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CALLIDE SOLAR POWER STATION PROJECT

ATTACHMENT A: EPBC REFERRAL IMPACT ASSESSMENT

PREPARED FOR EDIFY ENERGY

DOCUMENT TRACKING

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Contents

Tables

Figures

Acronyms

Term	Acronym
Commonwealth Department of Climate Change, Energy, the Environment and Water	DCCEEW
Construction Environmental Management Plan	CEMP
***Environment Protection and Biodiversity Conservation Act 1999* (Cth)**	EPBC Act
Matters of National Environmental Significance	MNES
Operational Environmental Management Plan	OEMP
Threatened Ecological Community	TEC
Term	**Description**
Avoidance Footprint	The areas that have been avoided due to environmental value and/or sensitivity. No activities under the Proposed Action will be undertaken in these areas. This area covers 94.4 ha.
Disturbance Footprint	The areas where activities under the Proposed Action may be undertaken. These areas may be directly and/or indirectly impacted by the Proposed Action and include areas of permanent works and temporary works. This area covers 412 ha.
Project Area	The area that encompasses the Disturbance Footprint and the Avoidance Footprint. This area covers 516.4 ha.

1 Introduction

Edify Energy are proposing to construct and operate a solar power station near Biloela in Central Queensland. The Callide Solar Power Station Project (the Proposed Action) will establish a 200 MW Solar Photovoltaic (PV) Farm with a 200 MW/800 MWh Battery Energy Storage System (BESS) in a site (the Project Area) located approximately 7 kilometres (km) North-east of Biloela. It is expected that the Proposed Action will supply renewable energy to the broader Banana Shire and Central Queensland region, via interconnection to the National Electricity Market's transmission network. The Proponent also intends to co-locate sheep grazing with the Project Area following construction of the solar facility.

The Proposed Action will have a lifespan of approximately 50 years. This will be facilitated through a lease arrangement with the landowner, with the possibility of extension. At the conclusion of the lease, the solar and energy storage facility will be decommissioned, and the land returned to its original state.

The Proposed Action location and scope was considered to be the most appropriate and feasible option for the following key reasons:

- The close proximity to Callide Power Station enables the efficient connection to the grid, without the need for additional extensive infrastructure
- The Project Area has suitable access with surrounding road network, removing requirements to construct new roads or extensive access points
- The Project Area is comprised predominantly of non-remnant vegetation, has low environmental value and minimal biodiversity constraints
- The existing use of the site (dryland cropping) supports the dual use of the Proposed Action (power generation/storage and agriculture) and provides opportunity to improve the long-term agricultural sustainability of the land. The Project Area can then be returned to sole agriculture use at the end of the life of the Project.
- The proximity to Biloela (7 km south-west) supports the socio-economic value of the Proposed Action, providing both short and long-term employment opportunities in both renewable energy and agriculture, and further expanding the renewable energy and sheep grazing industries in the region

The following chapter provides some useful context and background to this report, including:

- The purpose of this document
- Key elements of the approach taken to the impact assessment
- A general description of the environment within and surrounding the Project Area

1.1 PURPOSE OF THIS DOCUMENT

This document provides an EPBC significant impact assessment to support the Callide Solar Power Station EPBC referral and should be read in conjunction with the associated referral documentation.

1.2 APPROACH TO THE IMPACT ASSESSMENT

The EPBC Act significant impact assessment documented in this report is based on best available data and addresses all relevant legislative considerations and policy information.

This section provides a brief outline of:

- The EPBC Act guidance that was used to inform the impact assessment for MNES potentially impacted by the Proposed Action
- The ecological data and literature used to inform the assessment.

1.2.1 KEY POLICY DOCUMENTS

SIGNIFICANT IMPACT GUIDELINES

The *Matters of National Environmental Significance – Significant impact guidelines 1.1* (DEWHA, 2013) provide the overarching guidance to determine whether an action is likely to result in a significant impact to an MNES and if referral under the EPBC Act is required.

The assessment of significant impacts for listed threatened species and TECs draws on the following key concepts from these guidelines (DEWHA, 2013):

- A population – relevant to species listed as Endangered or Critically Endangered
- An important population – relevant to species listed as Vulnerable
- Habitat critical to the survival of a species or ecological community
- Important habitat for migratory species
- Ecologically significant proportion of the population of a migratory species

These key concepts are defined in Table 1 below and have been used when undertaking the impact assessments provided in Section 4.

Table 1: Key concepts for assessing significant impacts under the EPBC Act

Significant impact concept	**Definition as per** (DEWHA, 2013)
A population of a threatened species	*A 'population' is an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:* • *a geographically distinct regional population, or collection of local populations; or* • *a population, or collection of local populations, that occurs within a particular bioregion*
An important population of a threatened species	*An 'important population' is a population 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.*
Habitat critical to the survival of a species or ecological community	*Habitat critical to the survival of a species refers to areas that are necessary:* • *for activities such as foraging, breeding, roosting, or dispersal;* • *for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);* • *to maintain genetic diversity and long term evolutionary development; or* • *for the reintroduction of populations or recovery of the species or ecological community.* *Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/ or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.*
Important habitat for migratory species	*An area of 'important habitat' for migratory species is:* • *habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or* • *habitat that is of critical importance to the species at particular life-cycle stages; and/or* • *habitat utilised by a migratory species which is at the limit of the species range; and/or* • *habitat within an area where the species is declining.*

Ecologically significant proportion	*Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns (for example, site fidelity and dispersal rates).*
Population of a migratory species	*'Population', in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.*

REFERRAL GUIDELINES/GUIDANCE

A number of listed species, or groups of species, have referral guidelines or policies which provide more species-specific guidance to determine whether an action is likely to result in a significant impact to an MNES and if referral under the EPBC Act is required. These guidelines are designed to be read in conjunction with the *Matters of National Environmental Significance – Significant impact guidelines 1.1*, discussed above.

There is species-specific referral guidance relevant to MNES for this assessment. This is the *Referral guidance for the endangered Koala* (DCCEEW, 2023). This guidance provides recommendations on the referral and assessment of the Koala, including the process to determine impacts, reduce impacts, and the definition of a significant impact.

CONSERVATION ADVICE AND RECOVERY PLANS

Species or ecological communities that are listed as threatened under the EPBC Act are subject to various strategies to assist in recovery, including conservation advice and recovery plans.

The relevant conservation advice and recovery plans have been considered when undertaking the impact assessments provided in Section 4. For the purpose of these assessments, the conservation advice and recovery plans have:

- Provided useful background and context for threatened species assessments
- Helped to provide further species-specific definition around some of the key significant impact concepts listed above
- Formed important reference documents to confirm that the proposed action aligns with the conservation and recovery objectives of the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)

THREAT ABATEMENT PLANS

Threat abatement plans provide details of actions to reduce the impact of a key threatening process, such as research or management strategies. The Minister may decide whether a threat abatement plan is required for a threatening process that is listed under the EPBC Act

The relevant threat abatement plans have been considered when undertaking the impact assessments provided in Section 4. For the purpose of these assessments, the threat abatement plans have provided useful reference documents to confirm that the proposed action aligns with the relevant strategies or objectives of DCCEEW in addressing Australia's key threatening processes.

1.2.2 KEY DATA TO SUPPORT THE ASSESSMENT

MNES surveys consisting of desktop assessments and on-ground surveys of the Project Area and surrounds were conducted by Eco Solutions & Management (Eco Solutions & Management, 2024). An overview of these surveys is provided below. Further results of these surveys are discussed throughout the referral documentation (including this document) where relevant. For full details of the ecological survey methods and results, refer to (Eco Solutions & Management, 2024).

DESKTOP ASSESSMENTS

Desktop assessment of the Project Area and surrounds were undertaken prior to each of the on-ground surveys (see below). The desktop assessments involved a review of all relevant environmental databases, aerial photography, mapping, spatial layers, scientific journals, books, technical reports and legislation (Commonwealth, State and Local) to identify the ecological values that potentially occur within and surrounding the Project Area.

ON-GROUND SURVEYS

An initial terrestrial ecology field survey occurred on the 30th of August 2023, with a subsequent survey undertaken on the 12th of December 2023 (Eco Solutions & Management, 2024). An overview of these surveys is provided below, with full details provided in Eco Solutions & Management, 2024.

Vegetation and flora surveys

The initial survey in August 2023 assessed vegetation in accordance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.*, 2023). Quaternary vegetation assessment sites in regrowth or potential remnant vegetation were undertaken throughout the site and vegetation communities which were identified as potentially forming part of an EPBC listed threatened ecological community were assessed against the condition thresholds in the applicable Conservation Advice.

