Environmental Impact Statement

Glenellen Solar Farm

Appendix C: Biodiversity Development Assessment Report

October 2020

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Glenellen Solar Farm
Biodiversity Development Assessment Report

Trina Solar (Australia) Pty Ltd

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Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Trina Solar (Australia) Pty Ltd to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed development of the Glenellen Solar Farm on Lot 3 DP 411022, 101 DP 791421, Lot 1004 DP 1033823, Lot 1 DP 588720, and parts of Lot 27 DP 753342 and Lot 3 DP 411022, located in Glenellen and Jindera. The proposed project is an c. 200 MW utility scale electricity generation works comprised of solar photovoltaic (PV) modules, steel racking and piled, screwed or ballasted supports, electrical power conversion units, underground and/or above ground electrical cabling, telecommunications equipment, amenities and storage facilities, vehicular access and parking areas, along with security fencing and gates.

This BDAR addresses the Secretary's Environmental Assessment Requirements (SEARs) Application Number SSD 9550 – Biodiversity. This report has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act).

The proposed Solar Farm is located within the Greater Hume Local Government Area (LGA), approximately 4 km north-east of Jindera. The area is zoned RU1 Primary Production under the Greater Hume Local Environment Plan (LEP) (GHLEP 2012).

The project area has been subject to years (in excess of 50 years) of agricultural use and is comprised mainly of paddock trees with exotic pasture or pasture improved land. Very few areas showed evidence of native species persistence except for the canopy (i.e. trees). Two derived Plant Community Types (PCT) have been mapped within the Development Footprint.

One of the PCTs has been mapped as PCT 277 - *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*, which is present in three condition states (vegetation zone 1 – grazing/exotic pasture; vegetation zone 2 – planted; and vegetation zone 3 – low condition). The second PCT mapped within the Study Area is PCT 9 - *River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion* (vegetation zone 4 – low condition). An additional vegetation zone (5) is assigned to paddock trees, as determined by the BAM. Paddock trees were identified to most likely represent PCT 277.

Vegetation zone 3 conforms to the Critically Endangered Ecological Community (CEEC) '*White Box Yellow Box Blakely's Red Gum Woodland*', listed under the NSW BC Act. Vegetation zones 1 and 2, and paddock trees were not considered to meet the listing criteria for the CEEC under the BC Act. Vegetation zone 1 consisted of a native canopy over exotic pasture (improved land), with the natural soil and associated seed bank unlikely to be intact. This vegetation zone is unlikely under appropriate management to respond to assisted natural regeneration (a determining factor for meeting the CEEC). Vegetation zone 2 consisted of mixed native tree and shrub plantings with an exotic understorey. It was assigned to PCT 277, as it contained species native to NSW and PCT 277 was most likely to have existed prior to previous clearing and current plantings.

While PCT 277 can also comprise part of the Critically Endangered Ecological Community (CEEC) '*White Box Yellow Box Blakely's Red Gum Woodland*', listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the condition of vegetation in the study area did not meet the minimum condition thresholds under the EPBC Act.

No threatened flora or fauna species were recorded in the Development Footprint. However, potential habitat for *Myotis macropus* (Southern Myotis) listed as vulnerable under the BC Act and *Pilularia novae-hollandiae* (Austral Pillwort) listed as Endangered under the BC Act have been assumed to be present based on-site characteristics. Prior to conducting surveys, advice was sought from OEH (now BCD) for mapping potential habitat for the Southern Myotis. Based on the '*Species credit threatened bats and their habitat – NSW survey guide for the Biodiversity Assessment Methodology'*; habitat corresponds to PCTs within the Development Footprint that are associated with the species (as listed in the Threatened Biodiversity Data Collection – TBDC; BioNet) and that are within 200m of a waterbody (e.g. creek or dam). PCT 9 is listed in the TBDC as being associated with the Southern Myotis.

It is noted that when conducting the surveys for this project in 2018, BioNet listed the survey period for the *Pilularia novae-hollandiae* as all-year round. At the time of finalising this report (following design changes), the survey period has changed in BioNet to October to December. Therefore, the original surveys conducted for this species in late September are outside the nominated survey period. The BDAR has been updated to reflect this change and has assumed presence. PCT 9 is listed in the TBDC as being associated with *Pilularia novae-hollandiae.*

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts on the vegetation and species habitat present within the Development Footprint and measures to minimise impacts during construction and operation of the development. Following consideration of the above aspects, the residual unavoidable impacts of the project were calculated in accordance with BAM by utilising the Biodiversity Assessment Method Credit Calculator (BAMC).

A total of 138 ecosystem credits and 21 species credits are required to offset the residual impacts of the proposed project:

PCT #	PCT Name	Condition	Vegetation Zone	Area (ha) or Number*	Vegetation Integrity Score	Credits
Ecosystem Credits						
277	*Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*	Exotic pasture / Grazing	1	7.28 ha	14.8^	*0*
277	*Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*	Planted	2	0.64 ha	30.7	*10*
277	*Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*	Low	3	2.46 ha	36.7	*45*
9	*River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion*	Low	4	1.02 ha	19.6	*9*
Paddock Trees (PCT 277)			5	81	N/A	*74*
	Total Ecosystem Credits					**138**
Species Credits						
Myotis macropus (Southern Myotis)			N/A	1.02 ha	N/A	*10*
Pilularia novae-hollandiae (Austral Pillwort)			9	1.02 ha	N/A	*15*

Under BAM (Section 10.3.1.1), an assessor is required to determine an offset for all impacts of development on PCTs that are associated with:

a) a vegetation zone that has a vegetation integrity score ≥15 where the PCT is representative of an endangered or critically endangered ecological community, or

b) a vegetation zone that has a vegetation integrity score of ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or

c) a vegetation zone that has a vegetation integrity score ≥20 where the PCT is not representative of a TEC or associated with threatened species habitat.

Following BAM, no ecosystem credits are required to be offset for the removal of 7.28 ha of vegetation zone 1. This vegetation does not meet the listing criteria for a TEC but has been associated with threatened species habitat (item 'b' above). With a vegetation integrity score of 14.8, this is less than a score of 17 where an offset is required.

Serious and Irreversible Impacts (SAII) values have been considered as part of this assessment. '*White Box Yellow Box Blakely's Red Gum Woodland*' and *Pilularia novae-hollandiae* are listed candidate entities potentially subject to SAII. The SAII threshold for these entities are yet to be published. Given the small area (2.46 ha) of PCT 277 vegetation zone 3 representing Box-Gum Woodland, its degraded condition state, and it forming part of a contiguous larger patch including road verge vegetation and large stands, it is considered unlikely that the development would result in an SAII to this entity. Impacts to *White Box Yellow Box Blakely's Red Gum Woodland* are considered a worst-case scenario, with clearing to this community unlikely to occur within the substation lot, where a connection point is to be established. Therefore, approximately 1.26 ha of this community occurring within the Development Footprint of the substation lot is likely to be retained. Similarly, considering the low potential occurrence of *Pilularia novae-hollandiae* within the Development Footprint, and that only 1.02 ha of highly degraded and modified habitat (vegetation integrity score of 19.6) to be cleared, it is considered unlikely that the development would result in an SAII to this entity.

A likelihood of occurrence assessment was conducted for Matters of National Environmental Significance (MNES) based on the Protected Matters Search Tool Report for the site. Following a detailed habitat assessment for each MNES and previous records within the locality, targeted surveys for the Superb Parrot (*Polytelis swainsonii*), assessment against the criteria for listing Box-Gum Woodland and a Koala important habitat assessment, no MNES were considered as having the potential to be adversely impacted by the project. Therefore, the project would not have a significant impact on MNES, and as such, a referral to the Commonwealth is not required.

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BSSAR	Biodiversity Stewardship Site Assessment Report
CEEC	Critically Endangered Ecological Community
DNG	Derived Native Grassland
DoEE	Commonwealth Department of Environment and Energy
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FM Act	NSW Fisheries Management Act 1994
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environment Plan
LGA	Local Government Area
LLS	Local Land Service
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TBDC	Threatened Biodiversity Data Collection - BioNet
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	NSW Water Management Act 2000

1. Stage 1: Biodiversity assessment

1.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Matthew Dowle, who is an Accredited Person under the NSW Biodiversity Conservation Act 2016 (BC Act). The contents of this BDAR comply with the minimum requirements outlined in Table 25 of the Biodiversity Assessment Method (BAM: OEH, 2017).

1.1.1 General description of the Study Area

The Glenellen Solar Farm (hereafter referred to as the 'Proposed Development') is located within the Greater Hume Local Government Area (LGA), on Lot 3 DP 411022, 101 DP 791421, Lot 1004 DP 1033823, Lot 1 DP 588720, and parts of Lot 27 DP 753342, approximately 4 km north-east of Jindera. The area is zoned RU1 Primary Production under the Greater Hume Local Environment Plan (LEP) (GHLEP 2012).

The project is located within a low hill landscape or alluvial / colluvial plain. However, much of the Site has also been influenced by the modifications to the natural creek and ephemeral and permanent drainage channels. The Proposed Development comprises land that is highly modified and paddock trees with an understorey of exotic pasture, cropping or pasture improved land. The surrounding area shows a long history of clearing and agricultural activities such as grazing and improvement. Native species persistence is largely limited to the canopy.

This report includes two base maps, the Site Map (Figure 1) and the Location Map (Figure 2).

Two Plant Community Type's (PCT) have been mapped within the Proposed Development. One of the PCTs has been mapped as PCT 277 - *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*, which is present in three condition states / vegetation zones (vegetation zone 1 – grazing; vegetation zone 2 - planted; and vegetation zone 3 - low condition). The second PCT has been mapped as PCT 9 - *River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion* (vegetation zone 4 – low condition). An additional vegetation zone (5) has been mapped within the Site and represents trees that meet the BAM definition for paddock trees.

PCT 277 in vegetation zone 3 conforms to the Critically Endangered Ecological Community (EEC) 'White Box Yellow Box Blakely's Red Gum Woodland', listed under the NSW BC Act. While PCT 277 can also comprise part of the Critically Endangered Ecological Community (CEEC) 'White Box Yellow Box Blakely's Red Gum Woodland', listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the condition of vegetation within the Proposed Development did not meet the minimum condition thresholds under the EPBC Act.

No threatened flora or fauna species were recorded within the Proposed Development, however, potential habitat for *Myotis macropus* (Southern Myotis) and *Pilularia novae-hollandiae* has been assumed to be present.

1.1.2 Development Footprint

The Proposed Development covers approximately 350 ha and is designated by the Development Footprint. The Development Footprint includes both the construction and operational phases, including impacts associated with all temporary construction facilities and infrastructure (including roads and access tracks). The study area includes the development site and areas retained for biodiversity that do not form part of the BAM calculations.

1.1.3 Sources of information used

The following data sources were reviewed as part of this BDAR:

- Biodiversity Assessment Method Calculator
- BioNet Atlas of NSW Wildlife (OEH, 2018a) using a 10 km buffer of the study area
- EPBC Protected Matters Search Tool (DotEE, 2018a) using a 10 km buffer of the study area
- OEH Threatened Species Profile Database (OEH, 2018b)
- BioNet Vegetation Classification (OEH, 2018c)
- Aerial mapping and photography, including NearMap (2018) imagery
- Riverina State Vegetation Type Mapping- *Riverina Regional Native Vegetation Map Version v1.0 - VIS_ID 4469* (OEH 2016).
- Additional GIS datasets including soil, topography, geology and drainage

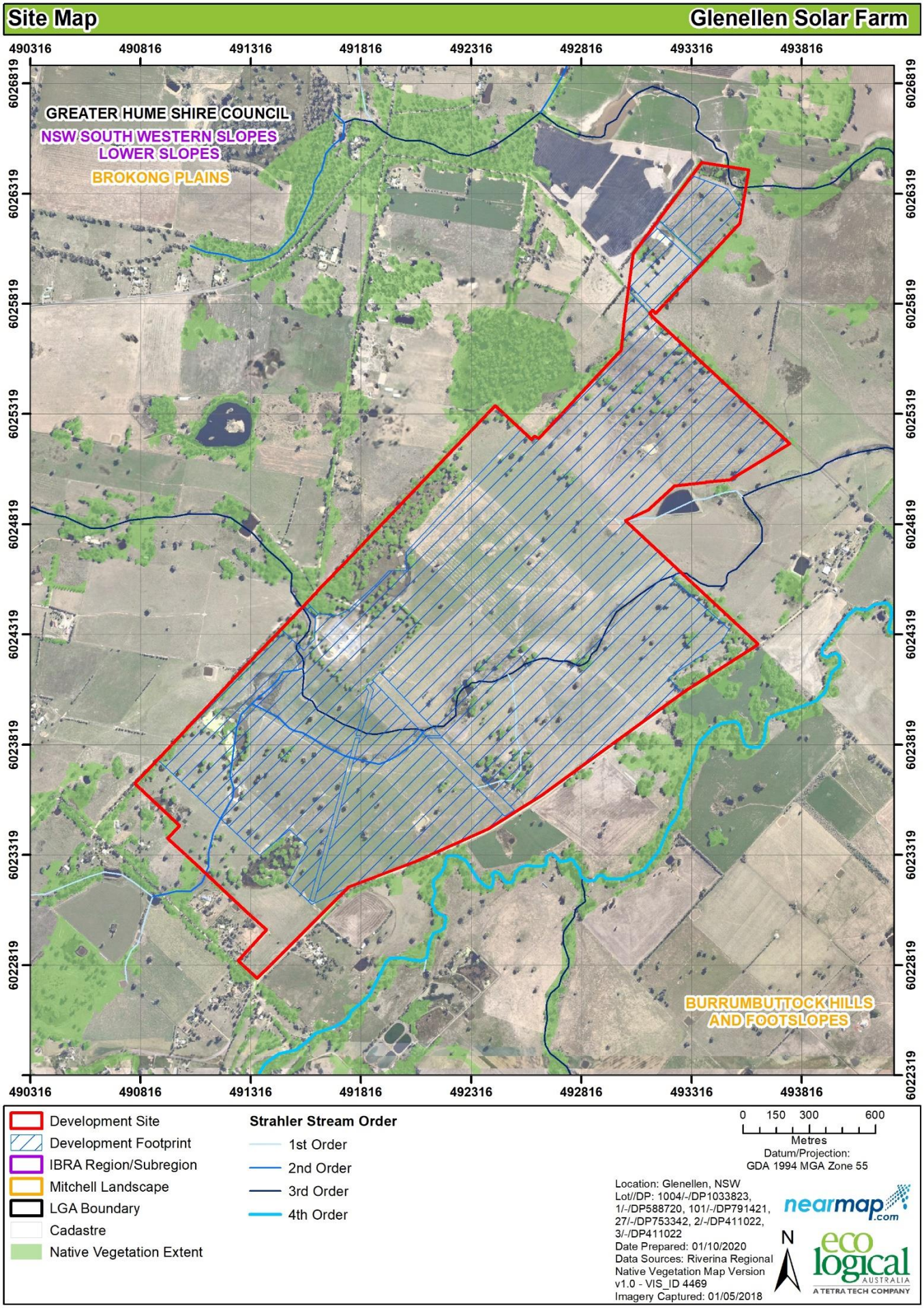

Figure 1: Site Map

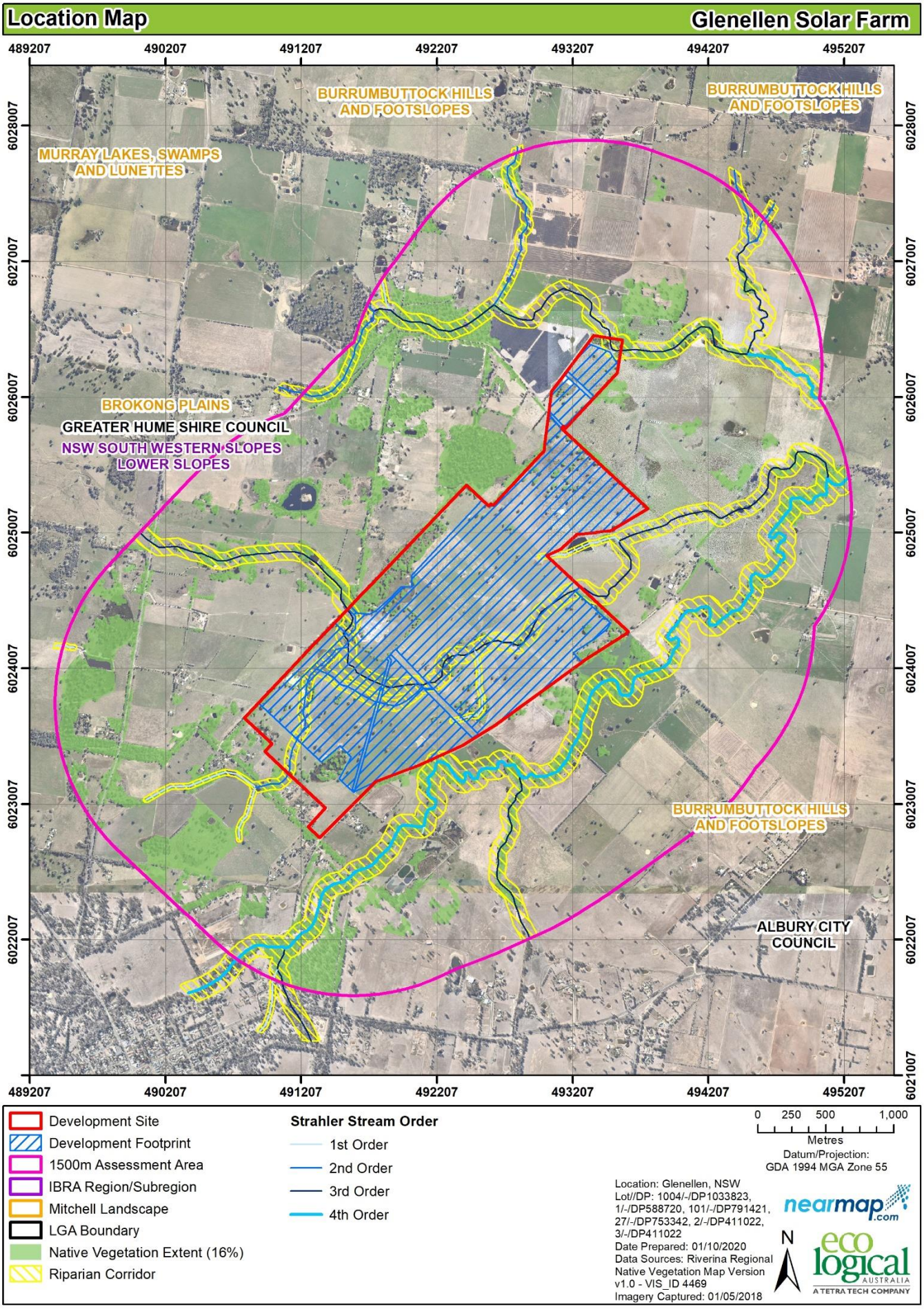

Figure 2: Location Map

1.2 Legislative context

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
***Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	Matters of National Environmental Significance (MNES) have been identified on or near the Study Area. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.	2.5.1
State		
***Environmental Planning and Assessment Act 1979* (EP&A Act)**	The proposed development requires consent under the Greater Hume Local Environmental Plan (LEP) and is to be assessed under Part 4 of the EP&A Act.	N/A
Biodiversity Conservation Act 2016	The proposed development exceeds the BAM threshold and as determined by the SEARS, requires submission of a BDAR (i.e. this report).	All
Fisheries Management Act 1994	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.	N/A
Local Land Services Amendment Act 2016	The LLS Act does not apply to development consent issued under Part 4 of the EP&A Act.	N/A
Water Management Act 2000	The project does not involve works on waterfront land. A Controlled Activity Approval under s91 of the WM Act is not required.	N/A
Planning Instruments		
Vegetation SEPP (non-rural areas 2017)	The Vegetation SEPP applies to development that does not require consent. As this project requires consent under the Greater Hume LEP, the Vegetation SEPP is not relevant.	N/A
SEPP Coastal Management	SEPP Coastal Management 2018 consolidated SEPP 14 Coastal Wetlands, SEPP 26 Littoral Rainforests and SEPP 71 Coastal Protection. The proposed development is not located on land subject to SEPP Coastal Management 2018.	N/A
SEPP – Koala Habitat Protection (2019)	The proposed development is located within Greater Hume Local Government Area, which is listed as one of the Council's to which this SEPP applies. Targeted surveys did not record this species.	2.5.2
Greater Hume Local Environment Plan 2012	The Study Area is zoned RU 1 Primary Production under the Greater Hume LEP 2012.	N/A
Greater Hume Development Control Plan (DCP)	The Greater Hume DCP has been reviewed for additional provisions that may relate to the Development Footprint. No additional provisions are required.	N/A
Secretary's Environmental Assessment Requirements		
Biodiversity - including: 1. an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW), the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), unless OEH and DPE determine that the proposed development is not likely to have any significant impacts on biodiversity values; 2. the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; and 3. an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the Fisheries Management Act 1994, and a description of the measures to minimise and rehabilitate impacts.		

1.3 Landscape features

1.3.1 IBRA regions and subregions

The entirety of the Development Footprint falls within the South Western Slopes IBRA region and Lower Slopes subregion (DoE 2012).

1.3.2 Mitchell Landscapes

The Development Footprint falls within the Mitchell Landscapes outlined in Table 2.

Table 2: Mitchell Landscapes

Mitchell landscape	Description
Brokong Plains – NSS Lower Slopes	Quaternary alluvial plains, general elevation 170m, local relief <10m. Red-brown texture-contrast soils, extensively cleared and cropped, formerly grey box (*Eucalyptus microcarpa*), yellow (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyi*) and white cypress pine (*Callitris glaucophylla*) woodland to open forest.

1.3.3 Rivers and streams

The Development Footprint contains Strahler first, second and third order streams (Figure 2).

1.3.4 Wetlands

The Development Footprint does not contain any wetlands.

1.3.5 Connectivity features

The Development Footprint is not considered to contain any connectivity features.

1.3.6 Areas of geological significance and soil hazard features

The Development Footprint does not contain areas of geological significance and soil hazard features.

1.3.7 Site context

1.3.7.1 Method applied

The site based method has been applied to this development.

1.3.7.2 Percent native vegetation cover in the landscape

The current percent native vegetation cover in the landscape was assessed in a Geographic Information System (GIS) using aerial imagery sourced from SIX Maps and NearMaps based on increments of 5%. The results of this analysis are shown in Table 3.

Table 3: Percent native vegetation cover in the landscape

Native Vegetation within the development footprint (ha)	Native Vegetation within 1,500 m buffer area (ha)	Area of the 1,500m buffer (ha)	Cover within the 1,500 m buffer (%)
11.41	407.19	2487.6	16.4

1.3.7.3 Patch size

The patch size for all vegetation zones is considered to be greater than the ≥ 100 ha patch size class. Therefore, the patch size of 101 ha was entered into the BAMC.

