



Anderson

ENVIRONMENTAL CONSULTANTS PTY LTD

ECOLOGICAL ASSESSMENT FOR CROOKWELL 3 WIND FARM

Prepared for
Crookwell Development Pty Ltd

Prepared by
Jason Anderson B.App.Sc (UNE)
(Conservation Technology 1992)

June 2010
(Revised in September 2012)

Version 3.4

© Copyright

This report is Copyright Protected, and is not to be reproduced in part or whole or used by a third party without the express written permission of Anderson Environmental Consultants Pty Ltd.

*Anderson Environmental Consultants Pty Ltd ABN 34 126 481 418
PO BOX 690 Springwood 2777 Ph: 1300 302 507 Fax: (02) 8580 4731*

www.andersonenvironmental.com.au

Legally Privileged and Confidential for the purposes of legal advice/litigation

Executive Summary

This study has been undertaken to address the Environmental Assessment Requirements and determine the presence or potential presence within the project site of any threatened species, populations or endangered ecological communities as listed under the *Threatened Species Conservation Act 1995* (NSW) (**TSC Act**) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**). The findings of this report indicate that the project is unlikely to have a significant impact on any communities, populations or threatened species listed under the EPBC Act or the TSC Act.

The results of the field surveys detected no Endangered Ecological Communities or threatened species listed under either the EPBC Act or the TSC Act within the site. Whilst no threatened species listed under either the EPBC Act or the TSC Act were detected within the site by the surveys undertaken, each threatened species which was considered likely to have the potential to occur with the site and to be impacted by the project was further assessed in accordance with:

- the criteria contained in the EPBC Act in the case of species listed under the EPBC Act; and
- the 7-Part Tests of Significance criteria in the case of species listed under the TSC Act.

The results of this ecological impact assessment concluded that:

- The project is not likely to result in a significant impact on any endangered ecological community or flora species listed under the EPBC Act. Accordingly, the project is not considered, for this reason, to be a controlled action which requires approval under the EPBC Act.
- The project is not likely to result in a significant impact on any fauna species listed under the TSC Act. Accordingly, there is no requirement for a species impact statement to be prepared.

The project is consistent with the principles of “improve or maintain” in relation to ecological impacts and although no offset is required, an offset of 60 ha is being proposed for extent of clearing required for the project which is estimated to be approximately 2.34 ha in total from the Western Tablelands Dry Forest vegetation community.

It is currently proposed that this offset will be provided by two formal Property Vegetation Plan agreements (PVPs) to be entered into with Hawkesbury Nepean Catchment Management Authority (HNCMA) once the project is approved. It is proposed that these PVPs would cover a total of approximately 60 hectares of the remnant vegetation located within the site being:

- 15 ha in perpetuity; and
- an additional 45 ha for the life of the wind farm,

and that the proponent would provide sufficient funds each year for feral animal control and management of these two agreement areas. HNCMA have provided their ‘in principal’ support for this proposed voluntary offset strategy and this is seen as a sound ecological practice even though legislatively an offset is not required.

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
1.1	BACKGROUND.....	1
1.2	SITE DESCRIPTION	1
1.2.1	Location	1
1.2.2	Physical Environment	2
1.3	DESCRIPTION OF THE PROJECT	4
1.4	DIRECTOR GENERAL’S REQUIREMENTS	6
1.5	LEGISLATIVE REQUIREMENTS	7
1.5.1	Commonwealth Legislative Requirements	7
1.5.2	NSW Legislative requirements	9
2.	METHODOLOGY - FLORA	11
2.1	DESKTOP REVIEW	11
2.2	SURVEY METHODOLOGY	11
2.3	LIMITATIONS	12
2.4	RESULTS (FLORA).....	12
2.4.1	Literature Review.....	12
2.4.2	Field Survey Results	17
3.	METHODOLOGY - FAUNA	23
3.1	DESKTOP REVIEW	23
3.2	SURVEY METHODOLOGY	23
3.3	LIMITATIONS	24
3.4	RESULTS FAUNA.....	24
3.4.1	Literature Review.....	24
3.4.2	Field Survey Results	29
4.	DISCUSSION - FLORA	30
4.1	ENDANGERED ECOLOGICAL COMMUNITIES.....	30
4.2	INDIVIDUAL THREATENED SPECIES	30
4.3	ASSESSMENT OF SIGNIFICANCE (EPBC ACT).....	38
4.3.1	Significant Impact Criteria for Critically Endangered and Endangered Threatened Flora Species	38
4.3.2	Significant Impact Criteria for Vulnerable Threatened Flora Species	39
4.3.3	Significant Impact Criteria for Critically Endangered and Endangered Ecological Communities	40
4.4	ASSESSMENT OF IMPACT (TSC ACT)	41
4.4.1	Endangered Ecological Communities – 7 Part Test of Significance.....	42
4.4.2	Threatened Species – 7 Part Tests of Significance.....	44
5.	DISCUSSION - FAUNA	64
5.1	THREATENED SPECIES	64
5.2	HABITATS AND POTENTIAL IMPACTS	97

5.3	POTENTIAL IMPACTS BIRD AND BAT STRIKE	98
5.4	ASSESSMENT OF SIGNIFICANCE (EPBC ACT 1999).....	99
5.4.1	Significant Impact Criteria for Critically Endangered and Endangered Individual Threatened Species .	99
5.4.2	Significant Impact Criteria for Vulnerable Individual Threatened Species	100
5.5	ASSESSMENT OF IMPACTS (TSC ACT).....	101
5.5.1	Threatened Species 7 Part Tests of Significance.....	102
6.	CONCLUSIONS.....	154
7.	RECOMMENDATIONS	155
8.	REFERENCES	156
9.	APPENDIX 1 – FLORA SPECIES RECORDED.....	157
10.	APPENDIX 2 – FAUNA SPECIES RECORDED.....	167
11.	APPENDIX 3 – DIRECTOR GENERALS REQUIREMENTS.....	171
12.	APPENDIX 4 – MAPPING	176
13.	APPENDIX 5 – CURRENT TARGETED SURVEY RESULTS	180

1. INTRODUCTION

1.1 BACKGROUND

Anderson Environmental Consultants Pty Ltd was engaged by Crookwell Development Pty Ltd (CDPL) to undertake an Ecological Assessment in relation to the proposed Crookwell 3 Wind Farm (**Project**).

This ecological assessment has been prepared to address the Director-General's Requirements issued in relation to the project and determine the potential ecological impacts of the project. This study will support the environmental assessment report being prepared in relation to the project.

1.2 SITE DESCRIPTION

1.2.1 Location

The location of the project is approximately 18km south east of Crookwell, NSW. The project is proposed to be located on two separate land parcels known as Crookwell 3 East (with an area of 1,100 Hectares) and Crookwell 3 South (with an area of 400 Hectares) (the **site**). The proposal includes road and transmission line construction outside these two parcels of land. Figure 1 shows the location of the site.

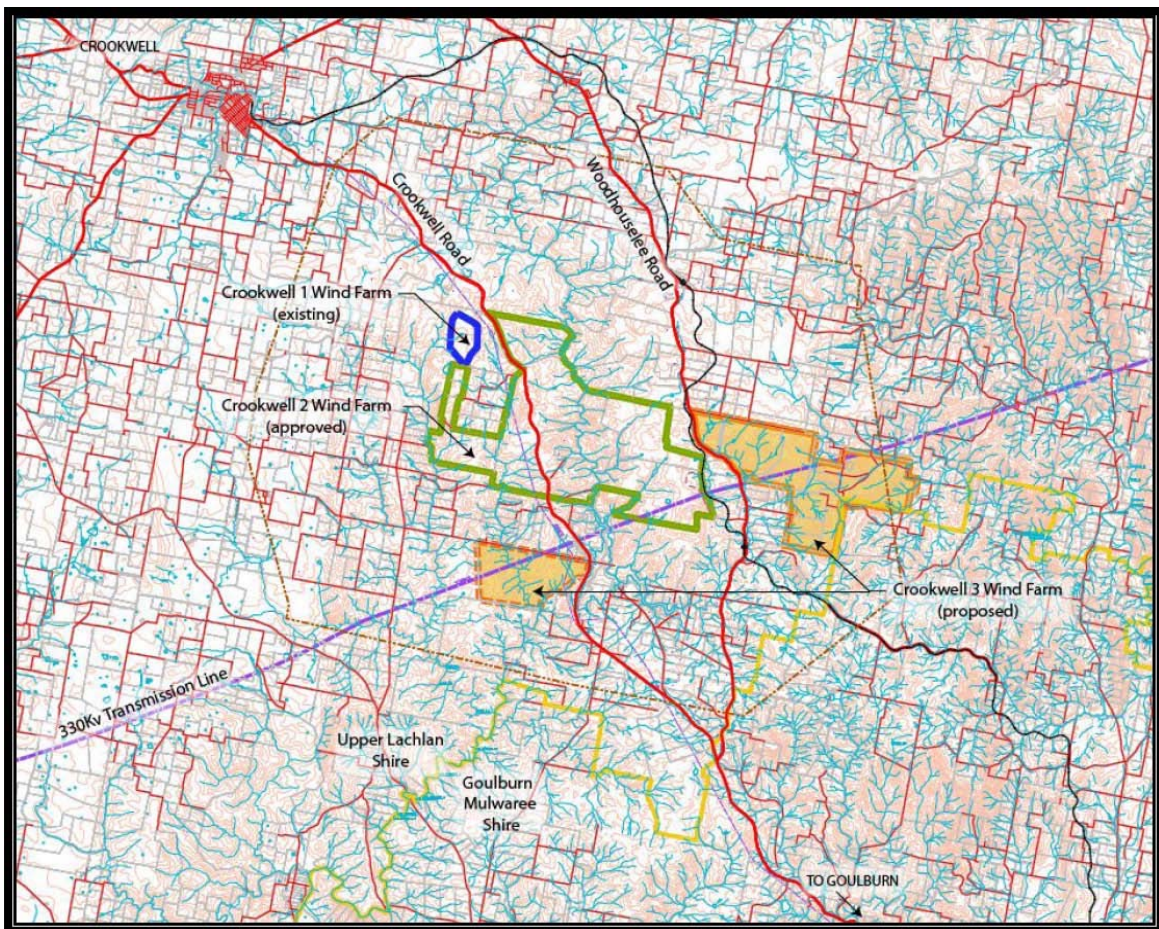


Figure 1: Site Location

1.2.2 Physical Environment

The site is located within Upper Lachlan Shire Local Government area. The site was selected due to its topography and high wind levels being located on the Great Dividing Range. The site is located approximately 30 kilometres north-west of Goulburn and approximately 14 kilometres south-east of Crookwell.

Predominantly, most of the site is cleared sheep and cattle grazing country with only limited native vegetation remaining. The wind turbines are proposed to be located primarily on cleared grazing lands as are the access roads and other associated infrastructure. The turbine sites vary in elevation from 799 mAHD to 933 mAHD.

The site contains Steeves Creek which flows to Pejar Creek and then to Pejar Dam.



Photo 1: Showing Greywood Siding Road Proposed Access.



Photo 2: Proposed Greywood Siding Road Access.



Photo 3: Proposed Turbine Site A18.



Photo 4: Typical proposed paddock turbine site location showing A5.

1.3 DESCRIPTION OF THE PROJECT

CDPL, the proponent, is seeking project approval for the construction and operation of a wind energy facility to be known as the Crookwell 3 Wind Farm.

The project comprises a number of elements, including:

- 30 individual wind turbines standing up to 152m at top of blade tip with a capacity of up to 3.4MW each (some of the turbines may be fitted with obstacle lighting as required);
- 30 individual kiosks for the housing of 33kV Transformers and 33kV Switchgears and associated control systems to be located in the vicinity of the wind turbine towers (in some turbine models being considered the kiosk's equipment are integrated within the tower or nacelle);
- internal unsealed tracks for turbine access;
- upgrades to local road infrastructure as necessary to provide access to the site;
- An underground electrical and communication cable network linking turbines to each other within the Site boundary and then using either an underground or overhead

connection between the Crookwell 3 site boundaries and the Crookwell 2 site boundary to reach the substation approved as part of the Crookwell 2 Wind Farm;

- up to 3 wind monitoring masts fitted with various instruments such as anemometers, wind vanes, temperature gauge and potentially other electrical equipment; and
- The project will require up to two temporary concrete batching plants during the construction phase only, to supply concrete for the foundations of the turbines and other associated structures;
- Electrical interconnections will be achieved via a connection to the 330kV transmission line which bypasses the site. The project will utilise and be connected to the single substation, control room and facilities for the electrical interconnection, approved as part of the Crookwell 2 Wind Farm.

Figure 2 shows the proposed indicative layout of the project and is subject to further detailed design.

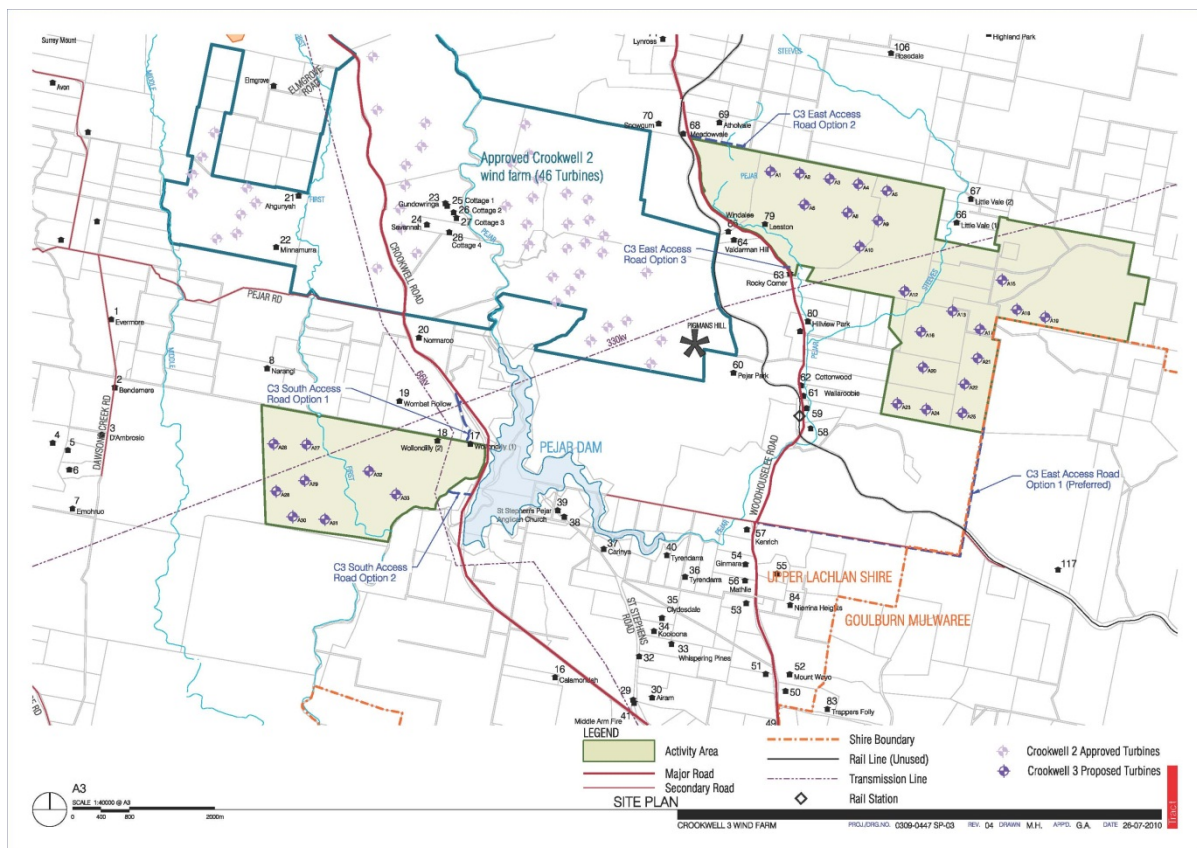


Figure 2: Site Layout Plan

Crookwell 3 East and Crookwell 3 South may be developed in stages.

A number of options have been considered and are being assessed for the internal unsealed tracks for turbine construction and access:

For Crookwell 3 East three options for access roads are being assessed:

- Option 1 (Preferred) - An extension of the Greywood Siding Road using the road reserve to access the site;
- Option 2 – Use of the existing Boltons Road for site access; and
- Option 3 – Access off Woodhouselee Road approximately mid-way between to two homesteads of Leeston and Hillview Park.

For Crookwell 3 South two options for access roads are being assessed:

- Option 1 – This would utilise the existing access to the property Wollondilly. This access is part of the old Crookwell to Goulburn Road, which is a dual bitumen carriageway.
- Option 2 – An access from the approximate centre of the property through to the Crookwell to Goulburn Road.

Early planning of the wind farm involved discussions aimed at avoiding areas of native vegetation to minimise potential ecological impacts. As such the design of the wind farm aimed to minimise disturbance to areas of native vegetation and establishing turbines and connecting infrastructure in areas of existing disturbance. This also encompassed the proposed electrical interconnections between Crookwell 2 and Crookwell 3.

1.4 DIRECTOR GENERAL’S REQUIREMENTS

The Director-General’s Requirements (**DGRs**) issued in relation to the Project require that the following flora and fauna impacts be assessed:

Flora and Fauna - the EA must:

- *include an assessment of all project components on flora and fauna and their habitat consistent with the Draft Guidelines for Threatened Species Assessment (DEC, 2005), including details on the existing site conditions and quantity and likelihood of disturbance;*
- *The EA must specifically consider impacts to threatened species and communities listed under both State and Commonwealth legislation that have been recorded on the site and surrounding land, impacts to riparian and/ or instream habitat in the case of disturbance of waterways, and to biodiversity corridors. In addition, impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips, and alteration to movement patterns resulting from the turbines must be assessed, including demonstration of how the project has been sited to avoid and/ or minimise such impacts;*
- *details of how flora and fauna impacts would be managed during construction and operation including adaptive management and maintenance protocols (including the mitigation and/or management of weeds); and*
- *measures to avoid, mitigate or offset impacts consistent with “improve or maintain” principles. Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project.*

A complete copy of the DGR’s is contained in Appendix 3 to this report.

Note:

Flora and fauna impact management is generally required if significant threatened species habitat would be impacted by a project. As discussed in this report no threatened species have been detected and since the project has been designed to minimise impacts as far as possible there are unlikely to be any impacts and therefore offsets are not required. The measures to avoid impact have been through the design of avoiding potential threatened species habitat as far as possible since the projects inception.

An offset of approximately 60 ha is being proposed for extent of clearing required for the project as highlighted in section 2.4.2.6. It is currently proposed that this offset will be provided by two formal Property Vegetation Plan agreements (PVPs) to be entered into with Hawkesbury Nepean Catchment Management Authority (HNCMA) once the project is approved. It is proposed that these PVPs would cover a total of approximately 60 hectares of the remnant vegetation located within the site being:

- 15 ha in perpetuity; and
- an additional 45ha for the life of the wind farm,

and that the proponent would provide sufficient funds each year for feral animal control and management of these two agreement areas.

HNCMA have provided their ‘in principal’ support for this proposed voluntary offset strategy and this is seen as a sound ecological practice even though legislatively an offset is not required. The precise terms of the proposed PVPs remain subject to further consultation with government stateholders, including the HNCMA.

Operative adaptive management would be through the pre-commissioning surveys for bird and bat strike. The gathering of good baseline data is important to determine the levels and significance of any potential impacts once the wind farm is in operation. In regard to the management of weeds there are already high levels of weeds present in this agricultural system. The recommendation to wash the wheels of any vehicles entering the bushland remnants would be written into the Vegetation Management/Ecological Restoration plans for the areas to be rehabilitated to reduce any potential for weed spread into these areas.

1.5 LEGISLATIVE REQUIREMENTS

1.5.1 Commonwealth Legislative Requirements

Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (Cth) (**EPBC Act**) applies to the site. The objects of the EPBC Act include “to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance”.

Under the EPBC Act, certain ‘actions’ that “has, will have or is likely to have a significant impact” on Commonwealth land or specified matters of national environmental significance (even if taken outside Commonwealth land) are subject to a rigorous assessment and approval process. An ‘action’ includes a project, development, undertaking, activity, or series of activities. Matters of national environmental significance include World Heritage properties, National Heritage places, Ramsar wetlands of international significance, listed threatened species and ecological communities and listed migratory species.

In order to determine whether an action needs approval under the EPBC Act, the proposed action may be

referred to the Commonwealth Environment Minister for a determination as to whether or not it is a controlled action which requires approval under the EPBC Act. The approval process for controlled actions under the EPBC Act is separate from and in addition to the approval processes under the NSW EP&A Act.

The *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (EPBC Guidelines) have been made under the EPBC Act to assist in determining whether an action is “likely to have a significant impact” on any matter of “national environmental significance” such that the action will be a controlled action which requires approval under the EPBC Act. The EPBC Guidelines state that:

An action will require approval if the action has, will have, or is likely to have a significant impact on a species listed in any of the following categories:

- *extinct in the wild*
- *critically endangered*
- *endangered, or*
- *vulnerable.*

An action will also require approval if the action has, will have, or is likely to have a significant impact on an ecological community listed in any of the following categories:

- *critically endangered, or*
- *endangered.*

Notes:

Species in the extinct and conservation dependant categories of species listed under the EPBC Act, and listed ecological communities in the vulnerable category of ecological communities listed under the EPBC Act, are not matters of national environmental significance for the purposes of Part 3 of the EPBC Act (requirements for environmental approvals).

Species and ecological communities listed under the EPBC Act may differ from those listed under State and Territory legislation. This is due to the different status of some species and ecological communities in the different States and Territories, and nationally.

One of the aims of this assessment has been:

- to identify any World Heritage properties, National Heritage places, Ramsar wetlands of international significance, listed threatened species and ecological communities and listed migratory species which may potentially occur at the site or be impacted by the project; and
- to determine whether the project is likely to have a significant impact on any World Heritage properties, National Heritage places, Ramsar wetlands of international significance, listed threatened species and ecological communities and listed migratory species which may potentially occur at the site or be impacted by the project.

The results of this assessment will guide the decision of the proponent in determining whether or not the project may potentially be a controlled action which may require referral under the EPBC Act.

1.5.2 NSW Legislative requirements

Environmental Planning and Assessment Act 1979 and the Threatened Species Conservation Act 1995

The key NSW legislation relating to the assessment of the project is the Environmental Planning and Assessment Act (1979) (**EP&A Act**). The project is a project to which Part 3A of the EP&A Act applies.

Section 75R of the EP&A Act limits the other provisions of the EP&A Act which apply to projects being assessed under Part 3A. Accordingly, whilst:

- both Part 4 and Part 5 of the EP&A Act are subject to specific obligations relating to the assessment of certain impacts, including impacts on threatened species, populations or ecological communities, or their habitats; and
- section 5A(1) of the EP&A Act contains a list of factors which must be taken into account in any such assessment,

These provisions do not apply to projects being assessed under Part 3A.

However, the DGR's prepared under Part 3A of the EP&A Act provide that the EA must:

- *include an assessment of all project components on flora and fauna and their habitat consistent with the Draft Guidelines for Threatened Species Assessment (DEC, 2005), including details on the existing site conditions and quantity and likelihood of disturbance;*
- *The EA must specifically consider impacts to threatened species and communities listed under both State and Commonwealth legislation that have been recorded on the site and surrounding land, impacts to riparian and/ or instream habitat in the case of disturbance of waterways, and to biodiversity corridors. In addition, impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips, and alteration to movement patterns resulting from the turbines must be assessed, including demonstration of how the project has been sited to avoid and/ or minimise such impacts*

The *Draft Guidelines for Threatened Species Assessment* (DEC, 2007) provide guidance as to the matters which are to be taken into account in assessing the impacts of projects on species, populations and ecological communities. This includes the factors which are to be taken into account in applying the 7 Part Test of Significance contained in section 94 of the *Threatened Species Conservation Act 1995 (NSW)* (**TSC Act**) is to be applied. The 7 Part Test of Significance is used to assess the potential impacts of a project on threatened species, population(s) (including their habitats) and Endangered Ecological Community. Schedules 1 and 2 of the TSC Act list threatened species and communities. The 7 part Test of Significance requires an assessment of the following:

- (a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
- (b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,
- (c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
 - (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
- (d) in relation to the habitat of a threatened species, population or ecological community:
 - (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and
 - (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and
 - (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.
- (e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),
- (f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,
- (g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

If the results of the seven part test of significance concludes that there is likely to be a significant impact on a listed species, population of Endangered Ecological Community then the *Draft Guidelines for Threatened Species Assessment* (DEC, 2005) specify that a Species Impact Statement is required.

Native Vegetation Conservation Act 2003

The *Native Vegetation Conservation Act 2003 (NSW)* (**NVC Act**) governs the conservation and sustainable management of native vegetation in NSW. If approval is granted under Part 3A of the EP&A Act for the project then no approval will be required under section 12 of the NVC Act to authorise the clearing of native vegetation.

State Environmental Planning Policy 44 – Koala Habitat Protection

State Environmental Planning Policy 44 – Koala Habitat Protection (**SEPP 44**) applies to the site. SEPP 44 was gazetted in 1995 to stem the decline of Koalas in NSW. The policy objective is “to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline”.

The SEPP defines potential habitat as native vegetation of the overstorey species listed in Schedule 2 of the policy. These must constitute at least 15% of the total number of trees in the upper or lower strata.

There have been no Koalas reported in the local area of the site for over 30 years (NSW DECCW Atlas Data) and this is likely to be due to the high levels of clearing in the landscape and lack of interconnecting vegetation. The site assessment detected no usage of the site by Koalas (utilising the Australian Koala Foundation methodology).

The site is highly degraded and it considered to represent negligible habitat for Koalas with the result that the site does not contain potential koala habitat or core koala habitat. Accordingly, there is no need to further consider the requirements of SEPP 44 in relation to the project.

2. METHODOLOGY - FLORA

2.1 DESKTOP REVIEW

A literature review was carried out in order to assist in the identification of threatened species and endangered ecological communities listed under the TSC Act and the EPBC Act with potential to occur in the area of the site. This literature review was based on database searches of:

- NPWS Wildlife Atlas for the Goulburn Mulwaree Local Government Area;
- EPBC online Protected Matters database search tool for Upper Lachlan Local Government Area; and
- NPWS (2000) Forest Ecosystem Classification and Mapping for the Southern CRA region, Volumes I and II.

