The western portion of the study area lies within a vegetated corridor from south to north from the Condamine River to Barakula State Forest. The field verified vegetation communities are shown in Figure 5 and discussed as follows.

### *3.2.1.2 Remnant Regional Ecosystems*

*RE 11.5.1 & 11.5.1a*

This community was identified from a patch on the southern boundary in the western portion of the study area and several smaller patches near the central waterway. The community is dominated by Spotted Gum with Narrow-leaved Ironbark, Moreton Bay Ash *Corymbia tessellaris* and Long-fruited Yellowjacket C. *watsoniana* also present. Poplar Box sometimes occurs and where it forms the dominant canopy, it is identified as RE 11.5.1a. Small patches of Queensland Blue Gum *Eucalyptus tereticornis* occur in some areas adjacent to the lower reaches of the mapped waterway.

The mid-storey is dominated by White Cypress Pine with Bulloak and Black Wattle *Acacia leiocalyx* as well as occasional Emu Apple *Owenia acidula* and Narrow-leaved Bottle Tree *Brachychiton rupestris*. There is a sparse low tree or shrub layer with Quinine Bush *Petalostigma pubescens*, Budgeroo and juvenile canopy and mid-storey species. The patch has been thinned as evidence by cut stumps and fallen timber and as such the ground cover is variable. The ground cover is grassy dominated by Many-headed Wiregrass *Aristida caput-medusae* with Barbed Wire Grass *Cymbopogon refractus,* Dark Wiregrass *A. calycina* and the exotic Red Natal Grass *Melinis repens* and Buffel *Pennisetum ciliare*. There is a sparse shrub layer comprising Currant Bush *Carissa ovata*. Plates 3 and 4 show the structure of the community.

Plate 3 – RE 11.5.1

Plate 4 – RE 11.5.1

*RE 11.7.4 / 11.7.7*

This community was not able to be separated into each RE type as it occurs as a mixed woodland dominated by Narrow-leaved Ironbark or co-dominant with Blue-leaved Ironbark as well as other gums such as Gum-topped Ironbark, Long-fruited Yellowjacket or Queensland Peppermint *Eucalyptus exserta* on ridges. The midstorey varies between being dominated by Budgeroo, White Cypress Pine and Bulloak to being dominated by Lancewood *Acacia shirleyi* and other *Acacia* species such as Crescent-leaved Wattle *A. semilunata* and Black Wattle *A. leiocalyx*. The ground cover is grassy comprising Many-headed Wiregrass, Barbed-wire Grass, Button Grass *Dactyloctenium radulans*, Curly

Windmill Grass *Enteropogon acicularis*, Western Rats-tail Grass *Sporobolus creber* and Slender Panic *Paspalidium gracile*. Currant Bush forms a sparse shrub layer with flax-lilies *Dianella* spp. mat-rushes *Lomandra* spp. Cough Bush *Cassinia laevis* and hopbushes *Dodonaea* spp. Small groves of *Micromyrtus sessilis* and/or *Leucopogon biflorus* were also observed in some areas.

Inspection of historical aerial photography since the 1960s shows that this community has been previously disturbed through clearing and thinning, predominantly around the edges of the large patches on the northern boundary as well as the patch on the south-eastern boundary. Areas of regrowth RE 11.7.4 / 11.7.7 are shown on Figure 5.

Plate 3 – RE 11.7.4 / 11.7.7 with Cypress Pine mid-storey

Plate 4 – RE 11.7.4 / 11.7.7 with Cypress Pine mid-storey

Plate 5 – RE 11.7.4 / 11.7.7 with Lancewood mid-storey

Plate 6 – RE 11.7.4 / 11.7.7 with Lancewood mid-storey

### *3.2.1.3 Category X Vegetation*

Category X vegetation includes vegetation that is not mapped as Category A, B or C and is described as non-remnant vegetation. Much of the study area is mapped as Category X vegetation, including improved pasture and small, isolated patches of remnant vegetation. However, some areas that were mapped as Category X were assessed to be remnant and would otherwise have been mappable as remnant. The reason for these discrepancies is not clear.

*Pasture Grasslands*

Pasture grasslands cover much of the study area and are characterised by a mix of native and exotic grass species with occasional shrub or juvenile tree species from adjacent communities. The pastures are dominated by exotic species including Purpletop Rhodes Grass *Chloris inflata*, Rhodes Grass *C. gayana*, Buffel, Red Natal Grass and Sabi Grass *Urochloa mosambicensis* with native species including Many-headed Wiregrass, Dark Wiregrass, Barbed-wire Grass and Western Rats Tail Grass. Herbaceous species can include Billy-buttons *Chrysocephalum apiculatum*, *Portulaca bicolor*, Corrugated Sida *Sida corrugata* and Mayne's Pest *Verbena aristigera*. Galvanised Burr and Black Roly-poly occurred in some areas, indicating heavy grazing.

Plate 7 – Pasture grasslands

Plate 8– Pasture grasslands

*Gilgai Formations*

The eastern portion of the study area is dominated by gilgai formations. Gilgai are small depressions that form in heavy cracking clay soils. During spring and summer, these depressions fill with rainfall and create wetland habitats containing aquatic and semi-aquatic plants. Most of the gilgai assessed were dry at the time of the survey, however a system of larger wetlands was present in the northern portion and these have been modified by bulk earthworks to create impoundments. The gilgai have been degraded from cattle trampling around the edges and grazing on palatable semi-aquatic plants. Where vegetation on the periphery is present, it is dominated by Ribbed Spikerush *Eleocharis plana*, Common Rush *Juncus usitatus*, Water Couch *Paspalum dilatatum* and Sticky Sedge *Cyperus fulvus*. Aquatic plants include Water Primrose *Ludwigia peploides* and Water Snowflake *Nymphoides indica*.

The mounds between gilgai are dominated by introduced and native grasses similar to other areas of the study area.

Plate 9– Well developed gilgai containing Ribbed Spikerush

Plate 10 – Disturbed gilgai from earthworks

Plate 11 – Dry, disturbed gilgai, between tussock grasses.

Plate 12 – Dry, disturbed gilgai (bare area)

*RE 11.4.3*

Several patches of Brigalow dominant vegetation were observed within the gilgai areas in the eastern portion of the study area. These patches are mapped as Category X and are too small (less than 5 hectares or 75 metres linear width) to be mappable under Neldner *et al.* (2012). Brigalow dominates the canopy to 14 metres in height and sometimes Belah *Casuarina cristata* is co-dominant. There are emergent *Eucalyptus woollsiana* and occasional Narrow-leaved Bottle Trees are present. The low tree layer comprises False Sandalwood *Eremophila mitchellii*, Black Tea Tree *Melaleuca bracteata*, Cattle Bush *Pittosporum angustifolium* and Wilga *Geijera parviflora*. There is a sparse shrub layer, possibly as a result of cattle grazing, comprising Scrub Bonaree *Alectryon diversifolius*, Currant Bush, Myrtle Tree *Psydrax oleifolia* and Bush Caper *Capparis lasiantha*. The ground layer is generally grassy comprising Fairy Grass *Sporobolus caroli*, Tall Chloris and Western Rats Tail Grass, although due to cattle grazing, grazing-tolerant species such as Galvanised Burr *Sclerolaena birchii*, Black Roly-poly *S. muricata* and chenopods are prevalent.

Several of the patches assessed meet the requirements for the EPBC Act-listed Brigalow TEC.

### 3.2.2 Significant Flora Species

The database searches identified nine threatened flora species that have been previously recorded or likely to occur within 20 kilometres of the study area (Appendix 2) and these are shown in Figure 3. The potential occurrence of each species within the study area was assessed based on the criteria described in Appendix 2. Two species have been assessed to have a moderate likelihood of occurrence within the study area; Belson's Panic *Homopholis belsonii* and Woolly Wrinklewort *Rutidosis lanata*.

### 3.2.3 Significant Fauna Species

The desktop review indicated that 26 significant fauna species and 19 special least concern species have been previously recorded or are predicted to occur within 20 kilometres of the study area (Appendix 2) and are shown on Figure 4. This comprises seven reptiles, 10 birds and nine mammals threatened species. Additionally, 18 bird species are listed as migratory under the EPBC Act and consequently as special least concern under the NC Act. The Echidna *Tachyglossus aculeatus* is also listed as special least concern fauna. These are shown separately in Appendix 2.

A likelihood of occurrence assessment was completed to determine the suite of threatened and conservation significant species that may potentially occur within the study area. The assessment is included in Appendix 3 (Table 10) and the species listed under the NC Act only (i.e. not including those species listed under the EPBC Act) with a high or moderate potential to occur within the study area are presented below.

Golden-tailed Gecko *Strophurus taenicauda*

High potential occurrence. Remnant and regrowth vegetation provides habitat for this species, particularly within RE 11.7.4 / 11.7.7 communities that have an understorey dominated by White Cypress Pine. Despite active searches and spotlighting for this species, it was not observed, however there is an abundance of habitat present for this species.

Grey Snake *Hemiaspis damelii*

High potential occurrence. The Grey Snake is listed as endangered under the NC Act. The species is most often detected at sites with low lying areas that pond water after rainfall and have an abundance of shelter sites such as rocks, logs and other debris. The eastern portion of the study area provides gilgai habitat for this species, though has been extensively disturbed through cattle grazing.

Echidna *Tachyglossus aculeatus*

High potential occurrence. The Echidna is listed as special Least Concern fauna under the NC Act as it is considered culturally significant. The Echidna occurs in a variety of habitats throughout Queensland and may occasionally traverse the study area.

### 3.2.4 Essential Habitat

No essential habitat as mapped by DRNM (2017a) is located within or adjacent the study area.

