



*Hamilton Environmental Services*  
ABN: 89 108 410 911



## TEST OF SIGNIFICANCE – PROPOSED PUMP STATION UPGRADE, EUSTON



## Test of Significance – Proposed Pump Station upgrade, Euston

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**Cover Photo:** Looking south towards the Murray River across the proposed development site and the existing pump area.

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## 1. INTRODUCTION

Euston Park Pty. Ltd. are proposing the establishment of a second river pump on the Murray River, adjacent to an existing pump, to provide water for irrigated agricultural developments at Euston (Samantha Grainger pers. comm. 2021).

However, the proposed second pump station site on the riverbank is wholly mapped within an area of mapped Biodiversity Value. The Biodiversity Offset Scheme Entry Threshold (BOSET) tool was used, and based on this, this proposal is required to enter the Biodiversity Offset Scheme, and a Biodiversity Development Assessment Report (BDAR) is required.

The landholder has indicated that no native vegetation is to be impacted, and therefore an assessment is required to determine if there is no native vegetation proposed to be removed, and if so to provide a Test of Significance; if native vegetation is to be removed, then entry into the BOS is triggered, and a BDAR is to be prepared.

In June 2021, Hamilton Environmental Services (HES) was engaged to undertake a Biodiversity Assessment to complete a Test of Significance under Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* for the landholder of to supplement the works application to Balranald Shire Council.

Field assessment of the site was conducted on the 22<sup>nd</sup> June 2021 by Dr. Steve Hamilton.

## 2. BACKGROUND

### 2.1 Consultant Background

#### Steve Hamilton (Dr.)

*AssocDipAppBiol, BAppSc(AppBiol), MAppSc (RMIT), PhD (University of Melbourne), BAM accredited Assessor (DPIE NSW), Vegetation Quality Assessment Certified (DSE/DEPI/DELWP Victoria), Bush Broker Assessor (DELWP Victoria), Certificate IV in Training and Assessment.*

Steve is an ecologist specialising in flora and fauna inventory, auditing, monitoring and surveying, as well as soil typing, analysis and mapping. He has 12 years consulting experience, associated with a range of ecological evaluations and monitoring processes across all of Victoria, and southern and western New South Wales, which includes assessing and mapping vegetation condition, vegetation type, targeted threatened species surveys, habitat quality assessment (in Victoria, Habitat Hectares assessment and 'Net Loss and Gain' evaluations), across the range of terrestrial, riparian and wetland ecosystems.

He has vast experience in the assessment of native vegetation and species, and habitat loss assessment, for irrigation, residential, infrastructure and mining (including sand, rock and ore extraction) developments, and the successful negotiation of the appropriate legislative, regulatory and statutory frameworks across the three levels of Government to provide suitable outcomes for clients across both States to allow developments to proceed. In Victoria, this involves the production of Net Loss Reports, Vegetation Offset Management Plans and Work Plans, and in NSW, reporting for potential native vegetation/habitat losses and threatened species threats in Development Applications (DAs), and in more detailed situations where Director General Requirements (or Secretary's Environmental Assessment Requirements; SEARs) are specified, Environmental Impact Statements (EISs) or Reviews of Environmental Factors (REFs).

Beyond statutory requirements and reporting, Steve is often called upon to provide technical reporting into particular issues, such as research/survey investigations into vegetation-soil-fauna

management issues in natural areas or for development proposals, such as weed management surveys and strategies, kangaroo survey and management, potential mining pollution impacts, sustainability of timber resources, soil mapping and land capability assessment, ecosystem restoration, or revegetation design.

Prior to consulting, Steve spent 20 years as a senior teaching/research academic, and has more than 30 peer-reviewed papers and many technical reports, most focussing on the impacts of disturbance on the ecology and floristics of woodlands and grasslands.

## 2.2 Location and Description

The property is 4.4 km north-east of the centre of the township of Euston (Fig. 2-1).

The property where the proposed pump upgrade is to be established has frontage on the Sturt Highway (the property is 4 Sturt Highway, Euston; Lot 4 DP2270452), and has been predominantly cleared of woody vegetation.

The proposed pump upgrade site is found on the north bank of the Murray River, and is 670 m south-south-east of the Sturt Highway, with the pump site accessed by an earth track from the highway; the area of the pump retains a more-or-less canopy of River Red Gum (*Eucalyptus camaldulensis*) along the riparian zone of the river, with a sparse ground layer that is a mixture of introduced and indigenous ground layer species (Fig. 2-2).



**Figure 2-1** Aerial image of the general location of the assessed site, shown as a red dot, with an arrow to guide location (Google Earth 2021).

The river bank area where the proposed pump upgrade is proposed is mostly bare, and contains minimal indigenous ground layer vegetation, with one mature and hollow-bearing River Red Gum found along the top of the river bank in close proximity. The existing river bank in the assessed area

slopes steeply, and is covered with the indigenous macrophyte, Common Reed (*Phragmites australis*)(see Plate 2-1).

It must be noted that the area surrounding the proposed development site contains a number of other existing pump stations, and the area has not surprisingly experienced significant disturbance and modification, with obvious past partial clearing, a number of formal and informal vehicle tracks and the commensurate compaction they provide, and with this disturbance, a simplified understory.



**Figure 2-2 Aerial image of the existing and proposed pump site (Image copyright NSW Land and Property Information 2021).**

The pump upgrade will result in a similar pump – with the same footprint extent - being installed directly alongside the existing pump in the same orientation. The existing eastern edge of the fencing along the existing pump will be removed, so that one continuous fence will surround both pumps – the extent of the fence will be the boundary surrounding both areas as shown in Fig. 2-2. Within the new fenced area, the new pump will be located on a concrete pad that will have footings to approximately 600-750 mm in depth; this pad will have an extent of approximately 4 m north-south and 3 m east-west within this fenced area, and the outlet pump will exit to the area to the north of the pump as currently occurs with the existing pump. The outlet pipe will follow the disturbed ground alignment where the existing outlet pipe from the other pump is located.

