TECHNICAL REPORT 4:
Commonwealth Matters Assessment

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ARTC

INLAND RAIL – PARKES TO NARROMINE

Commonwealth Matters Assessment

FINAL

June 2017

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Commonwealth Matters Assessment

FINAL

Prepared by
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on behalf of
Australian Rail Track Corporation

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This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Glossary

ARTC	Australian Rail Track Corporation
BAR	Biodiversity Assessment Report
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
CMA Subregion	Catchment Management Authority Subregion
DoEE	Commonwealth Department of the Environment and Energy
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
FBA	Framework for Biodiversity Assessment
FM Act	*Fisheries Management Act 1994*
IBRA	Interim Biogeographic Regionalisation for Australia (Version 7)
KP	Kilometre point (rail line kilometrage)
LGA	Local Government Area
MNES	Matters of national environmental significance
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
proposal	Construction and operation of the Parkes to Narromine section of the Melbourne to Brisbane Inland Rail.
proposal site	The area of impact within the proposal boundary.
proposal area	The total construction impact zone associated with the proposal which incorporates both permanent and temporary disturbance. The proposal area corresponds to the Development Site as described in the Biodiversity Assessment Report (Umwelt 2017a) and as shown on Figures in Section 3.0
SPRAT	Species Profile and Threats Database (Commonwealth)
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
TSC Act	*Threatened Species Conservation Act 1995* (NSW)

Table of Contents

Figures

Tables

Appendices

1.0 Introduction

This report has been prepared on behalf of the Australian Rail Track Corporation Ltd (ARTC) by Umwelt (Australia) Pty Limited (Umwelt) and provides an assessment of the Parkes to Narromine section of Inland Rail in relation to commonwealth Matters of National Environmental Significance (MNES). It addresses the specific requirements of Attachment A of the Environmental Assessment Requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued following determination of the proposal by the Department of the Environment and Energy (DoEE) as a controlled action on 11 October 2016.

1.1 Background and Overview of the Proposal

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor. The Inland Rail programme (Inland Rail) involves the design and construction of a new inland rail connection, about 1,700 kilometres long, between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail would enhance Australia's existing national rail network and serve the interstate freight market (**Figure 1.1**).

ARTC is seeking approval to construct and operate the Parkes to Narromine section of Inland Rail ('the proposal'), which consists of 106 kilometres of upgraded rail track and associated facilities.

The proposal requires approval from the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and also from the Commonwealth Minister of the Environment and Energy (DoEE) under Part 9 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report has been prepared as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to accompany the application for approval of the proposal, and addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), as revised and issued on 8 November 2016. The structure of this report reflects the specific requirements of Attachment A of the SEARs.

1.2 Designated Proponent

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Parkes to Narromine section of Inland Rail ('the proposal').

1.3 Current Status of Proposal

Attachment A to the SEARs refers to the 'action', however, for consistency with remainder of the EIS, this document uses the term 'proposal'.

The proposal was deemed to be a controlled action on 11 October 2016 as result of the likely impacts to Matters of National Environmental Significance (MNES) protected under the EPBC Act namely threatened species and communities (sections 18 & 18A). The proposal is to be assessed in accordance with the NSW Assessment Bilateral Agreement (2015) and guidelines for preparing assessment documentation provided in the SEARs.

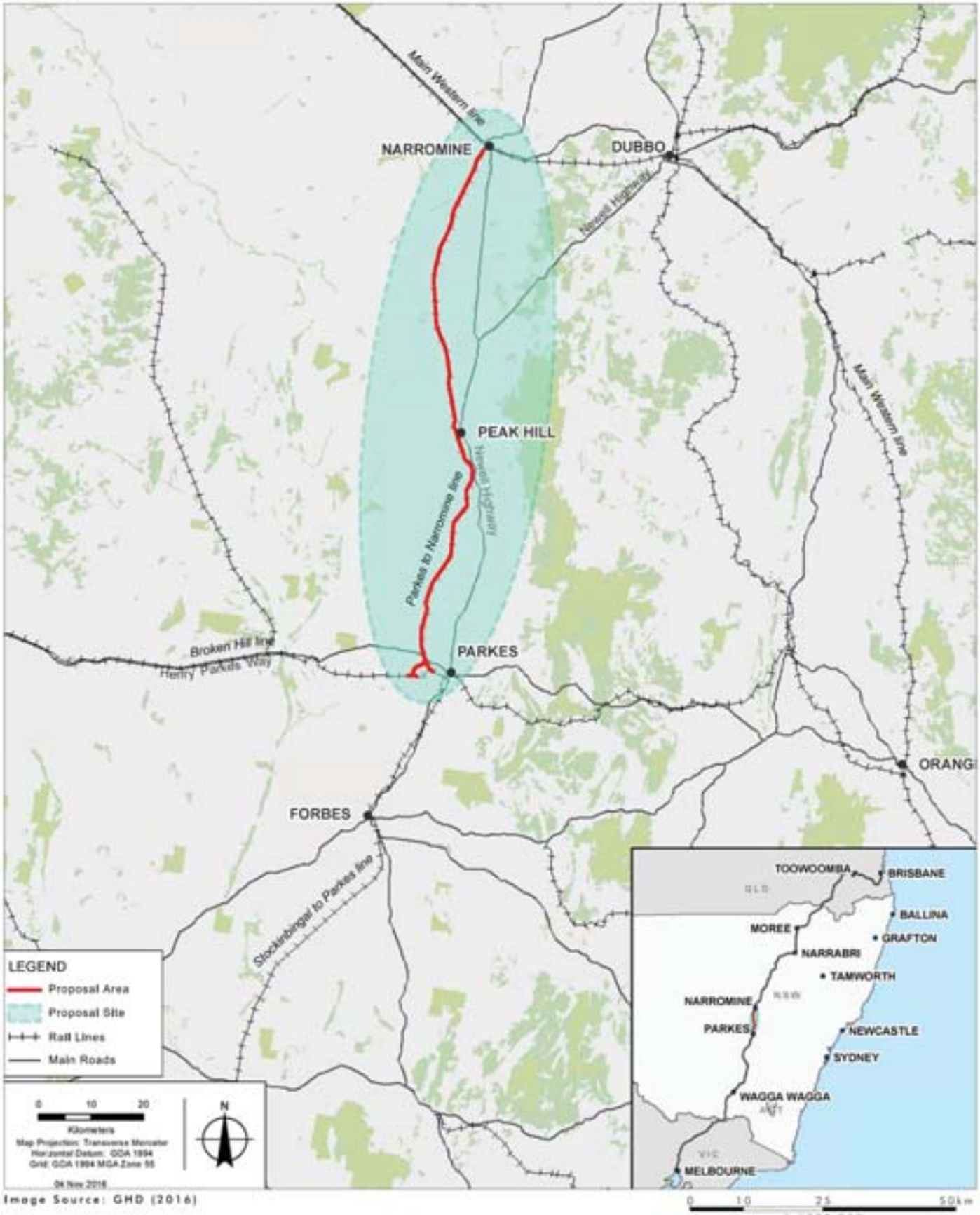


Image Source: GHD (2016)

FIGURE 1.1

Location of the Proposal

1.4 Location of the Proposal

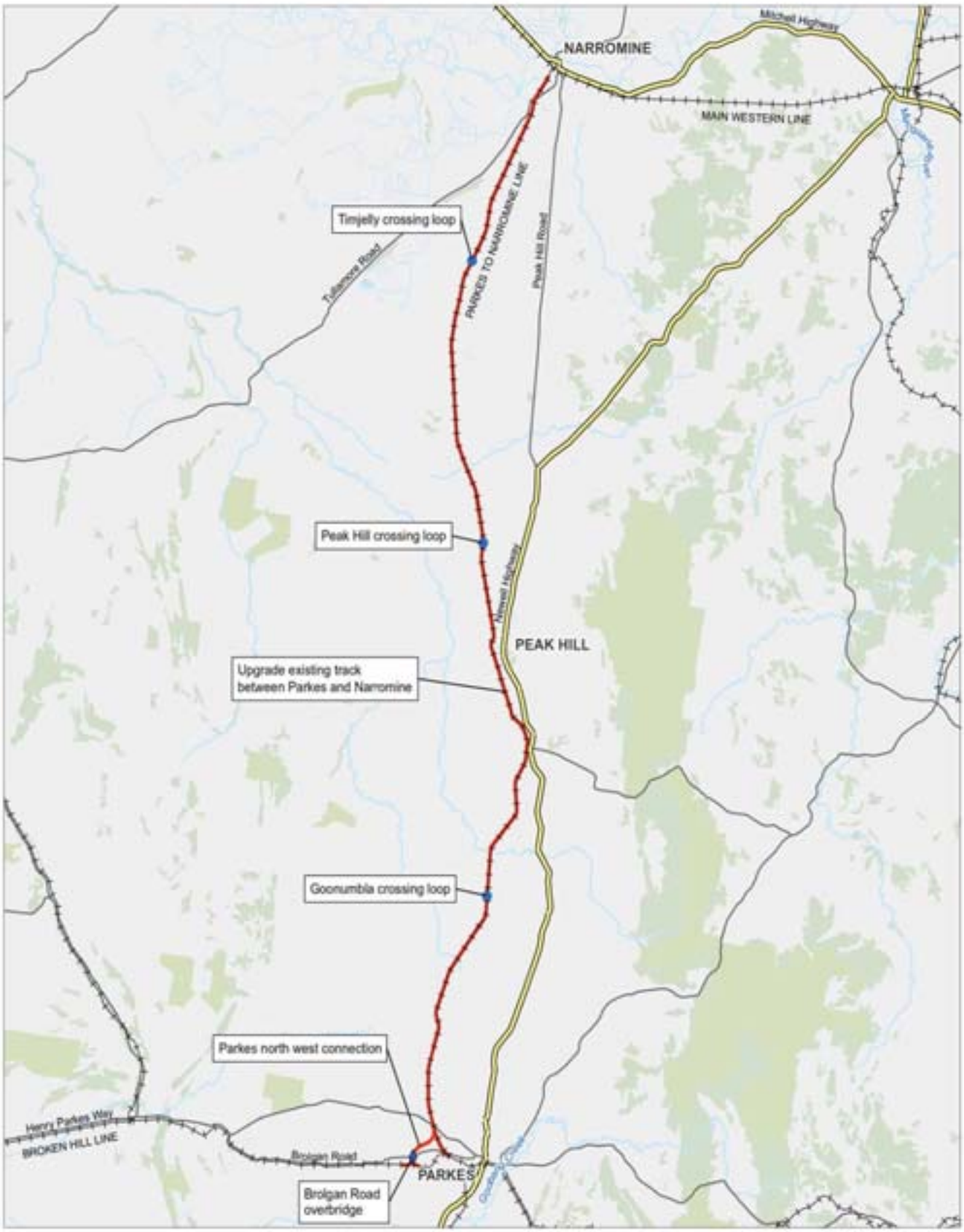
For the purposes of this Assessment of Commonwealth Matters report the location of the proposal is the construction impact zone shown on **Figure 1.2,** which is referred to in this document as the proposal area. The proposal area comprises the portion of the proposal that will be subject to temporary and permanent impact. The proposal area varies along the length of the proposal depending on the construction activities that are proposed in any given area. The proposal will be subjected to a range of temporary and permanent disturbances as outlined in **Section 3.0.**

1.4.1 Location

The proposal is generally located in the existing rail corridor between the towns of Parkes and Narromine, via Peak Hill. In addition, a new connection to the Broken Hill rail line ('the Parkes north west connection') is proposed outside the existing rail corridor at the southern end of the proposal site near Parkes. The location of the proposal is shown in **Figure 1.1**.

Table 1.1 Location in the Landscape

Parkes to Narromine	
IBRA Bioregions	NSW South Western Slopes Darling Riverine Plains
IBRA Subregions	Lower Slopes Bogan Macquarie
Major Catchment Areas	Lachlan Central West
Mitchell Landscapes	Bimbi Plains Bogan Alluvial Plains Boggy Cowal Alluvial Plains Boggy Cowal Channels and Floodplains Goonumbla Hills Narromine Hills
LGAs	Parkes Narromine



LEGEND

- New bridge
- Crossing loop
- The proposal
- Railway
- Highway
- Road

0 2.5 5 10 15

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

FIGURE 1.2

Key Features of the Proposal

Image Source: GHD (2017)

File Name (A4): R11/3606_137.dgn
20170620 13.53

The coordinates of the turning points of the rail line from south to north are as identified in **Table 1.2**.

Table 1.2 Coordinates of the proposal

Longitude (I)	Latitude (I)	Longitude (I)	Latitude (I)
148°8'15.0"" E	33°8'10.9"" S	148°11'48.1"" E	32°45'48.2"" S
148°7'48.3"" E	33°7'51.1"" S	148°10'32.5"" E	32°42'45.1"" S
148°7'21.7"" E	33°7'6.5"" S	148°10'33.24"" E	32°42'32.8"" S
148°6'50.4"" E	33°5'37.9"" S	148°10'40.44"" E	32°42'20.1"" S
148°6'48.2"" E	33°3'52.4"" S	148°10'42.24"" E	32°42'11.1"" S
148°7'28.5"" E	33°1'42.1"" S	148°9'53.28"" E	32°38'33.0"" S
148°7'18.4"" E	33°1'11.9"" S	148°9'52.2"" E	32°38'11.7"" S
148°7'18.4"" E	33°0'55.0"" S	148°9'57.96"" E	32°37'25.2"" S
148°8'8.5"" E	32°58'55.0"" S	148°9'29.52"" E	32°35'2.4"" S
148°10'13.4"" E	32°56'22.4"" S	148°9'24.84"" E	32°34'49.3"" S
148°10'20.2"" E	32°56'11.4"" S	148°8'38.04"" E	32°33'20.2"" S
148°10'39.7"" E	32°52'47.7"" S	148°8'19.68"" E	32°32'38.2"" S
148°10'46.2"" E	32°52'37.1"" S	148°8'15.0"" E	32°32'20.7"" S
148°12'6.8"" E	32°51'14.4"" S	148°7'51.6"" E	32°27'35.5"" S
148°12'14.0"" E	32°51'4.1"" S	148°8'3.4"" E	32°26'28.7"" S
148°12'16.5"" E	32°50'51.7"" S	148°8'21.4"" E	32°25'26.3"" S
148°12'9.7"" E	32°49'29.9"" S	148°8'36.2"" E	32°24'23.1"" S
148°12'11.5"" E	32°49'23.5"" S	148°9'13.3"" E	32°23'22.8"" S
148°12'47.8"" E	32°48'25.0"" S	148°9'56.5"" E	32°22'1.9"" S
148°12'54.3"" E	32°47'28.3"" S	148°10'14.8"" E	32°20'36.0"" S
148°12'52.9"" E	32°47'19.8"" S	148°12'43.5"" E	32°16'11.4"" S
148°12'34.9"" E	32°46'41.9"" S	148°12'49.6"" E	32°15'55.2"" S
148°12'28.8"" E	32°46'35.8"" S	148°12'54.0"" E	32°15'31.2"" S
148°12'1.8"" E	32°46'18.0"" S	148°13'41.5"" E	32°14'29.6"" S
148°11'53.5"" E	32°46'8.0"" S	148°13'47.6"" E	32°14'17.0"" S

1.4.2 Size

The proposal area covers approximately 923 hectares.

1.5 Relationship to Other Actions

The proposal forms one of 13 sections of the Inland Rail. Currently the Narrabri to North Star section of Inland Rail is the only other section to be referred to the DoEE. Similar to the Parkes to Narromine proposal, the Narrabri to North Star section of Inland Rail was determined to be a controlled action and will be assessed under the NSW Assessment Bilateral Agreement. ARTC is currently preparing an EIS to assess the impacts of the Narrabri to North Star section.

The relative location of the Parkes to Narromine and Narrabri to North Star sections of Inland Rail are shown on **Figure 1.3**.

1.6 Purpose and Scope of this Report

This report provides the findings of the assessment of Commonwealth matters. It addresses the specific requirements of the revised SEARs following determination of the proposal as a controlled action on 11 October 2016. Based on the information provided in the referral, and additional information provided on 19 August 2016, The DoEE consider the proposal is likely to have a significant impact on matters of national environmental significance, including but not limited to:

- the removal of up to 33.82 ha of critically endangered White Box-Yellow box Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community
- the removal of up to 41.67 ha of endangered Grey Box *(Eucalyptus microcarpa)* Grassy woodlands and Derived Native Grasslands of South-eastern Australia
- the removal of over 60 ha of known foraging habitat for the Superb Parrot *(Polytelis swainsonil,* and
- the removal of approximately 15 ha of known foraging habitat for the Regent Honeyeater *(Anthochaera phrygia),* and Swift Parrot *(Lathamus discolor).*

The Department also considers that *T.linearis* may be present within the proposal site and a significant impact on this species from the proposal is possible. Attachment A of the revised SEARs identifies the requirements for preparing assessment documentation relevant to the EPBC Act and these requirements are identified in **Table 1.3**.