1.4 Native vegetation

1.4.1 Survey effort

Vegetation survey was undertaken within the study area by Matthew Dowle and Clare Duck on June 25 - June 26 2018, to initially stratify the site into vegetation communities (PCTs -Table 4 and Figure 3) and map biodiversity constraints to inform the project design.

Further survey was undertaken on August 21 – 24, 2018 to: map paddock trees and hollow-bearing trees within 200 m of a water body; conduct targeted fauna surveys for *Crinia sloanei* (Sloane's Froglet), *Petaurus norfolcensis* (Squirrel Glider) and *Phascolarctos cinereus* (Koala). Field surveys were also conducted on September 18 – 21, 2018 to: complete BAM plots and floristic surveys; conduct targeted survey for *Polytelis swainsonii* (Superb Parrot), *Lophochroa leadbeateri* (Major Mitchell's Cockatoo), *Hieraaetus morphnoides* (Little Eagle), *Haliaeetus leucogaster* (White-bellied Sea-Eagle), *Lophoictinia isura* (Square-tailed Kite), *Myotis macropus* (Southern Myotis) and *Pilularia novae-hollandiae* (Austral Pillwort). Opportunistic surveys for non-targeted fauna species were also conducted during the above surveys.

Field survey for paddock trees and mapping of vegetation zones is described further below in Section 1.4.2 and Section 1.4.3, respectively. Field effort for fauna surveys and species credits is described in Section 1.6.1.

1.4.2 Plant Community Types and Paddock Trees

Two PCTs and paddock trees were identified within the Development Footprint (Table 4 and Figure 3).

PCT 9 contained one condition class and has been stratified into a single vegetation zone. PCT 277 has been stratified into three vegetation zones based on three condition classes (grazing / exotic pasture, planted vegetation and low condition). PCT 277 has also been selected as the likely PCT for the mapped paddock trees (Figure 3 and Figure 4).

Table 4: Plant Community Types within the Development Footprint

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area (ha)	Percent cleared
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	10.38	94%
9	River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion	Inland Riverine Forests	Forested Wetlands	1.02	66%

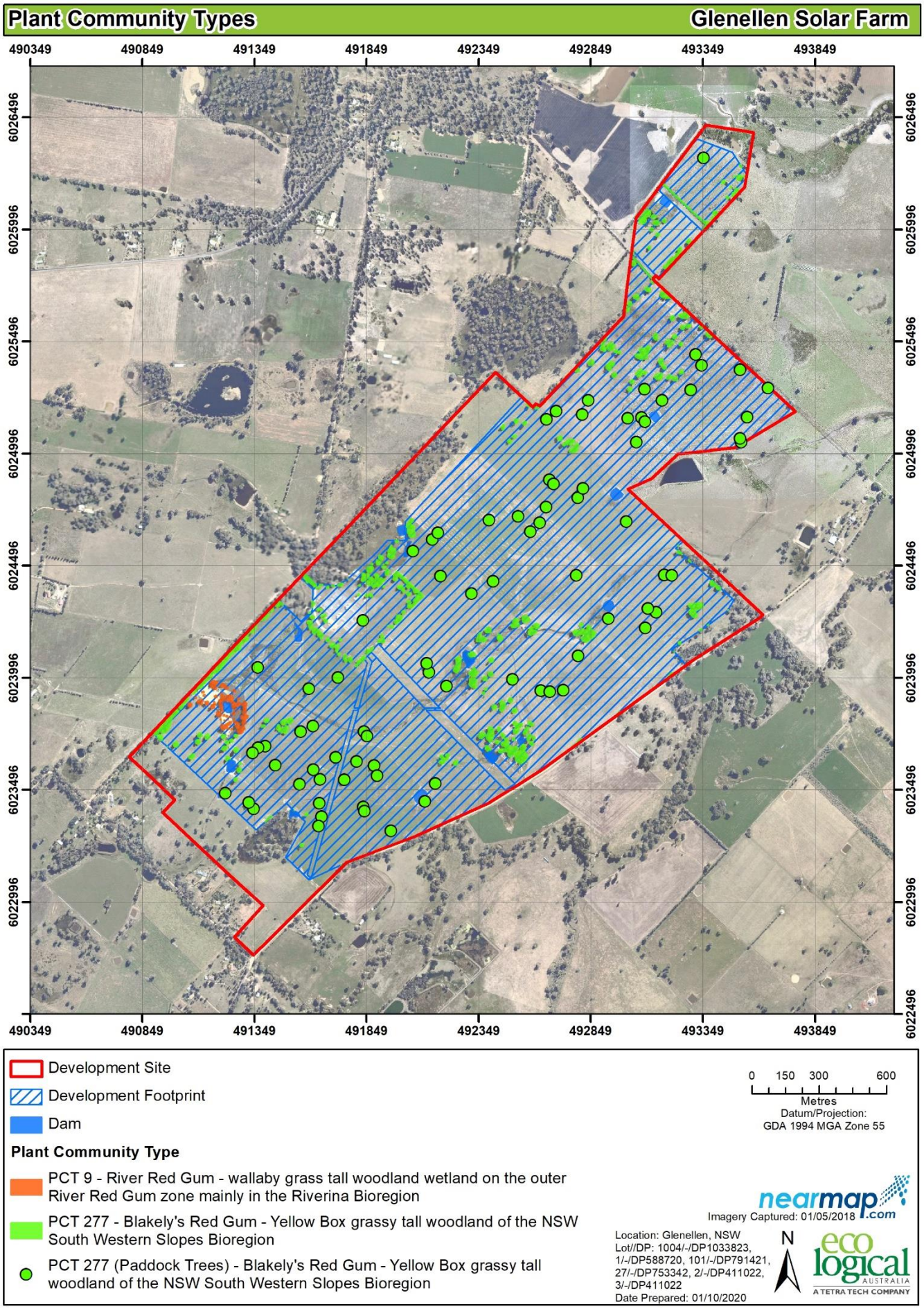

Figure 3: Plant Community Types and native vegetation extent

1.4.2.1 PCT selection justification

Justification for the selection of PCTs is based primarily on a qualitative analysis of broad-scale mapping (OEH 2016 - *Riverina Regional Native Vegetation Map Version v1.0*), landscape elements, soil characteristics and surrounding vegetation (Table 5). A quantitative analysis of floristic plot data was not possible for vegetation present, due to the depauperate condition and lack of native species in some stratum. The various attributes were considered in combination to assign vegetation to the best fit PCT.

PCT 277 was comprised of the canopy species *Eucalyptus blakelyi* (Blakely's Red Gum) and *Eucalyptus melliodora* (Yellow Box). A few *Eucalyptus bridgesiana* (Apple Box) were also present along the western edge of the Development Footprint. These three species were also found across the broader landscape outside of the project area, along with *Eucalyptus albens* (White Box). PCT 9 was comprised of a single remnant canopy species *Eucalyptus camaldulensis* (River Red Gum).

Table 5: PCT selection justification

PCT ID	PCT Name	Selection criteria	Species relied upon for identification of vegetation type and relative abundance
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	IBRA region, landform, soils, vegetation formation and vegetation class	*Eucalyptus blakelyi* and *Eucalyptus melliodora* were the dominant species observed within the site. Plain landform characteristics present with colluvial and alluvial soils. Surrounding vegetation, particularly along road verges include the above species and *Eucalyptus bridgesiana* and *Eucalyptus albens*
9	River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion	IBRA region, landform, soils, vegetation formation and vegetation class	Presence of *Eucalyptus camaldulensis.* Primarily clay, silty-loam soils associated with modified drainage lines within the site. Occurs in the lower lying areas of drainage lines and alluvial plains.

It is considered that the PCTs within the Development Footprint fall within a category of vegetation that has been highly disturbed, with the mid-storey and ground-layer species diverging considerably from species characteristic of these PCTs. In some cases, the disturbed vegetation no longer comprises characteristic species from multiple vegetative strata that would be present in the undisturbed form of the PCTs. The lack of characteristic native species increases the difficulty in assigning a PCT. In these instances, basic assumptions informed by the surrounding vegetation, landscape position and soils were used to determine the likely PCT present. Further increasing the difficulty in determining PCTs and vegetation boundaries was the 'intergrading' of Red Gums (*E. blakelyi* and *E. camaldulensis*). A number of 'intergrade' specimens were identified by the herbarium at the Australian National Botanic Gardens.

Another PCT considered in lieu of PCT 277 for this site was PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*. This PCT differs from PCT 277 in that it occurs on deep alluvial silty clay-loam soils in gullies and on creek flats in hill landscapes or along creeks. PCT 278 was ruled out as the mapped areas were not considered to occur in gullies or creek flats.

Another PCT considered in lieu of PCT 9 for this Site was PCT 5 - *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion*. However, PCT 9 was selected based on a few hardy ground layer species within and adjacent to the Site (e.g. *Poa labillardierei, Lachnagrostis filiformis, Rytidosperma* spp., *Rumex brownii, Oxalis perennans* and *Juncus flavidus*) and an absence of a shrub layer, combined with the vegetation and landscape description in the BioNet VIS database.

1.4.2.2 Justification for paddock trees

Paddock trees form a considerable component of the vegetation within the Development Footprint and have been mapped as paddock trees, based on the definition provided in Appendix 1 of BAM (see underline section). Paddock trees were assessed for their diameter at breast height (DBH) and whether hollows were present (Figure 4).

Vegetation meets the definition of paddock trees if:

- *a) the trees located on category 2 land are surrounded by category 1 land on the regulatory maps under the Biodiversity Conservation Act, or*
- *b) the native vegetation that comprises the groundcover is:*
  - *I. less than 50% of the cover of indigenous species of vegetation, and*
  - *II. not less than 10% of the area is covered with vegetation (whether dead or alive), and*
  - *III. the assessment is made at the time of year when the proportion of the amount of indigenous vegetation in the area to the amount of non-indigenous vegetation in the area is likely to be at its maximum, and*
- *c) the foliage cover for the tree growth form is less than 25% of the benchmark for the tree cover for the most likely plant community type, or*
- *d) it is a tree located more than 50m away from any living tree that is greater than 20cm DBH and the tree is located on category 2 land that is surround by category 1 land; or it is in a group of three (3) or fewer living trees within a distance of 50m of each other, that in turn, are greater than 50m from the next living tree that is greater than 20cm DBH and located on category 2 land that is surrounded by category 1 land.*

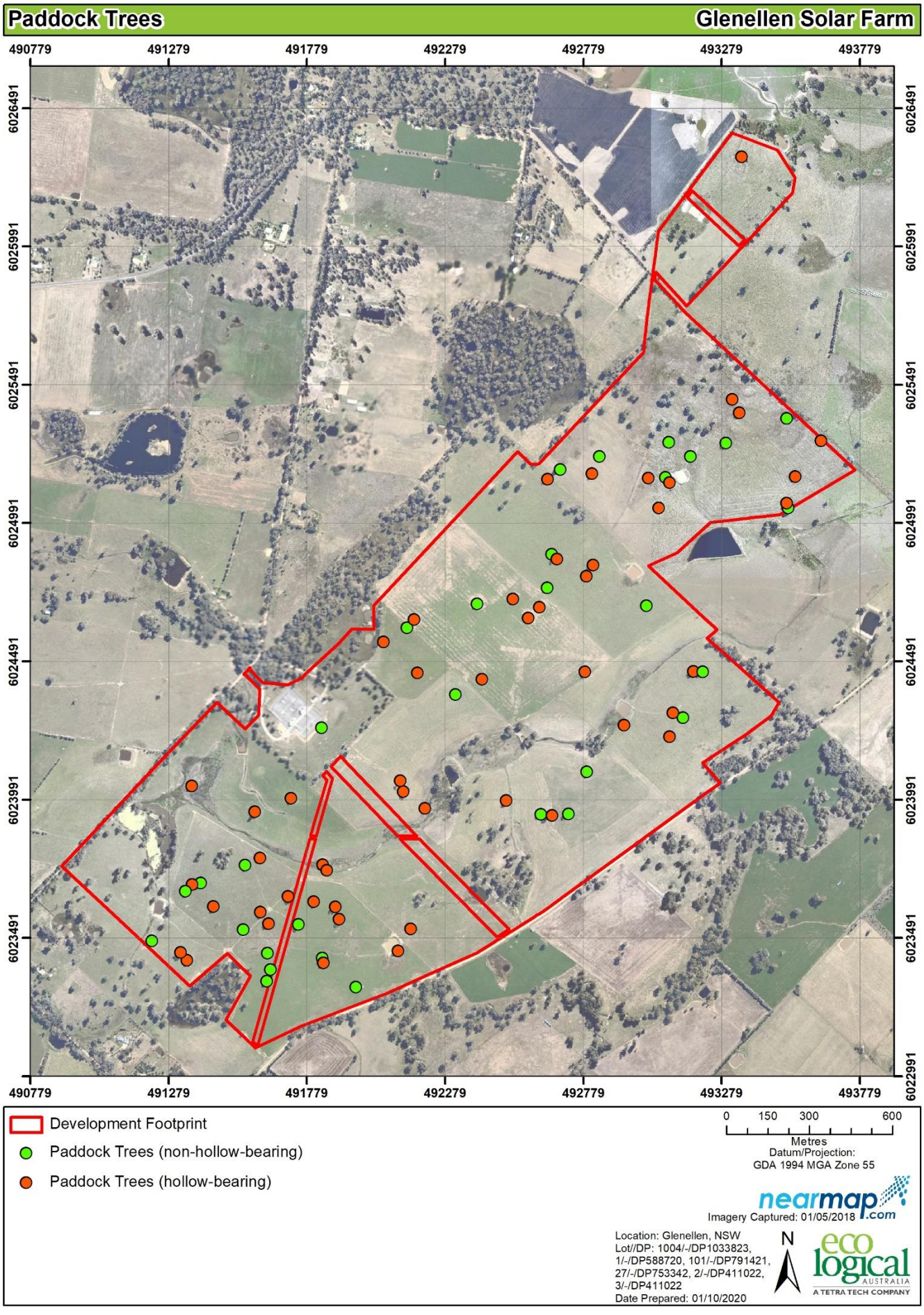

Figure 4: Paddock trees

1.4.3 Vegetation Zones and Threatened Ecological Communities

Eleven full-floristic/vegetation integrity plots (condition assessment) were surveyed to identify the condition of PCTs and map vegetation zones within the Development Footprint in accordance with the BAM (Table 6 and Figure 5). Following a refinement of project design to avoid biodiversity values, a number of these plots are outside the final Development Footprint.

Vegetation integrity plots were also used to map and justify the allocation of Threatened Ecological Communities (TECs) within the Development Footprint.

All field data collected at full-floristic and vegetation integrity plots is included in Appendix B.

Table 6: Vegetation integrity plots and Vegetation Zones

Veg Zone	PCT ID	PCT Name	Condition	Area (ha)	Plots required	Plots surveyed
1	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Grazing / Exotic Pasture	7.28 ha	3	3
2	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Planted	0.64 ha	1	1
3	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Low	2.46 ha	1	3
4	9	River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion	Low	1.02 ha	1	4~
5	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Paddock Trees	N/A*	N/A	N/A

* A total of 81 paddock trees have been mapped within the Development Footprint.
~ Plots 3 and 4 have not been included in the BAMC for PCT 9, as they occur outside the Development Footprint and sufficient plots have been completed within.

1.4.3.1 Vegetation integrity assessment

A vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 7.

The use of local data is not proposed to conduct this integrity assessment.

Table 7: Vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha) or Number*	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	277	Grazing / Exotic Pasture	7.28	2.5	32.4	39.7	14.8
2	277	Planted	0.64	43.9	59.9	11	30.7
3	277	Low	2.46	13.3	67.5	55.1	36.7
4	9	Low	1.02	20.4	10.8	33.8	19.6
5	277	Paddock Trees	81*	N/A	N/A	N/A	N/A

* Represents number of individuals

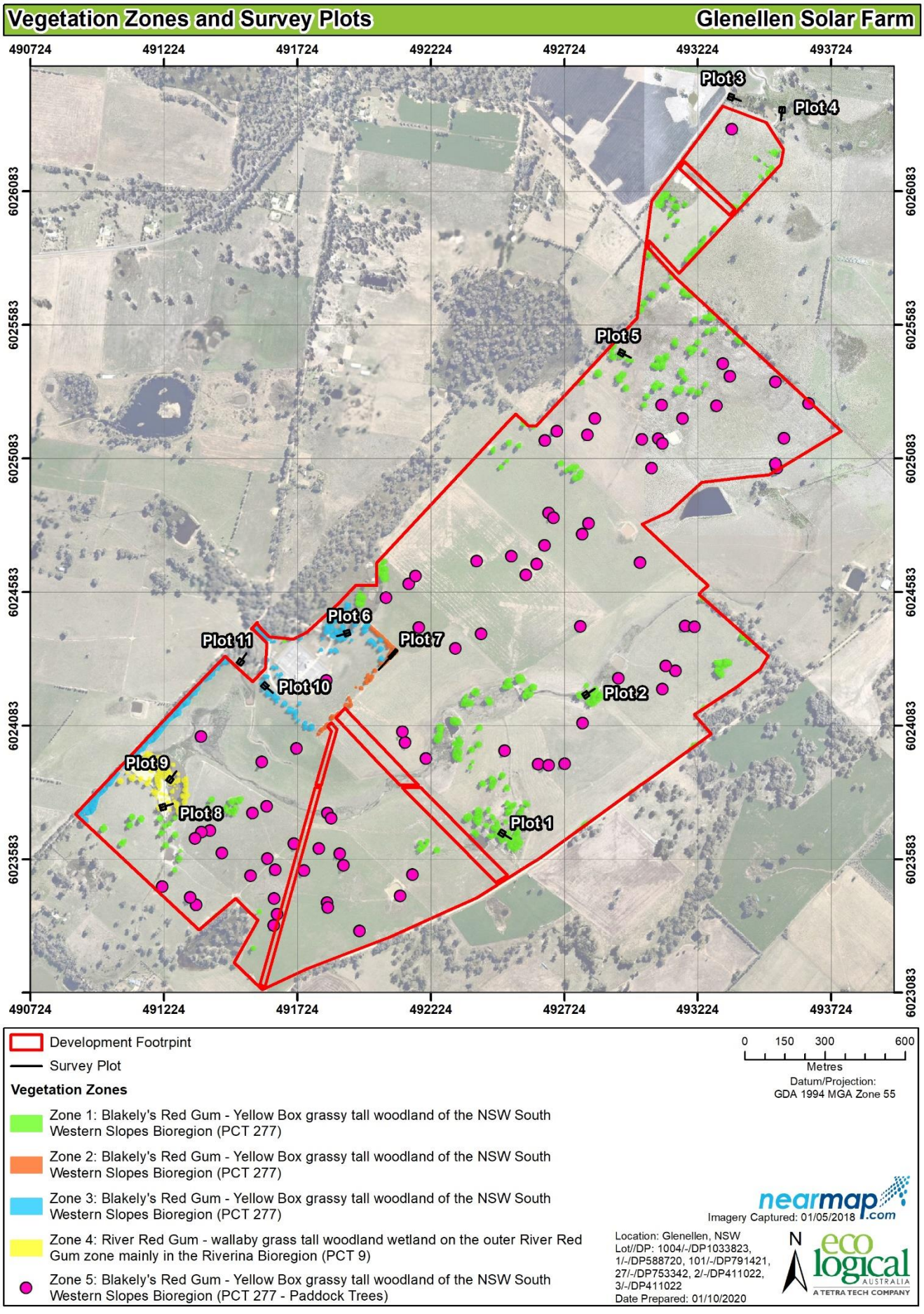

Figure 5: Vegetation Zones and Plot locations

1.4.4 Vegetation Zone Descriptions

VEGETATION ZONE 1	
PCT #	277
PCT Name	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Condition	Grazing / Exotic Pasture
TEC	Not listed as a TEC under the BC or EPBC Acts (see Section 1.4.1.1). The vegetation in this zone was not considered to meet the minimum condition threshold for listing as Box-Gum Woodland under either the State or Commonwealth legislation
Area	7.28 ha
Plots	Plots 1, 2 and 5 (Appendix B)
Vegetation Integrity Score	14.8
Description / Justification	Comprised of the canopy species *Eucalyptus blakelyi* (Blakely's Red Gum) and *Eucalyptus melliodora* (Yellow Box). A few *Eucalyptus bridgesiana* (Apple Box) were also present along the western edge of the Development Footprint. A midstorey was lacking and exotic pasture improved grasses dominated the ground layer, including *Avena* sp. (Wild Oats), *Bromus* spp. (Brome), *Festuca* spp. (Tall Fescue), *Hordeum* spp. (Barley), *Lolium* spp. (Rye Grass), *Phalaris aquatica* (Phalaris) and *Vulpia* sp. (Fescue). The majority of these exotic grasses are sown yearly as part of the on-going land management practices for pasture improvement. The majority of trees in this vegetation zone were over the large tree benchmark for the PCT (50cm dbh) and often contained multiple hollows. Fallen logs and leaf litter were rare.
Photo	

VEGETATION ZONE 2	
PCT #	277
PCT Name	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Condition	Planted
TEC	Not listed as a TEC under the BC or EPBC Acts (see Section 1.4.1.1). The vegetation in this zone was not considered to meet the minimum condition threshold for listing as Box-Gum Woodland under either the State or Commonwealth legislation
Area	0.64 ha
Plots	Plot 7 (Appendix B). This plot was modified from the standard 20 x 50 m plot, to a 10 x 100 m plot due to the linear nature of the planted vegetation.
Vegetation Integrity Score	30.7
Description / Justification	Comprised of mixed planted juvenile Eucalyptus species, including *Eucalyptus blakelyi* (Blakely's Red Gum), *Eucalyptus melliodora* (Yellow Box), *Eucalyptus microcarpa* (Grey Box) and *Eucalyptus crebra* (Thin-leaved Ironbark). A dense mid-storey was present containing planted shrubs including a number of Wattles and Callistemons such as *Acacia baileyana* (Cootamundra Wattle), *Acacia rubida* (Red-stemmed Wattle) and *Callistemon* sp. (Bottlebrush). The ground layer was predominately exotic with the occasional native grass, including *Phalaris aquatica* (Phalaris), *Vulpia* sp. (Fescue), *Lolium* sp. (Rye Grass), *Avena* sp. (Wild Oats), *Romulea rosea* (Onion Grass), *Anthosachne scaber* (Wheatgrass), *Austrostipa scabra* (Speargrass) and *Lachnagrostis filiformis* (Blown Grass) This vegetation zone was assigned to PCT 277 as it contained species native to NSW (including those present within PCT 277 and those absent, such as *Eucalyptus crebra*). PCT 277 was the most likely vegetation community prior to previous clearing and current plantings, based on the surrounding vegetation.
Photo	

VEGETATION ZONE 3	
PCT #	277
PCT Name	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Condition	Low condition
TEC	Meets the definition for listing as Box-Gum Woodland under the BC Acts, but did not meet the minimum condition threshold for listing under the EPBC Act (see Section 1.4.1.1).
Area	2.46 ha
Plots	Plot 6, 10 and 11 (Appendix B).
Vegetation Integrity Score	36.7
Description / Justification	This vegetation zone occurred only within the substation part of the Development Footprint where grazing pressure was less intense and pasture improvement was not recently evident. It comprised of the canopy species *Eucalyptus blakelyi* (Blakely's Red Gum) and no midstorey was present. The ground layer included a mix of native and exotic grasses and forbs including, *Anthosachne scaber* (Wheatgrass), *Microlaena stipoides* (Weeping Grass)), *Rytidosperma* sp. (Wallaby Grass), *Juncus* sp., *Avena* sp. (Wild Oats), *Hordeum* spp. (Barley), *Lolium* spp. (Rye Grass), *Vulpia* sp. (Fescue) and *Romulea rosea* (Onion Grass). The canopy trees in this vegetation zone were younger than the rest of the Development Footprint. Tree hollows and fallen logs were rare, while leaf litter was more abundant.
Photo	

VEGETATION ZONE 4	
PCT #	9
PCT Name	River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion
Condition	Low condition
TEC	Not listed as a TEC under the BC or EPBC Acts (see Section 1.4.1.1).
Area	1.02 ha
Plots	Plots 8 and 9 (Appendix B)
Vegetation Integrity Score	19.6
Description / Justification	Vegetation zone 4 was comprised of a single remnant canopy species *Eucalyptus camaldulensis* (River Red Gum). The majority of trees in this vegetation zone were over the large tree benchmark for the PCT and often contained multiple hollows. However, in the far north of the Development Footprint, a few planted indigenous Eucalypts were present, including *Eucalyptus microcarpa* (Grey Box) and *Eucalyptus polyanthemos* (Red Box). No mid-storey was present. The ground layer was dominated by exotic grasses and forbs, such as those recorded in vegetation zone 1 (but is not considered to be regularly pasture improved) with the occasional exotic and native forb including *Cirsium vulgare* (Spear Thistle), *Cotula coronopifolia* (Water Buttons), *Romulea rosea* (Onion Grass), *Juncus* sp., *Myriophyllum* sp. (Watermilfoils), and *Rumex brownii* (Swamp Dock). This vegetation zone occurs within slight depressions in the landscape and has been subject to drainage flow modifications (e.g. dams), creating ephemerally wet areas and large patches of bare ground / dried mud. Pro-longed dry conditions preceded the field surveys.
Photo	

VEGETATION ZONE 5	
PCT #	277
PCT Name	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Condition	Paddock Trees
TEC	Not listed as a TEC under the BC or EPBC Acts (see Section 1.4.1.1). The vegetation in this zone was not considered to meet the minimum condition threshold for listing as Box-Gum Woodland under either the State or Commonwealth legislation
Number of individuals	81
Plots	N/A
Vegetation Integrity Score	N/A
Description / Justification	Comprised of the canopy species *Eucalyptus blakelyi* (Blakely's Red Gum) and *Eucalyptus melliodora* (Yellow Box). The majority of trees were over the large tree benchmark for the PCT (50cm dbh) and often contained multiple hollows.
Photo	

1.4.4.1 Threatened Ecological Communities Justification

BioNet VIS lists PCT 277 as comprising the CEEC, '*White Box Yellow Box Blakely's Red Gum Woodland*' (Box Gum Woodland) listed under the BC Act. Justification of Box-Gum Woodland within the Development Footprint is based on a review of the NSW Scientific Committee Final Determination for the CEEC, presence of diagnostic species in the upper stratum, vegetation structure and characteristic soil of the community.