The floating pump inlet structure, as per the existing pump, will not impact on the Common Reed found on the river bank, and will be located above this vegetation.



**Plate 2-1** Views of the river bank where the proposed pump upgrade site will be located: looking south towards the river bank, showing the existing fenced pump (top left), the large River Red Gum (Tree 1) to the immediate north-east of the proposed pump site (top right), looking across the proposed site towards the existing pump and fence (middle left), looking along the river bank to the existing pump (middle right), the river bank in the immediate area of the proposed pump site (bottom left), and looking north along the proposed pump site (bottom right). Approximate pump site dimensions (including fencing) are shown as red lines.

### 3. METHODOLOGY

#### 3.1 Desktop Review

The following desktop information was gathered prior to field assessment:

- Aerial imagery and base map from Land and Property Information New South Wales;
- Determination of a general species list for the area (Department of Planning, Industry and Environment [DPIE] 2021a);
- Matters of National Significance reporting for the 10 km radius around the property (Department of Agriculture, Water and Environment [DAWE] 2021);
- Flora, fauna and threatened species lists, sighting records and information for the district was obtained from *BioNet – Website of the Atlas of NSW Wildlife* (DPIE 2021b).

#### 3.2 General Site Assessment

On the 22<sup>nd</sup> June 2021, Dr. Steve Hamilton (BAAS 18106) visited the property and the adjacent area to undertake the assessment. On this day, air temperatures were between 12 and 14°C, the sky was clear, and there was no wind (Bureau of Meteorology 2021).

The entire site was traversed by foot, and continuous active searching was conducted over a total period of 1 hour.

In a general sense, the following assessments were undertaken across the assessed area:

- Vascular plant species were identified and noted according to zone, with an overall cover/abundance value recorded for each species in each zone completed post-field assessment (see Table 3-1);
- The species, location, diameter, health and basic hollow characteristics of all assessed tree individuals was recorded, and an image of the tree taken;
- Opportunistic recording of any fauna;
- Digital images across the site taken.

Fifty eight (58) images were taken across the area during the assessment to facilitate identification and to provide context to the description.

**Table 3-1 Modified Braun-Blanquet scale applied to assessment to each vascular plant species identified.**

Visual assessment of cover/abundance	
<i>Symbol</i>	<i>Description</i>
+	rare, cover < 5%
1	Uncommon, cover < 5 %
2	Very common, cover < 5 % or cover 5-25 % with any number of individuals
3	Cover 25-50 % with any number of individuals
4	Cover 50-75 % with any number of individuals
5	Cover 75-100 % with any number of individuals

### **3.3 Taxonomy**

#### **3.3.1 Flora**

Vascular plants that could not be identified in the field, specimens and images were collected for identification using the *Flora of New South Wales* (Harden 1990, 1991, 1992, 1993), and *PlantNet Flora On-line* (Royal Botanic Gardens Sydney 2021).

#### **3.3.2 Fauna**

Any fauna observed were recorded, with the nomenclature based variously on the compilations of Hero *et al.* (1991), Menkhorst (1995), Cogger (1996) and Simpson and Day (1998), utilising Triggs (1996) for identification using indirect methods, such as the presence of scats or tracks.

## **4. EXISTING ENVIRONMENT**

### **4.1 Vegetation**

As indicated, the river bank area where the proposed pump upgrade is proposed is mostly bare, with some leaf litter (40 % cover), and contains minimal indigenous ground layer vegetation – indeed, the only indigenous species present in this area are 10 individual plants of Warrego Summer Grass (*Paspalidium jubiflorum*) that provide a projective foliage cover of only 5 % within the proposed development area. There is also one mature and hollow-bearing River Red Gum found along the top of the river bank in close proximity.

It must be noted that the area surrounding the proposed development site contains a number of other existing pump stations, and the area has not surprisingly experienced significant disturbance and modification, with obvious past partial clearing, a number of formal and informal vehicle tracks and the commensurate compaction they provide, and with this disturbance, a simplified understory.

There were no rare or threatened species observed (after DPIE 2021a).

The existing river bank in the assessed area slopes steeply, and is covered with the indigenous macrophyte, Common Reed. The floating pump inlet structure, as per the existing pump, will not impact on the Common Reed found on the river bank, and will be located above this vegetation.

Based on the evidence provided by the remaining vegetation on the river bank, the community in which the proposed development site would be located is categorised as NSW Plant Community Type (PCT) ID 11 – *River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)*(from Environment and Heritage 2012 and DPIE 2021d).

### **4.2 Remnant Trees**

Only one tree was assessed at site, as this was the only tree within appropriate proximity to the proposed development site – this was a hollow-bearing River Red Gum of 160 cm diameter at breast height (dbh).

The location of this tree (Tree 1) is shown in Fig. 4-1 and the tree is shown in Plate 2-1.

Construction projects that involve earthworks or soil disturbance can cause indirect losses of native vegetation that are retained during construction due to root damage and soil modification within the zone where roots occur. Of particular concern is the longer-term impact of soil compaction and excavation (e.g. trenching for pipelines) close to trees and the effects of this on immediate and longer-term tree health. Standards Australia (2009) has provided guidance and clarity on this issue,

and has defined an acceptable distance for tree retention in order to prevent indirect losses of native vegetation during and after construction activities as a guiding principle. These designated Tree Protection Zones (TPZs) should be implemented for the duration of construction activities (Standards Australia 2009) as part of the development conditions.