Table 1.3 SEARs Related to Commonwealth Matters of National Environmental Significance and where they are addressed in the report

SEARs Attachment A	Where Addressed In Report
4. The title of the action, background to the development and current status.	Section 1.0
5. The precise location and description of all works to be undertaken (including associated offsite work and infrastructure), structures to be built or elements of the action that may have impacts on matters of national environmental significance (MNES)	Section 2.0 **Figures 1.1** and **1.2**

SEARs Attachment A	Where Addressed In Report
6. How the action relates to any other actions that have been, or are being taken, in the region affected by the action.	Section 1.5
7. How the works are to be undertaken and design parameters of those aspects of the structures or elements of the action that may have relevant impacts on MNES.	Section 2.0
Impacts	
8. The EIS must include an assessment of the relevant impacts of the action on threatened species and communities; including: • a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts; • a statement whether any relevant impacts are likely to be known, unpredictable or irreversible; • analysis of the significance of relevant impacts; • any technical data and other information used or needed to make a detailed assessment of the relevant impacts; and • a comparative description of the impacts of alternatives, if any, on the threatened species and communities.	Section 3.2 Section 3.3 Section 3.4 Section 4.1.2
Avoidance, mitigation and offsetting	
9. For each of the relevant matters protected that are likely to be impacted by the development, the EIS must provide information on proposed avoidance and mitigation measures to deal with the relevant impacts of the action, including: • a description and an assessment of the expected or predicted effectiveness of the mitigation measures; • any statutory policy basis for the mitigation measures; • the cost of mitigation measures; • a description of the outcomes that the avoidance and mitigation measures will achieve; • and outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action; • a description of the offsets proposed to address the residual adverse significant impacts and how these offsets will be established.	Section 4.4 Section 4.2 Costs of mitigation measures will be developed during detailed design. Section 4.3 Section 4.3 Section 4.5
10. Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.	Section 4.5

SEARs Attachment A	Where Addressed In Report
Key Issues – Biodiversity	
11. The EIS must address the following issues in relation to biodiversity including separate: • Identification of each EPBC Act listed threatened species and community likely to be impacted by the development. Any likely impacts must be described for each matter and, if there are impacts, how these impacts are avoided, mitigated and if required offset. Note that only significant residual adverse impacts are required to be offset.	Appendix 1 and Section 3.3 Section 4.1 Section 4.5
12. For each of the relevant EPBC Act listed threatened species and communities likely to be impacted by the developments the EIS must provide a separate: • description of the habitat and habits (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans, threat abatement plans and wildlife conservation plans; and • details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements. • description of the impacts of the action having regard to the full national extent of the species or community's range. (Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database)	Appendix 1 and Section 3.3 Section 3.1 Section 3.2 and 3.3
13. For each of the relevant EPBC Act listed threatened species and communities likely to be impacted by the development the EIS must provide a separate: • identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account • detailed of how the current published NSW Framework for Biodiversity Assessment (FBA) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; • details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the development in accordance with the FBA and/or mapping and descriptions of the extent and condition of the relevant habit and/or threatened communities occurring on proposed offset sites. (Note: for the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposal i.e. 'like for like'. In applying the FBA, residual impacts on EPBC Act listed threatened ecological communities must be offset with plant community type (s) (PCT) that are ascribed to the specific EPBC listed ecological community. PCTs from a different vegetation class will not generally be acceptable as offsets for EPBC listed communities.)	Section 5.0 Section 4.5 Section 4.5

SEARs Attachment A	Where Addressed In Report
14. Any significant residual impacts not addressed by the FBA may need to be addressed in accordance with the Environment Protection and Biodiversity Conservation Act 1999 environmental Offset Policy. (Note: if the EPBC Act Environmental Offset Policy is used to calculate proposed offsets for a threatened species or community you may wish to seek further advice from the Department of Planning and Environment.)	None relevant
15. For each threatened species and community likely to be impacted by the development, the EIS must provide reference to, and consideration of, relevant approved conservation advice or recovery plan for the species or community. (Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database)	Appendix 2 and Section 3.3
Environmental Record of person proposing to take action	Section 6.0
16. Information in relation to the environmental record of a person proposing to take action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations 2000.	Section 6.0

Legend

- Existing Track
- New Track
- Upgrade Track

FIGURE 1.3

Inland Rail Project

2.0 Description of the Proposal

2.1 Key features

The key features of the proposal involve:

- upgrading the track, track formation, and culverts within the existing rail corridor for a distance of 106 kilometres between Parkes and Narromine
- realigning the track where required within the existing rail corridor to minimise tight curves
- providing three new crossing loops within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- providing a new 5.3 kilometre long rail connection to the Broken Hill Line to the west of Parkes ('the Parkes north west connection'), including a road bridge over the existing rail corridor at Brolgan Road ('the Brolgan Road overbridge').

The key features of the proposal are shown in **Figure 1.2**.

Ancillary work would include works to level crossings, signalling and communications, signage and fencing, and services and utilities.

A detailed description of the proposal is provided in the EIS main text.

2.2 Timing

Subject to approval of the proposal, construction is planned to start in early to mid 2018, and is expected to take about 18 months. The proposal is expected to be operational in 2020. Inland Rail as a whole is expected to be operational in 2025.

2.3 Operation

Prior to the opening of Inland Rail as a whole, the proposal would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day. It is estimated that the operation of Inland Rail would involve an annual average of about 8.5 trains per day in 2025, increasing to 15 trains per day in 2040. The trains would be a mix of grain, intermodal (freight), and other general transport trains.

3.0 Impact Assessment

3.1 Methods

A detailed description of the flora and fauna surveys undertaken within the proposal area can be found in Section 2.0 of the *ARTC Inland Rail – Parkes to Narromine Biodiversity Assessment Report* (Umwelt, 2017). A summary of the survey methodology is provided below. During all biodiversity surveys, consideration was given to relevant Commonwealth threatened species survey guidelines, conservation listing advice, recovery plans and policy statements to ensure appropriate survey techniques and seasonal considerations were employed.

The threatened species and ecological communities known or likely to occur within the proposal area were identified through appropriate database searches and detailed field surveys. The database searches included:

- EPBC Protected Matters Search Tool (05/12/16, refer to **Appendix 1**)
- OEH Atlas of NSW Wildlife (April 2016)
- NSW DPI - Fishing and Aquaculture – Threatened and protected species record viewer (May 2016).

Following the identification of target species and communities, the native vegetation assessment consisted of relevant desktop reviews prior to completing comprehensive field surveys over several seasons to identify the communities and threatened flora species present within the proposal area. The following activities were undertaken:

- literature and database review
- digital aerial photograph interpretation
- systematic plot/transect surveys
- semi-quantitative rapid sampling
- meandering transects
- vegetation mapping.

A total of 48 systematic plots/transect surveys and 218 rapid vegetation assessments were conducted across the proposal area during the surveys undertaken for this assessment (refer to Figures A1-A36 in Appendix A of the BAR). These surveys were undertaken over 19 days and four survey periods, being:

- 15 – 16 October 2014
- 11 – 21 January 2016
- 2 – 5 May 2016
- 1 – 2 June 2016.

Targeted threatened fauna surveys were undertaken in July, November and December 2015 with consideration of the survey guidelines for Australia's threatened mammals (DSEWPC 2011), bats (DSEWPC 2010), birds (DSEWPC 2010b), fish (DSEWPC 2011b), reptiles (DSEWPC 2011c) and frogs (DSEWPC 2010c). In order to identify the range of threatened fauna species occurring in the proposal area the following survey methods were utilised:

- habitat assessment
- diurnal bird area searches
- diurnal reptile/amphibian area searches
- nocturnal spotlighting
- nocturnal amphibian surveys in appropriate freshwater wetland habitat
- nocturnal call playback surveys
- nocturnal Anabat surveys targeting micro-bat species
- targeted fauna species inspections of cavities and expansion joints of timber, steel and concrete bridges
- targeted surveys for threatened species (refer to **Table 3.1**).

The survey methodology is shown on Figures A1-A36 in Appendix A of the BAR.

Table 3.1 Summary of Targeted Surveys Completed for EPBC Act-listed Threatened Species Predicted to Occur in the Proposal site (Umwelt 2017a, b)

Species	Status EPBC Act	Required Survey Period*	Survey Technique, Timing and Location
Flora			
Tylophora linearis	E	September - May	Targeted threatened flora searches in suitable habitat undertaken in October 2014, January 2016 and May 2016 throughout the proposal site. Opportunistic observations undertaken throughout all Umwelt survey periods.
Birds			
superb parrot *Polytelis swainsonii*	V	September – December	Diurnal bird surveys undertaken in November-December 2015 throughout the proposal site. Tree hollows were recorded on a GPS and hollows that could potentially provide suitable habitat were watched for activity across all survey sites. Selected suitable habitat trees were watched for at least an hour, in the morning where possible for any superb parrot activity. Opportunistic observations undertaken throughout all Umwelt survey periods.
swift parrot *Lathamus discolor*	CE	March – July	Targeted winter bird surveys were undertaken in July 2015 throughout the proposal site. Opportunistic observations undertaken throughout all Umwelt survey periods.

Species	Status EPBC Act	Required Survey Period*	Survey Technique, Timing and Location
regent honeyeater *Anthochaera phrygia*	CE	All year	Targeted call playback and bird surveys in July 2015 throughout the proposal site. Each survey consisted of a 5 minute period of call playback for the species followed by 20 minutes of searching, which consisted of a slow walking transect within a two hectare area within suitable vegetation types. Surveys were undertaken during early to mid-morning and mid to late afternoon. Bird species were identified from characteristic calls and by observation using binoculars with magnification up to 10 x. Opportunistic observations undertaken throughout all Umwelt survey periods.

*As specified in the NSW Threatened Species Profile Database which identifies required survey periods for threatened species. Where appropriate, the Survey Guidelines for Australia's Threatened Birds (DEWHA 2010a) were considered for survey timing and methods.
Source: Table 2.3 and Table 2.4 of the BAR (Umwelt 2017a). Further details provided in Section 2.4.3 of the BAR (Umwelt 2017a)

3.2 Nature and Extent of the Likely Short Term and Long Term Relevant Impacts

The construction and operation of the proposal will result in a range of direct impacts on MNES within the proposal area. Direct impacts include the loss of native vegetation and fauna habitats as a result of direct and permanent clearance works and track upgrades. The location and extent of direct (permanent) impacts is shown on **Figure 3.1A** to **3.1E**. The relevant impacts of the proposal are considered to be well known and predictable based on the extensive knowledge of the ecological values of the proposal area and a sound understanding of the impacts. The direct impacts of the proposal, as they relate to the clearing of threatened species habitat and ecological communities are predicted to be permanent; however, areas of temporary disturbance are also proposed.

The proposal would involve upgrading the existing rail line between Parkes and Narromine, including:

- upgrading the existing track and track formation
- replacement of culverts and bridges
- construction of new crossing loops, at Goonumbla, Peak Hill, and Timjelly
- rationalisation and upgrading of level crossings
- curve easing
- constructing the Parkes north west connection.

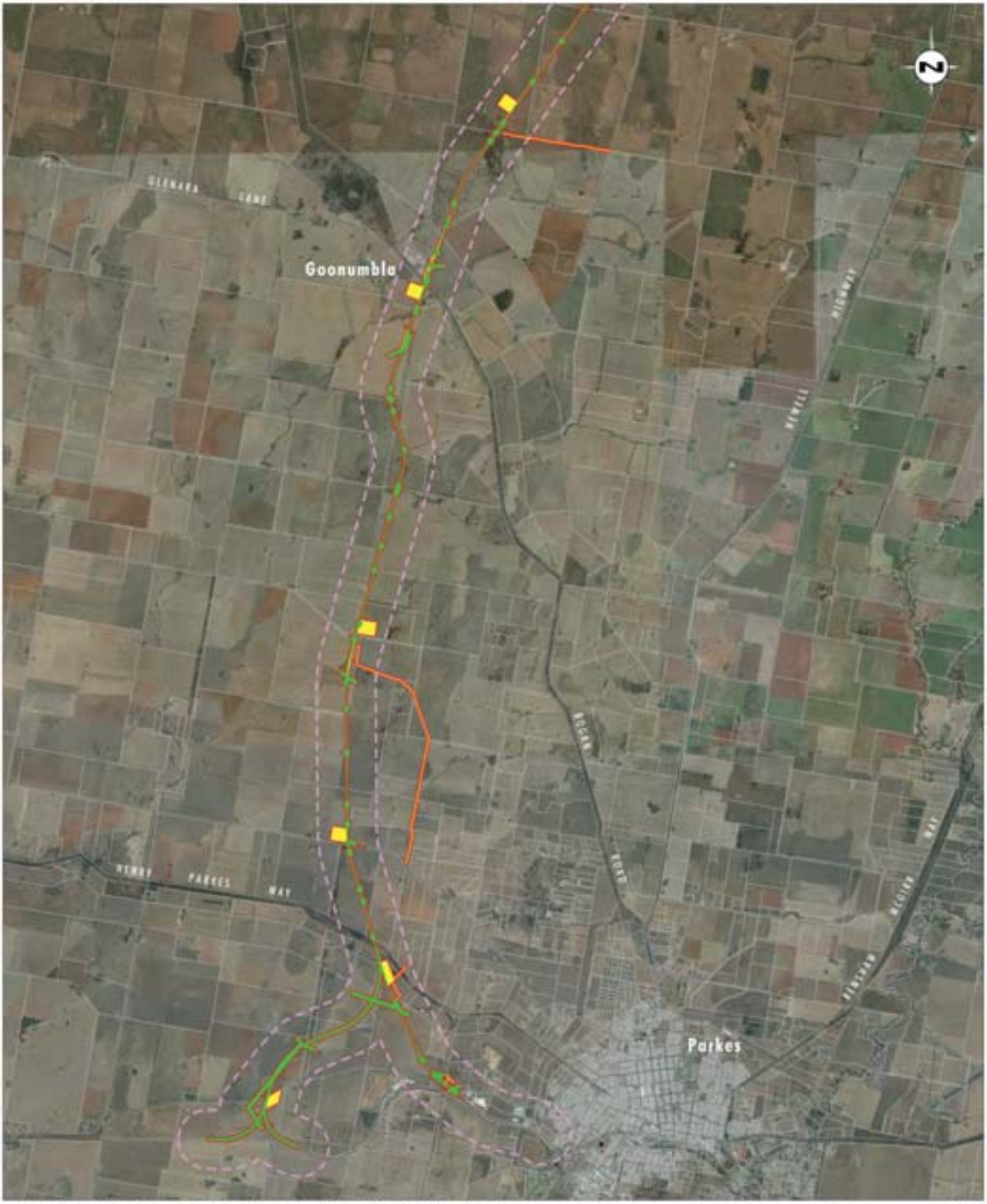


Image Source: Google Earth/CNES/Astrium/DigitalGlobe (Dec 2015)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 1.0 2.5 5.0 km
1:100 000

Legend

- Development Site
- Temporary Impact Zone
- Permanent Impact Zone
- 550m Buffer Area

FIGURE 3.1A

Development Site Impact Parkes to Narromine

Image Source: Google Earth/CNES/Astrium/DigitalGlobe (Dec 2015)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 1.0 2.5 5.0km
1:100 000

Legend

- Development Site
- Temporary Impact Zone
- Permanent Impact Zone
- 550m Buffer Area

FIGURE 3.1B

Development Site Impact
Parkes to Narromine

Image Source: Google Earth/CNES/Astrium/DigitalGlobe (Dec 2015)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 1.0 2.5 5.0km
1:100 000

Legend

- Development Site
- Temporary Impact Zone
- Permanent Impact Zone
- 550m Buffer Area

FIGURE 3.1C

Development Site Impact Parkes to Narromine

Image Source: Google Earth/CNES/Astrium/DigitalGlobe (Dec 2015)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 1.0 2.5 5.0km
1:100 000

Legend

- Development Site
- Temporary Impact Zone
- Permanent Impact Zone
- 550m Buffer Area

FIGURE 3.1D

Development Site Impact
Parkes to Narromine

File Name (A4): R11/3606_130.dgn
20170501 13.37

Image Source: Google Earth/CNES/Astrium/DigitalGlobe (Dec 2015)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 1.0 2.5 5.0 km
1:100 000

Legend

- Development Site
- Temporary Impact Zone
- Permanent Impact Zone
- 550m Buffer Area

FIGURE 3.1E

Development Site Impact Parkes to Narromine

The following ancillary works would also be undertaken:

- changes to some property access roads and the local road network in some locations as a result of the rationalisation of level crossings
- stormwater drainage works
- upgrading signalling and communications
- establishing or upgrading existing fencing of the rail corridor
- relocation of some services and utilities.

Further information regarding the proposal is contained in the main text of the EIS.

3.2.1 Direct and Permanent Impacts to MNES

Table 3.2 below outlines the impact of the proposal on Commonwealth listed ecological communities. A total of 49.82 hectares of direct impacts to native vegetation communities, and flora and fauna species and their habitats is proposed. Direct impacts have been focused, where possible, outside of native vegetation communities, with 579.71 hectares of cleared/non-native vegetation subject to direct impacts.

Table 3.2 Direct and Permanent Impacts of the Proposal on Threatened Ecological Communities

EPBC Act listed Threatened Ecological Community	Corresponding Plant Community Type in the Proposal Site	Area of TEC within the Proposal Site (ha)
Weeping Myall Woodlands EEC	PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion *Moderate to Good*	0.99
Total *Weeping Myall Woodlands EEC*		**0.99**
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good*	7.89
	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good_DNG*	23.64
Total *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC*		**31.53**

EPBC Act listed Threatened Ecological Community	Corresponding Plant Community Type in the Proposal Site	Area of TEC within the Proposal Site (ha)
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	3.12
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good_DNG*	0.46
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	3.40
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good_DNG*	10.32
Total *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC*		**17.3**

Table 3.3 Direct and Permanent Impacts of the Proposal on EPBC Act Listed Threatened Species

EPBC Act listed Threatened Species	Habitat within the Proposal Site	Area of Habitat within the Proposal Site (ha)
Tylophora linearis	PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt *Moderate to Good*	1.54
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	3.12
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	3.4

EPBC Act listed Threatened Species	Habitat within the Proposal Site	Area of Habitat within the Proposal Site (ha)
Total *Tylophora linearis* habitat		**8.06**
superb parrot *Polytelis swainsonii*	PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion *Moderate to Good*	3.16
	PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion *Moderate to Good*	0.87
	PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion *Low_Regeneration*	0.62
	PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions *Moderate to Good*	0.94
	PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions *Moderate to Good_DNG*	6.12
	PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt *Moderate to Good*	1.54
	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good*	8.58
	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good - DNG*	23.48
	PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) *Moderate to Good*	1.41

EPBC Act listed Threatened Species	Habitat within the Proposal Site	Area of Habitat within the Proposal Site (ha)
	PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) *Moderate to Good_DNG*	1.20
	PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion *Moderate to Good*	1.50
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	3.12
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good – DNG*	0.46
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	3.40
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good – DNG*	10.32
Total superb parrot foraging habitat		**66.72**
swift parrot *Lathamus discolor*	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good*	8.58
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	3.12
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	3.40
Total swift parrot foraging habitat		**15.10**

EPBC Act listed Threatened Species	Habitat within the Proposal Site	Area of Habitat within the Proposal Site (ha)
regent honeyeater *Anthochaera phrygia*	PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good*	8.58
	PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	3.12
	PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	3.40
Total regent honeyeater foraging habitat		**15.1**

3.2.2 Indirect and Temporary Impacts

The construction of the proposal will result in temporary impacts relating to construction impacts associated with facilities such as compounds and temporary access tracks. Native vegetation occurring in these areas is not expected to be fully impacted (i.e. will not be cleared) but will be subject to some disturbance and is expected to recover. While the vegetation and habitats in these areas will be impacted in the short term, it is considered that these areas will regenerate following the completion of the construction phase of the proposal. The location and extent of temporary impacts is shown on **Figure 3.1A** to **3.1E**.