It was considered that only vegetation zone 3 of PCT 277 conformed to the CEEC (Figure 6). Vegetation zones 1 and 2 (PCT 277) were not considered to meet the listing criteria for the CEEC under the BC Act.

PCT 277 within the Development Footprint represents highly degraded and modified vegetation, with varying degrees of disturbance. The Final Determination (NSW Scientific Committee 2011) - Criteria 8, 9 and 10 notes that remnants of the CEEC have been highly modified by disturbances such as grazing and agricultural practices (pasture improvement), and that some remnants may consist of only an intact overstorey or an intact understorey. Criteria 11 further describes that "*disturbed remnants are still considered to form part of the community including remnants where the vegetation, either understorey, overstorey or both, would under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact*."

Vegetation zone 1 consisted of a native canopy over exotic pasture (decades of pasture improvement), with the natural soil and seed bank unlikely to be intact. This vegetation zone is considered unlikely under appropriate management to respond to assisted natural regeneration and is therefore not considered to meet the Final Determination (NSW Scientific Committee 2011) for Box-Gum Woodland.

Vegetation zone 2 consisted of mixed native tree and shrub plantings with an exotic understorey. It was assigned to PCT 277 as it contained species native to NSW (including those present within Box-Gum Woodland and those absent, such as *Eucalyptus crebra*). PCT 277 was the most likely vegetation community prior to previous clearing and current plantings, based on the surrounding vegetation. However, due to the modified state, mixed planted species and disturbance to the natural soil and associated seed bank, this vegetation zone was not considered to represent Box-Gum Woodland.

While PCT 277 can also comprise part of the Critically Endangered Ecological Community (CEEC '*White Box Yellow Box Blakely's Red Gum Woodland*', listed under the Commonwealth EPBC Act, the condition of vegetation in the Development Footprint did not meet the minimum condition thresholds under the EPBC Act, primarily because the vegetation did not contain a native ground layer.

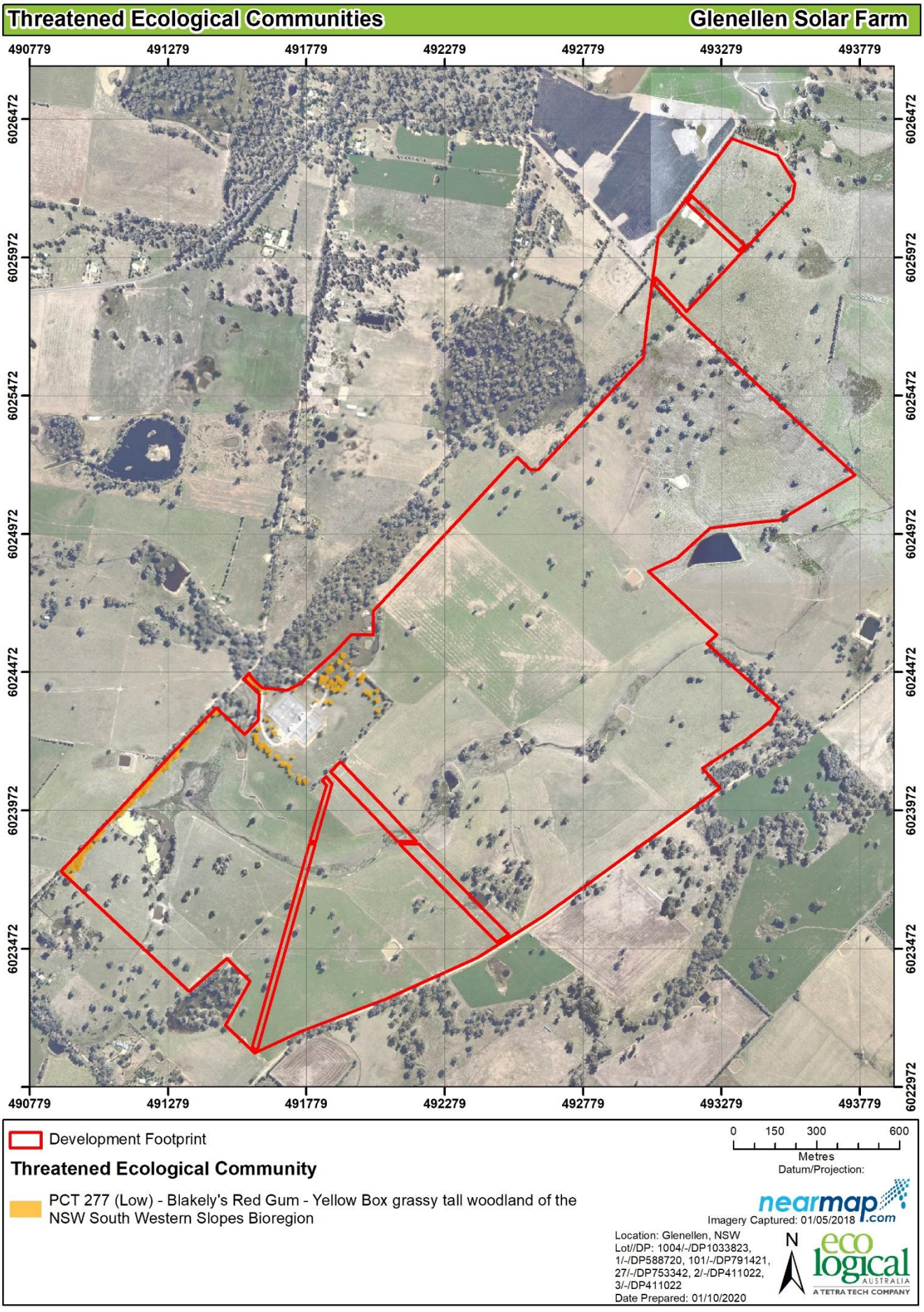

Figure 6: Threatened Ecological Communities

1.5 Threatened species

1.5.1 Ecosystem credit species

Ecosystem credit species predicted to occur in the BAMC within the Development Footprint, their associated habitat constraints, geographic limitations and sensitivity to gain class are included in Table 8. An assessment of those predicted ecosystem credit species identified has been undertaken to determine likelihood of those species to occur based on the absence of necessary habitat components or habitat constraints, in accordance with BAM sections 6.4.1.10 and 6.4.1.17. For those species that have been excluded, the justification is provided. The inclusion or exclusion of species considers all vegetation zones combined, unless otherwise stated.

Table 8: Predicted ecosystem credit species

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Anthochaera phrygia	Regent Honeyeater (foraging)	N/A	High	CE	CE	Included: Closest NSW BioNet Atlas record is 7km from site (40 yrs old). However, closest record less than 20 years old is > 10 km from the site. Potential habitat present at the site would be limited to intermittent foraging habitat.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Callocephalon fimbriatum	Gang-gang Cockatoo (foraging)	N/A	Moderate	V	Not Listed	Included: Has been included based on it also being a candidate species. However, it is noted that any habitat present is limited and degraded. Nearest records for the species are >12 km from the site and generally >30 years old. This conspicuous species was not recorded onsite during any of the targeted surveys.
Chalinolobus picatus	Little Pied Bat	N/A	High	V	-	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Chthonicola sagittata	Speckled Warbler	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Circus assimilis	Spotted Harrier	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Daphoenositta chrysoptera	Varied Sittella	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Dasyurus maculatus	Spotted-tailed Quoll	N/A	High	V	E	Excluded: Habitat present is substantially degraded such that this species is unlikely to utilise the Development Footprint. No NSW Atlas of the species exist within 10 km of the site.
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint. However, it is noted that no NSW BioNet Atlas records of the species exist within 10 km of site.
Glossopsitta pusilla	Little Lorikeet	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Grantiella picta	Painted Honeyeater	Mistletoes present at a density of >5 / ha	Moderate	V	V	Excluded: Habitat present is substantially degraded such that this species is unlikely to utilise the Development Footprint. Furthermore, habitat constraints are not present.
Haliaeetus leucogaster	White-bellied Sea-Eagle (foraging)	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Hieraaetus morphnoides	Little Eagle (foraging)	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Lathamus discolor	Swift Parrot (foraging)	N/A	Moderate	E	CE	Included: Closest NSW BioNet Atlas record is 8 km from site with three (3) records within 10 km. Potential habitat at the site would be limited to intermittent foraging habitat.
Lophochroa leadbeateri	Major Mitchell's Cockatoo (foraging)	N/A	Moderate	V	Not Listed	Included: Outside preferred range for the species, being semi-arid and arid habitats. No NSW BioNet Atlas records exist within 10 km and only a single record almost 40 years old within 20 km of the site.
Lophoictinia isura	Square-tailed Kite (foraging)	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Neophema pulchella	Turquoise Parrot	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Ninox connivens	Barking Owl	N/A	High	V	Not Listed	Excluded: The Development Footprint does not comprise of open forests or woodland and habitat present is substantially degraded such that this species is unlikely to utilise the site.
Nyctophilus corbeni	Corben's Long-eared Bat	N/A	High	V	V	Excluded: Habitat substantially degraded such that this species is unlikely to utilise the site. Not known to occur from the region and does not occur within habitat type present. More common with in box/ ironbark/ cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW. No NSW BioNet Atlas records occur within 20 km of the site.
Petroica boodang	Scarlet Robin	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Petroica phoenicea	Flame Robin	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Phascolarctos cinereus	Koala (Foraging)	N/A	High	V	V	Included: Has been included based on it also being a candidate species. However, it's noted that any habitat present is limited and degraded. Targeted survey as part of the species credit survey did not record this species. Furthermore, an EPBC important Koala habitat assessment conducted for the site concluded no important habitat present.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Polytelis swainsonii	Superb Parrot (foraging)	N/A	Moderate	V	V	Included: Potential foraging habitat within and adjacent to the Development Footprint. However, not observed during target candidate surveys for this species, following EPBC survey guidelines.
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Pteropus poliocephalus	Grey-headed Flying-fox (foraging)	N/A	High	V	V	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Rostratula australis	Australian Painted Snipe	N/A	Moderate	E	E	Excluded: Habitat present is substantially degraded such that this species is unlikely to utilise the Development Footprint.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	N/A	High	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Stagonopleura guttata	Diamond Firetail	N/A	Moderate	V	Not Listed	Included: Potential foraging habitat within and adjacent to the Development Footprint.
Tyto novaehollandiae	Masked Owl	N/A	High	V	Not Listed	Excluded: Habitat is substantially degraded such that this species is unlikely to utilise the site. The Development Footprint does not comprise of forests or suitable and habitat present is substantially degraded such that this species is unlikely to utilise the site. Roosts and breeds in moist eucalypt forested gullies, which is absent from the site. Furthermore, no NSW BioNet Atlas records for this species exist within 20 km of the site.

1.6 Species credit species

Species credit species predicted to occur within the Development Footprint (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class are included in Table 9. An assessment of those species credit species identified has been undertaken to determine likelihood of those species to occur based on the absence of necessary habitat components or habitat constraints, in accordance with BAM sections 6.4.1.10 and 6.4.1.17. For those species that have been excluded, the justification is provided. The inclusion or exclusion of species considers all vegetation zones combined, unless otherwise stated.

Table 9: Candidate species credit species

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Acacia ausfeldii	Ausfeld's Wattle	N/A	High	V	Not Listed	Excluded: Outside of known area for species and habitat is substantially degraded. Furthermore, species is conspicuous and was not observed during field surveys.
Anthochaera phrygia	Regent Honeyeater (breeding)	N/A	High	CE	CE	Excluded: Important habitat not present within the Development Footprint (confirmed by OEH in consultation on 24 July 2018, as important habitat map yet to be released).
Aprasia parapulchella	Pink-tailed Worm-lizard	Rocky areas Or within 50m of rocky areas	High	V	V	Excluded: Habitat constraint features not present. No rocky areas occur within the site or within 50m of site.
Burhinus grallarius	Bush Stone-curlew	Fallen/standing dead timber including logs	High	E	Not Listed	Excluded: Habitat constraint features not present within the Development Footprint. Other habitat features such as leaf litter for breeding and nesting are absent within the site. Only a single NSW BioNet Atlas record exists within 10 km. Furthermore, this species was not observed during targeted (nocturnal) candidate surveys.
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	N/A	Moderate	V	Not Listed	Excluded: Nearest records for the species are >12 km from the site and generally >30 years old. Breeding habitat (tall mountain forests and woodlands with dense shrubby understorey – particularly heavily timbered and mature wet sclerophyll forests) is not present. BioNet indicates this species moves to lower areas such as Box-Gum Woodland outside of the breeding period, and therefore non-breeding habitat maybe present. Furthermore, this conspicuous species was not observed while conducting targeted surveys for other species.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Cercartetus nanus	Eastern Pygmy Possum	N/A	High	V	Not Listed	Excluded: Habitat present is substantially degraded such that this species is unlikely to occur (e.g. native mid-storey and ground layer absent). Furthermore, no NSW BioNet Atlas records occur within 20 km of the site.
Chalinolobus dwyeri	Large-eared Pied Bat	N/A	High	V	V	Excluded: Habitat present is substantially degraded such that this species is unlikely to utilise the Development Footprint. Habitat features used for the candidate species assessment (cliffs and rocky areas within 2 km) are not present within or nearby.
Cullen parvum	Small Scurf-pea	N/A	High	E	Not Listed	Excluded: Habitat present is substantially degraded such that this species is unlikely to occur. Furthermore, no NSW BioNet Atlas records occur within 20 km of the site, and nearest record beyond is >50 years old.
Crinia sloanei	Sloane's Froglet	N/A	High	V	Not Listed	Included (added): This species was added due to known populations in the Albury area and potential marginal habitat occurs within the site. This species was also identified in the BAMC calculator during earlier iterations but is not listed with final selection of PCTs.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	N/A	High	V	Not Listed	Included: Habitat suitable for breeding present within the Development Footprint.
Hieraaetus morphnoides	Little Eagle (breeding)	N/A	Moderate	V	Not Listed	Included: Habitat suitable for breeding present within the Development Footprint.
Lathamus discolor	Swift Parrot (breeding)		Moderate	E	CE	Excluded: Important habitat not present within the Development Footprint (confirmed by OEH, as important habitat map yet to be released). Species breeds in Tasmania.
Lophochroa leadbeateri	Major Mitchell's Cockatoo	N/A	Moderate	V	Not Listed	Excluded: Outside known range for the species. No NSW BioNet Atlas records within 10 km and only a single record almost 40 years old within 20 km of the site. Furthermore, this conspicuous species was not observed whilst conducting targeted surveys for other species.
Lophoictinia isura	Square-tailed Kite (breeding)	N/A	Moderate	V	Not Listed	Included: Habitat suitable for breeding present within the Development Footprint.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Myotis macropus	Southern Myotis	Hollow-bearing trees Within 200m of riparian zone or other water body	High	V	Not Listed	Included (assumed to be present): Habitat is considered as all areas of PCT 9 (listed on the TBDC as being associated with the species) that is within 200 metres of a permanent water body greater than 3 metres wide.
Ninox connivens	Barking Owl	N/A	High	V	Not Listed	Excluded: The Development Footprint does not comprise of open forests or woodland and habitat present is substantially degraded such that this species is unlikely to utilise the site. Furthermore, limited hollows suitable for breeding (>300mm) and limited to isolated paddock trees. Species not observed during spotlighting surveys.
Petaurus norfolcensis	Squirrel Glider	N/A	High	V	Not Listed	Included: Habitat suitable for breeding present within and adjacent to the site.
Phascolarctos cinereus	Koala (breeding)	N/A	High	V	V	Included: Habitat suitable for breeding present within and adjacent to the Development Footprint.
Pilularia novae-hollandiae	Austral Pillwort	Semi-permanent ephemeral wet areas. Periodically water-logged sites	High	E	Not Listed	Included (assumed to be present): Habitat is considered as all areas of PCT 9 (listed on the TBDC as being associated with the species). It is likely that habitat is substantially degraded. The area associated with PCT 9 has been modified (e.g. dam) by the landowner for water management purposes.
Polytelis swainsonii	Superb Parrot (breeding)	N/A	High	V	V	Included: Habitat suitable for breeding present within and adjacent to the Development Footprint.
Pteropus poliocephalus	Grey-headed Flying-fox (breeding)	N/A	High	V	V	Excluded: No breeding camps occur within or nearby the Development Footprint.
Swainsona recta	Small Purple-pea	N/A	N/A	E	E	Excluded: Habitat present is substantially degraded such that this species is unlikely to occur. Furthermore, no NSW BioNet Atlas records occur within 20.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for species to be included or excluded
Swainsona sericea	Silky Swainson-pea		High	V	Not Listed	Excluded: Habitat present is substantially degraded such that this species is unlikely to occur. Furthermore, no records occur within 20 km.
Tyto novaehollandiae	Masked Owl	N/A	High	V	Not Listed	Excluded: Habitat is substantially degraded. The site does not comprise suitable habitat (e.g. roosts and breeds in moist eucalypt forested gullies, which is absent from the site). Furthermore, no NSW BioNet Atlas records for this species exist within 20 km and species not observed during spotlighting surveys.

1.6.1 Targeted surveys

Targeted surveys for species credit species and opportunistic surveys were undertaken within the Development Footprint on the dates outlined in Table 10. Weather conditions during the field surveys are shown in Table 11 and survey effort is outlined in Table 12.

Table 10: Targeted surveys

Date (2018)	Surveyors	Target species
25 June	Matthew Dowle and Clare Duck	Vegetation stratification and constraints mapping. Opportunistic survey for threatened species.
26 June	Matthew Dowle and Clare Duck	Vegetation stratification and constraints mapping. Opportunistic survey for threatened species.
21 August	Matthew Dowle and Mitchell Scott	Sloane's Froglet, Squirrel Glider, Koala and paddock tree mapping.
22 August	Matthew Dowle and Mitchell Scott	Sloane's Froglet, Squirrel Glider, Koala and paddock tree mapping.
23 August	Matthew Dowle and Mitchell Scott	Sloane's Froglet, Squirrel Glider, Koala and paddock tree mapping.
24 August	Matthew Dowle and Mitchell Scott	Paddock tree mapping and vegetation surveys.
18 September	Matthew Dowle	Superb Parrot, Little Eagle, Square-tailed Kite, White-bellied Sea-Eagle, Southern Myotis, Major Mitchell Cockatoo, Austral Pillwort and BAM floristic plots.
19 September	Matthew Dowle	Superb Parrot, Little Eagle, Square-tailed Kite, White-bellied Sea-Eagle, Southern Myotis, Major Mitchell Cockatoo, Austral Pillwort and BAM floristic plots.
20 September	Matthew Dowle	Superb Parrot, Little Eagle, Square-tailed Kite, White-bellied Sea-Eagle, Southern Myotis, Major Mitchell Cockatoo, Austral Pillwort and BAM floristic plots.
21 September	Matthew Dowle	Superb Parrot, Little Eagle, Square-tailed Kite, White-bellied Sea-Eagle, Southern Myotis, Major Mitchell Cockatoo, Austral Pillwort and BAM floristic plots.

Table 11: Weather conditions

Date	Rainfall (mm)	Minimum temperature ^{0}C	Maximum temperature ^{0}C
25 June 2018	0	-1.9	13.2
26 June 2018	0	-1.9	13.7
21 August 2018	0.8	5.1	11
22 August 2018	0.2	4.7	14.1
23 August 2018	0	1.4	13.3
24 August 2018	0	0.5	16.6
18 September 2018	0	1.5	22
19 September 2018	0	9	16
20 September 2018	0	1	16.9
21 September 2018	0	1.5	20.2

Source: Bureau of Meteorology, 2018.