A TPZ is a specific area above and below the ground, with a radius 12 times the Diameter at Breast Height (dbh; 1.3 m) of any individual tree; the TPZ of trees should be no less than 2 m or greater than 15 m, and it is recommended that physical barriers be erected to delineate the TPZ during construction activities. Should a development impinge on the TPZ area for > 10 % of its area, the tree shall be considered a loss, and will have to be offset (Standards Australia 2009).

The proposed development work is wholly within the TPZ of Tree 1, as were the works associated with the existing pump. The only effective impact on the development within this TPZ is the concrete pad that will have footings to approximately 600-750 mm in depth and an extent of approximately 4 m north-south and 3 m east-west – this area is only 1.6 % of the TPZ area. Allowing for the excavation associated with the installation of the outlet pipe along the same alignment as the existing pipe, and two new fence posts (each with a footprint of approximately 0.3 m<sup>2</sup> to 50 cm depth), it is asserted that the proposed development will have negligible impact on Tree 1.

There will need to be care taken in regards towards all retained trees within proximity to the development site, to ensure that the TPZs of retained trees are not further impacted than projected.

### 4.3 Fauna

There were 9 species of fauna observed (all birds), all of which are indigenous.

White-bellied Sea-Eagles were observed at the site, and are listed as *Vulnerable* in New South Wales

The Murray River corridor is clearly immediately adjacent to the site, and there is continuous vegetation (tree) cover along this corridor, and the site clearly maintains an excellent landscape connectivity.

Not surprisingly, the indigenous fauna observed across the assessed site is typical of those observed in riparian areas, such as the indigenous Black Swans, Purple Swamp-hens, White-bellied Sea-Eagles and Australian Pied Cormorant, and more generalist species such as Magpie-Lark, Australian Magpie, Galah, Red-rumped Parrot, Australian Ringneck, Sulphur-crested Cockatoo and Noisy Miner.

However, even given the excellent connectivity and the presence of hollow-bearing trees in the assessed area, the lack of observed species diversity across the site is not surprising, given:

- the lack of understorey woody vegetation across the across the riparian zone and the commensurate simplified vegetation structure, would considerably limit mammal, reptile, bat and bird species residency;
- a low diversity and abundance indigenous ground layer;
- the lack of fallen timber, which would considerably limit mammal, reptile, bat and bird species residency;
- the likely presence of feral animal populations such as foxes and feral cats, which would actively predate any ground-dwelling or near ground-dwelling species heavily.

On this basis, some bird and mammal fauna will be able to utilise the hollow and nectar resources found across the site, there are limited habitat opportunities for fauna even within this area in terms of residence because of the lack of vegetation structure, on-going disturbance at the site, and the lack of structural and compositional diversity. However, it is reasonable to assume that a reasonable range of fauna found within the Murray River corridor are likely to utilise the assessed site because of the excellent connectivity, and may infrequently utilise the canopy and mature trees across the