To facilitate the regeneration of temporary impact locations, a rehabilitation strategy will be prepared as part of the Construction Environmental Management Plan (CEMP).

3.2.3 Are any Relevant Impacts Likely to be Unknown, Unpredictable or Irreversible?

The relevant impacts of the proposal are considered to be well known and predictable based on the extensive knowledge of the ecological values of the proposal area and a sound understanding of the impacts of the proposal (e.g. clearing of vegetation, earthworks and water management). The direct impacts of the proposal, as they relate to the clearing of threatened species habitat and ecological communities listed under the EPBC Act are predicted to be permanent; however, a biodiversity offset program will be developed as part of the proposal in order to compensate for the residual impacts of habitat loss that cannot be adequately avoided or minimised.

3.3 Analysis of the Significance of Relevant Impacts

Following the completion of the database searches discussed in **Section 3.1**, an analysis of the EPBC Act listed threatened species and communities that could occur in the proposal area was undertaken. **Appendix 1** details the results of the EPBC Act protected matters database search which identified five communities and 23 threatened species as known or predicted to occur in suitable habitat within 10km of the proposal site. A description of the ecology of each threatened species and ecological community is provided along with a description of the outcomes of targeted surveys. For those threatened species and communities that were considered to be potentially significantly impacted by the proposal, an Assessment of Significance was undertaken in accordance with the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines – Matters of National Environmental Significance (DotE 2013).

The EPBC Act Significant Impact Guidelines 1.1 states the following:

When deciding whether or not a proposal is likely to have a significant impact on a matter of national environmental significance, the precautionary principle is relevant. Accordingly, where there is a risk of serious or irreversible damage, a lack of scientific certainty about the potential impacts of an action will not itself justify a decision that the action is not likely to have a significant impact on a matter of national environmental significance.

In light of the above, where there was lack of scientific certainty, the maximum potential impact was assumed. The development of mitigation and offset strategies were based on the outcomes of the impact assessment and the precautionary principle will also be applied in the development of the mitigation and offset strategies to ensure that uncertainties are compensated for with more robust mitigation or more substantial offset outcomes.

The assessments of significance were undertaken following an initial screening process to identify species that may be potentially significantly affected by the proposal (refer to **Appendix 1**), with a consequential full assessment of the likely significance of impacts being completed for these species (refer to **Appendix 2**).

The assessments of significance do not take into account the range of impact mitigation strategies and biodiversity offsets proposed for the proposal, rather they consider the impacts of the proposal without any mitigation or offsetting, consistent with the requirements of both State and Commonwealth significant impact assessment guidelines (Department of the Environment 2013). The Assessment of Significance was completed for the threatened species and threatened ecological communities (TECs) identified in **Appendix 1**, either due to their recorded presence or the presence of potential habitat in the proposal area, and the potential for the species or TECs to be significantly impacted.

Based on the information provided in the referral, and additional information provided on 19 August 2016, The DoEE consider the proposal is likely to have a significant impact on matters of national environmental significance, including but not limited to:

- the removal of up to 17.3 ha of critically endangered White Box-Yellow box Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community
- the removal of up to 31.53 ha of endangered Grey Box *(Eucalyptus microcarpa)* Grassy woodlands and Derived Native Grasslands of South-eastern Australia
- the removal of over 66 ha of known foraging habitat for the Superb Parrot *(Polytelis swainsonii),* and
- the removal of approximately 15 ha of known foraging habitat for the Regent Honeyeater *(Anthochaera phrygia),* and Swift Parrot *(Lathamus discolor).*

The Department also considers that *T.linearis* may be present within the proposed action area and a significant impact on this species from the proposed action is possible. Approximately 8.06 hectares of potential habitat is present. Attachment A of the SEARs requires an assessment of the relevant impacts of the proposal on threatened species and communities. This assessment is provided for the above relevant species and communities in the following sections.

3.3.1 *Tylophora linearis*

Tylophora linearis is listed as endangered under the EPBC Act and is a herbaceous climber with clear latex growing to approximately 2 m in length (DoEE 2008). In NSW the species is rarely collected, known from less than 10 localities in the Dubbo area and Mt Crow near Barrabra, growing in dry scrub, open forest and woodlands. It is also known to overlap in distribution with *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC under the EPBC Act (DoEE 2008), which occurs in the proposal area.

Tylophora linearis was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. A total of 48 systematic plots/transect surveys and 218 rapid vegetation assessments were conducted across the proposal area during the surveys undertaken for this assessment, and random meanders searching for threatened species within areas of native woodland and grassland. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). However due to the presence of the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC and PCT70 (CW220, LA223) White Cypress Pine woodland on Sandy Loams in Central NSW Wheatbelt in the proposal area, there is a low potential for this species to occur. A total of approximately 8.06 hectares of potential habitat for this species will be permanently removed.

3.3.2 Superb parrot – *Polytelis swainsonii*

The superb parrot is listed as vulnerable under the EPBC Act and is found in NSW and northern Victoria, where it occurs on the inland slopes of the Great Divide and on adjacent plains, especially along the major river-systems; vagrants have also been recorded in southern Queensland.

In the Southwest Slopes Bioregion, the superb parrot forages in box-gum woodlands dominated by white box, yellow box and Blakely's red gum (Webster 1988). The species has also been widely recorded between Parkes and Narromine (OEH 2016d). Breeding habitat for this species includes hollows more than 60 mm in diameter that are located more than 4 metres above ground (OEH 2016b). The national recovery plan for the species (Baker-Gabb 2011) identifies Blakely's red gum (*Eucalyptus blakelyii*) as the most important tree species for breeding for the superb parrot in the south western slopes bioregion, with most breeding events confined to this tree species. Blakely's red gum was not recorded in the proposal area and therefore breeding habitat is not considered likely to occur. Potential breeding habitat for this species is not likely to be impacted by the proposal.

Six superb parrots were recorded flying over the proposal area at two locations during targeted surveys.

- Two individuals were opportunistically recorded flying over rail line while Umwelt ecologists were undertaking targeted flora surveys in October 2014. The species was recorded around kilometre point (KP) 495.5 (refer to Figure A18 in Appendix A of the BAR).

- Four individuals were opportunistically recorded flying overhead while Umwelt ecologists were undertaking vegetation surveys in May 2016 at two locations within the proposal area. The species was recorded around KP 497 and 523 (refer to Figures A18 and A26 in Appendix A of the BAR).

The species has also been widely recorded between Parkes and Narromine (OEH 2016d). All of the vegetation communities identified in the proposal area are expected to provide potential foraging habitat, however potential breeding habitat is not expected to occur. The proposal will result in the permanent loss of approximately 66.72 hectares of native woodland and grassland communities that provides potential habitat for this species.

3.3.3 Regent Honeyeater - *Anthochaera phrygia*

The regent honeyeater is listed as critically endangered under the EPBC Act and has a patchy distribution extending from south-east Queensland, into NSW and the Australian Capital Territory, to central Victoria (CoA, 2016). The species is highly mobile, capable of travelling large distances and occurs only irregularly at most sites in varying numbers. Adding further difficulty to the survey and study of this species is its ability to often go long periods without being observed anywhere (CoA 2016). Its primary habitat is box-ironbark eucalypt woodland and dry sclerophyll forest, however it does utilise riparian vegetation and lowland coastal forest. Habitat critical to the survival of the regent honeyeater includes any breeding or foraging areas where the species is likely to occur and any newly discovered breeding or foraging locations.

It is known to undertake a complex series of movements, which are thought to be governed mainly by the flowering of a select number of Eucalyptus species. It is likely the species use different areas within its range in different years depending on food resources (CoA 2016).

The proposal area does not occur within the four known breeding areas for the species where it is regularly recorded, namely Bundarra-Barraba area of NSW, the Capertee Valley in NSW, Hunter Valley in NSW and the Chiltern area of north-east Victoria.

The regent honeyeater was not recorded within the proposal area despite thorough fauna surveys (including targeted winter bird surveys in 2015) undertaken in accordance with the seasonal requirements for this species. The proposal area contains two known foraging tree species (according to the approved National Recovery Plan (CoA 2016)). The closest record of the species occurs approximately 30 km to the east of the proposal area near Dubbo (OEH 2016d). The habitat within the proposal area is substantially degraded, however the proposal will remove approximately 15.1 hectares of potential foraging habitat for the species, associated with the woodland component of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC and Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. This species is considered to have a low likelihood of occurrence within the proposal area.

3.3.4 Swift Parrot – *Lathamus discolor*

The swift parrot is listed as critically endangered under the EPBC Act. The species breeds in Tasmania and moves to mainland Australia for the non-breeding season (usually arriving between February and March) (Saunders and Tzaros 2011). Most of the population winters in Victoria and NSW where is disperses across broad landscapes foraging on nectar and lerps in eucalypts. Until recently it was believed that in NSW, swift parrots forage mostly in the coastal and western slopes region along the inland slopes of the Great Dividing Range but are patchily distributed along the north and south coasts including the Sydney region (Saunders and Tzaros 2011). However, evidence is gathering that the forests on the coastal plains from southern to northern NSW are also important. They return to Tasmania in spring (September-October). The movements of this species on the mainland are poorly understood, but it is considered to be nomadic and irruptive, moving in response to food supply.

Upon reaching their core non-breeding range there is no known geographical pattern of movement. During the non-breeding season, the home-range varies tremendously between individuals and between years.

Priority sites for this species have been identified within the National Recovery Plan for the species (Saunders and Tzaros 2011).This species is likely to utilise box-ironbark vegetation associations within the western slopes natural resource management region, in communities dominated by mugga ironbark (*Eucalyptus sideroxylon*), grey box (*Eucalyptus microcarpa*), white box (*Eucalyptus albens*) and yellow box (*Eucalyptus melliodora*) (Saunders and Tzaros 2011).

The swift parrot was not recorded within the proposal area despite thorough fauna surveys (including targeted winter bird surveys in 2015) undertaken in accordance with the seasonal requirements for this species. The proposal area contains three known foraging tree species (according to the approved National Recovery Plan (Saunders and Tzaros 2011)). The closest record of the species occurs approximately 16 km to the south east of the proposal area (OEH 2016d). The habitat within the proposal area is substantially degraded, however the proposal will remove approximately 15.1 hectares of potential foraging habitat for the species, associated with the woodland component of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC and Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. This species is considered to have a low likelihood of occurrence within the proposal area.

The swift parrot occurs as a single population, although it migrates annually from breeding grounds in Tasmania to the winter foraging grounds on the coastal plains and western slope woodlands of mainland eastern Australia (Saunders 2002).

3.3.5 Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia is listed as an EEC under the EPBC Act. The community is characterised by a canopy dominated by inland grey box (*Eucalyptus microcarpa*), while several other canopy species are also commonly associated with the EEC. These include, but are not limited to bulloak (*Allocasuarina luehmannii*), kurrajong (*Brachychiton populneus*) and white cypress pine (*Callitris glaucophylla*).

A comprehensive analysis of this vegetation community was undertaken to determine whether it conformed to the listing advice for the EEC (TSSC 2010).

Particular Area

In relation to the particular area of the *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC*, the Threatened Species Scientific Committee (TSSC) (2010) states that the community occurs on low slopes and plains from central NSW, through northern and central Victoria into South Australia.

The area in which this community occurs within the proposal area is situated within the lower slopes of central NSW.

Additional Criteria – Key Diagnostic Characteristics

The *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* occupies a transitional landscape zone between semi-arid communities, temperate woodlands and forests of the lower slopes and ranges. Key diagnostic characteristics are provided within the Listing Advice for this EEC (TSSC 2010) as many of the plant species present in the community are widespread or occur is a variety of other vegetation types that adjoin the community. The key diagnostic characteristics are provided and assessed below.

- ***The ecological community occurs on low slopes and plains from central NSW, through northern and central Victoria into South Australia. Disjunct occurrences are known from near Melbourne and in the Flinders-Lofty Block Bioregion of South Australia.***

The woodland and associated derived native grassland (DNG) within the proposal area that is considered to conform with the *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* under the EPBC Act occurs on low slopes and plains of central NSW, particularly from Parkes to Narromine, NSW.

- ***The vegetation structure of the ecological community is typically a woodland to open forest.***

The vegetation communities within the proposal area that are considered to conform to *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* are typically a woodland but also occur in the form of derived native grasslands, with the canopy and understorey shrubs absent.

- ***The tree canopy is dominated (≥50% canopy crown cover) by Eucalyptus microcarpa (Grey Box). Other tree species may be present in the canopy and, in certain circumstances, may be co-dominant with Grey Box but are never dominant on their own.***

The woodland within the proposal area that is considered to conform to *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* comprised a canopy dominated by inland grey box (*Eucalyptus microcarpa*). Other canopy species were recorded but were never dominant. These species included kurrajong (*Brachychiton populneus*) and white cypress pine (*Callitris glaucophylla*). Only grasslands surrounding or in the vicinity of grey box woodland were considered to be derived from grey box woodlands and therefore conforming to the EEC under the EPBC Act.

- ***The mid layer comprises shrubs of variable composition and cover, from absent to moderately dense. The mid layer usually has a crown cover of less than 30% with local patches up to 40% crown cover.***

Shrubs were commonly present in the mid stratum of the woodland within the proposal area being considered as conforming to *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC*, however, they generally comprised a total crown cover of less than 10 per cent.

- ***The ground layer is highly variable in development and composition, ranging from almost absent to mostly grassy to forb-rich. Ground layer flora commonly present include one or more of the graminoid genera: Austrodanthonia, Austrostipa, Elymus, Enteropogon, Dianella and Lomandra; and one or more of the chenopod genera: Atriplex, Chenopodium, Einadia, Enchylaena, Maireana, Salsola and Sclerolaena.***

The woodland within the proposal area that is considered to conform to *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* varied in quality from diverse to species poor. Both woodland and DNG forms of the community recorded comprised at least one

of the graminoid genera listed above. Specifically, *Austrodanthonia*, *Austrostipa*, *Atriplex*, *Einadia* and *Sclerolaena* were common.

Derived grasslands are a special state of the ecological community, whereby the canopy and mid layers have been mostly removed to <10 per cent crown cover but the native ground layer remains largely intact, with 50 per cent or more of the total vegetation cover being native.

Only grasslands surrounding or in the vicinity of grey box woodland were considered to be derived from grey box woodlands and therefore conforming to the EEC under the EPBC Act. These areas of the EEC within the proposal area are predominantly absent of a remnant canopy, with only scattered trees and shrubs remaining. The cover of native flora species in the ground layer is at least 50 per cent.

Additional Criteria - Condition Thresholds

The condition thresholds identified in the Listing Advice for this EEC (TSSC 2010) have multiple criteria in order for vegetation to conform with the EEC under the EPBC Act. There are general criteria as well as a number of additional criteria depending on the size of the patch, and additional criteria for DNG.

General criteria (TSSC 2010) require:

- ***the minimum patch size is 0.5 hectare;***
- ***the canopy contains inland grey box (Eucalyptus microcarpa) as a dominant or co-dominant; and***
- ***the vegetative cover of non-grass weed species is less than 30% in the ground layer at any time of year.***

Due to the nature of the proposal, many of the patches are small in size and would not, in isolation, meet the size requirements of the general criteria. However these mapped areas within the corridor are part of larger patches adjacent to the corridor and were consequently larger than 0.5 hectares. Woodland patches all comprised inland grey box (*Eucalyptus microcarpa*) as a dominant or co-dominant and the vegetative cover of non-grass weed species was less than 30 per cent throughout the mapped communities.

Additional criteria (TSSC 2010) for patches between 0.5 and 2 hectares require:

- ***at least 50% of the vegetative cover of the ground layer comprises perennial native species at any time of year; and***
- ***8 or more perennial native species are present in the mid and ground layers at any time of year.***

The biometric plots that were completed within PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – Moderate to Good and Moderate to Good – Derived Native Grassland within the proposal area had at least 50 per cent of the vegetation cover comprised by perennial native species. There were some circumstances where this was not the case, however the large size of the proposal area and restrictive nature of the corridor resulted in limitations for plot locations. For this reason and based on the data collected, it is considered that the vegetation community meets this additional criterion. All floristic plots contain at least 8 perennial native species within the mid and ground layers.

Additional criteria (TSSC 2010) for patches where the canopy is less developed or absent include:

- ***The patch is a derived grassland with clear evidence that the site formerly was a woodland with inland grey box (Eucalyptus microcarpa) as a dominant or co-dominant;***
- ***At least 50% of the vegetative cover in the ground layer comprises perennial native species at any time of year; and***
- ***The ground layer comprises at least 12 native species at any time of year.***

Only native grasslands surrounding or in the vicinity of existing grey box woodland were considered to be derived from grey box woodlands and therefore conforming to the EEC under the EPBC Act.

The biometric plots that were completed within PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – Moderate to Good – Derived Native Grassland within the Development Site predominantly had at least 50 per cent of the vegetation cover comprised by perennial native species. There were some circumstances within this community where this was not the case, however the large size of the proposal area and restrictive nature of the rail corridor resulted in limitations for plot locations. Additionally, these plots all comprised at least 12 native species.

Summary

The proposal area supports a total of 31.53 hectares of *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* under the EPBC Act within Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – Moderate to Good and Moderate to Good – Derived Native Grassland. Of this extent, the proposal will result in the permanent loss of approximately 31.53 hectares of the EEC, comprising 7.89 hectares of remnant woodlands and 23.64 hectares of derived native grassland.

3.3.6 White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as a CEEC under the EPBC Act. This community occurs along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of white box, yellow box or Blakely's red gum trees.

A comprehensive analysis of this vegetation community was undertaken to determine if it conformed to Listing Advice provided by the Department of the Environment under the EPBC Act (TSSC 2006).

Particular Area

In relation to the particular area of the *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC*, the TSSC (2006) states that the community occurs within the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions.

