Review of Environmental Factors

Geurie Zone Substation

March 2025

Project No. 806993

Essential Energy

essentialenergy.com.au

Table 1: Revision History

VERSION	NATURE OF REVISION
Draft 01	Draft prepared for Essential Energy's Environmental Services peer review
Draft 02	Draft prepared for Essential Energy's Project Manager and Environmental Services Manager review
Final 01	Final prepared for Essential Energy determination

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Acronyms and Abbreviations

ACRONYM/ABBREVIATION	DETAIL
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ADSS	All-dielectric self-supporting. A type of fibre optic cable which is nonconductive, self-supporting and is capable of being erected under tension between supports.
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASS	Acid Sulfate Soils
AASS	Actual Acid Sulfate Soils
AEMO	Australian Energy Market Operator
BDAR	Biodiversity Development Assessment Report
CEMP	Construction Environmental Management Plan
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.
dB(A)	Decibels (A) weighted
DCCEEW (Cth)	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DCCEEW (NSW)	Department of Climate Change, Energy, the Environment and Water (New South Wales)
DPHI	Department of Planning, Housing and Infrastructure
DPE	Department of Planning and Environment (Former NSW Government Department)
DP	Deposited Plan
DRC	Dubbo Regional Council
EMF	Electric and Magnetic Fields
Environmental Aspect	Any element of an organisation's activities, products or services that can interact with the environment.
Environmental Impact	Any change in the environment whether adverse or beneficial, wholly or partially resulting from organisation activities, products or services.
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Reg	*Environmental Planning and Assessment Regulation 2021*

EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIs	Environmental Planning Instruments
ES Act	*Electricity Supply Act 1995*
ESD	Ecologically Sustainable Development
EWP	Elevated Work Platforms
FSC	Field Service Centre (Essential Energy)
FM Act	*Fisheries Management Act 1994*
GHG	Greenhouse Gas
Ha	Hectare
IPC	Independent Planning Commission
kV	Kilovolts
LALC	Local Aboriginal Land Council
Likelihood	A qualitative description of probability or frequency
LEP	Local Environmental Plan
LG Act	*Local Government Act 1993*
LGA	Local Government Area
mG	Milligauss
MVA	Mega Volt Amps
NES	National Environmental Significance
NO_x	Oxides of Nitrogen
NPW Act	*National Parks and Wildlife Act 1974*
PASS	Potential Acid Sulfate Soils
pHF	Field pH
pHFOX	Field pH peroxide test
POEO Act	*Protection of the Environment Operations Act 1997*
REF	Review of Environmental Factors
RF Act	*Rural Fires Act 1997*
Roads Act	*Roads Act 1993*
RMS	Roads and Maritime Service
SCADA	Supervisory control and data acquisition. A computer-based system for gathering and analysing real-time data to monitor and control equipment that deals with critical and time-sensitive materials or events.
SEE	Statement of Environmental Effects

SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SIS	Species Impact Statement
SWMP	Soil and Water Management Plan
T&I SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
WM Act	*Water Management Act 2000*

REF Approval Form

PROJECT AND PROPONENT DETAIL	
REF Name	Proposed Geurie Zone Substation
Project Number	806993
REF prepared by	Tim Haydon
Title	Environmental Senior Specialist
Qualifications	Bachelor of Environmental Science
Proponent Name	Essential Energy
Proponent Address	8 Buller Street, Port Macquarie NSW 2444

This Review of Environmental Factors (REF) assesses the potential impacts that may result from the proposed activities as outlined in "Description of the Proposal" section of this report.

Essential Energy is a state-owned corporation and is a determining authority as defined in the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal satisfies the definition of an 'activity' under the EP&A Act, and as such Essential Energy must assess and consider the environmental impacts of the proposal before determining whether to proceed. This REF has been prepared in accordance with Section 5.5 of the EP&A Act and Section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg). The EP&A Act requires Essential Energy to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. The EP&A Reg sets out environmental factors to be considered in making that assessment. If the activity is considered likely to significantly affect the environment, additional assessment requirements under the EP&A Act would be required.

Section 5.7 of the EP&A Act states that a determining authority shall not carry out an activity, or grant an approval in relation to an activity, that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, unless the determining authority has examined and considered an Environmental Impact Statement or Species Impact Statement in respect of the activity.

The REF has addressed the matters that are required to be considered by Part 5 of the EP&A Act, with the conclusion that if the activity is carried out as described, it is not likely to have a significant effect on the environment (including critical habitat) or threatened species, populations, ecological communities or their habitats, and accordingly an Environmental Impact Statement is not required. The mitigation strategies forming part of the activity are fully considered and discussed in the REF.

The activity was also assessed against the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). As the proposed activity will not have, and is not likely to have a significant impact on matters of national environmental significance, a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

The proposed activity is permissible under all relevant state and federal legislation, including the EPBC Act and the *Biodiversity Conservation Act 2016* (NSW).

Under *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) the activity is classified as development for the purpose of an electricity transmission or distribution network undertaken

by or on behalf of a public authority, and is hence permitted on the land without the requirement for development consent.

Declaration

The Review of Environmental Factors for the proposed activity has been assessed by Essential Energy.

Considering the assessment of the impacts, including Sections 1.7 and 5.5 of the Environmental Planning and Assessment Act 1979 and clause Section 171 of the Environmental Planning and Assessment Regulations 2021, it is concluded that:

- There is not likely to be a significant environmental effect as a result of the construction, operation and maintenance of the activity and an Environmental Impact Statement is not required; and
- A Species Impact Statement (SIS), or Biodiversity Development Assessment Report (BDAR) is not required.

AUTHOR DECLARATION	
I affirm that the information provided within this assessment is accurate to the best of my knowledge, belief and information	
REF prepared by	Tim Haydon
Signature	Tim Haydon Digitally signed by Tim Haydon Date: 2025.03.19 19:47:03 +11'00'
Title	Environmental Senior Specialist

PEER REVIEW DECLARATION	
I affirm that the information provided within this assessment is accurate to the best of my knowledge, belief and information	
Peer Review by	Nathan Hegerty
Signature	Nathan Hegerty Digitally signed by Nathan Hegerty Date: 2025.03.19 23:10:41 +11'00'
Title	Environmental Senior Specialist

PROJECT MANAGER REVIEW DECLARATION

The assessment has been reviewed and it is recommended that the Activity may now proceed subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Project Manager Review by	Pete van Niekerk
Signature	Peter van Niekerk Digitally signed by Peter van Niekerk Date: 2025.03.20 11:32:43 +11'00'
Title	Senior Program/Project Manager

DETERMINATION

Considering the assessment of the impacts, including sections 1.7 and 5.5 of the Environmental Planning and Assessment Act 1979 and clause section 171 of the Environmental Planning and Assessment Regulation 2021, it is determined that there is not likely to be a significant environmental effect as a result of the construction, operation and maintenance of the Geurie Substation. Neither an Environmental Impact Statement (EIS), nor SIS, nor BDAR is required.

The Activity may now proceed subject to obtaining and complying with the relevant approvals as identified in the REF and subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Brett Hayward
Digitally signed by Brett Hayward
Date: 2025.03.20 13:05:52 +11'00'

Determining Authority	Brett Hayward
Title	Environmental Services Manager

Executive Summary

Background/Justification

Essential Energy has a number of existing large customer to the west of Geurie and had recently received several new major connection applications/enquiries including:

- Maryvale Solar Farm
- Parkes Special Activation Precinct
- Future Mine Connections
- Other potential renewable energy projects

To cater for the known and expected connections, Essential Energy is proposing to design, construct, operate and maintain a new 132/11 kilovolt Zone Substation (ZS). The new ZS will also strengthen Essential Energy's existing electricity network in the broader area, as well as increase its capacity, which will help support future electricity connections.

The Proposal

The proposal comprises the construction, operation and maintenance of the proposed Geurie 132/11 kilovolt (kV) Zone Substation (ZS), located off Mitchell Highway, Geurie, New South Wales (NSW). This will encompass a disturbance footprint of approximately 220 metres (m) by 150m, encompassing approximately 33,000 square metres (m^2) or 3.3 hectares (ha) within a rural environment.

The proposed ZS will include the following elements:

One 132/11kV transformer bay, with one refurbished 132/11kV 15/18MVA power transformer

- 2 x 132kV Feeder Bays
- 2 x Future 132kV Feeder Bays
- High voltage switchgear operating at 132kV and 11kV
- Three prefabricated buildings (control, battery and telecommunications and switch rooms)
- Control equipment
- Underground cabling and associated conduits
- Auxiliary equipment and structures, including lightning masts, fencing and driveways.

Project options considerations

One option would be to refrain from undertaking any further development of the network in the area. The consequences of Essential Energy doing nothing would be that, as years passed, supply interruptions would occur more frequently and affect more people, and the electricity generated from the surrounding renewable energy infrastructure would not be as effectively distributed throughout the network. The do-nothing approach would not meet Essential Energy's network licence obligations to provide connection to renewable energy projects throughout the region.

The following factors determined the suitability of the preferred site:

- Adjoining the existing Geurie ZS

- Ability to utilise the existing access off the Mitchell Highway
- Proximity to the existing 94F 132kV feeder to the south
- Relative proximity to planned and approved renewable energy projects in the region
- Being predominantly located on an area subject to heavy modification and disturbance from agricultural activities
- Being on rural land with limited sensitive receptors
- Being outside of flood liable land
- Cost effectiveness by consolidating EE assets.

Statutory Planning and Legislation

Clause 2.44 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) applies to electricity transmission and distribution activities undertaken by an energy supply authority. Clause 2.44 states that development for the purpose of a transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without consent on any land, with additional requirements for land reserved under the *National Parks and Wildlife Act 1974*.

As the activity does not require development consent, Essential Energy is the designated determining authority. Additionally, whilst Essential Energy does not require development consent to undertake the proposed activity, it has an obligation under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to consider the environmental impacts of the activity.

Specifically, Essential Energy has a statutory obligation to examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of this activity. This REF has been prepared to facilitate the determination through consideration of the relevant factors specified in section 5.5 of the EP&A Act and clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg).

Environmental Impact Assessment

A number of potential environmental impacts associated with the project have been avoided or reduced to acceptable levels during the design development and assessment stages. However, the project may still result in some impacts including air quality (dust), noise, traffic, waste generation, Aboriginal archaeology, ecology and visual amenity during construction and operation, as outlined in **Section 6**. Management and mitigation measures to alleviate these impacts have been developed as part of this REF and would be implemented during construction and operation of the proposal. Notably, an AHIP is required to allow for salvage of three (3) Aboriginal artefacts identified within the proposal site. Cumulative impacts associated with future feeders, and other nearby developments, have been considered. These impacts will be minimised and would not be significant.

Considering the assessment of the impacts detailed in this REF, it is concluded that the proposed activity is not likely to have a significant impact on the environment. On balance, the project is justified on the basis of supporting increase in demand for electricity infrastructure, including those linked to the energy transition, and strengthening Essential Energy's electricity network in the broader area, whilst minimising potential environmental impacts.

1. Introduction

1.1 The Proposal

This Review of Environmental Factors (REF) assesses the potential environmental impacts associated with the construction, operation and maintenance of the proposed Geurie 132/11 kilovolt (kV) Zone Substation (ZS), located off Mitchell Highway, Geurie, New South Wales (NSW). The significance of impact has been determined and appropriate mitigation measures recommended.

1.2 Context and Justification of the Proposal

Essential Energy has received several new major connection applications/enquiries as well as existing large customers to the west of Geurie Region including:

- Maryvale Solar Farm
- Parkes Special Activation Precinct
- Future Mine Connections
- Other potential renewable energy projects

Essential Energy's network licence obligations set out requirements to provide connection to renewable energy projects throughout the region.

1.3 Network Investment Criteria

Network asset investment by Essential Energy is generally required to:

- Meet Essential Energy's duty of care
- Connect customers to the supply network
- Provide a satisfactory standard of supply to customers.

The overall performance of the network is driven by the reliability of individual network components and the redundancy provided by the network to enable maintenance of supply at times when critical parts of the network are out of service (due to maintenance or repair requirements). To maintain acceptable standards of customer service it is necessary to ensure:

- Infrastructure performance (reliability) is maintained at acceptable levels; and
- The network design provides adequate security (redundancy).

The reliability performance of equipment and infrastructure is managed through maintenance and replacement of that infrastructure and construction of new infrastructure. For Essential Energy, the decision to replace or construct new infrastructure is based on an assessment of equipment condition and consideration of the strategic needs of the network.

1.4 Proposal Objectives

The primary objective of the project is to design, construct, operate and maintain a new 132/11kV ZS, and provide connection to the Maryvale Solar Farm. The proposal will also strengthen Essential Energy's existing electricity network in the broader area. Secondary objectives associated with the project are to:

- Maximise social and economic benefits; and
- Minimise the environmental and social impacts.

1.5 Proposal Site

The proposed new 132/11kV Geurie ZS site is located in the central west of NSW. The nearest population centre is Geurie, located approximately 2.2 kilometres (km) to the northwest. The proposed new ZS site will be located off the Mitchell Highway, set back approximately 170 metres (m) from the nearest road edge (refer **Figure 1**). The new ZS site is currently located on land recognised as Lot 41 DP754313, with access track extension to occur within Lot 1 DP 1186092 and Lot 2 DP1186092. Ultimately, this lot will be subdivided to become owned by Essential Energy and house the ZS. The new ZS lot will be rectangular in shape, measuring approximately 220m by 150m, encompassing approximately 33,000 square metres (m^2) or 3.3 hectares (ha). It will accommodate all buildings, electrical plant, equipment and site drainage, forming "the proposal site" for the purposes of this assessment (refer **Figure 3**:). This newly created lot will share a boundary with the existing Geurie substation. Between the Mitchell Highway and the proposed substation site, the land has been utilised by Transport for NSW (TfNSW) as a stockpile site of excess fill, culverts and imported, quarry products.

Figure 1 shows the location of the proposal site in the regional context and **Figure 2**: shows the site within the immediately surrounding landscape.

The proposal site is located within the Dubbo Regional Local Government Area (LGA). The land is zoned RU1 – Rural under the *Dubbo Regional Local Environmental Plan 2022* (Dubbo Regional LEP).

An existing access track from the Mitchell Highway provides ingress and egress to the existing ZS site. This access will remain, with an extension to be constructed to access the proposed new ZS.

1.6 Study Area

The broader study area includes the predominately cleared, rural and partially vegetated areas, with sparse rural residential properties and existing road and powerline infrastructure in the general vicinity of the proposal site. Sensitive environmental areas within the broader region include waterways, biodiversity, Aboriginal and non-Aboriginal heritage, and other environmental values, that form part of the immediate surrounding landscape.

Figure 1: Regional context of proposal site

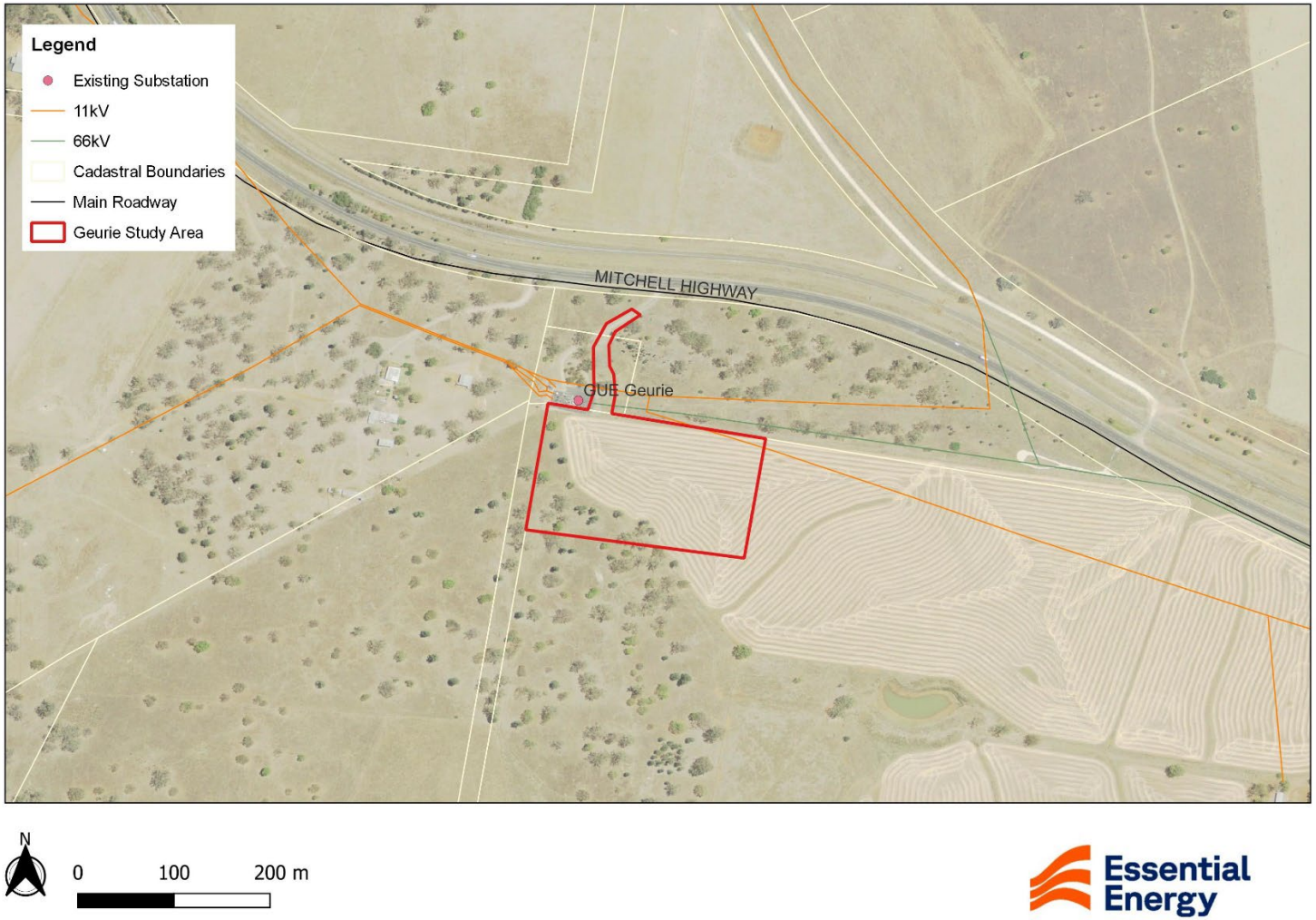

Figure 2: Study area and immediate surrounds

Plate 1 - View from western edge of proposal site looking north towards the existing substation

Plate 2 – view from western edge of proposal site looking south east towards the vegetated area and hillslope that will be excavated to supply fill material for the substation foundation

1.7 Purpose of the REF

The purpose of this REF is to document the assessment of potential environmental impacts of the proposal, and identify if there are likely to be any significant environmental impacts. It informs Essential Energy's determination of the proposal under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

2. Description of the Proposal

2.1 Scope of Works

The proposal includes the construction and operation of a new 132/11kV ZS. This will encompass a disturbance footprint of approximately 220m by 150m, an area of approximately 33,000 (m^2) or 3.3ha.

The general arrangement for the proposed substation is provided in **Figure 3**:. Further detail is provided in the civil design plans, and structural, building, footings, trenching and earth grid plans (**Appendix A**).

2.1.1 SITE ESTABLISHMENT

Site establishment works include:

- Installation of temporary construction fence around entire work area
- Installation and maintenance of erosion and sediment control measures
- Arrangement of suitable builder's power and water supply to site
- All vegetative matter to be cleared, grubbed and removed from the cut/fill area, strip topsoil and stockpile

2.1.2 CIVIL WORK

The civil works include:

- Bulk earth works for cutting and filling to create bench
- Excavation work for building/equipment footings
- Excavation and trenching work for installation of underground conduits for 132kV transformer and feeder cables
- Installation of site drainage, including stormwater pipes and pits
- Construction of access roads
- Earth grid
- Lightning protection
- High security fence

2.1.3 BUILDING WORK

Building works include:

- Foundations and concreting
- Piling
- Blockwork
- Structural reinforcing
- Installation of new control building, approximately 35m long by 15m wide by 15m tall. The building will have Colourbond walls, roof and guttering, all of neutral colouring
- Installation of power and lighting systems
- Installation of fire protection systems
- Installation of security system installation
- Installation of conduits, paths and all finishes as per design drawings.

Refer structural, building, and footings plans in **Appendix A**.

2.1.4 UNDERGROUND CONDUIT

Installation of all conduits as per design drawing and footing layouts (**Appendix A**).