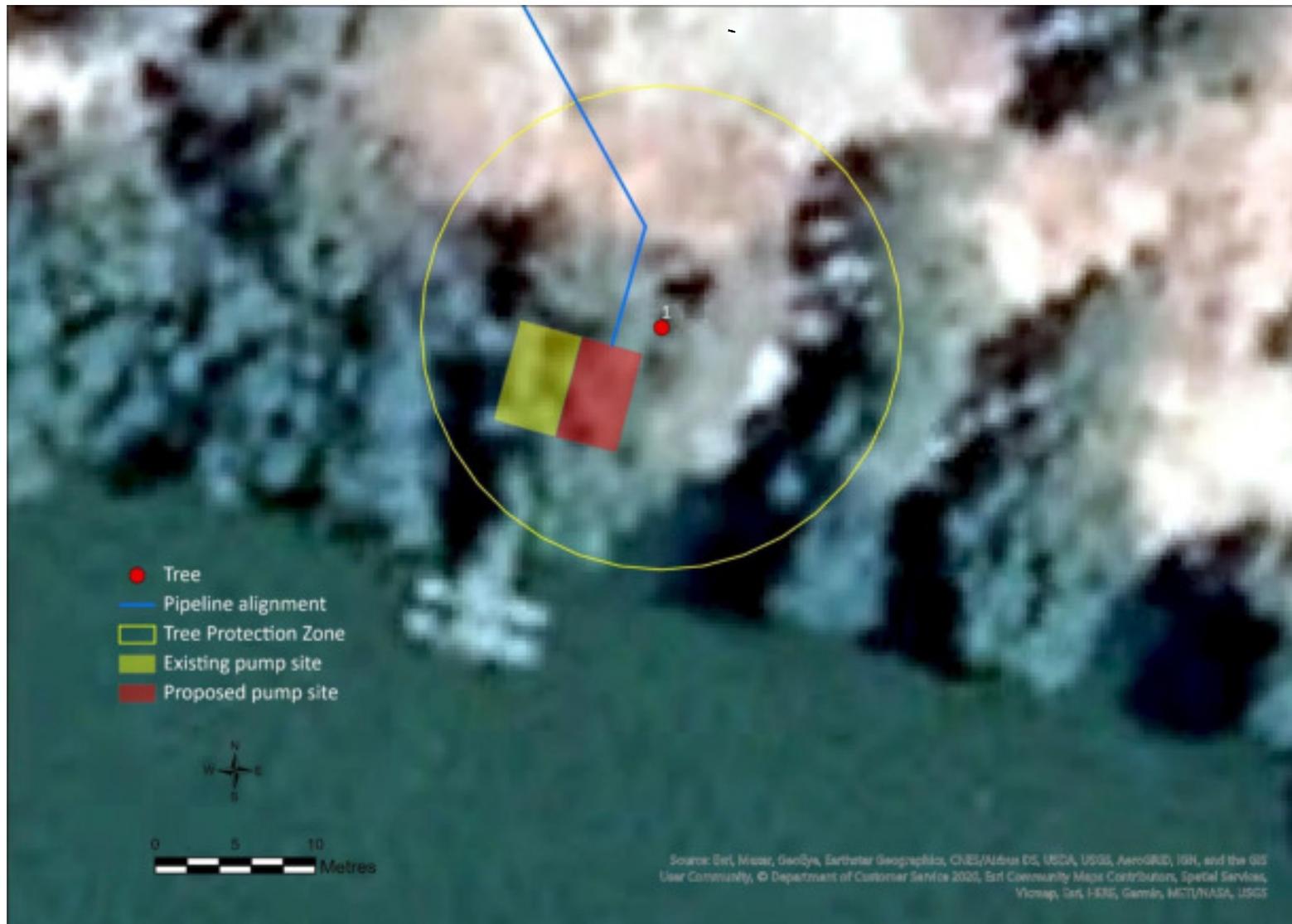


Figure 4-1 Aerial image of the assessed area, showing the location of the indigenous tree and its Tree Protection Zone (Image from Google Earth dated 25/2/2021).

site; it is clear that the remaining native vegetation on the site would not be primary or even secondary habitat for many species, and usage would be highly infrequent and opportunistic.

## **4.4 Threatened Species and Communities**

### **4.4.1 Threatened community likelihood**

As stated previously, the pre-European site was likely one NSW Plant Community Type (PCT) - ID 11 – *River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)*(from Environment and Heritage 2012 and DPIE 2021d).

Threatened Ecological Communities (TECs) are listed in the schedules of the *Biodiversity Conservation Act 2016*; *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions*, the *Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions*, the *Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes Bioregions* are listed as *Endangered* under the Act (DPIE 2021b).

Matters of National Environmental Significance searching reveals that the nationally critically endangered *Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions* community, and the nationally endangered *Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions* community occur within a 10 km radius of the site (DAWE 2021).

AS indicated, based on the evidence provided by the remaining vegetation on the river bank, the proposed development area, this community would be categorised as NSW Plant Community Type (PCT) ID 11 – *River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)*(from Environment and Heritage 2012 and DPIE 2021d); the assessed proposed works area is not one of the threatened community at a State or a National level.

### **4.4.2 Threatened species likelihood**

There were no rare or threatened species under the *Biodiversity Conservation Act 2016* observed at the property (DPIE 2021a).

The likelihood of presence for all recorded threatened species within a 10 km radius of the site has been considered (DPIE 2021a).

*BioNet – Website of the Atlas of NSW Wildlife and Matters of National Environmental Significance* searches revealed that there were records or predicted occurrences of thirty two (32) threatened fauna species within a 10 km radius of the site (DPIE 2021a, DAWE 2021; Appendix D).

*BioNet – Website of the Atlas of NSW Wildlife and Matters of National Environmental Significance* revealed that there were ten (2) records or predicted occurrences of threatened flora species within a 10 km radius of the site (DPIE 2021a, DAWE 2021; Appendix D).

The likelihood of the presence of these species and their likelihood of utilisation of the proposed development area was considered, and rated based on the habitat preferences of the species, the habitat quality of the site, the excellent landscape connectivity, known records for species and the currency of these records, and the composition, abundance and structure of the vegetation of the site (Appendix D).

Of these species, all flora, and twenty five fauna species were not likely to occur at the site or to utilise it because of the following issues (or combination of them):

- the lack of a suitable community/habitat type (e.g. Claypan and Mossiel Daisy, Swamp She-oak, Yellow Gum, Dusky Woodswallow, Mallee Worm-lizard, Malleefowl, Plains-wanderer, Wester Pygmy Possum);
- the lack of connectivity of the site through clearing of habitat to areas of known occurrence (e.g. Koala, Painted Honeyeater, Southern Scrub-robin);
- disturbance to, and simplification of the site (e.g. Slender Darling-pea, Yellow Swainson-pea).

Based on the assumptions described above, two threatened fauna species could potentially be found in the adjacent Murray River – Murray Cod and Silver Perch – while fifteen species of fauna beyond the White-bellied Sea-Eagle that was observed on-site – Black-breasted Buzzard, Brown Treecreeper, Corben’s Long-eared, Gilbert’s Whistler, Hooded Robin, Inland Forest Bat, Little Eagle, Major Mitchell’s Cockatoo, Regent Parrot, Speckled Warbler, Spotted Harrier, Superb Parrot, Swift Parrot, Varied Sittella and White-fronted Chat – were considered to have potential to find the site because of the excellent landscape connectivity, and utilise it given the available habitat resources.

Provided the construction activity can be managed to ensure that there are no impacts on the waterway, there will be no impact on the two threatened fish species. In addition, as the proposed development is unlikely to result in the loss of any trees and negligible impact on other indigenous vegetation, and the utilisation of the site by any of these species is unlikely to be impacted to any extent.

#### **4.4.3 Assessment of Significance**

Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* sets out five parameters that a determining authority must consider in deciding whether an activity is likely to have a significant effect on threatened species, populations, or ecological communities, or their habitats.

Two threatened communities, ten threatened species of flora, and thirty two species of fauna have been recorded within a 10 km radius of the site (DPIE 2021a), or are known or predicted to occur within 10 km of the site (DAWE 2021)(Appendix D).