The results of the August surveys were used to identify potential habitat for threatened flora species to inform the need for subsequent targeted surveys. Potentially suitable habitat for three EPBC listed threatened species was identified within the Project Area:

- *Solanum dissectum*
- *Solanum johnsonianum*
- *Xerothamnella herbacea*

Targeted surveys during optimal seasonal conditions in potential habitat for these species were conducted on the 12th of December 2023 (Eco Solutions & Management, 2024).

Fauna habitat assessment

The initial survey in August 2023 (discussed above) also considered potential habitat for threatened fauna species. Habitat quality was assessed based on a set of criteria which categorised vegetation into low, moderate or high habitat quality.

Results of the habitat quality assessments were used to determine the likelihood of occurrence for EPBC listed threatened fauna species within the Project Area and determine the requirement for targeted surveys. Limited potential habitat for threatened fauna species was identified within the Project Area and therefore targeted fauna surveys were not considered necessary (Eco Solutions & Management, 2024).

1.3 GENERAL DESCRIPTION OF THE ENVIRONMENT

1.3.1 CURRENT LAND USE, VEGETATION AND CONDITION

The Project Area has been historically cleared and is actively used for cropping. The majority of the Project Area therefore comprises non-native vegetation (Eco Solutions & Management, 2024). Figure 1 provides a map of the Project Area.

Recent field surveys of the Project Area confirmed the presence of remnant native vegetation confined to a small patch in the central eastern portion of the Project Area. This patch is identified as Regional Ecosystem 11.9.5 (*Acacia harpophylla* and/or *Casuarina cristata* open forest woodland on fine-grained sedimentary rocks) and comprises of Brigalow (*Acacia harpophylla)* with scattered emergent Poplar Box (*Eucalyptus populnea*) and a sparse shrub layer comprised primarily of native species including Wilga (*Geijera parviflora*), Stiff Denhamia (*Denhamia oleaster*), Scrub Boonaree (*Alectryon diversifolius*) and Peach Bush (*Ehretia membranifolia*). The ground layer predominately comprises of exotic grass species including Buffel (*Cenchrus ciliaris*) and Green Panic (*Megathyrsus maximus*). This patch of native vegetation is approximately 5.4 ha in size and is fragmented from other areas of vegetation (Eco Solutions & Management, 2024).

The remainder of the Project Area (511 ha) is comprised of non-remnant vegetation. The majority of this non-remnant vegetation is comprised of introduced species for dryland cropping. A first order watercourse (ephemeral) and several drainage lines intersect the Project Area (see Figure 1) with a groundcover dominated by Feathertop Rhodes Grass (*Chloris virgata*). Buffel Grass was typically confined to the upper banks. Small sections of theses drainage lines also support narrow fringing bands of non-remnant vegetation comprising Brigalow and Sally Wattle (*Acacia salicina*), with a dense ground cover of Green Panic and occasional Poplar Box (*Eucalyptus populnea*). These patches of fringing vegetation are significantly fragmented and narrow along the watercourse and drainage lines (Eco Solutions & Management, 2024).

1.3.2 HABITAT AND MNES OCCURRENCE

No threatened flora species were identified during recent field surveys. One EPBC listed threatened ecological community (TEC), Brigalow (*Acacia harpophylla* dominant and co-dominant) (Endangered) was identified within the Project Area. Approximately 1.4 ha of the Brigalow TEC was recorded within the patch of RE 11.9.5 discussed above (see Figure 2) (Eco Solutions & Management, 2024). Refer to Section 4.1.2 for further detail on the TEC.

All other threatened flora species and ecological communities identified by the EPBC Protected Matters Search Tool (PMST) conducted for the Project Area were considered unlikely to occur within the Project Area.

No threatened or migratory fauna species were recorded during field surveys. The surveys identified 21.8 ha of potential dispersal habitat for the Koala (*Phascolarctos cinereus*) (Endangered) in the Project Area (see Figure 2). This potential habitat is primarily associated with the patch of RE 11.9.5 and Brigalow TEC, and patches of non-remnant vegetation along the drainage lines which intersect the site. Refer to Section 4.1 for further detail on Koala occurrence and habitat.

All other threatened fauna species identified by the EPBC Protected Matters Search Tool (PMST) conducted for the Project Area were considered unlikely to occur within the Project Area.

Generally, the habitat present in the Project Area is of low habitat quality due to historical clearing and continued cultivation and cropping. The field surveys identified three main habitat types present within the Project Area:

- The small patch (5.4 ha) of remnant native vegetation, partly comprised of Brigalow TEC (1.4 ha). The patch is considered to be of low habitat quality for threatened species. This patch supports some habitat features such as sparse tree hollows, and fallen timber, hollow logs, and areas of deep leaf litter in low to moderate abundance. However, it is a small patch and is fragmented from other areas of vegetation
- Watercourse and vegetated drainage lines (non-remnant). These areas are considered to be of low habitat quality. Habitat features such as fallen timber, tree hollows and leaf litter are sparse to absent. Additionally, the patches are significantly fragmented and narrow
- Two constructed farm dams. These areas are considered to be of low habitat quality. The dams occur in cleared locations and do not support mature fringing vegetation