2.1.5 EARTH GRID

Installation of earth grid and device risers as per earth grid plans (**Appendix A**).

2.1.6 OTHER ZS YARD WORK

- Construction of transformer bunds (**Appendix A**)
- Kerbing, and installation and pavement of driveways and runway (**Appendix A**)

2.1.7 ELECTRICAL WORK

2 x 132kV Feeder Bays, each bay includes:

- 1 x 132kV OH landing span structure.
- 1 x 132kV dead tank circuit breaker.
- 3 x 132kV voltage transformers.
- 2 x 132kV isolators with earth switches per isolator.
- 3 x 132kV surge divertors.

2 x Future 132kV Feeder Bays

1 x 132kV Bus Section Circuit Breaker

2 x 132kV Main Bus Sections

1 x 132/11kV Transformer Bay:

- Install 132/11kV 15/18MVA power transformer

11kV TX CB bay

Auxiliary supplies:

- Site 230/400v supplies to be supplied from the existing ATX's in the existing Geurie ZS site

11kV UG cable:

- 500mm2 AL 3 core cable to supply existing Geurie ZS.

Control Building including:

- Control room.
- Battery room.
- Communications room.
- Amenities.
- Air-conditioned telecommunications room.
- Storeroom
- Associated conductor and fittings
- Secondary control cabling.

2.1.8 COMMUNICATIONS

Installation of a duplicate RTU SCADA scheme and telecommunications equipment as per plans in **Appendix A**.

2.1.9 STAGING AREAS

The designated ZS lot will house all the construction equipment required for the activity.

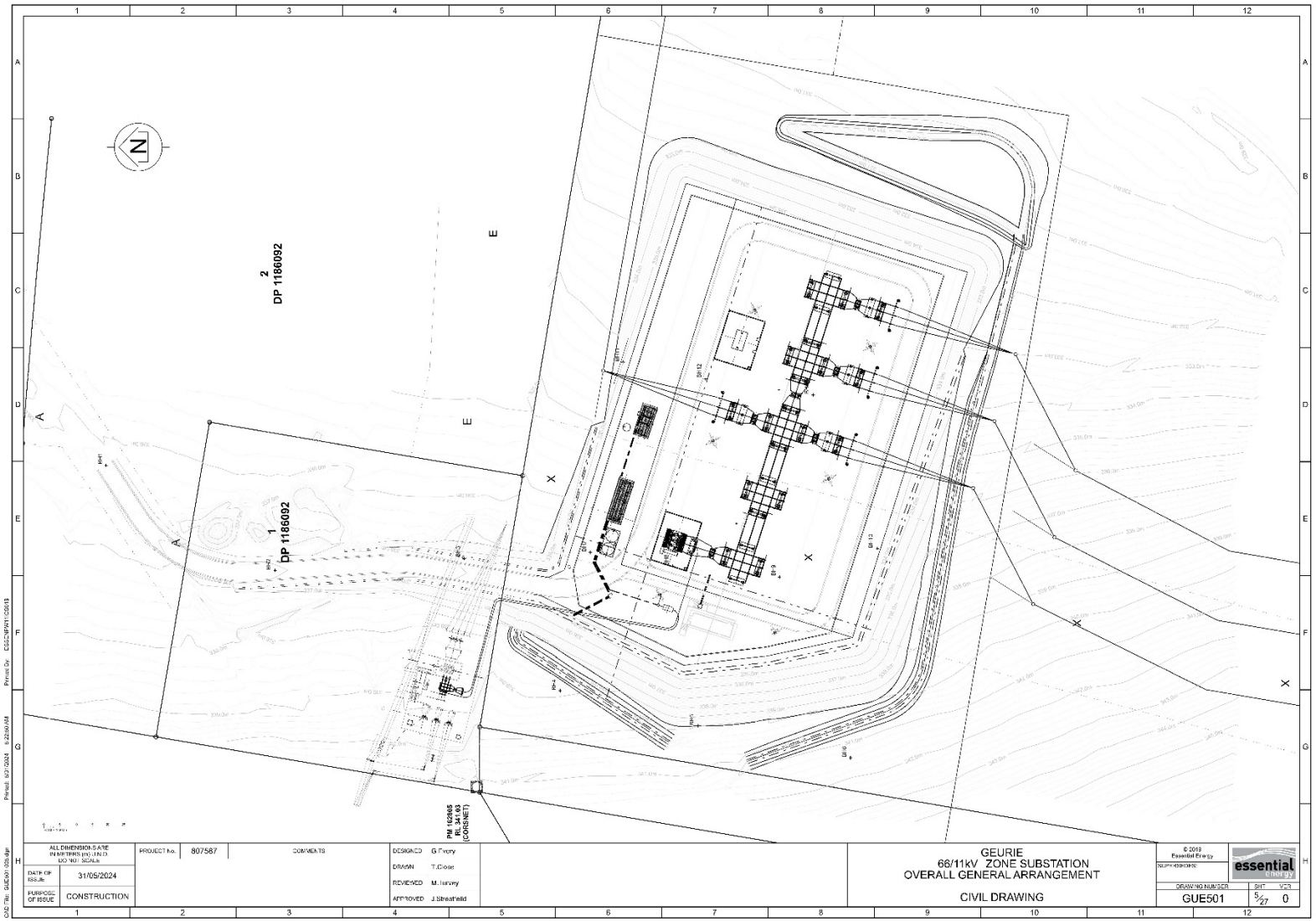

Figure 3: Geurie ZS General Arrangement

2.2 Design Criteria

The proposed new 132/11kV ZS will strengthen Essential Energy's existing electricity network in the broader area and enable a connection point for approved and proposed major projects within the area, including renewable energy generators.

Siting of the proposed ZS has been selected based on careful consideration to ensure the ZS is strategically located to ensure optimal and efficient delivery of electricity distribution infrastructure that minimises future land use conflicts. The design has also consolidated the electrical infrastructure adjacent to the existing Geurie ZS and nearby feeders. Direct views of the electricity substation will be partially obstructed by current vegetation within the road reserve of the Mitchell Highway. The design also avoids other sensitive and critical infrastructure within the immediate vicinity.

The design has been developed to meet the following criteria:

- Meet the design life requirements
- Be cost effective when assessed on a life cycle cost basis
- Be capable of being constructed cost-efficiently and within time constraints
- Provide durability and reliability of the intended function
- Minimise potential environmental impacts.

2.3 Building Code of Australia

Essential Energy's design standards for buildings and substations meet the requirements of the BCA where appropriate; and the relevant Australian standards (such as AS2067 2008 Substations and high voltage installations exceeding 1kV a.c.).

2.3.1 UTILITIES

The site will be serviced by an on-site wastewater treatment system. The existing on-site wastewater system for the existing Geurie ZS will be decommissioned and an upgraded system to service both will be installed. Water will be supplied by on-site water tanks.

2.3.2 FENCING AND SIGNAGE

Security of a substation is of paramount importance due to the extreme dangers which energised electrical equipment can pose to untrained individuals. Adequate security fencing will be provided. The fence will be designed in accordance with Essential Energy's zone substation security fencing requirements.

2.3.3 ACCESS AND PARKING

The proposal site will be accessed from the existing connection between the current Geurie ZS and the Mitchell Highway and an upgraded / proposed access track to the proposed new Geurie ZS. Car parking will be provided within the substation yard. The substation will be an unmanned facility. Adequate off-street parking is available.

2.4 Construction Activities

2.4.1 TIMING AND WORK HOURS

Construction work is expected to commence in early-mid 2025, and take approximately 13 months to complete, weather dependant.

The proposed ZS site location is considered a relatively remote site, being at least 180m away from the nearest sensitive residential receiver (herein referred to as R1). Work that has the potential to create an audible noise at the nearest sensitive receiver during construction, will be limited to between 7am and 6pm

Monday to Saturday. On occasions, works outside these hours may be undertaken where agreement with potentially impacted residents has been sought or the following requirements are met:

- Neighbours (and other sensitive receivers) adjacent to the works or the local council or the Environment Protection Authority (EPA) have been notified; and
- The works are justified on the basis that they are emergency works, or, because of supply security network outages or construction limitations, it is deemed that the works can only be achieved outside these hours.

2.4.2 RESOURCES AND EQUIPMENT

The following equipment is likely to be used on site to complete the work:

- Excavator
- Backhoe
- Elevated work platforms (EWP)
- Trucks
- Concrete trucks
- Cranes
- Grader
- Roller
- Bulldozer
- Concrete pump truck
- Forklift
- Under borers
- Bobcat
- Water truck
- Trencher
- Cable trucks
- Light vehicles.

2.4.3 IMPACT MITIGATION

The mitigation measures as detailed in **Section 6.17** form part of the proposed activity and will be implemented, as required, as part of the construction and operational phases.

2.5 Operation and Maintenance Requirements

Once the project is constructed, periodic maintenance will be required. Regular inspections of the infrastructure will be undertaken to help identify defects and hazards such as damaged components and vandalism. The site will not accommodate staff or contractors on a permanent basis. Periodic collection of waste may be required.

Likely maintenance activities include:

- Vegetation maintenance around perimeter of new ZS
- General landscape maintenance within the new ZS site
- Regular inspection and maintenance of ZS equipment

3. Consultation

3.1 Overview

Community consultation defines the processes we use to seek views or provide information about projects. The term consultation can describe processes ranging from simply delivering information to residents, community information displays, or holding meetings with community representatives designed to actively seek feedback from local communities into a particular project.

The population as a whole is more aware than ever of their social, environmental and economic needs. They want to know about what is planned for their area and how it would impact on them.

Incorporating community consultation as a key business practice is both a necessary and a desirable path for Essential Energy to take. It must be undertaken in good faith and be transparent in all activities.

Essential Energy has in place a policy for community consultation on all major projects. The policy ensures that the community is informed about proposed development, and that concerns and issues are taken into consideration.

3.2 Consultation Requirements under the T&I SEPP

Under the EP&A Act, Essential Energy is the determining authority for certain developments defined under the T&I SEPP as being permissible without consent. While the nature of work being undertaken does not require council consent, Division 1 of the T&I SEPP does provide consultation requirements with the local council where works are anticipated to impact upon council infrastructure, local heritage items, flood liable land and certain land within the coastal zone. In addition, consultation may be required with the State Emergency Service (flood liable land) and other specified public authorities in certain circumstances.

The proposed construction and operation of the new 132/11kV ZS will be limited to the designated lot for the ZS site. No connection to council stormwater network is proposed, with an onsite stormwater basin proposed. Sewer will be managed in an on-site wastewater system. This will require an approval under Section 68 of the *Local Government Act 1993* for the carrying out of a sewerage work. Water supply will be from an on-site 10,000L storage tank. As no connection to, or creation of a substantial impact to stormwater, water or sewerage system, consultation with the local council is not triggered under clause 2.10 of the T&I SEPP.

Some disruption to local roads may occur during the delivery of large plant and equipment during construction. The works are considered to be minor and inconsequential, will likely be undertaken under traffic control, and will not involve significant disruption of pedestrian or vehicle traffic. During operation, the site will be visited only on occasion and not generate significant volumes of traffic. Consultation with the local council is therefore not triggered under clause 2.10 of the T&I SEPP.

The proposal site is not located within a mapped area of local heritage, according to Dubbo Regional LEP. Consultation with the local council is therefore not triggered under clause 2.11 of the T&I SEPP.

The proposal site is not located on flood liable land (refer **Section 6.5.3**, and **Appendix A**). Consultation with the local council or State Emergency Services (SES) is therefore not triggered under clauses 2.12 and 2.13, respectively.

The proposal site is not located within the coastal zone. Consultation with the local council is therefore not triggered under clause 2.14 of the T&I SEPP.

The proposal is not located on land, or adjacent to land, that would trigger consultation with other specified public authorities under clause 2.15 of the T&I SEPP.

In addition to consultation requirements, additional notification and approval requirements are outlined in **Table 3**.

4. Project Alternatives

4.1 Do Nothing (Maintain Current Supply Infrastructure)

One option would be to refrain from undertaking any further development of the network in the area. The consequences of Essential Energy doing nothing would be that, as years passed, supply interruptions would occur more frequently and affect more people, and the electricity generated from the surrounding renewable energy infrastructure would not be as effectively distributed throughout the network. The do-nothing approach would not meet Essential Energy's network licence obligations to provide connection to its network.

4.2 Project Planning Considerations

The following factors determined the suitability of the preferred site:

- Adjoining the existing Geurie ZS
- Ability to utilise the existing access off the Mitchell Highway
- Proximity to the existing 94F 132kV feeder to the south
- Relative proximity to planned and approved renewable energy projects in the region
- Being predominantly located on an area subject to heavy modification and disturbance from agricultural activities
- Being on rural land with limited sensitive receptors
- Being outside of flood liable land
- Cost effectiveness by consolidating EE assets.

Post selection of the preferred site, geotechnical survey identified that material on site would be suitable for a cut/fill operation, thus reducing the requirement to import quarry product for the establishment of the ZS foundations.

5. Environmental Legislation

The following section addresses the regulatory and statutory context of the proposed activity including its definition, land use permissibility, and compliance with the relevant environmental planning instruments (EPIs).

5.1 Environmental Planning and Assessment Act, 1979 (EP&A Act)

The EP&A Act is the primary piece of legislation regulating land use planning in NSW. It provides the framework for the development of state and local planning instruments which, through their hierarchy, determine the statutory process for environmental impact assessment. Under the EP&A Act there are two distinct processes, which are:

- Part 4 - 'development' proposals which require consent, including state significant development; and
- Part 5, which regulates 'activities' and requires an approval by a determining authority (e.g. Essential Energy). Part 5 also includes an assessment pathway for state significant infrastructure.

The proposal can therefore proceed under Part 5, Division 5.1 of the EP&A Act, given the proposal:

- May be carried out without development consent
- Is not exempt development
- Would be carried out by a determining authority or requires the approval of a determining authority.

A determining authority, for the purposes of this activity, is defined in Part 5 of the EP&A Act to include, but not be limited to, a state-owned corporation within the meaning of the *State Owned Corporations Act 1989*. Essential Energy is listed as a state-owned corporation, and would therefore be the determining authority for the activity covered by this REF.

In accordance with state and local EPIs (described below), this REF has been prepared under Part 5, Division 5.1 of the EP&A Act to assess the possible environmental outcomes of the proposed activity. In determining the proposal and degree of impact, Essential Energy is required to consider Section 5.5 of the EP&A Act and clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg) which are summarised in **Section 9** of this REF.

In accordance with clause 171(4) of the EP&A Reg, Essential Energy is required to publish this REF on the NSW planning portal, as the capital value of the project will exceed $5 million, prior to the activity commencing.

5.2 Environmental Planning Instruments

EPIs regulate the permissibility to undertake an activity and the type of assessment process that is required. EPI is the generic term used to describe state environmental planning policies and local environmental plans (LEPs). EPIs that apply to this development are outlined below.

5.2.1 STATE ENVIRONMENTAL PLANNING POLICIES

5.2.1.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) consolidates and updates the planning process for new infrastructure. Subject to certain exemptions the T&I SEPP allows development for the purpose of an electricity transmission or distribution network to be carried out by or on behalf of an electricity supply authority or public authority without consent on any land.

Exemptions to this broad (on any land) application include developments which require Part 4 approval under *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) or activities

triggering designated development under *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazard SEPP).

The proposed activity falls within the scope of the T&I SEPP as being permissible without development consent.

Consultation requirements under the T&I SEPP are addressed in **Section 3.2**, whilst notification provisions are detailed in **Table 3.**

5.2.1.2 State Environmental Planning Policy (Planning Systems) 2021

State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) identifies state or regionally significant development, state-significant infrastructure, and critical state-significant infrastructure. It also provides for consideration of development delivery plans by local Aboriginal land councils in planning assessment, and allows the planning secretary to elect to be the concurrence authority for certain development that requires concurrence under nominated state environmental planning policies.

Chapter 2 of the Planning Systems SEPP identifies land which is State Significant Development (SSD), State Significant Infrastructure (SSI), Critical State Significant Infrastructure (CSSI), and Regionally Significant Development (RSD). Clause 2.6(1) of the Plannings Systems SEPP declares development to be SSD, pursuant to section 4.36 of the EP&A Act, if:

> *(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
>
> *(b) the development is specified in Schedule 1 or 2.*

The proposal does not meet the development specified in Schedule 1 or 2, and is permissible without consent pursuit to the T&I SEPP, as discussed in **Section 5.2.1.1.** The proposal therefore does not meet the requirements to be declared SSD.

Clause 2.13(1) of the Planning Systems SEPP declares development to be SSI, pursuant to section 5.12(2) of the EP&A Act, if:

> *(a) the development on the land concerned is, by the operation of a State environmental planning policy, permissible without development consent under Part 4 of the Act, and*
>
> *(b) the development is specified in Schedule 3.*

Clause 2.14 also declares development to be SSI, pursuant to section 5.12(4) of the EP&A Act, if the development is specified in Schedule 4 of the Plannings Systems SEPP.

The proposal is permissible without consent under Part 5 (Division 5.1) of the EP&A Act and does not satisfy the criteria for SSI under Schedule 3 or 4 of the Planning Systems SEPP. The proposal therefore does not meet the requirements to be declared SSI.

Clause 2.15 of the Planning Systems SEPP declares development to be CSSI if the development is specified in Schedule 5 of the Planning Systems SEPP —

> *(a) may be carried out without development consent under Part 4 of the Act, and*
>
> *(b) is declared to be State significant infrastructure for the purposes of the Act if it is not otherwise so declared, and*
>
> *(c) declared to be critical State significant infrastructure for the purposes of the Act The proposal does not meet the requirements to be declared CSSI.*

Clause 2.19 declares development to be RSD, pursuant to section 4.5(b) of the EP&A Act, if the development is specified in Schedule 6, generally above a certain value and requiring development consent. The proposal does not require consent and therefore there is no basis to be declared to be RSD.

5.2.1.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP), among other things, provides planning rules and controls for the clearing of native vegetation in NSW and the land use planning and assessment framework for koala habitat.

Vegetation removal is required to facilitate the proposed substation, and while the provisions relating to koala habitat do not apply to Part 5 assessments under the EP&A Act, potential impacts to koalas has been considered in **Section 6.5**.

5.2.2 LOCAL ENVIRONMENTAL PLAN (LEP)

LEPs are developed by councils (they become law only after Ministerial approval) and guide planning decisions for local government areas. According to the NSW Planning Group, now part of the NSW Department of Planning, Housing and Infrastructure (DPHI), LEPs, through zoning and development controls, allow councils to regulate the ways in which land is used. Council LEPs also list heritage items that are of local heritage significance.

The application of the T&I SEPP overrides the need to consider zoning controls, as developments covered by the T&I SEPP are permissible on any land without consent. However, the T&I SEPP provides consultation and notification provisions where activities are likely to substantially impact upon council-related infrastructure, or items of local heritage significance (refer **Section 3.2**).

5.3 Key Legislation

5.3.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (COMMONWEALTH) (EPBC ACT)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The EPBC Act lists nine matters of NES which must be addressed when assessing the impacts of a project. An assessment of how the project may impact on matters of NES is provided in **Table 2.**

Table 2: Matters of National Environmental Significance

MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	IMPACT
World heritage properties	There are no world heritage properties proximate to the proposed development, or that would potentially be affected by the proposal
National heritage places	There are no national heritage places proximate to the proposed development, or that would potentially be affected by the proposal
Wetlands of international importance	There are no Ramsar wetlands proximate to the proposed development, and the proposal is not likely to have a significant impact on the ecological character of a Ramsar wetland.
Commonwealth listed threatened species and ecological communities	The proposal is not expected to have any significant impact on threatened species, populations or ecological communities listed within Commonwealth (or State) legislation (refer **Section 6.5**)
Great Barrier Reef Marine Park	The proposal would not result in any impacts to the Great Barrier Reef Marine Park

Commonwealth listed migratory species	The proposal is not expected to have an impact on listed migratory species (refer **Section 6.5**)
Nuclear action	The proposal would not result in any nuclear action, nor would the activity require any nuclear action to be undertake
Commonwealth marine areas	There are no Commonwealth marine areas proximate to the proposed development, or that would potentially be affected by the proposal
Impacts on water resources resulting from large coal mining and coal seam gas developments	The proposal is not related to any large coal mining or coal seam gas developments. The project would not impact on water resources

5.3.2 BIODIVERSITY CONSERVATION ACT 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides the process for listing threatened species, threatened ecological communities, and areas of outstanding biodiversity value, and details the process for assessing impacts on those matters.