Targeted threatened flora surveys involved transects of suitable habitat for *Pilularia novae-hollandiae* and followed the *NSW Guide to Surveying Threatened Plants* (OEH 2016). No threatened flora was found during the surveys. It is noted that these areas within the Development Footprint are highly modified, contain an exotic ground layer, have been modified by the landowner and therefore maybe considered substantially degraded for the purposes of the BAM. It is noted that when conducting the surveys for this project in 2018, BioNet listed the survey period for the *Pilularia novae-hollandiae* as all-year round. At the time of finalising this report (following design changes), the survey period has changed in BioNet to October to December. Therefore, the original surveys conducted for this species are outside the nominated survey period. The BDAR has been updated to reflect this change and has assumed presence. PCT 9 is listed in the TBDC as being associated with *Pilularia novae-hollandiae.*

Field surveys for threatened fauna were consistent with the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (NSW DEC 2004) and requirements within the BAM and BAMC (based on information in BioNet), with the exception of the Southern Myotis.

Southern Myotis was not surveyed during the time period specified in the Threatened Biodiversity Data Collection (TBDC) (October to March) and has been assumed to be present within potential habitat (PCT 9). It is noted that surveys have been conducted for this species outside of the targeted survey time (September), and it has not been recorded within the Development Footprint to date.

Targeted survey for the Major Mitchell's Cockatoo and birds of prey (White-bellied Sea Eagle, Little Eagle and Square-tailed Kite) were conducted in conjunction with surveys for Superb Parrot, which followed the *Survey guidelines for Australia's threatened birds* (DEHWA 2010). Field survey involved transects and active searches in suitable habitat over four days in September 2018 (including one afternoon and three morning surveys). Surveys were conducted on foot and via vehicle in more open habitat. Additional opportunistic surveys were conducted outside of these times in suitable habitat, and across four days in August 2018, e.g. during paddock tree mapping.

It is noted that breeding habitat (old growth forest and woodland, e.g. wet sclerophyll forest) for the Gang-Gang Cockatoo is not considered to be present within the Development Footprint, and therefore not included as a candidate species. However, opportunistic searches were included in the targeted surveys for other bird species. It is noted, whilst surveys for this species were conducted in September (outside of BioNet October to January timing), it was appropriate as the species moves to lower altitudes such as areas of Box-Gum Woodland outside of the breeding season.

Targeted survey for the Sloane's Froglet was conducted over three nights, using two songmeters at two potential habitat sites. Songmeters were set to record for ten minutes every hour from 6pm to midnight, totalling 60 minutes of active listening for each site, for each of the three nights. Active searches of potential habitat were as also conducted over two nights at two sites, for up to 30 min each site. Surveys followed the *Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians* (DECC 2009).

Targeted survey for the Squirrel Glider and Koala were conducted over two nights using spotlighting (combination of walking and slow-moving vehicle) and call-playback techniques. On each of the two nights, four spotlighting transects were conducted for approximately 30 minutes each, and at two of the four transects call-playback was undertaken for 15 mins each.

Targeted and opportunistic surveys did not detect any candidate species within the project area. It is noted that a raptor nest was observed within the Development Footprint (middle of site). Whilst no individuals were observed within the nest, the nest was attributed to being that of a Whistling Kite, which was heard and observed flying over and close by to the nest on multiple days.

Table 12: Survey effort for Candidate Species

Candidate species	Survey method	Total effort within development site	BAM survey period
Austral Pillwort*	Flora transects*	2 hours	Oct-Dec
Sloane's Froglet^	Songmeter – active listen	6 hours	July-Aug
Squirrel Glider~	Spotlighting Call play-back	4 hours 1 hour	All year
Koala~	Spotlighting Opportunistic (diurnal survey)	4 hours Paddock tree and HBT survey	All year
Superb Parrot#	Active search Opportunistic (diurnal survey)	12 hours Paddock tree and HBT survey	Sept - Nov
Major Mitchell's Cockatoo~	Active search Opportunistic (diurnal survey)	12 hours Paddock tree and HBT survey	Sept-Dec
Little Eagle~	Active search Opportunistic (diurnal survey)	12 hours Paddock tree and HBT survey	Aug-Sept
Square-tailed Kite~	Active search Opportunistic (diurnal survey)	up to 12 hours Paddock tree and HBT survey	Sept-Jan
White-bellied Sea-Eagle~	Active search Opportunistic (diurnal survey)	up to 12 hours Paddock tree and HBT survey	July-Dec
Southern Myotis~	Active search Opportunistic (diurnal survey)	up to 12 hours Paddock tree and HBT survey	Oct-Mar

* *NSW Guide to Surveying Threatened Plants* (OEH 2016).

^ *Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians* (DECC 2009).

~ *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (NSW DEC 2004).

Survey guidelines for Australia's threatened birds' (DEHWA 2010)

1.6.2 Use of local data

The use of local data is not proposed.

1.6.3 Expert reports

Expert reports have not been used as part of this BDAR.

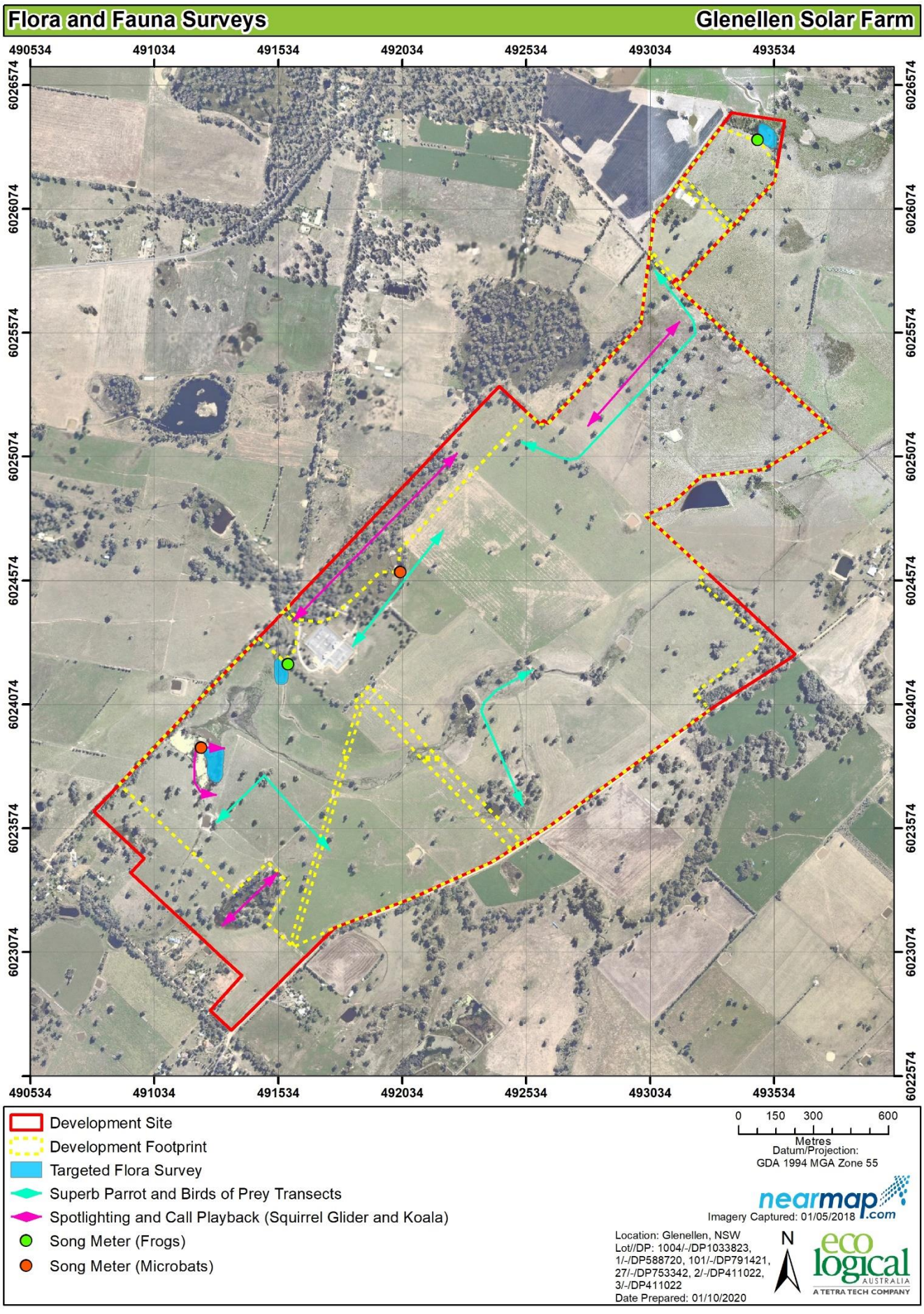

Figure 7: Candidate species surveys

2. Stage 2: Impact assessment (biodiversity values)

2.1 Avoiding impacts

2.1.1 Locating a project to avoid and minimise impacts on vegetation and habitat

The Proposed Development has been located in a way which avoids and minimises impacts (Table 13). Direct impacts including the final project footprint (construction and operation) are shown in Figure 8, with a comparison of impacted (11.41 ha) and retained (14.21 ha) native vegetation within the development site shown in Figure 9.

Table 13: Locating a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
locating the project in areas where biodiversity values are lowest	Areas of cleared land containing low biodiversity values have bene utilised.	The placement of the Development Footprint has been centred on the area of lowest biodiversity value (cleared, grazed). The footprint has been adjusted to avoid adjacent areas of higher biodiversity value, such as the stand of Box-Gum Woodland along the western boundary. The project has undergone a development design following BAM surveys to further avoid areas of biodiversity values, such as the drainage channel in the far north of the site and parts of the substation lot. Whilst much of the native vegetation within the substation lot has been included in the Development Footprint, up to 1.26 ha of this is likely to be retained. The area has been included as a worst-case scenario, as the connection point to the solar farm is yet to be determined by Transgrid.
locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition	Development Footprint placed on area of significant previous disturbance from historical clearing and constant agricultural practices (e.g. improvement and grazing).	The placement of the Development Footprint has centred on the area of lowest biodiversity value (cleared, grazed), with majority of native vegetation containing lower vegetation integrity scores. Nearby areas of remnant native vegetation outside the footprint to the south and west will not be impacted by the proposal, and following project design changes, will not impact on much of the vegetation within the substation and will avoid the drainage channel in the far north of the site.
locating the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species	The location of the Development Footprint has been designed to avoid areas of high quality vegetation and species habitat, e.g. by including Biodiversity Retention areas that retain patches of PCT 277.	The placement of the Development Footprint primarily utilises an area of low biodiversity value (cleared, grazed) and the footprint has been designed to avoid areas or higher biodiversity value, such as remnant stands of PCT 277 along the western edge of the site. These areas contain the CEEC Box-Gum Woodland and are marked for biodiversity retention. They also serve a screening function.
locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained	The Development Footprint has been able to avoid any impediments to connectivity.	The Development Footprint contains limited habitat connectivity and is located within a fragmented landscape. Lands directly adjoining (not impacted by project) are either heavily grazed and no habitat connectivity exists, or contain remnant vegetation (avoided) and contribute to the connectivity function. The Development Footprint has been placed to minimise any barrier to the movement of species and genetic material between areas of nearby habitat.

2.1.2 Designing a project to avoid and minimise impacts on vegetation and habitat

The development has been designed in a way which avoids and minimises impacts (Table 14).

Table 14: Designing a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
reducing the clearing footprint of the project	The Development Footprint has been placed in a previously cleared area with low biodiversity values.	The project has minimised vegetation clearing through strategic design changes following the initial BAM surveys (e.g. retaining native vegetation within the development site).
locating ancillary facilities in areas where biodiversity values are lowest	The entire Development Footprint has been designed to fit within the areas of lowest biodiversity values.	As highlighted in Table 13, placement of the Development Footprint occurs primarily on land with low biodiversity values, representing pasture improved agricultural land.
locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	The design has endeavoured to locate the ancillary facilities in areas of vegetation in poor condition, with low vegetation integrity scores.	The project uses existing roads and tracks, and is proposed across an area that has for decades undergone pasture improvements under agricultural management. Native vegetation is largely lacking (except paddock trees) and the vast majority of the site is below the condition threshold that requires offsets. No threatened species were recorded, but two have been assumed present.
locating ancillary facilities in areas that avoid habitat for species and vegetation in high threat status categories (e.g. an EEC or CEEC)	It has not been possible to completely avoid impacts to areas providing species habitat. The placement of the Development Footprint has minimised impacts as far as practicable to species habitat whilst maximising extent necessary for development.	The Development Footprint is utilising existing areas of previously cleared or disturbed (improved) land. Native vegetation is largely lacking (except paddock trees) and the vast majority of the site is below the condition threshold that requires offsets. No threatened species were recorded, but two have been assumed present.
providing structures to enable species and genetic material to move across barriers or hostile gaps	No regional or local corridors or remnant vegetation is impacted.	The Development Footprint has been strategically placed in a location where no current habitat connectivity exists. All existing corridors are off-site, thus the project is allowing for the movement of species and genetic material to be retained.
making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the Study Area.	During construction, additional infrastructure will be established including site offices and amenities, vehicle parking and turning areas, equipment laydown and storage areas, safety fencing, and temporary power. This infrastructure will be removed at completion of commissioning and disturbed ground made good through rehabilitation and revegetation.	The placement of the Development Footprint has been located to include the poorest condition native vegetation and species habitat where possible (majority of land is below the condition threshold for offsets). Areas outside the Development Footprint boundary are to be retained as no go areas to avoid impacts occurring to intact higher quality native vegetation adjacent to the site.
Ensuring vehicles remain on designated roads and tracks whenever possible	Use of signposting and driver education during the induction process and in ongoing project discussions	These areas have been included in the Development Footprint and avoid the higher condition native vegetation.
Establishment and regular maintenance of erosion and sediment controls during construction -until disturbed areas are revegetated.	Erosion and maintenance of regular sediment and erosion control is likely to be minimal during construction and operation, due to the vegetated nature of areas and flat landscape.	These areas have been included in the Development Footprint and avoid the higher condition native vegetation

2.2 Assessment of Impacts

2.2.1 Direct impacts

The development includes direct impacts on:

- native vegetation zones are outlined in Table 15
- threatened ecological communities are outlined in Table 16
- threatened species and threatened species habitat is outlined in Table 17
- six stags (all containing small hollows)

Direct impacts including the final project footprint (construction and operation) are shown in Figure 8, with a comparison of impacted and retained native vegetation shown in Figure 9.

Table 15: Direct impacts to native vegetation

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	10.38 ha
9	*River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion*	Inland Riverine Forests	Forested Wetlands	1.02 ha
277 (paddock trees)	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	81 Individuals

Table 16: Direct impacts on threatened ecological communities

PCT ID	PCT Name	NSW BC Act Name	Listing Status	Direct impact (ha)
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	2.46 ha

Table 17: Direct impacts on threatened species and threatened species habitat

Species	Common Name	Direct impact habitat (ha)	NSW listing status	EPBC Listing status
Myotis macropus	Southern Myotis	1.02 ha (PCT 9*)	V	Not Listed
Pilularis novae-hollandiae	Austral Pillwort	1.02 ha (PCT 9)	E	Not Listed

*Habitat is consistent with the OEH (2018) document, *Species credit threatened bats and their habitat – NSW survey guide for the Biodiversity Assessment Methodology* and corresponds to PCTs that are associated with the species and that are within 200m of a waterbody (e.g. creek or dam). PCT 9 is listed in the TBDC as being associated with both species.

2.2.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 18.

Table 18: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha) / Individuals*	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	277	Degraded	7.28 ha	14.8	0	-14.8
2	277	Planted	0.64 ha	30.7	0	-30.7
3	277	Low	2.46 ha	36.7	0	-36.7
4	9	Low	1.02 ha	19.6	0	-19.6
5	277	Paddock Trees	81*			

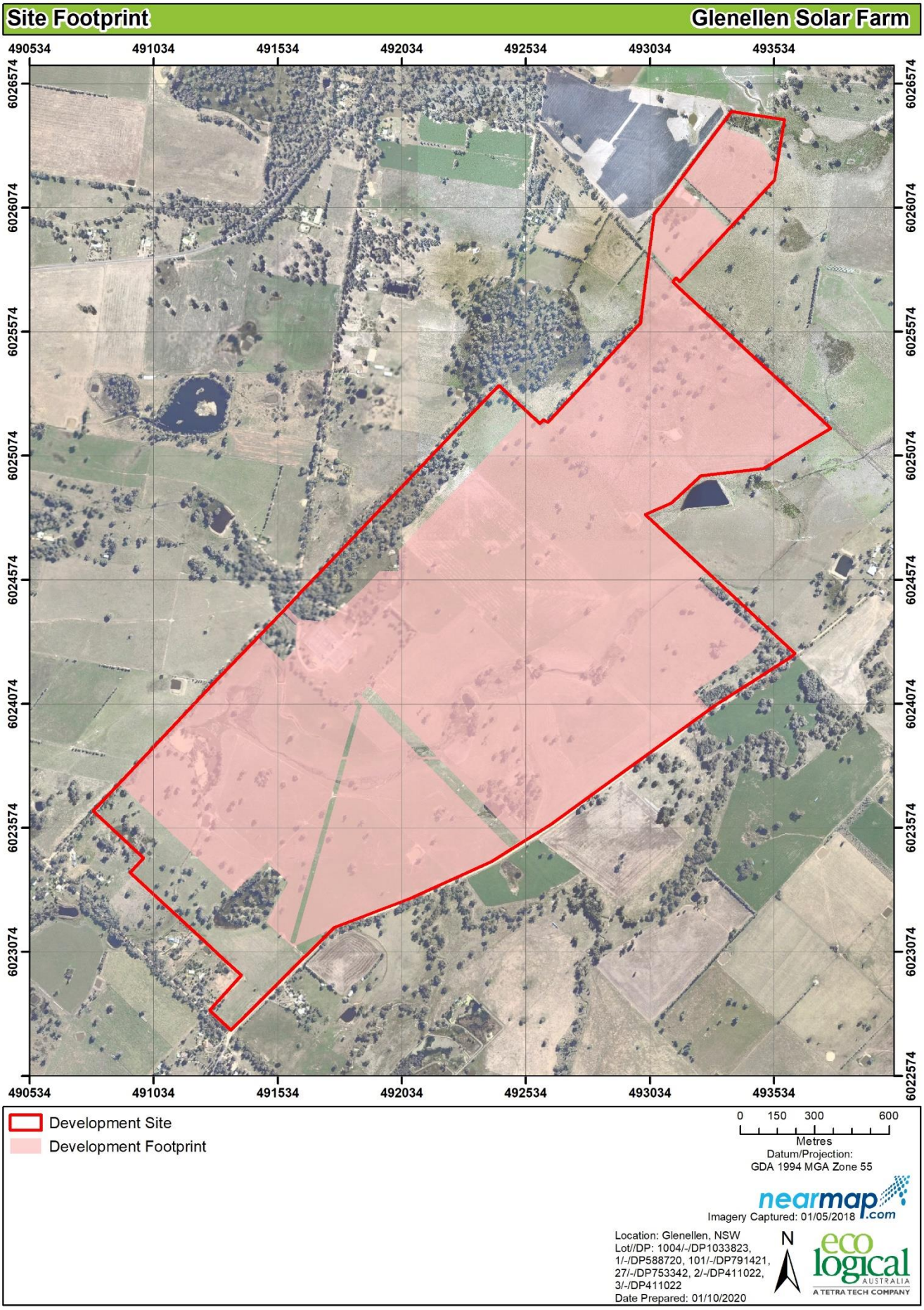

Figure 8: Final project footprint including construction and operation

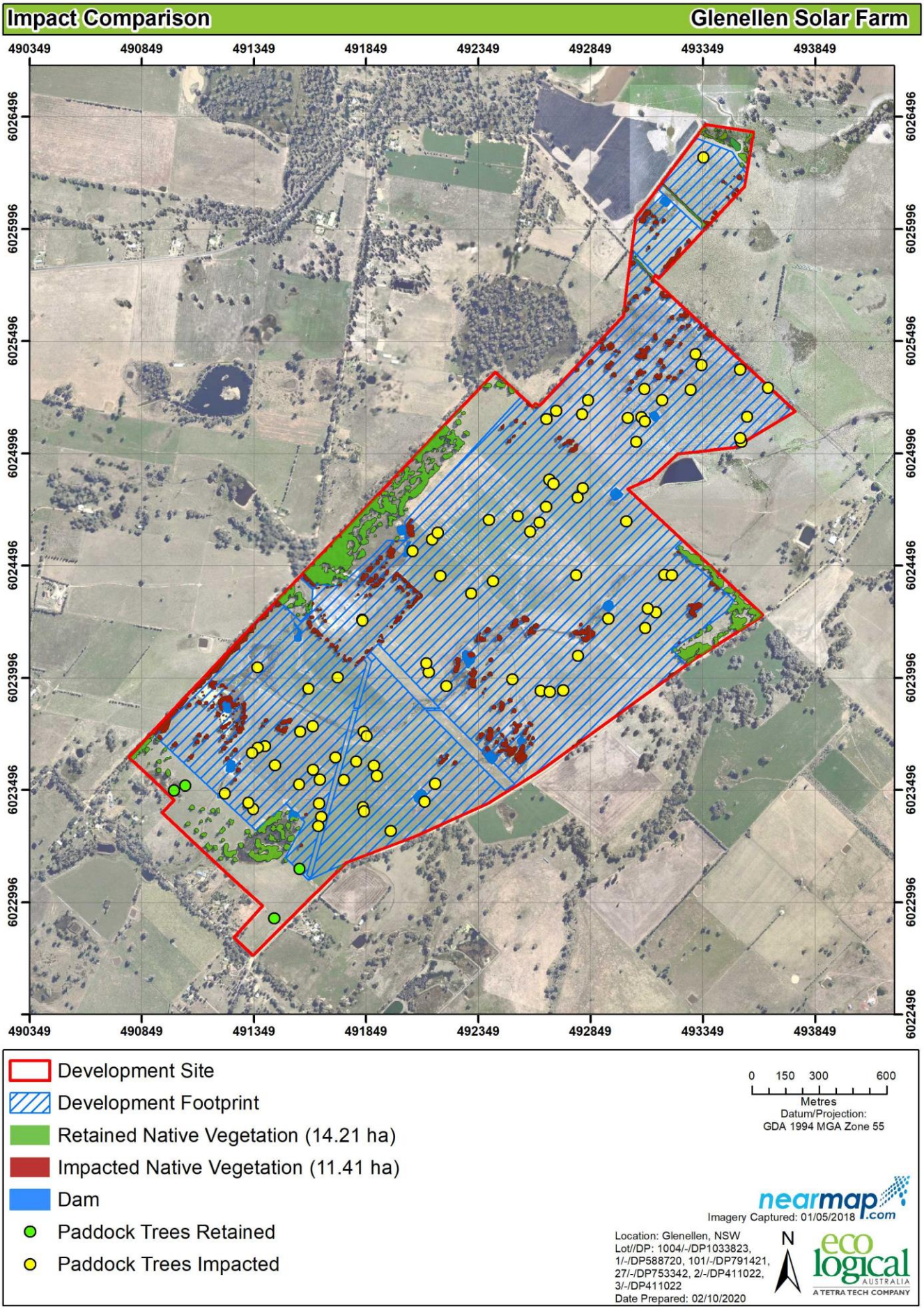

Figure 9: Impacted vegetation versus retained vegetation within the development site

2.2.3 Prescribed biodiversity impacts

Prescribed impacts as outlined in Section 8.2.1.2 of the BAM include:

(a) *impacts of development on the habitat of threatened species or ecological communities associated with: (i) karst, caves, crevices, cliffs and other geological features of significance, or (ii) rocks, or (iii) human made structures, or (iv) non-native vegetation*.