## 3.3 Fauna Habitats

*Improved Grasslands*

Due the disturbed nature of this community there is limited habitat for fauna present. The presence of small stands of trees and isolated trees provides some habitat and resources for open country bird species that can tolerate high levels of habitat modification such as common birds. Common species sighted included Australian magpie *Gymnorhina tibicen*, Torresian crow *Corvus orru,* Magpie-lark *Grallina cyanoleuca*, Singing Honeyeater *Lichenostomus virescens*, Willy Wagtail *Rhipidura leucophrys* and Australasian Pipit *Anthus novaeseelandiae*. Rabbits *Oryctolagus cuniculus* and signs of their presence (e.g. pellets and diggings) were observed throughout this community, however no burrows were observed.

*Gilgai Formations*

The gilgai formations provide habitat for frogs and wetland birds when the gilgai are full. Cane Toads *Rhinella marina* were prevalent throughout this community, although some native frogs species were observed including Ornate Burrowing Frog *Platyplectrum ornatum*, Salmon-striped Frog *L. salmini*, Broad-palmed Rocketfrog *Litoria latopalmata* and Green-striped Frog *Cyclorana alboguttata*. Native frog species were observed in low number and most likely reflects the timing of the survey in early autumn and lack of recent rainfall. The presence of frogs and gilgai provide potential habitat for Grey Snake and other snakes that feed on frogs such as Keelbacks *Tropidonophis mairii*. When full, the gilgai would provide wetland habitat for waterfowl and wetland birds.

*Ironbark Woodlands*

The ironbark woodlands within the study area provide similar habitat values for fauna. These are characterised by:

- Presence of hollow-bearing trees – providing nesting and denning opportunities for woodland birds, possums and small gliders and microbats. Ten species of microbats were recorded from within this community and all are listed as least concern;
- Production of nectar and pollen when trees are in flower – providing food resources for nectivorous birds and small gliders;
- Production of mistletoe and other berries – providing food resources for Mistletoebird *Dicaeum hirundinaceum* and other berry-eating birds; and
- Presence of exfoliating bark and presence of standing and fallen woody debris – providing shelter sites for reptiles including skinks, geckoes, lizards, dragons and snakes.

Several farm dams were located within this community and was found to contain disturbed habitat for amphibians and waterfowl. Cane Toads were prevalent within these areas, although some native species such as Wide-mouthed Frog *C. novaehollandiae* were observed.

*Brigalow Woodlands*

The Brigalow woodlands are characterised as narrow strips of vegetation in which the understorey has been disturbed through cattle damage. Some patches exhibited abundant fallen woody debris, which provides shelter sites for small mammals and reptiles. Dead standing trees were also a feature,

which provides roosting and nesting opportunities for microbats and birds. Gecko habitat is provided beneath exfoliating bark of dead and live standing trees. Several active nests of Apostlebird *Struthidea cinerea* and Grey-crowned Babblers *Pomatostomus temporalis* were observed within patches. After heavy rainfall events, the depressions within the woodland will fill up and it is expected that these areas would provide some wetland values, although they are degraded through cattle damage.

## 3.4 Weeds and Pest Animals

The pest plant Velvety Tree Pear *Opuntia tomentosa* was recorded throughout the study area and in all vegetation communities. Velvety Tree Pear is listed as a restricted matter under the *Biosecurity Act 2014*. The study area also contains the suite of herbaceous and grassy weed species that are expected within an agricultural property in southern Queensland.

Rabbits were observed within the study and primarily on the flats and gilgai community. Wild Dogs / Dingoes *Canis lupus familiaris* / *C. f. dingo* and Wild Pigs *Sus scrofa* are known from the local area and would be expected to occur within the study area. These animal pests are restricted matters under the Biosecurity Act.

## 3.5 Wetlands and Watercourses

No referrable wetlands, or wetland protected areas were identified within the study area during the desktop assessment, nor during the current field assessment.

Two watercourses as defined under the *Water Act 2000* are located within the study area (DNRM 2017c) and are identified as a first order and second order watercourse. Both watercourses had been dammed in several locations and were both in various states of degradation. Little riparian vegetation was observed in either waterway, although a small patch of Queensland Blue Gum was noted along the eastern waterway near the abandoned homestead.

# 4 POTENTIAL IMPACTS AND MITIGATION MEASURES

## 4.1 Potential Impacts

The proposed development will involve coverage of the majority of the Category X mapped areas (excluding a large area of remnant woodland mapped as Category X) with solar PV panel arrays and their associated infrastructure, including operations and maintenance buildings, substations and laydown areas.

Potential impacts to ecological values associated with the PV Facility will be limited to those during construction. Construction activities will involve:

- A construction laydown area will be established at the south-eastern end of the study area on the corner of Ryalls Road and Gearys Road. The areas will be graded and compacted;
- Construction of an informal internal road system, treated to minimise dust creation;
- Erecting a two metre high chain wire link stock proof fence around the perimeter of the solar farm;
- Construction of site facilities (O&M building, warehouse and carpark) on the corner of Kerwicks Road and Gearys Road;
- Construction of a substation adjacent to Gearys Road in the western portion; and
- Installation of solar PV panels on monopoles supported by screw piles or similar that are driven into the ground.

Construction impacts on assessed vegetation communities are shown in Table 5, and Table 6 shows the total area of habitats impacted for threatened fauna species. Where species are known to utilise regrowth vegetation as well as remnant vegetation, the potential impacts on regrowth vegetation are included in the total area of impact. Potential impacts on vegetation are shown in Figure 2.

Operational activities will be minimal and be largely restricted to use of the control building and operations and maintenance facility by staff. Slashing of the grass would occur as appropriate and grazing would be considered to reduce slashing costs.

Decommissioning activities would involve the removal of the panel arrays including monopole structures. The disturbance to the soil profile will be minimal and will able to be returned to an agricultural land use (e.g. grazing).

**Table 5** Vegetation communities impacted by the proposed development

| RE Type | Remnant Status* | Habitat for Threatened Species | Area to be removed (ha) |
|---|---|---|---|
| 11.4.3 | Remnant | Painted Honeyeater, Golden-tailed Gecko, Grey Snake, Echidna | 0 |
| | Regrowth | Golden-tailed Gecko, Grey Snake, Echidna | 1.22 |
| 11.5.1 | Remnant | Squatter Pigeon (southern), Golden-tailed Gecko, Echidna | 15.93 |
| | Regrowth | Golden-tailed Gecko, Echidna | 21.51 |
| 11.5.1a | Remnant | Koala, Squatter Pigeon (southern), Golden-tailed Gecko, Echidna | 13.41 |
| 11.7.4 | Regrowth | Squatter Pigeon (southern), Golden-tailed Gecko, Yakka Skink, Echidna | 1.01 |
| 11.7.4 / 11.7.7 | Remnant | South-eastern Long-eared Bat, Squatter Pigeon (southern), Golden-tailed Gecko, Yakka Skink, Echidna | 9.22 |
| | Regrowth | Squatter Pigeon (southern), Golden-tailed Gecko, Yakka Skink, Echidna | 13.84 |
| 11.7.7 | Remnant | Squatter Pigeon (southern), Golden-tailed Gecko, Echidna | 0.36 |
| | Regrowth | Squatter Pigeon (southern), Golden-tailed Gecko, Echidna | 1.52 |
| Gilgai paddock | Non-remnant | Grey Snake | 7.56^ |
| **Total** | **Remnant** | | **34.15** |
| | **Regrowth** | | **39.11** |

* Remnant Status indicates whether the assessed community is remnant or regrowth vegetation. No mapped Category B regulated vegetation (remnant vegetation) is proposed to be cleared.

^ All areas of gilgai (151. 38 ha) will be covered by solar PV panels, however the actual impact on gilgai is likely to be a small percentage (less than 5%) of the total area due to the relatively small amount of soil disturbance required to install PV panels and for trenching of electricity cabling.

**Table 6** Potential impacts on threatened species from vegetation clearing

| Listed Threatened Species | Status | Likelihood of Occurrence | Area of Impact (ha) (remnant and non-remnant) |
|---|---|---|---|
| EPBC Act listed species | | | |
| Painted Honeyeater *Grantiella picta* | Vulnerable | Moderate | 0 |
| Koala *Phascolarctos cinereus* | Vulnerable | Moderate | 13.41 |
| Squatter Pigeon *Geophaps scripta scripta* | Vulnerable | Moderate | 55.29* |
| South-eastern Long-eared Bat *Nyctophilus corbeni* | Vulnerable | Moderate | 9.43 |
| Yakka Skink *Egernia rugosa* | Vulnerable | Moderate | 24.07 |
| NC Act listed species | | | |
| Golden-tailed Gecko *Strophurus taenicauda* | Near threatened | High | 78.03 |
| Grey Snake *Hemiaspis damelii* | Endangered | High | 8.78 |
| Echidna *Tachyglossus aculeatus* | Special least concern | High | 78.03 |

*Foraging habitat only is proposed to be cleared. Potential breeding habitat will be retained within mapped Category B regulated vegetation.

## 4.2 Mitigation Measures

Mitigation measures follow the impact mitigation hierarchy of avoid, minimise and mitigate (including offsets). This section identifies how the proposed development will mitigate impacts to ecological values.

The PV Facility will be designed in such as manner as to minimise the extent of civil works required to occur on the site. All existing overland flow paths are intended to be maintained where practical so as to minimise the impact on the surrounding land uses. No formalised internal roads are envisaged to be provided between panels. The existing soil will be retained and re-seeded with an appropriate blend of pasture grass, to provide vegetation coverage over the site and predominantly in those areas where clearing of vegetation is required. Accordingly, it is intended that the facility will have minimal impact when decommissioned as the development components do not require substantial disturbance to the landscape.