Section 1.7 of the EP&A Act requires that assessment of an activity must consider its impact on threatened species, threatened populations, and threatened ecological communities or their habitats in accordance with Part 7 of the BC Act. The assessment for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats, referred to in section 7.3 of the BC Act, determines whether the proposed works are likely to have a significant impact. If a significant impact is determined, a species impact statement (SIS) is required, or if the proponent so elects, a Biodiversity Development Assessment Report (BDAR) can be prepared.

The proposed new 132/11kV ZS site is not located within a declared area of outstanding biodiversity value. A significant impact on threatened species, populations, ecological communities, or their habitats as a result of the proposal is considered unlikely (refer to **Section 6.5** and **Appendix B**).

5.3.3 BIOSECURITY ACT 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for the prevention, elimination, minimisation and management of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers. Section 22 of the Biosecurity Act requires that any person who deals with biosecurity matter, or a carrier, and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing, has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised. This obligation is referred to elsewhere within the Biosecurity Act as the “general biosecurity duty”.

Given the excavation and disturbance of surface and sub soils associated with the proposed activity, Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by the potential for the introduction of weed species are prevented, eliminated or minimised.

5.3.4 ELECTRICITY SUPPLY ACT 1995

The *Electricity Supply Act 1995* (ES Act) establishes a comprehensive wholesale and retail market in electricity and regulates the network operations, wholesale trading, and electricity supply in the retail market. The ES Act confers special powers on Essential Energy in respect of development and maintenance of electricity infrastructure and sets out the licencing regime. In particular, it allows Essential Energy to trim and remove trees, carry out works on public roads, and acquire land.

The ES Act also requires that no works (other than routine repairs or maintenance works) may be carried out unless 40 days’ notice has been given to the local council to make a submission in relation to the proposal. Any submission must be considered by Essential Energy.

5.3.5 HERITAGE ACT 1977

The *Heritage Act 1977* (Heritage Act) provides for the protection of heritage items of local and state significance. Such items may include places, buildings, works, relics, moveable objects, or precincts with historical, scientific, cultural or aesthetic value to the state. Where works are likely to impact upon an item listed on the State Heritage Inventory (SHI), approval may be required under two sections of the Heritage Act:

- Section 60 approval relating to impacts on items listed on the SHI; and
- Section 140 approval requiring an excavation permit for activities with potential to excavate or disturb a relic.

As described in **Section 6.7.2** there is no foreseeable likelihood that an item listed on the SHI would be impacted by the proposal, therefore further assessment and a permit from the Department is not required. Further discussion of potential impacts and measures to minimise impacts to items of local heritage significance is provided in **Section 6.7**.

5.3.6 LOCAL GOVERNMENT ACT 1993

The *Local Government Act 1993* (LG Act) implements a commitment made under section 51 of the NSW Constitution Act 1902 that requires the continuance of local government. The LG Act provides the legislative framework in which local councils operate and encourages local participation in the affairs of local government.

Whilst the central focus of the LG Act is about the governance of local councils and the participation of the local community in its affairs, the LG Act also includes provisions for approval of certain works. In areas outside of the operation of the Sydney and Hunter Water Boards, local councils have the responsibility for the regulation of water supply, sewerage and stormwater drainage work.

According to section 68 of the LG Act, approval from local council is required for water supply work, sewerage work, and stormwater drainage work. Water supply work includes the extension of any pipes or fittings of any water services communicating or intended to communicate, directly or indirectly, with any water main of a council. Sewerage work includes not only works related to the sewer system, but also septic tank disposal systems.

The proposed site will be self-sufficient with regards to water supply, with a 10,000L storage tank proposed for use in amenities. No stormwater connection is required, with a stormwater basin proposed as part of the site infrastructure. As the proposal will require removal of the septic system for the existing ZS and installation of a new septic system for the old and new ZS, a section 68 approval will be required from the local council. This is to be obtained by the plumbing contractor.

5.3.7 LOCAL LAND SERVICES ACT 2013

The *Local Land Services Act 2013* (LLS Act) established Local Land Services, a government agency with the responsibility for providing advice on biosecurity, natural resources and agricultural advisory services in NSW. The LLS Act includes provisions for the regulation of native vegetation including the approval of certain activities.

Under the LLS Act, approval is required from the Minister for the Environment or delegate to clear native vegetation (exemptions apply). Exemptions include, but are not limited to, urban areas, electricity line maintenance and Part 5 activities under the EP&A Act.

The LLS Act is administered by the various local land services under delegated authority by the Minister for the Environment.

Given that the proposal will be assessed under Part 5, Division 5.1 of the EP&A Act, the provisions relating to the LLS Act are not applicable.

5.3.8 NATIONAL PARK AND WILDLIFE ACT 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides for the management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. It also provides for the protection and care of native flora and fauna, and Aboriginal places and objects throughout NSW. Under the NPW Act it is an offence, without authorisation, to:

- Harm an Aboriginal object or place without consent
- Pick or harm any plant or animal that is protected or is a threatened species, population or ecological community; or
- Damage any critical habitat, or habitat of a threatened species, an endangered population or an endangered ecological community or reserved land.

When an activity is likely to harm an Aboriginal object or place, approval under section 90 is required.

As described in **Section 6.6** and **Appendix C**, three (3) Aboriginal objects were identified during site investigations. The proposal will need to impact these locations and thus an Aboriginal Heritage Impact Permit (AHIP) under section 90 will be sought. Works are not to commence until the AHIP has been received. Works are to be undertaken in accordance with the conditions of the AHIP, once received.

The NPW Act also serves to direct the management and protection of reserved land. In relation to utility installations, the Minister for the Environment may grant easements or rights of way through reserved land for the conveyance or transmission of electricity.

The proposal site is not located on reserved land.

5.3.9 PROTECTION OF ENVIRONMENT OPERATIONS ACT 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) provides a framework for the licencing of activities that have potential to result in pollution of the environment. The POEO Act is administered by OEH. An environment protection licence is not required for the proposed activities as they do not fall within Schedule 1 of the POEO Act; however, the following restrictions apply:

- The proposal must not pollute waters
- Waste from the works must not be wilfully or negligently disposed of in a manner that harms or is likely to harm the environment
- Waste must not be transported to a place that cannot lawfully be used as a waste facility for that waste
- There must be no litter in or on a public place or an open private place caused by workers
- Any environmental incident that involves actual or potential harm to the health or safety of human beings or to ecosystems must be reported to the Environment Protection Authority (EPA)

During construction, there is the potential for discharge to surface waters from earthworks activities. A number of management strategies are available to Essential Energy for the discharge to surface waters and prevention of erosion and sedimentation, including development of a site-specific Erosion and Sediment Control Plan, and discharging water over grassed or well vegetated areas away from waterways. Waste will be managed so as to prevent non-compliance with this legislation and relevant regulations.

5.3.10 ROADS ACT 1993

The *Roads Act 1993* (Roads Act) provides for the ownership and management of public roads and also requires the consent of the appropriate roads authority for various works in respect of certain public roads.

Section 138 of the Roads Act requires the consent of the appropriate roads authority for various works in respect of public roads and classified roads. Under Schedule 2 (5) (1) of the Roads Act Essential Energy is exempt from obtaining approval for works on or over an unclassified road other than a Crown Road. However, works that require a connection to or crossing of a classified road must be approved by Transport for NSW (TfNSW).

The proposed activity will be limited to private property with existing connection off the Mitchell Highway. No work within, on, or over a classified road is required, therefore there is no requirement for a Section 138 approval from TfNSW.

5.3.11 WATER MANAGEMENT ACT 2000

The *Water Management Act 2000* (WM Act) governs the issue of new water licences and the trade of water licences and allocations for those water sources (rivers, lakes and groundwater) in NSW where water sharing plans have commenced. Under the WM Act, should water need to be extracted from a surface water or groundwater source, defined in gazetted water sharing plan, then four licence/approvals may apply, including:

- An access licence to obtain access to a share of the water source
- A water use approval to obtain permission for how the water would be used
- A water management works approval to obtain permission to install and use the works for water supply, drainage or flood mitigation work
- An activity approval, namely a controlled activity approval and/or aquifer interference approval.

The proposed activity would not trigger the need to obtain a water use approval or a water management works approval.

The proposal does not involve the taking of water from a surface water or groundwater source, however, a water licence is required whether water is taken for consumptive use or whether it is taken incidentally by the aquifer interference activity. For example, dewatering of groundwater during building construction activity requires a water licence (unless an exemption applies) even where that water is not being used consumptively as part of the activity's operation.

The WM Act defines an aquifer interference activity as involving any of the following:

> *(a) the penetration of an aquifer,*
>
> *(b) the interference with water in an aquifer,*
>
> *(c) the obstruction of the flow of water in an aquifer,*
>
> *(d) the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations,*
>
> *(e) the disposal of water taken from an aquifer as referred to in paragraph (d).*

An aquifer is defined as, *a geological structure or formation, or an artificial landfill, that is permeated with water or is capable of being permeated with water*.

Fortify Geotech (2024) identified that groundwater was not encountered in the 13 boreholes established to a minimum depth of 3m, and to a maximum of 10m below ground surface during geotechnical testing. Thus, it is not expected that groundwater will be within 3m depth of the existing ground surface levels. Fortify Geotech (2024) stated that permanent groundwater is expected to be below excavation depths, though did note that temporary, perched seepages could be encountered within more pervious alluvial soils following rainfall. It is therefore unlikely that the earthworks (including the cut fill operation and trenching activities) at the proposal site will intercept groundwater.

Clause 7 in Schedule 4 of the *Water Management (General) Regulation 2018* (WM General Regulation) provides an exemption for the taking of up to 3 megalitres (ML) of groundwater from a groundwater source by one or more of those activities in a water year, if the taking of that groundwater is not for the purpose of its consumption or supply and the activity is in connection with an authorised project. The taking of groundwater as it relates to the proposal would be from accumulated surface water in trenches or any groundwater that may arise with excavations following periods of rainfall, rather than interfering with a known aquifer and not for the purposes of consumption or supply. An authorised project includes an activity

to which Division 5.1 of the EP&A Act applies. It is highly unlikely that dewatering in excess of 3ML will be required. A water access licence exemption would therefore apply in the unlikely event of aquifer interference activity.

As such aquifer interference activity approval or water access licence is not required.

A controlled activity approval confers a right on its holder to carry out a specified controlled activity at a specified location in, on or under waterfront land. Under the WM Act, a controlled activity means:

> *a) the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*
>
> *b) the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*
>
> *c) the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*
>
> *d) the carrying out of any other activity that affects the quantity or flow of water in a water source.*
>
> *Waterfront land means—*
>
> *(a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or*
>
> *(a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or*
>
> *(a2) the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high-water mark of the estuary, or*
>
> *(b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high-water mark of the coastal waters,*
>
> *where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land.*

The proposal site is not within waterfront land. Nevertheless, were the works proposed in waterfront land Section 41 of the *Water Management (General) Regulation 2018*, identifies that Essential Energy, a public authority, is exempt from section 91E (1) of the WM Act in relation to all controlled activities that it carries out in, on, or under waterfront land. A controlled activity approval is therefore not required.

5.4 Summary of Licences, Permits, Approvals and Notifications

Specific approvals required for the construction, maintenance and operation of the proposal are outlined in **Table 3**.

Table 3: Summary of licences, Permits, Approvals and Notifications

LEGISLATION	AUTHORITY	REQUIREMENT
State Environmental Planning Policy (Transport and Infrastructure) 2021	Local Council and occupiers adjoining land	21 days notification required for works involving new or existing substations. Essential Energy's Design Services will be responsible for this notification.

		This notification was sent to DRC on the 6 June 2024. Response received identified no objection from a planning perspective, and the potential requirement for a permit to operate an on-site sewage management system was identified.
Electricity Supply Act 1995	Local Council	40 days notice of the proposed works must be given. Essential Energy's Design Services will be responsible for this notification. This notification was sent to DRC on the 6 June 2024. Response as per above.
L*ocal Government Act 1993*	Local Council	Section 68 approval will be required for water supply, sewerage and stormwater drainage work.
National Parks and Wildlife Act 1974	Heritage NSW	Section 90 AHIP for harm to three Aboriginal objects

6. Environmental Assessment

6.1 Air Quality and Greenhouse Gases

6.1.1 EXISTING ENVIRONMENT

The proposal site is situated on a predominantly cleared and highly disturbed landscape. Current land use and historic disturbance in the form of agricultural activities including cropping for the majority of the eastern portion of the site and grazing of the southwestern portion of the site. At the time of the assessment the majority of the site was recently cultivated land awaiting seeding. The remainder of the southwestern portion of the site is predominately cleared with scattered mature paddock trees. The current influences on air quality in the locality are dust and vehicle emissions generated from agricultural activities and vehicle emissions from traffic movements on the Mitchell Highway.

The nearest sensitive receiver R1 is the residence that is approximately 180m to the west of the proposal site. The next closest receiver with a line of sight to the development is to the east of the proposal and is herein referred to as R2. This receiver is approximately 735m away. Approximately 400m to the north is another sensitive receiver, a residence off The Old Road, on the opposite side of the Mitchell Highway, though this residence does not have line of sight to the proposed ZS. Three other sensitive receivers (residences) are between 500m and 900m of the proposal site. These are shown in **Figure 5.**

6.1.2 ASSESSMENT OF IMPACT

6.1.2.1 Air quality during construction

It is expected that during topsoil stripping and bulk earth works, including constructing the bench, excavation and trenching work, that there would be minor amounts of dust generated from the disturbance of soil, and wind erosion of any exposed surfaces and stockpiles. Dust also has the potential to be generated should vehicles transporting materials to site be uncovered.

There will be minimal exhaust emissions from vehicles. Exhaust emissions from construction equipment are likely to include nitrogen oxides (NOx), carbon monoxide (CO), sulphur oxides (SO2), hydrocarbons, and total suspended particulates. All vehicles will be fitted with approved exhaust systems to maintain vehicle exhaust emissions within accepted standards.

Works will be limited to the proposal site itself. Impacts to air quality will be small in intensity, over 6 months, and will be small in scope. It is unlikely that there will be an odour impact. Any impacts on air quality will be short-term and localised.

6.1.2.2 Air quality during operation

Once operational, the ZS will have negligible impacts on air quality. All circuit breakers to be used on the site will contain an enclosed gas switch with sulfur hexafluoride (SF6, known to be a potent greenhouse gas) insulating medium. Only a small quantity of SF6 is contained with circuit breakers and are sealed for life. Therefore, the potential risk from gas being expelled to the atmosphere is low. Ground surfaces exposed during construction will be stabilised, and gardening landscaping will ensure no dust is generated from open ground surfaces during the lifetime of the substation. All Essential Energy's assets are subject to regular maintenance and monitoring to ensure all equipment is operating effectively and are thus not generating odour or emissions.

6.1.3 ENVIRONMENTAL MITIGATION MEASURES

The following minimisation measures will be implemented to prevent air quality impacts:

- Any potential dust-borne materials transported to and from the activity site will be covered at all times during transportation

- Any exposed surfaces or temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions
- All vehicles and machinery will be maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits
- Substation equipment, including circuit breakers, are the subject of regular inspection and maintenance to ensure equipment is operating as per the manufacturer's requirements.

6.1.4 CONCLUSION

The proposal is not anticipated to result in substantial or uncontrollable dust or exhaust emissions in the area during construction or operation. Any air quality impacts would be short-term and minor during construction or future maintenance. Given the mitigation measures outlined in this assessment the overall environmental risk is considered to be low.

6.2 Geology and Soil

6.2.1 EXISTING ENVIRONMENT

Reference to the NSW Geology Simplified layer, which can be viewed on the NSW Government's Central Resource for Sharing and Enabling Environment Data in NSW (SEED) website, indicates the proposal site is underlain by Grega group (Dwg) – fossiliferous limestone, calcareous sandstone, siltstone and breccia.

Review of the Mitchell Landscapes Mapping V3 (Department of Environment, Climate Change and Water [DECCW] 2010a) indicates that the proposal site is located on the Molong Ridges landscape. This landscape comprises steep hills and strike ridges on tightly folded Devonian quartz and lithic sandstones, shale and conglomerate with some limestone, minor chert and tuff, general elevation 530 to 780m, local relief 200m. Stony uniform sand and loam in extensive rock outcrop along crests and upper slopes, stony brown texture-contrast soil on lower slopes, red harsh texture-contrast soil on flanks, gravel in stream beds.

Soil landscape mapping (Murphy and Lawrie 1998) identifies the proposal site as the Arthurville soil landscape. Relevant limitations of this soil landscape include high erosion hazard under low surface cover, low to moderate fertility and high water holding capacity. The soils are generally suitable for the construction of earthworks and urban style development with normal precautions against erosion and control of runoff.

Figure 4 shows mapped Mitchell Landscapes relative to the proposal site.

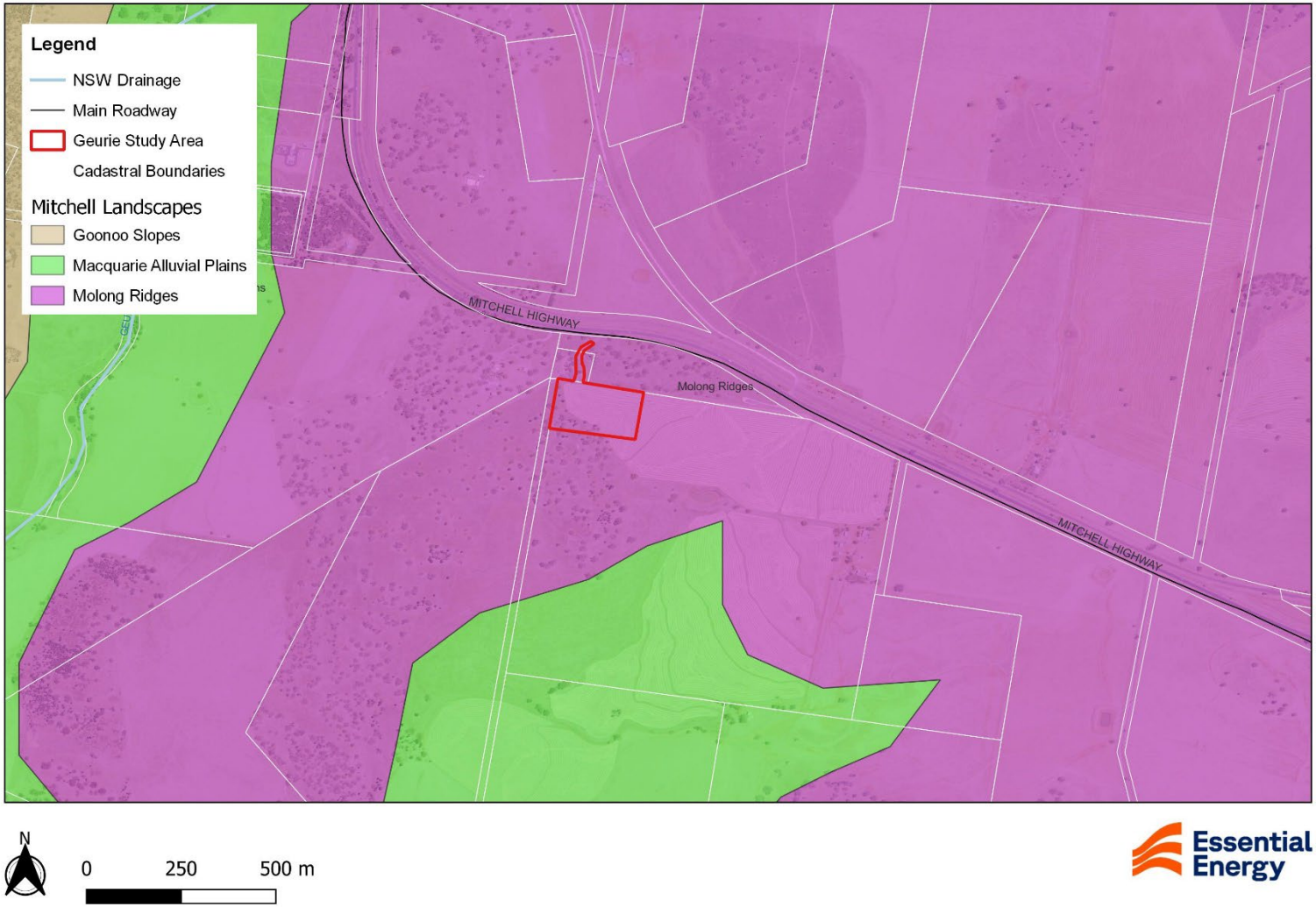

Figure 4: Mitchell landscapes relative to the proposal site

6.2.2 ASSESSMENT OF IMPACT

The proposed works will involve site disturbance through bulk earthworks, which will include cut and fill, benching, excavations and trenching. The cut to fill operation has predicted 4,456 cubic metres (m^3) of topsoil to be stripped and predicted 13,684m^3 of subsoils to be utilised for foundation works at the proposed substation site. Thereby limiting the importation of material to site, which will be limited to gravels required for substation surface and extended access track construction.