After likelihood assessment, no representative threatened communities or threatened flora are considered likely to occur in the area, two aquatic fauna species are likely to occur in the river, and fifteen terrestrial fauna species (other than White-bellied Sea-Eagle, which was observed on-site) have the potential to occur at the site, have been evaluated using the five parameters (Appendix D).

Given that this development will have negligible impact on any native vegetation – and therefore reducing the potential impact on any threatened species to a negligible extent - the five parameters of Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* have not been applied to the 2 aquatic fauna species likely to be present within the Murray River, the 1 species of threatened fauna that was observed, and the other 15 terrestrial fauna species that may utilise the site.

## **5. AVOIDANCE AND MINIMISATION OF NATIVE VEGETATION**

As indicated, the river bank area where the proposed pump upgrade is proposed is mostly bare, with some leaf litter (40 % cover), and contains minimal indigenous ground layer vegetation – indeed, the only indigenous species present in this area are 10 individual plants of Warrego Summer Grass that provide a projective foliage cover of only 5 % within the proposed development area. There is also one mature and hollow-bearing River Red Gum found along the top of the river bank in close proximity.

The proposed development work is wholly within the TPZ of Tree 1, as were the works associated with the existing pump. The only effective impact on the development within this TPZ is the concrete pad that will have footings to approximately 600-750 mm in depth and an extent of approximately 4 m north-south and 3 m east-west – this area is only 1.6 % of the TPZ area. Allowing for the excavation associated with the installation of the outlet pipe along the same alignment as the existing pipe, and two new fence posts (each with a footprint of approximately 0.3 m<sup>2</sup> to 50 cm depth), it is asserted that the proposed development will have negligible impact on Tree 1.

There will need to be care taken in regards towards all retained trees within proximity to the development site, to ensure that the TPZs of retained trees are not further impacted than projected.

It must be noted that the area surrounding the proposed development site contains a number of other existing pump stations, and the area has not surprisingly experienced significant disturbance and modification, with obvious past partial clearing, a number of formal and informal vehicle tracks and the commensurate compaction they provide, and with this disturbance, a simplified understorey.

The proposed second pump station site on the riverbank is wholly mapped as an area of mapped Biodiversity Value. The Biodiversity Offset Scheme Entry Threshold (BOSET) tool was used, and based on this, this proposal is required to enter the Biodiversity Offset Scheme, and a Biodiversity Development Assessment Report (BDAR) is required.

However, as there is negligible native vegetation to be impacted, entry into the BOS is not triggered, and a BDAR does not need to be prepared.

## 6. RECOMMENDATION

Euston Park Pty. Ltd. are proposing the establishment of a second river pump on the Murray River, adjacent to an existing pump, to provide water for irrigated agricultural developments at Euston (Samantha Grainger pers. comm. 2021).

However, the proposed second pump station site on the riverbank is wholly mapped within an area of mapped Biodiversity Value. The Biodiversity Offset Scheme Entry Threshold (BOSET) tool was used, and based on this, this proposal is required to enter the Biodiversity Offset Scheme, and a Biodiversity Development Assessment Report (BDAR) is required.

Assessment has revealed that there is negligible native vegetation to be impacted, and therefore entry into the BOS is not triggered, and a BDAR does not need to be prepared.

Given that this development will have negligible impact on any native vegetation – and therefore reducing the potential impact on any threatened species to a negligible extent - the five parameters of Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* have not been applied to the 2 aquatic fauna species likely to be present within the Murray River, the 1 species of threatened fauna that was observed, and the other 15 terrestrial fauna species that may utilise the site.

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## **7.1 Personal communications**

Grainger, Samantha (2021). Price Merrett Consulting, Kerang.

Hope, Pat (2021). Euston Park Pty. Ltd., Euston.

**APPENDIX A      THREATENED SPECIES LIKELIHOOD  
OF PRESENCE**

## Test of Significance – Pump Station Upgrade, Sturt Highway, Euston

List of threatened communities, and flora and fauna species recorded by the BioNet - Atlas of NSW Wildlife and by Matters of National Environmental Significance search of a 10 km radius from the proposed development site, their status, and their likelihood of occurrence on the site (DPIE 2021b; DAWE 2021).

Common Name	Scientific name	Conservation Status (NSW) <sup>1</sup>	Conservation Status (Comm) <sup>2</sup>	Likelihood of Occurrence <sup>3</sup>	Five Part Test
<b>Vegetation community</b>					
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions		e	E	While this TEC is represented within the district, the proposed works area is River Red Gum forest/woodland. <b>Likelihood: Not present</b>	No
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions		e	CE	While this TEC is represented within the district, the proposed works area is River Red Gum forest/woodland. <b>Likelihood: Not present</b>	No
<b>Flora</b>					
A spear-grass	<i>Austrostipa metatoris</i>	v	V	Grows in sandy areas of the Murray Valley; habitats include sandhills, sand ridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Unlikely to be present</b>	No
Claypan Daisy	<i>Brachyscome muelleroides</i>	v	V	A small annual herb restricted to the mid-Murray/Murrumbidgee Rivers region in NSW and Victoria. It occurs in seasonally wet depressions, and relies on seasonal inundation. The species is now restricted to only 10 known populations. Such habitat is not found on site. No records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Mossgiel Daisy	<i>Brachyscome papillosa</i>	v	V	The Mossgiel Daisy is endemic to NSW on clay soils in Saltbush and Bluebush plains, and in grasslands. The site is not suitable habitat. No records of the species within 10 km. <b>Likelihood: Not present</b>	No
Swamp She-oak	<i>Casaurina obesa</i>	e		Requires moist, slightly saline soils. Potential habitats include shorelines of permanent, ephemeral or relict lakes. These systems may be freshwater or saline-influenced judging by the present distribution of the species. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Yellow Gum	<i>Eucalyptus leucoxylon</i> spp. <i>pruinosa</i>	v		<i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i> is a tree species which, in New South Wales, occurs at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Winged Peppergrass	<i>Lepidium monoplacoides</i>	e	E	This species grows in seasonally wet situations such as floodways, usually on clayey soils. Has not been recorded within 10 km of the site. The development site is not suitable habitat. <b>Likelihood: Highly unlikely to be present</b>	No
Bitter Quandong	<i>Santalum murrayanum</i>	e		NSW populations found in mallee habitats on soft linear dune-crests, with deep and well-drained calcareous earths or red and brown sands, loamy sands or clay-loams. Associated species include <i>Eucalyptus socialis</i> and <i>Pimelea microcephala</i> . The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Menindee Nightshade	<i>Solanum karsense</i>	v	V	The Menindee Nightshade is largely confined to floodplain lakes, depressions, and Black Box swamps : this species is found in heavy grey clays with a highly self-mulching surface and also on sandy floodplains and ridges and in calcareous soil, red sands, red-brown earths, and loamy soils. Has not been recorded within 10 km of the site. The development site is not suitable habitat. <b>Likelihood: Highly unlikely to be present</b>	No