### 4.2.1 Avoidance

No impacts to mapped regulated vegetation (e.g. Category B vegetation) will occur and will be avoided by the proposed development. In addition, the majority of the large patch of remnant woodland within the western portion is proposed to be retained. Some clearing is proposed on the south-western corner of this patch to increase the developable area along the western boundary. Due to the inconsistencies in the vegetation management map, this patch is currently mapped as Category X. Small patches of remnant vegetation, regrowth vegetation and isolated groves of trees are also proposed to be removed to provide open areas for installation of PV panels. In addition, all development is proposed to be setback from both waterways as well as areas of retained vegetation.

### 4.2.2 Minimisation

Recommended measures to minimise impacts to terrestrial ecological values present within the study area include:

- The extent of ground disturbance will be the minimum necessary to construct the access tracks, buildings and install the solar PV arrays;
- Construction stockpiles, machinery and other infrastructure should be wholly contained outside of the waterways to minimise the risk of sediments and pollutants being mobilised downstream; and
- Restricted weed species (i.e. Velvety Tree Pear, Harrisia Cactus) must be treated prior to the construction of the project. This is to ensure that weed propagative material is not spread to other areas. A weed control contractor who is licenced to use herbicides should be engaged to treat weed infestations.

### 4.2.3 Mitigation and management measures

Recommended measures to mitigate impacts on terrestrial values present within the study area include:

- Fauna spotter-catchers should be engaged to provide fauna rescue and welfare services during tree clearing activities. Suitable roosts for microbats, namely hollow dead trees or old trees with dead vents and hollows must be checked by a Spotter-catcher prior to removal. Spotter-catchers must hold a current Rehabilitation Permit (spotter-catcher activities) issued by DEHP;
- Felled trees as a result of clearing of Brigalow vegetation within the eastern portion should be retained and left in situ, as far as practicable, to provide shelter sites for Grey Snake and other reptiles. Woody debris is an important microhabitat feature for the Grey Snake during the wet season when cracking clay soils swell and cracks close up; and
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times to prevent offsite impacts to downstream receiving environments. The Best Practice Erosion and Sediment Control Guidelines (Witheridge 2014) should be referred to.

### 4.2.4 Positive Impacts

Apart from generating renewable electricity, the project will have positive impact on the study area through the removal of cattle from the Project area (i.e. those areas will solar PV panels installed. The study area has been historically used for cattle grazing and such grazing has degraded native vegetation and soil by:

- Grazing on grasses that changes the natural composition of vegetation communities. For example heavy grazing can lead to a loss of grazing intolerant plant species;
- Fouling of waterways and wetlands from excrement;
- Damage to waterways contributing to bank and streambed erosion;
- Loss of riparian and wetland vegetation;
- Loss of understorey vegetation, which provides shelter and habitat for plants and animals;
- Compaction of soils contributing to vegetation loss, erosion and topsoil loss;
- Creation of trackways that provide a path for runoff leading to erosion;
- Are a vector for introduction and spread of weed seeds; and
- Trample nests for ground-nesting birds and shelter sites for ground-dwelling fauna.

Removal of cattle from the Project area will remove this threatening process from the grassland communities allowing for natural regeneration of grassland and communities adjacent to the watercourses to occur. Removal of cattle from the gilgai area will allow for the regeneration of these wetland communities and restoring habitat for frogs and Grey Snake.

## 4.3 Ecological Enhancements

Luminous Energy are considering a range of initiatives to restore and enhance biodiversity values across the study area and contribute to the local community. These initiatives are independent of the minimisation and mitigations measures presented above and seek to go beyond legislative compliance to restore some of the biodiversity values lost from the study area. Luminous will likely partner with a suitable non-government organisation to assist with delivery of the enhancements.

The following actions are being considered for biodiversity enhancement:

1. Removing cattle from the property;
2. Treating environmental weed infestations within Category B vegetation;
3. Completing animal pest management beyond what is required under the Biosecurity Act;
4. Stabilising and rehabilitating waterways;
5. Implementing a monitoring program for threatened fauna species;
6. Restoring and rehabilitating Brigalow areas and providing artificial shelter sites for the Grey Snake.
7. Implementing a monitoring program for response of gilgai to removal of cattle.

# 5 LEGISLATIVE AND POLICY IMPLICATIONS

## 5.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

### 5.1.1 Wetlands of international significance

The study area occurs within the catchment of four Ramsar sites that occur many hundreds of kilometres downstream. These sites are unlikely to be impacted as each is situated a considerable distance from the proposed action. Provided management practices and construction techniques are consistent with current industry standards, the Project is unlikely to affect the ecological character of any Ramsar wetland.

### 5.1.2 Threatened species and ecological communities

Communities: One ecological community listed under the EPBC Act is located within the study area, namely Brigalow TEC, which is listed as Endangered. The Project will retain the four discrete patches that are consistent with the Brigalow TEC and development will be setback 20 metres from the vegetation. Therefore, no impacts are expected to the Brigalow TEC.

Flora: No threatened flora species are predicted to occur within the study area. Cattle have degraded the understorey components of suitable vegetation communities which is likely to preclude the occurrence of these species.

Fauna: No fauna species listed under the EPBC Act were recorded within the study area during the field assessment. There is suitable habitat within the study area for five fauna species listed under the EPBC Act namely Painted Honeyeater, Koala, Squatter Pigeon, South-eastern Long-eared Bat and Yakka Skink. All these species are listed as vulnerable. Although no Category B remnant vegetation is proposed to be cleared, some areas of Category X vegetation areas were assessed as remnant or regrowth vegetation and therefore provide some habitat for some of these species that are known to tolerate some vegetation disturbance.

When determining the significance of impact on threatened species habitat, the criteria in the Significant Impact Guidelines (DoE 2013) are used. Some species, such as the Koala, also have referral guidelines which provide criteria specific to the species. These criteria were applied to the clearing areas for each species listed above.

When assessing the significance of an action on a vulnerable species, it is necessary to define whether an 'important population' of the species occurs or could potentially occur within the study area. An important population is defined as one that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

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

An assessment of whether an important population for any vulnerable species occurs within the study area is provided (Table 8). It is evident that the populations of Painted Honeyeater and Squatter Pigeon that may potentially occur within the study area would be considered to be important populations under the EPBC Act (Table 8).

**Table 7** Assessment of important population for vulnerable species

| Species | Key source population | Maintaining genetic diversity | Limit of the species range | Important Population? |
|---|---|---|---|---|
| Painted Honeyeater | No. As the species is migratory, all individuals are considered to be part of the same interbreeding population. | Yes. As the species occurs within one population, all breeding individuals are necessary for maintaining genetic diversity. The study area is located within the region of known breeding activity (generally south of Roma). | No. The study area is not near the limit of the species' range. | Yes |
| Koala | No. Key source populations of Koala in inland areas are considered to be those that occur within riparian and floodplain vegetation (i.e. those communities on land zone 3). The study area does not contain such communities. | No. There are several old records of the species within the region and the extensive areas of habitat present allow dispersal through the landscape and breeding with other local populations. | No. The species is not at the limit of its range in south-eastern Queensland. | No |
| Squatter Pigeon | Yes. As the species' range is contracting north, all populations south of Carnarvon Gorge are considered important populations. The study area occurs within the Condamine River catchment, which is noted to be important for the species. | | | Yes |
| South-eastern Long-eared Bat | No. There are no records of this species within 20km of the study area suggesting that the surrounding habitat does not contain a key source population. | No. Habitats within the study area are unlikely to be critical for maintaining genetic diversity given the extensive woodland vegetation to the north within Barakula State Forest and other areas. | No. The study area is not at the limit of the species range as it is known from the east to the Bunya Mountains, north to Cracow and west to Morven. | No |
| Yakka Skink* | No. Although there are records known from Goombi to the south and Gurulmundi State Forest to the north-west, these habitats are not contiguous with vegetation within the study area. | No. Habitat that provides connections to areas of known habitat are likely to be important for maintaining genetic diversity. The habitat within the study does not provide this connectivity. | No. The study area is not near the limit of the species' range. | No |

* The DoEE considers that important habitat for this species is a surrogate for an important population.

Painted Honeyeater

Four patches of Brigalow TEC are proposed to be retained by the Project and which provide suitable habitat for the Painted Honeyeater. As no impacts are expected to occur on habitat for Painted Honeyeater an assessment of significance has not been completed.

Koala

The patch of RE 11.5.1a occurring within the study area has been assessed as having a habitat score of 5 (Table 3). The referral guidelines (DoE 2014) consider that habitat with a score of 5 is critical to the survival of the Koala, albeit at the lower end of the range. Other patches of vegetation containing Queensland Peppermint (RE 11.7.4 / 11.7.7) is not considered to be critical habitat. Using the guidelines, the proposed loss of 13.41 hectares of habitat with a score of 5 means that the potential impact is uncertain and requires further analysis. An example is provided in the guidelines that a significant impact on habitat that scores a 5 would be expected with the clearing of 100 hectares of habitat. Given that only 13.41 hectares is proposed to be cleared, the project is unlikely to have a significant impact on the Koala.

Squatter Pigeon (southern subspecies)

A significant impact assessment has been completed for the Squatter Pigeon (Table 8). Although not sighted during the current survey, the species is a likely occurrence within the study area. The clearing of lower quality foraging habitats within the study area and retention of breeding habitats is unlikely to be a significant impact on this species.