There are no karst caves, crevices, cliffs, rocks, human made structures, or other geological features of significance that will be impacted by the project.

Non-native vegetation in the form of pasture improved exotic grasses is present within the Development Footprint and comprises most of the project area. This agricultural land dominants the landscape and includes scattered farm dams. The dams within the site are mostly devoid of vegetation and the edges have been heavily trampled by cattle. The farm dams and vast majority of exotic vegetation are not considered to represent habitat for threatened species.

One area within the Development Footprint that was considered non-native vegetation potential habitat for the Sloane's Froglet and marginally for the Austral Pillwort, is just south of the Transgrid substation. The non-vegetation is consistent with the majority of the site and contained the occasional Rush (*Juncus* sp.). The area contained water at the time of the project surveys. It is considered marginal habitat only, as it was established by the landowner for management of water in response to the development of the substation within the last five years. Neither species were observed following targeted surveys.

(b) *impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range*, *and*

(c) *impacts of development on movement of threatened species that maintains their life cycle*.

Threatened species are not considered to be reliant on the Development Footprint for its connectivity features or to maintain their life cycle. Rather, connectivity features occur outside the development footprint, to the south, west and east, along vegetated roadsides, dense stands of vegetation or riparian corridors. These areas will be retained and not directly impacted by the development. Threatened species that may utilise these adjacent vegetated areas would either unlikely traverse the Development Footprint using paddock trees (E.g. Squirrel Glider) or would be capable of flying entirely across the site (E.g. Superb Parrot). Therefore, impacts from the development on the connectivity of habitat and movement of species are considered to be minor.

Furthermore, no threatened species were recorded or are considered likely to occur within the development footprint.

(d) impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining).

The third order stream that runs roughly west to east through the development footprint is not considered to support threatened species or a threatened ecological community. This stream is highly modified and likely to be dry most of the time, even following periods of rain. The stream and water flow has been modified by agricultural practices (used as a main pathway for stock movement within the site) and through on-site water management. Considering the above, any downstream effects on water quality, water bodies or hydrological processes as a result of the development is considered to be minor.

(e) *impacts of wind turbine strikes on protected animals.*

Not relevant to this Solar Farm project

(f) impacts of vehicle strikes on threatened species or on animals that are part of a TEC.

No threatened species were recorded or are considered likely to occur within the Development Footprint. It is noted that the Squirrel Glider and other threatened species have been recorded outside of the Development Footprint and across the broader landscape. These species can exist along vegetated roadsides where they would currently be subjected to vehicle strike. There is potential for a slight increase in vehicle strikes due to vehicle activity associated with the development. However, this would mostly be limited to slow moving traffic associated with the construction of the Solar Farm (example truck movements being material to site), and not likely occur beyond the construction phase of the development.

2.2.4 Indirect impacts

The indirect impacts of the development are outlined in Table 19 and have been considered with reference to Section 9.1.4 of the BAM.

2.2.5 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts from the development, before, during and after construction are outlined in Table 20. Mitigation measures have been considered with reference to Section 9.3 of the BAM

Table 19: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
sedimentation and contaminated and/or nutrient rich run-off	Construction	Runoff during construction works	Potential for sedimentation and runoff into nearby creeks and streams	During heavy rainfall or storm events	During rainfall events	Short-term impacts
noise, dust or light spill	Construction	Noise and dust created from machinery No night works proposed so no light spill	Adjacent vegetation	Daily, during construction works	Sporadic throughout construction period; throughout operation period	Short-term impacts
inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to adjacent habitat or vegetation	Adjacent vegetation	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
transport of weeds and pathogens from the site to adjacent vegetation	Construction	Spread of weed seed and pathogens from incoming machinery and equipment	Potential for spread into nearby habitat	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
vehicle strike	Construction / operation	Potential for native fauna to be struck by working machinery and moving vehicles	Within access roads and within Study Area	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
trampling of threatened flora species	Construction / operation	No threatened flora species present	N/A	N/A	N/A	N/A
rubbish dumping	Construction / operation	Illegal dumping by workers	Potential for rubbish to spread into areas outside Study Area	Any time	Throughout life of project	Potentially long-term impacts
wood collection	Construction / operation	Removal of wood in vegetation adjacent to Study Area	Throughout adjacent vegetation	Potential to occur at any time during construction or operational phases	Throughout life of project	Short-term impacts
bush rock removal and disturbance	Construction / operation	Removal of rocks in vegetation adjacent to Study Area	Potential for disturbance in adjacent vegetation and area surrounding the Study Area	Potential to occur at any time during construction or operational phases	Throughout life of project	Short-term impacts
increase in predatory species populations	Construction / operation	Potential for an increase in predatory species in the	Throughout adjacent vegetation	Likely to occur gradually after disturbance to	During construction phase of project	Short-term impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
		locality through disturbance to vegetation		habitat and vegetation takes place.		
increase in pest animal populations	Construction / operation	Potential to increase if food scraps/rubbish is left on site. Potential to increase -/+ decrease due to disturbance to existing vegetation.	Throughout adjacent vegetation	Likely to occur gradually after disturbance to habitat and vegetation takes place	During construction phase of project	Short-term impacts
increased risk of fire	Construction / operation	Potential for fire to spark during construction and operation from any machinery or electrical works	Throughout adjacent vegetation	Potential to occur at any time throughout the operational or construction phases	During operating/ construction hours	During operational /construction hours
disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	Construction / operation	No specialist breeding or foraging habitat identified	N/A	N/A	N/A	N/A

Table 20: Measures proposed to mitigate and manage impacts

Measure (if required)	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	Minor	Negligible	Supervision by a qualified ecologist/licensed wildlife handler during disturbance and removal of habitat trees in accordance with best practice methods	Relocation of fauna in a sensitive manner	Prior to and during removal of habitat trees	Project Manager / Ecologist
timing works to avoid critical life cycle events such as breeding or nursing	Minor	Negligible	Avoid where possible clearing works between August and March, during the breeding/nesting time for the majority of avian and micro-bat species	Impacts to fauna during breeding/nesting avoided	During clearing works	Project Manager
instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Minor	Negligible	Supervision by a qualified ecologist/licensed wildlife handler during removal of hollow-bearing trees	Any fauna utilising habitat within the Development Footprint will be identified and managed to ensure clearing works minimise the likelihood of injuring fauna	During clearing works	Project Manager/ Ecologist
sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Manage exposed soil surfaces Sediment and erosion control on works- silt nets downslope from workings	Control of erosion and sedimentation	Duration of the project	Project Manager
noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise to fauna	Minor	Negligible	Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009). Or otherwise stated by a specialist noise report.	Noise impacts associated with the development will be managed in accordance with guidelines.	For the duration of construction works	Project Manager
light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill to fauna	Minor	Negligible	Operating times will only occur during daylight hours, and night lights will not be used	Light impacts associated with construction and operation will be avoided as works will occur during daylight hours	For the duration of the project	Project Manager
adaptive dust monitoring programs to control air quality	Moderate	Minor	Dust suppression measures	Mitigate dust created during construction/operation	For the duration of the project	Project Manager
programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known	Minor	Negligible	Timing of construction works should be planned to occur outside of the period between August and March (breeding/nesting season) where possible.	impacts to fauna during breeding/nesting avoided	During clearing works	Project Manager

Measure (if required)	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
to or likely to use the habitat on the site are not breeding or nesting						
hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Moderate	Minor	All machinery/equipment cleaned prior to entering/exiting the Study Area There are currently no weeds on the Study Area listed under the NSW Biosecurity Act 2015. Future weed infestations should be managed/removed by a qualified Bush Regenerator	Prevent the spread of weeds or pathogens	Duration of project	Project manager
staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Minor	Negligible	All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as: 1. Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) 2. What to do in case of environmental emergency (chemical spills, fire, injured fauna) 3. Key contacts in case of environmental emergency	All staff entering the site are fully aware of all environmental aspects relating to the development and know what to do in case of any environmental emergencies	To occur for all staff entering / working at the site and when environmental issues become apparent	Project Manager, all staff
development control measures to regulate activity in vegetation and habitat adjacent to residential development	Moderate	Minor	Installation of signage to indicate No Go zones, rubbish disposal guidance, prohibition of wood collection, prohibition from lighting fires, prohibition of disturbance to vegetation outside of the Study Area, and pest & disease management	Protection of flora and fauna surrounding the Study Area	Prior to the commencement of construction	Client

2.2.6 Serious and Irreversible Impacts (SAII)

The Development Footprint contains two Serious and Irreversible Impact (SAII) candidate entities, as identified in Table 21. It is noted that the SAII threshold for these entities are yet to be published.

Table 21: Candidate Serious and Irreversible Impacts

Species / Community	Common Name	Principle	Direct impact individuals / area (ha)	Threshold
White Box Yellow Box Blakely's Red Gum Woodland (BC Act)	Box Gum Woodland	Principle 1 and Principle 2	2.46	Not yet released
Pilularia novae-hollandiae	Austral Pillwort	Principle 1 and Principle 2	1.02	Not yet released

Detailed consideration of whether impacts on candidate entities are serious and irreversible are included in Table 22 and Table 23. Consideration was given to the principles and criteria set out in the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (OEH 2017).

Table 22: Evaluation of an impact on an SAII – Box-Gum Woodland

Impact Assessment Provisions	Assessment
a. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	The proposed development has been centred around areas of vegetation with lower condition, such as vegetation zone 1, and avoided areas of higher condition (adjacent areas of wooded nominated as biodiversity retention areas, which total approximately 12.8 ha). The development has undergone multiple design reviews to avoid habitat of the SAII, such as much of the vegetation within the Transgrid substation and along roadsides. It is noted that up to 1.26 ha of this SAII is likely to be retained within the substation lot, but has been included within the proposed impacts as a worst-case scenario, as a connection point is yet to be determined by Transgrid. Further detailed on avoidance of Box-Gum Woodland and other areas of biodiversity are described in Section 2.1 above.
b. the area and condition of the SAII to be impacted directly and indirectly by the proposed development	The development will remove up 2.46 ha of highly degraded Box Gum Woodland subject to years of disturbance, with an integrity score of 36.7 in the BAMC. This vegetation consists primarily of a native canopy with an exotic understorey and occurs along the south-western boundary of the site within the road verge, and parts of the substation lot. The proposed development has been centred around areas of vegetation with lower condition, such as vegetation zone 1, and avoided areas of higher condition (adjacent areas of wooded nominated as biodiversity retention areas, which total approximately 12.8 ha).
c. a description of the extent to which the impact exceeds the threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact	No threshold for the SAII entity has been determined.
d. the extent and overall condition of the TEC within an area of 2000 ha (NB: have extended the buffer from 1000 ha to 2000 ha to ensure site is included), and then 10,000 ha, surrounding the proposed Development Footprint.	The extent of Box Gum Woodland, most particularly the derived extent, has not been well documented. Detailed mapping of the local occurrence of the TEC is not available but has been mapped within the broad-scale Riverina State Vegetation Type Mapping sheet (*VIS_ID 4469*). Much of the landscape consists of lands similar

Impact Assessment Provisions	Assessment
	to that of the Development Footprint. These areas have been highly disturbed/grazed. Within 2,000 ha of the Development Footprint, similar condition Box-Gum Woodland* (disturbed/grazed) covers approximately 269 ha. The removal of up to 2.46 ha represents 0.91% of these lands within 2,000 ha. Within 10,000 ha of the Development Footprint, similar condition Box-gum Woodland* is estimated to cover approximately 1308 ha of the area. The removal of 2.46 ha represents just 0.19 % of these lands within 10,000 ha. * Box-Gum Woodland has been assumed to be represented by PCT 266, 268, 277, 278 in the broadscale mapping. It is noted that broad scale vegetation mapping does not account for condition, and therefore, similar to Box-Gum Woodland in the development site, there may be areas that do not meet the listing criteria under the BC Act, but have been included in the calculations.
e. an estimate of the extant area and overall condition of the TEC remaining before and after the impact of the proposed development has been taken into consideration	The proposal will reduce the extant area of the TEC by up to 2.46 ha. Considering the small area and poor quality of the vegetation to be removed in respect to similar vegetation in the landscape (e.g. 1000m and 10,000m as noted above), it is considered that the development will have a very small impact on the extant area and overall condition of the TEC. The impact is considered negligible when considering the extent of Box-Gum Woodland within the Lower Slopes IBRA Subregion (approximately 33,000 ha) and South-West Slopes IBRA (approximately 56,000 ha). Furthermore, up to 1.26 ha of this TEC is likely to be retained within the substation lot, as the connection point to the substation is unlikely to require the clearing of vegetation.
f. an estimate of the area of the potential TEC that is in the reserve system within the IBRA region and subregion	The EPBC Act listing advice (2006) for Box-Gum Woodland identifies approximately 56,000 ha of the TEC occurs within the South West Slopes. Of this, it is estimated that around 8100 ha occurs within the National Parks and Nature Reserves. This estimate is based on broad-scale mapping and does not take into consideration any derived areas of the TEC.
g. the development proposal's impact on:	
i. abiotic factors critical to the long-term survival of the TEC; for example, will the impact lead to a reduction of groundwater levels or substantial alteration of surface water patterns; will it alter natural disturbance regimes that the TEC depends upon, e.g. fire, flooding etc.?	The development will not impact abiotic factors critical to the long-term survival of the TEC.
ii. characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of under-storey species or harvesting of plants	The development will not impact characteristic and functionally important species outside of the proposed impact area.
iii. the quality and integrity of an occurrence of the TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the TEC	The development is unlikely to result in the spread of invasive weeds into vegetation adjacent to the Development Footprint. This potential impact will be controlled during pre-construction works, throughout construction and operation until decommissioning. The development is not likely to have additional impacts to the quality and integrity of the occurrence of Box Gum Woodland outside of the Development Footprint and is likely to reduce current fertiliser mobilisation into the surrounding environment.

Impact Assessment Provisions	Assessment
h. direct or indirect fragmentation and isolation of an area of the TEC	The development will not cause direct or indirect fragmentation or isolation of Box-Gum Woodland. The Development Footprint does not provide a sole link between habitat or areas of vegetation, and similar Box-Gum Woodland occurs adjacent and beyond the site.
i. the measures proposed to contribute to the recovery of the TEC in the IBRA subregion.	The development will result in an offset liability for this TEC through the clearing of vegetation 2 and 3, and the Paddock Trees. This offset liability will require the conservation and management in perpetuity of Box-Gum Woodland that is not otherwise protected. It is likely that the offsets would be within the IBRA subregion.

Table 23: Evaluation of an impact on an SAII – *Pilularia novae-hollandiae*

Impact Assessment Provisions	Assessment
a. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	The proposed development has been centred around areas of vegetation with lower condition, such as vegetation zone 1 and PCT 277, which is not an associated PCT for this species. The development has undergone multiple design reviews to avoid habitat of the SAII, such as a patch of PCT to the north of the Development Footprint. Further detailed on avoidance of this SAII and other areas of biodiversity are described in Section 2.1 above.
b. the size of the local population directly and indirectly impacted by the development, clearing or biodiversity certification	The size of the local population is not known. As noted above, this species has been assumed to be present within the Development Footprint, despite targeted surveys not recording the species. It is noted that the targeted surveys were conducted one-week prior to the BioNet survey period (following recent BioNet update), but at the time of the surveys being conducted in September 2018, was consistent with BioNet at that time. The potential habitat within the Development Footprint is likely to be similar to habitat adjacent and across the broader locality. The size and extent of potential habitat is unknown and unlikely to be estimated using broad-scale habitat mapping because of the species habitat requirements. There is a general paucity of information about this species and records within the locality. It is known to grow in shallow swamps and waterways among grasses and sedges, and it assumed to be ephemeral (OEH 2018b). There are 22 records for this species within the Lower Slope IBRA subregion (BioNet Atlas), of which only 1 occurs within 20km of the site. This record is from 1951 and has a very low accuracy associated with it. The majority of other records within the IBRA subregion and within 40km from the site are also from 1951/1952 with poor accuracy.
c. a description of the extent to which the impact exceeds the threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact	No threshold for the SAII entity has been determined.
d. the likely impact (including direct and indirect impacts) that the development, clearing or biodiversity certification will have on the habitat of the local population.	As noted above, this species has been assumed to be present within the Development Footprint, despite targeted surveys not recording the species. Therefore, the size of the local population is unknown. The development will remove approximately 1.02 ha of degraded potential habitat, with an integrity score of 19.6 in the BAMC. The potential habitat within the Development Footprint is likely to be similar to habitat adjacent and across the broader locality. The size

Impact Assessment Provisions	Assessment
	and extent of potential habitat is unknown and unlikely to be estimated using broad-scale habitat mapping because of the species habitat requirements. potential habitat. There are 22 records for this species within the Lower Slope IBRA subregion (BioNet Atlas), of which only 1 occurs within 20km of the site. This record is from 1951 and has a very low accuracy associated with it. The majority of other records within the IBRA subregion and within 40km from the site are also from 1951/1952 with poor accuracy. However, in consideration of the above, if a local population exists within the locality, it will not be adversely impacted by the development such that the local population would go extinct.
e. the likely impact on the ecology of the local population	This species has been assumed to be present within the Development Footprint, despite targeted surveys not recording the species. Therefore, the size of the local population is unknown. However, similar habitat to that within the Development Footprint occurs across the locality and may also represent potential habitat to the species. It is unlikely that impacts from the development will impact this potential habitat. The species is considered to be ephemeral, responding when soils are moistened by rain. A ground layer and grazing will occur once the solar farm has been constructed, and therefore changes to the current disturbance routine and hydrological processes are unlikely to be significantly different. In consideration of the above, if a local population exists within the locality, it will not be adversely impacted by the development such that the local population would go extinct.
f. a description of the extent to which the local population will become fragmented or isolated as a result of the proposed development	This species has been assumed to be present within the Development Footprint, despite targeted surveys not recording the species. Therefore, the size of the local population is unknown. However, if a local population is present, it is likely to occur across the broader locality in similar habitat (e.g. up and down-stream of the development site and similar semi-ephemeral areas). The development will not fragment or isolate these areas of habitat as hydrological and other processes (e.g. interaction of other species) will continue.
g. the relationship of the local population to other population/populations of the species. This must include consideration of the interaction and importance of the local population to other population/populations for factors such as breeding, dispersal and genetic viability/diversity, and whether the local population is at the limit of the species' range	This species has been assumed to be present within the Development Footprint, despite targeted surveys not recording the species. Therefore, the size of the local population is unknown. Furthermore, information regarding other populations or important population is lacking. The BioNet Atlas only contains 22 records of this species within the IBRA subregion, with the vast majority of these records from the early 50's. The Atlas of Living Australia has records for this species in the ACT, Victoria, South Australia and Tasmania. Therefore, if a local population was present, it would not be at the limit of its range.
h. the extent to which the proposed development will lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population.	Threats to this species are likely to be associated primarily with habitat removal. The development will remove 1.02 ha of assumed habitat. Mitigation measures to reduce indirect impacts of the development are described in Section 2.2.5. Any indirect impacts will be minor and unlikely to decrease the viability of a population.

Impact Assessment Provisions	Assessment
i. an estimate of the area, or number of populations and size of populations that is in the reserve system in NSW, the IBRA region and the IBRA subregion	An estimate of the area, or number of populations and size of populations in the NSW reserve system has not been provided. This is due to the paucity of information relating to this species. There are 22 records for this species within the Lower Slope IBRA subregion (BioNet Atlas), of which only 1 occurs within 20km of the site. This record is from 1951 and has a very low accuracy associated with it. The majority of other records within the IBRA subregion and within 40km from the site are also from 1951/1952 with poor accuracy
j. the measures proposed to contribute to the recovery of the species in the IBRA subregion.	The development will result in an offset liability for this species, which will require the conservation and management in perpetuity of similar potential habitat. It is likely that the offsets would be within the IBRA subregion.

2.3 Risk assessment

A risk assessment has been undertaken for any residual impacts likely to remain after the mitigation measures (Section 2.2) have been applied. Likelihood criteria, consequence criteria and the risk matrix are provided in Table 24, Table 25 & Table 26 respectively. The risk assessment is provided in Table 27.

Table 24: Likelihood criteria

Likelihood criteria	Description
Almost certain (Common)	Will occur, or is of a continuous nature, or the likelihood is unknown. There is likely to be an event at least once a year or greater (up to ten times per year). It often occurs in similar environments. The event is expected to occur in most circumstances.
Likely (Has occurred in recent history)	There is likely to be an event on average every one to five years. Likely to have been a similar incident occurring in similar environments. The event will probably occur in most circumstances.
Possible (Could happen, has occurred in the past, but not common)	The event could occur. There is likely to be an event on average every five to twenty years.
Unlikely (Not likely or uncommon)	The event could occur but is not expected. A rare occurrence (once per one hundred years).
Remote (Rare or practically impossible)	The event may occur only in exceptional circumstances. Very rare occurrence (once per one thousand years). Unlikely that it has occurred elsewhere; and, if it has occurred, it is regarded as unique.

Table 25: Consequence criteria

Consequence category	Description
Critical (Severe, widespread long-term effect)	Destruction of sensitive environmental features. Severe impact on ecosystem. Impacts are irreversible and/or widespread. Regulatory and high-level government intervention/action. Community outrage expected. Prosecution likely.
Major (Wider spread, moderate to long term effect)	Long-term impact of regional significance on sensitive environmental features (e.g. wetlands). Likely to result in regulatory intervention/action. Environmental harm either temporary or permanent, requiring immediate attention. Community outrage possible. Prosecution possible.

Consequence category	Description
Moderate (Localised, short-term to moderate effect)	Short term impact on sensitive environmental features. Triggers regulatory investigation. Significant changes that may be rehabilitated with difficulty. Repeated public concern.
Minor (Localised short-term effect)	Impact on fauna, flora and/or habitat but no negative effects on ecosystem. Easily rehabilitated. Requires immediate regulator notification.
Negligible (Minimal impact or no lasting effect)	Negligible impact on fauna/flora, habitat, aquatic ecosystem or water resources. Impacts are local, temporary and reversible. Incident reporting according to routine protocols.