2.2 SURVEY METHODOLOGY

The field surveys were based on the following methodology;

1. Initial site familiarisation to determine potential ecological issues in relation to turbine cluster sitings, access tracks and access roads.
2. Field surveys to identify vegetation types, condition and potential level of impacts including targeted threatened plant surveys. This entailed a modified random meander approach of transects through the vegetation and paddock areas. The approach was modified from Cropper 2003. This approach allows for the easy identification of vegetation community types and boundaries and is particularly suited to areas where the quality of vegetation varies.
3. Mapping of vegetation community units on aerial photographs. This was undertaken concurrently with the field surveys to identify the vegetation types.

The field surveys for flora recorded attributes including; vegetation type and structure (Specht), slope, aspect, soils and geology, elevation, floristics, vegetation condition, foliage projection cover (FPC), level of understorey disturbance, fire history and level of weed invasion. As part of these surveys, particular attention was paid to any threatened species that may occur on the TSC Act or EPBC Act. The survey was, however, undertaken out of season for some potential threatened flora species and this is discussed in the limitations and further surveys proposed section below.

Plant specimens that were not identifiable in the field were collected for identification using standard botanical texts such as Flora of NSW. Flora species recorded are represented in Appendix A. The condition assessment and conservation ratings of the vegetation communities described are based on the following criteria;

- **Poor:** Vegetation which has suffered high levels of historical and current disturbance. These areas are highly modified both structurally and floristically. They contain only the indicators of what the vegetation community would have once been.
- **Moderate:** Areas of moderate quality vegetation which retain many of their natural characteristics but have immediate indicators of disturbance and modification readily present. Moderate levels of structural and floristic modification evident.

- **Good:** Areas with high levels of natural integrity both structurally and floristically.

Surveys for any potentially listed Ecological Communities under both the Threatened Species Conservation Act (1995) and Environment Protection and Biodiversity Conservation Act (1999) were undertaken in accordance with the various guidelines available at the time (for the various potentially listed communities) with reference to the final determinations for these communities.

2.3 LIMITATIONS

Every survey has limitations in relation to timing and season. The surveys were undertaken from late February 2010 to early June 2010. A total of 6 days were spent surveying the site (excluding targeted surveys outlined in Appendix 5). Every survey has limitations however and, as far as possible, potential species were addressed in the surveys. Vegetation remnants which would in no way be impacted directly or indirectly were surveyed in less detail than the areas which would be potentially impacted by the project.

Additional targeted threatened species surveys were conducted to cover the spring/summer seasons. This was a requirement of the DGR's.

2.4 RESULTS (FLORA)

2.4.1 Literature Review

The results of the literature review and background searches revealed that the following endangered ecological communities and threatened flora species listed under the EPBC Act and/or TSC Act have the potential to occur at the site:

Critically Endangered Ecological Communities

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act – Critically Endangered, TSC Act – Endangered)

In a nomination received for the Yellow Box – Red Gum Grassy Woodland experts identified numerous similarities and intergradations between the nominated Yellow Box-Blakely's Red Gum and the Grassy White Box Woodlands ecological community, which was previously separately listed as endangered under the EPBC Act. The Committee now consider these two ecological communities to be sufficiently similar and intermixed with the result that they have now been listed as a single entity.

In addition, the Committee also consider that, in order to highlight the important contribution of the understorey to the biodiversity and function of this ecological community, emphasis should be placed upon it in naming the ecological community, including areas in which no overstorey remains. Therefore, to reflect the broader definition of the ecological community and the role of its understorey, the name of the ecological community was changed to the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, to be known informally as Box – Gum Grassy Woodland and Derived Grassland.

Box – Gum Grassy Woodlands and Derived Grasslands are 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. In the Nandewar Bioregion, Grey Box (*Eucalyptus microcarpa* or *E. moluccana*) may also be dominant or codominant. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated.

In its pre-1750 state, this ecological community was characterised by:

- a ground layer dominated by tussock grasses;
- an overstorey dominated or co-dominated by White Box, Yellow Box or Blakely's Red Gum, or Grey Box in the Nandewar bioregion; and,
- a sparse or patchy shrub layer.

Associated, and occasionally co-dominant, trees include, but are not restricted to: Grey Box (*Eucalyptus microcarpa*), Fuzzy Box (*E. conica*), Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Red Stringybark (*E. macrorhyncha*), White Cypress Pine (*Callitris glaucophylla*), Black Cypress Pine (*C. enderlicheri*), Long-leaved Box (*E. gonicalyx*), New England Stringybark (*E. calignosa*), Brittle Gum (*E. mannifera*), Candlebark (*E. rubida*), Argyle Apple (*E. cinerea*), Kurrajong (*Brachychiton populneus*) and Drooping She-oak (*Allocasuarina verticillata*).

This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 metres to 1200 metres (NSW Scientific Committee 2002). Given the occurrence of Box – Gum Grassy Woodlands and Derived Grasslands on the best soils, and therefore the most sought-after agricultural land, very little of the ecological community is reserved. The reserved areas tend to be shrubbier and occur on less arable soils. Remnants on the most fertile soils are the least commonly reserved and remnants in the existing reserves do not represent the natural variation in Grassy White Box Woodland, but favoured communities on poorer soils, i.e. soils classed as unsuitable for agriculture, generally associated with steeper slopes, or shallower soils and/or areas with high shrub abundance. While the ecological community does occur in a number of reserves, most reserves contain only small occurrences, and these remnants have usually been modified by historical land use (NSW Scientific Committee 2002).

Shrubs can occur naturally in grassy woodlands, and can form an important part of the Box – Gum Grassy Woodland and Derived Grassland ecological community, however, on poorer soils throughout its range, this ecological community grades into shrubby woodlands. This can lead to confusion in recognising the listed ecological community, and the following can be used to determine if a remnant is included in the listed ecological community or if it is a shrubby woodland. Shrub cover in this ecological community is naturally patchy, and shrubs may be dominant only over a very localised area. Shrub cover should therefore be assessed over the entire remnant, not just in a localised area. A remnant, with a significant ground layer of tussock grasses, and where the distribution of shrubs is scattered or patchy, is part of the ecological community. In shrubby woodlands, the dominance of native tussock grasses in the ground layer of vegetation is lost. Therefore, a remnant with a continuous shrub layer, in which the shrub cover is greater than 30%, is considered to be a shrubby woodland and so is not part of the listed ecological community. Remnant attributes, such as shrubbiness, should be measured on a scale of 0.1 hectares or greater.

Endangered Ecological Communities

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South Eastern Australia

The community is mapped as occurring outside the study area by the Department of Environment, Water, Heritage and Arts (2009).

Inland Grey Box Woodland includes those woodlands in which the most characteristic tree species, *Eucalyptus microcarpa* (Inland Grey Box), is often found in association with *E. populnea* subsp. *bimbil* (Bimble or Poplar Box), *Callitris glaucophylla* (White Cypress Pine), *Brachychiton populneus*

(Kurrajong), *Allocasuarina luehmannii* (Bulloak) or *E. melliodora* (Yellow Box), and sometimes with *E. albens* (White Box). Shrubs are typically sparse or absent, although this component can be diverse and may be locally common, especially in drier western portions of the community. A variable ground layer of grass and herbaceous species is present at most sites. At severely disturbed sites the ground layer may be absent. The community generally occurs as an open woodland 15–25 m tall but in some locations the overstorey may be absent as a result of past clearing or thinning, leaving only an understorey.

Inland Grey Box Woodland occurs predominately within the Riverina and South West Slopes regions of NSW down to the Victorian border. It includes Albury to the east and may extend out west towards Hay. This community also extends across the slopes and plains in Central and Northern NSW up to the Queensland Border. This includes Yetman and Inverell in the North, Molong to the east of the Central Slopes and plains and out towards Nymagee to the east

Inland Grey Box Woodland occurs on fertile soils of the western slopes and plains of NSW. The community generally occurs where average rainfall is 375–800 mm pa and the mean maximum annual temperature is 22–26°C. There is a correlation between the distribution of *Eucalyptus microcarpa* communities and soils of Tertiary and Quaternary alluvial origin, largely corresponding with the Red Brown Earths. The majority of remnant patches of Inland Grey Box Woodland survive with trees largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification. Some species that are part of the community appear intolerant to heavy grazing by domestic stock and are confined to the least disturbed remnants.

Native Temperate Grasslands of the Southern Tablelands of NSW and the Australian Capital Territory (EPBC Act – Endangered, TSC Act – Not Listed)

Natural temperate grassland is closed grassland, grassland and open grassland whose biomass is dominated by two or more of the perennial native tussock grasses *Themeda triandra* (Kangaroo Grass), *Austrodanthonia* spp (wallaby grasses), *Austrostipa* spp (speargrasses), *Bothriochloa macra* (Red Grass, Red-leg Grass) and/or *Poa* spp (snowgrasses).

Mature tussock grasses range in height from moderately tall (25–50 cm) to tall (50–100 cm) (Endangered Species Scientific Subcommittee 2000). The spaces between the dominant grass tussocks are occupied by graminoids (grasses and grass-like plants) and a wide range of forbs (herbaceous, non-graminoid plants) which may comprise up to 70% of all plant species and form a distinct, lower layer of vegetation. Many forbs are from the daisy family (Asteraceae), or are lilies or native legumes (Endangered Species Scientific Subcommittee 2000). Dwarf herbs, lichens and mosses may also be present on the soil surface.

Tablelands Basalt Forest (EPBC Act – Not listed, TSC Act – Endangered)

Tableland Basalt Forest is dominated by an open eucalypt canopy of variable composition. *Eucalyptus viminalis*, *E. radiata*, *E. dalrympleana* subsp. *dalrympleana* and *E. pauciflora* may occur in the community in pure stands or in varying combinations. The community typically has an open canopy of eucalypts with sparse mid-story shrubs (e.g. *Acacia melanoxylon* and *A. dealbata*) and understory shrubs (e.g. *Rubus parvifolius*) and a dense groundcover of herbs and grasses, although disturbed stands may lack either or both of the woody strata. The structure of the community varies depending on past and current disturbances, particularly fire history, clearing and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. At some sites, mature trees may exceed 30 m tall, although regrowth stands may be shorter than 10 m tall.

Tableland Basalt Forest is currently found in the Eastern Highlands and Southern and Central Tablelands, covering the local government areas of Bathurst Regional, Goulburn Mulwaree, Oberon, Palerang,

Shoalhaven, Upper Lachlan and Wingecarribee. The community, however, may be found elsewhere within the designated bioregions. It is known to occur in the Crookwell area on Clay Loam Soils.

Tableland Basalt Forest typically occurs on loam or clay soils associated with basalt or, less commonly, alluvium, fine-grained sedimentary rocks, granites and similar substrates that produce relatively fertile soils. The species composition of Tableland Basalt Forest varies with average annual rainfall. On basalt or plutonic substrates east of Mittagong and Moss Vale, at the eastern edge of its distribution where average rainfall exceeds 1000-1100 mm per year, the community is replaced by Robertson Basalt Tall Open-forest and Mount Gibraltar Forest. Its distribution spans altitudes from approximately 600 m to 900 m above sea level, usually on undulating or hilly terrain. Mean annual rainfall varies from approximately 750 mm up to 1100 mm across the distribution of the community.

Tablelands Forest Hollow Grassy Woodlands (EPBC Act – Not listed, TSC Act – Endangered)

This community occurs in the South-eastern Highlands, Sydney Basin, South-east Corner and NSW South-western Slopes Bioregions.

Tablelands Frost Hollow Grassy Woodlands typically forms an open-forest, woodland or open woodland that transitions into grassland at low tree cover. The canopy is dominated by *Eucalyptus pauciflora* (Snow Gum), *E. rubida* (Candlebark), *E. stellulata* (Back Sallee) and *E. viminalis* (Ribbon Gum), either as single species or in combinations. Other more localized *Eucalyptus* species may also occur within this community such as *E. aggregata* and *E. parvula*. A shrub layer may be present and sub-shrubs are often a component of the ground stratum, characteristic species include *Hymenanthera dentata*, and *Melichrus urceolatus*. The ground layer is dominated by grasses and other herbaceous species including *Themeda australis*, *Poa* spp., *Austrostipa* spp., *Austrodanthonia* spp., *Leptorhynchus squamatus*, *Chrysocephalum apiculatum*, and *Asperula conferta*.

Tablelands Frost Hollow Grassy Woodlands mainly occurs on valley floors, margins of frost hollows, footslopes and undulating terrain approximately between 600 and 1400 m in altitude. It occurs on a variety of substrates including granite, basalt, metasediments and Quaternary alluvium. Tablelands Frost Hollow Grassy Woodlands occurs as a part of a mosaic of native vegetation communities including swamps, bogs, wetlands, grasslands and sclerophyll forests. Tablelands Frost Hollow Grassy Woodlands falls within the general formation of Grassy Woodlands and the vegetation class of Subalpine Woodlands and Tableland Clay Grassy Woodlands.

Tablelands Frost Hollow Grassy Woodlands includes communities described as Frost Hollow Grassy Woodlands and Tablelands and Slopes Herb/Grassland/Woodland. Various high altitude woodlands of the Australian Alps, South Eastern Highlands and Sydney Basin Bioregions dominated by *Eucalyptus pauciflora* subsp. *niphophila*, *E. pauciflora* subsp. *debeuzevillei*, and *E. lacrimans* are not covered by this determination.

The Endangered Ecological Community Ribbon Gum, Mountain Gum, Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion has a similar structure to Tablelands Frost Hollow Grassy Woodlands but differs in its floristic composition. A number of Endangered Ecological Communities are known to inter-grade with the nominated community and are thus considered to be related. These include: White Box Yellow Box Blakely's Red Gum Woodland Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps and Natural Temperate Grassland of the Southern Tablelands.

Tablelands Frost Hollow Grassy Woodlands has been recorded from the local government areas of Bathurst, Blayney, Bega Valley, Blue Mountains, Bombala, Cabonne, Cooma-Monaro, Eurobodalla, Goulburn-Mulwarree, Lithgow, Oberon, Orange, Palerang, Shoalhaven, Snowy River, Tumbarumba,

Tumut, Upper Lachlan, Wingecarribee and Yass Valley local government areas (within the South Eastern Highlands, Sydney Basin, South East Corner, and NSW South western Slopes Bioregions and may occur elsewhere in these Bioregions.

Threatened Species

Table 1 below sets out the individual threatened flora species which the results of the literature review identified as having the potential to occur within the site. Table 1 also provides details of whether these individual flora species are listed under the EPBC Act and/or the TSC Act.

Table:1 - Individual Flora Species

Common Name	Scientific Name	EPBC	TSC	Data
PLANTS				
Yass Daisy	<i>Ammobium craspedioides</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
River Swamp Wallaby Grass	<i>Amphibromus fluitans</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Dense Cord-rush	<i>Baloskion longipes</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Thick-lipped Spider-orchid	<i>Caladenia tessellata</i>	V	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Buttercup Doubletail	<i>Diuris aequalis</i>	V	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Tricolor Diuris	<i>Diuris tricolor</i>	V	V	EPBC search states species or species habitat -may occur within Upper Lachlan LGA.
Cabbage Kunzea	<i>Kunzea cabbagei</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Basalt Pepper-cress	<i>Lepidium hyssopifolium</i>	E	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.

Common Name	Scientific Name	EPBC	TSC	Data
Hoary Sunray	<i>Leucochrysum albicans</i> var. <i>tricolor</i>	E	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Cobar Greenhood Orchid	<i>Pterostylis cobariensis</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Button Wrinklewort	<i>Rutidosia leptorrhynchoides</i>	E	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Kangaloon Sun Orchid	<i>Thelymitra</i> sp. <i>Kangaloon</i> (D.L Jones 18108)	CE	-	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Austral Toadflax	<i>Thesium australe</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA. Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.
Silky Swainson Pea	<i>Swainsonia sericea</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.
Small Purple Pea	<i>Swainsonia recta</i>	E	E	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Tarengo Leek Orchid	<i>Prasophyllum petilum</i>	E	E	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project

Key: CE= Critically Endangered, E= Endangered, V=Vulnerable.

2.4.2 Field Survey Results

2.4.2.1 General

The results of the field surveys detected no Endangered Ecological Communities or individual threatened

flora species listed under either the EPBC Act or the TSC Act within the site. The original field surveys were however, undertaken out of the Spring/Summer season when certain flora species are in flower and are hence more readily detectable. The additional targeted surveys which were undertaken to target threatened species (Appendix 5) did not detect any threatened species.

The vegetation across the site is represented for the most part by cleared grazing paddock, most of which is highly disturbed. Most of the more fertile areas of the site have been extensively cleared for grazing (primarily sheep grazing but also cattle). Parts of these cleared areas (primarily at the lower altitudes) would have probably once represented the Endangered Ecological community of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland however these areas are now largely cleared and pasture improved. The results of the surveys indicate that there is no Tablelands Frost Hollow Grassy Woodlands present on the site.

2.4.2.2 Cleared and Grazed Paddock Areas

For the purposes of the vegetation surveys the vegetation areas were mapped according to the timbered remnants remaining versus the cleared, pasture improved and fertilised grazing paddocks. The farmed areas have been farmed intensively and have been cleared and grazed historically. These areas were grouped for the mapping of the vegetation as Cleared and Grazed Paddock Areas.

The areas have been pasture improved through seeding of exotic grass species and clovers and also through the use of chemical fertilisers such as Superphosphate. There are also moderate numbers of weeds within these areas and these areas are used for the grazing of sheep and cattle. There are some native species of grasses still occurring within these paddock areas however the paddock areas do not represent Native Temperate Grassland due to the high levels of exotic species present along with their density.

It is likely that some of the paddock areas would have historically represented Native Temperate Grasslands before European settlement however due to the high levels of structural and floristic modification to the ecosystem this community is considered to be no longer present in this highly modified grazing system.

The analysis of the ground cover densities for these paddock areas indicated that the proportion of native tussock grasses was low and not consistent with the listing advice or final determinations for grassland communities. The areas were found to be predominately dominated by improved and exotic pasture grass species and as such they did not conform to the final determinations for the listed endangered ecological communities.

2.4.2.3 Remnant Native Vegetation

There are the following areas of remnant native forest vegetation remaining within the site as shown on the map in Appendix 4:

Remnant A

This remnant represents an area of approximately 45 hectares on the property of Hillview Park. It occurs approximately between two lines of turbines which are proposed to be located to its east and west. The turbine locations have been designed to avoid this remnant vegetation as do the service connections and there would be no disturbance to this vegetation as a result of this project.

The vegetation association in this remnant is representative of Western Tablelands Dry Forest. It contains Red Stringybark (*Eucalyptus macrorhyncha*), Silvertop Ash (*Eucalyptus sieberi*), Brittle Gum (*Eucalyptus mannifera*), Scribbly Gum (*Eucalyptus rossii*) and Candlebark (*Eucalyptus rubida*). This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act. This vegetation would not be disturbed or impacted by the project.

Remnant B

This remnant represents an area of approximately 171 hectares on the property of Hillview Park. It joins to some vegetation across the boundary to the adjoining property to the south. It is a very large remnant and represents the poorer country, which remains as on many farms due to its poor soil type and low agricultural potential. The vegetation is fenced off and is generally not grazed. Two turbines are proposed to be located at the margin of this remnant on two hill tops. These are turbines A18 and A19.

The vegetation association in this remnant is representative of Western Tablelands Dry Forest. It is dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Silvertop Ash (*Eucalyptus sieberi*) with other species such as Broad-leafed Peppermint (*Eucalyptus dives*), Brittle Gum (*Eucalyptus mannifera*), Scribbly Gum (*Eucalyptus rossii*) and Candlebark (*Eucalyptus rubida*). This vegetation is not representative of any Endangered Ecological Community (EEC) as listed under the EPBC Act or the TSC Act and no threatened species were detected within the area to be disturbed by proposed turbines A18 and A19. As no EES or threatened species would be impacted no offsets are required under the TSC Act (1995) or the EPBC Act (1999), however as there will be an impact on native vegetation the proponent has decided to provide an offset for this loss of native vegetation. This proposed offset has been designed in consultation with the Hawkesbury-Nepean Catchment Management Authority (HNCMA) and NSW Department of Planning and Infrastructure (DP&I).

This remnant is the subject of an existing Property Vegetation Plan agreement entered into by the landholder dated 17 December 2002 (2002 PVP). The 2002 PVP will expire on 17 December 2013. No works are proposed to be carried out in remnant B during the term of the 2002 PVP. Further, it is considered that the impacts from the placing of 2 turbines within this remnant would be very low. As outlined at section 1.4 above, it is proposed that the clearing required for the project, including in relation to Remnant B, will be offset by two new PVPs. Please refer to section 1.4 above for more information on the two proposed new PVPs.

Remnant C

This remnant occurs near to proposed turbine A17. It is a small remnant of approximately 3-4 hectares in size. It is fully fenced and not used for grazing. It would not be disturbed as part of the project.

It contains Red Stringybark (*Eucalyptus macrorhyncha*), Broad-leafed Peppermint (*Eucalyptus dives*), Brittle Gum (*Eucalyptus mannifera*), and Candlebark (*Eucalyptus rubida*). This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act. This remnant would not be disturbed by the project.

Remnant C is protected by an existing Property Vegetation Plan agreement entered into by the landholder

dated 12 February 2004 (2004 PVP). As the project will not disturb Remnant C, it will not impact on the performance by the landholder of its obligations in relation to Remnant C under the 2004 PVP.

Remnants D, E and F

These remnants have been quite disturbed in the past through some historical clearing. They contain Red Stringybark (*Eucalyptus macrorhyncha*), Broad-leafed Peppermint (*Eucalytus dives*), Brittle Gum (*Eucalytpus mannifera*), and Candlebark (*Eucalytpus rubida*). This vegetation is not representative of any Endangered Ecological Community listed under the EPBC Act or the TSC Act. Remnants D and F would not be disturbed by the project. Remnant E has been quite disturbed in the past and would have some disturbance from proposed turbine A12, however this disturbance would not create a significant impact on this remnant.

Remnant D is protected by the 2004 PVP and Remnant F is protected by the 2002 PVP (which will expire on 17 December 2013). As the project will not disturb Remnant D or Remnant F, it will not impact on the performance by the landholder of its obligations under the 2004 PVP or the 2002 PVP.

Remnant G

This remnant occurs on the property Wollondilly well away from any of the proposed development. It has been disturbed in the past through some historical clearing. It contains Red Stringybark (*Eucalyptus macrorhyncha*), a few Yellow Box (*Eucalyptus melliodora*), Broad-leafed Peppermint (*Eucalytus dives*), and Candlebark (*Eucalytpus rubida*). This area is highly modified and would require little to no disturbance as the access is already existing as part of the old Crookwell to Goulburn Road which remains as the main access to this property. This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act.

Remnant H

This remnant occurs adjacent to Pejar Dam. It has been disturbed in the past through the road construction and use of this area as a recreational area. It has also been disturbed in the past through some historical clearing. It contains Red Stringybark (*Eucalyptus macrorhyncha*) and Broad-leafed Peppermint (*Eucalytus dives*). This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act. There would only be minimal and temporary disturbance to this vegetation for the construction of the electricity easement line. Temporary disturbance of this vegetation for the electricity line easement would be in the order of 3000 square metres. This would be fully rehabilitated as part of the Ecological Management Plan and as such no offset is required.

Remnant I

This remnant occurs adjacent to Pejar Dam. It has been disturbed in the past through the road construction and use of this area as a recreational area. Currently it is used as a public recreation area and is grazed under lease by the owner of Wollondilly. It contains Red Stringybark (*Eucalyptus macrorhyncha*) and Broad-leafed Peppermint (*Eucalytus dives*). This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act. There would only be minimal and temporary disturbance to this vegetation for the construction of the electricity easement line. Temporary disturbance of this vegetation for the electricity line easement would be in the order of 900 square metres. The vegetation has been cleared in many places and maintained through grazing. Since disturbance would only be through transmission line interconnection there would be minimal disturbance as access could be via some existing tracks and cleared areas to erect infrastructure. Since the small area being disturbed would be restored through a Rehabilitation Plan no offset is required.

2.4.2.4 Paddock Areas (outside described remnants)

The main remnant areas have been described above. The other areas that occur are represented by largely modified paddocks. The levels of exotic species are generally high and most of the paddocks to be disturbed have been pasture improved.

2.4.2.5 Impacts of the project on remnant native vegetation

Turbines, internal access tracks and crane hard stands

Of the areas of remnant native vegetation only 3 turbines are proposed to be located in these remnant vegetation areas being turbines A12, A18 and A19 which are proposed to be located within remnants E and B. Only approximately 314 m² of this remnant vegetation is required to be disturbed for each turbine location, and up to 2,500 m² for the temporary crane hard stand for each of the three turbines. In addition approximately 2,000 square meters would be required for the road access for A12 and 4,000 square metres for the combined road accesses for A18 and A19. This level of vegetation removal is not considered significant for these remnants and would not constitute a significant impact. These turbine locations and associated access tracks and crane hard stand areas can be offset through the two new proposed PVP's (see section 1.4 above for details). This combined with the rehabilitation post construction would offset any impacts of the proposed development.

Access roads

Apart from the turbines, internal access tracks and temporary crane hard stand areas, the only significant vegetation disturbance that will result from the project is the access roads required to access the sites.

The following three possible access roads were examined for the proposed Crookwell 3 East:

- **Option 1** - Greywood Siding Road. This proposed access is option one and is the preferred access to the property. It utilises the existing Greywood Siding Road from Woodhouselee Road and this is termed Option 1 and is the preferred option for the access for Crookwell 3 East. This access is formed as a vehicle track and road reserve of 20 metres in width. It comes off Woodhouselee Road and is a defined road which is signed. The road passes through existing farm paddock which is highly modified and grazed for approximately 1.8 km of its length running from Woodhouselee Road to the east before the road turns north. Once the road turns north it is still highly modified grazing paddock with a combination of exotic and a few native pasture grass species. At the location of the old Goulburn to Crookwell railway crossing a small native vegetation remnant occurs which is represented by Red Stringybark (*Eucalyptus macrorhyncha*), Broad-leaved Peppermint (*Eucalyptus dives*), Brittle Gum (*Eucalyptus mannifera*), and Candlebark (*Eucalyptus rubida*). This vegetation is not representative of any Endangered Ecological Community as listed under the EPBC Act or the TSC Act. This would only have minimal impacts from the potential construction of the road for the access as the route of the road would be at its western extremity and most of this remnant occurs to the east of the proposed access road. Past this point the vegetation is generally cleared paddock with a mix of exotic and some native species and generally few overstorey tree species.
- **Option 2** – is from Woodhouselee Road just north of the existing access for the Hillview Park property. This access crosses grazed grassland which has been pasture improved. There would be negligible removal of native vegetation.
- **Option 3** – is to utilise the existing Boltons Road to access Crookwell 3 East. This is a formed road and would not result in any ecological impacts.

