT 483 (HU690) DNG	519.73	5,419
	DNG6(2)	PCT 437 (HU732) DNG	94.69	1,005
	DNG6(3)	PCT 437 (HU732) DNG	26.9	389
	DNG7(2)	PCT 483 (HU690) DNG	164.98	1,886
	DNG7(3)	PCT 483 (HU690) DNG	154.09	2,284
TOTAL			1,688.8	20,233

See Appendix 2 for detailed breakdown of vegetation units in each offset area.

Total number of ecosystem credits available from the offset areas (20,233) is well in excess of the number required (5,259 section 11).

17. Summarise any supplementary measure proposed for ecological communities, including whether the conditions for seeking to offset with a supplementary measure have been met and provide references to the EIS (Section, pages).

No supplementary measures will be required.

Threatened species

18. Summarise proposed offsets for EPBC- listed threatened species that are ecosystem credit species for the purposes of the FBA are summarised below. These offsets have been generated by remnant vegetation.

The BOS did not explicitly calculate the ecosystem credits available in the offset areas for the Swift Parrot, Spotted-tailed Quoll or Corben's Long-Eared Bat. OEH has extracted these from the BioBanking Credit Calculator for the vegetation types considered to be habitat for this species in the Threatened Species Profile Database.

The BOS did not explicitly calculate the ecosystem credits available in the offset areas for the New Holland Mouse. OEH has extracted these from the BioBanking Credit Calculator for the vegetation types considered to be habitat for this species in the EIS (EIS, Appendix J, Table 6.7) as the Threatened Species Profile Database does not have vegetation types assigned for this species.

EPBC-listed Threatened Species	Associated PCTs	Area	Credits generated
Swift Parrot	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	411.56	6,641
	HU886 Red Ironbark - Grey Gum - Black Pine heathy woodland on sandstone ranges of the Sydney Basin	11.34	189
	HU888 Red Ironbark - Brown Bloodwood - Black Pine heathy open forest on sandstone ranges of the Sydney Basin	27.68	409
TOTAL		450.58	7,239
New Holland Mouse	HU702 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	28.24	401
	HU714 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	3.13	41
	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes	785.50	10,598
	HU826 Narrow-leaved Ironbark - Grey Gum - Native Olive woodland of Central Hunter	3.56	52
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	411.56	6,641
	HU886 Red Ironbark - Grey Gum - Black Pine heathy woodland on sandstone ranges of the Sydney Basin	11.34	189
	HU888 Red Ironbark - Brown Bloodwood - Black Pine heathy open forest on sandstone ranges of the Sydney Basin	27.68	409
	HU891 Caley's Ironbark - Red Ironbark - Currawang shrubby woodland on sandstone ranges of the Sydney Basin	334.56	5,321
	HU893 Dywer's Red Gum - Fringe Myrtle heathy open woodland on sandstone plateau of the upper Hunter and Sydney Basin	2.71	42
TOTAL		1,608.28	23,694
Spotted-tailed Quoll	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes	785.50	10,598
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	411.56	6,641
	HU886 Red Ironbark - Grey Gum - Black Pine heathy woodland on sandstone ranges of the Sydney Basin	11.34	189
	HU888 Red Ironbark - Brown Bloodwood - Black Pine heathy open forest on sandstone ranges of the Sydney Basin	27.68	409
	HU891 Caley's Ironbark - Red Ironbark - Currawang shrubby woodland on sandstone ranges of the Sydney Basin	334.56	5,321
	HU893 Dywer's Red Gum - Fringe Myrtle heathy open	2.71	42

	woodland on sandstone plateau of the upper Hunter and Sydney Basin		
TOTAL		1,573.35	23,200
Corben's Long-eared Bat	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	411.56	6,641
	HU886 Red Ironbark - Grey Gum - Black Pine heathy woodland on sandstone ranges of the Sydney Basin	11.34	189
	HU888 Red Ironbark - Brown Bloodwood - Black Pine heathy open forest on sandstone ranges of the Sydney Basin	27.68	409
	HU891 Caley's Ironbark - Red Ironbark - Currawang shrubby woodland on sandstone ranges of the Sydney Basin	334.56	5,321
TOTAL		785.14	12,560

19. Summarise the proposed offsets for EPBC- listed threatened species that are species credit species for the purposes of the FBA are summarised below.