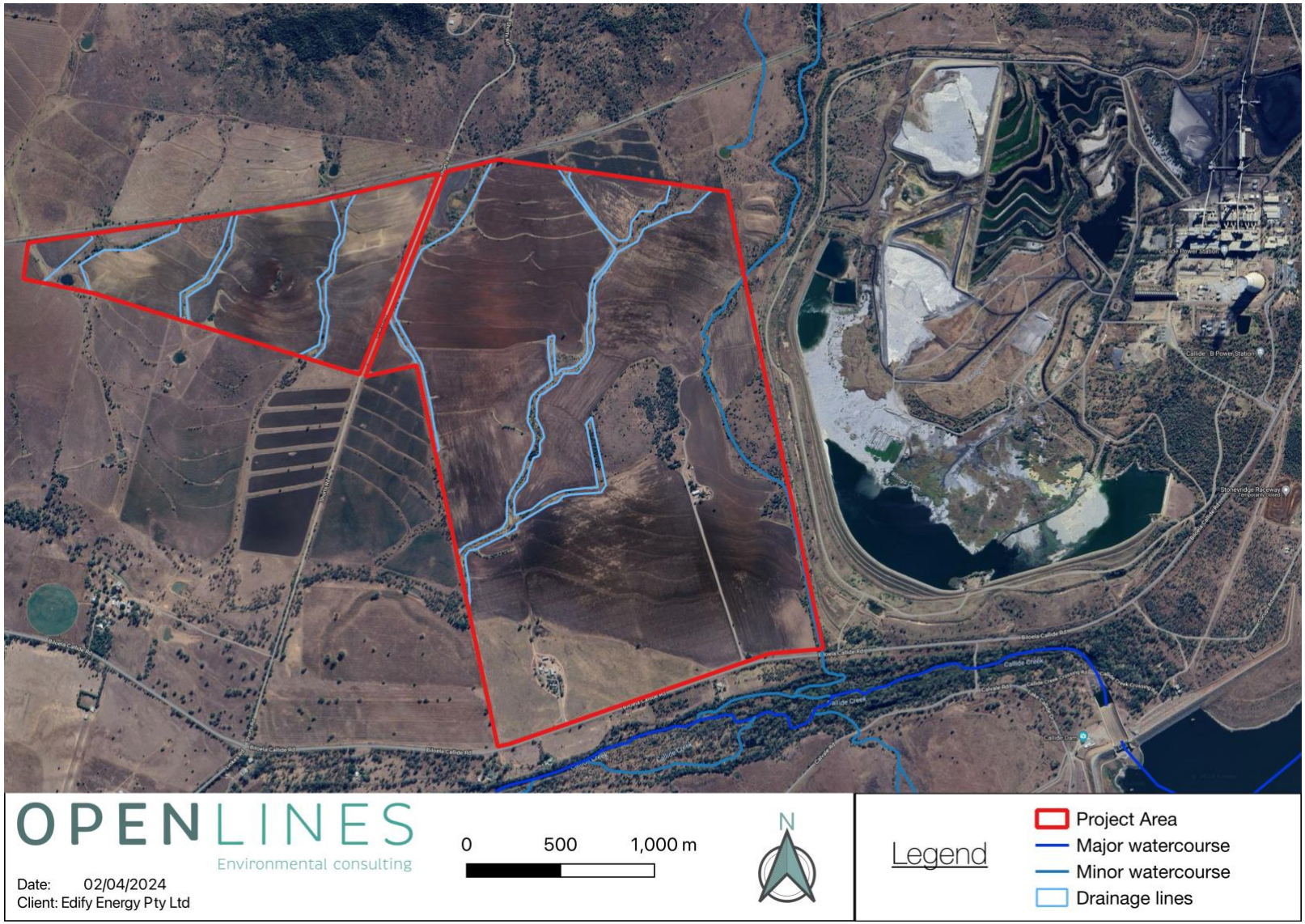

Figure 1: Project Area and locality

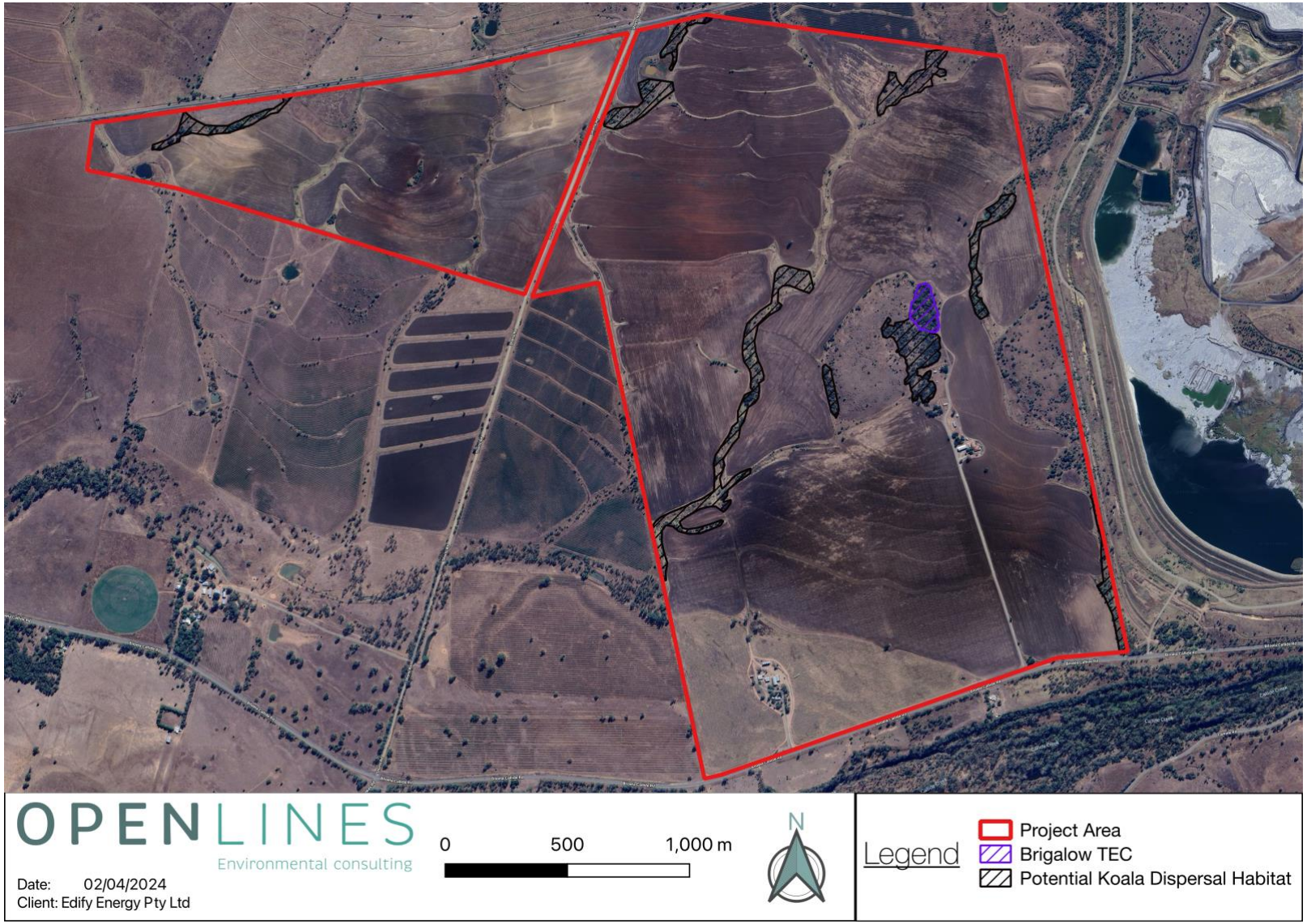

Figure 2: TEC and habitat occurrence within the Project Area

2 Potential impacts

This section outlines the type and nature of potential impacts that may occur as a result of development under the Proposed Action. The purpose of this section is to identify and describe the full range of potential impacts that have been considered and assessed as part of the detailed impact assessment for each MNES presented in Section 4. They include:

- Two potential direct impacts, including vegetation clearance, and direct injury or mortality of fauna as a result of the proposed action
- Seven potential indirect impacts, related to edge effects, water runoff and sedimentation, barriers to movement and the potential introduction of disease

Section 3 provides details of the avoidance, mitigation and management measures that have/will be undertaken to avoid and minimise these impacts.

2.1 DIRECT IMPACTS

The nature and extent of the potential direct impacts from the Proposed Action are identified below.

The extent and severity of impacts from potential direct impacts have been considered on a species or community specific level in the significant impact assessments (see Section 4).

2.1.1 VEGETATION CLEARANCE

The Proposed Action will result in the removal and clearing of vegetation for construction, operation and decommissioning of the Callide Solar Power Station. The maximum extent of clearing and direct disturbance is 412 ha (the Disturbance Footprint). The vegetation to be cleared is non-remnant, largely degraded and fragmented and represents low value to MNES (see Section 4).

The remaining areas within the Project Area comprise of the Avoidance Footprint (see Section 3.1 for further details) and an existing transmission easement (the Easement). The Easement is operated by Powerlink Queensland and comprises approximately 9.9 ha running east-west through the middle of the Project Area. Activities within the Easement associated with the Proposed Action will be limited to supporting ancillary infrastructure (road/track crossings and cabling) and will not include hard stand or other built infrastructure including solar panels. Key environmental values, where they exist within the Easement will also be avoided as part of the Proposed Action (see Section 3.1).

Table 2 provides the extent of the total Project Area including the Disturbance Footprint, Avoidance Footprint and Easement. Figure 3 provides a map of the Project Area and footprints.

Table 2: Project Area and footprint extent

Disturbance Footprint (ha)	Avoidance Footprint (ha)	Easement (ha)	Project Area (ha)
412	94.4	9.9	516.4

2.1.2 DIRECT FAUNA INJURY OR LOSS

Activities associated with construction and operation of the Proposed Action can result in injury or mortality of threatened fauna species that may occur within or adjacent to the Project Area. These activities and impacts include but are not limited to:

- Injury or mortality during vegetation clearance activities and earthworks (e.g. felling trees or removing ground cover)
- Collision with traffic and machinery that moves to/from and within the Project Area
- Entrapment of fauna including within holes/trenches for building foundations, and within or between buildings/equipment
- Collision or entanglement with fences or other components of the Proposed Action