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Common Name	Scientific name	Conservation Status (NSW) <sup>1</sup>	Conservation Status (Comm) <sup>2</sup>	Likelihood of Occurrence <sup>3</sup>	Five Part Test
Slender Darling-pea	<i>Swainsona murrayana</i>	e	V	Grassland and Grassy Woodland plant in sites prone to seasonal inundation. Has not been recorded within 10 km of the site. The development site is suitable habitat, but has been disturbed. <b>Likelihood: Unlikely to be present</b>	No
Yellow Swainson-pea	<i>Swainsona pyrophila</i>	v	V	Grows in mallee scrub on sandy or loamy soil and usually found only after fire. Has not been recorded within 10 km of the site. The development site is not suitable habitat. <b>Likelihood: Highly unlikely to be present</b>	No
<b>Fauna</b>					
Black-breasted Buzzard	<i>Hamirostra melanostemon</i>	v		Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Brown Treecreeper (eastern ssp.)	<i>Climacteris picumnus victoriae</i>	v		Occurs in intact woodlands, and adjacent agricultural land. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Chestnut Quail-thrush	<i>Cinlosoma castanotum</i>	v		In NSW it seems to occur almost exclusively in mallee habitats, with understorey dominated by spinifex, chenopods or other shrubs including Acacia species. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Corben's Long-eared Bat	<i>Nyctophilus corbeni</i>	v	V	Occurs in intact Buloke, mallee, Cypress-pine, ironbark and box woodlands and forests, and adjacent agricultural land. The development site is suitable habitat. Not recorded within 10 km of the site. <b>Likelihood: May be present</b>	Yes
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	v		Primarily inhabit 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. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Flat-headed Galaxias	<i>Galaxias rostratus</i>	ce	CE	The species can be found in still or slow flowing water on the margins of lakes, billabongs and streams. The Flat-headed Galaxias usually swims mid-water over rock and sandy substrates. This fish is often found close to, or amongst, aquatic plants. Historically this species was common to the southern regions of the Murray-Darling Basin, including the Murray, Loddon, Murrumbidgee, Goulburn, Ovens, Mitta Mitta and the Lachlan Rivers. The development will not significantly impact the aquatic environment in the Murray River; the species is thought to be extinct in the lower Murray River and may not occur in the study area. <b>Likelihood: Not present</b>	No
Gilbert's Whistler	<i>Pachycephala inornata</i>	v		Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes

## Test of Significance – Pump Station Upgrade, Sturt Highway, Euston

Common Name	Scientific name	Conservation Status (NSW) <sup>1</sup>	Conservation Status (Comm) <sup>2</sup>	Likelihood of Occurrence <sup>3</sup>	Five Part Test
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	v		Occurs in intact woodlands, and adjacent agricultural land. They occupy a wide range of Eucalypt woodlands, Acacia shrublands and open forests. In temperate woodlands, the species favours open areas adjoining large woodland blocks, with areas of dead timber and sparse shrub cover. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Inland Forest Bat	<i>Vespadellus baverstock</i>	v		Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high. The habitat requirements of this species are poorly known but it has been recorded from a variety of woodland formations, including Mallee, Mulga and River Red Gum. Most records are from drier woodland habitats with riparian areas inhabited by the Little Forest Bat. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Koala	<i>Phascolarctus cinereus</i>	v	V	Inhabit eucalypt woodlands and forests. Spend most of their time in trees, but will descend and traverse open ground to move between trees. The development site is suitable habitat, but no vegetation is proposed for removal. No records within 10 km. <b>Likelihood: Unlikely to be present</b>	No
Little Eagle	<i>Hieraetus morphnoides</i>	v		Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Macquarie Perch	<i>Macquaria australasica</i>	e	E	The species occurs naturally north of the Great Dividing Range. It is naturally a riverine fish, preferring deep holes, in cool, upper reaches of Victorian tributaries of the Murray-Darling system. It does well in impoundments with suitable spawning streams, and its abundance and distribution reduced by construction of dams on streams, changes to river flow and temperature regimes, siltation of spawning streams and impact of introduced species including Trout and Redfin. The development will not significantly impact the aquatic environment in the Murray River, and habitat mapping for the species does not identify the Murray River in the study area as likely habitat. <b>Likelihood: Unlikely to be present</b>	No
Major Mitchell's Cockatoo	<i>Lophochroa leadbeateri</i>	v		Major Mitchell's Cockatoos live mostly in semi-arid and arid areas, in dry woodlands, particularly mallee. They are also found in stands of River Red Gum or Black Box, and on sand plains and dunes. In Victoria, the species is largely confined to the NW, mostly around the Murray River corridor. While much of the property would have once been suitable habitat, the extent of clearing and site modification in the proposed development areas render it unsuitable habitat; however, the adjacent roadside vegetation (that are well connected regionally) and the larger woodland blocks on the property remain suitable habitat. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Mallee Worm-lizard	<i>Aprasia inaurita</i>	e		Inhabits semi-arid, mallee woodlands on red sands. Often shelters in sand, beneath mallee stumps, in leaf litter or in the nests of ants and other insects; thought to be dependent on Spinifex ( <i>Triodia scariosa</i> ). The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Malleefowl	<i>Leipoa ocellata</i>	e	V	The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No