These activities have the potential to impact on soil stability and erosion potential within the proposal site. The extent of these impacts will be restricted to the ZS site. With implementation of appropriate erosion and sediment control measures, the proposed activity is expected to have a low impact on soils and geology in the area.

Mitigation measures proposed to manage erosion and sedimentation are outlined in **Section 6.2.3**. Water quality impacts are discussed in **Section 6.3.2,** air quality impacts are discussed in **Section 6.1.2,** and contamination impacts are discussed in **Section 6.8.2.**

6.2.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to manage erosion and sedimentation:

- Risks associated with sediment and erosion will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). In particular, controls including, but not limited to the following, will be implemented:
  - Diversion of upslope runoff around the proposal site in a way that minimises erosion, to be developed prior to bulk earthworks
  - Sediment control fences or other measures shall be installed at the downslope perimeter of disturbed areas, including any temporary stockpiles
  - Maintenance of all erosion control measures at operational capacity until land is stabilised
- Disturbed areas will be progressively stabilised as soon as practicable following construction activities
- A site-specific Erosion and Sediment Control Plan (ESCP)should be included as part of the civil contractor's Construction Environmental Management Plan (CEMP)
- Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials

6.2.4 CONCLUSION

The proposal is not anticipated to have any adverse impacts on the soils and geology of the environment. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low. Further potential impacts to water quality are discussed in the following section.

6.3 Water quality and Hydrology

6.3.1 EXISTING ENVIRONMENT

The closest named water course is Geurie Creek that is located approximately 1.18km to the west of the proposal site. The closest named River is the Macquarie River, located approximately 2.81 km southwest of the proposal site. Geurie Creek flows into the Macquarie River. A second order water course is the closest feature, within the subject lot and features a farm dam. The farm dam is approximately 300m to the southeast of the proposal site and is within the overland flow path of runoff from the site. A stormwater basin is proposed as part of the proposal, to be located to the southeast of the ZS footprint.

Fortify Geotech (2024) identified that groundwater was not encountered in the 13 boreholes established to a minimum depth of 3m, and to a maximum of 10m below ground surface during geotechnical testing. Thus, it is not expected that groundwater will be within 3m depth of the existing ground surface levels.

Dubbo Regional Council flood planning mapping shows that the flood planning land is predominately around the township of Geurie and, in proximity to the proposal site, is limited in extent to a narrow corridor 40m wide around Geurie Creek, to the northwest,. The topographical range of the proposal site is between approximately 330mAHD and 341mAHD, with Geurie Creek flood level being below the 300mAHD contour, thus there is an increase in elevation from the area that floods to the proposed ZS site of approximately 30m over a distance of approximately 1100m.

6.3.2 ASSESSMENT OF IMPACT

The following activities have the potential to impact on water quality during the construction and operation of the project:

- Earthworks, including benching, excavations and trenching
- Concreting works
- Fuel or oil leaks from construction and maintenance equipment.

These activities have the potential to negatively affect the water quality in the area by the introduction of sediment laden runoff or contaminants within runoff. In consideration of the disturbance area being restricted to the proposed ZS site, and the location away from immediate receiving waterways, any potential impacts to surface water flows or water quality of receiving water bodies are likely be negligible. Similarly, the proposal is not expected to have an impact on the downstream, and off-site farm dam and further downstream Geurie Creek system.

Fortify Geotech (2024) stated that permanent groundwater is expected to be below expected excavation depths, though did note that temporary, perched seepages could be encountered within more pervious alluvial soils following rainfall.

Dubbo Regional Council flood planning mapping was reviewed and confirmed that the proposal site is located above the flood planning land surrounding Geurie Creek. The flood planning land is predominately around the township of Geurie and, in proximity to the proposal site, is limited in extent to a narrow corridor 40m wide around Geurie Creek, to the north west,. The Flood Planning Land is defined as the 1% Annual Exceedance Probability (AEP) flood level and a buffer of an additional 500mm.

6.3.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be applied:

- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling
- Transformers will be housed inside appropriately bunded areas
- Disturbed areas will be managed in accordance with the requirements of the Blue Book to minimise potential impacts to waterways. Sediment fencing will be erected, where required, downslope of disturbed areas, and impacts would be minimised where practicable. The implementation of overland discharge of sediment laden water across grassed areas
- Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment sock. All options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway.

6.3.4 CONCLUSION

The proposal is not anticipated to have any impact upon the water quality or hydrological conditions in the area. Any impacts that might occur would be short-term and minor, and would occur during construction and maintenance. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.4 Noise and Vibration

6.4.1 EXISTING ENVIRONMENT

The proposal site is located in a rural environment. The main noise sources within the locality be:

- Road traffic noise from the Mitchell Highway
- Agricultural activities
- Operational noise from the existing Geurie substation
- Train movements on the Main Western Railway
- Environmental noise such wind in vegetation and birdsong
- Land use activities and vehicle emissions from traffic movements on the Mitchell Highway.

  The nearest sensitive receiver R1 is the residence that is approximately 180m to the west of the proposal site. The next closest receiver with a line of sight to the development is to the east of the proposal and is herein referred to as R2. This receiver is approximately 680m away. Approximately 565m to the north is another sensitive receiver, a residence off The Old Road 'R3', on the opposite side of the Mitchell Highway. This residence has a partial (shielded) line of sight to the proposed ZS. Three other sensitive receivers (residences) are between 600m and 900m of the proposal site, with no line of sight to the proposed ZS. These are shown in **Figure 5**.

The existing noise environment of surrounding landscape would be characterised as a low noise environment. A background noise level of 30dB, characteristic of a rural environment has been utilised in the following loss for distance noise assessment.

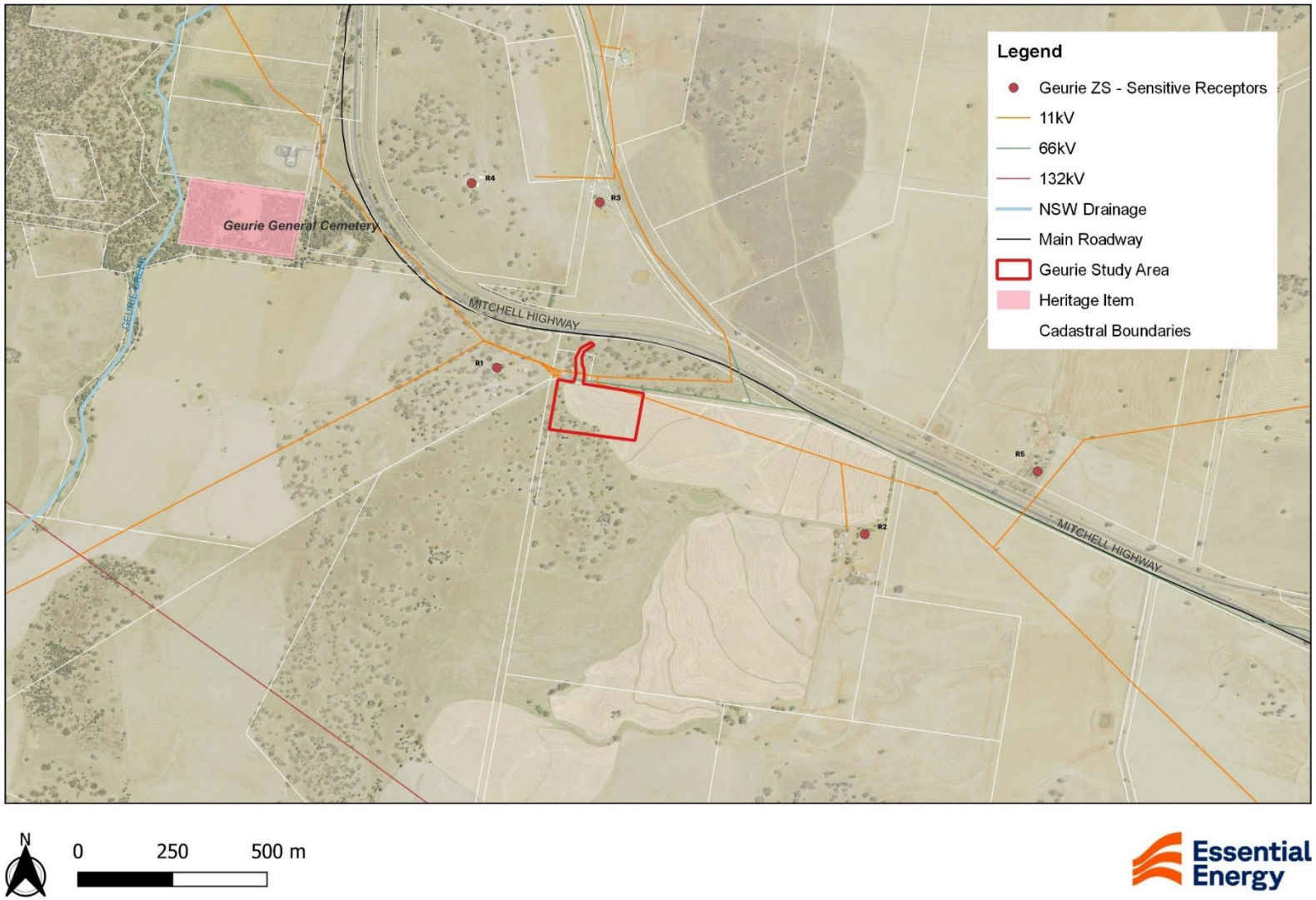

Figure 5: Nearest sensitive receivers relative to the proposal site

6.4.2 ASSESSMENT OF IMPACT

6.4.2.1 Noise during construction

Noise impacts during construction may potentially disturb sensitive receivers near the ZS. The main sources of noise during the construction phase will be equipment needed for site works and the transportation and installation of electrical equipment. The following activities are likely to be the main sources of construction noise impacts:

- Site preparation and benching
- Vehicles and trucks transporting construction materials to and from the site
- Set up and movement of construction vehicles and equipment
- Alteration of traffic movements on surrounding roads.

Construction vehicles will use the local road network to access the proposal site. Given the duration of the works, surrounding land use, the open landscape, the nature of existing traffic movements and relatively low intensity construction methods, it is anticipated that construction activities will not substantially affect the ambient noise in the area. Works will predominantly be undertaken between Monday and Saturday between 7am and 6pm.

6.4.2.2 Vibration during construction

The use of construction equipment has the potential to cause some vibration impacts. The vibration generated from construction works would vary depending on the level and type of activity carried out at each site during each activity. Potential vibration impacts to receivers for the works would be dependent on separation distances, the intervening soil and rock strata, dominant frequencies of vibration and the receiver structure.

Dominant vibration generating plant include:

- Excavator
- Bulldozer
- Drill rig for footing works
- Compactor/rollers
- Truck movements along unsealed roads

Given the distance from sensitive receivers and the relatively low intensity construction methods, there is not expected to be potential for cosmetic damage to residential dwellings.

6.4.2.3 Noise during operation

Initial operating capacity – One new transformer

The proposal will initially include the installation of a new control building housing high voltage switchboards and batteries, and one refurbished outdoor 132/11kV transformer, at the initial commissioning stage. The sound power level from the proposed 132/11kV transformer has been conservatively estimated at 75dB(A) (worst case scenario with fans and pumps in operation). All noise calculations used have included a 75dB(A) worst case assumption for the sound power level generated by the existing transformer at the existing substation site, which will remain operational alongside the proposed new Geurie ZS.

The following formula (herein called Formula 1) was utilised to determine the cumulative total sound pressure level.

SPLTotal = 10·LOG10[10SPL1/10 + 10SPL2/10 + 10SPL3/10 … + 10SPLN/10] (dB)

Where SPL1 to SPLN are the separate sound pressure levels, and N is the total number of separate noise levels (WKC Group 2025).

Based upon the land use type of the local area, a background noise level of 30dB(A) has conservatively been adopted. As noted above, the nearest residential property to the proposal site is approximately 180m west of the proposal site, however the distance from the predominant new noise generating equipment during operation (i.e. the proposed 132/11kV transformer) is approximately 230m.

To determine the potential sound power level or 'noise' from the proposed ZS at the nearest sensitive receiver the following formula (herein called Formula 2) can be applied as per the EPA 2013:

SPL=SWL-20log10r-8, where:

- SPL is sound pressure level in dB(A)
- SWL is sound power level (noise source) in dB(A)
- r is the distance from the source to the measuring point

Based on this calculation, the estimated 75dB(A) noise at the proposed new transformer source (in addition to the assumed worst case of 75dB(A) from the transformer at the existing substation) will be attenuated to a noise level of approximately 23dB(A) at the nearest receiving property, approximately 230m west of the proposed new 132/11kV transformer. This figure is 7 dB(A) under the noise goal for the surrounding land use. Given the local landscape and agricultural buffer area between the proposal site and nearest receivers, the attenuation will, in reality, likely be greater.

Forecast full operating capacity – four new transformers

The proposed Geurie ZS has the potential to house four 132/11kV transformers into the future. This will be in-line and installed further away from the currently proposed transformer (see general arrangement drawing in **Appendix A**).

Where SPL1 to SPLN are the separate sound pressure levels, and N is the total number of separate noise levels (WKC Group 2025).

The sum of four transformers each operating at a sound pressure level of 75dB generates a sound level of approximately 82dB(A), as calculated using Formula 1. This has been modelled using the same loss for distance calculation determined by Formula 2, with a worst case scenario of the sound level coming from the closest, single source. Based on this calculation, the estimated 82db(A) noise at the closest transformer source will be attenuated to a noise level of approximately 27dB(A) at the nearest receiving property to the west. This is 3 dB(A) under the noise goal for the surrounding land use.

6.4.2.4 Vibration during operation

The commissioning and operation of the ZS will not result in vibration causing activities.

6.4.3 ENVIRONMENTAL MITIGATION MEASURES

In considering the proposed ZS site location, with the main noise generating activity proposed at initial operating capacity (one 132/11kV transformer) and the future forecast operating capacity (four 132/11kV transformers) being at least 230m away from the nearest sensitive residential receiver have been assessed. Operational noise generated will be below the noise goal for the surrounding land use, thus no mitigation is proposed. Construction work that has the potential to create and audible noise at the nearest sensitive receiver, will be between 7am and 6pm Monday to Saturday. On occasions works outside these hours may be undertaken where agreement has been reached with sensitive receivers or the following requirements are met:

- Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and
- Where the works are required to take place in the vicinity of private access ways or driveways, consultation with individual residents would be undertaken to advise residents of the planned timing of the works.

Sensitive receivers located in close proximity to the proposal will be advised of the works schedule and provided with details of a site contact. All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. Any noise complaint will be investigated with additional control measures put in place if required.

6.4.4 CONCLUSION

The proposal will have acoustic and vibration impacts during construction and operation. The acoustic and vibration impacts during the construction phase will be medium term and moderate. Operational noise generated by the proposal will meet the assumed background noise criteria when the substation is a full capacity. Given the mitigation measures outlined in this assessment, the impacts can be effectively managed, and the overall environmental risk is considered to be low to moderate.

6.5 Flora and Fauna

AREA Environmental and Heritage Consultants (AREA) (2024) were engaged to undertake an ecological impact assessment for the proposal. The key findings of this assessment are presented below, with the full assessment report attached to this REF as **Appendix B**.

6.5.1 METHODOLOGY

The following methods were used for this assessment:

- Desktop review of ecological databases and literature
- Field survey of the study area using transect method by foot.

The assessment rationale was to evaluate the type and quality of habitat to be impacted by the proposal, and then complete targeted assessment of potential habitat to detect the region's listed species, populations, or communities.

6.5.1.1 Desktop / Database Searches

Information sources

AREA (2024) initially undertook a preliminary assessment, drawing on local experience, previous reporting, and information held on government databases and archives, including, but not limited to:

- DPE State Vegetation Type Mapping (SVTM)
- DPE Threatened Species website
- EPBC Protected Matters Search for MNES
- NSW Biodiversity Values Map and Threshold Tool
- NSW Native Vegetation Regulatory Map

The desktop review was used to inform field surveys and assessment of potential impact to threatened flora and fauna.

Field Survey

The field survey was undertaken on 16 June 2024 by an AREA ecologist. The objectives of the field assessment were to:

- Describe the nature and extent of vegetation removal
- Confirm PCTs and update those incorrectly mapped to the correct vegetation class, PCT and / or Threatened Ecological Communities (TECs)
- Adjust mapped boundaries and extents of PCTs after ground truthing, including areas where no native vegetation exists, such as areas cropped with exotics, access tracks and other disturbed areas

- Identify habitat features within the proposal area for listed species know or predicted to occur
- Determine if species, populations or communities listed in the EPBC, BC or FM Acts would be, or have potential to be, affected by the proposal
- Determine if groundwater dependent communities would be, or have potential to be, affected by the proposal
- Describe the quality and value of the habitat affected by the proposal.

Database searches were used to inform the field assessment, and applied to determine the likelihood for a protected matter and Plant Community Type (PCT) to be recorded within the proposal site and what targeted searches would be needed for detection.

Results of the field assessment are summarised in **Section 6.5.2.2** and presented in detail in **Appendix B**.

Plant Community Types (PCTs)

PCTs were identified in the field using the NSW SVTM map sourced from the NSW SEED website, as a baseline for the study area and region. The field assessment aimed to confirm PCTs and update those incorrectly mapped to the correct vegetation class, PCT and/or Threatened Ecological Communities (TECs). PCT IDs and boundaries between mapped PCTs were adjusted after ground-truthing. Areas of not native vegetation were also identified and included areas where the vegetation consisted of exotic species or where there was no vegetation such as along tracks and roads.

Threatened Ecological Communities (TECs)

TECs were predicted using database searches, and the PCTs associated with a TEC. Data collected during the field assessment and the NSW and Commonwealth descriptions of TECs were used to confirm presence or absence of TECs in the proposal site.

Habitat Assessment

Habitat was assessed for its potential to provide resources for listed species predicted or known to occur. Database searches were used to inform the field assessment. Professional judgement was applied on site to determine a likelihood for a protected matter to be recorded and what targeted searches would be needed to detect and consider the magnitude of the potential impact.

In the field, any indirect evidence of fauna (i.e., scats, tracks, calls, fur, feathers, sloughed skins etc.) was investigated. Mature trees, where present, were inspected for hollows and signs of use from listed fauna species and to determine if they were used as fauna breeding sites. Ground features such as rocks and logs which may be potential habitat for listed reptiles were inspected to determine if they were significant habitat.

Threatened Fauna

Opportunistic sightings of mammals, birds, reptiles, and frogs were recorded during assessment of the study area. Attention was given to identifying the presence of suitable habitat (e.g. tree hollows, nests, logs, waterways) and signs of activity (e.g. feeding scars, scats).

6.5.2 EXISTING ENVIRONMENT

6.5.2.1 Desktop analysis

EPBC Protected Matters

An EPBC Protected Matters Report generated for this proposal considered MNES within a 1500m buffer of the proposal. This report is provided in **Appendix B** and summarised in **Table 4**. Potential impacts to species and communities highlighted are considered in the following sections of this report.

Table 4: EPBC Protected Matters Report Summary - 1500 metre buffer from site

MNES	RESULT	RELEVANCE TO THIS ASSESSMENT
World Heritage Properties	None	-
National Heritage Places	None	-
Wetlands of International Importance	4	Banrock Station Wetland, Riverland, Hattah-Kulkyne Lakes, The Coorong, and lakes alexandrina and albert wetland
Great Barrier Reef Marine Park	None	-
Commonwealth Marine Area	None	-
Listed Threatened Ecological Communities	4	Grey Box (Eucalyptus macrocarpa) Grassy Woodlands and derived Native Grasslands of South-eastern Australia Poplar Box Grassy Woodland on Alluvial Plains Weeping Myall Woodlands, White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived Native Grassland.
Listed Threatened Species	33	20 birds, 2 fish, 1 frog, 3 mammals, 2 reptiles, 5 plants
Listed Migratory Species	9	All migratory birds, classified as: 1 migratory marine bird 3 Migratory terrestrial birds 5 migratory wetland birds
Commonwealth Land	1	Telstra Corporation Limited
Commonwealth Heritage Places	None	-
Listed Marine Species	16	All 16 are marine bird species
Whales and Other Cetaceans	None	-
Critical Habitats	None	-
Commonwealth Reserves Terrestrial	None	-
Australian Marine Parks	None	-
Habitat Critical to the survival of Marine Turtles	None	-
State and Territory Reserves	None	-

Regional Forest Agreements	None	-
Nationally Important Wetlands	None	-
EPBC Act Referrals	3	2015/7522: Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia (completed). 2017/8127: INDIGO central submarine telecommunications cable 2017/7996: INDIGO Marine Cable Route Survey (INDIGO)
Key Ecological Features (Marine)	None	-
Biologically Important Areas	None	-
Bioregional Assessments	None	-
Geological and Bioregional Assessments	None	-

Predicted Species

Eight listed fauna species and no flora species were recorded on the NSW BioNet species sightings database within 1500 metres of the subject land, see **Figure 6.** All fauna species recorded were birds as shown in **Table 5** below.