**Table 8** Significant Impact Assessment for Squatter Pigeon

| Significant | Impact Assessment |
|---|---|
| An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:<br>lead to a long-term decrease in the size of an important population of a species | An important population of Squatter Pigeon occurs within the locality. The project proposes to remove 55.29 hectares of potential habitat for this species, which has potential to be used as foraging habitat given its proximity to permanent water sources (e.g. farm dams). Breeding habitat along stony rises on sandy, gravelly soils is proposed to be retained within mapped Category B vegetation areas and will not be impacted. The Project proposes to retain the largest and most intact areas of remnant vegetation (mapped as Category B vegetation) and clear small and discontinuous patches or the previously disturbed edges of larger patches. The highest quality habitats for Squatter Pigeon will be retained including vegetated connections to substantial patches to the north as well as the connection to Barakula State Forest. The removal of small patches and disturbed edges is therefore unlikely to lead to a long-term decrease in the size of the Squatter Pigeon population. Water sources along waterways will be retained and as the Squatter Pigeon is known to utilise grassland habitats, it is considered that the species is likely to co-exist with the operation of a solar farm. |
| Reduce the area of occupancy of an important population | Squatter Pigeon was not observed within the study area, although has potential to occur based on proximity to previous records and presence of suitable habitats. Retention of large, intact patches of remnant vegetation will allow the species to persist within the study area, should it occur. Therefore, the construction of the solar farm is unlikely to reduce the area of occupancy of the population. |
| Fragment an existing important population into two or more populations | The large patches of vegetation to be retained provide connections to habitats to the north and south of the study area. These connections will be retained and no fragmentation of habitat is proposed to occur. The Squatter |

| Significant | Impact Assessment |
|---|---|
| | Pigeon is also considered likely to occur within the solar farm post construction and the solar farm will not prevent movement of the species through the study area. |
| Adversely affect habitat critical to the survival of a species | Habitat critical to the survival of the species is likely to be in higher quality habitats within large connected patches of remnant vegetation, i.e. mapped Category B areas. These patches will not be impact by the project. |
| Disrupt the breeding cycle of an important population | Breeding habitat occurs on stony rises on sandy or gravelly soils within 1 kilometre of a permanent waterbody. Several farm dams provide permanent water and are located within remnant vegetation throughout the study area. Several dams occur within vegetation to be retained and therefore construction of the solar farm is unlikely to disrupt the breeding cycle of the local population. |
| Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline | As mentioned previously, the largest and highest quality habitats will be retained and only small patches and disturbed edges will be cleared. It is unlikely that the removal of poorer quality habitats would result in the decline of the species. |
| Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat | The project will not result in the introduction of any invasive species that is likely to harm Squatter Pigeon or their habitat. Wild Dogs and Feral Cats are prevalent throughout the region, however the project will not result in the introduction of these species into new areas. |
| Introduce disease that may cause the species to decline, or | No known diseases impacting Squatter Pigeons are likely to be introduced by the project. |
| Interfere substantially with the recovery of the species. | There is currently no Recovery Plan for this species and one is not required. The project is unlikely to substantially interfere with the recovery actions proposed for the species. |

South-eastern Long-eared Bat

A significant impact assessment has been completed for the South-eastern Long-eared Bat (Table 9). The species is a likely occurrence within the study area. The clearing of lower quality and fragmented habitats within the study area is unlikely to be a significant impact on this species.

**Table 9** Significant Impact Assessment for South-eastern Long-eared Bat

| Significant | Impact Assessment |
|---|---|
| An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:<br>lead to a long-term decrease in the size of an important population of a species | An important population of South-eastern Long-eared Bat does not occur within the study area. The Project proposes to remove 9.43 hectares of potential habitat for this species, which has potential to be used as breeding and foraging habitat. The project proposes to retain the largest and most intact areas of remnant vegetation (mapped as Category B vegetation) and clear small, discontinuous patches or the previously disturbed edges of larger patches. As the bat preferentially occurs within large, connected habitat patches, the actual area of habitat impact is less than 9.43 hectares. The highest quality habitats for South-eastern Long-eared Bat will be retained including vegetated connections to substantial patches to the north as well as the connection to Barakula State Forest. The removal of small patches and disturbed edges is therefore unlikely to lead to a long-term decrease in the size of the local bat population. |
| Reduce the area of occupancy of an | An important population of South-eastern Long-eared Bat does not occur within the study area. The South-eastern Long-eared Bat was also not |

| Significant | Impact Assessment |
|---|---|
| important population | detected from the study area, however has potential to occur based on proximity to previous records and presence of suitable habitats. The analysis of calls also found that long-eared bats were detected however identification to species level is not possible through call analysis alone. Retention of large, intact patches of remnant vegetation will allow the species to persist within the study area, should it occur. Therefore, the construction of the solar farm is unlikely to reduce the area of occupancy of the population. |
| Fragment an existing important population into two or more populations | An important population of South-eastern Long-eared Bat does not occur within the study area. Regardless, the large patches of vegetation to be retained provide connections to habitats to the north and south of the study area. These connections will be retained and no fragmentation of habitat is proposed to occur. |
| Adversely affect habitat critical to the survival of a species | Habitat critical to the survival of the species is likely to be in higher quality habitats within large connected patches of remnant vegetation. Such habitats will be retained within the study area. |
| Disrupt the breeding cycle of an important population | Breeding biology is largely unknown and lactating females have been captured in November in Qld. As the higher quality and intact remnant vegetation patches will be retained, there is a low likelihood that any maternity roosts will be impacted by the project. Therefore, it is unlikely that the project would disrupt the breeding cycle of the bat. |
| Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline | As mentioned previously, the largest and highest quality habitats will be retained and only small patches and disturbed edges will be cleared. It is unlikely that the removal of poorer quality habitats would result in the decline of the species. |
| Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat | The project will not result in the introduction of any invasive species that is likely to harm South-eastern Long-eared Bat or their habitat. |
| Introduce disease that may cause the species to decline, or | No known diseases impacting the bat are likely to be introduced by the project. |
| Interfere substantially with the recovery of the species. | There is currently no Recovery Plan for this species. The project is unlikely to substantially interfere with the conservation actions proposed for the species. |

Yakka Skink

A significant impact assessment has been completed for the Yakka Skink (Table 10). Although signs of their presence were not observed during the current survey, the species is a likely occurrence within the study area. The clearing of lower quality habitats within the study area is unlikely to be a significant impact on this species.

**Table 10** Significant Impact Assessment for Yakka Skink

| Significant | Impact Assessment |
|---|---|
| An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:<br>lead to a long-term decrease in the size of an important population of a species | An important population of Yakka Skink does not occur within the study area. The project proposes to remove 24.07 hectares of potential habitat for this species, which has potential to be used as breeding and foraging habitat. The project proposes to retain the largest and most intact areas of remnant vegetation (mapped as Category B vegetation) and clear small, discontinuous patches or the previously disturbed edges of larger patches. As the Yakka Skink preferentially occurs within large, intact habitats that provide required microhabitat features (fallen woody debris, log piles or rocks). The highest quality habitats for Yakka Skink will be retained including vegetated connections to substantial patches to the north as well as the connection to Barakula State Forest. The removal of small patches and disturbed edges is therefore unlikely to lead to a long-term decrease in the size of the local Yakka Skink population. |
| Reduce the area of occupancy of an important population | An important population of Yakka Skink does not occur within the study area. Yakka Skink was also not detected from the study area, nor were signs of their presence such as potential burrows. Retention of large, intact patches of remnant vegetation will allow the species to persist within the study area, should it occur. Therefore, the construction of the solar farm is unlikely to reduce the area of occupancy of the population. |
| Fragment an existing important population into two or more populations | An important population of Yakka Skink does not occur within the study area. Regardless, the large patches of vegetation to be retained provide connections to habitats to the north and south of the study area. These connections will be retained and no fragmentation of habitat is proposed to occur. |
| Adversely affect habitat critical to the survival of a species | Habitat critical to the survival of the species is likely to be in higher quality habitats within large patches of remnant vegetation. Such habitats will be retained within the study area. |
| Disrupt the breeding cycle of an important population | No potential burrows were observed during the site assessment, although there is a potential for occurrence. As communal burrows, if present, are more likely within intact remnant habitats, the retention of these areas will avoid impacts to a breeding cycle for the species. |
| Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline | As mentioned previously, the largest and highest quality habitats will be retained and only small patches and disturbed edges will be cleared. It is unlikely that the removal of poorer quality habitats would result in the decline of the species. |
| Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat | The project will not result in the introduction of any invasive species that is likely to harm Yakka Skink or their habitat. Wild Dogs and Feral Cats are prevalent through the region and the project is unlikely to exacerbate the presence of such feral species. |
| Introduce disease that may cause the species to decline, or | No known diseases impacting the bat are likely to be introduced by the project. |
| Interfere substantially with the recovery of the species. | There is currently no Recovery Plan for this species although there is a draft recovery plan for Brigalow Belt reptiles (Richardson 2006). The project is unlikely to substantially interfere with the conservation actions proposed for the species. |

### 5.1.3 Migratory species

Several migratory species are likely to occur in or fly over the study area. However, the study area does not constitute 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DEWHA 2009) for any of these species and no further assessment is warranted.

### 5.1.4 Implications

The proposed action is unlikely to have a significant impact on any matter of NES known or likely to occur within the study area. As such, a referral to the Commonwealth Environment Minister is not required regarding matters listed under the EPBC Act. However, Luminous Energy have indicated that the Project will be referred to the DoEE.

## 5.2 Nature Conservation Act 1992 (Queensland)

### 5.2.1 EVNT Flora

No threatened flora species were recorded within the study area during the survey and no suitable habitat for threatened flora species occurs due to impacts from cattle.

The Flora Survey Trigger map was downloaded on 2/3/2017 and the study area is not identified as a high risk area (Appendix 2). This map is valid for 12 months from the date of download and will need to be re-downloaded if construction is likely to commence more than 12 months from this date.