Table 26: Risk matrix

Consequence	Likelihood				
	Almost certain	Likely	Possible	Unlikely	Remote
Critical	Very High	Very High	High	High	Medium
Major	Very High	High	High	Medium	Medium
Moderate	High	Medium	Medium	Medium	Low
Minor	Medium	Medium	Low	Low	Very Low
Negligible	Medium	Low	Low	Very Low	Very Low

Table 27: Risk assessment

Potential impact	Project phase	Risk (pre-mitigation)	Risk (post mitigation)
sedimentation and contaminated and/or nutrient rich run-off	Construction	Low	Very Low
noise, dust or light spill	Construction	Medium	Very Low
inadvertent impacts on adjacent habitat or vegetation	Construction	Low	Very Low
transport of weeds and pathogens from the site to adjacent vegetation	Construction	Medium	Very Low
vehicle strike	Construction / operation	Low	Very Low
trampling of threatened flora species	Construction / operation	Low	Very Low
rubbish dumping	Construction / operation	Very Low	Very Low
wood collection	Construction / operation	Low	Very Low
bush rock removal and disturbance	Construction / operation	Very Low	Very Low
increase in predatory species populations	Construction / operation	Low	Very Low
increase in pest animal populations	Construction / operation	Low	Very Low
increased risk of fire	Construction / operation	Low	Very Low
disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	Construction / operation	Medium	Very Low

2.4 Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

2.4.1 Serious and Irreversible Impacts (SAII)

As discussed in Section 2.2.6, because the thresholds for a SAII on Box Gum Woodland and *Pilularis novae-hollandiae* have not yet been published, it cannot be determined with certainty if the proposed development will have SAII. Considering the degraded nature of Box Gum Woodland habitat in the Development Footprint and small area to be removed (up to 2.46 ha with a vegetation integrity score of 36.7, of which 1.26 is likely to be retained) and that the SAII habitat consists predominantly of a native canopy over an exotic understorey of pasture grasses and few hardy natives, it is unlikely that the development would have a SAII on Box-Gum Woodland. Similarly, considering the low potential occurrence of *Pilularia novae-hollandiae* within the Development Footprint, and that only 1.02 ha of highly degraded and modified habitat (vegetation integrity score of 19.6) to be cleared, it is considered unlikely that the development would result in an SAII to this entity.

2.4.2 Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 28 and shown on Figure 10. The impacts of the development requiring offset for threatened species and threatened species habitat are outlined in Table 29 and on Figure 11 and Figure 12.

Table 28: Impacts to native vegetation that require offsets

Veg Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha) / individuals*
2	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	0.64 ha
3	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	2.46 ha
4	9	*River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion*	Inland Riverine Forests	Forested Wetlands	1.02 ha
5	277 (paddock trees)	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	81*

* Represents number of individuals

Table 29: Impacts on threatened species and threatened species habitat that require offsets

Species	Common Name	Direct impact habitat (ha)	NSW listing status	EPBC Listing status
Myotis macropus	Southern Myotis	1.02 ha*(assumed presence)	Vulnerable	Not Listed
Pilularis novae-hollandiae	Austral Pillwort	1.02 ha (assumed presence)	Endangered	Not Listed

*Habitat is consistent with the OEH (2018) document, *Species credit threatened bats and their habitat – NSW survey guide for the Biodiversity Assessment Methodology* and corresponds to PCTs that are associated with the species and that are within 200m of a waterbody (e.g. creek or dam). PCT 9 is listed in the TBDC as being associated with the Southern Myotis (OEH 2018d).

2.4.3 Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are outlined in Table 30 and shown on Figure 13. The BAMC determined that vegetation zone 1 (PCT 277 – Grazing/exotic pasture) has a vegetation integrity score of 14.8 and therefore is not required to be offset.

As outlined in Part 3.1.1.3 of the BAM, if a vegetation zone has a vegetation integrity score of <17 where the PCT is representative of habitat for a threatened species or is a vulnerable ecological community, then for that vegetation zone, an assessment of native vegetation is not required beyond Section 5.4 of the BAM and an assessment of ecosystem species habitat according to Section 6.2 and Paragraph 6.2.1.4 of the BAM is not required.

Table 30: Impacts to native vegetation that do not require offsets

Veg Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)	Rationale
3	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	7.28 ha	The vegetation integrity score at 14.8 is below the threshold for an offset requirement (17).

2.4.4 Credit summary

The number of ecosystem credits required for the development are outlined in Table 31. The number of species credits required for the development are outlined in Table 32. A biodiversity credit report is included in Appendix D.

Table 31: Ecosystem credits required

Veg Zone	PCT ID	PCT Name	Vegetation Formation	Direct impact (ha) / individuals*	Credits required
2	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Grassy Woodlands	0.64 ha	10
3	277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Grassy Woodlands	2.46 ha	45
4	9	*River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion*	Inland Riverine Forests	1.02 ha	9
5	277 (paddock trees)	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Grassy Woodlands	81*	74

* Represents number of individuals

Table 32: Species credit summary

Species	Common Name	Direct impact habitat (ha)	Credits required
Myotis macropus	Southern Myotis	1.02 ha (assumed presence)	10
Pilularis novae-hollandiae	Austral Pillwort	1.02 ha (assumed presence)	15

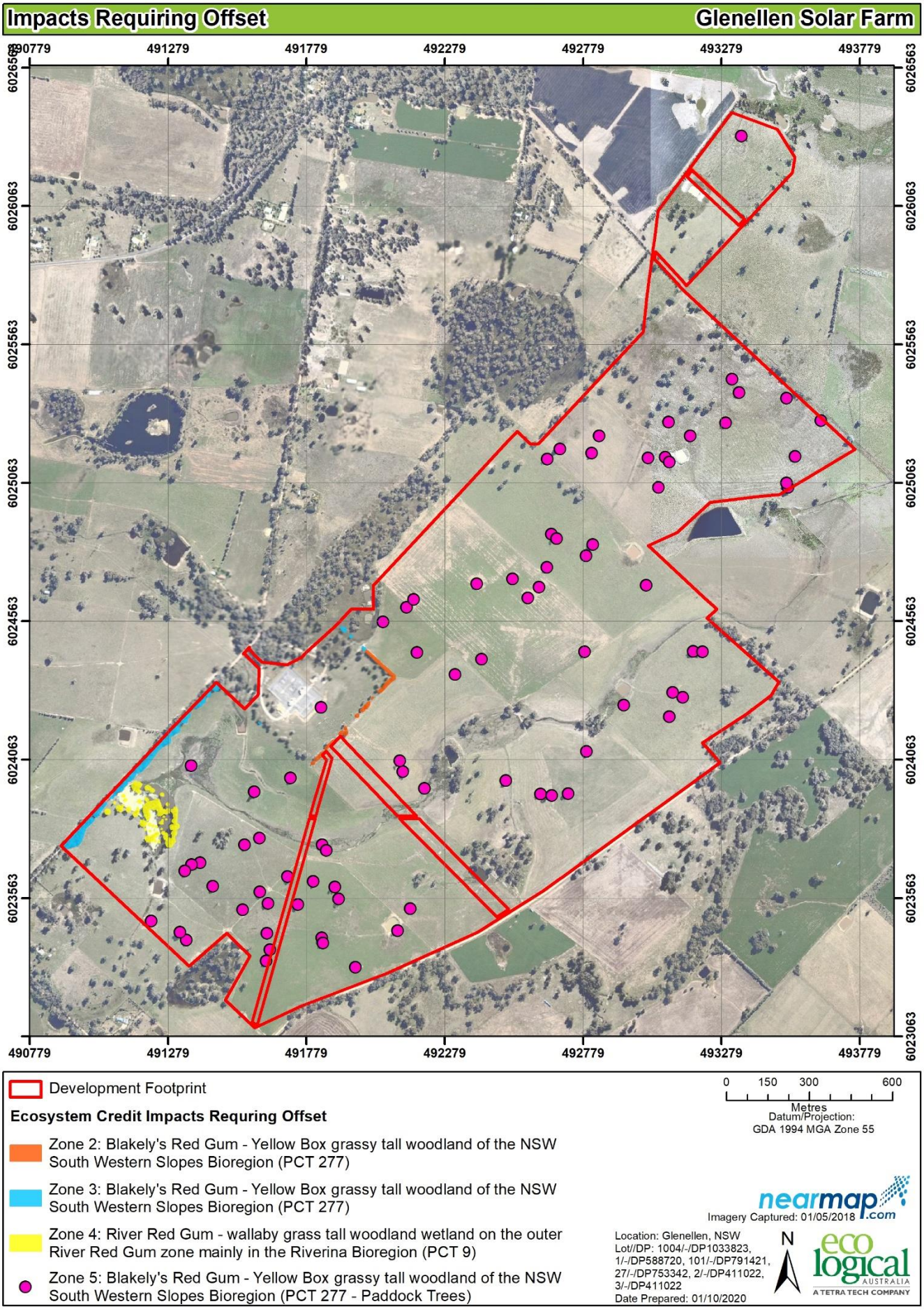

Figure 10: Impacts requiring offset

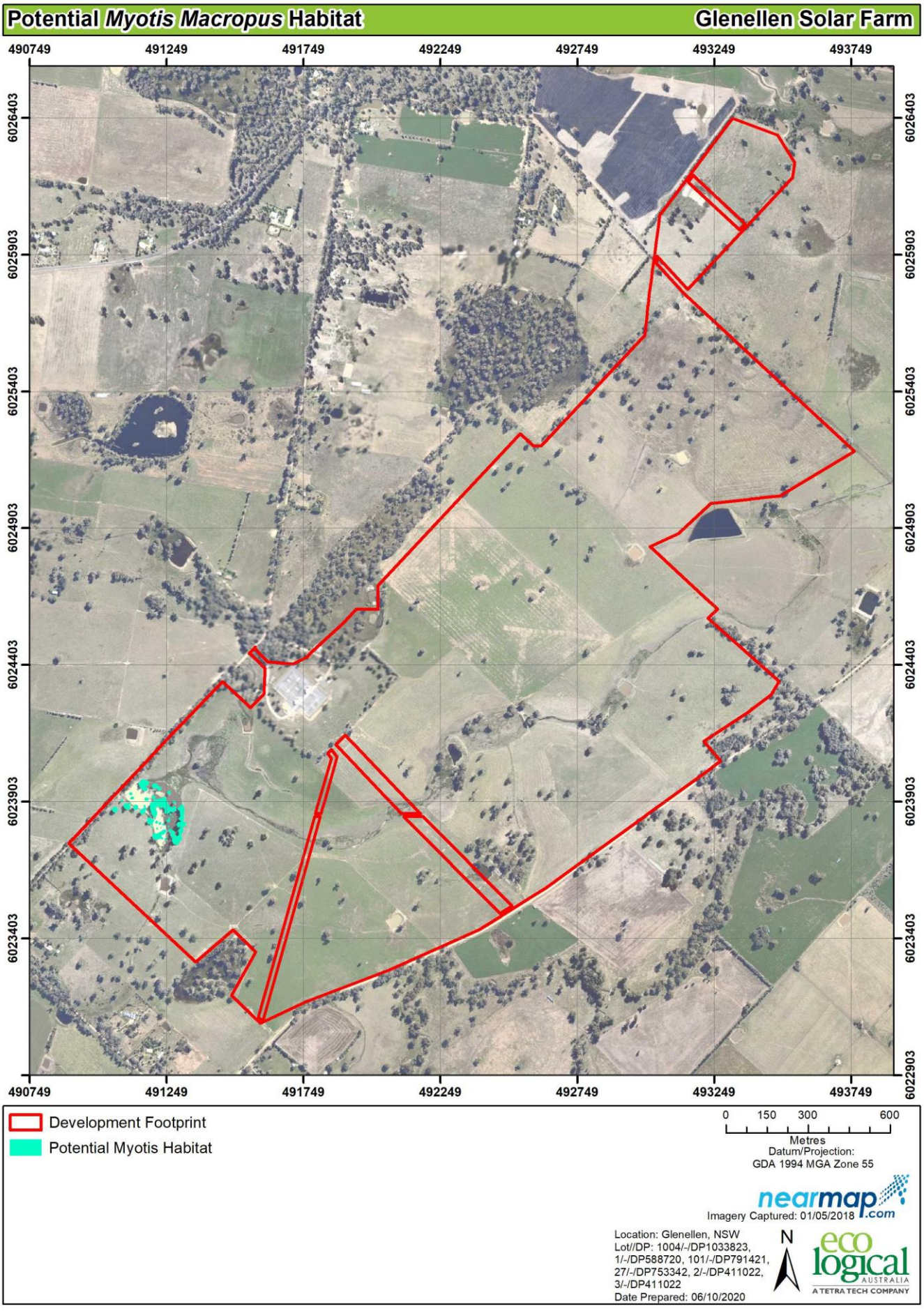

Figure 11: Assume Southern Myotis presence– potential habitat to be offset

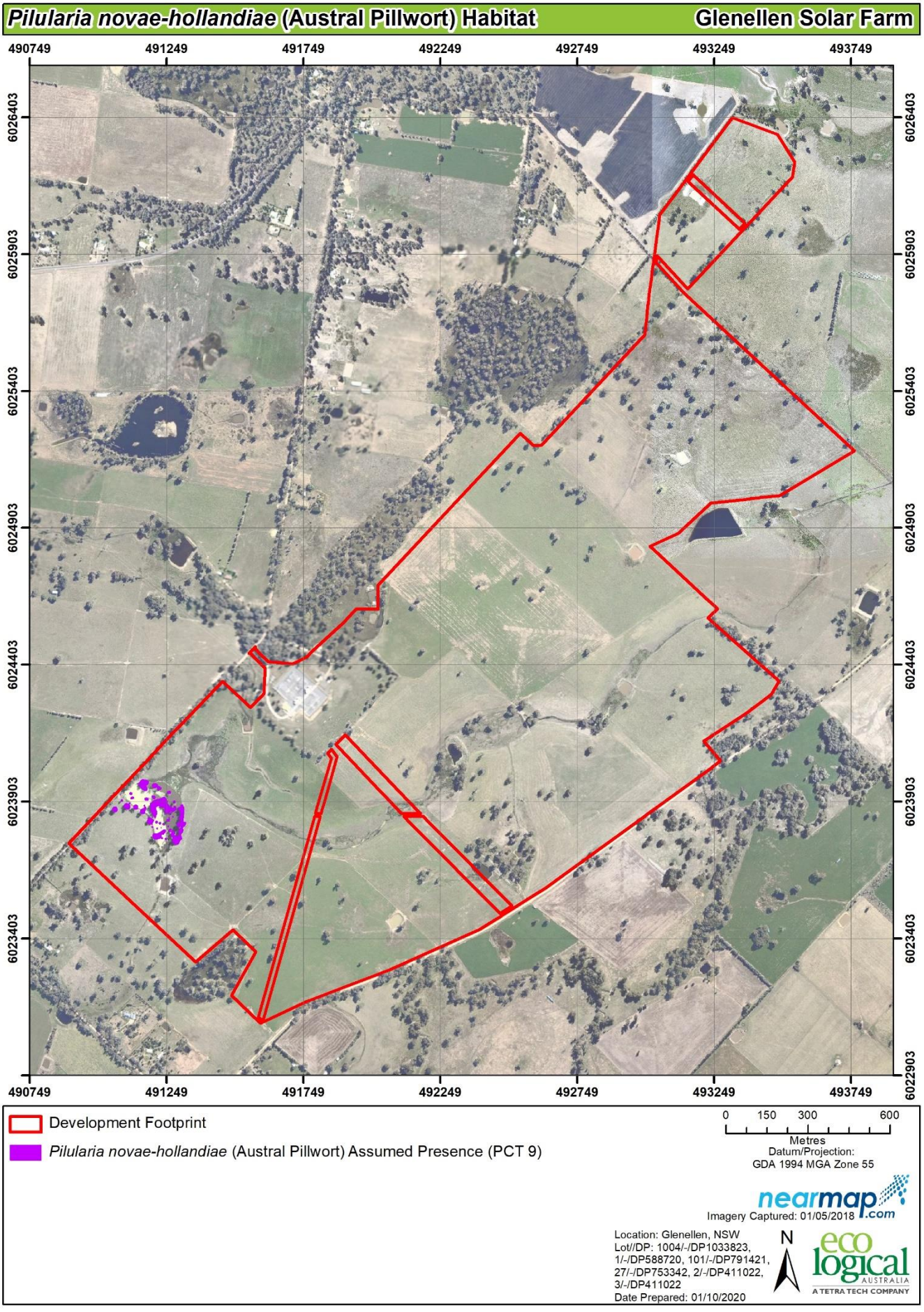

Figure 12: Assumed *Pilularia novae-hollandiae* presence – potential habitat to be offset

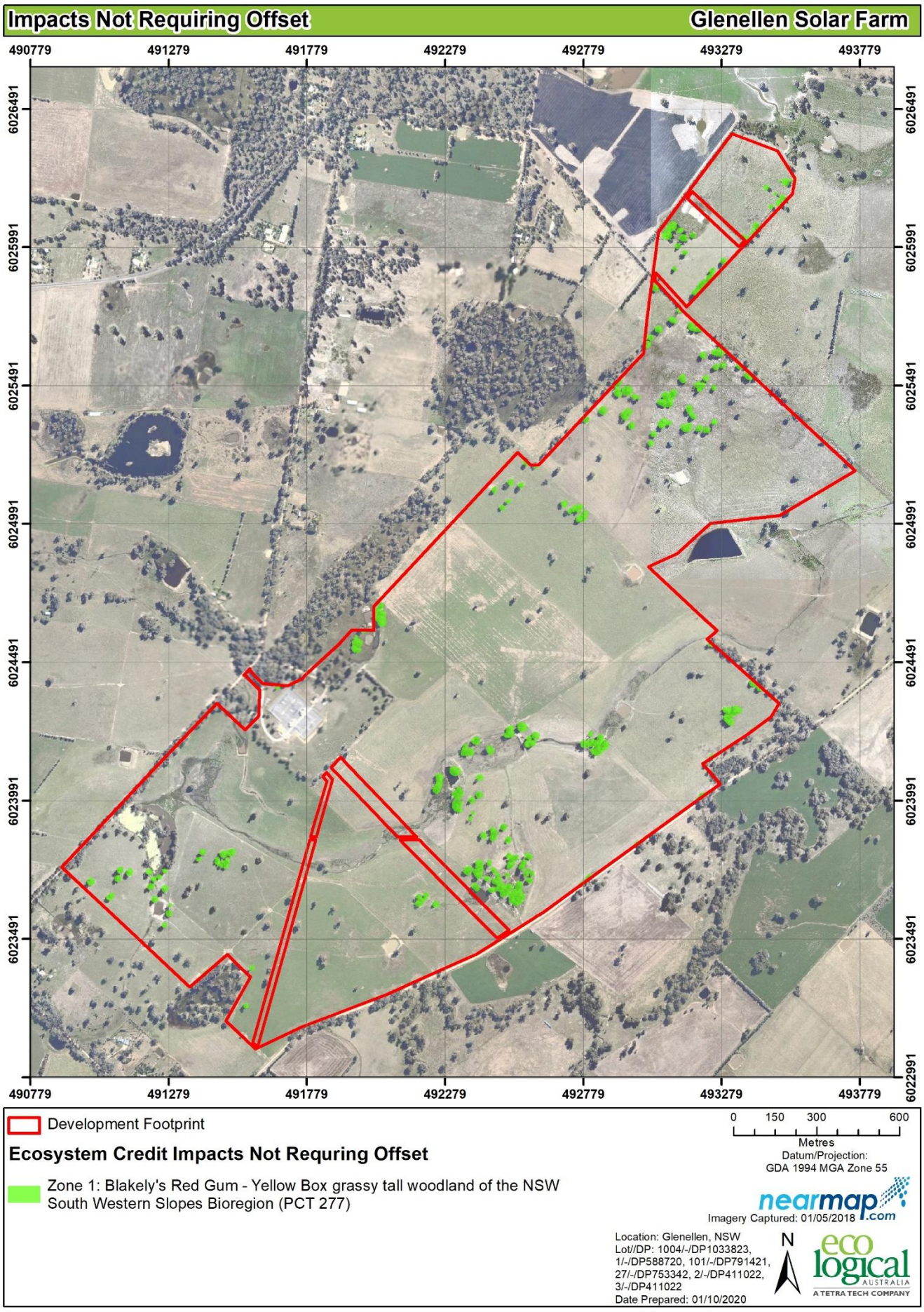

Figure 13: Impacts not requiring offset

2.5 Consistency with legislation and policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development. Potential impacts on MNES in accordance with the EPBC Act have been addressed below.

2.5.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which 'has, will have, or is likely to have a significant impact on a matter of MNES' is defined as a 'controlled action', and requires approval from the Commonwealth Department of the Environment and Energy (DotE), which is responsible for administering the EPBC Act (DotE 2013).

The process includes an assessment for listed threatened species and ecological communities that will be affected as a result of the proposed action. The Commonwealth has developed Significant impact guidelines (DotEE 2013) and species-specific referral guidelines that outline a number of criteria, to provide assistance in assessing impacts on MNES and help decide whether or not a referral to the Commonwealth is required.

A habitat assessment and Likelihood of Occurrence have been completed (Appendix C). Eight MNES were originally considered as having the potential to occur based on a desktop review, including NSW BioNet Records, Atlas of Living Australia records, aerial imagery and the BAMC. These MNES include:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland);
- *Anthochaera phrygia* (Regent Honeyeater);
- *Lathamus discolour* (Swift Parrot);
- *Litoria raniformis* (Growling Grass Frog);
- *Nyctophilus corbeni* (Corben's Long-eared Bat);
- *Polytelis swainsonii* (Superb Parrot);
- *Phascolarctos cinereus* (Koala); and
- *Amphibromus fluitans* (River-Swamp Wallaby Grass).

However, following initial field surveys conducted in June 2018 to identify biodiversity constraints, map potential habitat and map vegetation types, only the Superb Parrot was considered as having a likely potential to occur within the study area.

Further detail in relation to Box-Gum Woodland, Superb Parrot and Koala is provided below in Section 2.5.1.2, 2.5.1.3 and 2.5.1.3, respectively. Further detail on other species can be found in Appendix C– Likelihood of Occurrence, along with Section 1.6.

2.5.1.1 Box-Gum Woodland

The majority of vegetation on site was mapped as PCT 277 (Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion) and typically comprised the canopy species *Eucalyptus blakelyi* and *Eucalyptus melliodora* over exotic pasture grasses. A few *Eucalyptus bridgesiana* were also present along the western edge of the project area.

While PCT 277 can also comprise part of the CEEC '*White Box Yellow Box Blakely's Red Gum Woodland*', listed under the EPBC Act, the condition of vegetation in the study area did not meet the minimum condition thresholds under the EPBC Act, as the understorey was dominated by perennial exotic

vegetation. In determining condition thresholds for potential Box-Gum Woodland, reference was made to the listing advice from the Threatened Species Scientific Community and EPBC Act policy statement 3.5 - *White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands* (DEH 2006).

2.5.1.2 Polytelis swainsonii (Superb Parrot)

The Superb Parrot is listed as a vulnerable species under the EPBC Act. In the Riverina Superb Parrots occur in loose colonies and nest in the hollows of large trees (dead or alive), mainly in tall riparian River Red Gum Forest (*Eucalyptus camaldulensis*) 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 *Eucalyptus blakelyi*, *Eucalyptus melliodora*, *Eucalyptus bridgesiana* and Red Box (*Eucalyptus polyanthemos*) (DotEE 2018b, OEH 2018b).