The following two possible access roads were examined for the proposed Crookwell 3 South:

- **Option 1** – This would utilise the existing access to the property known as Wollondilly. This access is part of the old Crookwell to Goulburn Road, which is a dual bitumen carriageway. The vegetation along this area contains mainly Red Stringybark (*Eucalyptus macrorhyncha*) and Broad-leafed Peppermint (*Eucalytus dives*). This would not impact any of this vegetation as the road is already present.
- **Option 2** – An access from the approximate centre of the property through to the Crookwell to Goulburn Road. This contains paddock with no significant impact likely from this option. Negligible native vegetation would require removal.

2.4.2.6 Extent of clearing required for the project

The extent of clearing of remnant vegetation as a result of the project would be small. These areas are shown on the maps in Appendix 4. The approximate areas of vegetation required to be removed are outlined below;

- Turbine A12 (314m² –turbine location) with the addition of 2,000m² for its access track, and up to 2,500 m² for the temporary crane hard stand area (total removal of vegetation being 4,814 m²). The removal of vegetation would be within mapped remnant E.
- Turbines A18 and A19 (314m² for each turbine location) with the addition of 4,000m² for their access tracks, and up to 5,000 m² for the temporary crane hard stand areas (total removal of vegetation being 9,628 m²). The removal of vegetation would be within mapped remnant B.
- Greywood Siding Road proposed access would remove approximately 5,000 m² of vegetation combined for the whole of its route.
- Wollondilly access point and the transmission line interconnection around Pejar Dam would remove approximately 4,000 m² of vegetation in total.

The total area to be cleared for the project is approximately 23,442 m² or 2.34 hectares.

The clearing of these areas would not result in any significant impacts on any endangered ecological communities. The other areas where the turbines and other infrastructure are located represent cleared grazing paddock much of which is pasture improved.

Vegetation Impact Summary Table

Vegetation Community Name	EPBC / TSC Act status	Total area mapped within the project footprint	Total area to be cleared	Total area to be offset
Western Tablelands Dry Forest	Not Listed	336 ha	2.34 ha	60 ha (15 ha in perpetuity and 45 ha for the life of the project)

3. METHODOLOGY - FAUNA

3.1 DESKTOP REVIEW

A literature review was carried out in order to assist in the identification of threatened fauna species and endangered ecological populations listed under the TSC Act and EPBC Act with potential to occur in the area. This literature review was based on database searches of:

- NPWS Wildlife Atlas for the Goulburn Mulwaree Local Government Area; and
- EPBC online Protected Matters database search tool for Upper Lachlan Local Government Area;

3.2 SURVEY METHODOLOGY

The field surveys were based on the following methodology;

1. Initial site familiarisation to determine potential ecological issues in relation to turbine cluster sitings, access tracks and access roads.
2. Field surveys to identify habitat types, condition and potential level of impacts.
3. Mapping of habitat types on aerial photographs. This was undertaken concurrently with the field surveys to identify the vegetation types.

The field surveys for fauna recorded attributes including; vegetation type and structure (Specht), slope, aspect, soils and geology, elevation, floristics, vegetation condition, foliage projection cover (FPC), level of understorey disturbance, fire history and level of weed invasion. As part of these surveys particular attention was paid to any threatened species listed under the TSC Act or EPBC Act which the literature review identified as having the potential to occur at the site. The survey was, however, undertaken out of season for some potential threatened fauna species and this is discussed in the limitations and further surveys proposed section below.

Fauna species recorded during the survey are represented in Appendix 2. The condition assessment and conservation ratings of the habitat present is described are based on the following criteria;

- **Poor:** Habitat which have suffered high levels of historical and current disturbance. These areas are highly modified both structurally and floristically in relation to the flora species present. They contain only the indicators of what the vegetation community and habitat would have once been. They contain no species features such as fallen timber, hollow trees, rocky outcrops, or waterbodies to provide potential habitat for threatened fauna. These areas are generally farming paddocks with limited trees remaining and are often pasture improved.
- **Moderate:** Areas of moderate quality habitat which retain many of their natural characteristics but have immediate indicators of disturbance and modification readily present. Moderate levels of structural and floristic modification evident to the vegetation and any landform features. These areas are generally open paddock with scattered overstorey trees.
- **Good:** Areas with high levels of natural integrity both structurally and floristically in relation to the vegetation which provides fauna habitat. May contain other features such as hollow trees, fallen timber, water bodies, rocky outcrops of other significant fauna habitat features.

Targeted Survey for microchiropteran bats:

Targeted surveys were undertaken for microchiropteran bats during late February 2010 before conditions cooled significantly. A total of 8 anabat sites were across the site. Each site was surveyed for two non-consecutive nights with the recorders set up to record the entire night. Calls were analysed in the office. Conditions for the surveys avoided wind, full moon, rain and temperatures were generally 18 degrees at dusk.

Additional targeted surveys were undertaken for the species as per the DGR's as outlined in Appendix 5. No threatened species were detected as a result of these surveys.

3.3 LIMITATIONS

Every survey has limitations in relation to timing and season. The original surveys were undertaken from late February 2010 to early June 2010. As such this timing did not coincide with the best survey season(s) for all of the fauna species which had been identified as having the potential to occur at the site. Every survey has limitations however and, as far as possible, potential species were addressed in the surveys.

3.4 RESULTS FAUNA

3.4.1 Literature Review

The results of the literature review and background searches revealed that a number of threatened species listed under the EPBC Act and the TSC Act have the potential to occur at the site.

Table 2 below sets out the individual threatened fauna species which the results of the literature review identified as having the potential to occur within the site. Table 2 also provides details of whether these individual fauna species are listed under the EPBC Act and/or the TSC Act.

Table 2: - Potential Threatened Fauna Species

Common Name	Scientific Name	EPBC	TSC	Data
BIRDS				
Regent Honeyeater	<i>Anthochaera phrygia</i>	E	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Swift Parrot	<i>Lathamus discolor</i>	E	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Superb Parrot	<i>Polytelis swainsonii</i>	V	V	EPBC search states breeding likely to occur within Upper Lachlan LGA.

Common Name	Scientific Name	EPBC	TSC	Data
Australian Painted Snipe	<i>Rostratula australis</i>	V	E	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Brown Treecreeper	<i>Climacteris picumnus victoriae</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Diamond Firetail	<i>Stagonopleura guttata</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Speckled Warbler	<i>Pyrrholaemus saggitatus</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Varied Sittella	<i>Daphoenositta chrysoptera</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Scarlet Robin	<i>Petroica boodang</i>		V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Barking Owl	<i>Ninox connivens</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.

Common Name	Scientific Name	EPBC	TSC	Data
Powerful Owl	<i>Ninox strenua</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Gang Gang Cockatoo	<i>Callocephalon fimbriatum</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	V	E	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Common Name	Scientific Name	EPBC	TSC	Data
AMPHIBIANS				
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Booroolong Frog	<i>Litoria booroolongensis</i>	E	E	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Yellow-spotted Tree Frog	<i>Litoria castanea</i>	CE	E	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Littlejohn's Tree Frog	<i>Litoria littlejohni</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Growling Grass Frog	<i>Litoria raniformis</i>	V	E	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Common Name	Scientific Name	EPBC	TSC	Data
INSECTS				
Golden Sun Moth	<i>Synemon plana</i>	CE	E	EPBC search states species or species habitat known to occur within Upper Lachlan LGA.

Common Name	Scientific Name	EPBC	TSC	Data
MAMMALS				
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Tiger Quoll	<i>Dasyurus maculatus maculatus (SE mainland population)</i>	E	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Greater Long-eared Bat	<i>Nyctophilus timoriensis (south-eastern form)</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Brush-tailed Rock Wallaby	<i>Petrogale penicillata</i>	V	E	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Long-nosed Potoroo	<i>Potorous tridactylus tridactylus</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Grey-headed Flying Fox	<i>Pteropus poliocephalus</i>	V	V	EPBC search states foraging, feeding or related behaviour known to occur within Upper Lachlan LGA.
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Eastern Bent Wing Bat	<i>Miniopterus schreibersi</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Large Footed Myotis	<i>Myotis macropus</i>	V	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project

Common Name	Scientific Name	EPBC	TSC	Data
Greater Broad-nosed Bat	<i>Scoteanax rueppelli</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Common Name	Scientific Name	EPBC	TSC	Data
FISHES				
Murray Cod	<i>Maccullochella peelii peelii</i>	V		EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Macquarie Perch	<i>Macquaria australasica</i>	E		EPBC search states species or species habitat may occur within Upper Lachlan LGA.
Common Name	Scientific Name	EPBC	TSC	Data
REPTILES				
Pink-tailed Worm Lizard	<i>Aprasia parapulchella</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Striped Legless Lizard	<i>Delma impar</i>	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.
Little Whip Snake	<i>Suta flagellum</i>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project
Grassland Earless Dragon	<i>Tympanocryptis pinquicollis</i>	E	E	Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project

Common Name	Scientific Name	EPBC	TSC	Data
Broad-headed Snake	<i>Hoplocephalus bungarioides</i>	V	E	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.

Key: CE= Critically Endangered, E= Endangered, V=Vulnerable.

3.4.2 Field Survey Results

General

The results of the field surveys detected no individual threatened fauna species listed under either the EPBC Act or the TSC Act within the site. Most of the areas where the turbines and access roads/electricity easements are proposed represent cleared grazing paddock with high levels of disturbance and limited fauna habitat for most of the fauna listed. Only three of the proposed turbines are located in forested areas and these are proposed turbines A12, A18 and A19. The history of the use of most of the turbine sites through clearing for grazing, grazing and pasture improvement has severely degraded the habitat throughout most of the study site. Due to the proposed use of many of the existing access roads the levels of impacts are reduced and there would be no impacts on stream habitats. As the land is already fragmented there are considered to be no biodiversity corridor impacts likely.

The hollow densities within the remnants where turbines A12, A18 and A19 are proposed are at a density of approximately 5 hollows per hectare. This is based on hollows of 10cm in diameter (and greater) which is regarded as the general minimal size for most microchiropteran bats and arboreal mammals and birds. During the field surveys consideration was given as to the potential for hollow removal as well as the number of hollows to be potentially removed by the proposal. As the proposal is flexible somewhat in its road access for these three turbines micro-siting of the road guided by an ecologist should result in only minimal hollow removal.

The habitat types present generally conform to the remaining vegetation remnants on the site. The original field surveys were however, undertaken out of the Spring/Summer season which is optimal for identifying certain fauna species. Further targeted threatened species surveys were undertaken in the spring and summer period (refer to Appendix 5) in the more natural areas of the site. These surveys did not detect any threatened species.

4. DISCUSSION - FLORA

4.1 ENDANGERED ECOLOGICAL COMMUNITIES

No endangered ecological communities were identified as being present within the site. Accordingly, no endangered ecological communities will be significantly impacted as part of the project. Generally most of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland that would have occurred on the lower and more fertile soil types within the site have been extensively cleared for agriculture. Due to the high levels of use of the land resulting in high levels of clearing and pasture improvement it has been determined that there are no Endangered Ecological Communities present on this site. In any event, the project avoids any large impacts on the remaining vegetation remnants.

The whole design of the project from its conception has been to avoid impacts as far as possible and the existing farm roads are to be used where possible to reduce potential impact(s). As discussed in section 2.4.2 the amount of clearing of remnant forest vegetation is small and is estimated at approximately 2 hectares out of a site area of 1500 hectares. Although no offset is required as no EEC or Threatened Species would be impacted an offset of 60ha is being provided by way of two separate PVP's (see section 1.4 above for details). The impact assessment undertaken for the project indicates that there would be no potential impacts on Endangered Ecological Communities listed under either the EPBC or TSC Acts.

Nonetheless, each of the Endangered Ecological Communities which were considered likely to have the potential to occur with the site and to be impacted by the project were further assessed in accordance with:

- the criteria contained in the EPBC Act in the case of threatened flora species listed under the EPBC Act (see section 4.3 below); and
- the 7-Part Tests of Significance criteria in the case of threatened flora species listed under the TSC Act (see section 4.4 below).

4.2 INDIVIDUAL THREATENED SPECIES

The background searches identified a number of threatened flora species with the potential to occur within the site. Table 3 below provides information as to the identified potential threatened species, its preferred habitat and its potential to occur and likely impacts. This table also provides an analysis of each species with potential to occur and the potential likely impacts.

As set out in Table 3, whilst no listed threatened flora species were identified during the survey, each listed threatened flora species which was considered likely to have the potential to occur with the site and to be impacted by the project was further assessed in accordance with:

- the criteria contained in the EPBC Act in the case of threatened flora species listed under the EPBC Act (see section 4.3 below); and
- the 7-Part Tests of Significance criteria in the case of threatened flora species listed under the TSC Act (see section 4.4 below).

Table 3: - Individual Flora Species and Analysis

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
Yass Daisy <i>(Ammobium craspedioides)</i>	Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (<i>Eucalyptus blakelyi</i> , <i>E. bridgesiana</i> , <i>E. dives</i> , <i>E. goniocalyx</i> , <i>E. macrorhyncha</i> , <i>E. mannifera</i> , <i>E. melliodora</i> , <i>E. polyanthemos</i> , <i>E. rubida</i>). Apparently unaffected by light grazing, as populations persist in some grazed sites. Found in a number of TSRs, Crown reserves, cemeteries and roadside reserves within the region. Survey season is spring and early summer in wet years.	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA. <u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u>
River Swamp Wallaby Grass <i>(Amphibromus fluitans)</i>	Generally only found in the Hawkesbury/Nepean, Murray and Murrumbidgee CMA's. There is a recent record of this species near Laggan in Upper Lachlan Shire. <i>Amphibromus fluitans</i> grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with <i>Potamogeton</i> and <i>Chamaeraphis</i> species. <i>Flowering time for is from spring to autumn or November to March.</i>	V	V	EPBC search states species or species habitat may occur within Upper Lachlan LGA. <i>This species was not detected in the surveys which were undertaken. Potential habitat is negligible to low and only occurs around Pejar Dam which would not be impacted by the project. The likelihood of this species occurring around Pejar Dam is low and if present potential habitat would not be impacted. No further consideration is deemed necessary for this species.</i>
Dense Cord-rush <i>(Baloskion longipes)</i>	Known to occur in the Hawkesbury/Nepean, Lachlan and Southern Rivers CMA's. Restricted to the east of the Oberon to Goulburn Road. Occurs in: Mountain Gum - Manna Gum open forest of the South Eastern Highlands, Peppermint - Mountain Gum - Brown Barrel moist open forest of the South Eastern Highlands, Snow Gum - Mountain Gum tussock grass-herb	V	V	EPBC search states species or species habitat likely to occur within Upper Lachlan LGA. <i>This species was not detected in the surveys which were undertaken. Potential habitat is low due to the overall lack of swamps present and even drainage depressions are few and all are grazed. The microhabitat for this species is not present and it is deemed that no</i>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>forest of the South Eastern Highlands, and Black Sallee - Tussock Grass open woodland of the South Eastern Highlands.</p> <p>Specifically this species occurs in seasonally inundated peat, sandy wetland swamps. Its distribution overlaps with the EEC "Temperate Highland Peat Swamps on Sandstone".</p> <p>It is best detected in summer and autumn when it is in fruit.</p>			<p><i>significant habitat for this species would be impacted as part of this project. No further consideration is deemed necessary.</i></p>
<p>Thick-lipped Spider-orchid (<i>Caladenia tessellata</i>)</p>	<p>Occurs in the Hawkesbury/Nepean, Hunter/Central Rivers, Southern Rivers and Sydney Metro Catchments. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).</p>	V	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat is of low quality. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Buttercup Doubletail (<i>Diuris aequalis</i>)</p>	<p>The Buttercup Doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Like most <i>Diuris</i> species, the flowers mimic native pea flowers to attract pollinators; in this case the model is a small-flowered wedge-pea (<i>Gompholobium</i> sp.), with which it always grows. Leaves die back each year and resprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.</p> <p><i>Flowering occurs between mid-</i></p>	V	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat is moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p><i>October and mid-November in the southern part of its range, and between mid-November and early December in the populations north of the Abercrombie River. For the Lachlan CMA the flowering time is between late October and mid-December</i></p>			
<p>Tricolor Diuris (<i>Diuris tricolor</i>)</p>	<p>This species has been found in the Lachlan CMA.</p> <p>The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (<i>Callitris</i> spp.). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW. Usually recorded as common and locally frequent in populations, however only one or two plants have also been observed at sites.</p> <p>The species has been noted as growing in large colonies. Disturbance regimes are not known, although the species is usually recorded from disturbed habitats. Associated species include <i>Callitris glaucophylla</i>, <i>Eucalyptus populnea</i>, <i>Eucalyptus intertexta</i>, Ironbark and Acacia shrubland. The understorey is often grassy with herbaceous plants such as Bulbine species. Flowers from September to November or generally spring. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent.</p> <p>Best detected for the few weeks when it flowers in Spring.</p>	V	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low and is not representative of its known habitat. No further consideration is deemed necessary for this species.</i></p>
<p>(<i>Kunzea cambagei</i>)</p>	<p>Cabbage Kunzea occurs mainly in the Yerranderie / Mt Werong area in the Blue Mountains but has also been collected on the Wanganderry Plateau, and at Medway and along the Wingecarribee River (near Berrima).</p> <p>Cabbage Kunzea is restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments.</p>	V	V	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. The site is not considered to represent potential habitat for this species and no further assessment is considered necessary. The site does not contain the wet heath habitat where this species occurs.</i></p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	Flowering occurs between September and November.			
Basalt Pepper-cress (<i>Lepidium hysopifolium</i>)	<p>In NSW, there is a small population consisting near Bathurst, two populations near Bungendore, and one near Crookwell. The species was also recorded near Armidale in 1945 and 1958; however it is not known whether it remains in this area. A specimen collected in the Cooma area about 100 years ago may also be Aromatic Peppercress. Appears to respond to disturbance, having appeared after soil disturbance at one site. Its cryptic and non-descript nature (appearing like several weed species) makes it hard to detect. The species occurs in a variety of habitats including woodland with a grassy understorey and grassland. Found in Grassy Woodlands and Temperate Montane Grasslands as well as highly disturbed environments such as roadsides.</p> <p><i>Best detected when in flower or fruit (spring, summer and autumn).</i></p>	E	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low to moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>Tricolor</i>)	<p>In <u>NSW</u> and <u>ACT</u>, Hoary Sunray currently occurs on the Southern Tablelands and some adjacent areas (e.g. Tarcutta, Bega valley) in an area roughly bounded by Albury, Bega and Goulburn, in the South Eastern Highlands, Australian Alps and Sydney Basin bioregions. It once occurred more widely in inland NSW, with records from near Cobar, Dubbo, Lithgow, Mossvale and Delegate. The taxon is now absent from the NSW South West Slopes, South Eastern Corner, Cobar Penepplain and Brigalow Belt South bioregions.</p> <p>Occurs in a range of habitat types from upland peat to stoney sites.</p>	E	V	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low to moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
Cobar Greenhood Orchid (<i>Pterostylis cobarimensis</i>)	<p>Known chiefly from the Nyngan-Cobar-Bourke district in the far western plains of New South Wales. Recorded districts include Narrabri, Nyngan, Cobar, Nymagee, Mt Gundabooka, Mt Grenfel and Mutawintji National Park. There are</p>	V	V	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken.</i></p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>also records from the Darling Downs district of Queensland. Known to occur in the Central West, Namoi and Western CMA districts.</p> <p>Habitats are eucalypt woodlands, open mallee or <i>Callitris</i> shrublands on low stony ridges and slopes in skeletal sandy-loam soils. Associated species include <i>Eucalyptus morrisii</i>, <i>E. viridis</i>, <i>E. intertexta</i>, <i>E. vicina</i>, <i>Callitris glaucophylla</i>, <i>Geijera parviflora</i>, <i>Casuarina cristata</i>, <i>Acacia doratoxylon</i>, <i>Senna</i> spp. and <i>Eremophila</i> spp. Flowers from September to November.</p>			<p><i>The known distribution of this species is not present on this site. The known habitat is also not present on the site. This species is unlikely to occur on the basis of distribution and known habitat. No further consideration is deemed necessary for this species on this basis.</i></p>
<p>Button Wrinklewort (<i>Rutidosia leptorrhynchoides</i>)</p>	<p>Local populations at Goulburn, the Canberra - Queanbeyan area and at Michelago. Other populations occur in Victoria.</p> <p>Occurs in Box-Gum Woodland, secondary grassland derived from Box-Gum Woodland or in Natural Temperate Grassland; and often in the ecotone between the two communities. Grows on soils that are usually shallow, stony red-brown clay loams; tends to occupy areas where there is relatively less competition from herbaceous species (either due to the shallow nature of the soils, or at some sites due to the competitive effect of woodland trees). Exhibits an ability to colonise disturbed areas (eg. vehicle tracks, bulldozer scrapings and areas of soil erosion). Normally flowers between December to March; plants do not usually flower until their second year.</p>	E	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low based on soil type and background geology. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Kangaloon Sun Orchid (<i>Thelymitra sp. Kangaloon</i> (D.L Jones 18108))</p>	<p>Flowers in late October and early November. Occurs on Temperate Highland Peat swamps on Sandstone endangered ecological community. It is known from 3 locations near Robertson in the Southern Highlands all above the Kangaloon Aquifer. The locations are; Butlers Swamp, Sotckyard Swamp and Molly Morgan Swamp.</p>	C E	-	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>There is no potential habitat for this species on the study site. This species is unlikely to occur and would not be impacted. No further assessment or analysis is deemed necessary.</i></p>
<p>Austral Toadflax (<i>Thesium australe</i>)</p>	<p>Austral Toad-flax is found in very small populations scattered across</p>	V	V	<p>EPBC search states species or species habitat likely to occur within Upper</p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Known to occur in the following CMA areas: Border Rivers/Gwydir, Hunter/Central Rivers, Murray, Murrumbidgee, Namoi, Northern Rivers, Southern Rivers. Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (<i>Themeda australis</i>). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.</p>			<p>Lachlan LGA.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low to moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Silky Swainson Pea (<i>Swainsonia sericea</i>)</p>	<p>Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Found in Natural Temperate Grassland and Snow Gum <i>Eucalyptus pauciflora</i> Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines <i>Callitris</i> spp. Habitat on plains unknown. Regenerates from seed after fire.</p>	-	V	<p>Director Generals Requirements.</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low to moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Small Purple Pea (<i>Swainsonia recta</i>)</p>	<p>Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. It is also known from the ACT and a single population of four plants near Chiltern in Victoria.</p> <p>Before European settlement Mountain Swainson-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum <i>Eucalyptus blakelyi</i>, Yellow Box <i>E. melliodora</i>,</p>	E	E	<p>Director Generals Requirements</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low to moderate. Much of the sites are pasture improved with a variety of exotic and some native grasses.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Candlebark Gum <i>E. rubida</i> and Long-leaf Box <i>E. goniocalyx</i>. Grows in association with understorey dominants that include Kangaroo Grass <i>Themeda australis</i>, poa tussocks <i>Poa</i> spp. and spear-grasses <i>Austrostipa</i> spp. Plants die back in summer, surviving as rootstocks until they shoot again in autumn. Flowers throughout spring, with a peak in October. Seeds ripen at the end of the year. Individual plants have been known to live for up to 20 years. Generally tolerant of fire, which also enhances germination by breaking the seed coat and reduces competition from other species.</p> <p><i>It bears one to several sprays of between 10 and 20 purple, pea-shaped flowers, between late September and early December. Flowers are followed by pods up to 10 mm long in summer.</i></p>			
Tarengo Leek Orchid (<i>Prasophyllum petilum</i>)	<p>Natural populations are known from a total of four sites in NSW. These area at Boorowa, Captains Flat, Ilford and Delegate. Also occurs at Hall in the Australian Capital Territory. This species has also been recorded at Bowning Cemetery where it was experimentally introduced, though it is not known whether this population has persisted.</p> <p>Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock <i>Poa labillardieri</i> Black Gum <i>Eucalyptus aggregata</i> and tea-trees <i>Leptospermum</i> spp. at Captains Flat and within the grassy groundlayer dominated by Kanagroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT). Apparently highly susceptible to grazing, being retained only at little-grazed travelling stock reserves (Boorowa & Delegate) and in cemeteries (Captains Flat, Ilford and Hall). Population density at the Boorowa site is higher in the open grassland dominated by wallaby grasses <i>Austrodanthonia</i></p>	E	E	<p>Director Generals Requirements</p> <p><i>This species was not detected in the surveys which were undertaken. Potential habitat quality is low. Much of the sites are pasture improved with a variety of exotic and some native grasses</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat/Survey Season	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>spp., compared to that within the denser stands of Kangaroo Grass <i>Themeda australis</i>. Highly colonial, with very large numbers present and very conspicuous at the Boorowa site, but cryptic at the Captains Flat, Ilford and Delegate sites where low numbers are recorded. Flowers are followed by fleshy seed capsules in summer. Plants retreat into subterranean tubers after fruiting, so are not visible above-ground.</p> <p>Flowers in October at Boorowa and Ilford, and December at Captains Flat and Delegate.</p>			

Key: CE= Critically Endangered, E= Endangered, V=Vulnerable.

4.3 ASSESSMENT OF SIGNIFICANCE (EPBC ACT)

The EPBC Act Guidelines provide guidance as to the assessment required to determine whether an action is “likely to have a significant impact” on any matter of “national environmental significance” such that the action will be a controlled action which requires approval under the EPBC Act. Whilst no endangered ecological communities or threatened flora species listed under the EPBC Act were identified during the surveys, this section of the report contains an assessment in accordance with the EPBC Act Guidelines of each endangered ecological community and threatened flora species listed under the EPBC Act which was considered likely to have the potential to both occur with the site and to be impacted by the project.

4.3.1 Significant Impact Criteria for Critically Endangered and Endangered Threatened Flora Species

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

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

No critically endangered or endangered species were detected. It is unlikely that the project would lead to a long term decrease in the size of any population. No critically endangered or endangered species or populations were found during the surveys. Accordingly, it is considered that the project is not likely to lead to a long term decrease in the size of any critically endangered or endangered species or population.

- **reduce the area of occupancy of the species**

As no species were detected and since only a small area of the total site area would be disturbed there is unlikely to be a reduction in the area of occupancy of any species.