The area in which this community occurs within the proposal area is situated within the NSW South Western Slopes Bioregion (refer to **Appendix A** of the BAR for the extent of the community within the proposal area).

Additional Criteria

Detailed assessment of the vegetation communities described and mapped within the proposal area was undertaken to determine whether the vegetation present met the condition class thresholds identified in the Listing Advice (TSSC 2006). These thresholds have been incorporated into an identification flowchart for the CEEC within the EPBC Act Policy Statement (DEH 2006) for the community which was also utilised during the assessment.

- **Is, or was previously, at least one of the most common overstorey species white box, yellow box or Blakely's red gum?**

All vegetation in the proposal area assessed against the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC criteria was identified as having or previously having either white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*) or Blakely's red gum (*Eucalyptus blakelyi*) as one of the dominant overstorey species.

- **Does the patch have predominantly native understorey?**

A patch of White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion – Moderate to Good Condition in the southern portion of the proposal area was assessed as not having a predominantly native understorey. This patch had been heavily grazed and pasture improved and did therefore not meet the condition threshold for the CEEC. All other patches of vegetation in the proposal area assessed against the *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* criteria had a predominantly native understorey.

- **Is the patch 0.1 hectare or greater in size?**

Due to the restricted nature of the proposal area, a majority of patches strictly within the proposal area were smaller than the required 0.1 hectare size. A process was undertaken to identify which patches extended outside the bounds of the proposal area and therefore met the area patch requirements of the EPBC Act community.

- **Are there 12 or more native understorey species present (excluding grasses), of which at least one is deemed an important species.**

A patch of White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion – Moderate to Good Condition in the southern portion of the proposal area was assessed as not having 12 native understorey species present (excluding grasses) and therefore did not meet the condition threshold of the CEEC. All other patches of vegetation in the proposal area assessed against the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC criteria were identified as containing at least 12 or more native understorey species.

Summary

The proposal area is considered to support 17.3 hectares of *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* within White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (Moderate to Good – in part and Moderate to Good_DNG condition) and Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (Moderate to Good and Moderate to Good_DNG condition).

3.3.7 Summary of Technical Data and Other Information Used or Needed to Make a Detailed Assessment of the Relevant Impacts

The detailed assessment of the relevant impacts of the proposal was based on a thorough review of technical data and other relevant information, including but not limited to the following key resources, policies and documents:

- Matters of National Environmental Significance Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013)
- (DEWHA) Department of the Environment, Water, Heritage and the Arts (2010a) survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DEWHA) Department of the Environment, Water, Heritage and the Arts (2010b) survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DEWHA) Department of the Environment, Water, Heritage and the Arts (2010c) survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DSEWPC) Department of Sustainability, Environment, Water, Population and Communities (2011a) survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DSEWPC) Department of Sustainability, Environment, Water, Population and Communities (2011b) survey guidelines for Australia's threatened fish: Guidelines for detecting fish listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DSEWPC) Department of Sustainability, Environment, Water, Population and Communities (2011c) survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*
- (DoEE)– Department of the Environment and Energy (2016). *Species Profile and Threats Database (SPRAT)*
- Credit Calculator for Major Projects and BioBanking Operational Manual (OEH 2016a)
- Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects (OEH 2014a)
- Threatened species assessment guidelines The Assessment of Significance, DECCW (2007)
- BioBanking Assessment Methodology 2014 (OEH 2014b)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities –Working Draft (DEC 2004)
- BioBanking Credit Calculator (Major Project Assessment Type) (BBCC 2016), accessed in July 2016
- OEH Threatened Species Profile Database (TSPD) (OEH 2016b), assessed between April and July 2016

- Vegetation Information System (VIS) Classification Database (OEH 2016c), accessed between April and July 2016
- BioNet Atlas of NSW Wildlife database and mapping tool (OEH 2016d), accessed in April 2016
- PlantNET (Royal Botanic Gardens Sydney) database search for Rare or Threatened Australian Plant species within the Parkes and Narromine LGAs, accessed July 2016
- Department of the Environment (DoE) (now the Department of the Environment and Energy) Protected Matters Database (DoE 2016a), accessed in December 2016
- Environmental Assessment Northparkes Step Change Project (Umwelt 2013)
- NSW Guide to Surveying Threatened Plants (OEH 2016e)
- Regional and sub-regional vegetation mapping reports including:
    - Reconstructed and Extant Distribution of Native Vegetation in the Central West and Lachlan Catchment (DEC 2006)
    - Travelling Stock Reserve Conservation Values spatial layer (Rural Lands Protection Board 2010)
- results from the comprehensive ecological surveys undertaken by Umwelt;
- relevant listing/conservation advices and policy statements including:
    - Department of the Environment and Heritage (DEH) (2006) *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community Species List*, Appendix A of the *EPBC Act Policy Statement 3.5 for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community*.
    - Department of Sustainability, Environment, Water, Population and Communities (2012) *Grey Box (Eucalyptus macrocarpa) Grassy Woodlands and Derived native Grasslands of South-eastern Australia, A guide to the identification, assessment and management of a nationally threatened ecological community.* EPBC Act Policy Statement.
    - NSW Scientific Committee (NSWSC) (2002) Final Determination to list *White Box Yellow Box Blakely's Red Gum Woodland* as an endangered ecological community, 15 March 2002.
    - NSW Scientific Committee (NSWSC) (2007) Final Determination to list *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* as an endangered ecological community, 27 April 2007.
    - Threatened Species Scientific Committee (TSSC) (2006a) *White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands* Listing Advice, registered 17 May 2006.
    - Threatened Species Scientific Committee (TSSC) (2008) Approved Conservation Advice for *Tylophora linearis*. October 2008.
    - Threatened Species Scientific Committee (TSSC) (2010) *Listing Advice for Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*.

- Threatened Species Scientific Committee (TSSC) (2015*) Conservation Advice for Anthochaera phrygia Regent Honeyeater*.
- Threatened Species Scientific Committee (TSSC) (2016*) Conservation Advice for Lathamus discolor Swift Parrot*.
- Threatened Species Scientific Committee (TSSC) (2016*) Conservation Advice for Polytelis swainsonii Superb Parrot*.

- relevant national and/or NSW recovery plans including:
  - Baker-Gabb (2011) *National Recovery Plan for the Superb Parrot Polytelis swainsonii*. Department of Sustainability and Environment (DSE) Melbourne, Victoria.
  - Department of the Environment (2016) *National Recovery Plan for the Regent Honeyeater* (*Anthochaera phrygia*). Commonwealth of Australia, 2016.
  - Department of Environment, Climate Change and Water (DECCW) (2010) *National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Department of Environment, Climate Change and Water NSW, Sydney.
  - Saunders and Tzaros (2011) National Recovery Plan for the Swift Parrot *Lathamus discolor*. Birds Australia, Melbourne.

The technical data and other information considered in determining the relevant impacts of the Proposal on listed threatened and migratory species is provided in Sections 3.1 and 3.2 of the *ARTC Inland Rail – Parkes to Narromine Biodiversity Assessment Report* (Umwelt, 2017).

4.0 Avoidance, Mitigation and Offsetting

A range of avoidance, mitigation and offset strategies are proposed to minimise the impact of the proposal on threatened species and ecological communities, including relevant MNES listed under the EPBC Act.

4.1 Avoidance

4.1.1 Site Selection

ARTC commissioned a range of studies to guide the site selection for the proposal. Two major studies have been undertaken in relation to the development of an inland rail route between Melbourne and Brisbane. The first study, completed in 2006, considered potential corridors for the rail line to determine which route would deliver the best economic and financial outcome. This study identified that the 'far western corridor' through Parkes would be the best option.

The Melbourne-Brisbane Inland Rail Alignment Study (ARTC 2010) was finalised in 2010 and was prepared to determine the optimum alignment of the entire route in terms of operational, engineering and environmental factors. At each stage the options were analysed in sufficient detail to enable key decisions to be made and finally narrow the rail corridor options down to a single rail alignment. The successive stages of route analysis included:

- Inland rail route options – identification of a range of available route options. Environmental and land use assessments were undertaken along each route section.
- Identification of the route – evaluation of the route options and preliminary analysis of: Melbourne to Parkes; Parkes to Moree; and Moree to Brisbane.
- Analysis of the route – the route was analysed in terms of capital cost, environmental impacts and journey times as well as its preliminary economic and financial viability. Environmental constraints mapping was produced and survey data was obtained to assist with the alignment development.
- Development of the rail alignment – the rail alignment was developed considering environmental and engineering factors. Environmental risks were eliminated or minimised through consideration of local alternatives and moving the alignment to avoid significant constraints where possible.

For the Parkes to Narromine section of the Inland Rail, the proposed works only include upgrades to existing tracks as opposed to the construction of new track or work in greenfield sites. As a result, the overall disturbance footprint of the proposal is reduced through the use of the existing corridor. As the proposed works occur along or adjacent to the existing track, further positioning works to avoid native vegetation and habitat areas would only be possible in some cases. Conversely, these works would be primarily undertaken in the existing rail corridor that is regularly subject to disturbances related to rail activities and surrounding agricultural pursuits with relatively few important biodiversity features and habitats.

In light of this proposal utilising an existing corridor, the Melbourne-Brisbane Inland Rail Alignment Study (ARTC 2010) identified that some of the most significant environmental impacts of the proposal were those associated with vegetation removal required for construction of the railway and track upgrades. Identified impacts associated with the removal of vegetation included effects on threatened species, populations and ecological communities, the fragmentation of wildlife areas and habitats, and severance of wildlife (ARTC 2010).

Further information on proposal alternatives and options is outlined in Chapter 6 of the EIS.

4.1.2 Planning Phase

Ecological investigations were also undertaken during the constraints analysis phase to help to determine the potential impacts of the proposal. This facilitated the amendment of the design, where possible, to minimise potential impacts on threatened species, communities and their habitats.

The ecological investigations undertaken by Umwelt (2014) identified a range of key biodiversity constraints for the Parkes to Narromine section of the proposal. These investigations included database and literature reviews and rapid ecological field surveys of the rail corridor that included vegetation assessments, targeted inspections of bridge structures for micro-bats and rapid aquatic assessments. The investigations identified the presence of multiple threatened ecological communities (TECs) under the TSC and EPBC Acts occurring within and adjacent to the rail corridor. Fauna habitats, however, were found to be relatively limited due to the previous and ongoing disturbances within the rail corridor and extensive agricultural lands surrounding the proposal area.

Following these investigations, consideration was given to where works could be relocated outside of native vegetation (such as construction compounds) and to locate these areas in primarily disturbed or exotic landscapes. However, in most cases there was little scope for further avoidance of ecological impacts for the construction of the proposal itself as the location of works is constrained by the location the existing rail line and the existing rail corridor.

Further mitigation measures are described in **Section 4.2** below with the aim of further minimising impacts.

4.1.3 Avoidance Summary

ARTC undertook a detailed ecological constraints study to guide the design of the proposal which allowed for early consideration of the impacts of the proposal on significant ecological features, including MNES. ARTC was then able to implement avoidance measures, as described in **Table 4.1** that reduced the area of direct impact on EPBC Act listed threatened ecological communities and threatened species habitats.

Table 4.1 below outlines a summary of the avoidance measures that have been or will be implemented to minimise the impacts of the proposal.

Table 4.1 Avoidance Measures

Action	Outcome	Timing	Responsibility
The Melbourne-Brisbane Inland Rail Alignment Study	• Identification of a preliminary proposal route • Avoidance of native vegetation and habitat areas, where practicable	Site Selection	ARTC
Ecological constraints investigations	• Identification of areas of high conservation value • Relocation of works outside native vegetation and habitat areas, where practicable • Maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas)	Planning Phase	ARTC

Action	Outcome	Timing	Responsibility
Demarcation of areas approved for clearing, where practicable	• Minimisation of accidental clearing/disturbance of surrounding native vegetation	Construction	Construction contractor

4.2 Statutory or Policy Basis for Mitigation Measures

No specific State or Commonwealth policies are currently available to form the basis of the proposed mitigation strategy. The mitigation strategy has been developed specifically for the proposal based on previous learning and experience at ARTC and utilising best practise guidelines in ecological impact minimisation. Consideration has also been given to State and Commonwealth Recovery Plans and Threat Abatement Plans, where relevant.

4.3 Impact Mitigation and Biodiversity Management Measures

4.3.1 Construction

A CEMP would be prepared to detail the approach to environmental management during construction, as outlined below and in accordance with the conditions of approval for the proposal. The CEMP would include a number of sub-plans and management measures including for biodiversity. The key aspects of the proposed management plans are provided in **Table 4.2** and further detail regarding proposed environmental management is provided in the EIS. The measures identified in **Table 4.2** are a subset of the total measures provided in the EIS as these are measures that will mitigate impacts on the subject species and ecological communities as identified by the DoEE and assessed herein.

Table 4.2 Proposed Management Measures for Subject Species and Ecological Communities

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
1. General	The CEMP would outline the construction conditions and temporary environmental protection measures to manage the impact of construction activities. It would be consistent with the mitigation and management measures documented in this EIS, conditions of the approval, the conditions of any licences or permits issued by government authorities, and ARTC's environmental management system.	Site induction	All employees, contractors and subcontractors would receive an environmental induction which would include: • all proposal specific and standard noise and vibration mitigation measures • relevant conditions of licences/approvals/determinations etc • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • heritage requirements • construction employee areas • designated loading/unloading areas and procedures • construction traffic routes • site opening/closing times (including deliveries) • environmental incident procedures.	Informing employees and contractors of their responsibilities will encourage environmental awareness and should reduce unnecessary impacts on surrounding habitats and vegetation. This is applicable for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot
		Roles and responsibilities	The CEMP would identify all members of the Inland Rail and construction team, including roles and responsibilities relevant to implementation of the CEMP. Contact details would be provided, including contacts in the case of emergencies or incidents as well as out-of-hours contacts.	

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Reporting and communication	The CEMP would outline reporting requirements for different levels of environment incidents, as well as the required procedure for emergency and incident management, non-compliance management and corrective and preventative actions Any additional training requirements would be identified (in addition to the site induction). Reporting requirements would be included, including for the control of environmental records.	Early communication of any issues through reporting, monitoring and auditing will allow adaptive management to be undertaken to improve the environmental outcomes during construction. This is relevant for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot
		Monitoring and auditing	The CEMP would identify monitoring, auditing and inspection requirements, and determine the framework for the management of key environmental issues for construction.	

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Environmental control maps	The location of sensitive areas (e.g. heritage items and trees/vegetation to be retained) would be clearly identified on environmental control maps, which would be supplied to construction managers and workers.	Clear communication on areas approved for disturbance and the locations of sensitive environmental features should reduce unnecessary impacts on surrounding habitats and vegetation. This is applicable for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Working hours and out of hours protocol	Permissible working hours and activities would be defined. • An out-of-hours work protocol would be developed to guide the assessment, management, and approval of works for proposal construction hours.	Clear working hours and activities will assist in controlling access to work sites and may help reduce unnecessary impacts to surrounding areas of habitat and vegetation. This is relevant for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
Soil and water	The soil and water management sub-plan would detail how potential impacts on soils, erosion, sedimentation, watercourses and water quality (surface and groundwater) would be mitigated and managed during construction. The plan would provide for incident management in relation to potential water quality contamination incidents. It would include procedures to manage the impact of the proposal on flooding, and would take into account the requirements of relevant guidelines, including: • Managing Stormwater: Urban Soils and Construction Vol 1 (Landcom, 2004) • Managing Stormwater: Urban Soils and Construction Vol 2A Installation of Services (DECC, 2008) • Managing Urban Stormwater Volume 2C:	Erosion of exposed soils and sediment management	Sediment and erosion control devices would be installed to minimise mobilisation and transport of sediment in accordance with Managing Urban Stormwater, Soils and Construction (Landcom, 2004). Maintenance and checking of the erosion and sedimentation controls would be undertaken on a regular basis and any subsequent records retained. Sediment would be cleared from behind barriers/sand bags on a regular basis as required and all controls would be managed to ensure they work effectively at all times. The area of exposed surfaces would be minimised. Disturbed areas would be stabilised progressively to ensure that no areas remain unstable for any extended length of time. Soil and sediment that accumulates in erosion and sediment control structures would be reused where practicable during site reinstatement, unless it is contaminated or otherwise inappropriate for reuse. Work would cease where practicable during heavy rainfall events when there is a risk of sediment loss off site or ground disturbance due to waterlogged conditions. Equipment, plant and materials would be placed in construction compound/storage areas where they are least likely to cause erosion. Erosion control devices would be removed as part of the final site clean-up. This would include removing any sediment in drainage lines that has been trapped by erosion control devices, and restoring disturbed areas. Exposed surfaces would be stabilised, and final landscaping implemented, as soon as practicable.	Management of sediment and erosion will assist in the maintenance of habitat quality and vegetation community integrity and therefore minimise and mitigate the impacts of construction on the following MNES: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
	Unsealed roads (DECC, 2008) • OEH, 2012, Erosion and sediment control on unsealed roads (OEH, 2012) Technical Guideline: Temporary stormwater drainage for road construction (RMS, 2011) Waste Classification Guidelines (EPA, 2014).	Stockpile management	Stockpiles would be managed by implementing sediment and erosion control devices in accordance with Managing Urban Stormwater, Soils and Construction (Landcom, 2004). No stockpiles of materials or storage of fuels or chemicals would be located within high/medium flood risk areas or flow paths.	Stockpile management manages weeds and therefore mitigates potential for vegetation community integrity degradation for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis*