Table 5: Species Recorded on BioNet within 1500 metres

SCIENTIFIC NAME	COMMON NAME	STATUS – BC ACT	STATUS – EPBC ACT
Chthonicola sagittata	Speckled warbler	Vulnerable	N/A
Climacteris picumnus victoriae	Brown Treecreeper	Vulnerable	N/A
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	N/A
Hieraaetus morphnoides	Little Eagle	Vulnerable	N/A
Melanodryas cucullata cucullata	Hooded Robin	Endangered	Endangered
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable
Melithreptus gularis	Black-chinned honeyeater	Vulnerable	N/A
Pomatostomus temporalis temporalis	Grey-crowned Babbler	Vulnerable	N/A

Figure 6: BioNet records within 1500m of subject land.

Plant Community Types

Locally mapped PCTs were identified using SVTM map sourced from the NSW SEED website. This map is not necessarily correct within any given subject land; however, it can be reliably used as an indication of PCTs likely to occur in the local landscape and the subject land, see **Figure 7**. The mapped PCTs are named in **Table 6** below. Areas not shown as a PCT on **Figure 7** are mapped as not-native vegetation.

Table 6: Predicted Plant Community Type within 1500m of Proposal Area

PCT ID	PCT NAME	FORMATION
PCT 266	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Tall woodland with trees to 25 metre high dominated by White Box (*Eucalyptus albens*. The shrub layer is usually sparse, or absent ground cover typically contains grasses such as *Themeda australis, Poa sieberiana, Elymus scaber var. scaber*. Forbs include *Wurmbea dioica, Gonocarpus elatus*, and *Microseris*.
PCT 267	White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Tall or mid-high woodland or open woodland with trees to about 15 metre high dominated by White Box (*Eucalyptus albens*), White Cypress Pine *(Callitris glaucophylla*) and often Western Grey Box (*Eucalyptus microcarpa*) The shrub layer is sparse Grass species include *Austrostipa densiflora, Austrostipa bigeniculata, Austrostipa verticillata, Austrodanthonia caespitosa, Themeda australis, Enteropogon acicularis* and *Bothriochloa macra*. Forb species include *Xerochrysum viscosa, Dianella revoluta* and *Dichopogon strictus*. Occurs on red-brown loamy soils or loamy sandy soils.
PCT 511	Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion	Derived tussock grassland dominated by Queensland Bluegrass (*Dichanthium sericeum subsp. sericeum*), Queensland Panic (*Panicum queenslandicum*), Redleg Grass (*Bothriochloa decipiens* or *Bothriochloa macra*), Rats-tail Grass (*Sporobolus creberi*) and spear grasses (*Austrostipa scabra*) with other grass species.
PCT 76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Tall woodland to 25 metre high dominated by Western Grey Box (*Eucalyptus microcarpa*). A mid-dense or dense grass ground cover is present composed of *Austrodanthonia caespitosa, Austrodanthonia setacea, Austrostipa scabra subsp. falcata, Paspalidium constrictum*, etc. The small scrambler *Einadia nutans subsp. nutans* is usually present. Native forbs include *Sida corrugata, Wahlenbergia gracilis* and *Vittadinia*. Occurs on texture contrast red or brown earths or grey clay soils.
PCT 81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	Tall Western Grey Box (*Eucalyptus microcarpa*) woodland commonly 20 metre high, often with scattered White Cypress Pine (*Callitris glaucophylla*). Usually contains a very sparse shrub layer. The ground cover is mid-dense to dense and is dominated by grass and forb species. Native grass species include *Austrostipa scabra, Austrostipa verticillata, Austrodanthonia fulva* and *Enteropogon*

		acicularis. Occurs on well drained alluvial brown sandy loam to loam soil.
PCT 201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Tall woodland or open forest dominated by Fuzzy Box (*Eucalyptus conica*) often growing with Western Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) or Kurrajong (*Brachychiton populneus subsp. populneus*). Shrubs are generally sparse. The ground it is usually mid-dense and may be dominated by weed species. Native forbs include *Calotis cuneifolia, Eremophila debilis, Sida corrugata* etc. Native grasses include *Austrostipa scabra subsp. scabra, Chloris truncata, Elymus scaber var. scaber, Themeda australis* etc.

Figure 7: State Vegetation Type Mapping – Plant Community Types

Threatened Ecological Communities

Database searches (NSW predicted threatened species search by IBRA region, Matters of National Environmental Significance [MNES] protected matters search and PCT TEC associations, see **Appendix B**) predicted eleven TECs listed under the BC and EPBC Acts likely to occur in the subject land.

These are shown in **Table 7** below.

Table 7: Predicted Threatened Ecological Community within 1500m of Proposal Area

THREATENED ECOLOGICAL COMMUNITY	BC ACT	EPBC ACT
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Endangered Ecological Community	N/A
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered Ecological Community	N/A
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered Ecological Community	N/A
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Endangered Ecological Community	N/A
White Box - Yellow Box - Blakelys Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered Ecological Community	N/A
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	N/A	Endangered
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	N/A	Critically Endangered Ecological Community
Weeping Myall woodlands	Endangered Ecological Community	Endangered Ecological Community
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	N/A	Critically Endangered Ecological Community
Poplar Box Grassy Woodland on Alluvial Plains	N/A	Endangered Ecological Community
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	N/A	Endangered Ecological Community

Biodiversity Values Map

No locations within the proposal area are mapped as biodiversity values.

Key Fish Habitat

No Key Fish Habitat is present within the proposal area.

Groundwater Dependant Ecosystems (GDE)

Seed Portal Groundwater Dependant Ecosystems mapping identifies that the nearest high probability GDE is the River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion present along the fringes of the Macquarie River approximately 2.6 km to the south of the proposal site. The area of the proposal site that has not been subject to cropping is considered low probability of being a ground water dependant ecosystem (BOM 2019). Given the low probability of being a ground water dependant ecosystem, and the geotechnical investigation not identifying ground water to a depth of 3m below ground surface, ground water dependant ecosystems are not considered further. **Figure 8** demonstrates GDE probability mapping in the landscape.

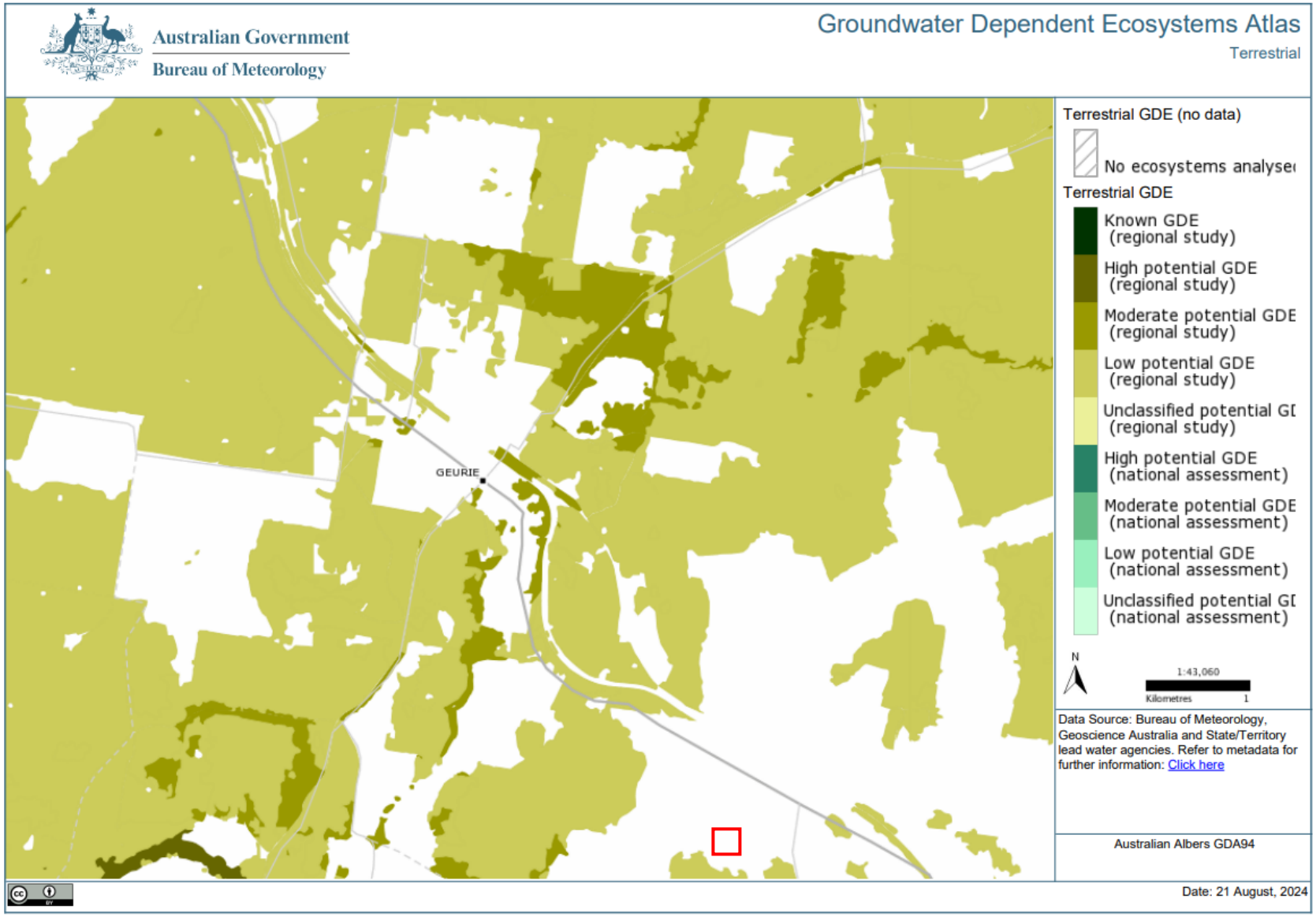

Figure 8: Groundwater Dependent Ecosystems within the landscape (approximate study area shown by red polygon).

Native Vegetation Regulatory (NVR) mapping

Figure 9 shows the Native Vegetation Regulatory mapping in the landscape. Cropped land is mapped as Category 1- exempt land, while the remaining vegetation is mapped as Category 2- regulated land. Impact to native vegetation has been assessed as required under EPBC Act and BC Act pathways.

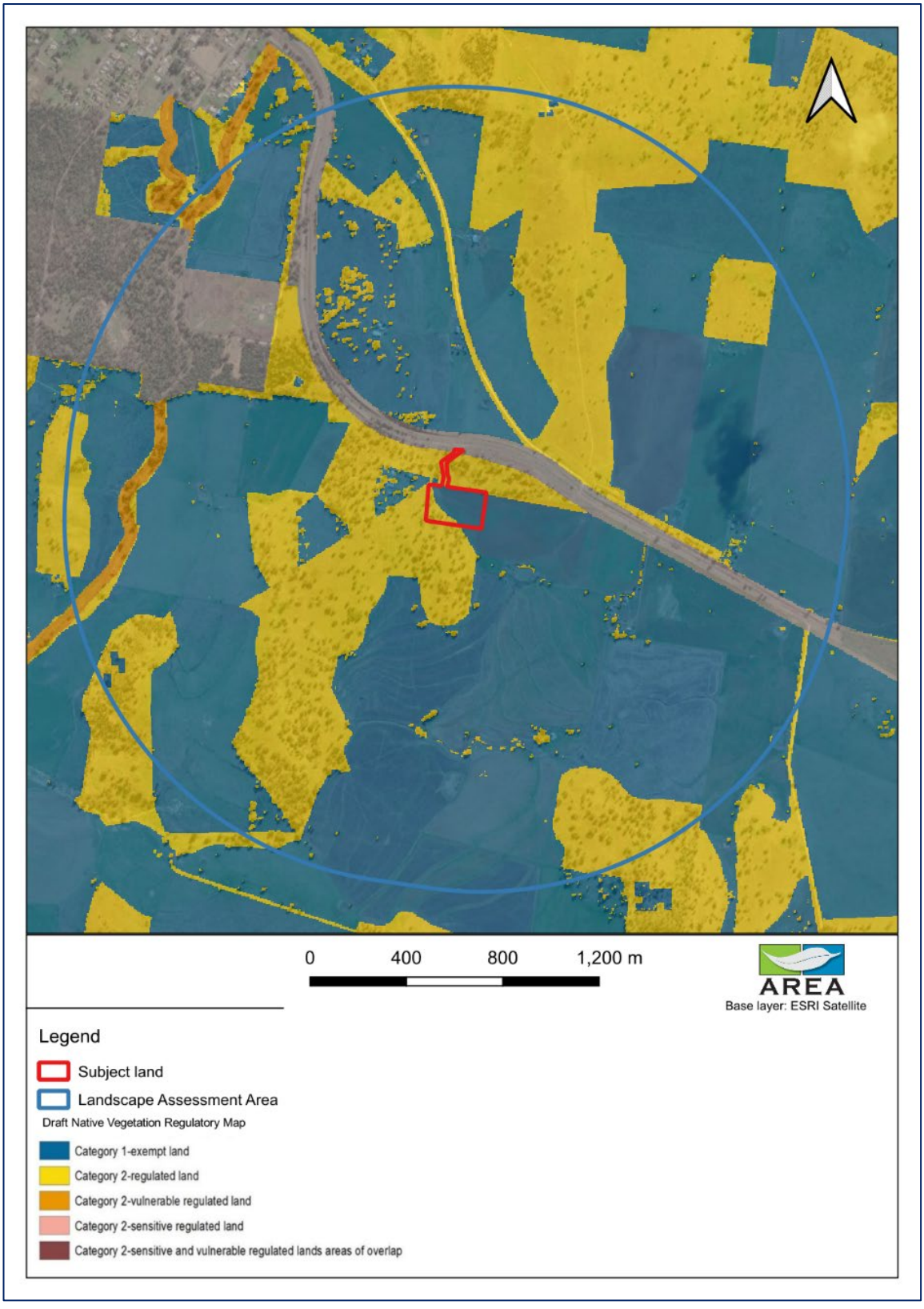

Figure 9: Native Vegetation Regulatory (NVR) Mapping

6.5.2.2 Field Survey Results

Plant Community Types

PCTs mapped as part of the desktop review were refined and corrected based on field observations of mid, upper, and ground stratum species and landform. PCTs confirmed as occurring within the proposal site are outlined in **Table 8** and **Figure 10**.

Table 8: Plant Community Types confirmed as present from site inspection

PCT ID	PCT NAME
PCT 266	White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion
PCT 0	Not Native

Figure 10: PCT designation following survey

Threatened Ecological Communities

Eleven TECs were identified as possibly occurring in the study area based on database searches. Two were determined to be present within the proposal site based on TEC description (including community composition and condition) and presence of associated PCT (**Figure 11**). Those determined not present, were inconsistent with the TEC determination. **Table 9** provides assessment of the TECs present in the proposal site.

Table 9: Threatened Ecological Communities confirmed as present from site inspection

ASSOCIATED PCT NUMBER	TEC NAME	NSW STATUS	EPBC STATUS	PRESENCE
266	White Box - Yellow Box - Blakelys Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered Ecological Community	N/A	Yes
266	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	N/A	Critically Endangered Ecological Community	Yes

An important consideration with TEC listings under the BC Act and EPBC Act is the different criteria that is applied for determining if a particular vegetation community conforms to a listing under the respective state or Commonwealth legislation. Therefore, in the mapping, there is sometimes differences in listing type with the same PCT number.

As noted in **Figure 11**, there are mapped polygons of the vegetation community that meets the criteria for listing under both state and Commonwealth legislation and areas where only state listing criteria has been satisfied.

Figure 11: TEC designation following survey

Habitat

The following core habitat features were identified within the subject land:

- The area of White Box woodland (1.03 ha) has value as habitat as it contains mature native trees with a mostly native understorey. Food and shelter may be provided to native animals in the remnant woodland. The ploughed area does not have significant habitat value.
- Ten hollow-bearing trees may contain habitat for threatened hollow-dependent species.
- There was not a significant number of logs and woody debris in the area.

The area does not contain aquatic habitat relevant to the FM Act as there are no major watercourses in the subject land.

Threatened Species

No threatened flora or fauna were recorded during the field assessment. Predicted listed fauna species are assumed to occur within the proposal site, where suitable habitat exists and where the survey was not sufficient to confirm the species was not present.

Suitable habitat for listed fauna species (predominately being tree hollows) recorded within the proposal site is shown in **Figure 12**.

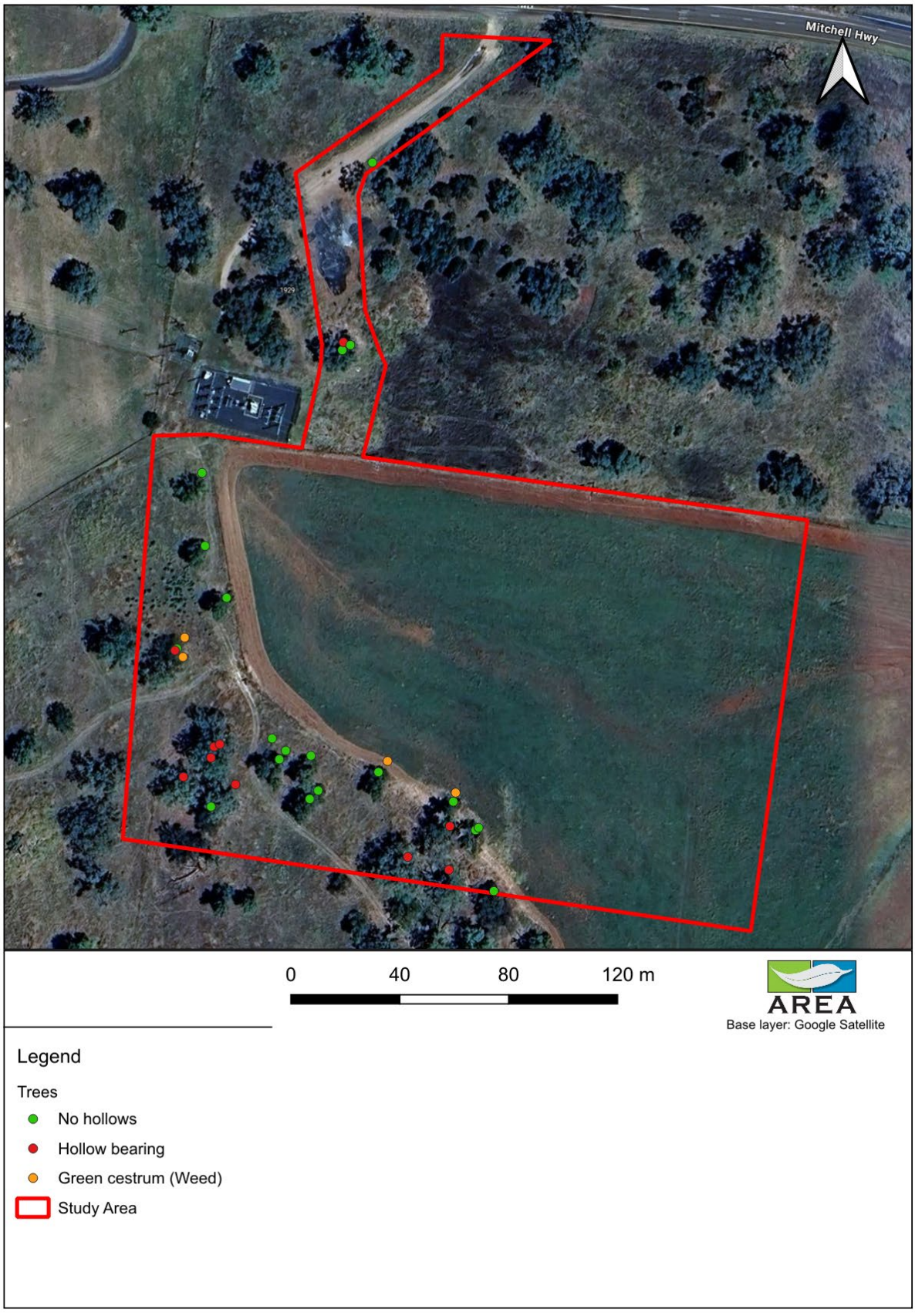

Figure 12: Hollow bearing trees (and high priority weed species) within the proposal site

Aquatic Communities

There are no watercourses in the subject land. There is a watercourse in the west of the landscape assessment area, Limestone creek, and a small unnamed watercourse south of the subject land. Overall, there are few hydrological features that may support terrestrial species in the subject area.