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

The project has been designed to avoid potential impacts on any threatened species or their habitats. No threatened populations were found and on the basis of the project it is unlikely that there would be any fragmentation to any possibly occurring populations.

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

The project has been designed to avoid where possible potential habitat for threatened species. No habitat critical to the survival of any threatened species would be impacted such that it would be placed at risk of extinction.

- **disrupt the breeding cycle of a population**

The habitats present have been degraded through farming. This is a major impact on the habitats present and as such has resulted in their historical degradation. It is unlikely that the breeding cycles of any critically endangered or endangered species or threatened population would be placed at risk of extinction as the project has been designed to avoid habitat where possible and since the footprint of the project is small. There would be no disruption to any population of any threatened species.

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

The level of potential modification to habitat is considered small. The project has aimed to avoid any native habitats and has as far as possible sited turbines and infrastructure within modified paddock areas. It is unlikely that there would be any significant modification of habitat such that any threatened species is likely to decline.

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

The project is unlikely to result in the introduction of any invasive species that are not already on the site. Accordingly, it is not considered necessary to implement measures such as wash down bays for vehicles entering and exiting the site to reduce the risk of weed spread.

- **introduce disease that may cause the species to decline, or interfere with the recovery of the species.**

It is highly unlikely that any disease would be introduced which could impact any potentially occurring threatened species.

4.3.2 Significant Impact Criteria for Vulnerable Threatened Flora Species

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

No important populations of any threatened species were detected and the project is designed to reduce impacts on any potential habitat. As such there is unlikely to be any long-term decrease in the size of any important population of any species.

- **reduce the area of occupancy of an important population**

The project will remove some habitat however it is unlikely that there would be any significant reduction in any area of occupancy of an important population.

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

No important populations were detected and the project has been designed to avoid impacts on biodiversity. The scale of the infrastructure is small within the site and it is highly unlikely that any fragmentation of an important population would occur. Gene flow would be maintained.

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

No habitat critical to the survival of any threatened species has been detected. As such it is unlikely that any habitat critical to the survival of any species would be impacted.

- **disrupt the breeding cycle of an important population**

The breeding resources of no threatened species are likely to be impacted. As such there would be no disruption to the breeding cycle of any important population.

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

There is unlikely to be any significant alteration to the quality or availability of habitat such that the extent of any species is likely to decline. The project has generally been designed to reduce the potential impacts.

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

It is highly unlikely that any invasive species would be introduced. As such there would be no harmful impact on any vulnerable species habitat.

- **introduce disease that may cause the species to decline, or interfere substantially with the recovery of the species.**

It is highly unlikely that any disease would be introduced. As such there would be no harmful impact on any vulnerable species habitat.

4.3.3 Significant Impact Criteria for Critically Endangered and Endangered Ecological Communities

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**

There would be no reduction in the extent of any vegetation communities on the site.

- **fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines**

There would be no increase in any fragmentation on the site due to clearing for roads or transmission lines as a result of this project. The project is located within farmland which already has a highly fragmented landscape. The project has been designed to minimise the levels of

potential impacts.

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

No habitat critical to the survival of any ecological community would be impacted.

- **modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater**

There would be no significant modification or destruction of abiotic factors such that it would impact any ecological community's survival.

- **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**

No substantial change to the species composition of any ecological community would occur. No functionally significant species would be lost and the incidence of fire would not be increased.

- **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, or**

There would be no reduction in the quality or integrity of any ecological community. The proposed impacts are of a low level and are in keeping with the current impacts in relation to the farming system.

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

The project would not interfere with the recovery of any ecological community.

In conclusion, the results of the assessment undertaken are that the project is not likely to result in a significant impact on any endangered ecological community or flora species listed under the EPBC Act. Accordingly, the project is not considered, for this reason, to be a controlled action which requires approval under the EPBC Act.

4.4 ASSESSMENT OF IMPACT (TSC ACT)

As outlined at section 1.5.2 above, the DGRs prepared under Part 3A of the EP&A Act provide that the EA must include an assessment of all project components on flora and fauna and their habitat consistent with the Draft Guidelines for Threatened Species Assessment (DEC, 2005). These provide guidance as to the matters which are to be taken into account in assessing the impacts of projects on species, populations and ecological communities. This includes the factors which are to be taken into account in applying the 7 Part Test of Significance contained in the TSC Act. The 7 Part Test of Significance entails the following

points:

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Whilst no endangered ecological communities or threatened flora species listed under the TSC Act were identified during the surveys, this section of the report contains an assessment in accordance with the Draft Guidelines for Threatened Species Assessment (DEC, 2005) of each endangered ecological communities and threatened flora species listed under the TSC Act which was considered likely to have the potential to both occur with the site and to be impacted by the project.

4.4.1 Endangered Ecological Communities – 7 Part Test of Significance

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable for Endangered Ecological Communities.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable for Endangered Ecological Communities.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

There would be no adverse effects on the extent of any endangered ecological community such that its local occurrence is likely to be placed at risk of extinction. No endangered community would be substantially or adversely modified in relation to its composition such that its local occurrence is likely to be placed at risk of extinction. There would be negligible impacts on any ecological communities and the whole project has been designed to minimise any potential impacts. The site has been farmed for many years and this has significantly modified the landscape and removed most of the native vegetation, which would have occurred on site prior to European settlement.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

There will be no significant reduction in the extent or modification, fragmentation or isolation to any endangered ecological community. The long term survival of no endangered ecological community would be impacted. There are high levels of fragmentation within this highly modified landscape and the project would not significantly increase this fragmentation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present within the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the project aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

4.4.2 Threatened Species – 7 Part Tests of Significance

Yass Daisy (*Ammobium craspedioides*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected during the surveys. This species can persist under light grazing in a range of forest types, Box Gum Woodland and associated grassland. The levels of existing disturbance to the site make it unlikely to occur in most places as the site is pasture improved in most areas and generally has high levels of grazing present. This species has been found in the Crookwell area (DECCW).

The potential for a viable local population to be impacted are relatively low due to the relatively small level of overall impact as a result of the project. It was not detected in the targeted survey which were undertaken. As such no viable local populations would be placed at risk of extinction. The current impacts of grazing are likely to impact this species more significantly than the project if this species were to occur.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat

is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat relates to this site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Thick-lipped Spider-orchid (*Caladenia tessellata*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected however the surveys were outside its flowering season. Additional seasonal surveys are planned. Generally the habitat present being disturbed is not high quality potential habitat for this species. It is unlikely that a viable local population would be impacted such that it would be placed at risk of extinction as a result of the project.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is located at this site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Buttercup Doubletail (*Diuris aequalis*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the surveys which were undertaken. Generally the habitat present being disturbed is not high quality potential habitat for this species. It is unlikely that a viable local population would be impacted such that it would be placed at risk of extinction as a result of the project. As this species was not detected no impact would occur.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is located at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Basalt Pepper-cress (*Lepidium hyssopifolium*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected during the surveys which were undertaken. Generally the habitat present being disturbed is not high quality potential habitat for this species. There would be no impacts on any viable local population.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is located at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as

the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Hoary Sunray (*Leucochrysum albicans* var. *Tricolor*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is potential microhabitat available for this species around some of the stony areas on the site. Generally, these areas of potential microhabitat are being mostly avoided except for some limited potential impacts due to turbine construction. This species was not detected in the surveys which were undertaken. As such it is unlikely that any local viable population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is located at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Button Wrinklewort (*Rutidosia leptorrhynchoidea*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Generally areas of potential microhabitat are being avoided except for some limited potential impacts due to turbine and road construction. This species was not detected in the surveys which were undertaken. As such it is unlikely that any local viable population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as

the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Austral Toadflax (*Thesium australe*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species is found in damp locations with Kangaroo Grass of which it is parasitic on its roots. Potential habitat for this species is low on site. The areas where the turbines are to be located and the proposed access infrastructure is not located in such an area and this species was not detected. No impacts on this species are likely.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Silky Swainson Pea (*Swainsonia sericea*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is potential microhabitat available for this species around some of the bushland remnant areas on the site. Generally, these areas of potential microhabitat are being avoided except for some limited potential impacts due to turbine construction. This species was not detected during the surveys which were undertaken. As such it is unlikely that any local viable population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Small Purple Pea (*Swainsonia recta*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is potential microhabitat available for this species around some of the bushland remnant areas on the site. Generally, these areas of potential microhabitat are being mostly avoided except for some limited potential impacts due to turbine construction. This species was not detected in the surveys undertaken. As such it is unlikely that any local viable population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small.

No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat

abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

Tarengo Leek Orchid (*Prasophyllum petilum*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is potential microhabitat available for this species around some of the bushland remnant areas on the site. Generally, these areas of potential microhabitat are being mostly avoided except for some limited potential impacts due to turbine construction. This species was not detected during the surveys which were undertaken. As such it is unlikely that any local viable population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small.

No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat

abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation.

In conclusion, the results of the assessment undertaken are that the project is not likely to result in a significant impact on any flora species listed under the TSC Act. Accordingly, there is no requirement for a species impact statement to be prepared.

5. DISCUSSION - FAUNA

5.1 THREATENED SPECIES

No threatened species as listed under the EPBC or TSC Acts were located during the surveys which were undertaken.

The design of the project is such that it has aimed at avoiding impacts on native vegetation if possible and this has therefore reduced the potential for significant impacts on any threatened fauna species. Generally, the siting of most of the proposed turbines is within highly modified, cleared grazing paddocks used for sheep and cattle grazing. Most of these paddocks have been pasture improved and fertilised with superphosphate. The location of the project is within a highly modified environment, which has been modified since early European settlement for farming purposes.

Only three turbines are located within areas of remnant vegetation and these are turbines A12, A18 and A19. In general, it is likely that these three turbines can be erected using minimal impact and removal of vegetation. The construction phase of the project creates the most potential disturbance however once the construction is complete only maintenance roads remain and all other areas can be rehabilitated. Hollows are at a density of approximately 5 hollows per hectare within these areas. As per the recommendations in this report the exact location of the access within these remnant areas should be defined in consultation with an ecologist to mark out potential hollow habitat trees to avoid (if possible) as part of the proposal. As such it is likely that most hollows can be avoided and only minimal potential hollow removal would occur.

As discussed in section 2.4.2 the amount of clearing is estimated at approximately 2 hectares of these forest vegetation remnants. Some of these areas are for crane pads for the erection of the turbines and these areas would be rehabilitated.

Table 4 in below provides information as to the identified potential threatened species, its preferred habitat and its potential to occur and likely impacts.

As set out in Table 4, whilst no listed threatened fauna species were identified during the survey, each listed threatened fauna species which was considered likely to have the potential to occur with the site and to be impacted by the project was further assessed in accordance with:

- the criteria contained in the EPBC Act in the case of threatened fauna species listed under the EPBC Act (see section 5.4 below); and
- the 7-Part Tests of Significance criteria in the case of threatened fauna species listed under the TSC Act (see section 5.5 below).

Table 4: - Potential Threatened Fauna Species and Analysis

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
BIRDS				
<p>Regent Honeyeater (<i>Anthochaera phrygia</i>)</p>	<p>Distribution</p> <p>The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years non-breeding flocks converge on flowering coastal woodlands and forests.</p> <p>Habitat and ecology</p> <p>The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.</p> <p>The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises : <i>E. microcarpa</i>, <i>E. punctata</i>, <i>E. polyanthemos</i>, <i>E. mollucana</i>, <i>Corymbia robusta</i>, <i>E. crebra</i>, <i>E. caleyi</i>, <i>Corymbia maculata</i>, <i>E. mckieana</i>, <i>E. macrorhyncha</i>, <i>E. laevopinea</i>, and <i>Angophora floribunda</i>. Nectar and fruit from the mistletoes <i>A. miquelii</i>, <i>A. pendula</i>, <i>A. cambagei</i> are also eaten during the breeding season. When</p>	E	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>The habitat on site does not represent the preferred breeding or foraging habitat for this species. This species is migratory and it quite specialised and selective of its foraging and breeding areas. This species was not detected in the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material.</p> <p>There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak</p>			
Swift Parrot <i>(Lathamus discolor)</i>	<p>Distribution</p> <p>Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes.</p> <p>Habitat and ecology</p> <p>On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i>, Spotted Gum <i>Corymbia maculata</i>, Red Bloodwood <i>C. gummifera</i>, Mugga Ironbark <i>E. sideroxylon</i>, and White Box <i>E. albens</i>. Commonly used lerp infested trees include Inland Grey Box <i>E. microcarpa</i>, Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i>. Return to some foraging sites on a cyclic basis depending on food availability.</p>	E	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>The preferred foraging species of eucalypt are not present for this species on the study site. The project would not impact any significant habitat for this species. This species would not be significantly impacted and no further consideration is deemed necessary.</i></p>
Superb Parrot <i>(Polytelis swainsonii)</i>	<p>Distribution</p> <p>The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the</p>	V	V	<p>EPBC search states breeding likely to occur within Upper Lachlan LGA.</p> <p><i>This species generally occurs approximately 100km further west of the site. They are generally absent in winter as they migrate north to the Upper Namoi and Gwydir River Region. They are migratory in this area and the habitat on the</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. It is estimated that there are less than 5000 breeding pairs left in the wild</p> <p>Habitat and ecology</p> <p>Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.</p> <p>In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.</p> <p>Nest in small colonies, often with more than one nest in a single tree.</p> <p>Breed between September and January.</p> <p>May forage up to 10 km from nesting sites, primarily in grassy box woodland.</p> <p>Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.</p>			<p><i>site is only of low quality. As there would be minimal impacts to only low quality habitat there are unlikely to be any significant impacts on this species.</i></p> <p><i>This species was not detected in the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Australian Painted Snipe (<i>Rostratula australis</i>)</p>	<p>Distribution</p> <p>In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin.</p> <p>Habitat and ecology</p> <p>Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.</p> <p>Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.</p> <p>The nest consists of a scrape in the ground, lined with grasses and leaves.</p> <p>Breeding is often in response to local conditions; generally occurs from September to December.</p>	V	E	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>Potential habitat for this species only occurs around Pejar Dam. The microhabitat of the dam is not favourable for this species within this area as it requires cover of grasses, lignum or low scrub. These are generally absent from Pejar Dam. This species would not be impacted by the project and no further consideration is deemed necessary.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Forages nocturnally on mud-flats and in shallow water.</p> <p>Feeds on worms, molluscs, insects and some plant-matter.</p>			
<p>Brown Treecreeper (Climacteris picumnus victoriae)</p>	<p>Distribution</p> <p>The two subspecies grade into each other through central NSW. Individuals are active, noisy and conspicuous, and give a loud ‘pink’ call, often repeated in contact, and sometimes given in a series of 5 - 10 descending notes. Breeds from July to Feb across its range.</p> <p>The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges.</p> <p>The western boundary of the range of <i>Climacteris picumnus victoriae</i> runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper <i>Climacteris picumnus picumnus</i> which then occupies the remaining parts of the state.</p> <p>The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys.</p> <p>The population density of this subspecies has been greatly reduced over much of its range, with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant vegetation fragments smaller than 300 hectares that have been isolated or fragmented for more than 50 years.</p> <p>Habitat and ecology</p> <p>Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found</p>	-	V	<p>Director Generals Requirements</p> <p>Potential habitat is present on the site however this species was not detected even though it is quite conspicuous. The level of potential impact is considered to be generally low as only a small portion of this species potential habitat would be disturbed as part of the project.</p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.</p> <p>Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many Sites; territorial year-round, though some birds may disperse locally after breeding.</p> <p>Gregarious and usually observed in pairs or small groups of eight to 12 birds; terrestrial and arboreal in about equal proportions; active, noisy and conspicuous while foraging on trunks and branches of trees and amongst fallen timber; spend much more time foraging on the ground and fallen logs than other treecreepers.</p> <p>When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks and fallen timber, and along trunks and lateral branches; up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (<i>Eucalyptus sideroxylon</i>) and paperbarks, and sap from an unidentified eucalypt are also eaten, along with lizards and food scraps; young birds are fed ants, insect larvae, moths, craneflies, spiders and butterfly and moth larvae.</p> <p>Hollows in standing dead or live trees and tree stumps are essential for nesting.</p> <p>The species breeds in pairs or cooperatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha). Each group is composed of a breeding pair with retained male offspring and, rarely, retained female offspring. Often in pairs or cooperatively breeding groups of two to five birds.</p>			
Diamond Firetail (<i>Stagonopleura</i>)	<p>Distribution</p> <p>The Diamond Firetail is endemic to south-</p>	-	V	Letter from DECCW setting out the matters it would like addressed in the environmental