Potential suitable habitat is present within the Development Footprint, and as such, targeted survey for the Superb Parrot following the 'survey guidelines for Australia's threatened birds' (DEHWA 2010) and consistent with the BAM were conducted.

Field survey involved transects and active searches in suitable habitat over four days in September 2018 (including one afternoon and three morning surveys), as specified in the survey guidelines and during the breeding period for the species. Surveys were conducted on foot and via vehicle (in more open habitat). Additional opportunistic surveys were also conducted outside of these times in suitable habitat, and across four days in August 2018 (outside of the breeding time for this species).

Targeted and opportunistic surveys did not detect the species on-site. No NSW BioNet Atlas records occur within 10 km of the site, with nearest records approximately 15 km away. Furthermore, the species was sighted and confirmed in the Albury area (approximately 20 km south of the site) during the targeted surveys (supporting the survey timing and local area detectability of the species during the survey period).

In consideration of the above, the Superb Parrot is considered unlikely to utilise the site, and therefore, the proposed action is not likely to have an impact on the species. Furthermore, an impact assessment for this species as outlined in the Significant impact guidelines (DotE 2013) and/or a referral is not required.

2.5.1.3 Phascolarctos cinereus (Koala)

The Koala is listed as a vulnerable species under the EPBC Act and can occurs from north-eastern Queensland to the south-east corner of South Australia (DotEE 2018b). Two NSW BioNet Atlas records exist within 10km. Both records are greater than ten years old. The nearest record is 1.5 km from the site, but this has a very low accuracy rating of 10,000 m.

The Koala inhabits Eucalypt woodlands and forests. Targeted survey conducted in August and September 2018, including both diurnal searches (during paddock tree assessment for the BAMC) and nocturnal spotlighting, did not detect the species.

With reference to the *EPBC Act Significant Guidelines 1.1* and the *EPBC Act referral guidelines for the vulnerable koala* (DotEE 2014), and application of the habitat assessment tool that assesses whether habitat critical to the survival of the Koala exists in the impact area (Table 4 within the referral guidelines), the project will not impact habitat critical to the survival of the Koala. This is because a score of 3 was calculated using the habitat assessment tool (Table 33), and scores greater than 5 are considered to contain habitat critical to the survival of the Koala according to Section 6 of the referral guidelines (DotEE 2014).

Table 33: Koala important habitat assessment (EPBC Act)

Attribute	Score	Discussion for inland areas
Koala occurrence	0 (low)	There is a NSW BioNet Atlas record within 2 km of the edge of the impact area, but this is greater than 10 years old. This record is a road kill with an accuracy rating of 10,000m, so informatively limited. Locality information is also withheld from this record. There are generally very few records in the locality (only 2 records total within 20km).
Vegetation composition	2 (high) – conservative score 0 (low) – direct impact area	The site contains forest or woodland vegetation (within the biodiversity retention areas) with 2 or more known koala food tree species; OR 1 food tree species (*Eucalyptus blakelyi*) that along accounts for >50% of the vegetation in the relevant strata. A conservative score of two (2) has been assigned to this attribute based on the predominance of *Eucalyptus blakelyi*. However, the impact area consists only of 'Open' Woodland or paddock trees, and therefore a less conservative score would be zero.
Habitat connectivity	0 (low)	The impact area is not part of a contiguous landscape. This is an assumption based on the rural landscape. Definition for contiguous landscape is not provided within the guideline and direct impact areas are largely limited to paddock trees of disturbed Open Woodland.
Key existing threats	1 (medium) - conservative	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence, OR Areas which score 0 for koala occurrence and are likely to have some degree of dog or vehicle threat present. A conservative score of one (1) has been assigned to this attribute. This is a conservative estimate as only 2 records for Koalas occur within 20 km of the site, and one of these records is a road kill. However, this record is over 10 years old and had a low accuracy.
Recovery value	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context.
Total	3	The total of three (3) is a conservative score based on the information above. Irrespective, the total score is less than 5, and therefore habitat to be impacted is not considered to be important habitat under the EPBC Act.

In consideration of the above, the Development Footprint does not contain important Koala habitat, and therefore, the proposed action is not likely to have any impact on the species. Furthermore, an impact assessment for this species as outlined in the Significant impact guidelines (DotE 2013) and/or a referral is not required.

3. References

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Appendix A: Definitions

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a Study Area, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development Footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Study Area	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a Study Area and the gain in biodiversity values at a biodiversity stewardship site.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the Study Area. In cases where multiple populations occur in the Study Area or a population occupies part of the Study Area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.
Patch size	An area of intact native vegetation that: a) occurs on the Study Area or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the Study Area or stewardship site..
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.

Terminology	Definition
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Remaining impact	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Study Area	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a Study Area, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by OEH and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a Study Area, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B: Vegetation plot data

Table 34: Species matrix (species recorded by plot)

Stratum	Form	Species name	Common name	Exotic (*)	High Threat Weed	Cover (%) Plot 1	Cover (%) Plot 2	Cover (%) Plot 5	Cover (%) Plot 6	Cover (%) Plot 7	Cover (%) Plot 8	Cover (%) Plot 9	Cover (%) Plot 10	Cover (%) Plot 11
M	SG	*Acacia baileyana*	Cootamundra Wattle							1				
M	SG	*Acacia* sp. (planted)								10				
M	SG	*Acacia rubida*	Red-stemmed Wattle							3				
G		*Acetosella vulgaris*	Sorrel	*	*								0.1	
G	FG	*Alternanthera* sp.									0.1	0.2		
G	GG	*Anthosachne scaber*	Wheatgrass							5			5	
G		*Arctotheca calendula*	Capeweed	*		0.1		0.1	0.1		0.2			
G	GG	*Austrostipa scabra*	Speargrass							1				
G		*Avena* sp.	Wild Oats	*		25	20	25		5			0.5	5
G		*Brassica* sp.	Canola	*							0.1			
G	GG	*Bromus* sp.	Brome	*										
M	SG	*Callistemon* sp. (planted)	Bottlebrush							1				
G	GG	*Carex appressa*	Tall Sedge								0.1			
G		*Cirsium vulgare*	Spear Thistle	*		0.5					1	0.1		
G		*Cotula coronopifolia*	Water Buttons	*					0.2			0.1		
G		*Erodium moschatum*	Musky Crowfoot	*										
U	TG	*Eucalyptus blakelyi*	Blakely's Red Gum			20	15	15	20				25	15
U	TG	*Eucalyptus camaldulensis*	River Gum								10	25		
U	TG	*Eucalyptus* sp. (planted)	Eucalyptus											
M	TG	*Eucalyptus* sp. (planted – *crebra*?)	Eucalyptus							10				
U	TG	*Eucalyptus melliodora*	Yellow Box							2				

Stratum	Form	Species name	Common name	Exotic (*)	High Threat Weed	Cover (%) Plot 1	Cover (%) Plot 2	Cover (%) Plot 5	Cover (%) Plot 6	Cover (%) Plot 7	Cover (%) Plot 8	Cover (%) Plot 9	Cover (%) Plot 10	Cover (%) Plot 11
M	TG	*Eucalyptus microcarpa*	Grey Box							15				
U	TG	*Eucalyptus polyanthemos*	Red Box											
G		*Festuca arundinacea*	Tall Fescue	*		25	10					0.2		2
G	FG	*Goodenia* sp.												
G	FG	*Gonocarpus* sp.												
G		*Hordeum* sp. (vulgare?)	Barley	*		30	20	25			5	2	1	15
G		*Hypochaeris radicata*	Catsear	*							0.1	0.1	1	
G	GG	*Juncus flavidus*												
G	GG	*Juncus usitatus*											5	
G	GG	*Juncus* sp.							5		0.1	0.1		0.2
G	GG	*Lachnagrostis filiformis*	Blown Grass							5				
G		*Lolium* sp. (perenne?)	Rye Grass	*		5	10	5	10	10	1	5	5	20
G	FG	*Lythrum hyssopifolia*	Hyssop Loosestrife								0.2	0.1		
G		*Malva* sp.	Mallow	*		0.1	0.1	0.1				0.1		
G	GG	*Microlaena stipoides*	Weeping Grass									0.1	2	0.1
G	FG	*Myriophyllum* sp.	Watermilfoils								0.1	0.1		
G	FG	*Oxalis perennans*	Oxalis											
G		*Phalaris aquatica*	Phalaris	*		2	10	5		25	0.2	0.5		5
G		*Poa annua*	Winter Grass	*								0.1		
G		*Romulea rosea*	Onion Grass	*	*				10	5	0.2	0.1	10	5
G	FG	*Rumex brownii*	Swamp Dock			0.1	0.1		0.1				0.1	
G	GG	*Rytidosperma* sp. (caespitosa?)	Wallaby Grass						5	2				
G	GG	*Rytidosperma* sp.	Wallaby Grass										20	5
G		*Sonchus asper*	Prickly Sowthistle	*				0.1						

Stratum	Form	Species name	Common name	Exotic (*)	High Threat Weed	Cover (%) Plot 1	Cover (%) Plot 2	Cover (%) Plot 5	Cover (%) Plot 6	Cover (%) Plot 7	Cover (%) Plot 8	Cover (%) Plot 9	Cover (%) Plot 10	Cover (%) Plot 11
G		*Stellaria media*	Common Chickweed	*								0.1		
G		*Trifolium* spp.	Clover	*		3					0.7	0.1	0.1	1
G		*Trifolium* repens	Clover	*		2	5				0.5			
G	FG	Utrica incisia	Stinging Nettle									0.1		
G		*Vulpia* sp.	Fescue	*		25		30	2	15	10	5	20	25

Tree (TG), Shrub (SG), Grass & Grasslike (GG), Forb (FG), Fern (EG), Other (OG)

Table 35: Vegetation integrity data (Composition, Structure and function)

Plot location data						
Plot no.	PCT	Vegetation Zone	Condition	Eastings	Northings	Bearing
1	277	1	Degraded	492481.51	6023685.31	120
2	277	1	Degraded	492795.91	6024192.60	40
5	277	1	Degraded	492928.67	6025482.99	120
6	277	3	Degraded	491871.83	6024417.60	210
7	277	2	Degraded	492095.24	6024365.86	205
8	9	4	Moderate	491210.11	6023775.13	35
9	9	4	Degraded	491240.39	6023872.48	60
10	277	3	Degraded	491594.24	6024238.16	115
11	277	3	Moderate	491504.35	6024312.71	20

Composition (number of species)							Structure (Total cover)					
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other	Tree	Shrub	Grass	Forb	Fern	Other
1	1	0	0	1	0	0	20.0	0.0	0.0	0.1	0.0	0.0
2	1	0	0	1	0	0	15.0	0.0	0.0	0.1	0.0	0.0
5	1	0	0	0	0	0	15.0	0.0	0.0	0.0	0.0	0.0
6	1	0	2	1	0	0	20.0	0.0	10.0	0.1	0.0	0.0
7	3	4	4	0	0	0	27.0	15.0	13.0	0.0	0.0	0.0
8	1	0	2	3	0	0	10.0	0.0	0.2	0.4	0.0	0.0
9	1	0	2	3	0	0	25.0	0.0	0.2	0.4	0.0	0.0
10	1	0	4	1	0	0	25.0	0.0	32.0	0.1	0.0	0.0
11	1	0	3	0	0	0	15.0	0.0	5.3	0.0	0.0	0.0

Function											
Plot no.	Large Trees	Hollow trees	Litter Cover	Length Fallen Logs	Tree Stem 5- 9 cm	Tree Stem 10-19 cm	Tree Stem 20-29 cm	Tree Stem 30-49 cm	Tree Stem 50-79 cm	Tree Regen	High Threat Weed Cover
1	4	1	7	8	0	0	1	0	1	0	0.0
2	7	1	32	4	0	0	1	1	1	0	0.0
5	2	1	3	3	0	0	0	0	0	0	0.0
6	1	0	38	0	1	1	1	1	1	0	10.0
7	0	0	14	0	0	1	1	0	0	0	5.0
8	3	2	9.2	8	0	0	0	0	0	0	0.2
9	2	2	3.4	12	0	1	1	1	1	0	0.1
10	3	0	26	6	0	0	1	1	1	0	10.1
11	3	0	11	2	0	0	1	1	1	0	5.0

Appendix C: Likelihood of Occurrence

An assessment of likelihood of occurrence was made for threatened species and threatened ecological communities identified from a database search (EPBC Act Protected Matters Search Tool Report (DotEE 2018a) and NSW BioNet Atlas records (OEH 2018a). This likelihood of occurrence was conducted to support the predicted and candidate species identified from the BAMC and further inform this BDAR. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "yes" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the study area, and
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
THREATENED FLORA					
Acacia ausfeldii	Ausfeld's Wattle	Associated species include *Eucalyptus albens, E. blakelyi* and *Callitris* spp., with an understorey dominated by *Cassinia* spp. and grasses. Potential habitat is not considered to be present. Natural habitats have been degraded and subject to decades of agricultural practices (including land improvement). This wattle is a conspicuous species and was not observed during the field surveys.	V	-	No. Not observed during field surveys and no BioNet records exist within 20 km.
Ammobium craspedioides	Yass Daisy	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes, in moist or dry forest communities, Box-Gum Woodland and secondary grassland. It grows in association with a large range of eucalypts (*Eucalyptus blakelyi, E. bridgesiana, E. dives, E. goniocalyx, E. macrorhyncha, E. mannifera, E. melliodora, E. polyanthemos, E. rubida*). It is apparently unaffected by light grazing, as populations persist in some grazed sites. Potential habitat is not considered to be present. Natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	V	V	No. Potential habitat is not considered to be present. No BioNet records exist within 20 km, and site is outside known species range.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Amphibromus fluitans	Floating Swamp Wallaby-grass	In NSW, recorded recently in lagoons beside the Murray River near Cooks Lagoon, Mungabarina Reserve, East Albury, at Ettamogah, Thurgoona, near Narranderra, near Mathoura, and near Laggan. It is found on swamp margins, dam and tank beds and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species. Potential habitat is not considered to be present. Natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses and banks of dams and other areas are heavily trampled from grazing cattle and sheep. Species was not observed during the field surveys.	V	V	No. Potential habitat is not considered to be present. A single BioNet record exists within 10 km of the site.
Caladenia concolor	Crimson Spider Orchid	Currently known from 3 populations in the vicinity of Cootamundra, Lake Burrinjuck and Albury. Found in sclerophyll forest on clay loams or gravelly soils, regrowth woodland on granite ridges. Potential habitat is not considered to be present. No regrowth woodland or granite ridges occur and any natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	E	V	No. Potential habitat is not considered to be present. Nineteen BioNet records exist within 10 km of the site (19 occur within 20 km).
Cullen parvum	Small Scurf-pea	In NSW, recorded near Wagga Wagga, Jindera, Jerilderie, near Young, and reportedly near Galong. It is found in grassland, *Eucalyptus camaldulensis* (River Red Gum) Woodland or Box-Gum Woodland, and in grazed land. It is usually located on table drains or adjacent to drainage lines or watercourses. Potential habitat is not considered to be present. Natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	E	-	No. Potential habitat is not considered to be present. No BioNet records occur within 20 km, and nearest record beyond is >50 years old.
Pilularia novae-hollandiae	Austral Pillwort	Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most of the records in the Albury-Urana area were from table drains on road sides. Marginal habitat considered present within Development Footprint (limited to shallow water and edges of dams within areas mapped as PCT 9, and a periodically wet area adjacent to the south of the substation). However, habitat is severely degraded and subject to decades of pasture improvement, but was not excluded from the BAM candidate species list. Targeted searches did not detect this species.	E	-	No. Not observed during targeted survey and habitat is degraded such that this species is unlikely to occur. No BioNet records occur within 20 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Prasophyllum petilum	Tarengo Leek Orchid	Located in four sites in NSW: at Boorowa, Captains Flat, Ilford and Delegate. It can be found in Natural Temperate Grassland, grassy woodland, and Box-Gum woodland. Potential habitat is not considered to be present and site is outside known range for species. Any natural habitats have also been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	E	E	No. Potential habitat is not considered to be present. No BioNet records exist within 20 km, and site is outside known species range.
Prasophyllum validum	Sturdy Leek Orchid	The species occurs in South Australia, Victoria, and southern New South Wales. Although little is known of the ecology of the species, it is thought to prefer relatively dry woodland habitats. Currently 18 populations containing about 3,200 plants are known. Potential habitat is not considered to be present. Natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.		V	No. Potential habitat is not considered to be present. No BioNet records exist within 20 km of the site.
Senecio garlandii	Woolly Ragwort	In NSW, found between Temora, Bethungra and Albury and possibly Burrinjuck near Yass, and prefers sheltered slopes of rocky outcrops. Potential habitat is not considered to be present as no sheltered slopes of rocky outcrops exist within the site. Furthermore, natural habitats have been substantially degraded and subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	V		No. Potential habitat is not considered to be present. No BioNet records exist within 10 km of the site (noting, 17 occur within 20 km).
Swainsona recta	Small purple pea	*Swainsona recta* occurs throughout the Queanbeyan and Wellington-Mudgee areas. It is also known from the ACT and a single population of four plants near Chiltern in Victoria. Over 81% of the southern population grows on a railway easement. It's habitat includes grassland, woodland and open forest dominated *Eucalyptus blakelyi* (Blakely's Red Gum), *E. melliodora* (Yellow Box), *E. rubida* (Candlebark Gum) and *E. goniocalyx* (Long-leaf Box) (OEH 2018b). Potential habitat is not considered to be present, as any natural habitat is substantially degraded and has been subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses.	E	E	No. Potential habitat is not considered to be present. No BioNet records exist within 20 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Swainsona sericea	Silky Swainson-pea	This species is typically found in Natural Temperate Grassland and Snow Gum (*Eucalyptus pauciflora*) Woodland on the Monaro. It also occurs in Box-Gum Woodland in the Southern Tablelands and South West Slopes and can sometimes be found in association with cypress-pines *Callitris* spp. Potential habitat is not considered to be present, as any natural habitat is substantially degraded and has been subject to decades of agricultural practices (including land improvement), resulting in a ground layer dominated by exotic pasture grasses	V	-	No. Potential habitat is not considered to be present. No BioNet records exist within 20 km of the site.
THREATENED FAUNA					
Actitis hypoleucos	Common Sandpiper	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties.	-	M	No. Habitat is not present. No BioNet records exist within 20 km of the site.
Anthochaera phrygia	Regent Honeyeater	Inhabits temperate woodlands and open forests of the inland slopes of south-east Australia, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. This species makes nomadic movements following winter flowering eucalypt species. Two of three known key breeding areas are in NSW: the Capertee Valley and the Bundarra-Barraba region, with the other breeding area in Chiltern, Victoria. They breed between July and January and usually nests in horizontal branches or forks in tall mature eucalypts and Sheoaks (OEH 2018b). Habitat critical to the survival of the species as described in the Recovery Plan, includes: breeding or foraging areas where the species is likely to occur; or, any newly discovered breeding or foraging locations. Breeding habitat is not present within the site. Foraging habitat is related to woodlands that have a very high bird species richness, significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Development Footprint does not contain a high canopy cover and mistletoes are in a very low abundance. Therefore, critical habitat is not considered to be present. The species is listed as a species credit species under the BAM. Confirmation from OEH indicates important not present, and therefore targeted BAM surveys not required.	CE	CE	Unlikely. Potential habitat not considered to be present within the Development Footprint. Closest BioNet record is 7km from site (40 yrs old). However, closest record less than 20 years old is > 10 km from the site. The species was not observed (opportunistically) during any of the surveys (noting survey guidelines require survey between May and August).