Pests, weeds and disease

The priority weed *Cestrum parqui* (Green Cestrum) was identified in the subject land. Three (3) other high threat weeds and ten (10) other exotic species were identified in the subject land as outlined in **Appendix B**.

6.5.3 ASSESSMENT OF IMPACT

6.5.3.1 Direct Impact

Habitat, Connectivity and Fragmentation

The proposal will not increase fragmentation, with the proposed works limited to a relatively small area on the edge of a disturbed remnant. This will not significantly hamper the movement of fauna species.

Native Vegetation

All mapped native vegetation within the study area aligns with PCT 266. This PCT meets the classification for TEC as described below.

Threatened Ecological Communities

All of PCT 266 within the subject land meets BC Act criteria (no area requirements) and two larger patches of PCT 266 met EPBC Act criteria (Larger than 0.1 ha), see **Figure 11**:

- Under the EPBC Act, 0.94 hectares of this CEEC will be potentially impacted
- Under the BC Act, 1.03 hectares of this CEEC will be potentially impacted

Tests of significance for impact to both these TECs are provided in **Appendix B**. These concluded there will be no significant impact. The same vegetation community is well represented outside of the subject land and any impact from the proposal will not substantially modify the composition of the CEEC to the extent that there is a risk of extinction.

Threatened Species

Thirty one (31) threatened species were determined to have potential occur within the subject land and/or use habitat in the proposal footprint. The threatened species, habitat and potential impacts are outlined in **Table 10**.

Assessment of the significance have been completed for these species as per the required BC Act test questions and EPBC Act significant impact criteria, relative to each species conservation listing status and requirements. Based on the results of the tests of significance, impact is unlikely to be significant, see **Appendix B**.

Table 10: Summary of threatened species and test of significance outcome

SCIENTIFIC NAME	COMMON NAME	HABITAT	POTENTIAL IMPACT	SIGNIFICANT IMPACT?
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Hollow nesting. May sally for insects.	This species uses tree hollows	No

Scoteanax rueppellii	Greater Broad-nosed Bat	Hollow nesting. May sally for insects.	This species uses tree hollows	No
Anthochaera phrygia	Regent Honeyeater	Flowering eucalypts may provide foraging habitat for birds in passage.	Minimal. The number of flowering box eucalypts to be affected will be small on a landscape scale.	No
Aphelocephala leucopsis	Southern Whiteface	Undisturbed grassy woodland with litter cover.	May be affected by loss of Grassy Woodland Habitat. Little litter cover present.	No
Artamus cyanopterus	Dusky Woodswallow	Grassy Woodland	May be affected by loss of Grassy Woodland Habitat.	No
Burhinus grallarius	Bush Stone-curlew	Open woodland with fallen timber.	May be affected by loss of Grassy Woodland Habitat. Little fallen timber.	No
Chthonicola sagittata	Speckled Warbler	Undisturbed Grassy Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Circus assimilis	Spotted Harrier	Grassy Woodand	May be affected by loss of Grassy Woodland Habitat.	No
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Grassy woodland. Fallen timber. Hollow nesting.	May be affected by loss of Grassy Woodland Habitat. Little fallen timber. This species uses tree hollows	No
Daphoenositta chrysoptera	Varied Sittella	Grassy Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	Grassy Woodland. Hollow nesting	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows	No
Grantiella picta	Painted Honeyeater	Mistletoes	If mistletoes are present, they may be removed.	No
Hieraaetus morphnoides	Little Eagle	Eucalypt woodland. Tall trees.	May be affected by loss of Grassy Woodland Habitat.	No

Lathamus discolor	Swift Parrot	Lerp-infested eucalypts. Yellow Box. Between February and October.	Minimal. If lerps are present on eucalypts there may be a small loss of habitat.	No
Lophoictinia isura	Square-tailed Kite	Dry woodland particularly timbered watercourses.	May be affected by loss of Grassy Woodland Habitat.	No
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Eucalypt Woodland	May be affected by loss of Grassy Woodland Habitat.	No
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Box Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Neophema pulchella	Turquoise Parrot	Edges of Eucalypt woodland. Hollow nesting.	This species uses tree hollows	No
Ninox connivens	Barking Owl	Woodland and partly cleared farmland. Hollow nesting.	This species uses tree hollows	No
Petroica boodang	Scarlet Robin	Eucalypt woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Petroica phoenicea	Flame Robin	In winter open woodland. Breeds in forest further east. Doesn't breed in woodland habitat	Unlikely to be affected. Migratory, doesn't breed in the area. Can find other sources of food during migration.	No
Polytelis swainsonii	Superb Parrot	Box-Gum Woodland. Tree hollows.	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows.	No
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Box woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Stagonopleura guttata	Diamond Firetail	Box-Gum Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Tyto novaehollandiae	Masked Owl	Woodlands, edge of forest. Tree Hollows.	May be affected by loss of Grassy Woodland Habitat.	No

			This species uses tree hollows	
Cercartetus nanus	Eastern Pygmy-possum	Woodlands. Tree hollows	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows.	No
Phascolarctos cinereus	Koala	Eucalypt trees	There will be some loss of eucalypt feed trees.	No
Dicanthium setosum	Bluegrass	Disturbed Grassy woodland	May be affected by loss of Grassy Woodland Habitat.	No
Swainsona recta	Small Purple-pea	Grassy Woodlands understorey.	May be affected by loss of Grassy Woodland Habitat.	No
Swainsona sericea	Silky Swainson-pea	Box-Gum Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Thesium australe	Austral Toadflax	Grassland and Grassy Woodland. Kangaroo Grass (*Themeda triandra*)	Minimal. Kangaroo grass was not present.	No

Migratory Species

Impact to migratory species is considered minor, given that there are similar areas of similar habitat for breeding and foraging in the immediate vicinity of the proposal site.

Hollow Bearing Trees

Ten large trees containing hollows are located within the proposal footprint. All trees recorded in the subject land are shown by size class below **Table 11**.

Large mature trees were recorded within the subject land. Trees containing hollows were older specimens of White Box (*Eucalyptus albens*).

The large hollows provide suitable nesting habitat for several large species of bird including the Barking Owl (*Ninox connivens*), and smaller species of bird including the Turquoise Parrot (*Neophema pulchella*). Bats and mammals would be capable of utilising smaller hollows as roosting habitat. The decorticating bark provides shelter for invertebrates, as well as bat and reptile species. These trees also provide a food resource for a range of species, for example, insects found under the bark are a food for various species such as the Grey-crowned Babbler (*Pomatostomus temporalis temporalis*).

Table 11: Tree Species, size and number recorded within the subject land

SCIENTIFIC NAME	CLASS 1 (DBH <5CM)	CLASS 2 (DBH 5-9 CM)	CLASS 3 (DBH 10-19CM)	CLASS 4 (DBH 20-29CM)	CLASS 5 (30-49CM)	CLASS 6 (50-79CM)	LARGE TREE (DBH >80CM)
Eucalyptus albens (WB)	0	0	0	0	2	2	8

Callitris glaucophylla (WCP)	0	0	0	4	4	3	0
Brachychiton populneus (K)	0	0	0	1	0	2	1
Total	0	0	0	5	6	7	9

Soils and Drainage

Soils will be disturbed during construction. Disturbed soils have the potential to move off the proposal site and impact waterways if not appropriately managed. Site stabilisation practices, including installation of appropriate erosion and sediment controls (refer **Section 6.2.3**) and will be applied to the area during, and where required after construction, to ensure no long-term impact to the biodiversity values. The development will not have a significant long-term impact on the hydrology at any scale.

6.5.3.2 Indirect impact

Injury to wildlife

Injury to wildlife is possible, but unlikely during the construction phase of this proposal. Contact with wildlife and suitable habitat will be avoided wherever possible. Local wildlife rescue organisation should be contacted in the event wildlife requires rescue or removal.

Spread of pests, weeds and disease

The risk of spreading pests and disease is unlikely given works will be contained to an already disturbed site.

Invasion and spread of weeds is also considered unlikely, although soil disturbance may result in new weed populations or encourage seed germination of existing weed species. Introduction or spread of weeds through the proposal site may be associated with these actions:

- Removing groundcover species
- Excavation, soil stripping and importation of fill.

Management of weed dispersion is considered in the mitigation measures **Section 6.5.4**.

Noise, light and vibration

Limited vibration will be caused for a short period of time during construction. Upon commissioning, no vibration is predicted. Construction will be generally occur during daylight– with no current allowance for lighting during the construction phase. Lighting is used on an ad-hoc basis at the substation during operation phase, when the site is being attended during an inspection, maintenance or emergency.

Impact on Key Threatening Processes

AREA (2024) detailed that the proposal has the potential to exacerbate the key threatening process of removal of native vegetation, however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.

6.5.3.3 Cumulative Impact

Impacts from the proposal are considered unlikely to result in a permanent cumulative impact to native species, populations and communities given the activity will largely occur in an historically cleared and

degraded landscape and a range of measures will be taken to avoid, minimise and mitigate potential impacts as set out in **Section 6.5.4**.

6.5.4 ENVIRONMENTAL MITIGATION MEASURES

Impacts to native vegetation have been largely avoided through site selection, being largely located within land previously cleared for agricultural grazing or cropping and road corridors. A small section of remnant vegetation on the edge of the disturbance area will occur, however, impacts to this vegetation has been minimised by maximising the siting of the works within the disturbed paddock. Notwithstanding, the following mitigation measures are recommended for minimising the residual impact of the proposal:

- Any change in design affecting land outside the proposal site assessed in this report will require further ecological survey - notwithstanding minor changes where the ecological value have been assessed for this proposal
- Erosion and Sediment Control measures will be established in accordance with Landcom's Managing Urban Stormwater, Soils & Construction Guidelines (The Blue Book. Landcom 2004) and documented in a Construction Environmental Management Plan (CEMP) to be prepared for the work.
- Stockpile and compound sites will be located using the following criteria:
  - At least 40 m away from the nearest waterway
  - In areas of low ecological conservation significance (i.e., previously disturbed land)
  - On relatively level ground
- Essential Energy has a general biosecurity duty under the Biosecurity Act 2015 to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable. Field crews shall follow procedures as outlined in Essential Energy's Operational Guideline: Biosecurity Risk Management (CERM1000.96) to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable, with particular reference to vehicle and equipment hygiene practises
- Prior to clearing, inspect trees with bird nests or hollows before pushing or felling to ensure the nests are vacant. Inspection would occur immediately before pushing or felling. If a bird is in the nest, clear the trees around it first to see if the animal will disperse. If the bird is a nestling (baby bird confined to the nest) all measures would be taken to collect the bird and remove to a safe location
- Immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling the area of clearing work is to be inspected for fauna
- If fauna is detected, the animal is to be allowed to leave the site without any coercion or a local wildlife rescue service is to be contacted to facilitate the safe removal of the animal from the worksite
-
- Do not refuel, store or decant chemicals within 50m of a waterway
- All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, dogs and cats.

6.5.5 CONCLUSION

The proposal will not result in a significant impact to the ecological values present in the proposal site. The impact to listed threatened species, populations or communities recorded or presumed to occur in the proposal site was assessed as not significant. Safeguards and mitigation measures have been provided to minimise harm to the environment. The proposal is unlikely to have a significant impact to species, populations or communities listed under the EPBC Act, BC Act, or FM Act. As such the environmental risk is considered to be low.

6.6 Aboriginal Heritage

6.6.1 EXISTING ENVIRONMENT

The study area is within the NSW South Western Slopes Bioregion and Inland Slopes Subregion. Geurie Creek is a tributary of the Macquarie River a major waterway in the region. A search of the Aboriginal Heritage Information Management System (AHIMS) determined that while no Aboriginal sites had been recorded within the study area, 11 Aboriginal sites had been recorded within five kilometres. The majority these Aboriginal sites are stone artefact scatters. The locations of these previously recorded sites are shown in **Figure 13**: .

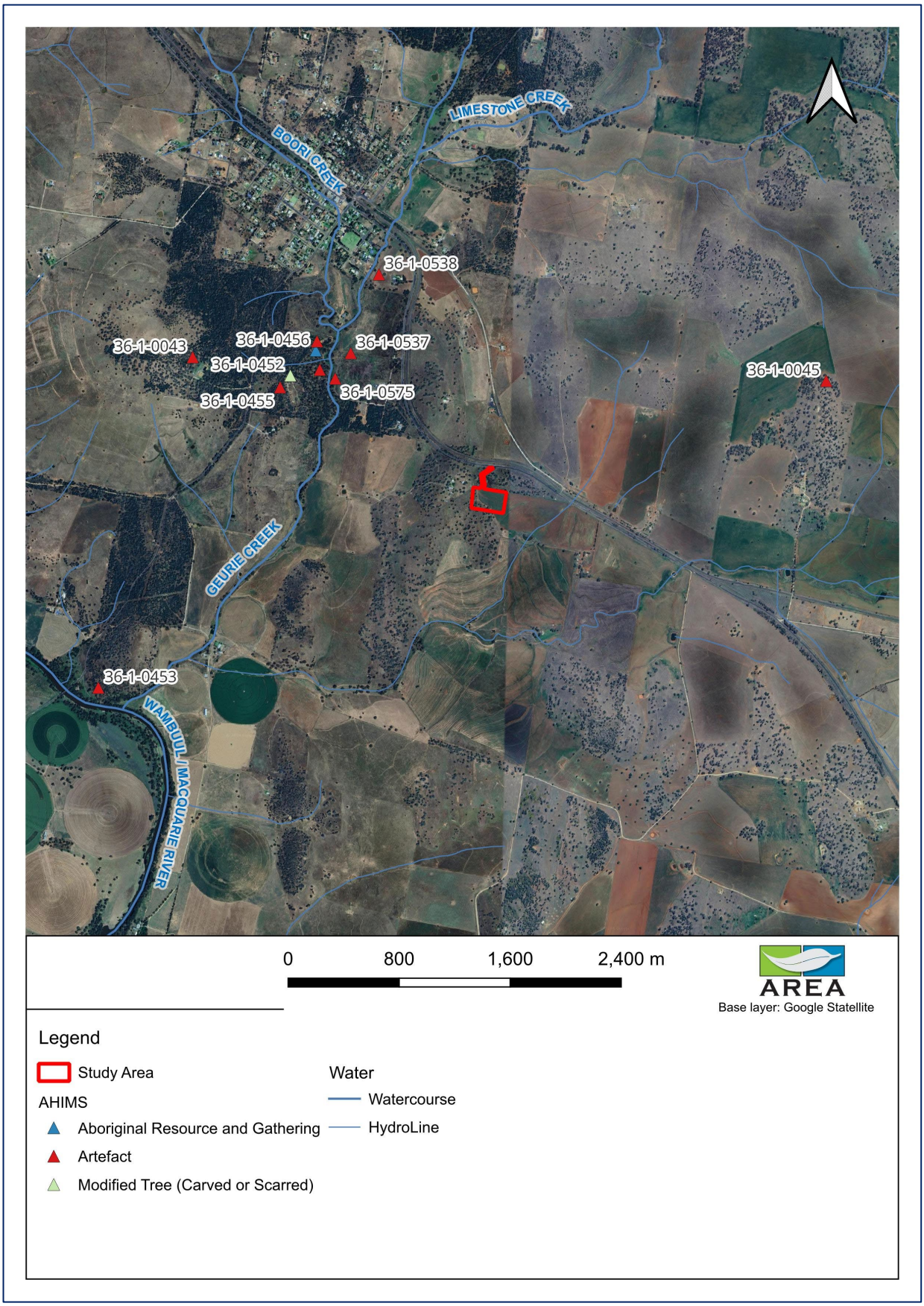

Figure 13: Previously identified Aboriginal Heritage sites (Source: AHIMS)

6.6.2 ASSESSMENT OF IMPACT

AREA Environmental and Heritage Consultants were engaged by Essential Energy to undertake an Aboriginal heritage due diligence assessment of the proposal site, in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). A site survey was undertaken by Kim Newman of AREA on 17 June 2024. One Aboriginal object (Geurie IF01) was recorded during the survey and will be impacted by the proposal.

The proponent then engaged AREA to undertake a second survey of the proposal and consult with the Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). The second survey was conducted in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). A secondary survey was conducted 31 October 2024 by Anna Darby of AREA with Greg Kennedy and Rodger Ebsworth of Dubbo LALC. Two additional Aboriginal objects (Geurie IF02 and Geurie IF03) were recorded during the October 2024 survey. All three objects will be impacted by the proposal. The objects found were stone artefacts, all of the same fine grained basalt material but have varying colour palettes. While basalt outcrops were observed in the footprint of the project site outside of where prior cropping has occurred, this was not the same material as the artefacts and there was no evidence of quarrying, or flaking.

The objects were recorded in the heavily disturbed paddock that has been historically utilised for cropping activities. It is possible that the artefacts have been washed down from the hillcrest in the north. The locations are shown in **Figure 14**.

Plates of Aboriginal objects identified at the Proposal site

PLATES OF ABORIGINAL OBJECTS IDENTIFIED AT THE PROPOSAL SITE

Plate 3: Geurie Isolated Find (IF) 01
AHIMS ID 36-1-0871

Plate 4: Geurie Isolated Find (IF) 01
AHIMS ID 36-1-0871

Plate 5: Geurie Isolated Find (IF) 02
AHIMS ID 36-1-0872

Plate 6: Geurie Isolated Find (IF) 02
AHIMS ID 36-1-0872

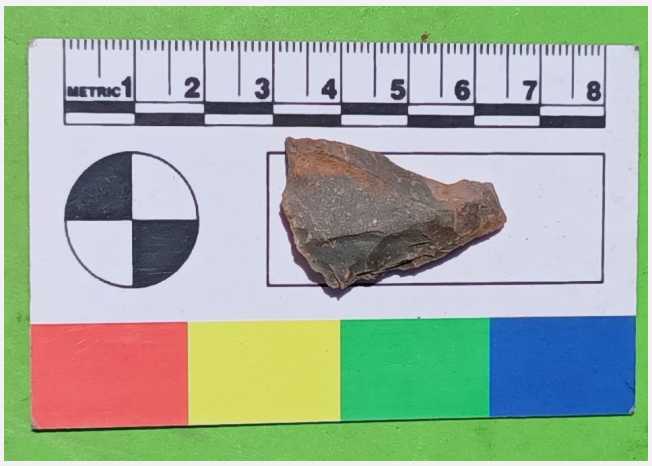

Plate 7: Geurie Isolated Find (IF) 03
AHIMS ID 36-1-0870

Plate 8: Geurie Isolated Find (IF) 03
AHIMS ID 36-1-0870

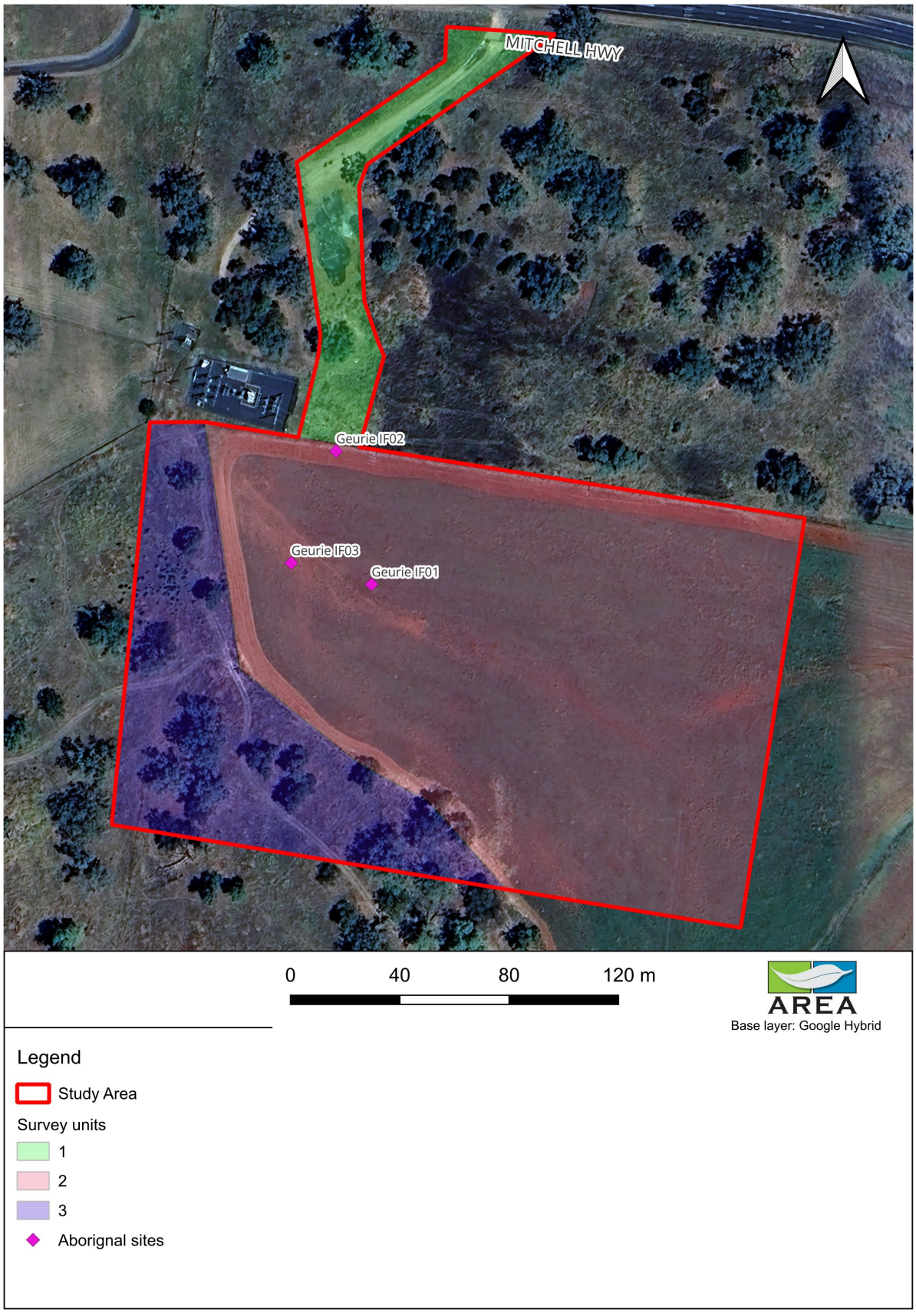

Figure 14: Aboriginal objects identified during site surveys

An Aboriginal Cultural Heritage Assessment Report (AREA 2025) was produced. The ACHAR noted that the presence of the Aboriginal objects provides evidence of connection to country, though the Aboriginal objects have low significance when considering:

- Social significance
- Aesthetic significance
- Historic significance
- Scientific significance

All objects will be directly impacted by the proposal.