EPBC-listed Threatened Species	Associated PCTs	Area	Credits generated
Regent Honeyeater	HU599 River Red Gum/ River Oak riparian woodland wetland in the Hunter Valley	13.28	94
	HU714 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	58.49	415
	HU910 Blakely's Red Gum - Rough-barked Apple shrubby woodland of central and upper Hunter	1.21	9
	HU732 Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion	146.42	1,040
	HU690 Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley	528.56	3,753
	HU824 White Box - Black Cypress Pine shrubby woodland of the Western Slopes	661.22	4,695
	HU869 Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	412.05	2,926
	HU891 Caley's Ironbark - Red Ironbark - Currawang shrubby woodland on sandstone ranges of the Sydney Basin	334.56	2,375
	HU702 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	28.24	201
TOTAL		2,184.02	15,507
Brush-tailed Rock-wallaby	Offset Area 1	577.90	4,103
	Offset Area 2	127.01	902
TOTAL		705	5,005

Large-eared Pied Bat	Offset Area 1	577.90	4,103
	Offset Area 2	127.01	902
	Offset Area 5	308.05	2,187
	Offset Area Yarran View	18.52	131
TOTAL		1,031	7,323

Regent Honeyeater - In the further advice supplied on 8 July 2016 (Table 1), KEPCO state that the six offset areas contain 2,225 ha of Regent Honeyeater habitat with 15,797 species credits. OEH considers that 41 ha of this is not Regent Honeyeater habitat because these areas lack key feed species and are isolated from other suitable habitat. OEH's calculations indicate that the offset areas contain 2,184 ha of habitat which equates to 15,507 species credits. Section 12 of this document states that the offset requirement is 13,892 species credits.

Large-eared Pied Bat – KEPCO have not mapped the area of potential Large-eared Pied Bat habitat across the offset sites, however in table 3.4 of the BOS they have identified a total potential habitat area of 1,031 ha.

The BAR states that "Identified cliffs include those within the Study Area as documented within MSEC (2015) and those outside of the Study Area as shown on the 1:250,000 topographic map." The "Study Area" in this case is the subsidence area and consequently only relevant to OA5. The 1:250,000 topographic map does not show any cliffs in offset areas. OEH assumes that the BAR meant 1:25,000 maps. These show some cliffs within and adjacent to OA1, OA2 OA5 and OAYV. OEH believes that the area of habitat calculated in the BOS may be an overestimate as it seems to be larger than that indicated by the cliffs on the 1:25,000 mapping. However, it seems likely that even this smaller area would comfortably provide sufficient habitat for the Large-eared Pied Bat within the offset areas to compensate for the habitat lost in the PDB.

- 20.** Describe any supplementary measure proposed, including whether the conditions for seeking to offset with a supplementary measure have been met and provide references to the EIS (Section, pages).

No supplementary measures will be required.

Information and advice relied upon

- 21.** The following references and information were relied upon for this evaluation of the assessment of impacts on EPBC- listed Threatened Species and Ecological Communities.

Reference	Information considered
EPBC Act Policy Statement. White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands.	Determination of patch size and mapping of box gum woodland and derived native grassland.
Consultation with Department of Environment officers (David Way, John Vranjic, Mark Bourne) in teleconference on 24 February 2016.	Determination of patch size and mapping of box gum woodland and derived native grassland for PDB area.

This section should include any references you have consulted in deliberating on impacts on EPBC-listed matters. Also include any expert reports prepared in accordance with the rules of the FBA, information sought from EPBC- experts and information or opinion provided in submissions on the EIS.

Acceptability of impacts

22. Make a summary statement on the acceptability of impacts. Consider the following:

- The impacts in the context of the avoid, minimise and offset package proposed

Box Gum Woodland

The area of Box Gum Woodland and DNG to be removed by the Project is 251.01 ha (65.52 woodland and 185.49 ha DNG). There are minimal opportunities to avoid this direct impact as this area is largely located within proposed open cut or overburden emplacement areas. The calculated credit requirement of 5,259 can be sufficiently offset by the 20,233 credits available in the offset package.

Regent Honeyeater

OEH's calculations indicate that the project will remove 180.4 ha of habitat which equates to 13,892 species credits (see section 12). The offset package includes 2,184.0 ha of vegetation types considered to be suitable Regent Honeyeater habitat equating to 15,507 species credits. The offset package is sufficient for this species.