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Spill/incident management	Spill kits would be maintained on-site at all times. Machinery would be checked daily to ensure that no oil, fuel or other liquids are leaking. Refuelling of plant and equipment would be undertaken within designated areas with appropriate controls. Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) would be undertaken on a regular basis to identify any potential spills. Vehicle wash down and/or cement truck washout would occur in a designated bunded area or off-site.	Spill management will assist in the maintenance of habitat quality and vegetation community integrity and therefore minimise and mitigate the impacts of construction in relation of the following MNES: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Groundwater	Any groundwater encountered during construction would be managed and disposed of in accordance with the Waste Classification Guidelines (EPA, 2014). Groundwater would be managed to ensure it does not cause pollution of waters in accordance with section 120 of the POEO Act. If dewatering is required during construction, the water would be tested, and treated if necessary, prior to re-use, discharge or disposal in accordance with the testing results.	Groundwater management (where required) will assist in the maintenance of habitat quality and vegetation community integrity and therefore minimise and mitigate the impacts of construction in relation of the following MNES: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
Biodiversity management	The biodiversity management sub-plan would detail how construction impacts on aquatic and terrestrial flora and fauna would be mitigated, managed and monitored.	Vegetation management	Employee education and training including inductions for staff, contractors and visitors to the site would include the biodiversity issues present at the site and so they know their role and responsibilities in relation to the protection and/or minimisation of impacts to native biodiversity. The CEMP and construction plans would document the extent of clearing required.	Employee education and training will encourage environmental awareness and should reduce unnecessary impacts on surrounding habitats and vegetation. This is applicable for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Management of trees to be retained	The management of trees in the vicinity of the construction zone would be consistent with the AS 4970-2009 Protection of trees on development sites (incorporating Amendment No. 1 (March 2010)).	The management of trees in the vicinity of the construction zone should reduce unnecessary impacts on surrounding habitats and vegetation. This is applicable for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Pre-clearance surveys – woody native vegetation	Pre-clearance surveys would be implemented within areas of woody native vegetation that are to be cleared. Pre-clearance surveys will be undertaken by suitably qualified and experienced ecologists and involve the following: • The demarcation of areas approved for clearing to reduce risk of accidental clearing/disturbance of surrounding native vegetation where practicable. • The likely habitat resources and habitat trees would be identified and marked. Habitat trees are those containing hollows, cracks or fissures and spouts, active nests, dreys or other signs of recent fauna usage. Other habitat features to be identified include fallen timber/hollow logs and burrows. • The potential presence of threatened flora and fauna species, endangered populations and TECs would be identified. • The identification of species or habitat features that are suitable for translocation or salvage. • In areas of koala habitat, visual inspection of trees for koalas prior to clearing.	Pre-clearance surveys provide the opportunity to minimise impacts on flora and fauna species occupying the habitat to be cleared and will therefore reduce potential impacts to: • *Tylophora linearis* • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Tree-felling	Tree clearing would be completed as close to the completion of pre-clearance surveys as practicable and would include: All habitat trees would be vigorously shaken with heavy machinery the day prior to clearing. On the day of habitat tree felling, the following would be undertaken: • all habitat trees would be subject to a visual inspection for threatened species • all reasonable attempts would be made to reduce the impact of felling on all fauna species • the lowering of hollow-bearing trees would be done as gently as possible with heavy machinery • if a native fauna species is identified in a habitat tree on the day of felling, an ecologist or appropriately qualified fauna handler would advise the most appropriate method to minimise potential harm • uninjured animals would be released on the day of capture into nearby suitable secure habitat and would not be held for extended periods of time • injured animals would be taken to the nearest veterinary clinic or wildlife carer as soon as possible for assessment and treatment. Following felling, habitat trees would be inspected for remaining or injured fauna species and to ensure that no hollows are blocked against the ground. This may require the tree to be rolled to ensure adequate access. All felled habitat trees would remain in place for a least one night to allow any fauna still present to move on.	Tree-felling supervision provides the opportunity to minimise impacts on fauna species occupying the habitat to be cleared and will therefore reduce potential impacts to: • superb parrot • regent honeyeater • swift parrot

Item/sub-plan	What would the plan address?	Issue	Management measures to be included in the CEMP and implemented during construction	MNES benefited by Proposed Management Measures
		Weed management	Weeds would be managed and disposed of in accordance with the requirements of the *Noxious Weeds Act 1993* and/or the Weeds of National Significance Weed Management Guide. Weed control mitigation and management strategies would be documented and implemented as follows: • vehicles or equipment being brought onto the proposal site and/or travelling around the site must be inspected and cleaned prior to commencing work to limit the spread of seeds and plant material • regular inspections to monitor the spread of weed species • training of environmental personnel on the identification of target weed species. • Any outbreak of noxious weeds will be controlled and eradicated as required under the *Noxious Weeds Act 1993*, and as required by the Local Land Services and other relevant authorities. Weed control and eradication techniques may include: • spraying with herbicides • physical removal • minimisation of area available for weed infestation, through prompt revegetation of bare areas.	Weed management will mitigate the potential for vegetation community integrity degradation for: • *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC* • *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC* • *Tylophora linearis*

4.3.2 Operation

An Operational Environmental Management Plan (OEMP) will also be developed for the proposal. Specific to MNES, the following management measures will be included in the OEMP:

- annual inspections would be undertaken for weed infestations and to assess the need for control measures
- any outbreak of noxious and/or weeds of national environmental significance would be managed in accordance with the *Noxious Weeds Act 1993*, the Weeds of National Significance Weed Management Guide, and the requirements of relevant authorities.

These management actions will assist in the maintenance of habitat quality and vegetation community integrity. Furthermore, the communication of any issues through reporting, monitoring and auditing will allow adaptive management to be implemented to improve environmental outcomes during operation. This will result in the mitigation of impacts to the following MNES during operation of the proposal:

- *White Box-Yellow box Blakely's Red Gum Grassy Woodland and DNG CEEC*
- *Grey Box Grassy woodlands and DNG of South-eastern Australia EEC*
- *Tylophora linearis*
- superb parrot
- regent honeyeater
- swift parrot.

4.4 Predicted Effectiveness of the Mitigation Measures

As discussed in **Section 4.3**, ARTC will prepare an appropriate biodiversity management sub-plan in accordance with the EIS and conditions of approval. The measures proposed to be implemented for the proposal are well established mitigation techniques that are commonly used and are well understood. The measures have been found to be effective in mitigating impacts, however, as they rely on procedural implementation (i.e. clearing supervision undertaken etc.) there is an element of human error risk. This risk will be mitigated by development of the biodiversity management sub-plan and appropriate personnel training. The human error risk is further mitigated be the mitigation measures being well established approaches that are therefore commonly understood by construction personnel and management.

Ongoing site inspections will be used to assess and inform the implementation and effectiveness of mitigation and management actions. The effectiveness and long-term success of mitigation actions will be evaluated against key outcomes, which necessitate regular and appropriately targeted auditing, in accordance with the requirements of the CEMP. This will be achieved by undertaking due diligence assessments that periodically examine measurable changes over time and provide information on impacts and the success or otherwise of mitigation actions. This process will provide for adaptive management allowing mitigation measures to be modified as required during construction or operations so that they remain effective.

The techniques proposed to be used to monitor the effectiveness of mitigation measures will be documented in the CEMP and biodiversity and soil and water management sub plans, however it will be targeted, systematic and repeatable.

4.5 Biodiversity Offset Strategy

In accordance with the Bilateral Agreement, offsets for MNES will be provided through the offset contribution required by the NSW FBA. The FBA offsetting requirements have been documented below with specific reference to relevant MNES.

ARTC is committed to delivering a Biodiversity Offset Strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the proposal under the NSW *Biodiversity Offsets Policy for Major Projects* (OEH 2014a). Firstly, ARTC has, where possible, altered the proposal to avoid and minimise ecological impacts in the proposal planning stage, and a range of impact mitigation strategies have been included in the proposal to mitigate the impact on ecological values (refer to **Section 4.3**) prior to the consideration of offsetting requirements.

4.5.1 NSW Framework for Biodiversity Assessment Biodiversity Credit Report

The controlled Action notification identified that the proposal was to be assessed via the Bilateral Agreement and the biodiversity assessment has been conducted in accordance with the NSW Framework for Biodiversity Assessment (FBA). The FBA process requires the calculation of biodiversity credits using a NSW Government credit calculator. The credits calculated and presented in this report have been prepared based on a proposal area provided by GHD in April 2016 (refer to **Appendix A**). It is noted that since this time, a range of alterations to the proposal were made following completion of further technical assessments and engineering design of the proposal which result in some changes to the proposal site. For this reason the proposal site used in this assessment, whilst substantially similar to the final proposal site, is different to that described in the remainder of the EIS. It is expected that the final credit generation for the proposal will be confirmed as an outcome of the detailed design process and that biodiversity offsetting for the proposal will be based on the final credit calculations.

Table 4.3 below provides a summary of the ecosystem and species credits that require offsetting in accordance with the NSW FBA and Major Projects Offset Policy**.** The total area of each PCT is included in **Table 4.3** and several PCTs are consistent entirely or in-part with EPBC Act listed threatened ecological communities. Ecosystem credits requiring offsetting in accordance with the FBA include communities that conform to *Weeping Myall Woodlands* EEC, *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* and *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC.* The retirement of credits associated with the native vegetation communities occurring in the proposal area also ensures that the habitat for EPBC Act listed threatened bird species (regent honeyeater, swift parrot and superb parrot) and the potentially occurring *Tylophora linearis* are all offset as part of the proposal.

Like-for-like credit retirement is to be undertaken for MNES significantly impacted by the proposal in accordance with the biodiversity offset strategy and Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects (OEH 2014a). The final application of offset credits following the like-for-like principle will be determined during detailed design.

Table 4.3 Plant Community Types Requiring Offset and the Total Ecosystem Credits Required in accordance with the NSW FBA and the outcomes of the Biodiversity Assessment Report (Umwelt 2017)

Plant Community Type	Corresponding MNES: TEC or Threatened Species Habitat	Total Area to be Impacted (ha)	Total Ecosystem Credits Required
PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion *Moderate to Good*	0.99 hectares meets condition threshold criteria of Weeping Myall Woodlands CEEC Superb parrot	3.16	146
PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion *Moderate to Good*	Superb parrot	0.87	46
PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion *Low_Regeneration*	Superb parrot	0.62	8
PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions *Moderate to Good*	Superb parrot	0.94	49
PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions *Moderate to Good_DNG*	Superb parrot	6.12	293
PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt *Moderate to Good*	*Tylophora linearis* Superb parrot	1.54	38
PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good*	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC Swift parrot Regent honeyeater Superb parrot	8.58	473

Plant Community Type	Corresponding MNES: TEC or Threatened Species Habitat	Total Area to be Impacted (ha)	Total Ecosystem Credits Required
PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions *Moderate to Good_DNG*	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC	23.48	556
PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) *Moderate to Good*	Superb parrot	1.41	79
PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) *Moderate to Good_DNG*	Superb parrot	1.20	35
PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion *Moderate to Good*	Superb parrot	1.50	70
PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good*	White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC Swift parrot Regent honeyeater Superb parrot *Tylophora linearis*	3.12	169
PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion *Moderate to Good_DNG*	White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC	0.46	16

Plant Community Type	Corresponding MNES: TEC or Threatened Species Habitat	Total Area to be Impacted (ha)	Total Ecosystem Credits Required
PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good*	White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC Swift parrot Regent honeyeater Superb parrot *Tylophora linearis*	3.40	235
PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion *Moderate to Good_DNG*	White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC	10.32	348
TOTAL		**66.72**	**2,561**
Species Credits			
koala (*Phascolarctos cinereus*)			491
Total			**491**

5.0 Summary of Impacts on Relevant MNES

Table 5.1 provides a summary of the direct and permanent impacts associated with the proposal that are described in **Section 3.2** and the range of avoidance, mitigation and management, and biodiversity offset strategies described in **Section 4.0.** As detailed in **Section 4.5** above, like-for-like offsets for MNES impacted by the proposal will be retired in accordance with the NSW FBA.

Table 5.1 Summary of the Impacts of the Proposal on Threatened Species and Ecological Communities

Matter	Avoidance and Mitigation	Proposal Impact	Like-for-like Offset In accordance with NSW FBA
White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grassland CEEC	Avoidance of native vegetation and habitat areas through proposal design, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in **Table 4.3** to be implemented as described in the: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	The proposal will result in the permanent loss of 17.3 hectares of the CEEC, of which 6.52 hectares comprises woodland and 10.78 hectares of grassland.	Subject to the revision of credits as part of the detailed design process, 768 ecosystem credits will be retired to offset impacts to this CEEC, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC	Avoidance of native vegetation and habitat areas through proposal design, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in **Table 4.3** to be implemented as described in the proposed: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	The proposal will result in the permanent loss of 31.53hectares of the EEC, of which 7.89 hectares comprises woodland and 23.64 hectares of derived native grasslands.	Subject to the revision of credits as part of the detailed design process, 1029 ecosystem credits will be retired to offset impacts to this EEC, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.

Matter	Avoidance and Mitigation	Proposal Impact	Like-for-like Offset In accordance with NSW FBA
Tylophora linearis	Avoidance of native vegetation and habitat areas through proposal design, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in **Table 4.3** to be implemented as described in the proposed: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. *Tylophora linearis* was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal site within Goobang National Park (OEH 2016d). This species distribution is known to overlap with occurrences of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC, which occurs in the proposal site and therefore there is potential for this species to occur (albeit low) in the proposal site. A *population* of the species (as described by the significant impact guidelines) is not expected to occur within the proposal area.	Subject to the revision of credits as part of the detailed design process, 442 ecosystem credits will be retired to offset impacts to *White Box Yellow Box – Blakely's Red Gum Woodland* CEEC, which provides potential habitat for this species, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.
Superb Parrot	Avoidance of native vegetation and habitat areas through proposal design, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in Table 4.3 to be implemented as described in the proposed: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	Six superb parrots were recorded flying over the proposal site at two locations during targeted surveys. Four individuals were recorded within the proposal area 1-4 km to the south of Peak Hill in May 2016 and two individuals were recorded approximately 25 km north of Peak Hill in October 2014. The species has also been widely recorded between Parkes and Narromine (OEH 2016d). All of the vegetation communities identified in the proposal site are expected to provide potential foraging habitat, however potential breeding habitat is not expected to occur. The proposal will result in the permanent loss of approximately 66.72 hectares of native woodland and grassland communities that provide foraging habitat for the species. Blakely's red gum was not recorded in the proposal site and therefore breeding habitat is not likely to be impacted by the proposal.	Subject to the revision of credits as part of the detailed design process, 2,561 ecosystem credits will be retired to offset impacts to the habitat of this threatened species, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.

Matter	Avoidance and Mitigation	Proposal Impact	Like-for-like Offset In accordance with NSW FBA
Regent Honeyeater	Avoidance of native vegetation and habitat areas through proposal design, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in **Table 4.3** to be implemented as described in the proposed: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The proposal area contains two known foraging tree species (according to the approved National Recovery Plan (DoE 2016c)). The closest record of the species occurs approximately 30 km to the east of the Proposal area near Dubbo (OEH 2016d). The habitat within the proposal site is substantially degraded. This species is considered to have a low likelihood of occurrence within the proposal site, however approximately 15.1 hectares of potential foraging habitat for the species will be directly impacted.	Subject to the revision of credits as part of the detailed design process, 877 ecosystem credits will be retired to offset impacts to habitat for this species, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.
Swift Parrot	Avoidance of native vegetation and habitat areas, where practicable and maximising disturbances within areas of low conservation value (exotic grasslands, disturbed areas) Mitigation of impacts through controls described in Table 4.3 to be implemented as described in the proposed: • CEMP • Soils and Water Management Sub-plan • Biodiversity Management Sub-plan.	The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species undertaken throughout the proposal site. There are no known records of swift parrot within 10km of the proposal site.	Subject to the revision of credits as part of the detailed design process, 877 ecosystem credits will be retired to offset impacts to habitat for this species, in accordance with the Programme Biodiversity Offset Strategy and the NSW FBA.

6.0 Environmental Record of the Proponent

Table 6.1 provides a summary of the environmental record of the proponent.

Table 6.1 The Environmental Record of the Proponent.

Environmental Record of the Proponent	Yes	No
Does the party taking the action have a satisfactory record of responsible environmental management?	X	
Provide details Through implementation of ARTC's Code of Practice, Environmental Management System, and Environmental Management Plans for a variety of construction projects, ARTC has maintained a satisfactory record of responsible environmental management.		
Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?		X
If yes, provide details		
If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?	X	
If yes, provide details of environmental policy and planning framework ARTC Code of Practice for environmental impact assessment of development proposals in NSW ARTC Environmental Management System (EMS)		
Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?	X	
Provide name of proposal and EPBC reference number (if known) Kooragang Coal Terminal Arrival Roads Stage 2 Upgrade, Newcastle, NSW (2014/7229) Rail Upgrades at Geelong Port Project (2010/5363) Maitland to Minimbah Third Track Project, NSW (2009/4897)		

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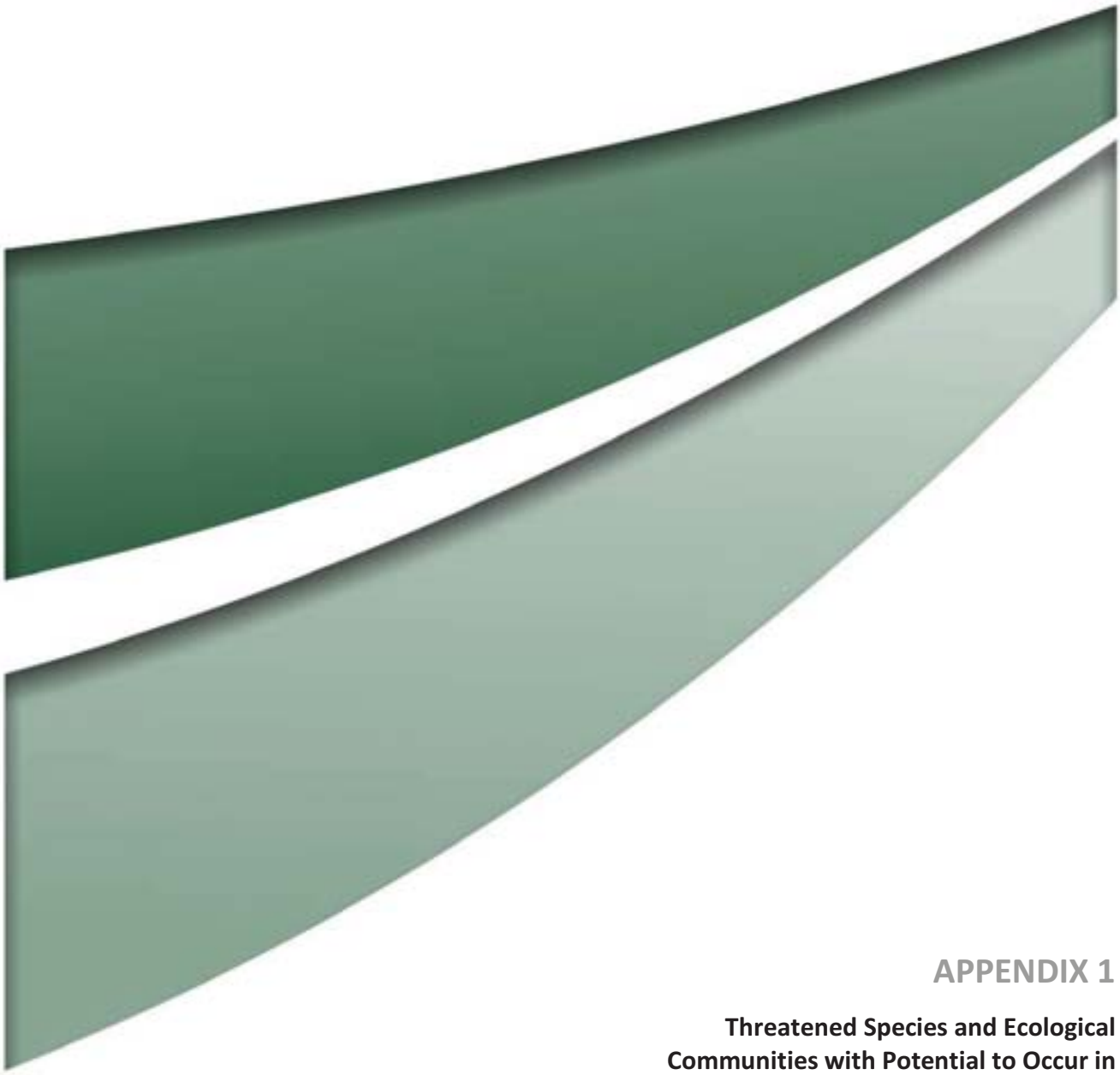


APPENDIX 1

Threatened Species and Ecological Communities with Potential to Occur in the Proposal Area

Appendix 1 – Threatened Species and Ecological Communities with Potential to Occur in the Proposal Area

Threatened species and threatened ecological communities (TECs) listed under the EPBC Act recorded or having the potential to occur within the proposal area have been identified based on the results of the searches of the OEH Atlas of NSW Wildlife Database, DoEE Protected Matters Database and the Primary Industries Fishing and Aquaculture Records Viewer.