### 5.2.2 EVNT Fauna

Although several EVNT and SLC fauna species have the potential occur within the study area (Grey Snake, Golden-tailed Gecko and Echidna), no specific licensing or approvals are required to take (e.g. damage or destroy) potential habitat for those species in this instance. However, under the EO Act, habitat for endangered, vulnerable or special least concern fauna is considered a matter of state environmental significance (MSES) and significant residual impacts to habitat would result in an offset being triggered. Therefore, significant residual impacts to Golden-tailed Gecko (being listed as near threatened) does not trigger an offset requirement and therefore does not require further assessment.

Under section 332 of the Nature Conservation (Wildlife Management) Regulation 2006 a person must not, without a reasonable excuse, tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring. Tampering with an animals breeding place under an approved Species Management Program (SMP) is a reasonable defence against a charge under Section 332.

Grey Snake

A significant impact assessment has been completed for the Grey Snake, which is listed as endangered (Table 11). Although not sighted during the current survey, the species is a likely occurrence within the study area. The clearing of lower quality Brigalow habitats within the study area is unlikely to be a significant impact on this species.

**Table 11** Significant residual impact assessment on Grey Snake

| Significant | Impact Assessment |
|---|---|
| An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is<br>likely to:<br>• lead to a long-term decrease in the size of a local population; or | The construction of the solar farm will result in the disturbance of non-remnant vegetation and disturbed habitat within gilgai areas. The four patches of Brigalow TEC are proposed to be retained and will provide habitat and refugia for the species.<br>The construction of the solar farm is unlikely to result in a long-term decrease in the size of a local population as there is likely to be a short-term impact from clearing small patches of Brigalow vegetation and disturbances to the ground and soil profile within gilgai. However, with implementation of management measures including micro-siting of trenches and piers will minimise potential impacts on this species. In addition, cessation of cattle grazing from the study area is likely to benefit the species through no further soil compaction and fouling of gilgai wetlands. Cessation of cattle grazing is also likely to allow regeneration of aquatic plants within gilgai thereby providing habitat for frog populations – and hence prey availability. Wet season shelter sites will be retained within the areas of Brigalow TEC to be retained. |
| • reduce the extent of occurrence of the species; or | The construction of the solar farm will not reduce the extent of occurrence of the species, if present within the study area. This is because the Project will retain the patches of Brigalow TEC and the solar farm is not an incompatible use of gilgai areas. Gilgai features will be retained beneath panels and therefore will maintain habitat for the snake. |
| • result in genetically distinct populations forming as a result of habitat isolation; or | As discussed above, it is considered that the Grey Snake, if present, would persist within the study area following construction of the solar farm. This is due to the small footprint required for installation of infrastructure and PV panels which allows the gilgais to remain and improve ecological values over time. Therefore, the construction of the solar farm is unlikely to preclude use of the study area by the species allowing dispersal to adjacent habitats. |
| • fragment an existing population; or | The extent of gilgai extends into the neighbouring property to the north and connections are provided to the property to the south. The construction of the solar farm is unlikely to prevent dispersal into these neighbouring areas. The Brigalow TEC patches are currently fragmented and do not provide connections to adjacent vegetation. |
| • cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species. | Grey Snakes breeding season is between January to March. The construction of Stage 2 of the solar farm is expected to take 9 – 12 months to complete and therefore may occur during the breeding season. Given that the breeding season is during the wet season and construction within wet cracking clay soils will be difficult, works may be scheduled when the soils are dry and when snakes can retreat to below the soil surface. Retention of Brigalow patches will also provide refuge for this species during construction.<br>As discussed previously, the potential impacts on Grey Snake habitat is expected to be minimal and is unlikely to significantly impact on habitat to the extent that the species is likely to decline.<br>The construction of the solar farm is likely to improve the quality of habitat for the Grey Snake in the medium to long-term (2 – 30 years), primarily through cessation of cattle grazing and allowing the gilgai habitat to regain ecological values. |
| • result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or | The construction of a solar farm is unlikely to introduce an invasive species that is harmful to the Grey Snake. The study area currently contains a population of Cane Toads, which can result in lethal toxic ingestion for the species, and the solar farm is unlikely to increase the number of Cane Toads within the study area. |

| Significant | Impact Assessment |
|---|---|
| • introduce disease that may cause the population to decline, or | There are currently no diseases that could be introduced by the proposed development that would impact on Grey Snake. |
| • interfere with the recovery of the species | Recovery actions for the Grey Snake are listed in Richardson (2008). Threats are thought to include pasture improvement, hydrological changes and feral animals (Richardson 2008). The proposed development will not interfere with any of the recovery actions proposed. |

Echidna

A significant impact assessment has been completed for the Echidna (Table 12). Although not sighted during the current survey, the species is a likely occurrence within the study area. The clearing of lower quality habitats within the study area is unlikely to be a significant residual impact on this species.

**Table 12** Significant residual impact assessment on Echidna

| Significant | Impact Assessment |
|---|---|
| An action is likely to have a significant impact on a special least concern (non-migratory) animal wildlife habitat if it<br>is likely that it will result in:<br>• a long-term decrease in the size of a local population; or | Echidnas are prevalent throughout the broader region and inhabit a variety of habitats. The project will retain the largest and most undisturbed remnants within the study area and will clear disturbed edges of larger patches and small, isolated patches. It is unlikely that this clearing will lead to a long-term decrease in the size of a local population. |
| • a reduced extent of occurrence of the species; or | The Echidna occurs in a variety of remnant and non-remnant habitats and is expected to traverse the study area once the construction of the solar farm has been completed. Therefore, it is unlikely that the project will reduce the extent of occurrence of the species. |
| • fragmentation of an existing population; or | The project currently provides a linkage (though bisected by a track) in the western portion of the study area. This linkage is expected to remain as well as the existing linkage along the watercourses. However, as discussed previously, the Echidna is known to traverse cleared land and will likely continue to do so following construction of the project. |
| • result in genetically distinct populations forming as a result of habitat isolation; or | No habitat is proposed to be isolated as a result of the project and therefore isolated populations are unlikely to form. |
| • disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species | Echidnas construct a new burrow each mating season and are not reused. Therefore, no areas are considered to be significant locations for breeding within the study area. Regardless, retention of large patches of remnant vegetation within the study provides abundant habitat for breeding and feeding for the Echidna. |

### 5.2.3 Implications

A significant residual impact assessment has been completed for Grey Snake and the Echidna. As the Golden-tailed Gecko is a near threatened species, a significant impact assessment is not required to be performed. The Project is unlikely to result in a significant residual impact to either species and it is

expected that the species, if present, will persist post-construction. Therefore, offsets are not expected to be required for these species.

As the Project will require the removal of dead, standing trees and live trees with hollows and/or nesting resources, an SMP for high risk activities should be prepared and submitted to DEHP. When approved, the SMP provides a protocol for the management of breeding places for most least concern species such as birds, possums and gliders, the special least concern Echidna and threatened fauna such as Grey Snake.

## 5.3 Vegetation Management Act 1999

The proposed development does not trigger the VM Act given that the study area is mapped as Category X vegetation.

## 5.4 Biosecurity Act 2014

Some animal pests and weed species are listed as prohibited or restricted matters under the *Biosecurity Act 2014*.

Velvety Tree Pear and Prickly Pear are restricted pests and landowners have an obligation to take all reasonable and practicable steps to prevent or minimise biosecurity risks associated with these matters. Reasonable steps should include treatment of restricted plants prior to construction commencing and on-going treatment of new plants during operations.

## 5.5 Water Act 2000

Several watercourses as defined under the *Water Act 2000* are located within the study area (DNRM 2017c). A riverine protection permit may be required should excavation or placement of fill be proposed to occur within any of the mapped watercourses and the activity can not be completed under the permit exemption requirements. Several existing tracks cross the mapped watercourses however these are likely to require improvements to allow construction vehicles and machinery to access all areas of the study area.

The minimum requirements outlined below must be achieved to be eligible for an exemption from having to apply for and obtain a riverine protection permit (DNRM 2016):

- The extent of the area required to carry out the permitted activity must be limited to the minimum area necessary to reasonably carry out the works.
- Sediment and erosion controls must be used.
- All areas of disturbed bed and banks must be stabilised to protect against erosion.
- All fill placed must be free from contamination (e.g. weeds seeds, oils, chemicals and other contaminants).
- Disturbed banks must be returned to a profile similar to the pre-disturbance condition.

- Natural stream bed controls or features that create natural waterholes (e.g. riffles, logs, sediment or rock bars) must not be lowered or removed.
- Any excavated material that is not removed as waste must be spread evenly within the bed and banks of the watercourse so that it does not interfere with the flow of water.
- All fill placed in the bed of the stream must not redirect flow into an adjacent bank.
- Access tracks or crossings must not interfere with the low flow of water.
- The invert of culverts or the deck height of a splash through crossing must be placed at or below bed level.
- All culverts placed within the watercourse must be aligned with the stream channel and placed as close to the centre of the watercourse channel as practical.
- All culverts placed within the watercourse must be of a sufficient size to ensure uninterrupted low flows and minimise the occurrence of blockage of culverts caused by flood-borne debris.
- Constructed access tracks (e.g. culverts or splash through crossings) must be provided with a scour apron and cut off wall on the downstream side sufficient to prevent bed erosion.
- All disturbed areas must be revegetated with trees, shrub and grasses endemic to the area, sufficient to re-establish a riparian environment and protect bed and banks from erosion.

There are no further requirements imposed on the project under the Act.

# 6 CONCLUSION AND FURTHER REQUIREMENTS

This ecological assessment has been prepared to identify the flora and fauna values within the study area, define and identify features of significance at the Commonwealth and State level, and to provide and assessment of the proposed development in consideration of relevant biodiversity legislation and government policy. The study area contains significant ecological values including the Brigalow TEC and potential habitat for threatened fauna species listed under the EPBC Act and/or NC Act. No impacts to the Brigalow TEC are expected to occur and as large areas of relatively undisturbed remnant vegetation are proposed to be retained and only disturbed edges and smaller, isolated patches are proposed to be cleared, no significant impacts are expected to occur to potential habitat for threatened fauna species.