Large-eared Pied Bat

The BAR states that 56.00 ha, which equates to 728 species credits, of breeding habitat occurs within the PDB which will be removed. The offset package as claimed in the BOS is sufficient at 1,031 ha and 7,323 species credits. OEH believes that the amount of habitat included in the BOS may be an overestimate, however, it seems likely that the BOS would comfortably provide sufficient habitat for the Large-eared Pied Bat within the offset areas to compensate for the habitat lost in the PDB.

The BAR fails to address the potential impact of the loss of a cave roost site (if present). The impact of this would be of much greater importance than can be measured using habitat within a specified distance of cliffs. Further work is required eg monitoring of cliffs above subsidence areas to determine if this is a likely impact. In the further advice supplied on 8 July 2016 (page 11), KEPCO have committed to avoid impacts on cliff C5 (in addition to C1, C3 and C4 avoided in EIS) and to conduct bat monitoring at potential roosts subject to subsidence. If a roost or breeding site for this species was found further measures would be required for this species. Impacts on potential roost habitat will not occur until approximately year 8 of the project. This provides time to check for roost or breeding sites prior to any impact.

New Holland Mouse

The EIS does not consider this species to be significantly impacted by the project. OEH concurs with this assessment. Although the species was not recorded within the PDB, the EIS indicates that approximately 125 ha of suitable habitat will be removed (OEH calculates 127 ha or 7,215 ecosystem credits of suitable vegetation types due to small changes in vegetation mapping since the EIS).

The offset package includes 1,608 ha of vegetation types suitable for the New Holland Mouse equating to 23,694 ecosystem credits. The offset package is sufficient for this species.

- Additional information provided for any "Impacts for further consideration"

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland and DNG) and the Regent Honeyeater were listed as Impacts for Further Consideration in a letter to KEPCO from OEH dated 2 March 2015.

Box-Gum Woodland and DNG CEEC

OEH calculates the area of Box Gum Woodland and DNG to be removed as 251.01 ha (65.52 woodland and 185.49 ha DNG). This results in a calculated credit requirement of 5,259 ecosystem credits. Section 6.2.2 of the BAR states that within an area of 10,000 ha of the PDB, approximately 1,600 ha of Box Gum Woodland and DNG occurs (800 ha woodland and 800 ha grassland). The BAR did not attempt to estimate the extent and condition of Box Gum Woodland and DNG in the IBRA subregion other than stating that it is likely that the remaining extent within the Kerrabee subregion is in a similarly variable condition as that within the Project Disturbance Boundary.

OEH has consulted the Greater Hunter Native Vegetation Mapping Geodatabase version 4.0 (OEH 2012). This geodatabase indicates that there are approximately 6,400 ha of White Box and Yellow Box grassy woodlands within the Kerrabee subregion which are likely to conform to the listing of Box Gum Woodland and DNG. Clearing of 251.01 ha of this would mean a loss of 3.9% of the CEEC within the IBRA subregion.

OEH considers that the impact of the Project on Box Gum Woodland and DNG is not likely to cause the extinction or significantly reduce the viability of the ecological community within the Kerrabee subregion. OEH is satisfied that the impact does not require further consideration by the consent authority and that the offset requirements calculated by the BioBanking Credit Calculator are sufficient.

Regent Honeyeater

OEH calculates that 180.4 ha of Regent Honeyeater habitat will be removed by the Project which results in a calculated credit requirement of 13,892 species credits. Section 6.2.3 of the BAR states that the local population of the Regent Honeyeater extends beyond the Study Area and is likely to include individuals occurring in the Capertee Valley, Munghorn Gap Nature Reserve, Goulburn River National Park, Wollemi National Park and the Hunter Valley. The size of this local population is unknown but in 2011, the total population of the species was estimated at 350–400 mature birds, possibly as a single, widely dispersed, contiguous population.

OEH has consulted the Greater Hunter Native Vegetation Mapping Geodatabase version 4.0 (OEH 2012). This geodatabase indicates that there are approximately 49,500 ha of potential Regent Honeyeater habitat within the Kerrabee subregion (based on vegetation types dominated by White Box, Yellow Box, Mugga Ironbark, Caley's Ironbark, Coastal Grey Box, Slaty Box and River Oak). Clearing of 180.4 ha of this would mean a loss of 0.4% of the potential Regent Honeyeater habitat within the IBRA subregion.

OEH considers that the impact of the Project on the Regent Honeyeater is not likely to cause the extinction or significantly reduce the viability of the species within the Kerrabee subregion. OEH is satisfied that the impact does not require further consideration by the consent authority and that the offset requirements calculated by the BioBanking Credit Calculator are sufficient.