Any threatened species or threatened ecological communities considered to have the potential to be significantly impacted are further assessed in **Appendix 2**.

The following abbreviations or symbols are used in the list:

V Vulnerable

E Endangered

CE Critically Endangered

EEC Endangered Ecological Community

CEEC Critically Endangered Ecological Community

Table 1 – Threatened Species and TECs Recorded or with Potential to Occur within the Proposal area

Species/Community Habitat Requirements and Ecological Features	Status	Likelihood to Occur	Assessment of Significance Required?
Threatened Ecological Communities			
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions Coolibah – Black Box Woodland of the Darling Riverine Plains and the Brigalow Belt South Bioregion is limited to the Darling Riverine Plains and Brigalow Belt South bioregions in northern NSW and southern Queensland (TSSC 2011). It is broadly characterised by a canopy dominated by coolibah (*Eucalyptus coolabah* subsp. *coolabah*) and black box (*Eucalyptus largiflorens*) with a grassy understorey (TSSC 2011).	EEC	This community is not likely to occur in the proposal area and will not be impacted by the proposal.	No
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* is listed as an endangered ecological community under the EPBC Act (TSSC 2010a). The community is characterised by a canopy dominated by inland grey box (*Eucalyptus microcarpa*), while several other canopy species are also commonly associated with the EEC (TSSC 2010a). These include, but are not limited to bulloak (*Allocasuarina luehmannii*), kurrajong (*Brachychiton populneus*) and white cypress pine (*Callitris glaucophylla*) (TSSC 2010a). The proposal will permanently impact 31.37 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act. Of this, 7.89 hectares comprises remnant woodland and 23.64 hectares occurs in the form of derived native grassland. An additional 0.69 hectares of plant community type (PCT) -76/BVT-CW145/LA154 - Western Grey Box Tall Grassy Woodland (Moderate/Good condition) does not meet the condition thresholds of the EEC under the EPBC Act.	EEC	31.53 hectares to be permanently impacted	**Yes** – refer to Appendix 2
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland *Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern QLD* occurs from the Darling Downs in Queensland to Dubbo in New South Wales however within this broad geographical area it is confined to where climate, soils and landform are conducive to the development of tussock grasslands. The community is typically dominated by tussock grasses in the genera *Austrostipa, Bothriochloa, Chloris, Enteropogon, Rytidosperma* or *Themeda*.	CEEC	This community is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features	Status	Likelihood to Occur	Assessment of Significance Required?
Weeping Myall Woodlands Weeping Myall Woodlands ecological community occur on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland. It occurs in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South, Brigalow Belt North, Murray-Darling Depression, Nandewar and Cobar Peneplain Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions. The ecological community currently occurs in small pockets throughout this range (TSSC 2008a). The Weeping Myall Woodlands occur in a range from open woodlands to woodlands, generally 4-12 m high, in which Weeping Myall (*Acacia pendula*) trees are the sole or dominant overstorey species. Weeping Myall trees often occur in monotypic stands, however other vegetation may also occur in the ecological community, though not as dominant species, including western rosewood (*Alectryon oleifolius* subsp. *elongatus*), poplar box (*Eucalyptus populnea*) or black box (*Eucalyptus largiflorens*) (Threatened Species Scientific Committee 2008a).	EEC	0.99 hectares to be permanently impacted	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as a critically endangered ecological community under the EPBC Act. This community occurs along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of white box, yellow box or Blakely's red gum trees. The proposal will permanently impact 6.52 hectares of box gum woodlands and 19.69 hectares of derived native grasslands that meet the condition thresholds of the EPBC Act listed White Box Yellow Box Blakely's Red Gum Woodland CEEC. Detailed assessment of the vegetation communities described and mapped within the proposal area was undertaken to determine whether the vegetation present in the proposal area met the condition class thresholds identified in the Listing Advice (TSSC 2006).	CEEC	17.3 hectares to be permanently impacted	**Yes** – refer to Appendix 2

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Threatened Flora Species				
Austrostipa metatoris	Austrostipa metatoris is a perennial grass that grows in tussocks to 1 m tall (TSSC 2008b). Within NSW, the species occurs along the Murray Valley near Balranald and the central-western slopes near Lake Cargelligo (TSSC 2008b). It occurs on sandy mallee areas on sandhills, sand ridges, undulating plains and flat open mallee country (TSSC 2008b). Austrostipa metatoris was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal survey requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and ongoing disturbance from the rail corridor. The proposal area is not considered to support suitable habitat for this species. The closest record of the species occurs approximately 100 km to the east of the proposal area at Condobolin (OEH 2016d).	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
a spear-grass *Austrostipa wakoolica*	*Austrostipa wakoolica* is a densely-tufted, perennial grass that grows to 1 m tall (TSSC, 2014). This spear grass flowers in response to rain (Jacobs and Everett 1993) between October to December (TSSC 2014). The species is considered unlikely to tolerate disturbance and may require sites that are protected from impacts of herbivore grazing and rabbits (TSSC 2014). *Austrostipa wakoolica* was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal survey requirements for this species, including after rain events. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor, making the habitat unsuitable for *Austrostipa wakoolica*. The closest record of the species occurs approximately 5 km to the east of the proposal area between Parkes and Bogan Gate (OEH 2016d).	E	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Philotheca ericifolia	*Philotheca ericifolia* is a wide spreading shrub to 2 m tall that in NSW is known only from the upper Hunter Valley and Pilliga to the Peak Hill districts (TSSC 2008c). It occupies dry sclerophyll forest and heath on damp sandy flats and gullies (TSSC 2008c). Philotheca ericifolia was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal survey requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest, most recent record of the species occurs within 1 km from the western edge of the proposal area at Peak Hill but was recorded in 1905 (OEH 2016d)	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
slender darling pea *Swainsona murrayana*	Slender darling pea is an ascending to erect perennial forb to 25 cm tall (TSSC 2008d). In NSW the species occurs in the central western slopes, Western Division and the Riverina Area in grassland, herbland and Black-box woodland (TSSC 2008d). The species occupies heavy grey or brown clays, loams or red cracking clays (TSSC 2008d). Slender darling pea was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal survey requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest most recent record of the species occurs approximately 30 km to the north of the proposal area (OEH 2016d). Extensive survey work in the locality has been undertaken and no populations have been found in the proposal area.	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Tylophora linearis	*Tylophora linear*is is an herbaceous climber with clear latex growing to approximately 2 m in length (TSSC 2008e). In NSW the species is rarely collected, known from less than 10 localities in the Dubbo area and Mt Crow near Barrabra, growing in dry scrub, open forest and woodlands. It is also known to overlap in distribution with White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland critically endangered ecological community under the EPBC Act (TSSC 2008e). *Tylophora linearis* was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). However due to the presence of the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC in the proposal area, there is a potential for this species to occur (albeit low) and thus be significantly impacted.	E	Low likelihood of occurrence, it was not recorded in the proposal area, lack of records within 10 km of the proposal area, however 8.06 ha of the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC and PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt will be permanently removed which comprises potential habitat.	**Yes** – refer to Appendix 2

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Threatened Aquatic Species				
trout cod *Maccullochella macquariensis*	The natural distribution and abundance of trout cod (*Maccullochella macquariensis*) has declined since European settlement. They are often found in faster flowing water with rocky and gravel bottoms as well as slower flowing, turbid lowland rivers where there is lots of large woody debris. The habitats occurring within the proposal area are outside the known range of the species and review of the DPI Threatened and protected species – records viewer did not identify any historic records of the species. No further assessment required. There are no known threatened fish records for the watercourses crossed by the existing rail corridor between Parkes and Narromine.	E	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
Murray cod *Maccullochella peelii*	Murray cod (*Maccullochella peelii*) has been recorded in the Macquarie River at Narromine in 2001, 2007, 2008 and 2009, upstream of Narromine in 2006 and downstream in 2000 and 2001. However the Macquarie River does not occur within the proposal area. Further, review of the EPBC Act referral guidelines for the vulnerable Murray cod (*Maccullochella peelii*) (Commonwealth of Australia 2016) determined that the proposal area does not provide habitat for an important population of the Murray cod. No records of threatened fish species known within the Parkes LGA (DPI 2016).	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Macquarie perch *Macquaria australasica*	Macquarie perch (*Macquaria australasica*) are found in both river and lake habitats, especially in the upper reaches. The western form is known historically from the southern Murray Darling basin with a viable population in the upper Lachlan River (upstream of Wyangala) and the Abercrombie River (DPI 2016b). The habitats occurring within the proposal area are outside the known range of the species and review of the DPI Threatened and protected species – records viewer did not identify any historic records of the species within the Parkes LGA (DPI 2016). There are no threatened fish records for the watercourses crossed by the existing rail corridor between Parkes and Narromine.	E	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
Threatened Reptiles				
pink-tailed worm-lizard *Aprasia parapulchella*	The pink-tailed worm-lizard is a small, legless and slender lizard growing to 25 cm in length that lives underground (TSSC 2015a). In NSW the species only occurs from Central and Southern Tablelands and the South Western Slopes (TSSC 2015a). The species occupies both primary and secondary grasslands, grassy woodlands and woodlands, usually inhabiting sloping sites that contain rocky outcrops or scattered, partially buried rocks (TSSC 2015a). The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The pink-tailed worm-lizard was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There are no known records of this species within 10 kilometres of the proposal area (OEH 2016d).	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Striped legless lizard *Delma impar*	The striped legless lizard has a long and think body, growing to about 30 cm long, when the tail is unbroken it is about twice the length of the body (Smith and Robertson 1999). The species is restricted to temperate grassland habitats in NSW, however has been recorded in secondary grasslands, box-gum woodlands and grasslands with a high proportion of introduced species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The striped legless lizard was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There are no known records of this species within 10 kilometres of the proposal area (OEH 2016d).	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
Threatened Birds				
regent honeyeater *Anthochaera phrygia*	The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The proposal area contains two known foraging tree species (according to the approved National Recovery Plan (DoE 2016)). The closest record of the species occurs approximately 30 km to the east of the Proposal area near Dubbo (OEH 2016d). The habitat within the proposal area is substantially degraded, however the proposal will remove approximately 15 hectares of potential foraging habitat for the species. The closest record of the species in the local area is approximately 30 km from the proposal area. This species is considered to have a low likelihood of occurrence within the proposal area but has the potential to be significantly impacted due to the removal of 15 hectares of potential foraging habitat for the species.	CE	Low likelihood of occurrence, it was not recorded in the proposal area, lack of records within 10 km of the proposal area, but there is 15.1 ha of the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC which comprises potential habitat	**Yes** – refer to Appendix 2

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Australasian bittern *Botaurus poiciloptilus*	Australasian bittern was not recorded within the proposal area despite thorough fauna surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 30 km to the north of the proposal area along the Macquarie River north of Narromine (OEH 2016d). The proposal area does not contain any permanent freshwater wetlands with tall, dense fringing vegetation, which is required habitat for the species. This species is not likely to occur in the proposal area and will not be impacted by the proposal.	E	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
curlew sandpiper *Calidris ferruginea*	The curlew sandpiper is a small and slim sandpiper that in NSW are widespread east of the Great Divide especially in coastal regions, Riverina and south-west NSW, but occasionally recorded in the Tablelands (TSSC 2015b). The species does not breed in Australia, its general habitat is on intertidal mudflats in sheltered coastal areas, while inland it occupies ephemeral and permanent lakes, dams, waterholes and bore drains that have bare edges of mud or sand (TSSC 2015b). Feeding habitat includes mudflats and nearby shallow water. The curlew sandpiper was not recorded within the proposal area despite extensive fauna survey undertaken throughout the proposal area across multiple seasons. There are two records of curlew sandpiper within 10km of the proposal area, both of which occur approximately 2km east of the proposal area in Parkes. The proposal area is not considered to contain suitable wetlands that supports mudflat habitat. The species is not likely to occur in the proposal area and will not be impacted by the proposal.	CE	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
painted honeyeater *Grantiella picta*	Targeted surveys of the proposal area did not identify any painted honeyeaters. The species has been recorded once in the local area with one record in the Atlas of NSW wildlife within 10km of the proposal area from 1990, approximately 1.6km east of Peak Hill. The painted honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. The conservation advice for the painted honeyeater (TSSC 2015c) describes the species habitat as mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. Within the proposal area potential woodland habitat is restricted to small linear patches and scattered trees, mostly fragmented by agricultural lands but sometimes with adjoining woodland areas. Due to the highly dispersive nature of the species, the species is considered to have a single population. The proposal area does not support a key population for breeding and dispersal, does not provide habitat for a portion of the population that is necessary for maintaining genetic diversity and the species is not at the limit of its range in the proposal area. Therefore, the proposal area does not contain an important population of the painted honeyeater.	V	An important population of the species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
swift parrot *Lathamus discolor*	The swift parrot is a slim, medium sized parrot approximately 25 cm in length (TSSC 2016a). In NSW the species disperses widely to forage in forests and woodlands throughout the coastal and western slopes on flowers and *psyllid* lerps in Eucalyptus species (TSSC 2016a). It is considered that the proposal will permanently remove 15 ha of potential foraging habitat for the species. Breeding occurs in Tasmania, there is no breeding habitat in the proposal area. The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. There are no known records of swift parrot within 10km of the proposal area. This species is considered to have a low likelihood of occurrence within the proposal area but has the potential to be significantly impacted due to the removal of 15 hectares of potential foraging habitat for the species.	CE	Low likelihood of occurrence, it was not recorded in the proposal area, lack of records within 10 km of the proposal area, but there is 15.1 ha of the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC which comprises potential habitat	**Yes** – refer to Appendix 2
malleefowl *Leipoa ocellata*	The malleefowl is a mound building species of bird that is restricted to the mainland, inhabiting semi-arid and arid habitats (Benshemesh, 2007). The species occupies shrublands and low woodlands dominated by mallee and associated semi-arid and arid habitats. The proposal area is not considered to support suitable habitat critical for this species. The malleefowl was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There is one record of malleefowl within 10km of the proposal area, approximately 5km east of the proposal area in Peak Hill. This species is not likely to occur in the proposal area and will not be impacted by the proposal.	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