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Aprasia parapulchella	Pink-tailed Worm-lizard	This species inhabits sloping, open woodland areas with predominantly native grassy groundcover, particularly those dominated by *Themeda triandra* (Kangaroo Grass). This species is commonly found beneath small, partially-embedded rocks and appears to spend considerable time in burrows below these rocks. This habitat type and habitat features are absent within the Development Footprint	V	V	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	The species occurs throughout most of New South Wales, and primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the Development Footprint. Nine BioNet records occur within 10 km of the site.
Botaurus poiciloptilus	Australasian Bittern	Found over most of NSW, this species' habitat consists of permanent freshwater wetlands, with tall, dense vegetation, particularly *Typha spp*. (Bulrushes) (OEH 2018b). This habitat type is absent within the Development Footprint.	E	E	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Burhinus grallarius	Bush Stone-curlew	In NSW, it is found sporadically in coastal areas, and west of the divide throughout the sheep-wheat belt. It occurs in lowland grassy woodland and open forest. Potential habitat is not considered to be present, as important habitat features such as fallen logs and high abundance of leaf litter are absent within the Development Footprint. Furthermore, it was not observed during targeted candidate surveys.	E		Unlikely. Potential habitat not considered to be present. A single BioNet record exists within 10 km of the site.
Calidris acuminata	Sharp-tailed Sandpiper	This species prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. It also occurs in saltworks and sewage farms and uses flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. The species uses intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. It tends to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season.	-	M	No. Potential habitat not considered to be present. No BioNet records exist within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Calidris ferruginea	Curlew Sandpiper	The Curlew Sandpiper occupies littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland (OEH 2018b). This habitat type is absent within the Development Footprint	E	CE	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Calidris melanotos	Pectoral Sandpiper	The Pectoral Sandpiper is a summer migrant to Australia and is widespread but scattered in NSW. It has been recorded east of the Great Divide, from Casino and Ballina, and south to Ulladulla. West of the Great Divide, it is widespread in the Riverina and Lower Western regions. It occupies shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	-	M	No. Potential habitat not considered to be present. No BioNet records exist within 10 km of the site.
Callocephalon fimbratum	Gang-gang Cockatoo	In spring and summer (during the breeding season), this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter (non-breeding season), the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas (OEH 2018b). Potential habitat is considered to be limited and substantially degraded. Nearest records for the species are >12 km from the site and generally >30 years old. This conspicuous species was not recorded onsite during any of the targeted surveys	V	-	Unlikely. Potential habitat considered to be limited within the site. No BioNet record exists within 10 km of the site. Conspicuous species not observed during targeted surveys.
Cercartetus nanus	Eastern Pygmy-possum	In NSW the species extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. It is found in rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath and feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. It also eats soft fruits and insects (OEH 2018b).	V	-	No. Potential habitat not considered to be present. No BioNet records exist within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Circus assimilis	Spotted Harrier	It occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential habitat within and adjacent to the Development Footprint. No BioNet records occur within 10 km of the site.
Chthonicola sagittata	Speckled Warbler	The Speckled Warbler is found in south-eastern Qld, the eastern half of NSW and into Victoria, and as far west as the Grampians, mostly on hills and tablelands of the Great Dividing Range and rarely on the coast. It prefers Eucalyptus-dominated communities with a grassy understorey and sparse shrub layer, and is often found on rocky ridges or in gullies (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the Development Footprint. Five BioNet records occur within 10 km of the site.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	This species occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is not usually not found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. It is a sedentary species and is resident in many locations throughout its range and present in all seasons or year-round at many sites. Hollows in standing dead or live trees and tree stumps are essential for nesting (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the Development Footprint. Fourteen BioNet records occur within 10 km of the site.
Crinia sloanei	Sloane's Froglet	Sloane’s Froglet is found in floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in NSW. It periodically inhabits inundated areas in grassland, woodland and disturbed habitats (OEH 2018b). Potential habitat maybe present. This is a species credit species under BAM.	V	-	Unlikely. Species not recorded during the targeted surveys. No BioNet records exist within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Daphoenositta chrysoptera	Varied Sittella	The distribution of the Varied Sittella in NSW is nearly continuous from the coast to the far west. It inhabits eucalypt forests and woodlands, mallee and Acacia woodland (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the site. Two BioNet records within 10 km of the site.
Dasyurus maculatus maculatus	Spotted-tailed Quoll (SE mainland population)	The Spotted-tailed Quoll has been 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. It uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. It is mostly nocturnal, and spends most of the time on the ground, although is also an excellent climber and will hunt in tree hollows and prey on roosting birds (OEH 2018b).	V	E	No. Potential habitat not considered to be present within the Development Footprint. No BioNet records exist within 10 km of the site.
Delma impar	Striped Legless Lizard	This species occurs throughout temperate lowland grasslands in the Australian Capital Territory (ACT), the south-western slopes and southern tablelands of New South Wales (NSW), central and southern Victoria, and the south-eastern corner of South Australia (SA). This species is found in habitat where grassland is dominated by perennial, tussock-forming grasses such as *Themeda australis* (Kangaroo Grass), Spear-grasses such as *Austrostipa* spp. and *Poa* spp. (Poa tussocks) and occasionally *Rytidosperma* spp. (Wallaby grasses) (OEH 2018b). These habitat features are absent in the site.	V	V	No. Potential habitat not considered to be present within the Development Footprint. No BioNet records exist within 10 km of the site.
Epthianura albifrons	White-fronted Chat	The White-fronted Chat occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. It prefers saltmarsh vegetation, open grasslands, and sometimes low shrubs bordering wetland areas. These habitats are largely absent within the Development Footprint.	E	-	No. Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.
Falco hypoleucos	Grey Falcon	The Grey Falcon inhabits arid and semi-arid zones. In NSW, it is found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. It is found in shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	E	-	No. Potential habitat not considered to be present. Two BioNet record exists within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Galaxias rostratus	Flathead Galaxis	The Flathead Galaxis is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong. It prefers still or slow moving water bodies, such as wetlands and lowland streams, with rock or sandy bottoms and aquatic vegetation.	E	-	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Gallinago hardwickii	Latham's Snipe	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, and around bogs and other water bodies). Potential habitat is not considered to be present, as any natural habitat is substantially degraded and has been subject to decades of agricultural practices (including land improvement).	-	M	Unlikely. Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	In NSW, records of the Purple-crowned Lorikeet are scattered across the box-ironbark woodlands of the Riverina and south west slopes, River Red Gum forests, and mallee of the Murray Valley as far west as the SA border. It inhabits open forests and woodlands, mallee habitats (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the Development Footprint. However, no BioNet records occur within 10 km of site.
Glossopsitta pusilla	Little Lorikeet	In NSW, the Little Lorikeet is found from the coast westward as far as Dubbo and Albury. It inhabits open forests and woodlands, mallee habitats (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the site. Five BioNet records occur within 10 km of site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Grantiella picta	Painted Honeyeater	This species is a nomadic species that occurs predominantly on the inland slopes of the Great Dividing Range. It inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. It is a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias, preferring mistletoes of the genus *Amyema*. Nesting occurs from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches (OEH 2018b). Potential habitat not considered to be present, as high occurrences of mistletoes are absent from the Development Footprint. BAM habitat constraints requires mistletoes at a density of >5 / ha	V	V	Unlikely. Potential habitat not considered to be present within the Development Footprint (absence of mistletoe). Closest BioNet record is >10 km from site and all records are >15 years old.
Haliaeetus leucogaster	White-bellied Sea-Eagle	The White-bellied Sea-eagle is distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia. It inhabits freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds, and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas (OEH 2018b). This is a dual species credit under BAM. Foraging habitat is predicted to occur based on PCT mapping and these impacts are part of the ecosystem credits. Breeding habitat (species credit component) is not considered to be present and no individuals were recorded during the targeted candidate species surveys.	V	-	Unlikely. Potential foraging habitat considered to be present, but breeding habitat absent based on targeted surveys. Three BioNet records occur within 10 km of the site.
Hieraaetus morphnoides	Little Eagle	The Little Eagle is found throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment. It prefers open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW (OEH 2018b). This is a dual species credit under BAM. Foraging habitat is predicted to occur based on PCT mapping and these impacts are part of the ecosystem credits. Breeding habitat (species credit component) is not considered to be present and no individuals were recorded during the targeted candidate species surveys.	V	-	Unlikely. Potential foraging habitat considered to be present, but breeding habitat absent based on targeted surveys. No BioNet records occur within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
HIrundapus caudacutus	White-throated Needletail	The White-throated Needletail is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. They are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but are less commonly recorded flying above woodland. The species also occurs over heathland, but less often over treeless areas such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (OEH 2018b).	-	M	Unlikely. Potential habitat considered to be limited within the site. A single BioNet record exists within 10 km of the site.
Lathamus discolor	Swift Parrot	This species breeds in Tasmania during Spring and Summer and migrates to the Australian south-east mainland between March and October. On the mainland they occur where eucalypts are flowering profusely, or where there are abundant lerp infestations. Favoured feed trees include winter flowering species such as *Eucalyptus robusta* (Swamp Mahogany), *Corymbia Maculata* (Spotted Gum), *C. gummifera* (Red Bloodwood), *E. sideroxylon* (Mugga Ironbark), and *E. albens* (White Box) (OEH 2018b). These preferred feed trees do not occur within the Development Footprint. The species is listed as a species credit species under the BAM. Confirmation from OEH indicates important not present, and therefore targeted BAM surveys not required.	E	CE	Unlikely Potential habitat not considered to be present. Closest BioNet record is 8 km from the site. Species not observed (opportunistically) during any of the surveys (noting survey guidelines require survey between March and July).
Litoria raniformis	Southern Bell Frog	In NSW, the southern bell frog is only known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few recent unconfirmed records have also been made in the Murray Irrigation Area. Their preferred habitat includes 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 can also be found in irrigated rice crops. These species are not present within the site.	E	V	Unlikely. Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Lophochroa leadbeateri	Major Mitchell's Cockatoo	In NSW, Major Mitchell's Cockatoo occurs across the arid and semi-arid inland, as far east as Bourke and Griffith, and sporadically even further east. It occurs in a wide range of treed and treeless inland habitats that always within easy reach of water (OEH 2018b). Species range is the semi-arid and arid habitats of Australia.	V	-	Unlikely Outside preferred range for the species. No BioNet records exist within 10 km and not recorded during targeted surverys.
Lophoictinua isura	Square-tailed Kite	This species is found in a variety of timbered habitats including dry woodlands and open forests and shows a particular preference for timbered watercourses (OEH 2018b). This is a dual species credit under BAM. Foraging habitat is predicted to occur based on PCT mapping and these impacts are part of the ecosystem credits. Breeding habitat (species credit component) is not considered to be present and no individuals were recorded during the targeted candidate species surveys	V	-	Unlikely Potential foraging habitat considered to be present, but breeding habitat absent based on targeted surveys. No BioNet records occur within 10 km of the site
Maccullochella peelii	Murray Cod	The Murray Cod can be found throughout most of the Murray Darling Basin, with the exception of some localised extinctions. Its range of preferred habitat includes clear rocky streams, slow flowing to turbid rivers and billabongs. It is frequently found in the main river channel and larger tributaries, as well as in floodplain channels when they contain water.		V	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Macquaria australasica	Macquarie Perch	The Macquarie Perch is found in the Murray-Darling Basin, particularly in the upstream reaches of the Lachlan, Murrumbidgee and Murray rivers, and in parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. It inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries.	E	E	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	The Hooded Robin is widespread across Australia, except for the driest deserts and the wetter coastal areas. It prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, and requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the site. Five BioNet records occur within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	The Black-chinned Honeyeater is widespread in NSW from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is also found in the Richmond and Clarence River areas and in a few scattered sites in the Hunter, Central Coast and Illawarra regions. It prefers open forests or woodlands dominated by box and ironbark eucalypts, or by smooth-barked gums, stringybarks, river sheoaks and tea-trees (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the site. Four BioNet records occur within 10 km of the site.
Merops ornatus	Rainbow Bee-eater	The Rainbow Bee-eater is distributed across much of mainland Australia, including NSW. It inhabits open forests and woodlands, shrublands, farmland, areas of human habitation, inland and coastal sand dune systems, heathland, sedgeland, vine forest and vine thicket. This species is listed as Marine species under the EPBC Act.	-	Ma	Potential. Potential foraging habitat is likely to occur within and adjacent to the site. Twenty-seven BioNet records occur within 10 km of the site.
Monarcha melanopsis	Black-faced Monarch	In New South Wales and the Australian Capital Territory, the species occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park, Wombeyan Caves and Canberra. It is rarely recorded farther inland. It occurs mainly in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. These habitats are absent within the Development Footprint.	-	M	No. Habitat is not present. No BioNet records exist within 10 km of the site.
Myiagra cyanoleuca	Satin Flycatcher	Populations have been found near Mudgee in eucalypt forests, often near wetlands or watercourses. They inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and, on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. These habitats are absent from the site.	-	M	No. Habitat is not present. No BioNet records exist within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Neophema pulchella	Turquoise Parrot	The Turquoise Parrot can be found along the length of NSW from the coastal plains to the western slopes of the Great Dividing Range. It inhabits eucalytpt and cypress pine open forests and woodlands, ecotones between woodland and grassland, or coastal forest and heath (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	v	-	Potential. Potential foraging habitat within and adjacent to the site. Thirteen BioNet records occur within 10 km of the site.
Ninox connivens	Barking Owl	Has a wide but sparse distribution in NSW, avoiding the most central arid regions. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests. It inhabits woodland and open forest, including fragmented remnants and partly cleared farmland, wetland and riverine forest (OEH 2018b). The Development Footprint does not comprise of open forests or woodland and habitat present is substantially degraded such that this species is unlikely to utilise the site. Furthermore, limited hollows suitable for breeding (>300mm) occur, which are limited to exposed paddock trees, and not the preferred habitat of woodland and open forest	V	-	Unlikely Potential habitat not considered to be present. Two BioNet record exists within 10 km of the site. Species not observed during spotlighting surveys for other species.
Numenius madagascariensis	Eastern Curlew, Far Eastern curlew	In NSW, the Eastern Curlew has a primarily coastal distribution. It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (OEH 2018b). These habitats are absent within the site.	-	CE	No. Suitable habitat not present. No NSW BioNet Atlas records within 10km of the site.
Nyctophilus corbeni	Corben's Long-eared Bat	Corben's Long-eared Bat inhabits a variety of vegetation types, including mallee, *Allocasuarina leuhmanni* (Bulloke) 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, with a stronghold in the Pilliga. It roosts in tree hollows, crevices, and under loose bark. This species is thought to prefer structurally complex forest as foraging habitat (OEH 2018b). These vegetation types are absent from the Development Footprint and do not occur in the general area. Furthermore, this species is an ecosystem species under the BAM, and was not predicted to occur based on the PCTs and IBRA subregion present.	V	V	Unlikely. Potential habitat not considered to be present and outside known range of the species. No BioNet record exists within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Petauroides volans	Greater Glider population in the Eurobodalla local government area	The Greater Glider occurs in Eucalypt forests along the ranges and coastal plains of eastern Australia, feeding almost exclusively on the young leaves and flower buds of select eucalypt species. It shelters in tree hollows, with a particular preference for large hollows in large, old trees. They occupy a relatively small home range with an average size of 1 to 3 ha, and are very loyal to their territory (OEH 2018b).	-	V	No. Suitable habitat not present. No NSW BioNet Atlas records within 10km of site.
Petaurus norfolcensis	Squirrel Glider	The Squirrel Glider is widely yet sparsely distributed on both sides of the Great Dividing Range in eastern Australia. It 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 (OEH 2018b). Potential habitat maybe present within and adjacent to the Development Footprint and thirteen BioNet records occur within 10 km. However, species was not recorded during the targeted candidate species surveys.	V		Unlikely. Not observed during targeted candidate species surveys. Thirteen BioNet records within 10km of site.
Petroica boodang	Scarlet Robin	In NSW, this species occurs from the coast to the inland slopes. It is often found in dry eucalypt forests and woodlands, and occasionally in mallee, wet forest, wetlands and tea-tree swamps (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V		Potential. Potential foraging habitat within and adjacent to the site. Eight BioNet records occur within 10 km of site.
Petroica phoenicea	Flame Robin	In NSW, the Flame Robin breeds in upland areas, and in winter many birds move to the inland slopes and plains, or occasionally to coastal areas. It breeds in upland tall moist eucalypt forests and woodlands. In winter it uses dry forests, open woodlands, heathlands, pastures and native grasslands. It can occasionally be found in temperate rainforest, herbfields, heathlands, shrublands and sedgelands (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V		Potential. Potential foraging habitat within and adjacent to the site. Six BioNet records occur within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Phascolarctos cinereus	Koala	In NSW, the Koala mainly occurs on the central and north coasts, with some populations in the west of the Great Dividing Range. It is associated with both wet and dry eucalypt forest and woodland, feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species, primarily those listed in Schedule 2 of SEPP 44 (OEH 2018b). Targeted survey conducted in August and September including diurnal searches (during paddock tree assessment for the BAMC) and nocturnal spotlighting, did not detect the species. EPBC Act important habitat assessment determined important habitat not present.	V	V	No. Targeted species surveys did not record species. Two NSW BioNet Atlas records occur within 10km of the site.
Plegadis falcinellus	Glossy Ibis	Has been recorded over much of NSW. In spring and summer it is a breeding migrant to the southern Murray-Darling region and Macquarie Marshes. It predominantly inhabits the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation, and occasionally can be found near estuaries, deltas, saltmarshes and coastal lagoons.	-	M	No. Suitable habitat not present. One NSW BioNet Atlas record within 10km of site.
Polytelis swainsonii	Superb Parrot	The Superb Parrot is found throughout eastern inland NSW in Box-gum woodland, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. It nests in small colonies, often with more than one nest in a single tree. They 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. The species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. They feed in trees and understorey shrubs and on the ground, and their diet consists mainly of grass seeds and herbaceous plants (OEH 2018b).	V	V	Unlikely Potential habitat considered to be present. However, targeted seasonal and opportunistic surveys did not detect the species. No NSW BioNet Atlas records occur within 10 km of the site.
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	In NSW, the Grey-crowned Babbler occurs on the western slopes of the Great Dividing Range, and as far as Louth and Balranald on the western plains. It also occurs in woodlands in the Hunter Valley and in some locations on the north coast. It often inhabits open woodland habitats; it favours Box-gum woodlands on the slopes and Box-cypress and open Box woodlands on alluvial plains (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V		Potential. Potential foraging habitat within and adjacent to the site. No BioNet records occur within 10 km of the site.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Pteropus poliocephalus	Grey-headed Flying Fox	The Grey-headed Flying Fox inhabits subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps, as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20-50km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. They feed on the nectar and pollen of Eucalyptus, Melaleuca and Banksia species, and fruits of rainforest trees and vines (OEH 2018b).	V	V	Unlikely No roosts or camps occur within the site and foraging habitat is limited. No BioNet records occur within 10 km of the site.
Rhipidura rufifrons	Rufous Fantail	The Rufous Fantail inhabits the coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW. It is often found in sclerophyll forests, and subtropical and temperate rainforest, and sometimes drier sclerophyll forests and woodlands.	-	M	No. Suitable habitat not present. One NSW BioNet Atlas record within 10km of site.
Rostratula australis	Australian Painted Snipe	In NSW, records of the Painted Snipe are from the Murray-Darling Basin, including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp, and swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. It prefers the fringes of swamps, dams and nearby marshy areas, where there is a cover of grasses, lignum, low scrub or open timber. It nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (OEH 2018b). These habitat types and features are absent from the Development Footprint.	E	E	Unlikely Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-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. Roosts in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements	V	-	Potential. Potential foraging habitat within and adjacent to the site. No BioNet record exists within 10 km of the site

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Stagonopleura guttata	Diamond Firetail	The Diamond Firetail is distributed in NSW, and has mainly been recorded in the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina, and less commonly found in coastal areas and further inland. It prefers gassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas, and lightly wooded farmland (OEH 2018b). This is an ecosystem species under BAM (can be predicted to occur within a PCT). Impacts to this species (or habitat) are part of the ecosystem credits requirements.	V	-	Potential. Potential foraging habitat within and adjacent to the site. Nineteen BioNet records occur within 10 km of the site.
Stictonetta naevosa	Freckled Duck	The Freckled Duck inhabits inland river systems, occurring as far as coastal NSW in times of drought. It can be found in freshwater swamps and creeks, lakes, reservoirs, farm dams and sewage ponds (OEH 2018b).	V	-	Unlikely. Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.
Tringa nebularia	Common Greenshank	Common Greenshank is a summer migrant to Australia. It has been recorded in most coastal regions of NSW; it also widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. It prefers terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms). These habitat types and features are absent from the Development Footprint.	-	M	Unlikely Potential habitat not considered to be present. No BioNet record exists within 10 km of the site.
Tyto novaehollandiae	Masked Owl	Extends from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands and roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting (OEH 2018b). These vegetation types are absent from the Development Footprint.	V	-	Unlikely Potential habitat not considered to be present. No BioNet record exists within 10 km of the site. Not observed during spotlighting. surveys for other species.

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
THREATENED ECOLOGICAL COMMUNITIES					
White Box-Yellow Box-Blakely's Red Gum Woodland (TSC Act)	Box-Gum Woodland	This TEC is characterised by the presence or prior occurrence of *Eucalyptus albens* (White Box), *E. melliodora* (Yellow Box) and/or *E. blakelyi* (Blakely's Red Gum). Trees may occur as pure stands, mixtures of the three species, or in mixtures with other trees, including wattles. The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include *Themeda triandra, Poa sieberiana, Rytidosperma* spp., *Austrostipa* spp., *Chrysocephalum apiculatum, Goodenia pinnatifida, Hypericum gramineum, Vittadinia muelleri* and *Wahlenbergia* spp. Shrubs are generally sparse or absent, though they may be locally common. Remnants generally occur on fertile lower parts of the landscape where resources such as water and nutrients are abundant (OEH 2018b).	E	-	Yes. Box-Gum Woodland under the BC Act occurs on site
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act)	Box-Gum Woodland		-	CE	No.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (TSC Act) **Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (EPBC Act)**	Grey-Box Woodland	The TEC is comprised of woodland to open forest with a canopy dominated by *Eucalyptus microcarpa* (Grey Box). Other tree species are often present and may be co-dominant with Grey Box at some sites, including *Allocasuarina luehmannii* (Bulloak), *Brachychiton populneus* (Kurrajong), *Callitris glaucophylla* (White Cypress Pine), *Eucalyptus albens* (White Box), *E. camaldulensis* (River Red Gum), *E. conica* (Fuzzy Box), *E. leucoxylon* (Yellow Gum), *E. melliodora* (Yellow Box) and *E. populnea* (Bimble Box). The understorey is characterised by a moderately dense to sparse shrub layer, and a ground layer of perennial and annual native forbs and graminoids dominated by tussock grasses. The TEC includes patches of derived grassland, where the tree canopy and mid layer has been removed to less than 10% crown cover but the native ground layer remains largely intact. It most commonly occurs in flat to undulating plains, low slopes and rises and, to a lesser extent, drainage depressions and flats. It may also extend to more elevated hillslopes on the fringes of its range. It often occurs on productive soils derived from alluvial or colluvial materials.	E	E	No

Scientific name	Common name	Habitat associations	Conservation status		Likelihood of occurrence
			BC Act	EPBC Act	
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (TSC Act) **Weeping Myall Woodlands (EPBC Act)**	Weeping Myall	This TEC is described as an open woodlands to woodland, generally 4-12 m high, in which *Acacia pendula* (Weeping Myall) trees are the sole or dominant overstorey species. Other vegetation may include *Alectryon oleifolius subsp*. *elongatus* (Western Rosewood), *Eucalyptus populnea* (Poplar Box) or *Eucalyptus largiflorens* (Black Box). *Amyema quandang* (Grey Mistletoe) commonly occurs on the branches of Weeping Myall trees. The understorey often includes an open layer of shrubs above an open ground layer of grasses and herbs, though the ecological community can exist naturally either as a shrubby or a grassy woodland. Generally, it occurs on flat areas, shallow depressions or gilgais on raised (relict) alluvial plains. It occurs on black, brown, red-brown or grey clay or clay loam soils.	E	E	No

Appendix D: Biodiversity Credit Reports

BAM Credit Summary Report

Proposal Details

Assessment Id
00011597/BAAS17043/18/00011598

Proposal Name
15523 - Glenellen Solar Farm PCT Assessment

BAM data last updated *
20/08/2020

Assessor Name
Matthew Dowle

Report Created
06/10/2020

BAM Data version *
30

Assessor Number
BAAS17043

BAM Case Status
Finalised

Date Finalised
06/10/2020

Assessment Revision
0

Assessment Type
Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion								
1	277_Grazing	14.8	7.3	0.25	High Sensitivity to Potential Gain	2.00	TRUE	0
2	277_Planted	30.7	0.64	0.25	High Sensitivity to Potential Gain	2.00	TRUE	10

3	277_Low	36.7	2.5	0.25	High Sensitivity to Potential Gain	2.00	TRUE	45
							Subtotal	**55**
River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion								
4	9_Low	19.6	1	0.25	High Sensitivity to Potential Gain	1.75		9
							Subtotal	**9**
							Total	**64**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits
Myotis macropus / Southern Myotis (Fauna)						
9_Low	19.6	1	0.25	2	False	10
					Subtotal	**10**
Pilularia novae-hollandiae / Austral Pillwort (Flora)						
9_Low	19.6	1	0.25	3	True	15
					Subtotal	**15**

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00011597/BAAS17043/18/00012402	10726 - Glenellen Solar Farm Paddock Trees	20/08/2020
Assessor Name	Report Created	BAM Data version *
Matthew Dowle	06/10/2020	30
Assessor Number	BAM Case Status	Date Finalised
BAAS17043	Finalised	06/10/2020
Assessment Revision	Assessment Type	
0	Paddock Trees	

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Paddock Trees Credit Requirement

Class	Contains hollows	Number of trees	Ecosystem credits
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion			
3	True	31.0	31
3	True	20.0	20
3	False	12.0	9
3	False	17.0	13
3	True	1.0	1
			74
			74

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