Further requirements associated with proposed development are provided below (Table 13).

**Table 13** Further requirements associated with development of the study area

| Legislation | Description of Values | Action Required |
|---|---|---|
| *Environment Protection and Biodiversity Conservation Act 1999* | The proposed action is unlikely to have a significant impact on the Brigalow TEC or habitats for threatened fauna species. As such, a referral to the Commonwealth Environment Minister is not required. | No further action required. However, Luminous Energy have indicated that they will refer the project to the DoEE. |
| *Vegetation Management Act 1999* | No regulated vegetation is proposed to be removed. | No further action required |
| *Nature Conservation Act 1992* | The project is unlikely to result in a significant residual impact to Grey Snake or Echidna and it is expected that the species, if present, will persist post-construction. Therefore, offsets are not expected to be required for these species. | An SMP for high risk activities should be prepared and lodged with DEHP. |
| *Biosecurity Act 2014* | The study area contains restricted matters (Velvety Tree Pear, Harrisia Cactus) | The proponent must take all reasonable and practical steps to minimise the risk associated with invasive plants within the study area. |
| *Water Act 2000* | Several watercourses are mapped within the study area and will be protected by the project. However, some existing crossings may be required to be improved. | Provided that the works with the crossings can be completed in accordance with the permit exemptions, then no further actions are required. |

# REFERENCES

Bostock, PD & Holland, AE [eds)] 2007. *Census of the Queensland Flora 2007*. Queensland Herbarium, Environmental Protection Agency, Brisbane.

Christidis, L. and Boles, W.E. 2008. *Systematics and Taxonomy of Australian Birds*. CSIRO Publishing, Canberra.

Cogger, H.G. 2014. *Reptiles and Amphibians of Australia* - 7th edition. Sydney, NSW: CSIRO Publishing.

Cropper, S.C. 1993. *Management of Endangered Plants*. CSIRO, East Melbourne, Victoria.

DEWHA. 2010. Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. Australian Government, Canberra.

DEHP. 2014b. Nature Conservation (Wildlife Management) Regulation 2006 Protected Plants Assessment Guideline. Queensland Government, Brisbane.

DEHP. 2016a. Certified Regional Ecosystem Mapping Database. Available from: http://www.ehp.qld.gov.au/ecosystems/biodiversity/regional-ecosystems/data/index.php. Queensland Department of Environment and Heritage Protection.

DEHP. 2016b. Wildlife Online Database. URL: https://www.qld.gov.au/environment/plants-animals/species-list/ Accessed: 14/7/2015. Queensland Department of Environment and Heritage Protection.

DEHP. 2016c. Protected Plants Flora Survey Trigger Map. Website address: https://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php.

DNRM. 2016. Queensland Globe mapping and data application – Vegetation Management, Inland Waters, Biota: Google Earth Application. Queensland Department of Natural Resources and Mining.

DoEE. 2016a. EPBC Act Protected Matters Search Tool (PMST). URL: http://www.environment.gov.au/epbc/pmst/ Accessed: 12/2/2016. Commonwealth Department of the Environment.

DoEE. 2016b. Brigalow (*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks) in Community and Species Profile and Threats Database. Department of the Environment, Canberra. Available from http://www.environment.gov.au/sprat. Accessed: 15/2/2016.

Hourigan, C. 2012. Glossy Black Cockatoo *Calyptorhynchus lathami*. Targeted species survey guidelines. Queensland Herbarium, Department of Science, Information Technology and Innovation, Brisbane.

Neldner, V.J., Wilson, B.A., Thompson, E.J. & Dillewaard, H.A. 2012. *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland*. Version 3.1 Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane.

Queensland Herbarium 2015. *Regional Ecosystem Description Database* (REDD). Version 9.0 (April 2015) (Queensland Department of Science, Information Technology, Innovation and the Arts: Brisbane).

Richardson, R. 2006. Queensland Brigalow Belt Reptile Recovery Plan 2008-2012. Report to the Department of the Environment, Water, Heritage and the Arts, Canberra. WWF-Australia, Brisbane.

Roland, J. 2012a. Grey Snake *Hemiaspis damelii*. Targeted species survey guidelines. Queensland Herbarium, Department of Science, Information Technology and Innovation, Brisbane.

Roland, J. 2012b. Painted Honeyeater *Grantiella picta*. Targeted species survey guidelines. Queensland Herbarium, Department of Science, Information Technology and Innovation, Brisbane.

Sattler, P. and Williams, R. 1999. *Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Van Dyck, S.M. & Strahan, R. (Ed.) 2008. *The Mammals of Australia*. Third Edition. New Holland Publishers.

Threatened Species Scientific Committee. 2013. Commonwealth Conservation Advice for Brigalow Ecological Community. Department of Sustainability, Environment, Water, Populations and Communities, Canberra. Website address: www.environment.gove.au/biodiversity/threatened/communities/pubs/028-conservation-advice.pdf.

Tyler, M. J., & Knight, F. 2009. *Field guide to the frogs of Australia.* CSIRO Publishing, Collingwood, Vic.

WItheridge, G. 2014. *Best Practice Erosion and Sediment Control Guidelines*. International Erosion Control Association.

# APPENDIX 1 – LEGISLATION (BACKGROUND)

## A1.1. Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of national environmental significance (NES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any of the following matters of NES:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory and marine species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining);
- Great Barrier Reef Marine Park; or,
- Water resources impacted by coal seam gas or mining development.

## A1.2. Nature Conservation Act 1992 (Queensland)

The *Nature Conservation Act 1992* (NC Act) provides for the conservation of nature through protection of all native plants and animals in Queensland. Protection is provided under the NC Act through conservation of land as protected areas and wildlife protection outside of protected areas. Actions impacting on protected native flora and fauna are regulated under the NC Act. Permits for disturbance to native flora and fauna can be administered under the NC Act. The Queensland Nature Conservation (Wildlife) Regulation 2006 lists flora and fauna species considered to be extinct in the wild, endangered, vulnerable, near threatened or special least concern in Queensland.

### Protected Plants

In Queensland, all plants that are native to Australia are "protected plants" under the NC Act. The DEHP administer this Act to ensure that protected plants and their parts are not illegally removed from the wild or traded. The take and use of protected plants (including whole plants, plant parts and propagating material) from the wild is regulated by a licensing system. People who wish to take protected plants from the wild, for any reason, may be required by law to obtain a licence, permit or authority from the Department of Environment and Heritage Protection (DEHP). This will be the case unless the activity is specifically exempt under a regulation or conservation plan under the Act (such as for timber harvesting of common species). Whether the activity is bound by, or exempt from,

provisions of the Act, the clearing of native vegetation may also require development approval under other legislation such the *Vegetation Management Act 1999* (VM Act).

The Protected Plants Flora Survey Trigger Map (DEHP 2016) shows high risk areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location. Areas shown on the map as high risk are subject to particular requirements under the NC Act.

Protected Animal Breeding Places

Section 332 of the Nature Conservation (Wildlife Management) Regulation 2006 (Wildlife Management Regulation) governs tampering with animal breeding places. Under the Wildlife Management Regulation, Section 332(1), it is an offence to tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.

Section 332(2) states that an animal breeding place is being used by a protected animal to incubate or rear the animal's offspring if:

- the animal is preparing, or has prepared, the place for incubating or rearing the animal's offspring; or
- the animal is breeding, or is about to breed, and is physically occupying the place; or
- the animal and the animal's offspring are physically occupying the place, even if the occupation is only periodical; or
- the animal has used the place to incubate or rear the animal's offspring and is of a species generally known to return to the same place to incubate or rear offspring in each breeding season for the animal.

Section 332(5) defines tamper (with an animal breeding place) as "damage, destroy, mark, move or dig up the breeding place".

Section 332(1) does not apply if the removal or tampering is part of an approved Species Management Program (SMP) for animals of the same species (section 332(4)). Section 332(5) defines an approved SMP, for a species of animal, as "a program about managing the population and habitat of the species of animal that is approved by the chief executive".

If a breeding place for a protected animal is likely to be disturbed by construction activities, an SMP is required to be prepared and approved by DEHP.

## A1.3. Vegetation Management Act 1999

The VM Act provides a framework for the regulation of woody, terrestrial native vegetation located outside of protected areas. The stated purpose of the Act is to regulate the clearing of native vegetation in a way that:

- Conserves remnant vegetation that is an endangered, of concern or least concern RE
- Conserves vegetation in declared areas
- Ensures clearing does not cause land degradation
- Prevents biodiversity loss

- Maintains ecological processes
- Manages the environmental effects of the clearing to ensure the above purposes are obtained.

The Act provides for the establishment and mapping of REs that encompass vegetation community descriptions within a geological and bioregional context, and for the creation and use of clearing codes (among other things). In addition, it provides a process for RE mapping changes by the public, and for the investigation and prosecution of clearing offences. Details on what clearing activities require assessment against the various regional clearing codes authorised under the VM Act are provided by the *Sustainable Planning Act 2009* (SP Act).

## A1.4. Environmental Offsets Act 2014

The *Environmental Offsets Act 2014* (EO Act) was recently enacted in Queensland to streamline the offsets process for proponents and developers. The EO Act and subordinate Environmental Offsets Regulation 2014 and Environmental Offsets Policy replaced the Queensland Government Environmental Offsets Policy and four specific-issue policies for vegetation management, koala habitat, fish habitat and biodiversity values.

The EO Act amended other Acts to provide consistency for when offsets are triggered and how they should be delivered. The EO Act does not trigger offsets directly, but is indirectly involved through existing approval pathways under the SP Act, NC Act, VM Act and Fisheries Act 1994. Offsets can be imposed by an authority when a prescribed activity will have a significant residual impact on a prescribed environmental matter.