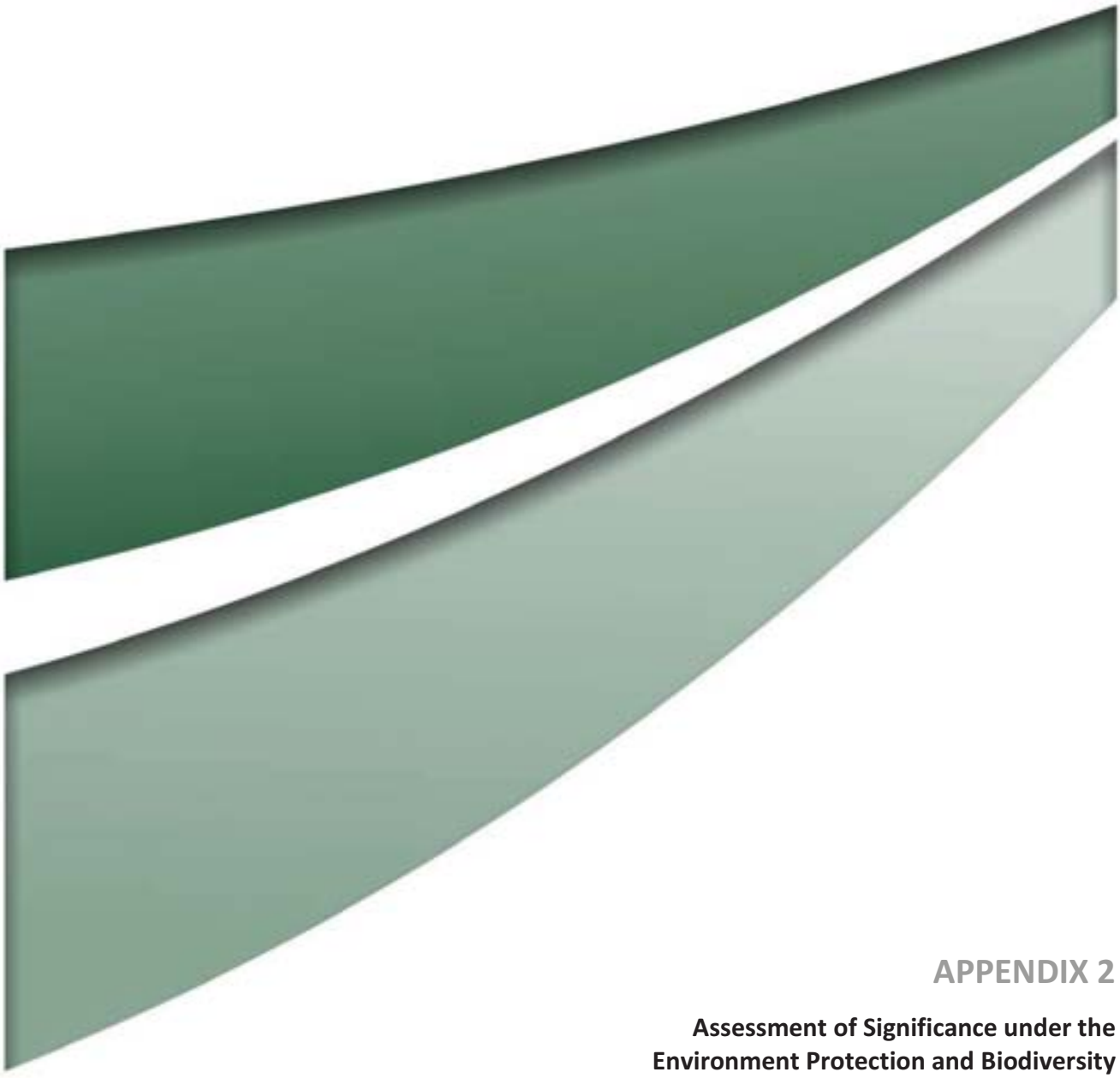
Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
eastern curlew *Numenius madagascariensis*	The eastern curlew is the largest migratory shorebird in the world, with long neck, long legs and very long downcurved bill (TSSC 2015d). The species does not breed in Australia, therefore no breeding habitat occurs in the proposal area. In general, the eastern curlew is largely associated with sheltered coasts, but also occurs on beaches, saltmarshes and mudflats fringed by mangroves (TSSC 2015d). The eastern curlew was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There are no known records of eastern curlew within 10km of the proposal area. The proposal area is not considered to contain suitable habitat to support this species. The species is not likely to occur in the proposal area and will not be impacted by the proposal.	CE	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
superb parrot *Polytelis swainsonii*	The superb parrot occurs through the inland slopes and plains of NSW (including the Australian Capital Territory) to northern Victoria. The breeding range of the superb parrot is mostly in the NSW South Western Slopes and Riverina bioregions. The three main breeding areas are: (1) bounded by Molong, Rye Park, Yass, Coolac, Cootamundra and Young (NSW);(2) along the Murrumbidgee River, between Wagga Wagga and Toganmain Station (near Bringagee), and farther north at Goolgowi (NSW); and (3) along the Murray and Edward Rivers, from east of Barmah and Millewa State Forest to south of Taylors Bridge (Baker-Gibb 2011). The proposal area is considered unlikely to provide breeding habitat for the species. Breeding habitat for this species includes hollows more than 60 mm in diameter located more than 4 metres above ground (OEH 2016b). The national recovery plan for the species (Baker-Gabb 2011) identifies Blakely's red gum (*Eucalyptus blakelyi*) as the most important tree species for breeding for this species in the south western slopes bioregion, with most breeding events confined to this tree species. Blakely's red gum was not recorded in the proposal area and therefore breeding habitat is not considered likely to occur. Potential breeding habitat for this species is not likely to be impacted by the proposal. Superb parrot was recorded on three occasions within the proposal area during surveys. Four individuals were recorded within the proposal area 1-4 km to the south of Peak Hill in May 2016 and two individuals were recorded approximately 25 km north of Peak Hill in October 2014. The species has also been widely recorded between Parkes and Narromine (OEH 2016d). All vegetation communities identified in the proposal area are expected to provide potential foraging habitat. The proposal will result in the permanent loss of approximately 75.77 hectares of native woodland and grassland communities.	V	Foraging habitat of the species recorded within the proposal area and 66.72 hectares will be removed as a result of the project.	**Yes** – refer to Appendix 2

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
Australian painted snipe *Rostratula australis*	The Australian painted snipe is a stocky wading bird between 24 and 30 cm in length (TSSC 2013). This species occupies shallow freshwater and occasionally brackish wetlands that are both ephemeral and permanent with a good cover of grass, rush, reeds, low scrub and open timber (TSSC 2013). The Australian painted snipe was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There are no known records of Australian painted snipe within 10km of the proposal area. The proposal area is not considered to contain suitable habitat to support this species. The species is not likely to occur in the proposal area and will not be impacted by the proposal.	E	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
Threatened Mammals				
south-eastern long-eared bat *Nyctophilus corbeni*	The south-eastern long-eared bat is found in southern central Queensland, central western NSW, north-western Victoria and eastern South Australia, where it is patchily distributed, with most of its range in the Murray Darling Basin (TSSC 2015e). The south-eastern long-eared bat is found in a wide range of inland woodland vegetation types. These include box / ironbark / cypress pine woodlands, Buloke woodlands, Brigalow woodland, Belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee (TSSC 2015e). The species mainly roosts in tree hollows (TSSC 2015e). The south-eastern long-eared bat was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There is one record of this species on the OEH Atlas of NSW Wildlife within 10 kilometres of the proposal area (recorded in 1997), approximately 10km north east of Peak Hill. Based on the scarcity of local records and small area of habitat within the proposal area, it is considered unlikely that an important population of the south-eastern long-eared bat occurs within the proposal area.	V	An important population of the species is not likely to occur in the proposal area and will not be impacted by the proposal.	**No**

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
koala *Phascolarctos cinereus*	Koala was not recorded within the proposal area despite thorough fauna surveys undertaken in accordance with the seasonal requirements for this species. The proposal area contains six known food tree species for this species (according to Appendix 2 of the Approved Recovery Plan (DECC 2008)) for the Western Slopes and Plains Koala Management Area. Four records of the species occur within 10 km of the proposal area (OEH 2016d). One koala was recorded approximately 500 metres from the Proposal area as road kill on the Newell Highway. Another was recorded in remnant vegetation approximately 7 km south of the proposal area, while a third was recorded approximately 3.5 km to the east of the proposal area. Another record occurs approximately 8.5 km to the north-east of the proposal area between Narromine and Narromine East. These were all located in remnant vegetation. The Referral Guidelines advise that the assessment of significant impacts on the koala is to be undertaken primarily through the assessment of habitat critical to the survival of the koala and actions that interfere substantially with the recovery of the koala. This approach aims to avoid and address habitat loss as well as promote a streamlined assessment and approval process. Umwelt undertook an assessment of Koala Habitat Quality within the proposal area that resulted in a total score of 2, which is less than the score indicating habitat critical for the survival of the koala of ≥5. The proposal area is considered to contain potential habitat for the species in accordance with the TSPD, but the species is not considered likely to occur in the proposal area and will not be impacted by the proposal.	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No

Species/Community Habitat Requirements and Ecological Features		Status	Likelihood to Occur	Assessment of Significance Required?
New Holland mouse *Pseudomys novaehollandiae*	New Holland mouse is a small, burrowing native rodent that occurs in fragmented distributions across Tasmania, Victoria, New South Wales and Queensland (TSSC 2010). Throughout its range it is known to inhabit open heathlands, open woodlands with heathy understorey and vegetated sand dunes (TSSC 2010). The New Holland mouse was not recorded despite thorough fauna surveys undertaken throughout the proposal area. There are no known records of New Holland mouse within 10km of the proposal area. The proposal area is not considered to contain suitable habitat to support this species. The species is not likely to occur in the proposal area and will not be impacted by the proposal.	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No
grey-headed flying-fox *Pteropus poliocephalus*	Grey-headed flying-fox was not recorded within the proposal area despite thorough fauna surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 25 km to the east of the proposal area near Dubbo (OEH 2016d) and no camps have been recorded in the locality (DoE 2016b). This species is not likely to occur in the proposal area and will not be impacted by the proposal.	V	This species is not likely to occur in the proposal area and will not be impacted by the proposal.	No



APPENDIX 2

Assessment of Significance under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Appendix 2 – Assessment of Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the completion of an Assessment of Significance relating to the potential impacts of a proposed action on listed Matters of National Environmental Significance (MNES). A search of the Department of the Environment and Energy (DoEE) Protected Matters Database (undertaken on 5 December 2016) identified threatened species and ecological communities known to occur or considered likely to occur, on the basis of habitat modelling, within 10 kilometres of the proposal area.

Following vegetation community and fauna habitat assessment and targeted threatened species surveys, an assessment of the likelihood of occurrence of each ecological community and threatened species identified in the Protected Matters Database search was completed (see **Appendix 1**).

An Assessment of Significance (according to the EPBC Act significant impact guidelines 1.1 (DotE 2013) is provided below for those ecological communities and threatened species considered to be impacted by the proposal by the DoEE. As outlined in **Appendix 1**, no migratory species are considered to be potentially significantly impacted by the proposal, and further assessment of migratory species is not provided.

Table 1 presents the threatened ecological communities and **Table 2** presents the threatened species considered in the following assessment.

Table 1 Threatened Ecological Communities Considered in the Following Assessments of Significance

Threatened Ecological Communities
Critically Endangered Ecological Communities
White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act
Endangered Ecological Communities
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act

Table 2 Threatened Species Considered in the Following Assessments of Significance

Common Name	Scientific Name
Critically Endangered	
regent honeyeater	*Anthochaera phrygia*
swift parrot	*Lathamus discolor*
Endangered	
	Tylophora linearis
Vulnerable Species	
superb parrot	*Polytelis swainsonii*

Description of Impacts

The key features of the proposal involve:

- upgrading the track, track formation, and culverts within the existing rail corridor for a distance of 106 kilometres between Parkes and Narromine
- realigning the track where required within the existing rail corridor to minimise the radius of tight curves
- providing three crossing loops mainly within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- providing a 5.3 kilometre long rail connection to the Broken Hill Line to the west of Parkes ('the Parkes north west connection'), including a road bridge over the existing rail corridor at Brolgan Road ('the Brolgan Road overbridge').

The following works would also be undertaken:

- Changes to some property access roads and the local road network in some locations as a result of the rationalisation of level crossings.
- Flood protection works.
- Stormwater drainage works.
- Upgrading signalling and communications.
- Establishing or upgrading existing fencing of the rail corridor.
- Relocation of some services and utilities.

White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as a critically endangered ecological community under the EPBC Act. This community occurs along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*) or Blakely's red gum (*Eucalyptus blakelyi*) trees.

The proposal area supports a total of 24.93 hectares of box gum woodlands and derived native grasslands that meet the condition thresholds of the EPBC Act listed White Box Yellow Box Blakely's Red Gum Woodland CEEC. Detailed assessment of the vegetation communities described and mapped within the proposal area was undertaken to determine whether the vegetation present in the proposal area met the condition class thresholds identified in the Listing Advice (TSSC 2006). These thresholds have been incorporated into an identification flowchart for the CEEC within the EPBC Act Policy Statement (TSSC 2006) for the community which was also utilised during the assessment. Vegetation communities that conform to the EPBC Act listed White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC is included in **Table 3** below.

Of the total 24.93 hectares of the CEEC identified in the proposal area, a total of 17.3 hectares will be permanently disturbed.

Table 3 White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act mapped within the proposal area

Vegetation Community	Permanent Disturbance Area (ha)	Temporary Disturbance Area (ha)
White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion_Moderate/Good	3.12 (all meets the criteria of the EPBC Act CEEC)	0.12 (all meets the criteria of the EPBC Act CEEC)
White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion_Moderate/Good - Derived Native Grassland	0.46 (all meets the criteria of the EPBC Act CEEC	0.11 (all meets the criteria of the EPBC Act CEEC)
Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion _Moderate/Good	3.40 (all meets the criteria of the EPBC Act CEEC)	3.76 (all meets the criteria of the EPBC Act CEEC)
Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion _Moderate/Good - Derived Native Grassland	10.32 (all meets the criteria of the EPBC Act CEEC)	3.64 (all meets the criteria of the EPBC Act CEEC)
TOTAL	**17.3**	**7.63**

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- **Reduce the extent of an ecological community**

The proposal would result in the permanent reduction in extent of approximately 17.3 hectares of the White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grasslands CEEC, of which comprises 6.52 hectares of the remnant woodland form and 10.78 hectares of Derived Native Grassland.

The estimated total current national extent of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grassland is estimated to be approximately 416 000 hectares (TSSC 2006). The permanent loss of approximately 17.3 hectares of the CEEC as a result of the proposal represents a negligible reduction in the estimated current extent of the community across its national range.

- **Fragment or increase fragmentation of an ecological community**

A total of 17.3 hectares of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grassland occurs within the proposal area, adjacent to the existing rail corridor. This community is already highly fragmented within the local region with adjacent land typically comprising heavily disturbed agricultural land.

The proposal is not likely to further fragment or increase the degree of fragmentation of the ecological community within the proposal area or local area.

- **Adversely affect habitat critical to the survival of an ecological community**

Due to a long history of agricultural practices within the local area, the habitat of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grassland exists in a relatively disturbed and fragmented state.

- **Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alternation of surface water drainage patterns**

The proposal would result in the permanent reduction in extent of 17.3 hectares of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grasslands, of which 6.52 hectares is remnant woodland and 10.78 hectares is Derived Native Grasslands.

The proposal would result in the modification of abiotic factors necessary for this ecological community's survival within the permanent impact area in the proposal area, but not in the temporary impact area. However, the proposal would be unlikely to adversely modify or destroy abiotic factors necessary for the survival of the ecological community in the local area.

- **Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting**

The proposal would result in the permanent reduction in extent of 17.3 hectares of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grasslands, of which 6.52 hectares is remnant woodland and 10.78 hectares is Derived Native Grasslands. However, the proposal is unlikely to impact upon the species composition (including causing a decline or loss of functionally important species) of this ecological community in the local area.

- **Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**

    - **Assisting invasive species, that are harmful to the listed ecological community, to become established, or**

    - **Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community,**

The proposal would result in the permanent reduction in extent of 17.3 hectares of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grasslands, of which 6.52 hectares is remnant woodland and 10.78 hectares is Derived Native Grasslands.

The proposal is not expected to result in the introduction of invasive species or cause the regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in the community.

- **Interfere with the recovery of an ecological community.**

The proposal would result in the permanent reduction in extent of 17.3 hectares of White Box Yellow Box – Blakely's Red Gum Woodland and Derived Native Grasslands, of which 6.52 hectares is remnant woodland and 10.78 hectares is Derived Native Grasslands. This removal of area is not likely to interfere with the recovery of this ecological community due to the small incremental decrease in the size of the patches occurring within the proposal area and the very high degree of fragmentation currently affecting the community within the proposal area.

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act

Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia is listed as an endangered ecological community under the EPBC Act. The community is characterised by a canopy dominated by inland grey box (*Eucalyptus microcarpa*), while several other canopy species are also commonly associated with the EEC. These include, but are not limited to bulloak (*Allocasuarina luehmannii*), kurrajong (*Brachychiton populneus*) and white cypress pine (*Callitris glaucophylla*).

The proposal area supports a total 41.67 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act. Of this 41.67 hectares, a total of 31.53 hectares will be permanently disturbed.

The breakdown of the community into woodland and derived native grassland; and permanent and temporary disturbance is provided in **Table 4**.

Table 4 Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act mapped within the proposal area

Vegetation Community	Permanent Disturbance Area (ha)	Temporary Disturbance Area (ha)
Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions _Moderate/Good	8.58 (7.89 meets the criteria of the EPBC Act EEC)	1.55 (all meets the criteria of the EPBC Act EEC)
Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions _Moderate/Good - Derived Native Grassland	23.64 (all meets the criteria of the EPBC Act EEC)	8.59 (all meets the criteria of the EPBC Act EEC)
TOTAL	**31.53**	**10.14**

An additional 0.69 hectares of plant community type Western Grey Box Tall Grassy Woodland (Moderate/Good condition) does not meet the condition thresholds of the EEC under the EPBC Act.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- **Reduce the extent of an ecological community**

The proposal would result in the permanent reduction in extent of approximately 31.53 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, comprising 7.89 hectares of remnant woodlands and 23.64 hectares of derived native grasslands.

The estimated total current national extent of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC is estimated to be approximately 332 000 hectares (TSSC 2010). The permanent loss of approximately 31.53 hectares of the EEC as a result of the proposal represents a negligible reduction in the estimated current extent of the community across its range.

- **Fragment or increase fragmentation of an ecological community**

A total of 41.67 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC occurs within the proposal area, adjacent to the existing rail corridor. This community is already highly fragmented within the local region with adjacent land typically comprising heavily disturbed agricultural land.

The proposal is not likely to further fragment or increase the degree of fragmentation of the ecological community within the proposal area or local area.

- **Adversely affect habitat critical to the survival of an ecological community**

Due to a long history of agricultural practices within the local area, the habitat of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC exists in a relatively disturbed and fragmented state therefore is not considered to be habitat critical to the survival of the community.

- **Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alternation of surface water drainage patterns**

The proposal would result in the permanent reduction in extent of approximately 31.53 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, of which 7.89 hectares is remnant woodland and 23.64 hectares is derived native grasslands.

The proposal would result in the modification of abiotic factors necessary for this ecological community's survival within the permanent reduction extent of the proposal area, but not the temporary reduction area. However, the proposal would be unlikely to adversely modify or destroy abiotic factors necessary for the survival of the ecological community in the local area.

- **Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting**

The proposal would result in the permanent reduction in extent of approximately 31.53 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, of which 7.89 hectares is remnant woodland and 23.64 hectares is derived native grasslands. However, the proposal is unlikely to impact upon the species composition (including causing a decline or loss of functionally important species) of this ecological community in the local area.