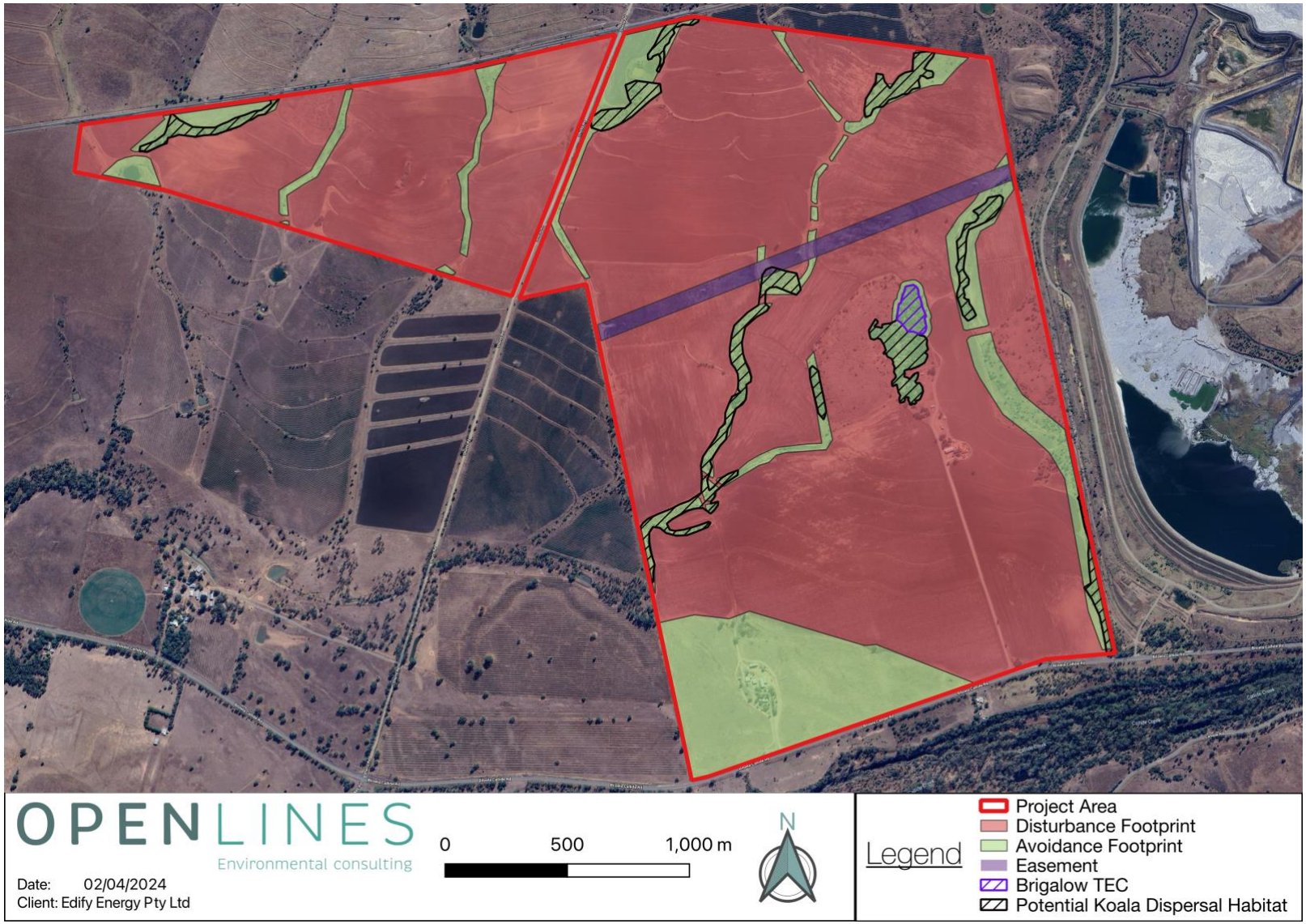

Figure 3: Project Area and footprints with TEC and Koala habitat extent

2.2 INDIRECT IMPACTS

Table 3 identifies each indirect impact type that may occur as part of the Proposed Action and the nature, extent, and duration of these impacts (prior to the implementation of mitigation measures – see Section 3.2).

Assessment of the indirect impacts for the Koala and Brigalow TEC has been provided in the significant impact assessments (see Section 4).

Table 3: Indirect impact types and nature, extent and duration of indirect impacts associated with the Proposed Action (prior to the implementation of mitigation measures)

Potential indirect impact type	Nature of potential indirect impact	Extent/general location of potential indirect impact and/or high-risk areas	Duration of potential indirect impact
Hydrological / soil disturbance	The Proposed Action may result in changes to surface water flows and water quality due to construction and infrastructure disrupting natural flows; the introduction of pollutants particularly associated with construction; and soil erosion/disturbance.	Drainage lines, waterways, wetlands and flood-prone areas within or downstream of the Project Area.	Generally short-term
Spread of disease / pathogens	Spread of pathogens may occur from livestock, contaminated clothing and equipment or surface water runoff from the Proposed Action.	Native vegetation and habitat within or adjacent to the Project Area.	Potential long-term
Introduction and / or spread of weeds	Invasive weed species may be introduced or spread via contaminated vehicle or personnel movements or introduced through sheep grazing. This can be exacerbated by edge effects due to vegetation clearance, surface water run-off and changed fire regimes.	Native vegetation and habitat retained within or adjacent to the Project Area.	Potential long-term
Predation / competition by pest species	The Proposed Action may result in increased predation and competition of species by pest fauna. Rubbish or movements mainly associated with construction has the potential to attract pest fauna to the site.	Habitat retained within or adjacent to the Project Area.	Generally short-term
Altered fire regimes	Native vegetation within and surrounding the Project Area will be susceptible to fires that may be caused by construction or operation of the Proposed Action. Fires may be caused by the use of machinery and equipment that generate sparks and the use or production of flammable chemicals.	Native vegetation and habitat retained within or immediately adjacent to the Project Area.	Potential long-term
Noise, vibration, dust and light pollution	Noise, vibration, dust and light pollution may be created mainly due to construction machinery and activities. This has the potential to impact species and their habitat, particularly adjacent to the Project Area. If impacts are substantial, this can result in reduced habitat availability due to reduced occupancy of impacted habitat.	Habitat retained within or adjacent to the Project Area.	Generally short-term
Fauna displacement, fragmentation and barriers to movement	Reduced movement and connectivity between habitat areas for fauna species due to the introduction of new barriers or fragmentation of habitat.	Habitat intersected by development or clearance that poses a barrier to movement or accessibility.	Potential long-term

3 Avoidance and mitigation of impacts

This section provides details of the avoidance, mitigation and management measures that have/will be undertaken to avoid and minimise the impacts identified in Section 2. Section 4 provides detailed impact assessments for each MNES that have the potential to be impacted by the Proposed Action.

3.1 AVOIDANCE

The locations of the Disturbance Footprint and avoided areas (the Avoidance Footprint) (see Figure 3) were determined after consideration of a number of factors and constraints, including evidence of environmental value for MNES identified during recent site surveys. The purpose of this process was to avoid any key MNES habitat values within the Project Area and reduce the potential for environmental impacts. The surveys confirmed that:

- Vegetation and habitat are sparse throughout the Project Area as it has been historically cleared and currently subject to dryland cropping
- Habitat within the Project Area is limited to small sections of the watercourse and drainage lines that intersect the Project Area, and one isolated patch in the central eastern section of the Project Area
- The habitat is generally of low environmental value for species, including the Koala
- Areas surrounding the Project Areas, to the north and south, provide higher value habitat for the Koala, including more of their preferred habitat attributes in better condition

Based on these observations, the Avoidance Footprint was established to avoid the following:

- The entire patch (5.4 ha) of native vegetation in the central eastern portion of the Project Area which comprises of RE 11.9.5 (*Acacia harpophylla* and/or *Casuarina cristata* open forest woodland on fine-grained sedimentary rocks). This area contains 1.4 ha of EPBC listed Brigalow TEC and may provide potential dispersal habitat for Koala
- A 20 m buffer around edges of the Brigalow TEC where it interfaces with development (to minimise the risk of edge effects/indirect impacts, see Section 3.2 below)
- The watercourse and drainage corridors that intersect the site to ensure potential use of these areas as dispersal habitat for the Koala is maintained. Avoidance of these corridors will also maintain existing hydrological flows within the Project Area

The Avoidance Footprint covers 94.4 ha (see Table 2). Narrow crossings of the watercourse and drainage lines will be required for access across the Project Area. These areas have been excluded from the Avoidance Footprint, and instead form part of the Disturbance Footprint (see Figure 3). These tracks/crossings will:

- Utilise existing crossings where available
- Be constructed to retain the natural hydrology of these areas
- Be constructed in a way which maintains landscape connectivity for species movement, including the Koala.

Key environmental values within the Easement which includes watercourse and drainage corridors that contain areas of potential Koala dispersal habitat will also be avoided.

The Avoidance Footprint will therefore ensure that potential habitat and environmental values (including Brigalow TEC and koala dispersal habitat) will remain within the landscape, and connectivity through the Project Area will be maintained.

3.2 MEASURES TO REDUCE IMPACTS

Measures to mitigate impacts of development on MNES will be implemented through a Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP) which will be developed for the Proposed Action. The CEMP and OEMP will detail the mitigation measures that will be implemented, including any relevant species-specific measures, and will be developed prior to implementation of the Proposed Action.

Table 4 provides an overview of the management measures that will be implemented for the Proposed Action, based on the impacts identified in Section 2. The management actions proposed here, including control and management of weeds and pests, are expected to lead to improvements in the habitat values and condition of the Brigalow TEC within the Project Area.