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Common Name	Scientific name	Conservation Status (NSW) <sup>1</sup>	Conservation Status (Comm) <sup>2</sup>	Likelihood of Occurrence <sup>3</sup>	Five Part Test
Murray Cod	<i>Maccullochella peelii</i>		V	The Murray Cod is the largest freshwater fish found in Australia. It is a long lived predator species that is highly territorial and aggressive. It occurs naturally in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. While the adjacent Murray River contains suitable habitat and the species will be present, the development will not significantly impact the aquatic environment in the Murray River. <b>Likelihood: Present</b>	No
Murray Hardyhead	<i>Craterocephalus fluviatilis</i>	ce	E	Murray Hardyhead is a species of small freshwater fish, native to inland parts of south-eastern Australia. They were once widespread and abundant in the Murray and Murrumbidgee river systems in southern NSW and northern Victoria; however, they have suffered a serious population decline, and now seem to be limited to a few sites, mainly in northern Victoria. The development will not significantly impact the aquatic environment in the Murray River, and habitat mapping for the species does not identify the Murray River in the study area as likely habitat. <b>Likelihood: Unlikely to be present</b>	No
Painted Honeyeater	<i>Grantiella picta</i>	v	V	The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Inhabits Boree/ Weeping Myall, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests, particularly those infested with mistletoe. While the development site is suitable habitat, no vegetation is proposed for removal. No records within 10 km. <b>Likelihood: Unlikely to be present</b>	No
Plains-wanderer	<i>Pedionomus torquatus</i>	e	CE	Occurs in extensive quality riparian grasslands and plains woodlands, and adjacent agricultural land. Site is not suitable habitat. No records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Regent Parrot (eastern subspecies)	<i>Polytelis anthopeplus monarchoides</i>	e	V	In Victoria, the subspecies is restricted to the Mallee district in three main areas, including from Piangil, west to Manangatang and north to Robinvale. The species primarily inhabits River Red Gum forests or woodlands and adjacent Black Box woodlands. Nearby open mallee woodland or shrubland, usually with a ground cover of spinifex or other grasses, also provide important habitat. They often occur in farmland, especially if the farmland supports remnant patches of woodland along roadsides or in paddocks: the subspecies seldom occurs in more extensively cleared areas. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Shy Heathwren	<i>Hylacola cautus</i>	v		Inhabits mallee woodlands with a relatively dense understorey of shrubs and heath plants. The central NSW population (for example in Cocoparra NP) also occurs at low densities in rocky hilltop vegetation with a thick shrub layer such as Broombush or Tea-tree. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Silver Perch	<i>Bidyanus bidyanus</i>	v	CE	Silver perch are found in similar habitats to Murray Cod and Golden Perch, i.e. lowland, turbid and slow-flowing rivers. Formerly widespread over much of the Murray-Darling Basin excluding the most upper reaches, Silver perch has declined over most of its range. While the adjacent Murray River contains suitable habitat and the species will be present, the development will not significantly impact the aquatic environment in the Murray River. <b>Likelihood: Present</b>	No