- **Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
    - **Assisting invasive species, that are harmful to the listed ecological community, to become established, or**
    - **Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community,**

The proposal would result in the permanent reduction in extent of approximately 31.53hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, of which 7.89 hectares is remnant woodland and 23.64 hectares is derived native grasslands.

The proposal is not expected to result in the introduction of invasive species or cause the regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in the community.

- **Interfere with the recovery of an ecological community.**

The proposal would result in the permanent reduction in extent of approximately 31.53 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, of which 7.89 hectares is remnant woodland and 23.64 hectares is derived native grasslands. This removal of area is unlikely to interfere with the recovery of this ecological community as it involves the removal from an already highly fragmented state of the ecological community within the proposal area or local area.

CRITICALLY ENDANGERED SPECIES

Regent Honeyeater (*Anthochaera phrygia*)

The regent honeyeater has a patchy distribution extending from south-east Queensland, into New South Wales and the Australian Capital Territory, to central Victoria (CoA, 2016). The species is highly mobile, capable of travelling large distances and occurs only irregularly at most sites in varying numbers. Adding further difficulty to the survey and study of this species is its ability to often go long periods without being observed anywhere (CoA 2016). Its primary habitat is box-ironbark eucalypt woodland and dry sclerophyll forest, however it does utilise riparian vegetation and lowland coastal forest. Habitat critical to the survival of the regent honeyeater includes any breeding or foraging areas where the species is likely to occur and any newly discovered breeding or foraging locations.

It is known to undertake a complex series of movements, which are thought to be governed mainly by the flowering of a select number of Eucalyptus species. It is likely the species use different areas within its range in different years depending on food resources (CoA 2016).

The proposal area does not occur within the four known breeding areas for the species where it is regularly recorded, namely Bundarra-Barraba area of NSW, the Capertee Valley in NSW, Hunter Valley in NSW and the Chiltern area of north-east Victoria.

The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The proposal area contains two known foraging tree species (according to the approved National Recovery Plan (CoA 2016)). The closest record of the species occurs approximately 30 km to the east of the Proposal area near Dubbo (OEH 2016d). The habitat within the proposal area is substantially degraded, however the proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. This species is considered to have a low likelihood of occurrence within the proposal area.

In this case, a population of a species is an occurrence of 1 species in a particular area that include but are not limited to:

- **a geographically distinct regional population, or collection of local populations; or**
- **a population, or collection of local populations, that occurs within a particular bioregion.**

Although there appears to be minor behavioural differences between regent honeyeaters in the three main areas inhabited by the species (the Bundarra-Barraba area in NSW, the Capertee Valley in NSW, and north-eastern Victoria), the direction and extent of movements, including evidence of movement between breeding sites, and a lack of discernible genetic differences between the sites suggest that the regent honeyeater occurs as a single, contiguous population (Garnett and Crowley 2000).

The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 30 km to the east of the proposal area near Dubbo (OEH 2016d). Therefore, the proposal area does not contain a portion of the population of the regent honeyeater.

In this case, habitat critical to the survival of a species refers to areas that are necessary:

- **for activities such as foraging, breeding, roosting, or dispersal;**
- **for the long-term maintenance of the species, including the maintenance of species essential to the survival of the species such as pollinators;**
- **to maintain genetic diversity and long term evolutionary development; or**
- **for the reintroduction of populations or recovery of the species.**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. However the closest record of regent honeyeater in the local area is approximately 30 km from the proposal area and it was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. Despite the presence of approximately 15.1 hectares of potential foraging habitat for the species within the proposal area, it is not considered to be habitat critical to the survival of the species.

An action has, will have, or is likely to have a significant impact on a critically endangered species if it does, will, or is likely to:

- **lead to a long-term decrease in the size of a population, or;**

The proposal area does not provide critical habitat for, or a population of the regent honeyeater. Therefore the proposal is considered unlikely to lead to a long-term decrease to a *population* of the regent honeyeater.

- **reduce the area of occupancy of the species, or;**

The proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the regent honeyeater. However the proposal area does not provide critical habitat for, or a population of the species. The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 30 km to the east of the proposal area near Dubbo (OEH 2016d).

Therefore the proposal is considered unlikely to reduce the area of occupancy of a *population* of the regent honeyeater.

- **fragment an existing population into two or more populations, or;**

The proposal will permanently remove approximately 15.1 hectares of known foraging habitat for the regent honeyeater from an area that is already considered to be a highly fragmented landscape. However the proposal area does not provide critical habitat for, or a population of the species. The regent honeyeater was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 30 km to the east of the proposal area near Dubbo (OEH 2016d). Therefore the proposal is not considered to support a *population* of the regent honeyeater, and thus will not fragment an existing population of the species into two or more populations.

- **adversely affect habitat critical to the survival of a species, or;**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately15.1 hectares of potential foraging habitat for the species. However the closest record of regent honeyeater in the local area is approximately 30 km from the proposal area and it was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. Despite the presence of approximately 15.1 hectares of potential foraging habitat for the species within the proposal area, it is not considered to be habitat critical to the survival of the species.

- **disrupt the breeding cycle of an population, or;**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. However the closest record of regent honeyeater in the local area is approximately 30 km from the proposal area and it was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. The proposal area does not occur within one of the four key breeding locations known to be important to the species. Therefore the proposal is considered unlikely to disrupt the breeding cycle of a *population* of the regent honeyeater.

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or;**

The proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. However the habitat within the proposal area is already substantially degraded and therefore the proposal is unlikely to modify, destroy, remove, isolate, or decrease the availability or quality of habitat for the regent honeyeater to the extent that the species would likely decline.

- **result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat, or;**

The proposal is unlikely to result in an invasive species that is harmful to the regent honeyeater becoming established in its habitat.

- **introduce disease that may cause the species to decline, or;**

Psittacine beak and feather disease (BFD) is a common and potentially deadly disease of parrots caused by a circovirus named beak and feather disease virus. The disease appears to have originated in Australia and is widespread and continuously present in wild populations of Australian parrots. BFD affecting endangered psittacine species (parrots and related species) was listed in April 2001 as a key threatening process under the EPBC Act.

It is considered unlikely that the Proposal will introduce BFD or any other disease that may cause regent honeyeater to decline.

- **interfere with the recovery of the species.**

The proposal is unlikely to interfere substantially with the recovery of the regent honeyeater.

Swift Parrot (*Lathamus discolor*)

In this case, a population of a species is an occurrence of the species in a particular area that include but are not limited to:

- **a geographically distinct regional population, or collection of local populations; or**
- **a population, or collection of local populations, that occurs within a particular bioregion.**

The swift parrot occurs as a single population, although it migrates annually from breeding grounds in Tasmania to the winter foraging grounds on the coastal plains and slope woodlands of mainland eastern Australia (Saunders 2003). The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species undertaken throughout the proposal area. There are no known records of swift parrot within 10km of the proposal area. Therefore, the proposal area does not contain a population of the swift parrot.

In this case, habitat critical to the survival of a species refers to areas that are necessary:

- **for activities such as foraging, breeding, roosting, or dispersal;**
- **for the long-term maintenance of the species, including the maintenance of species essential to the survival of the species such as pollinators;**
- **to maintain genetic diversity and long term evolutionary development; or**
- **for the reintroduction of populations or recovery of the species.**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. There are no known records of swift parrot within 10km of the proposal area and it was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. Despite the presence of approximately 15.1 hectares of potential foraging habitat for the species within the proposal area, it is not considered to be habitat critical to the survival of the swift parrot.

An action has, will have, or is likely to have a significant impact on a critically endangered species if it does, will, or is likely to:

- **lead to a long-term decrease in the size of a population, or;**

The proposal area does not provide critical habitat for, or a population of the swift parrot. Therefore the proposal is considered unlikely to lead to a long-term decrease to a *population* of the swift parrot.

- **reduce the area of occupancy of the species, or;**

The proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the swift parrot. However the proposal area does not provide critical habitat for, or a population of the species. The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. Additionally, there are no known records of swift parrot within 10km of the proposal area.

Therefore the proposal is considered unlikely to reduce the area of occupancy of a *population* of the swift parrot.

- **fragment an existing population into two or more populations, or;**

The proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the swift parrot from an area that is already considered to be a highly fragmented landscape. However the proposal area does not provide critical habitat for, or a population of the species. The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. There are no known records of swift parrot within 10km of the proposal area. Therefore the proposal is not considered to support a *population* of the swift parrot, and thus will not fragment an existing population of the species into two or more.

- **adversely affect habitat critical to the survival of a species, or;**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately 15.1 hectares of known foraging habitat for the species. The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. There are no known records of swift parrot within 10km of the proposal area. Therefore despite the presence of approximately 15.1 hectares of potential foraging habitat for the species within the proposal area, it is not considered to be habitat critical to the survival of the species.

- **disrupt the breeding cycle of an population, or;**

Despite habitat within the proposal area being substantially degraded, the proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. The swift parrot was not recorded within the proposal area despite thorough general fauna surveys, as well as targeted surveys for the species in winter 2015, undertaken in accordance with the seasonal requirements for this species. There are no known records of swift parrot within 10km of the proposal area. Therefore the proposal is considered unlikely to disrupt the breeding cycle of a *population* of the swift parrot.

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or;**

The proposal will permanently remove approximately 15.1 hectares of potential foraging habitat for the species. However the habitat within the proposal area is already substantially degraded and therefore the proposal is unlikely to modify, destroy, remove, isolate, or decrease the availability or quality of habitat for the swift parrot to the extent that the species would likely decline.

- **result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat, or;**

The proposal is unlikely to result in an invasive species that is harmful to the regent honeyeater becoming established in its habitat.

- **introduce disease that may cause the species to decline, or;**

Psittacine beak and feather disease (BFD) is a common and potentially deadly disease of parrots caused by a circovirus named beak and feather disease virus. The disease appears to have originated in Australia and is widespread and continuously present in wild populations of Australian parrots. BFD affecting endangered psittacine species (parrots and related species) was listed in April 2001 as a key threatening process under the EPBC Act.

It is considered unlikely that the Proposal will introduce BFD or any other disease that may cause swift parrot to decline.

- **interfere with the recovery of the species.**

The proposal is unlikely to interfere substantially with the recovery of the swift parrot.

ENDANGERED SPECIES

Tylophora linearis

Tylophora linearis is an herbaceous climber with clear latex growing to approximately 2 m in length (DoEE 2008). In NSW the species is rarely collected, known from less than 10 localities in the Dubbo area and Mt Crow near Barrabra, growing in dry scrub, open forest and woodlands. It is also known to overlap in distribution with *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC under the EPBC Act (TSSC 2008), which occurs in the proposal area.

Tylophora linearis was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). However due to the presence of 8.06 hectares of woodland that conforms to *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC and PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt in the proposal area, there is a potential for this species to occur (albeit low).

In this case, a population of a species is an occurrence of the species in a particular area that include but are not limited to:

- **a geographically distinct regional population, or collection of local populations; or**

- **a population, or collection of local populations, that occurs within a particular bioregion.**

Tylophora linearis was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. Therefore, the proposal area does not contain an important population of the *Tylophora linearis*.

In this case, habitat critical to the survival of a species refers to areas that are necessary:

- **for activities such as foraging, breeding, roosting, or dispersal;**

- **for the long-term maintenance of the species, including the maintenance of species essential to the survival of the species such as pollinators;**

- **to maintain genetic diversity and long term evolutionary development; or**

- **for the reintroduction of populations or recovery of the species.**

The habitats within the proposal area are generally highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor. *Tylophora linearis* was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area.

An action has, will have, or is likely to have a significant impact on an endangered species if it does, will, or is likely to:

- **lead to a long-term decrease in the size of a population, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. The proposal area does not provide critical habitat for, or a population of *Tylophora linearis*. Therefore the proposal is considered unlikely to lead to a long-term decrease to a *population* of the species.

- **reduce the area of occupancy of the species, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. However, the species was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). Therefore the proposal is considered unlikely to reduce the area of occupancy of a *population* of the *Tylophora linearis*.

- **fragment an existing population into two or more populations, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. However, the species was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). Therefore the proposal is not considered to support a *population* of the *Tylophora linearis*, and thus will not fragment an existing population of the species into two or more.

- **adversely affect habitat critical to the survival of a species, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. However, the species was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). Therefore despite the presence of potential habitat in the proposal area, it is not considered to be habitat critical to the survival of *Tylophora linearis*.

- **disrupt the breeding cycle of an population, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. However, the species was not recorded within the proposal area despite thorough vegetation surveys undertaken in accordance with the seasonal requirements for this species. The closest record of the species occurs approximately 10 km to the east of the proposal area within Goobang National Park (OEH 2016d). Therefore the proposal is considered unlikely to disrupt the breeding cycle of *Tylophora linearis*.

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or;**

The proposal will permanently remove 8.06 hectares of woodland which provides potential habitat for the species in the proposal area. However the habitat within the proposal area is already substantially degraded and therefore the proposal is unlikely to modify, destroy, remove, isolate, or decrease the availability or quality of habitat for the *Tylophora linearis* to the extent that the species would likely decline.

- **result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat, or;**

The proposal is unlikely to result in an invasive species that is harmful to the *Tylophora linearis* becoming established in its habitat.

- **introduce disease that may cause the species to decline, or;**

The proposal is unlikely to introduce disease that may cause *Tylophora linearis* to decline.

- **interfere with the recovery of the species.**

The proposal is unlikely to interfere substantially with the recovery of the *Tylophora linearis*.

VULNERABLE SPECIES

Superb Parrot (*Polytelis swainsonii*)

The Superb Parrot (*Polytelis swainsonii*) occurs through the inland slopes and plains of NSW (including the Australian Capital Territory) to northern Victoria. The breeding range of the Superb Parrot is mostly in the NSW South Western Slopes and Riverina bioregions. The three main breeding areas are: (1) bounded by Molong, Rye Park, Yass, Coolac, Cootamundra and Young (NSW);(2) along the Murrumbidgee River, between Wagga Wagga and Toganmain Station (near Bringagee), and farther north at Goolgowi (NSW); and (3) along the Murray and Edward Rivers, from east of Barmah and Millewa State Forest to south of Taylors Bridge (Baker-Gibb 2011). The proposal area is considered unlikely to provide breeding habitat for the species.

Six superb parrots were recorded flying over the proposal area at two locations during targeted surveys. Four individuals were recorded within the proposal area 1-4 km to the south of Peak Hill in May 2016 and two individuals were recorded approximately 25 km north of Peak Hill in October 2014. The species has also been widely recorded between Parkes and Narromine (OEH 2016d). All of the vegetation communities identified in the proposal area are expected to provide potential foraging habitat, however potential breeding habitat is not expected to occur. The proposal will result in the permanent loss of approximately 66.72 hectares of native woodland and grassland communities that are likely to provide habitat for the species.

Breeding habitat for this species includes hollows more than 60 mm in diameter located more than 4 metres above ground (OEH 2016b). The national recovery plan for the species (Baker-Gabb 2011) identifies Blakely's red gum (*Eucalyptus blakelyi*) as the most important tree species for breeding for this species in the south western slopes bioregion, with most breeding events confined to this tree species. Blakely's red gum was not recorded in the proposal area and therefore breeding habitat is not considered likely to occur. Potential breeding habitat for this species is not likely to be impacted by the proposal.

In this case, an important population is a population that is necessary for a species' long-term survival and recovery. This may include populations that are:

- **key source populations either for breeding or dispersal; or**
- **populations that are necessary for maintaining genetic diversity, and/or**
- **populations that are near the limit of the species range.**

The superb parrot was recorded at two locations within the proposal area, however the proposal area is not expected to support a key population for breeding and dispersal, does not provide habitat for a portion of the population that is necessary for maintaining genetic diversity and the species is not at the limit of its range in the proposal area. Blakely's red gum was not recorded in the proposal area and therefore breeding habitat is not considered likely to occur. Therefore, the proposal area is not likely to not contain an important population of the superb parrot.

An action has, will have, or is likely to have a significant impact on threatened species if it does, will, or is likely to:

- **lead to a long-term decrease in the size of an important population of a species, or;**

The proposal area does not provide habitat for an important population of the superb parrot. Therefore the proposal is considered unlikely to lead to a long-term decrease to an *important population* of the superb parrot.

- **reduce the area of occupancy of an important population, or;**

The proposal will result in the permanent loss of approximately 66.72 hectares of native woodland and grassland communities that comprise habitat for the species. However the proposal area does not provide habitat for an important population of the superb parrot. Therefore the proposal is considered unlikely to reduce the area of occupancy of an *important population* of the superb parrot.

- **fragment an existing important population into two or more populations, or;**

The proposal area does not provide habitat for an important population of the superb parrot. The proposal area occurs within a highly fragmented landscape and therefore, the proposal is considered unlikely to fragment an *important population* of the superb parrot.

- **adversely affect habitat critical to the survival of a species, or;**

The proposal area is not considered to represent habitat critical to the survival of the superb parrot and therefore the proposal is unlikely to adversely affect habitat critical to the survival of the superb parrot.

- **disrupt the breeding cycle of an important population, or;**

The proposal will result in the permanent loss of approximately 66.72 hectares of native woodland and grassland communities. However the proposal area does provide suitable breeding habitat for the species and thus does not provide habitat for an important population of the superb parrot. Therefore the proposal is considered unlikely to disrupt the breeding cycle of an *important population* of the superb parrot.

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or;**

The proposal would result in the removal of known and potential habitat for the superb parrot. However, the proposal is unlikely to modify, destroy, remove, isolate, or decrease the availability or quality of habitat for the superb parrot to the extent that the species would be likely to decline.

- **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat, or;**

The proposal is unlikely to result in an invasive species that is harmful to the superb parrot becoming established in its habitat.

- **introduce disease that may cause the species to decline, or;**

Psittacine beak and feather disease (BFD) is a common and potentially deadly disease of parrots caused by a circovirus named beak and feather disease virus. The disease appears to have originated in Australia and is widespread and continuously present in wild populations of Australian parrots. BFD affecting endangered psittacine species (parrots and related species) was listed in April 2001 as a key threatening process under the EPBC Act.

It is considered unlikely that the Proposal will introduce BFD or any other disease that may cause superb parrot to decline.

- **interferes substantially with the recovery of the species.**

The proposal is unlikely to interfere substantially with the recovery of the superb parrot.

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