Offsets can be delivered by a proponent driven offset (land-based offset) or financial settlement offset depending upon the activity and the matter(s) involved.

If the proposed development is shown to have a significant residual impact on a matter of State environmental significance (SES), then an environmental offset is likely to be conditioned onto the project approval.

## A1.5. Biosecurity Act 2014

The *Biosecurity Act 2014* and subordinate *Biosecurity Regulation 2016* commenced on 1 July 2016. The Act is a combination of several pieces of now superseded legislation in relation to managing pests (weeds and animals), diseases and contaminants and provides a risk-based approach to biosecurity. Biosecurity matters include prohibited matters, restricted matters, notifiable incidents and restricted places.

- Prohibited Matters are matters (pests, diseases, contaminants) not found in Queensland, but would have a significant adverse impact on our health, way of life, the economy or the environment if it entered the State. All prohibited matters must be reported to Biosecurity Queensland.
- Restricted Matters are matters that are found in Queensland and have a significant impact on human health, social amenity, the economy or the environment. There are 7 categories of

restricted matters and Category 1 and 2 matters must be reported. Categories 2, 4, 5 and 6 relate to restrictions on keeping, feeding and moving weeds, pest animals and noxious fish and Category 7 requires people to kill noxious fish. Multiple categories can apply to several matters.

The Act also introduces a new concept called a General Biosecurity Obligation (GBO). This applies to everyone in Queensland for managing biosecurity risks that are:

- under their control and
- that they know about, or should reasonably be expected to know about.

Under the GBO, individuals and organisations whose activities pose a biosecurity risk must:

- take all reasonable and practical steps to prevent or minimise each biosecurity risk;
- minimise the likelihood of causing a biosecurity event, and limit the consequences if such an event is caused; and
- prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse.

## A1.6. Water Act 2000

The *Water Reform and Other Legislation Amendment Act 2014* was passed on 26 November 2014. The Act includes a number of changes to the Water Act 2000 and other resource related legislation. Amongst the changes, a new watercourse identification map has been prepared to show watercourses and drainage features as described in the Water Act.

# APPENDIX 2 – FLORA SURVEY TRIGGER MAP


## Protected Plants Flora Survey Trigger Map

**Legend**

- Lot and Plan
- High risk area
- Cadastral line
  Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets


N

0 240 480 720 960 1,200 m

This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Heritage Protection at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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# APPENDIX 3 – SIGNIFICANT SPECIES ASSESSMENT

**Table 14** Assessment of Significance for Threatened Flora Species within 20km of the Study Area

| Species Name | Common Name | EPBC Status | NC Act Status | Preferred Habitat | Likelihood of Occurrence | Source |
|---|---|---|---|---|---|---|
| *Cadellia pentastylis* | Ooline | V | V | Occurs in a variety of habitats and often at the edge of sandstone and basalt escarpments. Associated with semi-evergreen vine thickets, brigalow-belah woodlands, Poplar Box and Bendee communities. | Unlikely. Majority of records are west of Miles and not suitable habitat present. | PMST |
| *Calytrix gurulmundensis* | Gurulmundi Fringe-myrtle | V | V | Occurs in open shrubland on laterised sandstone ridges. | Unlikely. Most records are north of Miles within Gurulmundi and Binkey State Forests and from northern Barakula. No suitable habitat is present. | PMST |
| *Dichanthium setosum* | Bluegrass | V | LC | Associated with heavy black soils derived from basalt (land zone 8) in woodland or derived grasslands. | Unlikely. Occurs around Dalby in southern Queensland and no suitable habitat occurs within the study area. | PMST |
| *Homopholis belsonii* | Belson's Panic | V | E | Occurs in a variety of habitats including woodlands on poor quality soils, rocky hills, in Wilga woodland and in Poplar Box communities. | Unlikely. Although there are records to the south and west of Miles, there are few records north of Chinchilla. Some potential habitat occurs within the study area, cattle have degraded much of the understorey habitats and is likely to have precluded this species from the study area. | PMST |
| *Homoranthus decumbens* | a shrub | E | V | Occurs in heath and shrubby woodlands on deep sandy soils with lateritic pebbles and is currently only known from Barakula State Forest. | Unlikely. The species is associated with RE 11.7.5 communities, which was not observed to occur within the study area. | PMST |
| *Micromyrtus carinata* | Gurulmundi Heath-myrtle | | E | Known from Gurulmundi State Forest within heath and shrubby woodlands on deep sandy soils. | Unlikely. The species is associated with RE 11.7.5 communities, which was not observed to occur within the study area. | ALA, Wildnet |
| *Rutidosis lanata* | Woolly Wrinklewort | | V | Occurs on sandy, gravelly soils in shrubby eucalypt woodlands. Associated with Poplar Box, False Sandalwood, Brigalow or Belah woodlands on loamy clays (land zone 3)and Brigalow, Coolibah, Poplar Box on alluvial clay soils. (land zone 3) and sedimentary rises (land zone 9) | Unlikely. Most records are from south of the Warrego Highway, although other records are known from northern Barakula State Forest. No suitable habitat occurs within the study area. | ALA, Wildnet |
| *Thesium* | Austral | V | V | Semi-parasitic on the roots of | Unlikely. The nearest record is | PMST, |

| Species Name | Common Name | EPBC Status | NC Act Status | Preferred Habitat | Likelihood of Occurrence | Source |
|---|---|---|---|---|---|---|
| *australe* | Toadflax | | | native grasses including Kangaroo Grass *Themeda australis*. Occurs in a range of habitats and shows a preference for damp sites. | at Macalister near Dalby and suitable habitat does not occur within the study area. | Wildnet, ALA |
| *Westringia parvifolia* | | V | V | Occurs within Baker's Mallee *Eucalyptus bakeri* and Green Mallee *E. viridis* and Spinifex *Triodia* species low woodlands on sandy, stony soils. | Unlikely. No such habitat occurs within the study area. | PMST |

**Table 15** Assessment of Significance for Threatened Fauna Species within 20km of the Study Area

| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| INVERTEBRATES | | | | | | |
| *Adclarkia cameroni* | Brigalow Woodland Snail | V | E | PMST, ALA | Restricted to a small area on the Condamine River Floodplain near Dalby and Chinchilla where it is associated with Brigalow remnants and Eucalypt woodland patches within road verges and along the river. | Unlikely. The study area does not occur on alluvium soils and therefore is unlikely to provide habitat for this species. |
| *Adclarkia dulacca* | Dulacca Woodland Snail | E | E | PMST | Occurs in a broad triangle from Miles in the east, Dulacca in the west and Meandarra in the south. The species occurs in a variety of habitats including vine thicket, Brigalow woodlands and Ironbark and Acacia woodlands on ridges. | Unlikely. No records north of the Warrego Highway, east of Miles. Due to cattle impacts throughout the stud y area, suitable habitat is unlikely to occur. |
| FISH | | | | | | |
| *Maccullochella peelii* | Murray Cod | V | LC | PMST | Occurs within the Murray Darling River system within the main channels of rivers and larger tributaries.. | Unlikely. The watercourses within the study area are not considered large enough to provide habitat for this species. |
| REPTILES | | | | | | |
| *Anomalopus mackayi* | Five-clawed Worm-skink | V | E | PMST | Open grasslands on heavy cracking clay in the Darling Downs. Usually in soil under dead grass. Often on relict roadside verges of natural grasslands. The worm-skink is generally known from south of the Warrego Highway around Bowenville, Jondaryan, Oakey, Pittsworth and Felton. However, records are from Jimbour to the north of Dalby and a relatively recent (2008) record from Dalby township, suggesting that the species can persist in highly modified environments. | Unlikely. The study area is outside of the species known range. |
| *Delma torquata* | Collared Delma | V | V | PMST | The Collared Delma is known from rocky areas associated with dry open forests and from Brigalow associations. Within these habitats the presence rocky substrates (with small rocks which act as shelter sites) is an essential microhabitat element. | Unlikely. Required habitat does not occur within the study area. |
| *Denisonia maculata* | Ornamental Snake | V | V | PMST | Ornamental Snake is most often associated with | Unlikely. The Ornamental Snake occurs as far |

| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| | | | | | Brigalow communities on cracking clay soils; however, is readily detected in other habitats that combine a source of prey (i.e. frogs) with shelter sites (e.g. cracking clay soils). Habitats range from Poplar Box, Coolibah *E. coolabah* and riparian woodlands and native grasslands and where these communities previously existed. | south as south of Rolleston and therefore is an unlikely occurrence within the study area. |
| *Egernia rugosa* | Yakka Skink | V | V | PMST, Wildnet | Ground-dwelling, reliant on logs, ground debris and/or burrows for shelter. Widespread but rare. Dry open forests or woodland with dense ground vegetation, rocky areas, fallen timber and other debris. | **Moderate**. Suitable habitat occurs within connected patches of RE 11.7.4 / 11.7.7 within the study area. |
| *Furina dunmalli* | Dunmall's Snake | V | V | PMST | Poorly known, so that preferred habitats are uncertain. Open dry sclerophyll forests and woodlands, especially Brigalow, with fallen timber and ground litter on floodplains of cracking clay soils. In Queensland, the snake occurs almost exclusively within the Brigalow Belt bioregion. | Unlikely. No recent records from the Miles region and the study area occurs in isolation from other habitat areas. |
| *Hemiaspis damelii* | Grey Snake | E | | ALA, Wildnet | The Grey Snake feeds on frogs and lizards and occurs in woodlands on heavy cracking clay soils. | **High**. The eastern portion of the study area provides habitat for this species, though has been extensively disturbed through cattle grazing. |
| *Strophurus taenicauda* | Golden-tailed Gecko | NT | | ALA, Wildnet | The Golden-tailed Gecko occurs in a dry open forests and woodlands of ironbark, Cypress Pine and Acacias. It shelters under exfoliating bark or in hollow limbs. | **High**. Remnant and regrowth vegetation provides habitat for this species. |
| **BIRDS** | | | | | | |
| *Calidris ferruginea* | Curlew Sandpiper | LC | CE | PMST | Occurs in intertidal mudflats in sheltered coastal areas. Occasionally found in saltworks and sewage farms as well as inland areas on dams, waterholes and bore drains. | Unlikely. Required habitat does not occur within the study area. |
| *Calyptorhynchus lathami* | Glossy Black Cockatoo | V | | Wildnet, ALA | Occurs in south east Queensland from Gympie to the NSW border and inland to Tambo. Glossy Black Cockatoos are extremely selective in their choice of feed tree and is related to the nutrient value of the soils in which feed trees grow. They | Unlikely. Many records from the region, however most are old and more recent records are from the west or south of Miles. Within the study area, although feed trees such as Bulloak occur throughout the study area, it occurs on |