It is currently proposed that a surface collection of the artefacts be undertaken and that the artefacts be placed in the long-term care of the Dubbo Local Aboriginal Land Council (LALC). An application for an Aboriginal Heritage Impact Permit (AHIP) has been submitted to Heritage NSW.

6.6.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed:

- All construction work would be undertaken within the assessed areas of the proposal site only
- Work will not commence until the AHIP has been issued by Heritage NSW
- Work would be undertaken in accordance with the conditions of the AHIP.
- In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken
- If human remains are uncovered, works must immediately cease, and the NSW Police department and Essential Energy's Environmental Services team will be notified

6.6.4 CONCLUSION

The proposal will have a direct impact on three identified Aboriginal objects. An AHIP has been sought for the three objects. With implementation of conditions of the AHIP, and mitigation measures outlined in this REF, it is considered unlikely the proposal will have a significant impact upon on Aboriginal heritage. The overall environmental risk is considered to be low.

6.7 Non-Aboriginal Heritage

6.7.1 EXISTING ENVIRONMENT

Non-Aboriginal heritage refers to any deposit, object or material evidence which relates to the settlement of New South Wales, not being Aboriginal settlement, and is of state or local heritage significance (Section 4 of the Heritage Act).

A desktop search of Australia's World Heritage Sites (Commonwealth DCCEEW, 2024c), National Heritage List (Commonwealth DCCEEW, 2024d), NSW State Heritage Inventory (Heritage NSW, 2024), Dubbo Regional LEP 2022 was conducted to determine the extent of non-Aboriginal heritage in the vicinity of the proposal.

6.7.2 ASSESSMENT OF IMPACT

A review of the above-mentioned heritage registers indicated no sites of world, national, state or local heritage significance are located within, or intersected by, the boundary of the proposal site. The nearest identified non-Aboriginal heritage site was a locally listed heritage site on the Dubbo Regional LEP (Item

I263), the Geurie General Cemetery, located approximately 815m northwest of the proposal site (refer**Figure 15**). The local heritage site will not be impacted by the proposal.

The site inspection undertaken on 4 July 2024 and 1 October 2024 did not indicate any evidence of non-Aboriginal heritage items being located within the proposal site.

Given the level of historical and more recent disturbance at the site, lack of records at, and in the immediate vicinity of, the proposal site, it is unlikely the proposal will impact non-Aboriginal heritage.

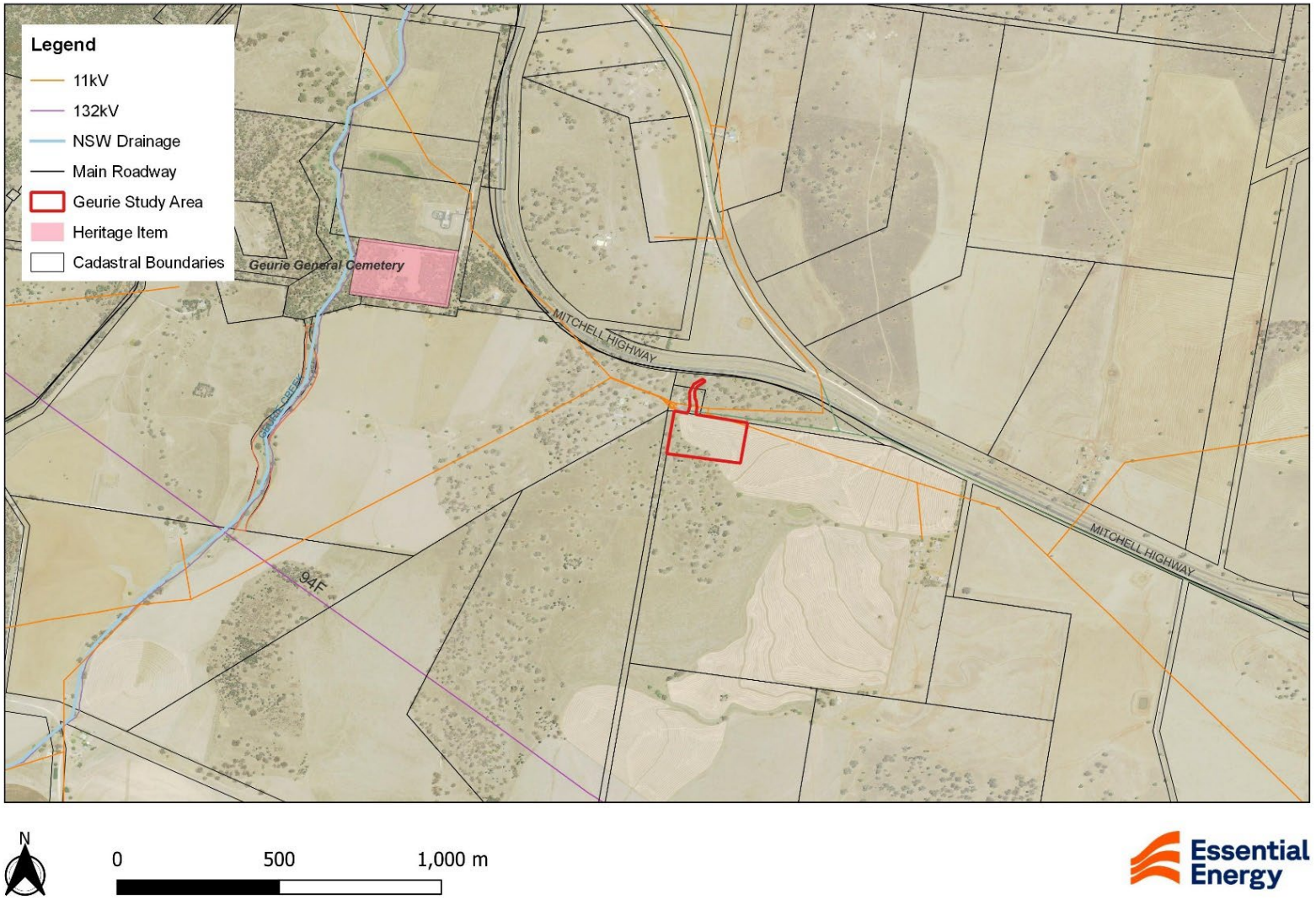

Figure 15: Nearest Non-Aboriginal heritage item relative to the proposal site

6.7.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures would be applied:

- All construction work would be undertaken within the assessed areas of the proposal site only
- In the unlikely event that a previously unknown heritage site or object is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken

6.7.4 CONCLUSION

The proposal is unlikely to have a significant impact upon non-Aboriginal heritage in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.8 Contamination

6.8.1 EXISTING ENVIRONMENT

6.8.1.1 Desktop Assessment

A search of the NSW EPA 'Contaminated Land – Record of Notices' (EPA, 2024a) and 'List of NSW Contaminated Sites Notified to EPA' (EPA, 2024b) did not identify any contaminated sites within or in the near vicinity of the proposal site.

A search of NSW Department of Primary Industries (DPI) Cattle Tick Dip Site Locator did not indicate any tick dip sites within or in the immediate vicinity of the proposal site.

6.8.1.2 Site Inspection

Inspection of the proposal site by Essential Energy's Environmental Senior Specialist, on 4 July and 30 September 2024 indicated the proposal site has undergone significant previous disturbance in the form of regular cultivation and cropping for the majority of the site. The southwestern portion of the site has been subject to agricultural activity in the form of native vegetation grazing. Immediately to the north, and at similar topographic height, of the proposal area is an existing electricity substation. Within the substation footprint, inspection from the perimeter revealed no visual or olfactory evidence of hydrocarbon spills, or visual evidence of asbestos containing materials (ACM).

The proposed location of the new substation access track has been subject to stockpiling of materials such as concrete culverts, excavated materials and crushed rock by Transport for NSW (TfNSW). Some of this crushed rock has hydrocarbon coating (a typical product used in road construction). The area is identified by Transport for NSW as NSW DUBO6: Geurie Substation stockpile site.

6.8.2 ASSESSMENT OF IMPACT

There are no known records of contamination at the proposed ZS site. While surface soils and subsoils may have been subjected to periodic pesticide and fungicide use during agricultural activities, it is not expected that significant contamination would have resulted from the application of these chemicals. The lack of olfactory or visual evidence of contamination and understanding of prior land use, indicate that the risk of encountering significant areas of contamination is considered low, and could be managed on-site during construction.

There is low potential for surface soil and ground water contamination from the existing substation as there are no recorded incidents at the site. The potential for offsite sources of contamination to impact the proposal site is considered low as there is limited potential sources of contamination given the use of surrounding land for agricultural purposes.

The storage of hydrocarbon coated crushed rock within the TfNSW, NSW DUBO6: Geurie Substation stockpile site has likely created a pathway for underlying surface soils to be subject to come in contact with this material. However, it is likely that the concentration of any potential contamination would be low, given

the low volume of hydrocarbon used to coat the rock. These hydrocarbon coated stockpiles and any other excavated material stockpiles will be relocated within the TfNSW stockpile site should they be within the proposed access track construction footprint.

Spillage of diesel, lubricating oils or other chemicals could occur during refuelling and/or maintenance of construction plant/equipment and vehicles, whilst leakage of fuels or oils could occur from poorly maintained construction plant/equipment and vehicles, during civil and construction work for the ZS. Any on-site chemical spill or leak could adversely affect the water quality of surrounding waterways. The risk of chemical spills and leaks is expected to be minor, provided that adequate mitigation measures are implemented (see **Section 6.8.3**).

6.8.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be adopted if and where required:

- It is intended to reuse surplus spoil beneficially on site, where possible
- Essential Energy's *CEOP8064 Management of Excavated Material; Guideline for Construction Sites* will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials
- In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) *Waste Classification Guidelines*, and then disposed of at a facility that is lawfully able to accept the waste
- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling
- Sediment and erosion control structures will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses.

6.8.4 CONCLUSION

The proposal will have minimal interaction with hydrocarbon contaminated surface soils, from prior stockpiling of road construction materials. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.9 Electric and Magnetic Fields

6.9.1 EXISTING ENVIRONMENT

6.9.1.1 Introduction

Electric and Magnetic Fields (EMF) are part of the natural environment and are present in the Earth's core and the atmosphere. EMF is also produced wherever electricity or electrical equipment are in use. Powerlines, electrical wiring, household appliances and electrical equipment all produce EMF.

The EMF associated with electrical equipment, whilst interrelated, are not dependent on each other and can exist independently. The electric field is associated with the voltage of the equipment and the magnetic field is associated with the current (amperage). In combination, these fields cause energy to be transferred along electric wires.

An electric field is a region where electric charges experience an invisible force. The strength of this force is related to the voltage, or pressure, which forces electricity along wires. Electric fields are strongest closest to their source, and their strength diminishes rapidly with distance from the source, in much the same way as the warmth of a fire decreases with distance. Many common materials – such as brickwork or metal – block electric fields, so they are readily shielded and, for all practical purposes, do not penetrate buildings. They are also shielded by human skin, such that the electric field inside a human body will be at least 100,000 times less than the external field. (WHO, 2007)) Being related to voltage, the electric fields associated with HV aerial lines and electrical substations remain relatively constant over time, except where the operating voltage changes.

A magnetic field is a region where magnetic materials experience an invisible force produced by the flow of electricity (known as electric current and measured in Amperes). The strength of a magnetic field depends on the size of the current and decreases as distance from the source increases. The magnetic field strength resulting from an electrical installation varies continually with time and is affected by a number of factors including:

- The total electric load
- The size and nature of the equipment
- The design of the equipment
- The layout and electrical configuration of the equipment and its interaction with other equipment

While electric fields are blocked by common materials, this is not the case with magnetic fields. This is why locating equipment in enclosures or underground will eliminate any external electric field but not the magnetic field.

Alternating electric and magnetic fields are produced by any electric wiring or equipment carrying alternating current (AC). This current does not flow steadily in one direction but oscillates backwards and forwards at a frequency1[1] of 50Hz and hence the fields produced by AC systems oscillate at the same frequency. This frequency falls into a range referred to as extremely low frequency (ELF), so the electric and magnetic fields are referred to as ELF fields.

6.9.1.2 Electromagnetic Radiation

It is not uncommon for the EMF associated with electrical equipment to be confused with electromagnetic radiation (EMR). The fact that, in many jurisdictions, agencies which regulate the various forms of EMR are also involved in the setting of guidelines/standards for EMF tends to add to this confusion.

EMR is a term used to describe the movement of electromagnetic energy through the propagation of a wave. This wave, which moves at the speed of light in a vacuum, is composed of electric and magnetic waves which oscillate (vibrate) in phase with, and perpendicular to, each other. This is in contrast to EMF, where the electric and magnetic components are essentially independent of one another.

EMR is classified into several types according to the frequency of its wave; these types include (in order of increasing frequency): radio waves, microwaves, terahertz radiation, infra-red radiation, visible light[2], ultraviolet radiation, X-rays, and gamma rays. Whereas EMR causes energy to be radiated outwards from its source e.g., light from the sun or radio-frequency signals from a television transmitter, EMFs cause energy to be transferred along electric wires.

In the context of the EMF/health issue, the distinction between EMF and EMR is addressed by the New Zealand Ministry of Health in its public information booklet "Electric and Magnetic Fields and Your Health" (NZ Ministry of Health, 2009) as follows:

> *"The electric and magnetic fields around power lines and electrical appliances are not a form of radiation. The word "radiation" is a very broad term, but generally refers to the propagation of energy away from some source. For example, light is a form of radiation, emitted by the sun and light bulbs. ELF fields do not travel away from their source but are fixed in place around it. They do not propagate energy away from their source. They bear no relationship, in their physical nature or effects on the body, to true forms of radiation such as x-rays or microwaves."*

6.9.1.3 Overview of EMF Health Issue

Research into EMFs and health is a complex area involving many scientific disciplines – from biology, physics and chemistry to medicine, biophysics, and epidemiology. Many of the health issues of interest to researchers are quite rare. In this context, it is well accepted by scientists that no study considered in

[1] Frequency is a measure of the number of times per second a wave oscillates or vibrates. The most common unit of measurement of frequency is the Hertz (Hz) where 1 Hz is equal to 1 cycle per second.

[2] Visible light is a group (spectrum) of frequencies which can be sensed by the eyes of humans and various other creatures.

isolation will provide a meaningful answer to the question of whether or not EMFs can contribute to adverse health effects. In order to make an informed conclusion from all of the research, it is necessary to consider the science in its totality. Over the years, governments and regulatory agencies around the world have commissioned independent scientific review panels to provide such overall assessments.

Extremely Low Frequency (ELF) Fields

The possibility of adverse health effects due to the EMFs associated with extremely low frequency electrical equipment has been the subject of extensive research throughout the world. To date, while adverse health effects have not been established, the possibility that they may exist cannot be ruled out.

While EMFs involve both electric and magnetic components, electric fields are relatively constant over time, are readily shielded and, in the health context, are generally no longer associated with the same level of interest as magnetic fields. Nevertheless, high electric field strengths, such as those associated with high voltage equipment in major substations can approach a level at which "nuisance shocks" can occur and this phenomenon needs to be managed. Magnetic fields are not readily shielded, are more ubiquitous and remain the subject of some debate. Accordingly, much of the remainder of this section is directed towards magnetic fields.

The most recent scientific reviews by authoritative bodies are reassuring for most potential health issues. However, statistical associations[3] between prolonged exposure to elevated magnetic fields and childhood leukaemia have persisted. This led the International Agency for Research on Cancer (IARC) [World Health Organisation (WHO) IARC, 2001] in 2002 to classify magnetic fields as a "possible carcinogen"[4]

The fact that, despite over 30 years of laboratory research, no mechanism for an effect has been established, lends weight to the possibility that the observed statistical associations reflect some factor other than a causal relationship. This point is made in the 2001 report of the UK National Radiological Protection Board's (NRPB) Advisory Group, chaired by eminent epidemiologist, the late Sir Richard Doll (United Kingdom National Radiological Protection Board, 2001)

> *"In the absence of clear evidence of a carcinogenic effect in adults, or of a plausible explanation from experiments on animals or isolated cells, the evidence is currently not strong enough to justify a firm conclusion that such fields cause leukaemia in children" (page 164)*

6.9.1.4 Health Guidelines for Extremely Low Frequency Electric and Magnetic Fields

The WHO recognises two international EMF/Health guidelines:

- *Guidelines for Limiting Exposure to Time-varying Electric and Magnetic Fields (1Hz to 100kHz)* produced by the International Commission on Non-Ionising Radiation Protection (ICNIRP, 2010)
- *Standard C95.1,* produced by the International Committee on Electromagnetic Safety, Institute of Electrical and Electronics Engineers (IEEE) in the USA.

In July 2015, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) officially adopted the more conservative of the above two, the ICNIRP 2010 Guidelines, in full, stating:

> *"The ICNIRP ELF guidelines are consistent with ARPANSA's understanding of the scientific basis for the protection of the general public (including the foetus) and workers from exposure to ELF EMF."* (ARPANSA, 2015)

In line with the regulator's advice, Essential Energy has applied the current international ICNIRP guideline reference levels to this assessment.

The reference levels for both electric and magnetic fields contained in the current ICNIRP guidelines are summarised in **Table 12**.

[3] It should be noted that a statistical association does not necessarily reflect a cause-and-effect relationship.

[4] IARC publishes authoritative independent assessment by international experts of the carcinogenic risks posed to humans by a variety of agents, mixtures, and exposures.

Table 12: Health Guideline Reference Levels

PARAMETER	ICNIRP 2010 REFERENCE LEVELS
Electric Fields – General Public	5 kV/m (kilovolts per metre)
Electric Fields – Occupational	10 kV/m
Magnetic Fields – General Public	2,000 milligauss (mG)
Magnetic Fields – Occupational	10,000 mG

In applying the guidelines, it is to be noted that, unlike earlier versions, the various limits are now independent of duration of exposure.