Table 4: Potential impacts and mitigation measures

Potential impact	Mitigation measure
Vegetation clearance	• Clearing will only occur within approved Disturbance Footprints • Pre-clearance assessments for native fauna will be undertaken prior to any clearing of native vegetation • No-go zones will be established around any active fauna habitat features to be retained • A suitably qualified person will monitor all clearing works and undertake relocation of flora and/or fauna species where required • A tree felling protocol will be implemented to avoid impacts to species relying on trees that are to be cleared • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint • Sheep exclusion fencing will be erected to prevent access to Brigalow TEC to mitigate potential impacts to native vegetation
Inadvertent impacts on adjacent habitat or vegetation	• Vegetation to be retained will be clearly marked • Equipment laydown and parking areas will not be located within the Avoidance Footprint • Temporary fencing will be erected to manage inadvertent impacts on adjacent natural areas • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint
Hydrological and soil disturbance	• All stormwater discharged from the Project Area will meet the requirements of the Capricorn Municipal Development Guidelines and the Queensland Water Quality Guidelines 2009 • An Erosion and Sediment Control Plan will be prepared and implemented in accordance with the *Capricorn Municipal Design Guidelines* throughout construction and operation • Development buffers of 4 metres from the centreline of drainage areas and 50 m from the centreline of watercourses will be maintained • Water sensitive urban design treatment will be utilised where required for potential increases in total suspended solids and nutrients as a result of increased impervious ground area • Hazardous materials will be provided and stored in sealed, labelled containers, without leaks and stored in bunded and ventilated storage facilities • All vehicles, plant and equipment will be inspected upon arrival to the site to ensure they are clean and authorised to be used on site. If any vehicle, plant or equipment does not pass inspection upon arrival, it will be removed for clean down and re-inspected prior to use on site • Access roads within the Disturbance Footprint will be constructed to match the existing terrain profile. This will ensure the existing flow regime remains as sheet flow and avoids areas of concentrated flow • Tracks/crossings within the watercourse and drainage lines will be constructed to retain the natural hydrology of these areas
Spread of infection and disease	• A biosecurity plan will be prepared and implemented to prevent or minimise biosecurity risks • Best practice site hygiene protocols will be implemented to minimise spread of infection/disease • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint

Introduction and / or spread of weeds	• Any imported soil or fill will be certified weed free and a Weed Hygiene Declaration will be provided in accordance with Queensland Government's Operational policy – Pest plant and pathogen spread prevention (QPW/2013/746) • Weed infestation in uncleared areas of the Project Area, including the Avoidance Footprint, will be managed as appropriate to reduce the severity of weeds and prevent further degradation of remaining vegetation • Weed hygiene procedures and management will be implemented to minimise the risk of further weed invasion/introduction • Vehicles and machinery will remain on approved and/or existing tracks throughout operation to limit the risk of weed incursion within undisturbed areas • Weeds of National Significance and on the National Environmental Alert List under the National Weeds Strategy will be managed and eradicated as required throughout the Project Area • Sheep exclusion fencing will be erected to prevent access to Brigalow TEC to mitigate potential weed introduction from sheep • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint
Pest fauna	• Property boundaries will have appropriate fencing to contain domestic animals within surrounding land and exclude cattle (and potentially other pest species) from the Project Area • Sheep exclusion fencing will be erected to prevent access to Brigalow TEC • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance footprint • All bins and waste disposals at the site will be covered and pest resistant
Altered fire regimes	• Personnel will undertake training in fire prevention and management • Cleared vegetation will not be burned unless approved • Bushfire Asset Protection Zones will be maintained within the Project Area and will not impact on surrounding vegetation • A Bushfire Management Plan will be prepared and implemented
Fauna disturbance due to noise, dust and light pollution	• Dust control measures will be implemented in accordance with the *Environmental Protection Act 1994* and compliant with the air quality objectives of the *Environmental Protection (Air) Policy 2019* • Construction activities will be limited to daylight hours (6:00am – 6:00pm). This will help limit potential noise impacts to fauna in adjacent habitat and reduce construction noise and light impacts for nocturnal fauna • High-intensity outdoor lighting will be designed/installed to avoid light spill into adjoining natural areas • Any outdoor lighting fixtures will be installed and maintained to prevent glare or light above those stated in Australian Standard 4282 - 1997 Control of the Obtrusive Effects of Outdoor Lighting • All vehicles and machinery will be serviced and maintained to minimise machinery noise and vibration • Vehicles will adhere to speed limits and only travel within defined areas to avoid excess dust production • Any material that may easily disperse during transport will be appropriately covered • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint

Fauna injury/mortality, displacement, and barriers to movement	• Construction traffic will only travel on clearly defined access and egress points to and from a development site to avoid remnant wildlife corridors and native vegetation communities • All construction personnel will undergo induction training on MNES fauna values and vehicle speed limits • Vehicles will adhere to speed limits and only travel within defined areas • Daily site inspections will be undertaken to identify any trapped or injured fauna, and relocation or appropriate care will be provided as required • Site fencing will be constructed to meet Koala Permeable Fencing requirements in accordance with the *Koala Sensitive Design Guidelines* (DEHP, 2022), to enable entry, exit and movement for the species across the Project Area and broader landscape • Tracks/crossings within the watercourse and drainage lines will be constructed to retain the natural hydrology of these areas and maintain landscape connectivity and movement for the Koala

4 Significant impact assessments

The following sections provide a significant impact assessment for MNES that are known to occur, or have the potential to occur, within the Project Area. The significant impact assessments are based on best available data and addresses all relevant legislative considerations and policy information (see Section 1). The impact assessments have been informed by the results of the ecological assessments undertaken for the Proposed Action (see section 3.1 and 3.2) and consider the potential impacts identified in Section 2, along with the avoidance and mitigation measures described in Section 3.

4.1 KOALA (*PHASCOLARCTOS CINEREUS*) – LISTED THREATENED SPECIES

4.1.1 SPECIES OVERVIEW

The Koala (*Phascolarctos cinereus*) is listed as Endangered under the EPBC Act. The listed population has a wide but disjointed range across Queensland, New South Wales and the Australian Capital Territory, with suitable habitat often occurring as small to large patches across the landscape (DAWE, 2022a).

In much of Queensland, the species typically occurs as low-density populations across a variety of bioregions, including the Brigalow Belt. Koala occurrence is typically low density, fragmented and widespread across the landscape. The species is known to occur in much higher densities within bioregions of south-east Queensland and the Central Mackay Coast, which were significantly impacted by the bushfires of 2019/20 (DAWE, 2022a).

Koala habitat comprises a variety of vegetation types within Queensland including coastal forests, southern and central western sub-humid woodlands, and eucalypt woodlands adjacent to waterbodies in the semi-arid western parts of the state. Home ranges vary between 3 ha and 500 ha depending on the location.

The species forages only on the foliage of *Eucalyptus*, *Corymbia* and *Angophora* species, with specific preferences for certain species, often limited to one or two species at any given location. Habitat has been shown to be strongly dependent upon annual rainfall and distance to water. Refugial habitat is considered to be areas resilient to long term dry conditions such as woodland within riparian and drainage zones (DAWE, 2022a).

The *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (DAWE, 2022a) describes habitat for an individual Koala as any habitat that has *"sufficient quality food and shelter trees to meet their daily energetic requirements and reproductive needs, and a place to avoid predators"*, this includes:

- Areas of forest or woodland (remnant or non-remnant), particularly when a higher proportion of feed trees are present
- Trees on roadsides or railways, and paddock trees
- Ground between trees and patches that is safe for travelling
- Vegetated corridors or paddock trees used for dispersal between patches of vegetation

A population of Koala will require good quality habitat with a sufficient amount of resources to enable a balance of mortality, survival, and recruitment or recruitment increasing to optimal carrying capacity (DAWE, 2022a).

Habitat critical to the survival of Koala is defined as, *"areas that the species relies on to avoid or halt decline and promote the recovery of the species*", as per the conservation advice. This can include (DAWE, 2022a):

- Habitat likely to be used during periods of stress (e.g. flood, drought or fire), due to the availability of locally important Koala habitat trees
- Habitat used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns)
- Habitat used regularly by important populations
- Habitat necessary to maintain genetic diversity and long-term evolutionary development
- Habitat that is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements
- Whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation

- Any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community

Key threats to the Koala include:

- Climate change resulting in:
  - Reduced habitat
  - Increased intensity and / or frequency of drought, heatwaves and / or bushfire
  - Declining nutritional value of foliage
- Clearing and degradation of habitat
- Mortality from vehicles and dogs
- Koala retrovirus (KoRV) and Chlamydia (*Chlamydia percorum*)

4.1.2 OCCURRENCE WITHIN AND ADJACENT TO THE PROJECT AREA

The Koala is not known to use the Project Area. There are no historical records of the Koala and recent field surveys did not detect any evidence of habitat use.

There are a number of historical records within the vicinity of the Project Area. The most recent record within 10 km of the Project Area is dated 1997. Two historical records of the species occur within 3 km of the Project Area to the north (dated 1987 and 1997). The remaining records occur over 4 km from the Project Area (Eco Solutions & Management, 2024).

4.1.3 POTENTIAL HABITAT AND HABITAT VALUES WITHIN THE PROJECT AREA

The habitat value of the Project Area for the Koala is considered to be low due to minimal habitat features, and the patch size and level of fragmentation of the vegetation. Potential habitat for the Koala within the Project Area comprises a very sparse abundance of locally important feed trees. As a result, the Project Area is considered unlikely to provide any functional foraging habitat that could support the species in isolation (Eco Solutions & Management, 2024).