- Conditions that may improve the acceptability of the impact

OEH has no comment at this stage.

- Whether further information is required to properly evaluate the acceptability of the impact.

Detailed final calculation of ecosystem and species credits available in the offsets will be completed after consent is given. Offset areas have sufficient credits available with a wide margin of safety.

EPBC- decision making

Assessment not inconsistent with plans

Name of plan	Relevant matters	Key considerations	Reference in EIS
National Recovery Plan for the Regent Honeyeater (<i>Anthochaera phrygia</i>)	Strategy 1: Improve the extent and quality of regent honeyeater habitat	Clearing within the PDB will reduce extent of habitat by 180.4 ha. Offsetting through BioBanking will contribute towards quality of 2,184 ha of habitat.	EIS Main report s7.3.5. EIS appendix J – Tables I2, I3
National Recovery Plan. White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Objective 1: Achieving no net loss in extent and condition of the ecological community throughout its geographic distribution	Clearing within the PDB will reduce extent of this community by 251.01 ha (65.52 woodland and 185.49 ha DNG). Offsetting through BioBanking will improve condition of 653 ha of woodland and 595 ha of DNG.	EIS Main report s7.3.5 EIS Appendix J – Tables I2, I3
	Objective 2: Increasing protection of sites with high recovery potential	Large areas of listed woodland and DNG exist in offset areas 3, 4 and 5 in particular. These are likely to have high recovery potential.	EIS Main report s7.3.7
National Recovery Plan for the Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Objective 1: Identify priority roost and maternity sites for protection	From letter to DP&E of 6 July 2016 – “As recommended by OEH, KEPCO will include provisions within the Biodiversity Management Plan (BMP) to undertake searches of potential roost sites at prominent cliffs within and adjacent to the Subsidence Study Area (C5, C6, C8 and C9) in conjunction with the above mentioned monitoring of cave-dwelling microbats”	Letter from KEPCO to DP&E of 6 July 2016

Consideration of guidelines and plans

EPBC-listed species or community	Relevant Approved Conservation Advice	Reference in EIS
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	EPBC Act Policy Statement. White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands.	EIS Main report s 7.2.2 EIS Appendix J – s2.3 EIS Appendix J – s3.3

Appendix 1: EPBC Act Species and Communities potentially affected by Bylong Coal Project.

Declared Controlled Action 12 March 2014 (EPBC 1024/7133).

Scientific Name	Common Name	TSC Act Status	EPBC Act Status	Occurrence	Potential Impact EIS	Considered in FBA
<i>Tylophora linearis</i>		V	E	Recorded just outside PDB. PDB altered to avoid.	Not significant	Species Credit Species
<i>Ozothamnus tessellatus</i>		V	V	Recorded edge of subsidence area, north of Bylong township.	Not significant	Species Credit Species
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		E	CE	Recorded within PDB	Significant Impact	Species Credit Species
<i>Prasophyllum</i> sp. <i>Wybong</i>		Not Listed	CE	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i>	Wollemi Mint-bush	V	V	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Prostanthera discolor</i>	N/A	V	V	Potential to occur	Not significant	Species Credit Species
<i>Commersonia rosea</i> (syn. <i>Androcalva rosea</i>)	N/A	E	E	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Homoranthus darwinioides</i>	N/A	V	V	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Pomaderris sericea</i>	Silky Pomaderris	E	V	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Philotheca ericifolia</i>	N/A	Not listed	V	Potential to occur	Not recorded in EIS study area	Species Credit Species
<i>Thesium australe</i>	Austral Toadflax	V	V	Potential to occur	Not significant	Species Credit Species

Appendix 1 (cont)