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
<i>guttata</i>)	<p>eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River.</p> <p>Habitat and ecology</p> <p>Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).</p> <p>Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands.</p> <p>Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.</p> <p>Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.</p> <p>Usually encountered in flocks of between five to 40 birds, occasionally more.</p> <p>Groups separate into small colonies to breed, between August and January.</p> <p>Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests.</p> <p>Birds roost in dense shrubs or in smaller nests built especially for roosting.</p> <p>Appears to be sedentary, though some populations move locally, especially those in the south.</p> <p>Has been recorded in some towns and near farm houses.</p>			<p>assessment for the project</p> <p>This species was not detected during the surveys which were undertaken.</p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
Hooded Robin (<i>Melanodryas cucullata cucullata</i>)	<p>Distribution</p> <p>The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>This species was not detected during the surveys which were undertaken.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>local seasonal movements are possible. The south-eastern form (subspecies <i>cucullata</i> is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies <i>picata</i>. Two other subspecies occur outside NSW.</p> <p>Habitat and ecology</p> <p>Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.</p> <p>Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.</p> <p>Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey.</p> <p>Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.</p> <p>May breed any time between July and November, often rearing several broods.</p> <p>The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground.</p> <p>The nest is defended by both sexes with displays of injury-feigning, tumbling across the ground.</p> <p>A clutch of two to three is laid and incubated for fourteen days by the female. Two females often cooperate in brooding.</p>			<p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Speckled Warbler (<i>Pyrrholaemus sagittatus</i>)</p>	<p>Distribution</p> <p>The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>This species was not detected during the surveys which were undertaken. There is potential habitat on site around potential turbines A18 and A19. The potential habitat is considered to be of low quality as it is closed woodland or rocky hills whereas this species generally</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Habitat and ecology</p> <p>The Speckled Warbler lives in a wide range of <i>Eucalyptus</i> dominated communities that have a grassy understorey, often on rocky ridges or in gullies.</p> <p>Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.</p> <p>Large, relatively undisturbed remnants are required for the species to persist in an area.</p> <p>The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees.</p> <p>Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.</p> <p>The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside.</p> <p>A clutch of 3-4 eggs is laid, between August and January, and both parents feed the nestlings. The eggs are a glossy red-brown, giving rise to the unusual folk names 'Blood Tit' and 'Chocolatebird'.</p> <p>Some cooperative breeding occurs. The species may act as host to the Black-eared Cuckoo.</p> <p>Speckled Warblers often join mixed species feeding flocks in winter, with other species such as Yellow-rumped, Buff-rumped, Brown and Striated Thornbills.</p>			<p><i>prefers more open areas.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Varied Sittella (Daphoenositta chrysoptera)</p>	<p>Distribution</p> <p>The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west (Higgins and Peter 2002; Barrett <i>et al.</i> 2003).</p> <p>Habitat and ecology</p> <p>It inhabits eucalypt forests and woodlands,</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>Potential habitat is present on site however this species was not detected. Potential habitat is only in the vegetated areas around A12, A18 and A19 however the potential habitat is of only low to moderate quality for this species.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>especially rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland. The Varied Sittella feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Generation length is estimated as 5 years (Debus and Soderquist 2008).</p>			<p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Scarlet Robin <i>(Petroica boodang)</i></p>	<p>Distribution</p> <p>The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter.</p> <p>Habitat and ecology</p> <p>The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding.</p> <p>The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.</p> <p>This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps.</p> <p>Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.</p> <p>The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude.</p> <p>In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>Potential habitat is present on site however this species was not detected. Potential habitat is only in the vegetated areas around A12, A18 and A19 however the potential habitat is of only low to moderate quality for this species.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached.</p> <p>Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer.</p> <p>Scarlet Robin pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season.</p> <p>This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub.</p> <p>Eggs are pale greenish-, bluish- or brownish-white, spotted with brown; clutch size ranges from one to four.</p> <p>Birds usually occur singly or in pairs, occasionally in small family parties; pairs stay together year-round.</p> <p>In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands.</p>			
<p>Barking Owl (<i>Ninox connivens</i>)</p>	<p>Distribution</p> <p>The Barking Owl is found throughout continental Australia except for the central arid regions. Although common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains (especially the Pilliga) and in some northeast coastal and escarpment forests. Many populations have crashed as woodland on fertile soils was cleared, leaving linear riparian strips of remnant trees as the last inhabitable areas. Sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights.</p> <p>Habitat and ecology</p> <p>Inhabits woodland and open forest, including fragmented remnants and partly</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>This species was not detected and the potential prey base is moderate for this species. Diurnal roost sites are sparse as are nesting hollows. The project is unlikely to remove any significant potential habitat for this species.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>cleared farmland. Is flexible in its habitat use and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils.</p> <p>Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance.</p> <p>Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these prey populations it becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Can catch bats and moths on the wing, but typically hunts by sallying from a tall perch.</p> <p>Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.</p> <p>Two or three eggs are laid in hollows of large, old trees. Living eucalypts are preferred though dead trees are also used. Nest Sites are used repeatedly over years by a pair, but they may switch Sites if disturbed by predators (e.g. goannas).</p> <p>Nesting occurs during mid-winter and spring. Female incubates for 5 weeks, roosts outside the hollow when chicks are 4 weeks old, then fledging starts 2 weeks later. Young are dependent for several months</p> <p>Territorial pairs respond strongly to recordings of Barking Owl calls from up to 6 km away, though humans rarely hear this response farther than 1.5 km. Because disturbance reduces the pair's foraging time, and can pull the female off her eggs even on cold nights, recordings should not be broadcast unnecessarily nor during the nesting season</p>			
<p>Powerful Owl (<i>Ninox strenua</i>)</p>	<p>Distribution</p> <p>The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains. Now uncommon throughout its range where it occurs at low densities.</p> <p>Habitat and ecology</p> <p>The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.</p> <p>The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine (<i>Syncarpia glomulifera</i>), Black She-oak (<i>Allocasuarina littoralis</i>), Blackwood (<i>Acacia melanoxylon</i>), Rough-barked Apple (<i>Angorophora floribunda</i>), Cherry Ballart (<i>Exocarpus cupressiformis</i>) and a number of eucalypt species.</p> <p>The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. There may be marked regional differences in the prey taken by Powerful Owls. For example in southern NSW, Ringtail Possum make up the bulk of prey in the lowland or coastal habitat. At higher elevations, such as the tableland forests, the Greater Glider may constitute almost all of the prey for a pair of Powerful Owls. Birds comprise about 10% of the diet, with flying foxes important in some areas. As most prey species require hollows and a shrub layer, these are important habitat components for the owl.</p> <p>Pairs of Powerful Owls are believed to have high fidelity to a small number of hollow-bearing nest trees and will defend a large home range of 400-1450 ha.</p> <p>Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. During the breeding season, the male Powerful Owl roosts in a “grove” of up to 20-30 trees, situated within 100-200 metres of the nest tree where the female shelters.</p>			<p><i>The habitat types present on the site are not this species preferred habitat types. No signs of this species were detected in the form of owl whitewash, nest sites, diurnal shelter sites or owl pellets. If this species is utilising the local area it is unlikely to be significantly impacted by the project.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Powerful Owls are monogamous and mate for life. Nesting occurs from late autumn to mid-winter, but is slightly earlier in north-eastern NSW (late summer - mid autumn). Clutches consist of two dull white eggs and incubation lasts approximately 38 days.</p>			
<p>Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>)</p>	<p>Distribution</p> <p>The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee.</p> <p>Habitat and ecology</p> <p>In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.</p> <p>May also occur in sub-alpine Snow Gum <i>Eucalyptus pauciflora</i> woodland and occasionally in temperate rainforests.</p> <p>Move to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas.</p> <p>Favours old growth attributes for nesting and roosting.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p>This species was not detected in the surveys undertaken despite the winter period being a time when they often move from Wet Sclerophyll Forest to the Drier more open eucalypt forests and woodlands. The potential habitat on site does not represent its preferred winter habitat. Overall the level of potential habitat disturbance would be low as a result of the project and this species is unlikely to be significantly impacted.</p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Glossy Black Cockatoo (<i>Calyptorhynchus lathami</i>)</p>	<p>Distribution</p> <p>The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.</p>	V	E	<p>Director Generals Requirements</p> <p><i>There is negligible foraging habitat for this species on the site. It was not detected in the surveys undertaken. Hollow densities for this sized bird for nesting are also generally low. These two critical habitat resources in combination make it unlikely that this site forms</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Habitat and ecology</p> <p>Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) occur.</p> <p>In the Riverina area, again usually associated with woodlands containing Drooping She-oak but also recorded in open woodlands dominated by Belah (<i>Casuarina cristata</i>).</p> <p>Feeds almost exclusively on the seeds of several species of she-oak (<i>Casuarina</i> and <i>Allocasuarina</i> species), shredding the cones with the massive bill.</p> <p>Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.</p>			<p><i>an important habitat for this species.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
AMPHIBIANS				
<p>Giant Burrowing Frog (<i>Heleioporus australiacus</i>)</p>	<p>Distribution</p> <p>The Giant Burrowing Frog is distributed in south eastern NSW and Victoria, and appears to exist as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria.</p> <p>Habitat and ecology</p> <p>Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water.</p> <p>This frog is a slow growing and long-lived species, living up to 10 years of age, possibly longer.</p> <p>Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.</p> <p>Spends more than 95 % of its time in non-breeding habitat in areas up to 300 m from</p>	V	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species generally only calls for 1-2 weeks after rain in October to November. The habitat on site does not represent its preferred potential habitat. The proposed development will not significantly disturb any potential habitat for this species. As this species does not call every year and only generally only calls after heavy rain in October to November it can be missed. The potential habitat is of low quality, does not represent its preferred habitat and would not be significantly disturbed by the project. No further consideration is deemed necessary for this species.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size.</p> <p>Individuals move into the breeding site either immediately before or following heavy rain and occupy these sites for up to 10 days. Most individuals will not attempt to breed every year.</p> <p>The Giant Burrowing Frog has a generalist diet and studies to date indicate that they eat mainly invertebrates including ants, beetles, cockroaches, spiders, centipedes and scorpions.</p> <p>When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Males show strong territoriality at breeding sites. This species breeds mainly in Autumn, but has been recorded calling throughout the year. Egg masses are foamy with an average of approximately 500-800 eggs and are laid in burrows or under vegetation in small pools. After rains, tadpoles are washed into larger pools where they complete their development in ponds or ponded areas of the creekline. Tadpole development ranges from around 12 weeks duration to up to 12 months with late developing tadpoles overwintering and completing development when warmer temperatures return.</p>			
<p>Booroolong Frog (<i>Litoria booroolongensis</i>)</p>	<p>Distribution</p> <p>The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. The species is rare throughout most of the remainder of its range.</p> <p>Habitat and ecology</p> <p>Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.</p>	E	E	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA. <i>This species is known to occur in the Crookwell area (DECCW). There is potential habitat in and around Steeves Creek and to a lesser extent First Creek. It was not detected. The potential impacts on these habitats would be small due to the lack of disturbance to potential habitat.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Adults occur on or near cobble banks and other rock structures within stream margins.</p> <p>Shelter under rocks or amongst vegetation near the ground on the stream edge.</p> <p>Sometimes bask in the sun on exposed rocks near flowing water during summer.</p> <p>Breeding occurs in spring and early summer and tadpoles metamorphose in late summer to early autumn.</p> <p>Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.</p> <p>Known to occur in Crookwell LGA (DECCW).</p>			<p><u>impact analysis section of this report.</u></p>
<p>Yellow-spotted Tree Frog (<i>Litoria castanea</i>)</p>	<p>Distribution</p> <p>There is only a single known population of the Yellow-Spotted Bell Frog, which occurs on the Southern Tablelands. Historically, this species occurred in two separate highland ranges, on the New England Tableland and on the southern and central highlands from Bathurst/Orange to Bombala.</p> <p>Habitat and ecology</p> <p>Require large permanent ponds or slow flowing streams with plenty of emergent vegetation such as bulrushes.</p> <p>Adults are active during spring and summer and bask on sunny days.</p> <p>Move and forage at night on grassy banks or float on the water's surface.</p> <p>Males call at night from the open water and breeding generally occurs during or following rain.</p> <p>Eggs are laid amongst aquatic vegetation.</p> <p>Shelter during autumn and winter under fallen timber, rocks, other debris or thick vegetation.</p>	<p>C E</p>	<p>E</p>	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>The habitat formed by Steeves and First Creeks is not representative of this species preferred habitat. They generally require very slow flowing streams with good vegetative cover.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Littlejohn's Tree Frog (<i>Litoria littlejohni</i>)</p>	<p>Distribution</p> <p>Littlejohn's Tree Frog has a distribution that includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria. The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian</p>	<p>V</p>	<p>V</p>	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species is very rare and breeds in late summer or early spring. No perched swamps are on site and this species is not likely to have any potential</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude.</p> <p>Habitat and ecology</p> <p>This species breeds in the upper reaches of permanent streams and in perched swamps.</p> <p>Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.</p> <p>Breeding is triggered by heavy rain and can potentially occur all year, but is usually from late summer to early spring when conditions are favourable.</p> <p>Males call from low vegetation close to slow flowing pools.</p> <p>Eggs are laid in loose gelatinous masses attached to small submerged twigs.</p> <p>Eggs and tadpoles are mostly found in still or slow flowing pools that receive extended exposure to sunlight, but will also use temporary isolated pools.</p>			<p><i>breeding habitat impacted by the project.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Growling Grass Frog (<i>Litoria raniformis</i>)</p>	<p>Distribution</p> <p>In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area in recent years. The species is also found in Victoria, Tasmania and South Australia, where it has also become endangered.</p> <p>Habitat and ecology</p> <p>Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no</p>	V	E	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>The habitat on site does not represent this species preferred potential habitat.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>available natural habitat.</p> <p>Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels.</p> <p>During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops.</p> <p>Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop.</p> <p>Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.</p> <p>Prey includes a variety of invertebrates as well as other small frogs, including young of their own species.</p>			
INSECTS				
Golden Sun Moth (<i>Synemon plana</i>)	<p>Distribution</p> <p>The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. It is now known from only 40 sites in NSW, about 12 sites in the Australian Capital Territory and eight sites in Victoria.</p> <p>Habitat and ecology</p> <p>Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses <i>Austrodanthonia</i> spp.</p> <p>Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for</p>	C E	E	<p>EPBC search states species or species habitat known to occur within Upper Lachlan LGA.</p> <p><i>The potential habitat on site for this species is generally of low quality. It was no detected during the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males.</p> <p>Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses <i>Austrostipa</i> spp. or Kangaroo Grass <i>Themeda australis</i>.</p> <p>Adults are short-lived (one to four days) and do not feed - having no functional mouthparts; the larvae are thought to feed exclusively on the roots of wallaby grasses.</p> <p>Males spend their entire adult life patrolling the grassland in search of females; once mated, the females spend their time laying eggs at the bases of wallaby grass tussocks.</p> <p>Females have reduced hind wings and are reluctant to fly, even when disturbed, though males are capable of active and prolonged flight. However, males will not fly long distances (no greater than 100 m) away from areas of suitable habitat. Thus populations separated by distances of greater than 200 m can be considered effectively isolated and populations which have gone extinct, or vacant patches of suitable habitat, are highly unlikely to be recolonised.</p> <p>The flight period is relatively short, typically lasting from six to eight weeks (during November and December in the ACT region, possibly earlier or later in other regions). Males fly only in bright sunshine during the warmest part of the day (1000 - 1400 hrs). Adults emerge continuously throughout the flying season.</p> <p>Larvae feed on the roots of the wallaby grass plant. The larval development time (and thus generation time) is unknown - it possibly varies between one and three years.</p>			
MAMMALS				
Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)	<p>Distribution</p> <p>Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW.</p>	V	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>No caves were detected on site to form the breeding habitat of</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>There are scattered records from the New England Tablelands and North West Slopes.</p> <p>Habitat and ecology</p> <p>Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Hirundo ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves. They remain loyal to the same cave over many years.</p> <p>Found in well-timbered areas containing gullies.</p> <p>The relatively short, broad wing combined with the low weight per unit area of wing indicates maneuverable flight. This species probably forages for small, flying insects below the forest canopy.</p> <p>Likely to hibernate through the coolest months.</p> <p>It is uncertain whether mating occurs early in winter or in spring.</p>			<p><i>this species. They were not detected in the Anabat surveys which were undertaken. This species would not be significantly impacted by the project as its breeding habitat would not be impacted and it has a broad range of foraging habitat in the local area. This species would not be significantly impacted and no further consideration is deemed necessary.</i></p>
<p>Tiger Quoll (<i>Dasyurus maculatus maculatus</i> mainland population)) (SE)</p>	<p>Distribution</p> <p>The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common.</p> <p>Habitat and ecology</p> <p>Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds.</p> <p>Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.</p> <p>Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites.</p>	E	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>No signs of this species were detected in the form of den or latrine sites. Potential den sites are very few on the site. This species generally favours large tracts of bushland with dense vegetated creeklines which form its connecting pathways in the landscape. Even if this species were to occur (which is unlikely) it would not be significantly impacted due to the nature of the project. No further consideration is deemed necessary for this species.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Use 'latrine sites', often on flat rocks among boulder fields and rocky cliff-faces; these may be visited by a number of individuals; latrine sites can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals.</p> <p>Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl.</p> <p>Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creeklines.</p> <p>Average litter size is five; both sexes mature at about one year of age.</p>			
<p>Greater Long-eared Bat <i>(Nyctophilus timoriensis (south-eastern form))</i></p>	<p>Distribution</p> <p>Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species.</p> <p>Habitat and ecology</p> <p>Inhabits a variety of vegetation types, including mallee, bulloak <i>Allocasuarina leuhmanni</i> and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland.</p> <p>Roosts in tree hollows, crevices, and under loose bark.</p> <p>Slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground.</p> <p>Mating takes place in autumn with one or two young born in late spring to early summer.</p>	V	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species was not detected in the Anabat surveys which were undertaken. As this species forages over a large area and since negligible potential breeding or sheltering habitat would be removed this species is unlikely to be significantly impacted by the project.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Brush-tailed Rock Wallaby <i>(Petrogale penicillata)</i></p>	<p>Distribution</p> <p>The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. However the distribution of the species across its</p>	V	E	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>There is negligible potential habitat for this species as there are no rocky escarpments</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>original range has declined significantly in the west and south and has become more fragmented. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit.</p> <p>Habitat and ecology</p> <p>Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges facing north.</p> <p>Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.</p> <p>Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night.</p> <p>Highly territorial and have strong site fidelity with an average home range size of about 15 ha.</p> <p>Live in family groups of 2 – 5 adults and usually one or two juvenile and sub-adult individuals.</p> <p>Dominant males associate and breed with up to four females.</p> <p>Breeding is likely to be continuous, at least in the southern populations, with no apparent seasonal trends in births.</p>			<p><i>present. This species is unlikely to occur and would not be impacted. No further consideration is deemed necessary.</i></p>
<p>Long-nosed Potoroo (<i>Potorous tridactylus tridactylus</i>)</p>	<p>Distribution</p> <p>The Long-nosed Potoroo is found on the south-eastern coast of Australia, from Queensland to eastern Victoria and Tasmania, including some of the Bass Strait islands. There are geographically isolated populations in western Victoria. In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm.</p> <p>Habitat and ecology</p> <p>Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy</p>	V	V	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species preferred habitat of heaths is not present on this site. This species is highly unlikely to occur and requires no further consideration.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>loam soil is also a common feature.</p> <p>The fruit-bodies of hypogeous (underground-fruited) fungi are a large component of the diet of the Long-nosed Potoroo. They also eat roots, tubers, insects and their larvae and other soft-bodied animals in the soil.</p> <p>Often digs small holes in the ground in a similar way to bandicoots.</p> <p>Mainly nocturnal, hiding by day in dense vegetation - however, during the winter months animals may forage during daylight hours.</p> <p>Individuals are mainly solitary, non-territorial and have home range sizes ranging between 2-5 ha.</p> <p>Breeding peaks typically occur in late winter to early summer and a single young is born per litter. Adults are capable of two reproductive bouts per annum.</p>			
<p>Grey-headed Flying Fox (<i>Pteropus poliocephalus</i>)</p>	<p>Distribution</p> <p>Grey-headed Flying-foxes are found within 200 km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria.</p> <p>Habitat and ecology</p> <p>Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.</p> <p>Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.</p> <p>Individual camps may have tens of thousands of animals and are used for mating, birth and the rearing of young.</p> <p>Annual mating commences in January and a single young is born each October or November.</p> <p>Site fidelity to camps is high with some camps being used for over a century.</p> <p>Travel up to 50 km to forage.</p> <p>Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.</p> <p>Also forage in cultivated gardens and fruit</p>	V	V	<p>EPBC search states foraging, feeding or related behaviour known to occur within Upper Lachlan LGA.</p> <p><i>No camps were detected for this species. The potential foraging resources and potential camp sites are not preferred by this species. This species would not be impacted and require no further consideration.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	crops and can inflict severe crop damage.			
Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>)	<p>Distribution</p> <p>The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.</p> <p>Habitat and ecology</p> <p>Prefers moist habitats, with trees taller than 20 m.</p> <p>Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.</p> <p>Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.</p> <p>Hibernates in winter.</p> <p>Females are pregnant in late spring to early summer.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There are potential roost and foraging areas on the site. This species was not detected in the Anabat surveys. Generally very few potential roost and breeding trees would require removal as part of the project. If this species were to occur avoiding the removal of hollow trees would reduce any potential impacts as potential breeding sites are important for its survival. Microchiropteran bat species do however change roosts every few days to avoid predation.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
Eastern Bent Wing Bat (<i>Miniopterus schreibersii oceanensis</i>)	<p>Distribution</p> <p>Eastern Bent-wing Bats occur along the east and north-west coasts of Australia.</p> <p>Habitat and ecology</p> <p>Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.</p> <p>Form discrete populations centered on a maternity cave that is used annually in spring and summer for the birth and rearing of young.</p> <p>Maternity caves have very specific temperature and humidity regimes.</p> <p>At other times of the year, populations disperse within about 300 km range of maternity caves.</p> <p>Cold caves are used for hibernation in southern Australia.</p> <p>Breeding or roosting colonies can number from 100 to 150,000 individuals.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>No caves were detected on site to form the breeding habitat of this species. They were not detected in the Anabat surveys which were undertaken. This species would not be significantly impacted by the project as its breeding habitat would not be impacted and it has a broad range of foraging habitat in the local area. This species would not be significantly impacted and no further consideration is deemed necessary.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	Hunt in forested areas, catching moths and other flying insects above the tree tops.			
<p>Large Footed Myotis (<i>Myotis macropus</i> (formally <i>Myotis adversus</i>))</p>	<p>Distribution</p> <p>The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.</p> <p>Habitat and ecology</p> <p>Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.</p> <p>Forage over streams and pools catching insects and small fish by raking their feet across the water surface.</p> <p>In NSW females have one young each year usually in November or December.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>This species has potential habitat on the site however they generally prefer streams with more surface water for foraging. It was not detected in the Anabat surveys despite potential stream and dam habitat being targeted. Generally there would no disturbance to the waterbodies on the site and as such this species is unlikely to be impacted by the project.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>)</p>	<p>Distribution</p> <p>The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.</p> <p>Habitat and ecology</p> <p>Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.</p> <p>Although this species usually roosts in tree hollows, it has also been found in buildings.</p> <p>Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m.</p> <p>Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There are potential roost and foraging areas on the site. This species was not detected in the Anabat surveys. Generally very few potential roost and breeding trees would require removal as part of the project. If this species were to occur avoiding the removal of hollow trees would reduce any potential impacts as potential breeding sites are important for its survival. Microchiropteran bat species do however change roosts every few days to avoid predation.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>to eat other bat species.</p> <p>Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity Sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.</p>			
<p>Squirrel Glider (<i>Petaurus norfolcensis</i>)</p>	<p>Distribution</p> <p>The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.</p> <p>Habitat and ecology</p> <p>Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.</p> <p>Prefers mixed species stands with a shrub or Acacia midstorey.</p> <p>Live in family groups of a single adult male one or more adult females and offspring.</p> <p>Require abundant tree hollows for refuge and nest sites.</p> <p>Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There is potential habitat for this species on site in and around remnants A and B. Generally there will be low levels of potential impacts on this species potential habitat. This species was not detected in the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Yellow-bellied Sheath-tailed Bat (<i>Saccolaimus flaviventris</i>)</p>	<p>Distribution</p> <p>The Yellow-bellied Sheath-tail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.</p> <p>Habitat and ecology</p> <p>Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.</p> <p>When foraging for insects, flies high and fast over the forest canopy, but lower in</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There are potential roost and foraging areas on the site. This species was not detected in the Anabat surveys. Generally very few potential roost and breeding trees would require removal as part of the project. If this species were to occur avoiding the removal of hollow trees would reduce any potential impacts as potential breeding sites are important for its survival. Microchiropteran bat species do however change roosts every few day to avoid</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>more open country.</p> <p>Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.</p> <p>Breeding has been recorded from December to mid-March, when a single young is born.</p> <p>Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.</p>			<p><i>predation. This species, although being the only high flier of the microchiropteran bats is unlikely to be impacted by bat strike from the blades of the turbines as although it flies high it only generally flies above the tree canopy which is below the blade impact height.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
FISHES				
<p>Murray Cod <i>(Maccullochella peelii peelii)</i></p>	<p>Distribution</p> <p>The Murray Cod is found extensively throughout the Murray Darling Basin in the south-eastern region of Australia. Its range throughout the Basin includes South Australia, Victoria, NSW, ACT and Queensland. Historically the species occurred throughout the entire Basin, with the exception of the upper reaches of some tributaries. It still occurs throughout most of the Basin with the exception of some localised extinctions. The Murray Darling Basin contains approximately 13 245 km of waterways that may encompass areas of suitable habitat for the Murray Cod. The estimated extent of occurrence is 660 km². Some translocated populations exist outside the species' natural distribution in impoundments and waterways in NSW and Victoria.</p> <p>Habitat and ecology</p> <p>The Murray Cod has the ability to live in a diverse range of habitats, including clear rocky streams (such as those found in the upper western slopes of NSW), to slow flowing, turbid rivers and billabongs. Within the large range of habitats, the Murray Cod is usually found near complex structural cover such as large rocks, snags, overhanging vegetation and other woody structures. The Murray Cod is considered a main channel specialist as it is frequently found in the main river channel and larger tributaries. It is found in floodplain channels when they contain water;</p>	V	-	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species is highly unlikely to occur as preferred habitat is generally absent. This species would not be impacted and no further consideration is deemed necessary.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>although this usage appears limited. Juveniles are most commonly found in the main river channel until about one year of age, after which they branch out (National Murray Cod Recovery Team 2009).</p>			
<p>Macquarie Perch (<i>Macquaria australasica</i>)</p>	<p>Distribution</p> <p>The natural geographical range of the Macquarie Perch was once widespread through the cooler upper reaches of the southern tributaries of the Murray-Darling river system; however, its distribution did not usually extend to the source of these rivers. Although rare downstream in the Murray River, this species occurred in the Barmah Lakes region and nearby tributaries such as Broken Creek and the upper reaches of the Macquarie River system. Prior to 1970, this species was recorded at 52 localities within its natural geographical range in the Murray-Darling Basin, however, since then it has been recorded at only 20 localities.</p> <p>Macquarie Perch was a popular and abundant angling and food species and strong populations existed in the 1950s in rivers and lakes such as the Goulburn River and tributary streams, including the Yea River and Lake Eildon in Victoria. Populations existed in east flowing waterways in the Hawkesbury and Shoalhaven River catchments including the Nepean and Avon Rivers, and also in some of Sydney's water supply dams. The species also occurs in the upper reaches of the Murrumbidgee and Lachlan Rivers catchments in NSW and the Murrumbidgee, Molonglo, Paddys and Cotter Rivers of the ACT.</p> <p>Fish from coastal catchments are morphologically and genetically distinct from fish in the Murray-Darling Basin. Although some experts consider these differences warrant taxonomic differentiation, no such separation has occurred. Although it has been suggested that coastal populations were translocated from the Murray-Darling Basin, no records of translocation to coastal rivers have been documented for the Hawkesbury or Shoalhaven populations.</p> <p>Of the many recorded translocations of this species from within and outside its natural range, few translocated populations remain</p>	E	-	<p>EPBC search states species or species habitat may occur within Upper Lachlan LGA.</p> <p><i>This species is highly unlikely to occur as preferred habitat is generally absent. This species would not be impacted and no further consideration is deemed necessary.</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>or have self-sustaining breeding populations. Macquarie Perch were translocated from the upper Murrumbidgee River near Cooma to two locations in the Snowy River, however, since then, no fish have been recorded at that location. The populations in Cataract Dam (NSW) and the Yarra River (Victoria) were translocated from the Murray River.</p> <p>Habitat and ecology</p> <p>The Macquarie Perch is a riverine, schooling species. It prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks. Spawning occurs just above riffles (shallow running water). Populations may survive in impoundments if able to access suitable spawning sites.</p> <p>Spawning sites used by the Macquarie Perch in the rivers flowing into Lake Eildon (between 1966–69) consisted of rubble substrate of small boulders, pebbles and gravel. Water depth was 0.2–0.9 m (usually 0.4–0.6 m) and water velocity was 0.3–0.6 m/s. There was also a pool (usually 15–30 m long and at least 1.5 m deep) immediately upstream and fast-flowing broken water immediately downstream. Although this species can tolerate temperatures of < 9 °C (the temperature of the water at the bottom of Lake Eildon) they appear to require a temperature of at least 16.5 °C for spawning to occur. Newly hatched yolk sac larvae shelter amongst pebbles. In Seven Creeks, this species occurred in deep pools and riffles above falls where the substrate was gravel and boulders.</p>			
REPTILES				
Pink-tailed Worm Lizard (<i>Aprasia parapulchella</i>)	<p>Distribution</p> <p>The Pink-tailed Worm Lizard is only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West</p>	V	V	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>There is some potential habitat present for this species however this is very limited and is of low to moderate quality. The</i></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Wyalong. This species is also found in the Australian Capital Territory.</p> <p>Habitat and ecology</p> <p>Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>).</p> <p>Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.</p> <p>Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.</p> <p>Feeds on the larvae and eggs of the ants with which it shares its burrows.</p> <p>It is thought that this species lays 2 eggs inside the ant nests during summer; the young first appear in March.</p>			<p><i>species was not detected during the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Striped Legless Lizard (<i>Delma impar</i>)</p>	<p>Distribution</p> <p>The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia.</p> <p>Habitat and ecology</p> <p>Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component.</p> <p>Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.</p> <p>Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass <i>Themeda australis</i>, spear-grasses <i>Austrostipa</i> spp. and poa tussocks <i>Poa</i> spp., and occasionally wallaby grasses <i>Austrodanthonia</i> spp.</p> <p>Sometimes present in modified grasslands with a significant content of exotic grasses.</p> <p>Sometimes found in grasslands with significant amounts of surface rocks,</p>	V	V	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>There is some potential habitat present for this species however this is very limited and is of low to moderate quality. This species was not detected during the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>which are used for shelter.</p> <p>Actively hunts for spiders, crickets, moth larvae and cockroaches.</p> <p>Two papery eggs are laid in early summer.</p> <p>Goes below ground or under rocks or logs over winter.</p>			
<p>Little Whip Snake (<i>Suta flagellum</i>)</p>	<p>Distribution</p> <p>The Little Whip Snake is found within an area bounded by Crookwell in the north, Bombala in the south, Tumbarumba to the west and Braidwood to the east.</p> <p>Habitat and ecology</p> <p>Occurs in Natural Temperate Grasslands and grassy woodlands, including those dominated by Snow Gum <i>Eucalyptus pauciflora</i> or Yellow Box <i>E. melliodora</i>.</p> <p>Also occurs in secondary grasslands derived from clearing of woodlands.</p> <p>Found on well drained hillsides, mostly associated with scattered loose rocks.</p> <p>Most specimens have been found under rocks or logs lying on, or partially embedded in the soil.</p> <p>Little is known about the habits of this small snake as it is primarily nocturnal.</p> <p>Feeds on lizards and frogs.</p> <p>Up to seven live young are born between September and February.</p>	-	V	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There is some potential habitat present for this species however this is very limited and is of low to moderate quality.</i></p> <p><i>This species was not detected in the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>
<p>Grassland Earless Dragon (<i>Tympanocryptis pinguicolla</i>)</p>	<p>Distribution</p> <p>Historically, the Grassland Earless Dragon ranged from Bathurst to Cooma, including the ACT region. The only populations now known are in the ACT and adjacent NSW at Queanbeyan, and on the Monaro Basalt Plains between Cooma and south-west of Nimitabel. Formerly known from Victoria, though no recent records.</p> <p>Habitat and ecology</p> <p>Restricted to a small number of Natural Temperate Grassland sites dominated by wallaby grasses (<i>Nothodanthonia spp.</i>), spear grasses (<i>Austrostipa spp.</i>), Poa Tussock (<i>Poa sieberiana</i>), Red Grass (<i>Bothriochloa macra</i>), and occasionally Kangaroo Grass (<i>Themeda australis</i>).</p>	E	E	<p>Letter from DECCW setting out the matters it would like addressed in the environmental assessment for the project.</p> <p><i>There is some potential habitat present for this species however this is very limited and is of low to moderate quality.</i></p> <p><i>This species was not detected during the surveys which were undertaken.</i></p> <p><u>Potential impacts on this species and its potential habitat is examined in the impact analysis section of this report.</u></p>

Name	Preferred Habitat	EPBC	TSC	Potential to Occur/Likely Impacts
	<p>Introduced pasture grasses occur at many of the sites supporting this species, which has also been captured in secondary grassland.</p> <p>Within its habitat, apparently prefers areas with a more open structure, characterised by small patches of bare ground between the grasses and herbs.</p> <p>In addition to tussocks, partially embedded surface rocks, and spider and insect holes are used for shelter. These are important micro-habitat elements within the grassland habitat. Rocks and arthropod holes provide important thermal refuges during temperature extremes.</p> <p>Feeds on small invertebrates, including ants and spiders.</p> <p>Tends to be inactive beneath rocks or in arthropod burrows during the winter months.</p> <p>Lays up to five eggs in shallow nests or burrows, (sometimes those dug by spiders or other arthropods), between late spring and late summer.</p> <p>Young hatch in late summer and autumn.</p>			
<p>Broad-headed Snake (<i>Hoplocephalus bungarioides</i>)</p>	<p>Distribution</p> <p>The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney.</p> <p>Habitat and ecology</p> <p>Nocturnal.</p> <p>Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring.</p> <p>Moves from the sandstone rocks to shelters in hollows in large trees within 200 m of escarpments in summer.</p> <p>Feeds mostly on geckos and small skinks; will also eat frogs and small mammals occasionally.</p> <p>Females produce four to 12 live young from January to March, which is a relatively low level of fecundity.</p>	V	E	<p>EPBC search states species or species habitat likely to occur within Upper Lachlan LGA.</p> <p><i>The preferred habitat for this species is not present and the project would cause no disturbance to potential habitat for this species. No further consideration is deemed necessary.</i></p>

Key: CE= Critically Endangered, E= Endangered, V=Vulnerable.

5.2 HABITATS AND POTENTIAL IMPACTS

The main habitats on site are inter-related to the distribution of vegetation, and as such habitats are discussed in relation to habitat features and vegetation communities. Generally the remnant vegetation communities are being avoided as part of the project and with the result that the levels of potential impacts have been significantly reduced. Overall there would be only small levels of clearing of remnant forest vegetation habitat. As discussed in section 2.4.2 only approximately 2 hectares would require clearing.

Turbine Locations

There are only three towers proposed in a vegetation remnant. These are A12, A18 and A19 which occur in remnants E and B. Remnant B provides a range of habitat features including; rocky outcrops, shrub layers, and hollow trees. The level of potential impact is likely to be low to moderate particularly once the project is completed as rehabilitation of all but the essential service roads is proposed. No threatened species were detected in the targeted surveys which were undertaken. In relation to the habitat available on the subject sites no JAMBA or CAMBA migratory species are likely to be impacted. No potential migratory species were detected and the potential impacts would not interfere with any potential migratory corridors or area.