More suitable foraging and shelter habitat for the Koala is likely to occur outside of the Project Area, to the south along Callide Creek. A sizeable patch of potentially suitable habitat may also occur approximately 1 km to the north of the Project Area. On this basis, field surveys identified approximately 21.8 ha of potential Koala dispersal habitat within the Project Area that the Koala may use if travelling between Callide Creek and potential habitat to the north (see Figure 3). This habitat includes:

- The patch of remnant native vegetation (RE 11.9.5) / Brigalow TEC in the east of the Project Area
- Portions of non-remnant vegetation in the watercourse and drainage lines which contain isolated tree species that the Koala may use to move between the potential habitat areas identified to the north and the south of the Project Area (Eco Solutions & Management, 2024)

It is noted that this is considered to be a conservative assessment of the use and value of potential habitat within the Project Area for the Koala, given:

- The area mapped as north-south dispersal habitat is based on a conservative assumption that the potential habitat to the north of the Project Area supports suitable habitat for the Koala. There is no current evidence to support this
- There are no historical records or evidence of the species using the Project Area for dispersal and the species has not been recorded in proximity of the Project Area since 1997 (Eco Solutions & Management, 2024)

Table 5 below provides details of the areas of potential dispersal habitat for the Koala mapped within the Project Area. Figure 3 provides a map of the habitat within the Project Area.

Table 5: Potential Koala dispersal habitat within the Project Area

Disturbance Footprint (ha)	Avoidance Footprint (ha)	Easement (ha)	Total - Project Area (ha)
1.3	20.4	0.1	21.8

4.1.4 AVOIDANCE

The Avoidance Footprint has been designed to avoid potential habitat features and functions for the Koala. Avoidance decisions for the Project Area were focused on maintaining connectivity and the use of potential dispersal habitat by the Koala should the species seek to move between potentially suitable habitat to the north and south of the Project Area. This includes complete avoidance of the woodland patch in the central eastern portion of the Project Area which provides potential dispersal habitat for Koala, and avoidance of a majority of the potential dispersal habitat that occurs across the remainder of the Project Area; primarily within the watercourse and drainage lines.

The sections of the watercourse and drainage lines that will be utilised for tracks/crossings to enable access throughout the entire Disturbance Footprint (see Figure 1) were designed to avoid potential Koala dispersal habitat as much as possible. These tracks/crossings will be constructed to retain the natural hydrology of these areas and maintain landscape connectivity and movement for the Koala.

In total, the Avoidance Footprint will retain a minimum of 20.4 ha of potential dispersal habitat for the Koala (see Table 5 and Figure 3). Additionally, the 0.1 ha of potential Koala dispersal habitat that occurs within the Easement will also be avoided.

4.1.5 DIRECT IMPACTS

The Proposed Action is not expected to directly impact the Koala. Project design has ensured that the potential function of mapped dispersal habitat within the Project Area to facilitate movement of the species north-south is maintained.

The Proposed Action will lead to small-scale clearing of minor, fringing areas of this potential habitat, comprising up to around 1.3 ha of the 21.8 ha mapped within the Project Area. This clearing will not affect, interfere with or impede on the potential dispersal function of the mapped habitat (see Figure 3 and Table 5).

Direct impacts to habitat are therefore minimal and are mostly associated with the construction of the fencing and bushfire/access around the boundary of the Project Area and small sections of the drainage lines that will be utilised for tracks/crossings. The fencing and the tracks/crossings will be designed to retain the natural hydrology of these areas and maintain landscape connectivity and movement for the Koala.

While activities associated with construction and operation of the Proposed Action may have the potential to result in direct injury or mortality of Koalas should they occur within or adjacent to the Project Area, these potential impacts are considered unlikely to eventuate due to the remote chance that the species using the area and the management measures that will be implemented for the Proposed Action (see Section 3.2).

The activities and impacts that have been considered in this assessment include but are not limited to:

- Injury or mortality during vegetation clearance activities and earthworks (e.g. felling trees or removing ground cover)
- Collision with traffic and machinery that moves to/from and within the Project Area
- Entrapment of fauna including within holes/trenches for building foundations, and within or between buildings/equipment

The key management measures that will be implemented to mitigate these potential impacts include:

- Construction traffic will only travel on clearly defined access and egress points to and from a development site to avoid remnant wildlife corridors and native vegetation communities
- All construction personnel will undergo induction training on MNES fauna values including Koala and vehicle speed limits
- Vehicles will adhere to speed limits and only travel with defined areas
- Daily site inspections will be undertaken to identify any trapped or injured fauna including Koalas, and relocation or appropriate care will be provided as required
- Pre-clearance assessments for native fauna will be undertaken prior to any clearing of native vegetation
- No-go zones will be established around any active fauna habitat features to be retained
- A suitably qualified person will monitor all clearing works and undertake relocation of flora and/or fauna species where required

- A tree felling protocol will be implemented to avoid impacts to species relying on trees that are to be cleared

4.1.6 POTENTIAL INDIRECT IMPACTS AND MITIGATION

A number of potential indirect impacts to the Koala and/or its habitat have been considered, including:

- Predation by pest species (particularly dogs)
- Altered fire regimes
- Species displacement, fragmentation and barriers to movement

The nature, extent, and duration of indirect impacts (prior to the implementation of mitigation measures) is described in Section 2.2.

The management measures described in Section 3.2 will be implemented to mitigate potential indirect impacts to the Koala. The key management measures for Koala include:

- Site fencing will be constructed to meet Koala Permeable Fencing requirements in accordance with the *Koala Sensitive Design Guidelines* (DEHP, 2022), to enable movement for the species across the Project Area and broader landscape
    - Project Area security boundary fencing will be constructed to meet Koala-permeable fencing requirements provided in the guidelines, to achieve a permeable landscape at the regional and local scale, while still restricting livestock and other pests such as dogs as much as possible
    - Brigalow TEC stock (sheep) exclusion fencing will also be constructed to meet Koala-permeable fencing requirements provided in the guidelines
- Tracks/crossings will be constructed to retain the natural hydrology of the watercourse and drainage lines, and will maintain landscape connectivity and movement for the Koala
- Bushfire Asset Protection Zones will be maintained within the Project Area and will not impact on surrounding vegetation
- A Bushfire Management Plan will be prepared and implemented
- All bins and waste disposals at the site will be covered and pest resistant

4.1.7 SIGNIFICANT IMPACT ASSESSMENT

Table 6 below provides an assessment of potential impact of the Proposed Action on the Koala against the EPBC significant impact criteria. When considered against the criteria, the Proposed Action is unlikely to have a significant impact on the Koala.

Table 6: Assessment against the EPBC significant impact criteria - Koala

Significant impact criteria	Significant impact (yes / no)	Justification
Lead to a long-term decrease in the size of a population	No	Recent field surveys did not record the Koala or evidence of the Koala within the Project Area, and the species has not been recorded within proximity of the Project Area since 1997. Given the lack of records, and that the potential habitat within the Project Area is limited to small areas of fragmented dispersal habitat with a very sparse abundance of locally important feed trees, it is highly unlikely that the Project Area supports a population of Koala. Project design will also retain dispersal across the Project Area, ensuring movement for the species across the Project Area and broader landscape. Therefore, it is unlikely that the Proposed Action will lead to a decrease in the size of a population of Koala.
Reduce the area of occupancy of the species	No	The potential habitat for the Koala within the Project Area is not considered likely to support the species in isolation predominantly due to the very sparse abundance of locally important feed trees present and would only provide dispersal habitat for individual Koalas that may move between habitat to the north and the south of the Project Area. The extent of potential dispersal habitat clearing is minimal (1.3 ha), would not impede the dispersal function of any mapped habitat and would be considered negligible in relation to the areas of suitable habitat remaining in the Project Area and surrounding landscape, including the habitat to the north and south of the Project Area. Additionally, a majority of the potential dispersal habitat is avoided, including the entire isolated patch in the central eastern portion of the site. Movement for the species across the Project Area and broader landscape will also be retained through appropriate site fencing and tracks/crossings that will not act as barriers to movement for the species. Further, Koalas are not likely to be limited in their movements within the Project Area (but outside of the potential dispersal habitat), as the species is known to traverse land without significant barriers to movement. Hard stand will be minimal and the ground beneath the solar panels, access tracks and other ground areas could still be utilised by Koalas that may disperse across the Project Area. The Proposed Action is therefore unlikely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	No	As discussed, the Project Area is unlikely to support a population of Koala and movement for the species across the Project Area and broader landscape will also be retained. Therefore, it is unlikely that the Proposed Action will lead to fragmentation of an existing population.
Adversely affect habitat critical to the survival of the species	No	As per the conservation advice for the Koala (DAWE, 2022a), the Project Area could be considered to provide habitat critical to the survival of the species, as it contains potential dispersal habitat that may contribute to: • *"Habitat used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns)"* • *"Habitat that is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements"* It is noted that this is based on the assumption that vegetation north of the Project Area supports Koala habitat (Eco Solutions & Management, 2024).