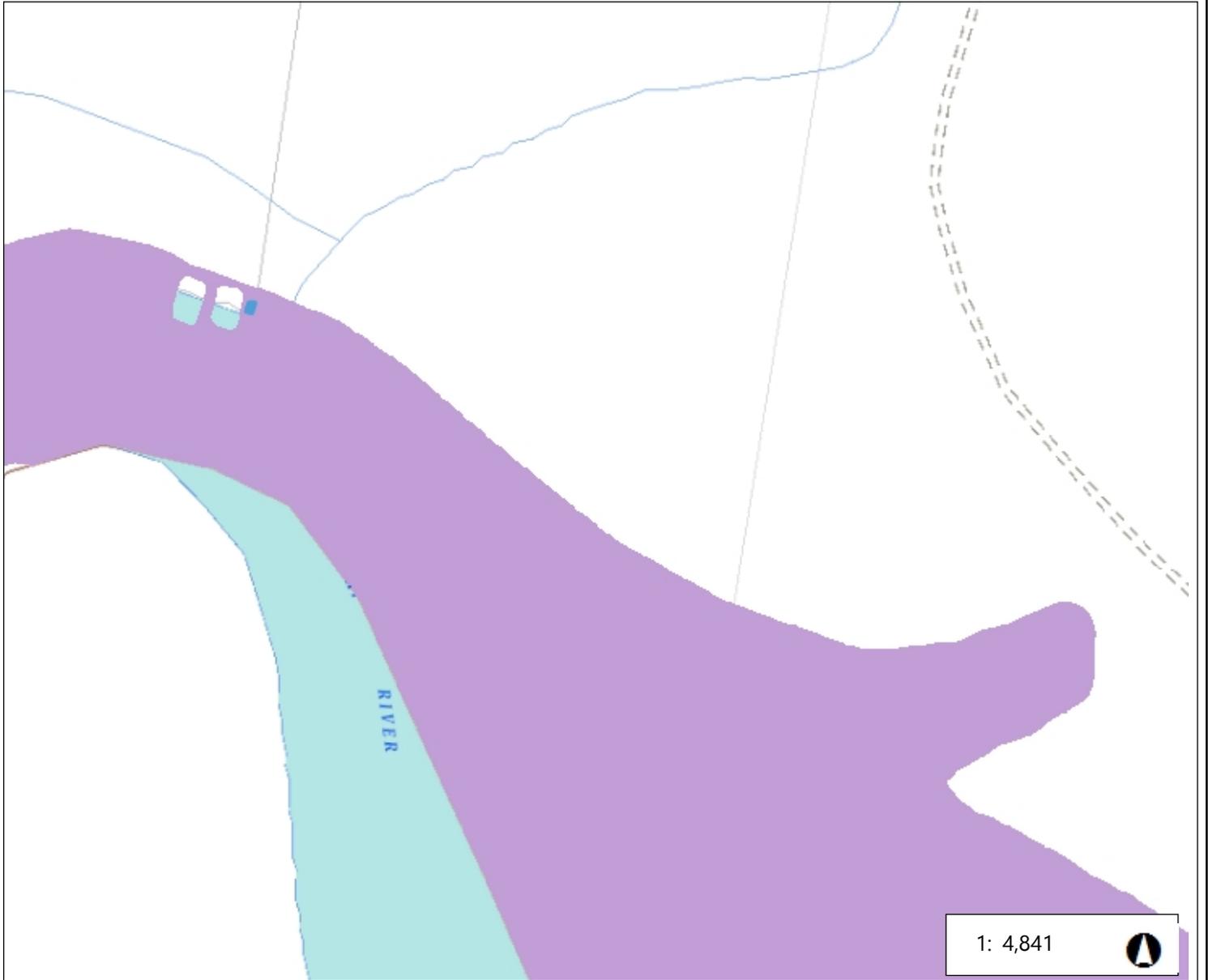
## Test of Significance – Pump Station Upgrade, Sturt Highway, Euston

Common Name	Scientific name	Conservation Status (NSW) <sup>1</sup>	Conservation Status (Comm) <sup>2</sup>	Likelihood of Occurrence <sup>3</sup>	Five Part Test
Southern Bell Frog	<i>Litoria raniformis</i>	e	V	In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Southern Scrub-robin	<i>Drymodes brunneopygia</i>	v		Inhabits mallee and acacia scrub, particularly with dense sub-shrubs in the understorey, including Broombush and other dry shrubs. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
Speckled Warbler	<i>Chthonicola sagittata</i>	v		Patchy distribution on and inland of the Great Dividing Range, from level with Mackay in Queensland, to the Grampians National Park in Victoria. Lives in dry sclerophyll forests and woodlands dominated by eucalypts. It is mostly seen on the grassy ground layer when it is foraging. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Spotted Harrier	<i>Circus assimilis</i>	v		Found in mainland Australia and Indonesia. It is widespread but sparsely distributed. Found in open wooded country in tropical and temperate Australia, particularly in arid and semi-arid areas. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Superb Parrot	<i>Polytelis swainsonii</i>	v	V	Occurs in riparian woodlands and forest, and adjacent woodlands and agricultural land. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Swift Parrot	<i>Lathamus discolor</i>	e	CE	Occurs in extensive riparian forests and woodlands, and adjacent agricultural land. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Varied Sittella	<i>Daphoenositta chrysoptera</i>	v		Occurs in extensive riparian forests and woodlands, and adjacent agricultural land. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
Western Pygmy Possum	<i>Cercartetus concinnus</i>	e		In NSW, has been found in mallee shrubland either dominated by spinifex ( <i>Triodia</i> spp.) or with an understorey of tea-tree ( <i>Leptospermum</i> spp.) and also in Belah ( <i>Casuarina pauper</i> ) in a mixed woodland with a well-developed understorey of saltbush. The development site is not suitable habitat. Records within 10 km. <b>Likelihood: Highly unlikely to be present</b>	No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	v		Occurs in extensive quality wetlands and riparian woodlands, and adjacent agricultural land. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes
White-fronted Chat	<i>Epthianura albifrons</i>	v		In NSW, it 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. The development site is suitable habitat. Records within 10 km. <b>Likelihood: May be present</b>	Yes

1. x = presumed extinct in NSW; e = endangered in NSW; v = vulnerable in NSW; ce = critically endangered in NSW (from DPIE 2021b).
2. V = vulnerable nationally; E = endangered nationally; CE = critically endangered nationally (DAWE 2021).

**APPENDIX B    BIODIVERSITY OFFSET SCHEME  
ENTRY THRESHOLD (BOSET) TOOL  
REPORT DATED 11<sup>TH</sup> AUGUST 2021**

## Biodiversity Offset Scheme (BOS) Entry Threshold Map



245.9 0 122.96 245.9 Metres

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

### Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

### Notes

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## Biodiversity Values Map and Threshold Report

### Results Summary

<b>Date of Calculation</b>	11/08/2021 9:55 PM	<b>BDAR Required*</b>
<b>Total Digitised Area</b>	0 ha	
<b>Minimum Lot Size Method</b>	LEP	
<b>Minimum Lot Size</b>	40 ha	
<b>Area Clearing Threshold</b>	1 ha	
<b>Area clearing trigger</b> Area of native vegetation cleared	no	no
<b>Biodiversity values map trigger</b> Impact on biodiversity values map(not including values added within the last 90 days)?	yes	yes
<b>Date of the 90 day Expiry</b>	N/A	

\*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor> to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

# Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

## Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies with all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

## Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature \_\_\_\_\_ Date: 11/08/2021 09:55 PM