The only other areas where there is potential for some vegetation removal is the Greywood Siding Road (Crookwell 3 East Option 1) and the Wollondilly (Crookwell 3 South Option 1):

Greywood Siding Road (Crookwell 3 East Option 1)

The habitat along Greywood Siding Road is generally only regrowth except for a very small finger of vegetation along the old Crookwell to Goulburn Railway line. This area would require minimal disturbance for the construction of the proposed access road and this area has been disturbed in the past from the railway line construction. There would be no significant removal of habitat for potential threatened species as a result of this option and no significant impact is likely.

Wollondilly (Crookwell 3 South Option 1)

The existing access to the property Wollondilly is formed by the old Crookwell to Goulburn Road (C3 South Option 1). This road may have to be deviated slightly at the end near the new Goulburn to Crookwell Road and near to the farm grid in order to achieve the swing for the trucks carrying the construction materials. The habitat within this area has been disturbed due to its historical use as a road reserve for the old Goulburn to Crookwell Road. The electricity interconnection to Crookwell 2 runs adjacent to Pejar Dam. Only minimal vegetation removal would be required and it is unlikely this would involve the removal of any potential habitat trees. As such no threatened species are likely to be impacted.

5.3 POTENTIAL IMPACTS BIRD AND BAT STRIKE

There is potential for bird and bat strike to turbines as part of any proposed wind farm development. Generally birds and bats do not impact with the upright part of the turbines so the main threat is from the turbine blades themselves as they spin. For bats that forage at night moderate to high wind conditions significantly reduce their foraging behaviour. When this is combined with the cooler months of May to August when many bats are in torpor (a form of hibernation), foraging behaviour is impacted (significantly reduced). This behaviour is important as the main risk to microchiropteran bats is from blade strike and during conditions when the blades are spinning at high speeds bat activity is significantly reduced. As such the amount of time that bats are potentially exposed to this risk is reduced. Microchiropteran bats which have potential to be impacted are high fast flyers.

There are generally only two threatened bat species with potential to be impacted. These are the Common-bent Wing Bat and the Yellow-bellied Sheath-tailed Bat. These species both have high aspect wing ratios resulting in a fast flight. Microchiropteran bats are excellent at echolocation and can fly in crowded environments and catch and eat insects on the wing. As such, they are highly unlikely to not detect the movement of a wind turbine and it is likely that these would be totally avoided by these species. As such the potential losses of bats as a result of impacts with turbines are likely to be extremely low. Monitoring should however be undertaken of collisions within the first year of operation. Monitoring of any dead birds or bats under each turbine should be monitored on a weekly basis with specimens collected by an Ecologist for identification.

In relation to potential bird strike the main species with the potential to be impacted are high flying species such as raptors, waterbirds, owls and migratory species. In general migratory species can be discounted as being at any significant risk from the turbines due to the fact that there are no high quality habitats within the local area. Pejar Dam, Lake Pejar and Lake Edward do not provide high quality potential habitat for waterbird and migratory bird species due to their structural characteristics in not providing good nesting habitat. As such the risk of collisions to waterbirds and migratory species is unlikely to be significant. Indeed no significant flocks of waterbirds were seen during the surveys undertaken.

In relation to raptors and owls these groups have potential to be impacted. Raptors such as the Whistling Kite and Wedge-tailed Eagle have potential to be impacted as they spend much of their time on the wing in thermals at similar heights to the rotor blades. These groups (raptors and owls) have excellent sight and can detect the smallest of movements at ranges of up to 500 metres as they forage on small to large native ground and arboreal mammals and birds (pers. obs). The likelihood of these species not detecting such a large movement as a turbine blade is extremely low and potential losses to these groups is unlikely to be significant. Low pressure air at the blade tips would be unlikely to impact these groups due to their high levels of sensory perception in relation to site and air pressure awareness as they utilise thermals.

In regard to the species with potential to be impacted by the project none are likely to have their foraging areas or migratory patterns significantly disturbed by the proposal. The habitats are adjacent and similar to the Crookwell 2 wind farm and the ecological report for Crookwell 2 also found there was unlikely to be any significant impacts on bird or bat species.

5.4 ASSESSMENT OF SIGNIFICANCE (EPBC ACT 1999)

The EPBC Act Guidelines provide guidance as to the assessment required to determine whether an action is “likely to have a significant impact” on any matter of “national environmental significance” such that the action will be a controlled action which requires approval under the EPBC Act. Whilst no endangered threatened fauna species listed under the EPBC Act were identified during the surveys, this section of the report contains an assessment in accordance with the EPBC Act Guidelines of each threatened flora species listed under the EPBC Act which was considered likely to have the potential to both occur with the site and to be impacted by the project.

5.4.1 Significant Impact Criteria for Critically Endangered and Endangered Individual Threatened Species

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

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

The project is unlikely to lead any long-term decrease in the size of any population. No critically endangered or endangered populations were detected and based on the potential habitat and surveys undertaken none are likely to be disturbed.

- **reduce the area of occupancy of the species**

It is unlikely that any area of occupancy of any species would be reduced.

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

It is unlikely that any population would be fragmented. The only species with potential for this to occur is the Golden Sun Moth however the targeted surveys undertaken did not detect this species.

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

No habitat critical to the survival of any species would be impacted.

- **disrupt the breeding cycle of a population**

The project would not disrupt the breeding cycle of a population.

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

There would be no modification, destruction, removal, or isolation or reduction in the quality of habitat to the extent that a species is likely to decline.

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

No invasive species are likely to become established.

- **introduce disease that may cause the species to decline, or interfere with the recovery of the species.**

It is highly unlikely that any disease would be introduced which would cause any species to decline.

5.4.2 Significant Impact Criteria for Vulnerable Individual Threatened Species

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

The project will result in no long-term decrease in the size of any important population of any species. No vulnerable populations were detected and based on the potential habitat and surveys undertaken none are likely to be disturbed.

- **reduce the area of occupancy of an important population**

No area of occupancy of any important population would be reduced.

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

There would be no fragmentation to any population into two or more populations. The project has aimed to avoid potential habitat for any threatened species.

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

There would be no impacts on habitat critical to the survival of any species.

- **disrupt the breeding cycle of an important population**

There would be no disruption in the breeding cycle of any important population.

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

There would be no modification, destruction, removal, or isolation or reduction in the quality of habitat to the extent that a species is likely to decline.

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

No invasive species are likely to become established.

- **introduce disease that may cause the species to decline, or interfere substantially with the recovery of the species.**

It is highly unlikely that any disease would be introduced which would cause any species to decline.

In conclusion, the results of the assessment undertaken are that the project is not likely to result in a significant impact on any fauna species listed under the EPBC Act. Accordingly, the project is not considered, for this reason, to be a controlled action which requires approval under the EPBC Act.

5.5 ASSESSMENT OF IMPACTS (TSC ACT)

As outlined at section 1.5.2 above, the DGRs prepared under Part 3A of the EP&A Act provide that the EA must include an assessment of all project components on flora and fauna and their habitat consistent with the Draft Guidelines for Threatened Species Assessment (DEC, 2005). These provide guidance as to the matters which are to be taken into account in assessing the impacts of projects on species, populations and ecological communities. This includes the factors which are to be taken into account in applying the 7 Part Test of Significance contained in the TSC Act. The 7 Part Test of Significance entails the following points:

- (a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

- (b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,*

- (c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:*
 - (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
 - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

- (d) in relation to the habitat of a threatened species, population or ecological community:*
 - (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
 - (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
 - (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Whilst no endangered ecological communities or threatened flora species listed under the TSC Act were identified during the surveys, this section of the report contains an assessment in accordance with the Draft Guidelines for Threatened Species Assessment (DEC, 2005) of each endangered ecological communities and threatened flora species listed under the TSC Act which was considered likely to have the potential to both occur with the site and to be impacted by the project.

5.5.1 Threatened Species 7 Part Tests of Significance

5.5.1.1 Birds

Regent Honeyeater - (*Anthochaera phrygia*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some moderate quality potential habitat on site. This species is migratory and forages over a very large range. While a small area of potential habitat would be disturbed for this species the level of impact is low and it is unlikely that a local viable population would be placed at risk of extinction. This species was not detected and no significant impact is likely.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs largely in the vegetation remnants and scattered paddock trees which remain. This habitat will remain largely unaffected by the project and as such this species is unlikely to be significantly impacted.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Superb Parrot - (*Polytelis swainsonii*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential breeding and foraging habitat on site of moderate quality. While a small area of potential habitat would be disturbed for this species the level of impact is low and it is unlikely that a local viable population would be placed at risk of extinction. This species often forages up to 10km from their nests. This species was not detected and no significant impact is likely.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential nesting habitat occurs in the vegetation remnants and scattered paddock trees which remain. This habitat will remain largely unaffected by the project. This species forages over a large area and since it would not have its nesting resources significantly impacted it is unlikely to be significantly impacted by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Brown Treecreeper - (*Climacteris picumnus victoriae*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the targeted surveys, which were undertaken however there is good quality potential habitat within the vegetation remnants, which remain on the site. Generally these areas will remain largely unaffected by the project. Proposed turbines A12, A18 and A19 are the only turbines, which are proposed to be located in woodland areas. While a small area of potential habitat would be disturbed for this species the level of impact is low and it is unlikely that a local viable population would be placed at risk of extinction.

The main disturbance would occur during the construction phase of the project for proposed turbines 12, 18 and 19. The construction roads are proposed to be rehabilitated once construction is finalised. This will reduce the level of impact upon the potential habitat of this species. Overall this species is unlikely to be impacted by the proposal.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat

is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in the vegetation remnants which remain. This habitat will remain largely unaffected by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Diamond Firetail - (*Stagonopleura guttata*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is potential habitat for this species in various parts of the site. Generally the best quality habitat on the site relates to the remaining areas of woodland which provide good quality sheltering and nesting resources for this species. Other areas of the site including paddock areas represent potential foraging habitat although the species was not detected. If present, the species is unlikely to be significantly impacted as the project is unlikely to significantly change the current levels of impacts for this species. This species was not detected in the surveys which were undertaken. As such, no local viable population of the species is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in the vegetation remnants which remain. This habitat will remain largely

unaffected by the project. Of the vegetation remaining on the site the vegetation within the remnants represents the most important potential habitat for this species. This habitat will remain largely undisturbed by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Hooded Robin - (*Melanodryas cucullata cucullata*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site however the understorey is largely cleared in the areas which represent lighted wooded country in the paddocks where paddock trees remain. This habitat lacks the perches of good fallen timber and stumps where this species perches and pounces on its prey. Generally this species preferred habitat on this site is likely to be within the remnant vegetation and their immediate surrounds. This species was not detected in the surveys which were undertaken. The project would cause minimal impact on areas of native vegetation and as such no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in the vegetation remnants, which remain. This habitat will remain largely

unaffected by the project. Of the vegetation remaining on the site the vegetation within the remnants represents the most important potential habitat for species. This habitat will remain largely undisturbed by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Speckled Warbler - (*Pyrrholaemus saggitatus*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat mainly around the remaining vegetation remnants particularly the large remnants A and B. It utilises open areas however generally keeps close to the cover of woodland. This species was not detected in the surveys which were undertaken. The project would cause minimal impact on areas of native vegetation and as such no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in the vegetation remnants, which remain. This habitat will remain largely unaffected by the project. Of the vegetation remaining on the site the vegetation within the remnants represents the most important potential habitat for species. This habitat will remain largely undisturbed by

the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Varied Sittella - (*Daphoenositta chrysoptera*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site, however the understorey is largely cleared in the areas which represent lighted wooded country such as in the paddocks where only paddock trees remain. This habitat lacks the perches of good fallen timber and stumps where this species perches and pounces on its prey. Generally this species preferred habitat on this site is likely to be within the remnant vegetation and their immediate surrounds. This species was not detected in the surveys which were undertaken. The project would cause minimal impact on areas of native vegetation and as such no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in the vegetation remnants, which remain. This habitat will remain largely

unaffected by the project. Of the vegetation remaining on the site the vegetation within the remnants represents the most important potential habitat for species. This habitat will remain largely undisturbed by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Scarlet Robin - (*Petroica boodang*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The potential habitat for this species on site is generally in and around the remaining vegetation remnants and the scattered paddock trees (autumn and winter only). This species relies on woodland with good levels of fallen timber and these are present within particularly remnants A and B. This is good quality habitat for this species, however this species was not detected in the surveys which were undertaken. The project would cause minimal impact on areas of native vegetation and as such no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in and around the vegetation remnants, which remain. This habitat will remain largely unaffected by the project. Of the vegetation remaining on the site the vegetation within the

remnants represents the most important potential habitat for this species. This habitat will remain largely undisturbed by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Barking Owl – (*Ninox connivens*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Diurnal roost sites are not abundant and generally the prey base is moderate for this species. This species hunts at night at generally low altitudes below the blades of the turbines and is therefore generally not at risk from blade strike. The level of proposed development would not significantly alter the current situation for this species and no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential habitat occurs in and around the vegetation remnants, which remain. This habitat will remain largely unaffected by the project. Of the vegetation remaining on the site the vegetation within the remnants represents the most important potential habitat for this species. This habitat will remain largely undisturbed by the project.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Powerful Owl - (*Ninox strenua*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected. Diurnal roost sites are not abundant nor are potential nesting hollows. This species requires large nesting hollows and these are, in general sparse. The prey base is moderate for this species. This species hunts at night at generally low altitudes below the blades of the turbines and is therefore generally not at risk from blade strike. This species forages over a large range of approximately 1000 hectares. Generally nest sites are the critical habitat resource for the survival of this species and areas of native vegetation are generally not being disturbed. The level of proposed development would not significantly alter the current situation for this species and no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential breeding habitat occurs in and around the vegetation remnants, which remain. The level of

development would not be significant in relation to the survival of this species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Gang Gang Cockatoo - (*Callocephalon fimbriatum*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the surveys which were undertaken. The level of proposed development is unlikely to significantly alter the current situation for this species and no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential breeding habitat occurs in and around the vegetation remnants and scattered overstorey eucalypts which remain. The level of development is unlikely to be significant in relation to the survival of this species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Glossy Black Cockatoo - (*Calyptorhynchus lathami*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the targeted surveys which were undertaken. The level of proposed development is unlikely to significantly alter the current situation for this species and no viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. This species potential breeding habitat occurs in and around the vegetation remnants, which remain. The level of development would not be significant in relation to the survival of this species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

5.5.1.2 Amphibians

Booroolong Frog - (*Litoria booroolongensis*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has low to moderate quality potential habitat in and around Steeves Creek and to a lesser extent First Creek. The sheltering sites for the adults being rocks and cobbles near the banks are not present so the habitat is generally of low to moderate quality. The works around the streams are limited and it is unlikely that a local viable local population would be placed at risk of extinction if one was to occur. If present under the current levels of agricultural based disturbance regimes then this species would remain as part of this project as the project would not significantly increase the current existing and potential impacts on this species potential habitat.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Yellow-spotted Tree Frog - (*Litoria castanea*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has low to moderate quality potential habitat in and around Steeves Creek and to a lesser extent First Creek. It requires streams with large permanent ponds, slow flowing water and plenty of emergent vegetation such as bullrush and the streams present on the site generally do not have this microhabitat. The works around the streams are limited and it is unlikely that a local viable local population would be placed at risk of extinction if one was to occur. If present under the current levels of agricultural based disturbance regime then this species would remain as part of this project as the project would not significantly increase the current existing and potential impacts on this species potential habitat.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Littlejohn's Tree Frog - (*Litoria littlejohni*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has very low quality potential habitat in and around Steeves Creek and to a lesser extent First Creek. Streams where it breeds generally have heath fringing their banks and the streams present generally do not have this microhabitat. The works around the streams are limited and it is unlikely that a viable local population would be placed at risk of extinction if one was to occur. If present under the current levels of agricultural based disturbance regimes then this species would remain as part of this project as the project would not significantly increase the current existing and potential impacts on this species potential habitat.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean "a population specified in Part 2 of Schedule 1" of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Growing Grass Frog - (*Litoria raniformis*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has low quality potential habitat in and around Steeves Creek and to a lesser extent First Creek. Generally found in a swampy area along floodplains and river valleys these streams generally do not have this microhabitat. The works around the streams are limited and it is unlikely that a local viable local population would be placed at risk of extinction if one was to occur although its occurrence is considered unlikely. If present under the current agricultural based disturbance regimes then this species would remain as part of this project as the project would not significantly increase the current existing and potential impacts on this species potential habitat.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

5.5.1.3 Insects

Golden Sun Moth - (*Synemon plana*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has generally low quality potential habitat on site due largely to the pasture improvement which has been undertaken. The targeted surveys undertaken did not detect this species.

The level of low quality potential habitat removal is small and is unlikely to significantly impact this species. Populations are discrete and only cover small areas with males not generally flying long distances of greater than 100 metres. As such, populations separated by distances of greater than 200 metres can be considered to be isolated populations. If present under the current levels of agricultural based disturbance regimes then this species is likely to remain as part of this project as the project would not significantly increase the current existing and potential impacts on this species potential habitat.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No

significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

5.5.1.4 Mammals

Eastern False Pipistrelle - (*Falsistrellus tasmaniensis*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the Anabat surveys, which were undertaken earlier this year for this species. It was detected in previous surveys, which were undertaken for Crookwell 2 and would occur on and utilise this site. The level of impact on microchiropteran bats which shelter in tree hollows is directly related to the level of hollow habitat tree removal. In general few large hollow trees are likely to require removal as part of the project. Sheltering habitat is abundant within remnants A and B and they are also known to utilise isolated paddock trees for sheltering and breeding. Foraging is generally within flyways within forest and woodland with the species often utilising the ecotone between forest and open areas.

Farm dams often provide a useful foraging area for this species as they concentrate insect activity to provide a foraging base for this species. Due to the relatively low number of potential hollow sheltering/breeding trees to be removed this species is unlikely to be significantly impacted such that a local viable population would be placed at risk of extinction. It is however recommended that once the project and road routes are finalised that habitat trees are avoided if possible in the micro-siting of the roads. Additional stag watching (with anabat and infrared inspection of potential hollow trees) should be undertaken for any large hollow trees, which require removal to ensure that no members of this species are harmed during tree removal.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Greater Long-eared Bat (*Nyctophilus timoriensis* SE form)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the Anabat surveys, which were undertaken earlier this year for this species. This species could occur on and utilise this site. The level of impact on microchiropteran bats which shelter in tree hollows is directly related to the level of hollow habitat tree removal. In general few large hollow trees are likely to require removal as part of the project. Sheltering habitat is abundant within remnants A and B and they are also known to utilise isolated paddock trees for sheltering and breeding. Foraging is generally within flyways within forest and woodland with the species often utilising the ecotone between forest and open areas.

Farm dams often provide a useful foraging area for this species as they concentrate insect activity to provide a foraging base for this species. Due to the relatively low number of potential hollow sheltering/breeding trees to be removed this species is unlikely to be significantly impacted such that a local viable population would be placed at risk of extinction. It is however recommended that once the project and road routes are finalised that habitat trees are avoided if possible in the micro-siting of the roads. Additional stag watching (with anabat and infrared inspection of potential hollow trees) should be undertaken for any large hollow trees, which require removal to ensure that no members of this species are harmed during tree removal.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Greater Broad-nosed Bat - (*Scoteanax rueppellii*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the Anabat surveys, which were undertaken earlier this year for this species. This species could occur on and utilise this site. The level of impact on microchiropteran bats which shelter in tree hollows is directly related to the level of hollow habitat tree removal. In general few large hollow trees are likely to require removal as part of the project. Sheltering habitat is abundant within remnants A and B and they are also known to utilise isolated paddock trees for sheltering and breeding. Foraging is generally within flyways within forest and woodland with the species often utilising the ecotone between forest and open areas.

Farm dams often provide a useful foraging area for this species as they concentrate insect activity to provide a foraging base for this species. Due to the relatively low number of potential hollow sheltering/breeding trees to be removed this species is unlikely to be significantly impacted such that a local viable population would be placed at risk of extinction. It is however recommended that once the project and road routes are finalised that habitat trees are avoided if possible in the micro-siting of the roads. Additional stag watching (with anabat and infrared inspection of potential hollow trees) should be undertaken for any large hollow trees, which require removal to ensure that no members of this species are harmed during tree removal.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Squirrel Glider - (*Petaurus norfolcensis*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has potential sheltering and breeding habitat within remnants A and B. It was not detected in the targeted surveys which were undertaken. Due to the relatively low number of potential hollow sheltering/breeding trees to be removed this species is unlikely to be significantly impacted such that a local viable population would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or

indirectly),

No critical habitat relates to this site. The TSC Act 1995 defines “*critical habitat*” as “*habitat declared to be critical habitat under Part 3*” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Yellow-bellied Sheath-tailed Bat - (*Saccolaimus flaviventris*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species was not detected in the Anabat surveys, which were undertaken earlier this year. This species could occur on and utilise this site and is likely to occur in the area. This is a high flying wide ranging species. It is seldom captured as it forages above the canopy. This species is at risk of blade strike due to its high and fast flight. Due to its low frequency call it has a longer detection distance for its echolocation than other more slower flying species which glean insects from leaves. As such it is highly likely that it could echolocate the obstruction of the turbines and thus avoid them. It nests in tree hollows.

The level of impact on microchiropteran bats which shelter in tree hollows is directly related to the level of hollow habitat tree removal. In general few large hollow trees are likely to require removal as part of the project. Sheltering habitat is abundant within remnants A and B and they are also known to utilise isolated paddock trees for sheltering and breeding. Foraging is generally within flyways within forest and woodland with the species often utilising the ecotone between forest and open areas. Due to the relatively low number of potential hollow sheltering/breeding trees to be removed this species is unlikely to be significantly impacted such that a local viable population would be placed at risk of extinction. It is however recommended that once the project and road routes are finalised that habitat trees are avoided, if possible, in the micro-siting of the roads.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction. Monitoring of blade strike incidents should be undertaken for this species in the first year of operation.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

5.5.1.5 Reptiles

Pink-tailed Worm Lizard - (*Aprasia parapulchella*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site. It was not detected in the surveys which were undertaken around proposed turbines A18, A19 and A25. In general there is some potential habitat on proposed Crookwell 3 East however there is negligible potential habitat on proposed Crookwell 3 West due to its high levels of pasture improvement.

Only relatively small portions of this potential habitat would be impacted. Overall the potential impacts on this species in relation to potential habitat disturbance are low and it is unlikely that a local viable population would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the

project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Striped Legless Lizard - (*Delma impar*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site. It was not detected in the surveys which were undertaken around proposed turbines A18, A19, and A25. In general there is some potential habitat on the proposed Crookwell 3 East however there is negligible potential habitat on proposed Crookwell 3 South due to its high levels of pasture improvement. Only relatively small portions of this potential habitat would be impacted. Overall the potential impacts on this species in relation to potential habitat disturbance are low and it is unlikely that a local viable population would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Little Whip Snake - (*Suta flagellum*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site. This species was not detected in the targeted surveys undertaken. In general there is some potential habitat on proposed Crookwell 3 East however there is negligible potential habitat on proposed Crookwell 3 South due to its high levels of pasture improvement. Overall the potential impacts on this species in relation to potential habitat disturbance are low and it is unlikely that a local viable population would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

Grassland Earless Dragon - (*Tympanocryptis pinguicolla*)

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

This species has some potential habitat on site. This species was not detected in the targeted surveys undertaken. In general there is some potential habitat on proposed Crookwell 3 East however there is negligible potential habitat on proposed Crookwell 3 South due to its high levels of pasture improvement. Overall the potential impacts on this species in relation to potential habitat disturbance are low and it is unlikely that a local viable population would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered population is present at the site. The TSC Act defines an endangered population to mean “a population specified in Part 2 of Schedule 1” of the TSC Act.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable for individual threatened species.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The extent of potential habitat removal/modification as a result of this project is small. No area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the project. No significant potential habitat is likely to be removed, modified, fragmented or isolated as a result of the project such that the long-term survival of this species would be placed at risk of extinction.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat is present at the site. The TSC Act 1995 defines “critical habitat” as “habitat declared to be critical habitat under Part 3” of the Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not inconsistent with the objectives of any recovery or threat abatement plans as the action aims at minimising potential habitat loss and minimises habitat disturbance.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Clearing of native vegetation is recognised as a key threatening process however the project has been designed as far as possible to minimise the removal of native vegetation. The project has been responsive to ecological issues and aims to minimise and mitigate against ecological impacts.

In conclusion, the results of the assessment undertaken are that the project is not likely to result in a significant impact on any fauna species listed under the TSC Act. Accordingly, there is no requirement for a species impact statement to be prepared.

6. CONCLUSIONS

The findings of this report indicate that the project is unlikely to have a significant impact on any communities, populations or threatened species listed under the EPBC Act or the TSC Act.

The results of the field surveys detected no Endangered Ecological Communities or threatened species listed under either the EPBC Act or the TSC Act within the site. Whilst no threatened species listed under either the EPBC Act or the TSC Act were detected within the site by the surveys undertaken to date, each threatened species which was considered likely to have the potential to occur with the site and to be impacted by the project was further assessed in accordance with:

- the criteria contained in the EPBC Act in the case of species listed under the EPBC Act; and
- the 7-Part Tests of Significance criteria in the case of species listed under the TSC Act.

The results of this assessment concluded that:

- The project is not likely to result in a significant impact on any endangered ecological community or species listed under the EPBC Act. Accordingly, the project is not considered, for this reason, to be a controlled action which requires approval under the EPBC Act.
- The project is not likely to result in a significant impact on any species listed under the TSC Act. Accordingly, there is no requirement for a species impact statement to be prepared.

The project is consistent with the principles of “improve or maintain” in relation to ecological impacts and although no offset is required, an offset of 60 ha is being proposed for extent of clearing required for the project which is estimated to be approximately 2.34 ha in total from the Western Tablelands Dry Forest vegetation community.

It is currently proposed that this offset will be provided by two formal Property Vegetation Plan agreements (PVPs) to be entered into with Hawkesbury Nepean Catchment Management Authority (HNCMA) once the project is approved. It is proposed that these PVPs would cover a total of approximately 60 hectares of the remnant vegetation located within the site being 15 ha in perpetuity and an additional 45 ha for the life of the wind farm. It is proposed that the proponent would provide sufficient funds each year for feral animal control and management of these two agreement areas. HNCMA have provided their ‘in principal’ support for this proposed voluntary offset strategy and this is seen as a sound ecological practice even though legislatively an offset is not required.