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| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| | | | | | prefer groves of she-oak *Allocasuarina or* Oak *Casuarina* within open sclerophyll forests and woodlands and appears to have prefers for she-oaks on certain high nutrient soils. West of the Great Dividing Range, the species is know to feed on Bulloak, Belah and Forest She-oak. | low nutrient value sandy soils (land zone 7). Belah occurs within small patches of Brigalow on heavy clay soils (land zone 4), which has a higher nutrient value, however no activity (chewed cones) of Glossy Black Cockatoo usage was observed and the patches are likely to be too small and narrow |
| *Erythrotriorchis radiatus* | Red Goshawk | V | V | PMST | The Red Goshawk is generally found in open woodland, the edges of rainforest, and in dense riverine vegetation of coastal and subcoastal forests. This species is known to have a large home range but nests in tall trees usually within 1km of a waterway or wetland. | Unlikely. Required habitat does not occur within the study area. |
| *Geophaps scripta scripta* | Squatter Pigeon (southern) | V | V | PMST | This species is known from tropical dry, open sclerophyll woodlands and sometimes savanna. It appears to favour sandy soil dissected with low gravely ridges (land zones 5 and 7) and is less common on heavier soils with dense grass cover. It is nearly always found in close association with permanent water (within 3 km). This species is now rarely recorded in southern Queensland and northern NSW. | Moderate. The Squatter Pigeon is sparsely distributed in southern Queensland, however has been observed to the north of the study area (author observation). The species is likely to occur within RE 11..5.1, 11.5.1a & 11.7.4 / 11.7.7 communities. |
| *Grantiella picta* | Painted honeyeater | V | V | PMST, ALA, Wildnet | Forests, woodlands and dry scrublands on deep productive soils, where mistletoe is abundant. Widespread throughout Queensland but rare in inland Australia. | Moderate. Various mistletoe species occur on dominant tree species throughout the study area. Some mistletoes including *Viscum articulatum* and *Amyema quandang* were observed within Brigalow patches on higher nutrient soils and which could provide habitat for this species. |
| *Lathamus discolor* | Swift Parrot | E | E | PMST | This species only breeds in Tasmania and migrates to the mainland to feed each year mainly on the inland slopes of the Great Dividing Range particularly in Victoria and NSW with a small number of birds reaching as far as south east Queensland. This species is considered to have a moderate potential to occur within the study area during its winter, non breeding period. However, | Unlikely. Required habitat does not occur within the study area and no recent records from within 20km radius of the study area. |

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| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| | | | | | this would be expected to be a rare occurrence. While it has been recorded historically from Chinchilla, recent records tend to be from coastal Queensland. | |
| *Rostratula australis* | Australian Painted Snipe | V | E | PMST, ALA, Wildnet | This species occurs in shallow, vegetated temporary or infrequently filled wetlands, sometimes with trees or shrubs where it feeds at the water's edge on seeds and invertebrates. | Unlikely. No records from the broader locality and cattle damage to dams and gilgai preclude use of these areas by this species. |
| MAMMALS | | | | | | |
| *Chalinolobus dwyeri* | Large-eared Pied Bat, Large Pied Bat | V | V | PMST | This species is uncommon in dry and wet Eucalypt forests from Blackdown Tableland in Central Queensland to near Wollongong. Primarily a cave rooster, this species inhabits sclerophyll forests and woodlands throughout much of its range. It is however, primarily associated with Dry Sclerophyll Woodlands throughout its range. | Low. Required habitat occurs within the study area, however no recent records from within 20km radius of the study area. |
| *Phascolarctos cinereus* | Koala | V | V | PMST, ALA, Wildnet | Koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species. Koala habitat can be broadly defined as any environment containing Koala food trees species or shelter trees, which may be used by koalas for roosting, sheltering or breeding, and which is sufficiently connected. The distribution of this habitat is largely influenced by land elevation average, annual temperature and rainfall patterns, soil types and the resultant soil moisture availability and fertility. Preferred food and shelter trees are naturally abundant on fertile clayey soils. | **Moderate**. Many old records from the broader region and most are associated with larger creeks and river systems. Some food species were present (Qld Blue Gum, Poplar Box, Qld Peppermint) along the waterway in the central and eastern portion and may provide some habitat for this species. |
| *Pteropus poliocephalus* | Grey-headed Flying-fox | LC | V | PMST, Wildnet | The Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The | Unlikely. The closest camp containing Grey-headed Flying-foxes is located on Myall Creek at Dalby, although the species has not been observed within this camp since 2013. It is unlikely that the species would forage within the study area. |

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| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| | | | | | primary food source is blossom from Eucalyptus and related genera but in some areas it also utilises a wide range of rainforest fruits. None of the vegetation communities used by the Grey-headed Flying-fox produce continuous foraging resources throughout the year. As a result, the species has adopted complex migration traits in response to ephemeral and patchy food resources. | |
| *Tachyglossus aculeatus* | Short-beaked echidna | SL | | Wildnet | Occurs in a wide range of habitats, from alpine and cold-temperate areas to deserts and tropical regions. Appears to have no specific habitat requirements beyond a food supply of ants and termites. | **High**. Echidnas are ubiquitous throughout the region and may occur on the study area. |
| *Nyctophilus corbeni* | Eastern Long-eared Bat | V | V | PMST | Open dry woodland and forest. Individuals and small colonies roost in tree hollows, cracks in branches and under sheets of bark. Capable of flying large distances (>7km) between roosts and foraging habitat. | **Moderate**. Large connected patches of RE 11.7.4 / 11.7.7 provide habitat for this species. |
| *Dasyurus hallucatus* | Northern Quoll | LC | E | PMST | Occurs within a variety of habitats, although areas of high relief such as ridges and escarpments are preferred. Also prefers woodland and forest habitats with an abundance of large rocks and close to water. | Unlikely. Preferred habitat does not occur within the study area. |
| *Petauroides volans* | Greater Glider | LC | V | PMST | Greater Gliders occur throughout Coastal and central Queensland from Port Douglas to Coolangatta and west to Carnarvon. The species primarily feeds on the young leaves and flower buds of eucalypt species as they have a higher moisture content and lower fibre than mature leaves. Preference is shown for several species of Eucalyptus and Corymbia species and vary according to the location. Presence of large, old hollow-bearing trees is critical for determining presence of Greater Gliders. | Unlikely. The study area does not contain forest or woodland habitat conducive to supporting Greater Gliders. Although some preferred tree species (Qld Blue Gum) occur within the study area, these occur as small isolated patches and unlikely to support the species. |

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| Scientific Name | Common Name | Qld | EPBC | Source | Habitat Requirements and Distribution | Likelihood of Occurrence Assessment |
|---|---|---|---|---|---|---|
| *Dasyurus maculatus maculatus* | Spotted-tail Quoll | E | E | PMST | The Spot-tailed Quoll occurs in south-east Queensland: coastally from Bundaberg to the border and inland to Monto and Stanthorpe. Occurrences from five broad geographic areas are known: four from coastal ranges and the Great Dividing Range from the NSW border to Gladstone. The fifth is centred on the eastern Darling Downs - Inglewood Sandstone provinces of the Brigalow Belt South Bioregion. Unconfirmed reports suggest the subspecies may occur in the Clarke and Conway Range areas, eastern Queensland.<br>Historical locations include the D'Aguilar Range west of Brisbane and coastal areas from Coolangatta to Bundaberg. The species is now believed to be extinct in these regions. | Unlikely. No recent records from the Miles region and preferred habitat does not occur within the study area. |

**Notes**: 1) Listed as Critically Endangered (CE), Endangered (E), Vulnerable (V), Special Least Concern (SL) under the EPBC Act and/or NC Act
3) Likelihood of occurrence:

| | | | | | |
|---|---|---|---|---|---|
| 1 | High Likelihood | • Known resident in the Study area based on site observations, database records, or expert advice; and/or,<br>• Recent records (i.e. within five years) of the species in the local area (VBA 2011); and/or,<br>• The Study area contains the species' preferred habitat. | 2 | Moderate Likelihood | • The species is likely to visit the Study area regularly (i.e. at least seasonally); and/or,<br>• Previous records of the species in the local area (DSE 2011b); and/or,<br>• The Study area contains some characteristics of the species' preferred habitat. |
| 3 | Low Likelihood | • The species is likely to visit the Study area occasionally or opportunistically whilst en route to more suitable sites; and/or,<br>• There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,<br>• The Study area contains few or no characteristics of the species' preferred habitat. | 4 | Unlikely | • No previous records of the species in the local area; and/or,<br>• The species may fly over the Study area when moving between areas of more suitable habitat; and/or,<br>• Out of the species' range; and/or,<br>• No suitable habitat present. |

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