		As discussed, clearing of dispersal habitat will be minimal (1.3 ha) and limited to small sections that will not fragment or reduce the capacity for the Koala move through the dispersal habitat. Connectivity of the potential dispersal corridors will also be maintained across the Project Area and broader landscape through appropriate site fencing. Additionally, Koalas are not likely to be limited in their movements within the Project Area (but outside of the potential dispersal habitat,) as the species is known to traverse land without significant barriers to movement. The Proposed Action is therefore unlikely to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	No	As discussed, the recent surveys did not identify the Koala or evidence of the Koala within the Project Area, there are no recent records within the Project Area and the Project Area is considered unlikely to support a population of the Koala. The habitat within the Project Are also comprises of only potential dispersal habitat and would not provide breeding habitat for the species. It is therefore unlikely that the Proposed Action will disrupt the breeding cycle of a population of Koala.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No	The potential dispersal habitat for Koala within the Project Area is already highly fragmented, mostly comprised of non-remnant vegetation and subject to existing impacts including dryland cropping. A majority of the habitat will also be avoided and the Proposed Action will retain dispersal across the Project Area, ensuring movement for the species across the Project Area and broader landscape. Therefore, it is unlikely that the Proposed Action will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to the endangered species becoming established in the endangered species' habitat	No	Both feral and domestic dogs are considered as a significant threat to the Koala, as they often attack, injure and/or kill Koalas, particularly during post-weaning dispersal (DAWE, 2022a). It is likely that wild dogs are already present in the area and the Proposed Action is unlikely to result in the establishment of any further dogs or other invasive species due to the implementation of weed and pest mitigation measures during construction and operation. Overall, it is therefore considered unlikely that the Proposed Action will result in invasive species that are harmful to the Koala becoming established in the species' habitat.
Introduce disease that may cause the species to decline	No	Koala retrovirus (KoRV) and Chlamydia (*Chlamydia percorum*) are both considered to be threats to the survival of the Koala. Although these diseases are present throughout the listed population, their impacts are considered to be exacerbated due to extreme weather (drought and bushfire), habitat loss and habitat fragmentation (DAWE, 2022a). As discussed, the Proposed Action is unlikely to impact a population of the Koala or significantly impact Koala habitat. It is therefore unlikely that the Proposed Action will introduce (or exacerbate) any disease that may cause the species to decline.
Interfere with the recovery of the species	No	The *National Recovery Plan for the Koala* (DAWE, 2022b) contains a set of objectives to achieve the overall goal of the recovery plan: *"To stop the trend of decline in population size of the listed Koala, by having resilient, connected, and genetically healthy metapopulations across its range, and to increase the extent, quality and connectivity of habitat occupied."* These objectives are: • The area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised then increased

		• The area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased • Metapopulation processes are maintained or improved • Partners, communities and individuals have a greater role and capability in listed Koala monitoring, conservation and management These objectives focus of maintaining and improving the current population and increasing their habitat quality, extent and connectivity. Given that the Project Area is unlikely to support a population of the Koala, the limited direct clearance of potential dispersal habitat (1.3 ha), retaining the species movement across the Project Area and broader landscape, and the availability of potentially suitable habitat in the surrounding landscape, it is unlikely that the Proposed Action will interfere with the recovery of the Koala.

4.2 BRIGALOW (*ACACIA HARPOPHYLLA* DOMINANT AND CO-DOMINANT) – THREATENED ECOLOGICAL COMMUNITY

4.2.1 TEC OVERVIEW

Brigalow (*Acacia harpophylla* dominant and co-dominant) Threated Ecological Community (Brigalow TEC) occurs in Queensland and New South Wales (DoE, 2013). Within Queensland, core remnants of Brigalow TEC occur in the Brigalow Belt North Bioregion and the Brigalow Belt South Bioregion (DCCEEW, 2024). The dominant species of the TEC, Brigalow (*Acacia harpophylla*) is a distinctive shrub or tree with silver foliage (DoE, 2013).

Brigalow TEC has been historically, extensively cleared and now exists predominantly as fragmented patches across its range. This often includes patches within modified landscapes such as within cleared paddocks and along roadsides. Current threats to the TEC include (DCCEEW, 2024):

- Clearing and fragmentation due to mining and other developments
- Weed incursion which causes substantial declines in the diversity of native plant species in Brigalow communities. The most significant weeds that threaten the TEC are pasture grasses such as Buffel Grass
- Altered fire regimes, particularly where weed invasion is present due to changes in fuel load and fire intensity
- Pest fauna such as livestock and both native and feral herbivores including cattle, feral pigs and goats
- Climate change influencing temperature, rainfall, fire frequency/intensity and flood frequency/intensity

Buffer zones around existing patches are important to mitigate impacts to the TEC from surrounding land use (DoE, 2013).

For vegetation to be considered as Brigalow TEC in the Queensland Brigalow Belt Bioregion, it must meet the description of one of twelve district Regional Ecosystems (REs) as defined by the Queensland Herbarium. Additionally, vegetation must meet specific condition thresholds to be considered as Brigalow TEC. These thresholds determine that (DoE, 2013a; Eco Solutions & Management, 2024):

- The patch must be 0.5 ha or more in size
- Exotic perennial plant cover must not exceed 50 per cent
- The patch must not have been comprehensively cleared within the last 15 years

The conservation advice for Brigalow TEC defines areas critical to the survival of the Brigalow TEC as any patches that meet the key diagnostic characteristics and condition thresholds for the ecological community; including the buffer zones, particularly where they include native vegetation (DoE, 2013).

4.2.2 OCCURRENCE WITHIN THE PROJECT AREA

Recent field surveys identified a patch of RE 11.9.5 on the eastern side of the Project Area (see Section 1.3.1). Approximately 1.4 ha of this vegetation community met the condition thresholds outlined above to be classified as a patch of the TEC. Figure 3 provides a map of Brigalow TEC within the Project Area.

The canopy of the Brigalow TEC patch was comprised of Brigalow with scattered Poplar Box (*Eucalyptus populnea*). The shrub layer of the patch was sparse and comprised mostly of native species Wilga (*Geijera parviflora*), Stiff Denhamia (*Denhamia oleaster*), Scrub Boonaree (*Alectryon diversifolius*) and Peach Bush (*Ehretia membranifolia*). The Ground layer was mostly exotic including Green Panic, and Buffel Grass (Eco Solutions & Management, 2024).

Tree hollows within the patch were sparse and limited to the scattered Poplar Box trees. Other habitat features such as fallen timber, hollow logs, and deep leaf litter were present in low to moderate abundance (Eco Solutions & Management, 2024).

No other patches of Brigalow TEC were identified within or adjacent to the Project Area.

4.2.3 AVOIDANCE

The Avoidance Footprint has been designed to avoid any patches of Brigalow TEC that occur within the Project Area. As such, the entire 1.4 ha patch of Brigalow TEC, with an additional 20 m buffer zone will be avoided and contained within the Avoidance Footprint. The entirety of the adjacent patch of RE 11.9.5 will also be avoided within the Avoidance Footprint (see Figure 3).

The Avoidance Footprint will ensure that existing Brigalow TEC will remain within the landscape, and broader landscape connectivity will be maintained for adjacent patches of vegetation, waterways and drainage lines that may have ecological functions associated with the Brigalow TEC. Additionally, the proposed management actions (see 3.2 below) including control and management of weeds and pests may lead to improvements in the condition of the Brigalow TEC within the Project Area.

Brigalow TEC will not be subject to any direct clearance or removal as a result of the Proposed Action, as the entire patch including a 20 m buffer zone will be avoided. Any accidental direct clearing or damage to the TEC will be prevented by the mitigation measures implemented for the Proposed Action (see Section 3.2). This includes:

- Establishment of a 20 m buffer around the border of the Brigalow habitat which will form part of the Avoidance Footprint
- Clearing will only occur within approved Disturbance Footprints
- Vegetation to be cleared will be clearly marked
- Equipment laydown and parking areas will not be located within the Avoidance Footprint
- Temporary fencing will be erected to manage inadvertent impacts on adjacent natural areas
- Sheep exclusion fencing will be erected to prevent access to Brigalow TEC

4.2.4 POTENTIAL INDIRECT IMPACTS AND MITIGATION

A number of potential indirect impacts to Brigalow TEC have been considered in relation to the Proposed Action, in particular the following:

- Introduction and / or spread of weeds
- Impacts from pest species
- Altered fire regimes

The potential nature, extent, and duration of indirect impacts (prior to the implementation of mitigation measures) is described in Section 2.2.