7. RECOMMENDATIONS

The following recommendations are made in relation to the implementation of the project:

Bat Monitoring and Habitat Tree Inspections

Once the roads are pegged by surveyors potential hollow habitat trees (that require removal) should be identified by ecological survey. These trees should be stag watched at dusk using infra-red spotlights and anabat detectors to determine usage by any threatened microchiropteran bats. Accessible tree hollows that require removal should be inspected for fauna by infrared telescopic camera prior to removal to ensure that no species present in the hollow are harmed during removal. An Ecologist should be present on site when any hollow trees are removed to assist in relocating any fauna which may be found to occur.

Bird Monitoring and Bat Strike Monitoring

An additional baseline pre-commissioning survey should be undertaken at each turbine site during the spring/summer season. This would provide baseline data for the bird and bat strike monitoring study which should be undertaken during the first year of the operation of the wind farm.

Vegetation/Ecological Restoration Management Plan

A vegetation/ecological restoration plan should be undertaken for the areas that are disturbed as part of the construction works so they can be rehabilitated once construction is finalised. This would entail details for the management of any areas of native vegetation to be disturbed and the method and timing for their restoration along with specifics or habitat restoration for fauna and weed management. The proposed two PVP agreements proposed to be entered into in relation to the remnants in the vicinity of Turbines 18 and 19 will ensure that they are protected for conservation purposes (please refer to section 1.4 above for details).

Riparian Vegetation Management Plan

A riparian vegetation management plan should be undertaken for the proposed creek crossings. This would only be required for areas where there is any native vegetation to be disturbed.

8. REFERENCES

- Auld B.A. and Medd R.W. (1992). *Weeds: An Illustrated Botanical Guide to the Weeds of Australia*. Inkarta Press.
- Blakers M., Davies S.J.J.F. and Reilly P.N. (1984). *The Atlas of Australian Birds*. Royal Australasian Union and University of Melbourne Press, Melbourne.
- Briggs J.D. and Leigh J.H. (1995). *Rare or Threatened Australian Plants*. Draft Codings for new edition.
- Cogger H. (1994). *Reptiles and Amphibians of Australia*. Reed International Books: Chatswood.
- Cropper S.C. (1993) *Management of Endangered Plants*. CSIRO Publishing, Collingwood, Victoria, Australia.
- Guidelines for Threatened Species Assessment (DEC, 2007)
- Environmental Planning and Assessment Act (1979).
- Environment Protection and Biodiversity Conservation Act (1999).
- Fairley, A., and Moore, P., (1995). *Native Plants of the Sydney District*. Bookpublishers, Hong Kong.
- Harden G. (ed) (1990 –1993, 2003, 2004). *Flora of New South Wales Vols 1-4*. NSW University Press, Kensington.
- Menkhorst P.W (1995). *Mammals of Victoria*. Oxford University Press Australia.
- NSW Scientific Committee. Final determinations for threatened species, populations and ecological communities. Updated to time of Writing.
- Robinson M. (1995). *Field Guide to the Frogs of Australia*. Reed Books Australia, Chatswood.
- Simpson K. and Day N. (1993). *Field Guide to the Birds of Australia*. Lifetime Distributors, Girraween, NSW.
- Specht, (1981). In Gillison A.N and Anderson D.J (eds), *Vegetation Classification of Australia*. CSIRO and ANU Press Canberra.
- State Forests of NSW (1995). *Fauna Impact Statement Morisset Forestry District*. State Forests of NSW.
- Strahan R. (1995). *The Mammals of Australia*. Reed Books: Chatswood.
- Threatened Species Conservation Act (1995).
- Threatened Species Conservation Act (1995)
- URS. (2004) *A Survey and Impact Assessment of the Terrestrial Flora and Fauna of the Proposed Crookwell 2 Wind Farm Development*.

9. APPENDIX 1 – FLORA SPECIES RECORDED

SCIENTIFIC NAME	COMMON NAME
NATIVE	
FERN	
<i>Asplenium flabellifolium</i>	Necklace Fern
<i>Cheilanthes sieberi</i>	Narrow Rock Fern
<i>Pteridium esculentum</i>	Common Bracken, Gurgi (Cadigal), Austral Bracken, Bracken
GRASS	
<i>Agrostis capillaris</i> *	Browntop Bent
<i>Aristida muricata</i>	Threeawn Grass
<i>Aristida vagans</i>	Threeawn Speargrass
<i>Aristida ramosa</i>	Purple Wiregrass, Kerosene Grass, Prickly Threeawn
<i>Austrodanthonia caespitosa</i>	Ringed Wallaby-grass, Common Wallaby-grass
<i>Austrodanthonia laevis</i>	Wallaby Grass
<i>Austrodanthonia racemosa</i> var <i>racemosa</i>	Clustered Wallaby-grass, Slender Wallaby Grass
<i>Austrostipa bigeniculata</i>	Tall Speargrass
<i>Austrostipa scabra</i>	Corkscrew, Corkscrew Speargrass, Rough Spear-grass, Rough Needle-grass, Speargrass
<i>Bothriochloa macra</i>	Redgrass, Redleg Grass
<i>Brizia minor</i> *	Shivery Grass
<i>Chloris truncata</i>	Windmill Grass
<i>Chloris ventricosa</i>	Tall Windmill Grass
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Cynodon dactylon</i>	Couch
<i>Cynosurus echinatus</i> *	Rough Dog's Tail
<i>Dactylis glomerata</i> *	Cocksfoot
<i>Dichelachne micrantha</i>	Short-hair Plumegrass

SCIENTIFIC NAME	COMMON NAME
<i>Echinopogon caespitosus</i>	Tufted Hedgehog-grass
<i>Echinopogon cheelii</i>	Long-flowered Hedgehog Grass
<i>Echinopogon ovatus</i>	Forest Hedgehog-grass, Hedgehog Grass, Rough-bearded Grass
<i>Elymus scaber</i>	Common Wheat-grass, Wheatgrass, Rough Wheatgrass
<i>Eragrostis leptostachya</i>	Paddock Lovegrass
<i>Hordeum sp.*</i>	Barley Grass
<i>Imperata cylindrica</i>	Blady Grass
<i>Lolium perenne *</i>	Perrenial Rye Grass
<i>Microlaena stipoides</i>	Microlaena, Weeping Grass
<i>Panicum dilatatum *</i>	Paspalum
<i>Panicum effusum</i>	Hairy Panic, Poison Panic
<i>Phalaris aquatica *</i>	Phalaris
<i>Poa labillardierei</i>	Tussock Grass
<i>Poa sieberiana</i>	Snow Grass, Fine-leaved Tussock-grass
<i>Sporobolus creber</i>	Western Rat-tail Grass, Slender Rat's Tail Grass
<i>Themeda australis</i> (syn. <i>Themeda triandra</i>)	Kangaroo Grass
<i>Trifolium camoestres *</i>	Hop Clover
<i>Trifolium arvense *</i>	Haresfoot Clover
<i>Trifolium sp.*</i>	Clover
<i>Typha orientalis</i>	Broad-leafed Cumbungi
HERB	
<i>Acaena agnipila</i>	Sheep's Burr, Bidgee-widgee
<i>Acaena echinata</i>	Sheep's Burr
<i>Asperula conferta</i>	Common Woodruff
<i>Brachyscome rigidula</i>	Leafy Daisy

SCIENTIFIC NAME	COMMON NAME
<i>Calotis cuneifolia</i>	Purple Burr-daisy
<i>Calotis glandulosa</i>	Mauve Burr-daisy
<i>Calotis lappulacea</i>	Yellow Burr-daisy, Yellow Daisy-burr
<i>Calotis scabiosifolia</i>	Rough Burr-daisy
<i>Carex inversa</i>	Knob Sedge, Common Sedge
<i>Centella asiatica</i>	Pennywort
<i>Chenopodium pumilio</i>	Clammy Goosefoot, Small Crumbweed
<i>Chrysocephalum apiculatum</i>	Yellow Buttons, Common Everlasting
<i>Clematis microphylla</i>	Small-leaved Clematis
<i>Convolvulus erubescens</i>	Australian Bindweed, Blushing Bindweed
<i>Correa reflexa</i>	Common Correa, Native Fuchsia
<i>Desmodium varians</i>	Slender Tick-trefoil
<i>Dianella longifolia</i>	Smooth Flax Lily
<i>Dianella revoluta</i>	Blueberry Lily, Black-Anther Flax Lilly, Spreading Flax Lily
<i>Dichondra repens</i>	Kidney Grass, Kidney Weed
<i>Drosera sp.</i>	
<i>Erodium crinitum</i>	Native Crowfoot, Blue Storks-bill, Blue Crowfoot, Blue Herons-bill
<i>Euchiton involucratus</i>	Star Cudweed
<i>Glycine clandestina</i>	Twining Glycine
<i>Glycine tabacina</i>	Glycine Pea, Variable Glycine
<i>Gonocarpus elatus</i>	Hill Raspwort
<i>Gonocarpus tetragynus</i>	Common Raspwort
<i>Goodenia hederacea</i>	Forest Goodenia, Ivy Goodenia
<i>Helichrysum collinum</i>	Hill Daisy
<i>Helichrysum scorpioides</i>	Button Everlasting
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort

SCIENTIFIC NAME	COMMON NAME
<i>Hypericum gramineum</i>	Small St John's Wort
<i>Hypericum japonicum</i>	Small St John's Wort, Matted St John's Wort
<i>Hypericum perforatum</i> *	St Johns Wort
<i>Kennedia prostrata</i>	Running Postman, Scarlet Running Pea, Scarlet Coral-pea
<i>Lomandra filiformis</i>	Wattle Mat-rush
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush, Honey Weed
<i>Lomandra multiflora</i>	Many-flowered Matrush
<i>Opercularia diphylla</i>	Stinkweed
<i>Oxalis perennans</i>	Grassland Wood Sorrel, Grass Wood-sorrel, Creeping Yellow Sorrel
<i>Patersonia sericea</i>	Silky Purple-flag
<i>Plantago debilis</i>	Shade Plantain, Slender Plantain
<i>Plantago euryphylla</i>	Plantain
<i>Plantago lanceolata</i> *	Plantain
<i>Plantago varia</i>	Variable Plantain, Small Plantain, Sago-weed
<i>Pratia purpurascens</i>	Whiteroot
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed
<i>Rumex brownii</i>	Swamp Dock, Slender Dock
<i>Rumex dumosus</i>	Wiry Dock
<i>Rumex tenax</i>	Shiny Dock
<i>Rutidosis leiolepis</i>	Monaro Golden Daisy
<i>Rutidosis leptorhynchoides</i>	Button Wrinklewort
<i>Rutidosis multiflora</i>	Small Wrinklewort
<i>Scleranthus biflorus</i>	Spiny Mat-plant, Knawel, Cushion-bush, Two-flowered Knawel
<i>Senecio quadridentatus</i>	Cotton Fireweed
<i>Senecio tenuiflorus</i>	Woodland Groundsel, Narrow Groundsel, Cotton Groundsel, Slender Fireweed

SCIENTIFIC NAME	COMMON NAME
<i>Urtica incisa</i>	Stinging Nettle
<i>Viola hederacea</i>	Native Violet, Ivy-leaf Violet, Ivy-leaved Violet
<i>Wahlenbergia luteolla</i>	Native Bluebell
SEDGE / RUSH	
<i>Isolepis inundata</i>	Swamp Club-sedge, Swamp Club-rush
<i>Juncus articulatus</i> *	Jointed Rush
<i>Juncus cognatus</i>	Common Rush
<i>Juncus subsecundus</i>	Finger Rush
<i>Lepidosperma laterale</i>	Sword Sedge, Variable Swordsedge
<i>Schoenus apogon</i>	Common Bog Sedge, Fluke Bogrush
SHRUB	
<i>Acacia brownii</i>	Prickly Moses, Golden Prickly Wattle, Heath Wattle
<i>Acacia dealbata</i>	Silver Wattle
<i>Acacia decora</i>	Western Silver Wattle, Showy Wattle, Western Golden Wattle, Pretty Wattle
<i>Acacia decurrens</i>	Black Wattle, Early Black Wattle, Green Wattle, Queen Wattle, Sydney Green Wattle
<i>Acacia genistifolia</i>	Spreading Wattle, Early Wattle, Wild Irishman
<i>Acacia paradoxa</i>	Prickly Acacia, Acacia Hedge, Kangaroo Thorn, Hedge Wattle, Kangaroo Acacia, Prickly Wattle, Paradoxa Wattle
<i>Acacia parramattensis</i>	Sydney Green Wattle, Parramatta Wattle, Parramatta Green Wattle
<i>Acacia siculiformis</i>	Dagger Wattle
<i>Acacia ulicifolia</i>	Prickly Moses, Juniper Wattle
<i>Acrotriche serrulata</i>	Honeypots
<i>Astroloma humifusum</i>	Native Cranberry, Cranberry Heath
<i>Bossiaea buxifolia</i>	Box-leaved Bitter-pea
<i>Brachyloma daphnoides</i>	Daphne Heath

SCIENTIFIC NAME	COMMON NAME
<i>Carthamus lanatus</i> *	Saffron Thistle
<i>Cassinia aculeata</i>	Common Cassinia, Chinese-scrub, Sifton Bush, Dogwood, Dolly Bush
<i>Cassinia arcuata</i>	Drooping Cassinia, Chinese Tea-scrub, Sifton Bush, Chinese Shrub
<i>Cassinia longifolia</i>	Shiny Cassinia, Cauliflower Bush, Long-leaf Dogwood
<i>Cirsium vulgare</i> *	Thistle
<i>Conyza bonariensis</i> *	Fleabane
<i>Daviesia ulicifolia</i>	Gorse Bitter-pea
<i>Dillwynia retorta</i>	Heathy Parrot-pea
<i>Echium plantagineum</i> *	Patterson's Curse
<i>Exocarpos cupressiformis</i>	Cherry Ballart, Native Cherry, Wild Cherry, Cherry Wood
<i>Exocarpos strictus</i>	Pale Ballart, Pale-fruit Ballart, Dwarf Cherry
<i>Hardenbergia violacea</i>	False Sarsparilla, Purple Coral-pea, Native Lilac
<i>Hibbertia obtusifolia</i>	Hoary Guinea-Flower
<i>Hirschfeldia incana</i> *	Hairy Brassica
<i>Hovea linearis</i>	Creeping Hovea
<i>Hypochoeris glabra</i> *	Smooth Catsear
<i>Hypochoeris radicata</i> *	Catsear
<i>Indigofera australis</i>	Austral Indigo, Australian Indigo, Native Indigo, Hill Indigo
<i>Jacksonia scoparia</i>	Winged Broom-pea, Dogwood, Broom
<i>Lepidium africanum</i> *	Peppergrass
<i>Leptospermum myrtifolium</i>	Swamp Myrtle, Swamp Tea-tree, Myrtle-leaved Tea-tree, Grey Tea-tree
<i>Leucopogon attenuatus</i>	
<i>Leucopogon virgatus</i>	Common Beard Heath
<i>Lissanthe strigosa</i>	Peach Heath
<i>Melichrus urceolatus</i>	Urn Heath

SCIENTIFIC NAME	COMMON NAME
<i>Monotoca scoparia</i>	
<i>Ozothamnus</i> spp.	Everlastings
<i>Pultenaea microphylla</i>	Spreading Bush-pea
<i>Rubus fruticosus</i> *	Blackberry
<i>Senecio madagascariensis</i> *	Fireweed
<i>Solanum brownii</i>	Violet Nightshade
<i>Solanum nigrum</i> *	Blackberry Nightshade
<i>Sonchus olearaceus</i> *	Common Sowthistle
<i>Styphelia triflora</i>	Pink Five-corners
TREE	
<i>Acacia dealbata</i>	Silver Wattle
<i>Acacia implexa</i>	Lightwood, Hickory Wattle, Black Wattle, Hickory, Sally Wattle, Scrub Wattle, Screw-pod Wattle, Bastard Myall, Lignum Vitae, Fish Wattle, Broad-leaf Wattle
<i>Acacia melanoxylon</i>	Blackwood, Black Wattle, Hickory, Mudgerabah, Paluma Blackwood, Sally Wattle
<i>Allocasuarina littoralis</i>	Black Sheoak
<i>Brachychiton populneus</i>	Kurrajong
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum
<i>Eucalyptus bridgesiana</i>	Apple Box, But-but
<i>Eucalyptus dalrympleana</i>	Mountain Gum
<i>Eucalyptus dives</i>	Broad-leaved Peppermint, Peppermint, Blue Peppermint (Vic)
<i>Eucalyptus goniocalyx</i>	Long-leaved Box, Bundy, Olive-barked Box
<i>Eucalyptus macrorhyncha</i>	Red Stringybark
<i>Eucalyptus mannifera</i>	Brittle Gum
<i>Eucalyptus melliodora</i>	Yellow Box, Yellow Jacket, Honey Box (Qld), Yellow Ironbark (Qld)
<i>Eucalyptus pauciflora</i>	Snow Gum, Cabbage Gum (Tas), Weeping Gum (Tas), White Sally

SCIENTIFIC NAME	COMMON NAME
<i>Eucalyptus rossii</i>	Scribbly Gum, Snappy Gum, White Gum, Inland Scribbly Gum
<i>Eucalyptus rubida</i>	Candlebark, Ribbon Gum, White Gum
<i>Eucalyptus stellulata</i>	Black Sally
<i>Eucalyptus viminalis</i>	Manna Gum, Ribbon Gum
EXOTIC	
GRASS	
<i>Aira elegantissima</i>	Delicate Hairgrass
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass, Sweet-scented Vernal-grass, Sweet Vernal
<i>Avena barbata</i>	Bearded Oats
<i>Avena fatua</i>	Wild Oats
<i>Briza maxima</i>	Quaking Grass, Blowfly Grass
<i>Briza minor</i>	Shivery Grass, Lesser Quaking Grass
<i>Bromus diandrus</i>	Great Brome
<i>Bromus molliformis</i>	Silky Brome, Soft Brome
<i>Cynosurus echinatus</i>	Rough Dogstail
<i>Dactylis glomerata</i>	Cocksfoot, Orchard Grass
<i>Holcus lanatus</i>	Yorkshire Fog
<i>Hordeum leporinum</i>	Barley-grass
<i>Hyparrhenia hirta</i>	Coolatai Grass
<i>Lolium perenne</i>	Perennial Ryegrass
<i>Lolium rigidum</i>	Ryegrass
<i>Lolium spp.</i>	Ryegrass
<i>Nassella neesiana</i>	Chilean Needle-grass
<i>Nassella trichotoma</i>	Serrated Tussock
<i>Paspalum dilatatum</i>	Paspalum
<i>Phalaris aquatica</i>	Phalaris

SCIENTIFIC NAME	COMMON NAME
<i>Poa bulbosa</i>	Bulbous Poa
<i>Vulpia bromoides</i>	Squirrel Tail Fescue, Silver Grass
<i>Vulpia myuros</i>	Rat's Tail Fescue
HERB	
<i>Acetosella vulgaris</i> *	Sorrel, Sheep Sorrel
<i>Anagallis arvensis</i> *	Scarlet Pimpernel, Blue Pimpernel, Pimpernel
<i>Arctotheca calendula</i> *	Cape Weed, African Marigold, Cape Dandelion
<i>Carthamus lanatus</i>	Saffron Thistle
<i>Centaureum erythraean</i> *	Common Centaury
<i>Cerastium glomeratum</i>	Broad-leaved Mouse-ear Chickweed, Sticky Mouse-ear Chickweed
<i>Chondrilla juncea</i>	Skeleton-weed
<i>Cirsium vulgare</i>	Spear Thistle
<i>Echium plantagineum</i> *	Paterson's Curse, Salvation Jane, Murrumbidgee Bluebell, Riverina Bluebell
<i>Geranium molle</i>	Cranes-bill Geranium
<i>Geranium solanderi</i>	Australian Cranesbill
<i>Geum urbanum</i> *	Wood Avens
<i>Hypericum perforatum</i>	St John's Wort, Perforated St John's Wort
<i>Hypochaeris glabra</i>	Smooth Cat's-ear
<i>Hypochaeris radicata</i>	Flatweed, Cat's-ear
<i>Lepidium africanum</i>	Common Pepper-cress, African Pepper-cress, Rubble Pepper-cress
<i>Linaria pelisseriana</i>	Pelisser's Toadflax
<i>Medicago lupulina</i>	Black Medic, Hop Medic
<i>Medicago polymorpha</i> *	Burr Medic
<i>Moenchia erecta</i>	Erect Chickweed, Upright Moenchia
<i>Myosotis discolor</i>	Yellow and Blue Forget-me-not, Forget-me-not

SCIENTIFIC NAME	COMMON NAME
<i>Petrorhagia nanteuilii</i>	Proliferous Pink, Childing pink
<i>Plantago lanceolata</i>	Ribwort, Ribgrass, Lamb's Tongue
<i>Romulea rosea</i>	Onion-grass, Guildford Grass
<i>Salvia verbenaca</i>	Wild Sage, Vervain
<i>Sherardia arvensis</i>	Blue Fieldmadder, Field Madder
<i>Trifolium angustifolium</i>	Narrow-leaved Clover
<i>Trifolium arvense</i>	Hare's-foot Clover
<i>Trifolium campestre</i>	Hop Clover
<i>Trifolium glomeratum</i>	Clustered Clover
<i>Trifolium scabrum</i>	Rough Clover
<i>Trifolium striatum</i>	Knotted Clover
<i>Trifolium subterraneum</i>	Subterranean Clover, Sub Clover
<i>Urtica urens</i>	Small Nettle
<i>Vicia sativa</i>	Common Vetch, Narrow-leaved Vetch
SHRUB	
<i>Rosa rubiginosa</i> *	Sweetbriar, Briar Rose, Eglantine

10. APPENDIX 2 – FAUNA SPECIES RECORDED

COMMON NAME	SCIENTIFIC NAME
<u>BIRDS</u>	
Australasian Shoveler	<i>Anas rhynochotis</i>
Australian Hobby	<i>Falco longipennis</i>
Australian Magpie	<i>Gymnorhina tibicen</i>
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>
Australian Raven	<i>Corvus coronoides</i>
Australian Shelduck	<i>Tadorna tadornoides</i>
Australian White Ibis	<i>Threskiornis molucca</i>
Australian Wood Duck	<i>Chenonetta jubata</i>
Barn Owl	<i>Tyto alba</i>
Black Falcon	<i>Falco subniger</i>
Black Swan	<i>Cygnus aratus</i>
Black-faced Cuckoo Shrike	<i>Coracina novaehollandiae</i>
Brown Falcon	<i>Falco berigora</i>
Brown Goshawk	<i>Accipiter fasciatus</i>
Brush Cuckoo	<i>Cuculus variolosus</i>
Cattle Egret	<i>Ardea ibis</i>
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>
Chestnut Teal	<i>Anas castenea</i>
Cockatiel	<i>Nymphicus hollandicus</i>
Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>
Common Bronzewing	<i>Phaps chalcoptera</i>
Common Koel	<i>Eudynamis scolopacea</i>
Common Starling *	<i>Sturnus vulgaris</i>
Crested Pigeon	<i>Ocyphaps lophotes</i>
Crested Shrike-tit	<i>Falcunculus frontatus</i>
Crimson Rosella	<i>Platycercus elegans</i>
Diamond Dove	<i>Geopelia cuneata</i>
Dollarbird	<i>Eurystomus orientalis</i>
Ducky Woodswallow	<i>Artamus cyanopterus</i>

COMMON NAME	SCIENTIFIC NAME
Dusky Moorhen	<i>Gallinula tenebrosa</i>
Eastern Yellow Robin	<i>Eopsaltria australis</i>
Eurasian Coot	<i>Fulica atra</i>
European Goldfinch *	<i>Carduelis carduelis</i>
Fairy Martin	<i>Hirundo ariel</i>
Fan-tailed Cuckoo	<i>Coccyzus flabellifrons</i>
Feral Pigeon *	<i>Columba livia</i>
Galah	<i>Cacatua roseicapilla</i>
Glossy Ibis	<i>Plegadis falcinellus</i>
Great Egret	<i>Ardea alba</i>
Grey Fantail	<i>Rhipidura fuliginosa</i>
Grey Shrike-thrush	<i>Colluricincla harmonica</i>
Grey Teal	<i>Anas gracilis</i>
Hardhead	<i>Aythya australis</i>
House Sparrow *	<i>Passer domesticus</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Little Corella	<i>Cacatua sanguinea</i>
Magpie-lark	<i>Grallina cyanoleuca</i>
Masked Lapwing	<i>Vanellus miles</i>
Nankeen Kestrel	<i>Falco cenchroides</i>
Nankeen Night Heron	<i>Nycticorax caledonicus</i>
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>
Noisy Friarbird	<i>Philemon corniculatus</i>
Noisy Minor	<i>Manorina melanocephala</i>
Pacific Black Duck	<i>Anas superciliosa</i>
Pallid Cuckoo	<i>Cuculus pallidus</i>
Peaceful Dove	<i>Geopelia placida</i>
Pied Butcherbird	<i>Cracticus nigrogularis</i>
Pied Currawong	<i>Strepera graculina</i>
Purple Swamphen	<i>Porphyrio porphyrio</i>
Rainbow Bee-eater	<i>Merops ornatus</i>
Red Wattlebird	<i>Anthochaera carunculata</i>
Restless Flycatcher	<i>Mylagra inquieta</i>

COMMON NAME	SCIENTIFIC NAME
Richard's Pipit	<i>Anthus novaeseelandiae</i>
Rufus Whistler	<i>Pachycephala rufiventris</i>
Sacred Ibis	<i>Threskiornis aethiopica</i>
Sacred Kingfisher	<i>Todiramphus sanctus</i>
Satin Flycatcher	<i>Myiagra cyanoleuca</i>
Silvereye	<i>Zosterops lateralis</i>
Singing Bushlark	<i>Mirafra javanica</i>
Spotted Pardalote	<i>Pardalotus punctatus</i>
Spotted Turtle Dove	<i>Streptopelia chinensis</i>
Straw-necked Ibis	<i>Threskiornis spinicollis</i>
Striated Pardalote	<i>Pardalotus striatus</i>
Sulphur –crested Cockatoo	<i>Cacatua galerita</i>
Superb Fairy Wren	<i>Malurus cyaneus</i>
Tawny Frogmouth	<i>Podargus strigoides</i>
Tawny Grassbird	<i>Megalurus timoriensis</i>
Tree Martin	<i>Hirundo nigricans</i>
Wedge-tailed Eagle	<i>Aquila audax</i>
Welcome Swallow	<i>Hirundo neoxena</i>
Whistling Kite	<i>Halistur sphenurus</i>
White-browed Scrubwren	<i>Sericornis frontalis</i>
White-browed Woodswallow	<i>Artamus leucorhynchus</i>
White-winged Chough	<i>Corcorax melanochlamphos</i>
Willie Wagtail	<i>Rhipidura leucophrys</i>
Yellow-billed Spoonbill	<i>Platalea flavipes</i>
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>
Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>
<u>MAMMALS</u>	
Common-brushtail Possum	<i>Trichosurus vulpecula</i>
Eastern Grey Kangaroo	<i>Macropus giganteus</i>
Common Wallaroo	<i>Macropus robustus</i>
Common Wombat	<i>Vombatus ursinus</i>
Chocolate Wattlet Bat	<i>Chalinolobus morio</i>