Common Name	Scientific Name	TSC Act Status	EPBC Act Status	Occurrence	Potential Impact EIS	Considered in FBA
BIRDS						
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	E*	Recorded (assumed)	Loss of important habitat	Species Credit Species
Rainbow Bee-eater	<i>Merops ornatus</i>	Not listed	M	Recorded	Not significant	Not considered
White-throated Needletail	<i>Hirundapus caudacutus</i>	Not listed	M	Recorded	Not significant	Not considered
Swift Parrot	<i>Lathamus discolor</i>	E	E	Potential to occur	Loss of potential habitat	Ecosystem Credit species
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	Not listed	M	Potential to occur	Not significant	Not considered
Fork-tailed Swift	<i>Apus pacificus</i>	Not listed	M	Potential to occur	Not significant	Not considered
Cattle Egret	<i>Ardea ibis</i>	Not listed	M	Potential to occur	Not significant	Not considered
Eastern Great Egret	<i>Ardea modesta</i>	Not listed	M	Potential to occur	Not significant	Not considered
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	Not listed	M	Potential to occur	Not significant	Not considered
Rufous Fantail	<i>Rhipidura rufifrons</i>	Not listed	M	Potential to occur	Not significant	Not considered
MAMMALS						
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	Recorded	Not significant	Ecosystem Credit species
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	Recorded	Loss of potential habitat	Species Credit Species
Corben's Long-eared Bat	<i>Nyctophilus corbeni</i>	V	V	Recorded	Not significant	Ecosystem Credit species
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	Not listed	V	Recorded	Loss of potential habitat	Ecosystem Credit species
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	Recorded	Loss of potential habitat	Species Credit Species
Koala	<i>Phascolarctos cinereus</i>	V	V	Potential to occur	Not significant	Species Credit Species
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	Potential to occur	Not significant	Species Credit Species
REPTILES						
Broad-headed Snake	<i>Hoplocephalus bungaroides</i>	E	V	Potential to occur	Not significant	Species Credit Species
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	V	V	Potential to occur	Not significant	Species Credit Species

* declared CE on 8 July 2015

Appendix 2: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland within Offset areas. [Blue text conforms to EPBC Act listing.](#) Black Text is not EEC. .

Veg Unit	Associated PCTs	OA1		OA2		OA3		OA4		OA5		OAYV		Total	
		Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits
PCT 437 (HU732) - Yellow Box Woodland															
6a1	Yellow Box Grassy	6.11	97	0	0	4.85	75	19.77	376	0	0	0	0	30.73	548
6a1+ 6a3	Yellow Box Grassy									107.65	1614	0	0	107.65	1,614
6b	Yellow Box Shrubby	8.04	128	0	0	0	0	0	0	0	0	0	0	8.04	128
DNG6(1)	Yellow Box Grassy DNG	7.25	83	0	0	2.47	27	47.84	696	17.71	186	0	0	75.27	992
DNG6(2)	Yellow Box Grassy DNG	0	0	0	0	0	0	11.33	160	83.36	845	0	0	94.69	1,005
DNG6(3)	Yellow Box Grassy DNG	2.18	25	0	0	0	0	24.72	364	0	0	0	0	26.9	389
TOTAL EEC		15.54	205	0	0	7.32	102	103.66	1,596	208.72	2645	0	0	335.24	4,548
Total non EEC		8.04	128	0	0	0	0	0	0	0		0	0	8.04	128

Appendix 2 (cont)

Veg Unit	Associated PCTs	OA1		OA2		OA3		OA4		OA5		OAYV		Total	
		Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits	Area	Credits
PCT 483 (HU690) - Yellow Box Woodland															
7a1+ 7a3	White Box Grassy	39.33	492	0	0	0	0	0	0	0	0	0	0	39.33	492
7a1	White Box Grassy	0	0	16.29	187	56.78	685	5.56	87	377.51	4383	19.3	262	475.44	5,604
10	Grey Box	0.88	11	0	0	4.44	55	1.71	27	6.77	81	0	0	13.8	174
DNG7(1)	White Box Grassy DNG	30.17	328	18.11	178	145.72	1517	34.33	480	159.02	1583	132	1333	519.73	5,419
DNG7(2)	White Box Grassy DNG	0	0	20.93	228	7.01	80	16.84	253	120.2	1325	0	0	164.98	1,886
DNG7(3)	White Box Grassy DNG	0.38	5	34.15	404	10.77	134	108.79	1741	0	0	0	0	154.09	2,284
DNG10	Grey Box DNG	8.69	110	0	0	90.16	1099	0.48	8	12.12	142	0	0	111.45	1,359
TOTAL EEC		69.88	825	89.48	997	220.28	2,416	165.52	2,561	656.73	7,291	151.3	1,595	1,353.57	15,685
Total non EEC		9.57	121	0	0	94.6	1,154	2.19	35	18.89	223	0	0	125.25	1,533
Total EEC both PCTs														1,688.81	20,233
Total non EEC both PCTs														133.29	1,661
Total Credits both PCTs														1,822.1	21,894