The management measures described in Section 3.2 will be implemented to appropriately mitigate the potential for these indirect impacts to affect the Brigalow TEC. The key management measures for Brigalow TEC include:

- A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint
- Sheep exclusion fencing will be erected to prevent access to Brigalow TEC to mitigate potential weed introduction, soil compaction or plant consumption by sheep
- Property boundaries will have appropriate fencing to contain domestic animals within surrounding land and exclude cattle (and potentially other pest species) from the Project Area
- Any imported soil or fill will be certified weed free, and a Weed Hygiene Declaration will be provided in accordance with Queensland Government's Operational policy – Pest plant and pathogen spread prevention (QPW/2013/746)
- Weed infestation in uncleared areas of the Project Area, including the Avoidance Footprint, will be managed as appropriate to reduce the severity of weeds and prevent further degradation of remaining vegetation
- Weed hygiene procedures and management will be implemented to minimise the risk of further weed invasion/introduction
- Vehicles and machinery will remain on approved and/or existing tracks throughout operation to limit the risk of weed incursion within undisturbed areas
- Weeds of National Significance and on the National Environmental Alert List under the National Weeds Strategy will be managed and eradicated as required throughout the Project Area
- Personnel will undertake training in fire prevention and management
- Cleared vegetation will not be burned unless approved
- Bushfire Asset Protection Zones will be maintained within the Project Area and will not impact on surrounding vegetation
- A Bushfire Management Plan will be prepared and implemented

4.2.5 SIGNIFICANT IMPACT ASSESSMENT

Table 7 below provides an assessment of potential impact of the Proposed Action on Brigalow TEC against the EPBC significant impact criteria. When considered against the criteria, the Proposed Action is unlikely to have a significant impact on Brigalow TEC.

Table 7: Assessment against the EPBC significant impact criteria – Brigalow TEC

Significant impact criteria	Significant impact (yes / no)	Justification
Reduce the extent of an ecological community	No	Recent surveys of the Project area identified a 1.4 ha patch of Brigalow TEC within the Project Area. The entirety of this patch will be avoided and therefore retained in the landscape. Additionally, mitigation measures will be implemented to mitigate any accidental clearing or impacts that could cause a reduction in the extent of the TEC. This includes establishment of a 20 m buffer zone around the patch of Brigalow TEC that will be protected within the Avoidance Footprint. Therefore, it is unlikely that the Proposed Action will reduce the extent of Brigalow TEC.
Fragment or increase fragmentation of an ecological community	No	As discussed, the entire patch of Brigalow TEC within the Project area will be avoided and not subject to direct clearance, and any potential direct and indirect impacts will be appropriately managed through implementation of the mitigation measures. The Avoidance Footprint will also ensure that broader landscape connectivity will also be maintained for adjacent patches of vegetation, waterways and drainage lines that may have ecological functions associated with the Brigalow TEC. Therefore, it is unlikely that the Proposed Action will fragment or increase fragmentation of Brigalow TEC.
Adversely affect habitat critical to the survival of an ecological community	No	As per the conservation advice for Brigalow TEC, the entire 1.4 ha patch plus the 20 m buffer zone is considered to be habitat critical to the survival of an ecological community. As discussed, the entire patch of Brigalow TEC including the buffer area will be avoided and not subject to direct impacts, and any potential direct and indirect impacts will be appropriately managed through implementation of the mitigation measures. It is therefore unlikely that the Proposed Action will adversely affect habitat critical to the survival of Brigalow TEC.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	No	As discussed, the entire patch of Brigalow TEC including the 20 m buffer zone within the Project area will be avoided and not subject to direct clearance. The Avoidance Footprint will ensure that broader landscape connectivity will also be maintained for adjacent patches of vegetation, waterways and drainage lines that may have ecological functions associated with the Brigalow TEC. Potential direct and indirect impacts which include impacts to soil and hydrology will be appropriately managed through implementation of the mitigation measures described in Section 3.2, in particular: • All stormwater discharged from the Project Area will meet the requirements of the Capricorn Municipal Development Guidelines and the Queensland Water Quality Guidelines 2009 • An Erosion and Sediment Control Plan will be prepared and implemented in accordance with the *Capricorn Municipal Design Guidelines* throughout construction and operation • Development buffers of 4 metres from the centreline of drainage areas and 50 m from the centreline of watercourses will be maintained

		• Water sensitive urban design treatment will be utilised where required to for potential increases in total suspended solids and nutrients as a result of increased impervious ground area • Hazardous materials will be provided and stored in sealed, labelled containers, without leaks and stored in bunded and ventilated storage facilities • All vehicles, plant and equipment will be inspected upon arrival to the site to ensure they are clean and authorised to be used on site. If any vehicle, plant or equipment does not pass inspection upon arrival, it will be removed for clean down and re-inspected prior to use on site • Access roads within the Disturbance Footprint will be constructed to match the existing terrain profile. This will ensure the existing flow regime remains as sheet flow and avoids areas of concentrated flow • Tracks/crossings within the watercourse and drainage lines will be constructed to retain the natural hydrology of these areas It is therefore unlikely that the Proposed Action will modify or destroy abiotic factors necessary for survival of the Brigalow TEC.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	No	As discussed, the entire patch of Brigalow TEC within the Project area will be avoided and not subject to direct clearance. Potential direct and indirect impacts which include changed fire regimes and other sheep grazing will be appropriately managed through implementation of the mitigation measures described in Section 3.2, in particular: • Sheep exclusion fencing will be erected to prevent access to Brigalow TEC to mitigate potential weed introduction, soil compaction or plant consumption by sheep • Personnel will undertake training in fire prevention and management • Cleared vegetation will not be burned unless approved • Bushfire Asset Protection Zones will be maintained within the Project Area and will not impact on surrounding vegetation • A Bushfire Management Plan will be prepared and implemented Therefore, the Proposed Action is unlikely to result in a substantial change in the species composition of Brigalow TEC present within the Project Area.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • Assisting invasive species, that are harmful to the listed ecological community, to become established, or	No	The Brigalow TEC within the Project Area exists within an already highly modified/degraded landscape due to historic land use and ongoing impacts including fragmentation of habitat, invasion of exotic weeds and grasses, and presence of pest species. The ground layer of the TEC was mostly exotic and comprised of pasture grasses including Green Panic, and Buffel Grass which are significant threatening weeds for Brigalow TEC. A number of mitigation measure will be implemented to mitigate further impacts from invasive fauna species, weeds and mobilisation of fertilisers, herbicides or other chemicals or pollutants, as described in Section 3.2. This includes but is not limited to the following: • A 20 m buffer will be established around the border of the Brigalow habitat which will form part of the Avoidance Footprint • Sheep exclusion fencing will be erected to prevent access to Brigalow TEC to mitigate potential weed introduction, soil compaction or plant consumption by sheep

• Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community		• Weed infestation in uncleared areas of the Project Area, including the Avoidance Footprint, will be managed as appropriate to reduce the severity of weeds and prevent further degradation of remaining vegetation • Weed hygiene procedures and management will be implemented to minimise the risk of further weed invasion/introduction • Hazardous materials will be provided and stored in sealed, labelled containers, without leaks and stored in bunded and ventilated storage facilities • Any material that may easily disperse during transport will be appropriately covered Therefore, the Proposed Action is unlikely to result in a substantial reduction in the quality or integrity of the Brigalow TEC present within the Project Area.

Interfere with the recovery of an ecological community	No	There is no adopted or made Recovery Plan for Brigalow TEC; however, the *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, 2013) identifies the following recovery and threat abatement actions:
		• Threat reduction and control
		  o Protect, preserve and prevent clearing of the TEC
		  o Mitigate severity of impact where clearing is unavoidable and appropriately offset
		  o Implement threat management for fire, weeds and pests
		  o Protect shrubby understorey and manage grazing pressure
		• Undertake land management
		  o Encourage land managers to balance production with conservation
		  o Undertake regeneration of high value regrowth sites and revegetation of degraded sites
		  o Increase the amount of the TEC managed for conservation
		  o Establish adequate buffer zones to protect remnants.
		  o Devise and implement water management, sediment erosion and pollution control and monitoring plans
		• Undertake management actions that help to increase the diversity of species and their abundance
		• Encourage woodland regeneration close to areas of existing woodland
		• Develop and propagate conservation information
		Given that the entire patch of Brigalow TEC including a 20 m buffer zone will be avoided and not subject to direct clearance, and any potential direct and indirect impacts will be appropriately managed through implementation of the mitigation measures; it is considered unlikely that the Proposed Action will interfere with the recovery of Brigalow TEC.

5 Conclusion

Based on the results of the significant impact assessments, the Proposed Action is unlikely to result in any significant impacts for MNES within or adjacent to the Project Area. Any potential indirect impacts will be mitigated and appropriately managed through implementation of the mitigation measures described above. The Proposed Action is therefore not expected to be a controlled action.

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