COMMON NAME	SCIENTIFIC NAME
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>
Large Forest Bat	<i>Vespadelus darlingtoni</i>
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>
White-striped Mastiff Bat	<i>Nyctinomus australis</i>
European Rabbit *	<i>Oryctolagus cuniculus</i>
Fox *	<i>Vulpes vulpes</i>
Sheep *	<i>Ovis aries</i>
<u>REPTILES</u>	
Bearded Dragon	<i>Pogona barbata</i>
Copper-tailed Skink	<i>Ctenotus taeniolatus</i>
Cunningham's Skink	<i>Egernia cunninghami</i>
Eastern Blue-tongued Lizard	<i>Tiliqua scincoides</i>
Eastern Brown Snake	<i>Pseudonaja textilis</i>
Jacky Lizard	<i>Amphibolurus muricatus</i>
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>
Striped Skink	<i>Ctenotus robustus</i>
<u>AMPHIBIANS</u>	
Common Eastern Froglet	<i>Crinia signifera</i>
Peron's Tree Frog	<i>Litoria peronii</i>
Smooth Toadlet	<i>Uperoleia laevigata</i>
Spotted Grass Frog	<i>Limodynastes tasmaniensis</i>

* = Exotic Species

11. APPENDIX 3 – DIRECTOR GENERALS REQUIREMENTS

Project	Construction and operation of a wind farm that will have a generation capacity of 45 to 116 megawatts. The wind farm is to include two development parcels to the east and south of the existing Crookwell 1 wind farm and approved Crookwell 2 wind farm (referred to as Crookwell 3 East and Crookwell 3 South). The project includes up to 35 wind turbines and associated infrastructure, including access tracks, internal cabling and underground connections to link Crookwell 3 East and South to the approved substation within Crookwell 2 wind farm.
Site	Approximately 17 kilometres to the south east of Crookwell, in the Upper Lachlan local government area.
Proponent	Crookwell Development Pty Ltd
Date of Issue	7 April 2010
Date of Expiration	7 April 2012
General Requirements	<p>The Environmental Assessment (EA) must include:</p> <ul style="list-style-type: none"> ▪ an executive summary; ▪ a detailed description of the project including: <ul style="list-style-type: none"> → construction, operation and decommissioning details; → the location and dimensions of all project components including the wind turbines (including map coordinates and AHD heights), electrical sub stations, underground cabling between turbines and underground connection linking Crookwell 3 East and South to Crookwell 2 wind farm substation, on Site control room and equipment storage, temporary concrete batching plant(s), construction compounds and access roads; → a timeline identifying the proposed construction and operation of the project components, their envisaged lifespan and arrangements for decommissioning and staging; → supporting maps/plans clearly identifying existing environmental features (e.g. watercourses, vegetation), infrastructure and landuse (including nearby residences and approved residential developments or subdivisions) and the location/ siting of the project (including associated infrastructure) in the context of this existing environment; and → resourcing requirements (including, but not limited to, water supply and gravel). ▪ consideration of any relevant statutory provisions including the consistency of the project with the objects of the <i>Environmental Planning and Assessment Act</i>

	<p>1979;</p> <ul style="list-style-type: none"> ▪ an assessment of the key issues outlined below, during construction, operation and decommissioning (as relevant). The Environmental Assessment must assess the worst case as well as representative impact for all key issues considering cumulative impacts, as applicable, from the surrounding Crookwell 1 Wind Farm (existing), other approved wind farms in the viewshed of the project, and the Crookwell 2 Wind Farm (approved), including associated key ancillary components; ▪ a draft Statement of Commitments detailing measures for environmental mitigation, management and monitoring for the project; ▪ a conclusion justifying the project taking into consideration the environmental, social and economic impacts of the project; the suitability of the Site; and the public interest; and ▪ certification by the author of the EA that the information contained in the Assessment is neither false nor misleading.
<p>Key Assessment Requirements</p>	<p>The EA must include assessment of the following key issues:</p> <ul style="list-style-type: none"> ▪ Strategic Justification - the EA must: <ul style="list-style-type: none"> → include a strategic assessment of the need, scale, scope and location for the project in relation to predicted electricity demand, predicted transmission constraints and the strategic direction of the region and the State in relation to electricity supply, demand and electricity generation technologies; → include a clear demonstration of quantified and substantiated greenhouse gas benefits, taking into consideration sources of electricity that could realistically be replaced and the extent of their replacement; → include an analysis of the suitability of the project with respect to potential land use conflicts with existing and future surrounding land uses (including rural residential development, land of significant scenic or visual value, land of high agricultural value, mineral reserves and conservation areas), taking into account local and strategic landuse objectives; and → describe the alternatives considered (location and/or design) for all project components, and provide justification for the preferred project demonstrating its benefits including community benefits (for example community enhancement programs) on a local and strategic scale and how it achieves stated objectives. ▪ Visual Impacts - the EA must: <ul style="list-style-type: none"> → provide a comprehensive assessment of the landscape character and values and any scenic or significant vistas of the area potentially affected by the project. This should describe community and stakeholder values of the local and regional visual amenity and quality, and perceptions of the project based on surveys and consultation; → assess the impact of shadow “flicker”, blade “glint” and night lighting from the wind farm; → identify the zone of visual influence (no less than 10 kilometres) and assess the visual impact of all project components on this landscape;

- include photomontages of the project taken from potentially affected residences (including approved but not yet developed dwellings or subdivisions with residential rights), settlements and significant public view points, and provide a clear description of proposed visual amenity mitigation and management measures;
- provide an assessment of the feasibility, effectiveness and reliability of proposed mitigation measures and any residual impacts after these measures have been implemented.

▪ **Noise Impacts** - the EA must:

- include a comprehensive noise assessment of all phases and components of the project including, but not limited to, turbine operation, the operation of the electrical substation, construction, and traffic noise. The assessment must identify noise sensitive locations (including approved but not yet developed dwellings), baseline conditions based on monitoring results, the levels and character of noise (e.g. tonality, impulsiveness etc) generated by noise sources, noise criteria, modelling assumptions and worst case and representative noise impacts;
- in relation to wind turbine operation, determine the noise impacts under operating meteorological conditions (i.e. wind speeds from cut in to rated power), including impacts under meteorological conditions that exacerbate impacts (including varying atmospheric stability classes and the van den Berg effect for wind turbines). The probability of such occurrences must be quantified;
- include monitoring to ensure that there is adequate wind speed/profile data and ambient background noise data that is representative for all sensitive receptors;
- provide justification for the nominated average background noise level used in the assessment process, considering any significant difference between daytime and night time background noise levels;
- include an assessment of vibration impacts associated with the project;
- if any noise agreements with residents are proposed for areas where noise criteria cannot be met, provide sufficient information to enable a clear understanding of what has been agreed and what criteria have been used to frame any such agreements;
- clearly outline the noise mitigation, monitoring and management measures that would be applied to the project. This must include an assessment of the feasibility, effectiveness and reliability of proposed measures and any residual impacts after these measures have been incorporated; and
- include a contingency strategy that provides for additional noise attenuation should higher noise levels than those predicted result following commissioning and/or noise agreements with landowners not eventuate.

The assessment must be undertaken consistent with the following guidelines:

- Wind Turbines - the South Australian Environment Protection Authority's *Wind Farms - Environmental Noise Guidelines* (2003);
- Site Establishment and Construction – *Interim Construction Noise Guidelines* (DECC, 2009);

- Traffic Noise – Environmental Criteria for Road Traffic Noise (NSW EPA, 1999); and
- Vibration – Assessing Vibration: A Technical Guideline (DECC, 2006).

- **Flora and Fauna** - the EA must:

- include an assessment of all project components on flora and fauna and their habitat consistent with the *Draft Guidelines for Threatened Species Assessment* (DEC, 2005), including details on the existing Site conditions and quantity and likelihood of disturbance;
- The EA must specifically consider impacts to threatened species and communities listed under both State and Commonwealth legislation that have been recorded on the Site and surrounding land, impacts to riparian and/ or instream habitat in the case of disturbance of waterways, and to biodiversity corridors. In addition, impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips, and alteration to movement patterns resulting from the turbines must be assessed, including demonstration of how the project has been Sited to avoid and/ or minimise such impacts;
- details of how flora and fauna impacts would be managed during construction and operation including adaptive management and maintenance protocols (including the mitigation and/or management of weeds); and
- measures to avoid, mitigate or offset impacts consistent with “improve or maintain” principles. Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project.

- **Indigenous Heritage** - the EA must include an assessment of the potential impact of the project components on indigenous heritage values (archaeological and cultural). The EA must demonstrate effective consultation with indigenous stakeholders during the assessment and in developing mitigation options (including the final recommended measures) consistent with *Guidelines for Aboriginal Cultural Impact Assessment and Community Consultation* (DEC, July 2005).

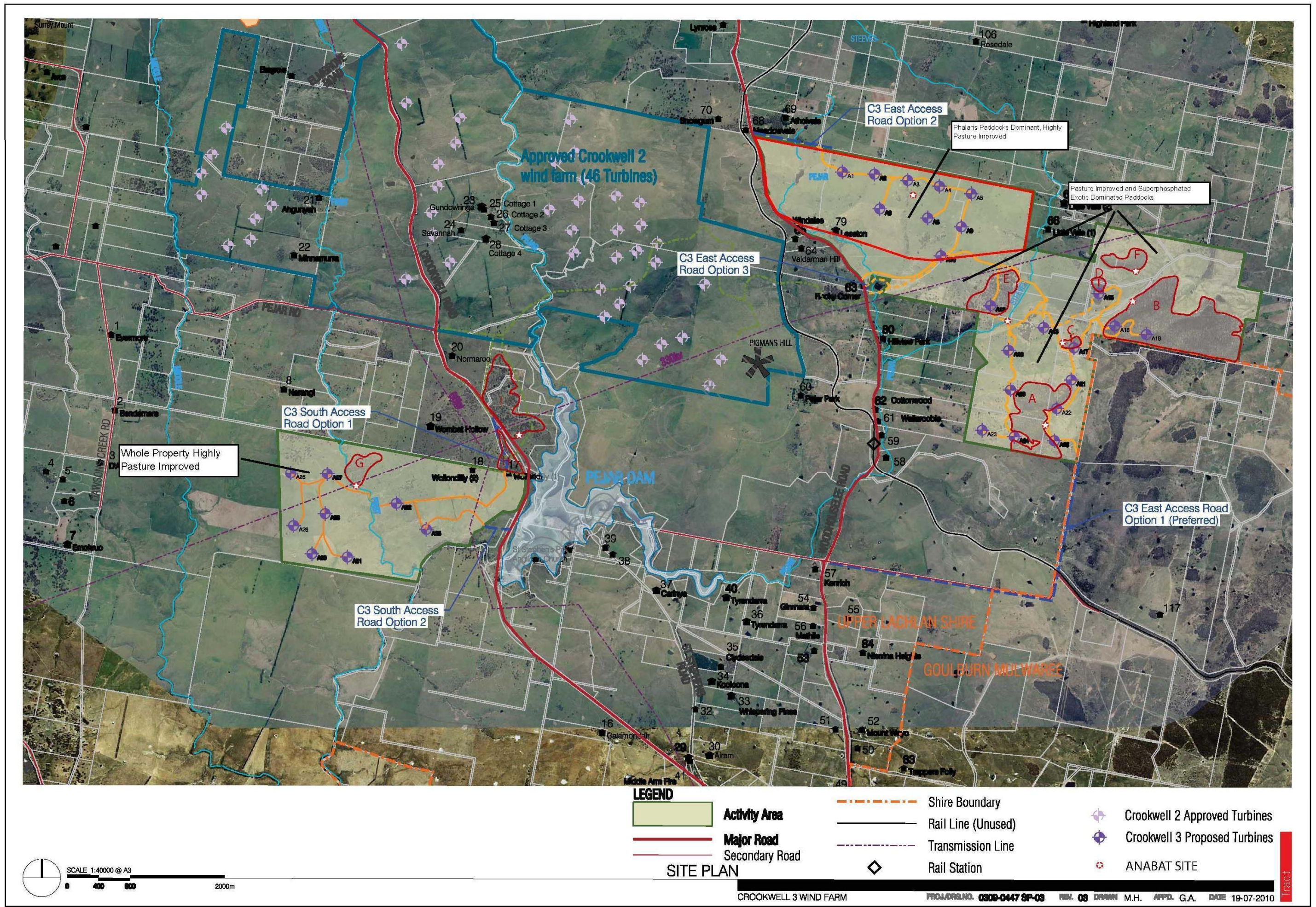
- **Traffic and Transport** – the EA must assess the construction and operational traffic impacts of the project including:

- details of the nature of traffic generated, transport routes, traffic volumes and potential impacts on local and regional roads, bridges and intersections, including any proposed road upgrades and repairs;
- details of measures to mitigate and/or manage the potential impacts, including measures to control soil erosion and dust generated by traffic volumes;
- details of Site access roads including how these would connect to the existing road network and any operational maintenance or handover requirements.

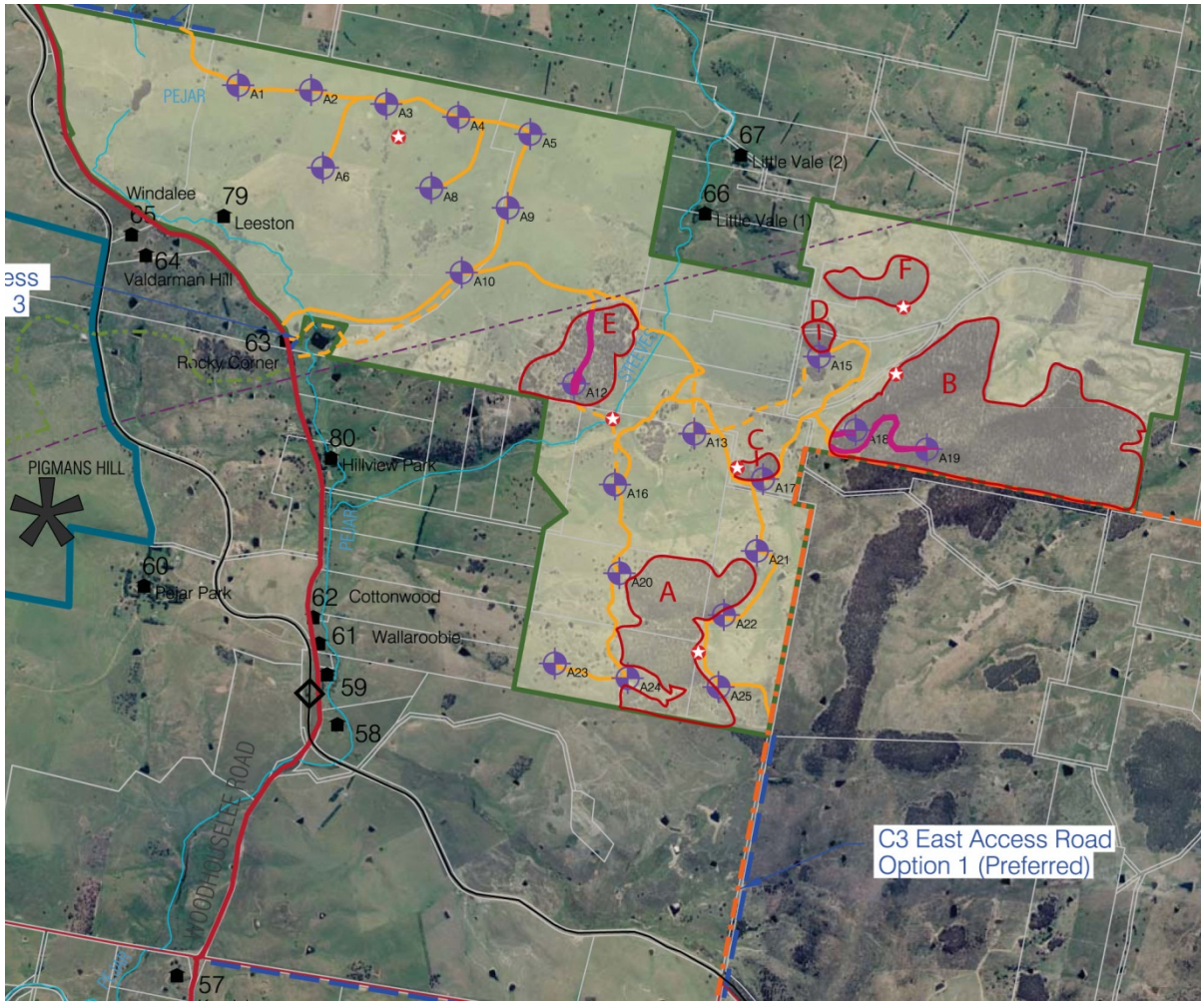
- **Hazard/Risks**– the EA must include an assessment of the potential impacts on aviation safety considering nearby aerodromes and aircraft landing areas, defined air traffic routes, aircraft operating heights, radar interference, communication systems, and navigation aids. In addition, the EA must assess the impact of the turbines on the safe and efficient aerial application of agricultural fertilisers and pesticides in the vicinity of the turbines. The management of any land contamination must also be addressed. Potential

	<p>hazards and risks associated with electric and magnetic fields and bushfires must be assessed. The EA must also detail measures to contain any hazardous substances to prevent the contamination of pasture and dams.</p> <ul style="list-style-type: none"> ▪ Water Supply and Waterways – The EA must determine whether an adequate and secure water supply is available for the life of the project including the statutory (licensing) context of the water supply sources, and assess potential environmental impacts associated with the identified sources, including impacts on groundwater. Where the project would cross significant waterways, the EA must identify likely impacts to the waterways and measures to minimise impacts. The EA must also assess the potential for water pollution impacts, including the risks to the environment and human health. ▪ General Environmental Risk Analysis –notwithstanding the above key assessment requirements, the EA must include an environmental risk analysis to identify potential environmental impacts associated with the project, proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed mitigation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of the additional key environmental impact(s) must be included in the EA.
<p>Consultation Requirements</p>	<p>The Proponent must undertake an appropriate and justified level of consultation with the following parties during the preparation of the EA:</p> <ul style="list-style-type: none"> ▪ Upper Lachlan Shire Council; ▪ Goulburn Mulwaree Council; ▪ Department of Environment, Climate Change and Water; ▪ NSW Office of Water; ▪ Department of Industry and Investment; ▪ NSW Roads and Traffic Authority; ▪ NSW Rural Fire Service; ▪ Land and Property Management Authority; ▪ Sydney Catchment Authority; ▪ Commonwealth Department of Defence; ▪ Civil Aviation Safety Authority; ▪ Airservices Australia; ▪ Aerial Agricultural Society of Australia; and ▪ the local community and landowners. <p>The EA must clearly describe the consultation process and indicate the issues raised by stakeholders during consultation and how these matters have been addressed.</p>

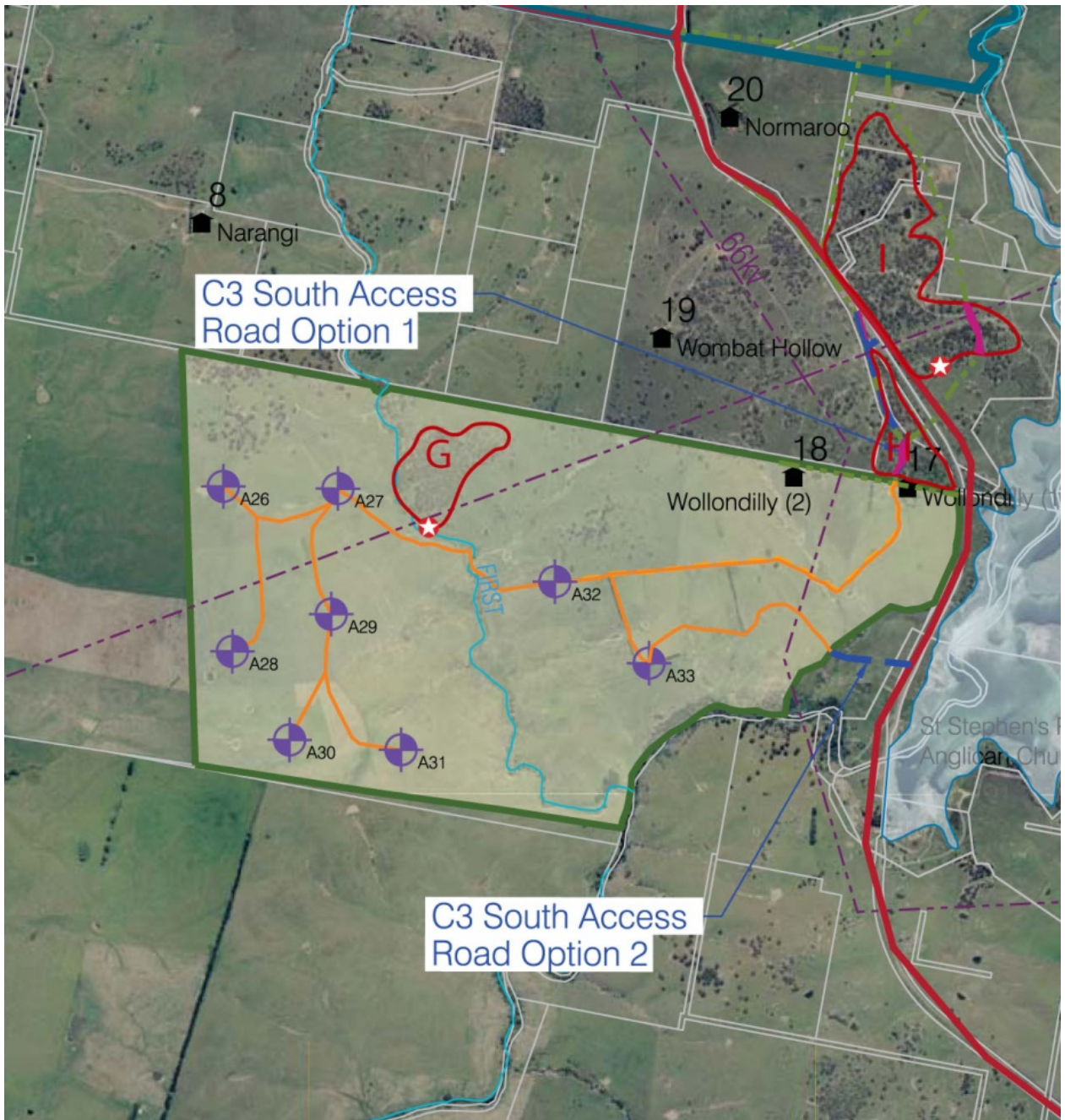
12. APPENDIX 4 - MAPPING



INTENTIONALLY LEFT BLANK



Crookwell 3 East - showing areas of vegetation removal in “Pink” within remnants B and E.



Crookwell 3 South – showing proposed vegetation removal marked in “Pink” at proposed access and electrical interconnection area.

13. APPENDIX 5 – CURRENT TARGETED SURVEY RESULTS

Species	Survey Season	Survey Effort	Result
Pink Tailed Worm Lizard and Little Whip Snake	August to October (Rocky Slopes after Rain)	3 sessions of 1 day each	Not Detected
Striped Legless Lizard (<i>Delmar impar</i>)	Nov-Dec (6 weeks of trapping). Trapping in dense Kangaroo Grassland. Roof tiles to be placed in potential habitat 4 month prior to trapping (August to place roof tiles)	Trapping undertaken from second week of November (both pit and funnel)	Not Detected
Grassland Earless Dragon (<i>Tympanocryptis pinguicolla</i>)	Spider Tubes for 10 weeks from February to April with tubes checked twice a week. Two tubes per hectare in Grassland Habitat.	Trapping commenced in mid January due to warm season and almost complete at time of writing.	Not Detected
Squirrel Glider	Live Trapping in trees with traps 50-100 metres apart in potential habitat set for 3-4 consecutive nights. Traps checked in the morning and closed until dusk when they are re-opened. (No specific Season Required)	120 trap nights in remnants B and E.	Not Detected
Regent Honeyeater	Call Playback in Spring-Summer in potential foraging or breeding habitats.	Undertaken over 2 days (September and January) around vegetation remnants.	Not Detected
Brown Treecreeper, Diamond Firetail, Hooded Robin, Speckled Warbler and Varied Sittella.	Early morning and or late afternoon on three occasions separated by a period of one week each. Three locations must be spread across the site. (No specific time of year required)	Undertaken during September, December and late January at ecotones.	Not Detected

Species	Survey Season	Survey Effort	Result
Scarlet Robin	Diurnal bird census in early morning and or late afternoon on three occasions separated by one week each. Surveys to be conducted from July to January. Surveys to concentrate on ridges, hills and foothills.	Undertaken during July, September, and January at ecotones.	Not Detected
Barking and Powerful Owls	1 site per 100 ha. Survey for potential nest trees. Surveys best undertaken in Winter over 3 nights.	Surveys undertaken in August at the same locations as anabat. Surveys over 3 nights.	Not Detected
Gang Gang Cockatoo/ Glossy Black Cockatoo/ Superb Parrot	Diurnal surveys and nesting assessments using stagwatching and call identification in late afternoon. Gang Gang (Sept-January) Glossy Black (March to August) Superb Parrot (September to December)	Two days for each species separated by one month each.	Not Detected
Microchiropteran Bats Eastern False Pipistrelle, Eastern Bent Wing Bat, Large Footed Myotis, Greater Broad Nosed Bat, Yellow bellied Sheath Tailed Bat and Greater Long Eared Bat	Surveys have been completed last season.	Surveys previously completed.	Not Detected
Golden Sun Moth	October to December. Hand netting during known flight periods in > 40% <i>Austrodanthonia</i> in the groundcover.	Surveys during October, November and December. Undertaken while doing other surveys for extensive coverage.	
Swainsonia sericea, Swainsonia recta, Prasophyllum petilum, Austral Toad Flax. <i>Diuris aequalis</i> (Oct-Nov)	Transects 10 metres apart through all areas of woodland /grassland.	October to mid January.	