It is also important to recognise that the numerical limits, e.g., 2,000 mG, are based on established health effects. In ICNIRP's fact sheet on the guidelines (ICNIRP, 2010), it notes that:

> *"It is the view of ICNIRP that the currently existing scientific evidence that prolonged exposure to low frequency magnetic fields is causally related with an increased risk of childhood leukaemia is too weak to form the basis for exposure guidelines. Thus, the perception of surface electric charge, the direct stimulation of nerve and muscle tissue and the induction of retinal phosphenes are the only well-established adverse effects and serve as the basis for guidance."*

Being based on established biological effects (which occur at field levels much higher than those normally encountered in the vicinity of electrical equipment), the (numerical) exposure limits in the guidelines and standards cannot be said to define safe limits for possible health effects, should these exist, from magnetic fields at levels normally encountered in the vicinity of electrical equipment.

It is in this context that precautionary measures for ELF magnetic fields such as "Prudent Avoidance" have arisen.

6.9.1.5 Prudent Avoidance for Extremely Low Frequency Magnetic Fields

Regarding the potential health effects from ELF magnetic fields, while compliance with the relevant guideline is important in protecting people from established health effects, it does not necessarily address possible health effects, should they exist, from fields at levels normally encountered in the vicinity of electrical equipment. The possibility of such effects has been comprehensively studied over several decades worldwide but, to this day, there is no clear understanding of how ELF electric or magnetic fields at low levels could pose a threat to human health.

Since the late 1980s, many reviews of the scientific literature have been published by authoritative bodies. There have also been several inquiries such as those by Sir Harry Gibbs in NSW (Gibbs, 1991) and Professor Hedley Peach in Victoria (Peach, 1992). These reviews and inquiries have consistently found that:

- Adverse health effects have not been established
- The possibility cannot be ruled out
- If there is a risk, it is more likely to be associated with the magnetic field than the electric field

Both Sir Harry Gibbs and Professor Peach recommended a policy of prudence or prudent avoidance, which Sir Harry Gibbs described in the following terms:

> *"... [doing] whatever can be done without undue inconvenience and at modest expense to avert the possible risk ..."*

In 1999, the United States of America (USA) National Institute of Environmental and Health Sciences (NIEHS) (1999) found:

> *"In summary, the NIEHS believes that there is weak evidence for possible health effects from ELFEMF exposures, and until stronger evidence changes this opinion, inexpensive and safe reductions in exposure should be encouraged." (Page 38)*

The practice of 'prudent avoidance' has been adopted by the (Australian) Energy Networks Association (ENA) and most Australian power utilities, including Essential Energy.

The World Health Organisation has also addressed the notion of prudence or precaution on several occasions, including in its 2007 publication Extremely low frequency fields. Environmental Health Criteria, Vol. 238 (WHO, 2007), which states:

> *"...the use of precautionary approaches is warranted. However, it is not recommended that the limit values in exposure guidelines be reduced to some arbitrary level in the name of precaution. Such practice undermines the scientific foundation on which the limits are based and is likely to be an expensive and not necessarily effective way of providing protection."*

It also states:

> *"Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposure is reasonable and warranted."*

Given the inconclusive nature of the science, it is considered that a prudent approach continues to be the most appropriate response in the circumstances. Under this approach, subject to modest cost and reasonable convenience, power utilities and transport authorities should design their facilities to reduce the intensity of the fields they generate, and locate them to minimise the fields that people, especially children, encounter over prolonged periods. While these measures are prudent, it cannot be said that they are essential or that they will result in any benefit.

In the Australian context, ENA's position, as adopted in their EMF Management Handbook (Energy Networks Association, 2016), states:

> *"Prudent avoidance does not mean there is an established risk that needs to be avoided. It means that if there is uncertainty, then there are certain types of avoidance (no cost / very low-cost measures) that could be prudent."*

It also states:

> *"Both prudent avoidance and the precautionary approach involve implementing no cost and very low cost measures that reduce exposure while not unduly compromising other issues."*

6.9.2 ASSESSMENT OF IMPACT

The location of the new ZS has been selected on the basis of its close proximity to existing electricity infrastructure, including the current Geurie ZS. Therefore, the proposed development will not introduce a new source of EMF into a location that previously had low sources of EMF.

The proposed new ZS incorporates prudent EMF avoidance measures into the standard designs for substations. The design of the proposal has minimised the magnetic field as far as technically reasonable and within the context of "...[doing] whatever can be done without undue inconvenience and at modest expense to avert the possible risk [to health]", consistent with Gibbs Inquiry (1991).

The closest sensitive receiver is a rural premise, R1, located approximately 180m to the west of the proposal site (See **Figure 5**). Given this separation distance between the receiver and the proposed ZS, it is unlikely that the ZS will expose these sensitive receivers to EMF.

6.9.3 CONCLUSION

The proposal will comply with all relevant national and international guidelines. The resulting magnetic fields from the ZS are within the range of fields expected from electricity infrastructure in the area. The overall environmental risk is considered to be low.

6.10 Visual and Aesthetics

6.10.1 APPROACH

The following visual amenity assessment approach was applied to evaluate the potential visual impacts associated with the project. It is based on a professionally recognised system developed by the United States Forest Service (1974), and similar methods adopted by the Forestry Commission of Tasmania (1983) and the NSW Department of Planning (1980).

The approach used in this assessment is as follows:

- The existing visual environment of the site is described (in terms of landscape character, scenic quality, visual and landscape sensitivity and major viewpoints)
- A brief description is made of the proposed visual changes
- An impact assessment is then undertaken, assessing both the changes to the site itself, and any impacts to views from surrounding areas

The visual impact of the proposed activity has been determined though the interaction of visual modification and visual sensitivity. These are discussed in more detail in the following sections. The 'visual impact matrix', illustrated in **Table 13**, is used to determine the potential visual impact of the proposed activity by combining a ranking of high, medium and low for both visual modification and visual sensitivity.

Table 13: Visual Impact Matrix

		VISUAL SENSITIVITY		
		High	Medium	Low
VISUAL MODIFICATION	High	High Impact	High Impact	Moderate Impact
	Medium	High Impact	Moderate Impact	Minor Impact
	Low	Moderate Impact	Minor Impact	Minor Impact

6.10.1.1 Visual modification

Visual modification expresses the visual interaction between the proposal and the existing visual environment. It is the visual contrast between pre and post-development, and is a combination of the appearance of the development (size, form, colour, texture), absorptive capacity of the landscape setting, and the distance from which the development is viewed. Visual modification is expressed here as high, medium or low.

High visual modification

A high degree of visual modification would result if the proposed developments are a major element and contrast strongly with the existing landscape. The contrast is likely to occur if there is little or no natural screening or integration created by vegetation, or if there is an open plain. For example, powerlines passing over vegetated ridge tops also usually represent a high visual modification, particularly if it is a new powerline passing through otherwise undisturbed vegetated terrain and the viewer is parallel to the line.

Medium visual modification

A medium degree of visual modification would result if the proposed developments are visible and contrast with the landscape but are integrated to some degree. This would happen if the surrounding vegetation and/or topography provide some measure of visual screening, backgrounding or other form of visual integration of the development with its setting. An example of a medium visual modification is an urbanised streetscape with existing powerlines and/or established trees on the roadside.

Low visual modification

A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration of size, form, colour or texture between the development and the environment. This would occur if there is a high degree of visual integration of the development into the existing landscape or a low level of visual modification of the existing visual setting is achieved. A low visual modification may reflect a situation where the development may be noticeable, but it does not markedly contrast with the existing landscape, as is the case with upgrading existing powerlines.

Throughout the study area, the degree of visual modification is highly dependent on the distance the viewer is from a new development. As the distance from the new development to the viewing location increases, the development becomes less prominent, and therefore its visual modification is less.

Visual modification is also affected by the angle at which a new development is viewed. In general, the visual modification when viewing the new development at right angles is less than when viewing in parallel, depending on the distance from the new development.

6.10.1.2 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape would be viewed from various viewpoints. This is dependent on a number of viewer characteristics, such as the number of viewers affected, land use, existing vegetation patterns, distance of the development from viewers, and the visibility of the development from critical viewing locations.

High visual sensitivity

Occupiers of residential properties with long viewing periods adjacent or within close proximity to the proposal. High sensitive areas can also apply to users of outdoor recreational areas, including reserved land or nature recreation such as walking, swimming, fishing or trail riding. This is particularly the case where their attention is focussed, in part, on the landscape and amenity that is being affected by the proposed development.

Medium visual sensitivity

Medium sensitivity would apply to circumstances in which viewers have intermittent exposure, such as outdoor workers and outdoor recreation users, however, for the recreational user, attention is focussed predominantly on the activity they are viewing, such as a sporting event, rather than the proposed development. In addition, medium sensitivity would also apply to occupiers of residential properties with long viewing periods at a distance from or partially screened from the proposed development or project area.

Low visual sensitivity

Low sensitive viewers include predominantly those groups that have a short term view of the proposed development. This would be limited to mainly road users, trains or transport routes that are passing through or adjacent to the study area. Low sensitivity would also apply where viewers are adequately screened from the proposed development so that their viewing periods are limited to short periods.

6.10.2 EXISTING VISUAL ENVIRONMENT (LANDSCAPE DESCRIPTION)

The proposal site is situated predominately in a low incline area surrounded by gently undulating rises and low hills, as described in the Arthurville Soil Landscape mapping (Murphy and Lawrie 1998). The majority of the site has been subject to cultivation and cropping where ground elevation is less inclined. The

southwestern portion of the proposed lot is cleared grazing areas with occasional paddock trees, positioned on a gentle rise.

The visual landscape surrounding the proposed ZS lot includes:

- An existing substation to the immediate north of the proposed ZS, covering an area of approximately 40m by 22m with access track leading to the Mitchell Highway. An area adjoining the substation access track has been used by Transport for NSW for stockpiling of aggregates and culverts associated with road maintenance / construction. North of the stockpile area is the Mitchell highway and then the Main western railway line. Approximately 400m north is a residential dwelling, 'R3', that has partial line of site to the proposed development.
- To the east of the proposed ZS site the visual landscape is a cultivated and cropped area. Further to the east, approximately 735m away, is the residential dwelling 'R2' of the previous land owner of the proposed ZS site. There is line of sight from this receiver to the proposed development.
- To the immediate south is the low hill that comprises the grazed land with scattered trees before returning to an area used for cropping where the topography is flatter further to the south.
- West of the proposal site is a gentle rise of scattered paddock trees with previously grazed grassed areas below. The nearest residential dwelling in this direction is 'R1' approximately 180m from the proposed ZS.

6.10.3 ASSESSMENT OF IMPACT

6.10.3.1 Visual modification

The proposed ZS will require a cut and fill operation that will cut from the hillslope in the southwestern portion of the proposed ZS Lot, to create a pad for the ZS construction. This will require the removal of trees, including some that provide visual buffer between the adjoining land to the west and the proposed ZS. The civil works and site preparatory works will be short term but will create a high degree of change to the visual landscape.

A permanent change to the visual landscape will arise upon the construction of the electrical infrastructure required for the ZS, including:

- four transformer bays,
- high voltage switchgear operating at 132kV and 11kV,
- building with amenities,
- control room building
- batter and telecommunication building
- control equipment
- 10,000 Litre water tank
- structures including lightning masts, fencing, and driveways
- a stormwater pond.

The control building required for the proposed ZS will be positioned on the northern boundary of the site. This will provide a visual screen to the above ground electrical infrastructure comprising feeders and switch gear, within the substation site, though vegetation within the highway road reserve provides the most screening at present. Once constructed the new 132/11kV ZS will have some degree of integration with the existing ZS and other existing electrical infrastructure (i.e., powerlines). Long term visual change is therefore assessed as medium.

The substation will be subject to future above ground feeder construction. Design is on-going for two proposed 132kV overhead feeders to the south of the proposed ZS and one 132kV feeder to the east of the proposed substation. This will be the subject to a separate environmental assessment, however cumulative impacts are discussed later in this review.

The three dimensional (3D) model provided in **Figure 16** gives an indicative representation of the substation features.

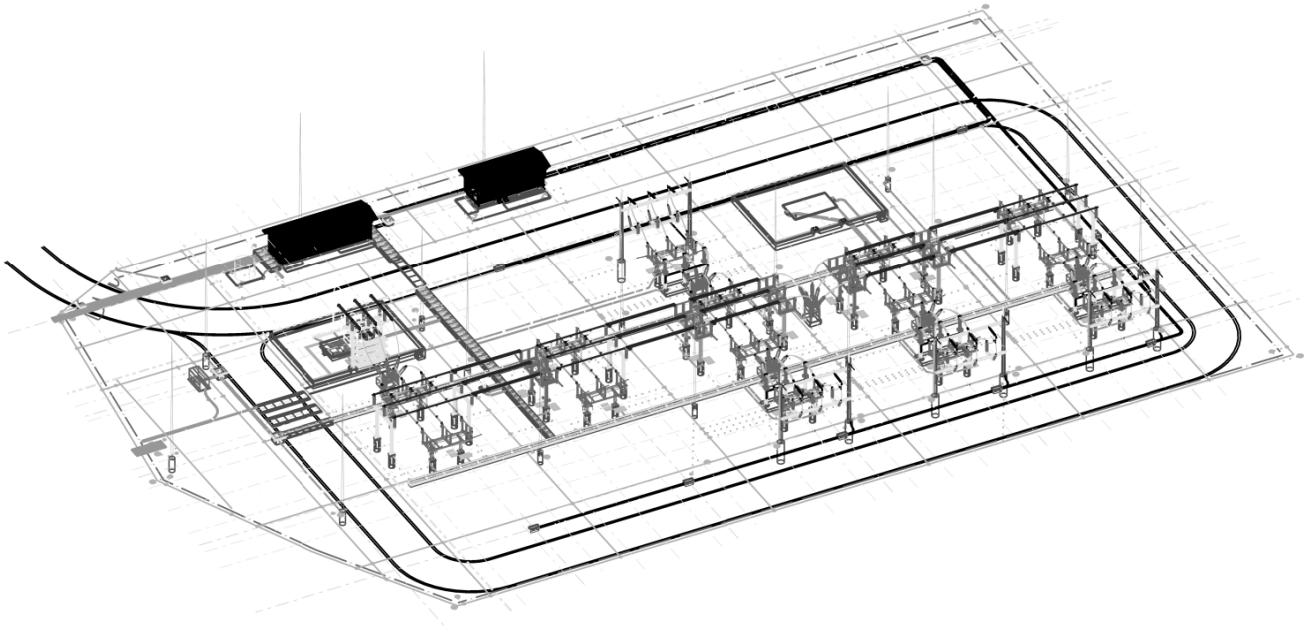

Figure 16: Three Dimensional (3D) Model of the proposed Geurie ZS site

6.10.3.2 Visual sensitivity

The nearest sensitive receivers with a potential direct line of sight are the residential dwelling to the west (R1) at 180m from the nearest edge of the ZS footprint, and the residential dwelling to the east (R2) at 680m away. R1 is the closest receiver. Neither dwelling has their façade facing the substation. R1 has direct line of sight from approximately two windows on the eastern side of the dwelling. A level of visual shielding will be provided from the sparse paddock trees within the lot where R1 is located between the proposed ZS site and R1. R2 is the next closest receiver to the east of the proposed ZS. R2 is owned by the same landowner that previously owned the land where the substation is located. Minimal screening is provided by vegetation within the house paddock surrounding R2, though lines of sight would be available from the western side of the dwelling. Open, low incline land used for cropping is between the R2 house paddock and the proposed ZS. Within the viewshed of the proposed ZS, both R1 and R2 would have periodic views when undertaking agricultural activities on their properties. Current periodic views when undertaking such works would be subject to the existing Geurie substation. Thus there would be a level of integration with existing electrical infrastructure in the viewshed, though an increase in area occupied by said infrastructure. Visual sensitivity for these two closest receivers is therefore assessed as medium. The receiver to the north of the proposed substation, R3, has the dwelling façade facing toward the substation. However, this receiver is considered to be of low visual sensitivity given partial line of sight due to the vegetative screen provided by vegetation within the road reserve and integration with the existing substation.

The majority of viewers besides these two closest receivers of the proposed substation will be low sensitivity viewers given that the view will be short term and limited to passing views from train and vehicle movements on the main western railway and Mitchel Highway respectively. The ZS setback from the road and scattered trees present within the road reserve will provide screening in the vicinity of the ZS. Little vegetation screening is present from traffic travelling to Dubbo from the south-east given the open cropping land present.

Plate 9: Example of the style and colouring of the building to be used at the substation site, typical of that used at other Essential Energy substations and switching stations.

6.10.4 SUMMARY OF POTENTIAL IMPACTS

The design has positioned the substation so as to be adjoining an existing substation, in close proximity to multiple feeders and in a rural location with limited sensitive receivers.

Visual modification has been assessed as medium over the longer term. Visual sensitivity for the two closest receivers is considered to be medium over both the short and longer term. In accordance with the visual impact matrix, the proposed activity is likely to result in a moderate visual impact for the two closest receivers.

Whilst the proposal has been determined to have a moderate visual impact in accordance with the visual impact matrix, this is not the same as a significant impact. Electrical infrastructure, including ZS are considered to be relatively low impact due to their size, scope and intensity. The ZS will not block significant amounts of sunlight, and will not significantly impede views, or impact upon privacy.

Furthermore, electricity is an essential service provision that benefits the broader Australian population and the economy, including the transition to renewables. As such, ZS, like other utilities, are generally permissible within all planning zones and are a reasonable and necessary development.

6.11 Waste

6.11.1 ASSESSMENT OF IMPACT

Waste material generated from the proposal would generally comprise the following:

- General construction waste including but not limited to cardboard, paper, wood, mesh, steel, concrete, and other damaged or excess construction materials
- General refuse generated by personnel including putrescible wastes, food scraps, packaging and other domestic wastes
- Surplus excavated soil material from cut and fill (although not expected), excavation and trenching works
- Vegetation debris from clearing works associated with tree felling and site preparations.

Any surplus soil that cannot be reused on site will be assessed against the virgin excavated natural material (VENM) criteria, any relevant waste exemption and order, or classified and disposed of at a facility lawfully able to accept the waste.

Operation of the proposal is not expected to generate any substantial quantities of waste material, with the exception of transformer oil.

6.11.2 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to minimise and manage impacts to waste:

- All wastes that are generated as a result of the project will be classified in accordance with the Waste Classification Guidelines (EPA, 2014)
- All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste.

6.11.3 CONCLUSION

The proposal is not anticipated to generate a large quantity of waste. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.12 Bushfire

6.12.1 EXISTING ENVIRONMENT

The proposal site is mapped as vegetation category three (3) by the NSW Bushfire Prone Land Mapping. This is due to the lack of upper storey vegetation on the cultivated land that occurs over the majority of the ZS site and the sparse vegetation in the southwestern area of the proposed ZS site.

6.12.2 ASSESSMENT OF IMPACT

The proposal comprises the construction of a new ZS on rural land. The majority of the proposed footprint has been predominately cleared for historic cropping, with exotic and grass cover as the predominate vegetation type. A smaller area within the proposed footprint contains scattered paddock trees and limited mid storey. Activities with the potential to generate a spark will be avoided where possible during times of heightened bushfire risk.

6.12.3 ENVIRONMENTAL MITIGATION MEASURES

Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained for around the ZS perimeter.

6.12.4 CONCLUSION

The proposal is not anticipated to substantially add to the bushfire risk. The overall environmental risk is considered to be low

6.13 Traffic and Access

6.13.1 EXISTING ENVIRONMENT

The proposal site is adjacent to the Mitchell Highway. An unsealed access track to the existing substation is present off the Mitchell Highway. The Mitchell Highway has a single lane in each direction and a 100km/hr speed limit in the vicinity of the proposal site.

6.13.2 ASSESSMENT OF IMPACT

The proposed accessway to gain access from the Mitchell Highway will not require alterations at the confluence with the Highway. Construction works to modify the current access track will start approximately 35m from the castral boundary of the road reserve. The proposed driveway will deviate from the current alignment that leads to the existing substation and travel southward through the area currently used to stockpile road aggregate.

Low loaders will be required to deliver transformers to the site. Float trucks will be required to deliver large earth moving plant to and from site. Light vehicles will deliver construction staff to site during construction. Upon commissioning, on-going traffic the site will be limited to light vehicles conveying site to staff to site for regular inspection / monitoring and maintenance purposes.

The proposal plans to utilise suitable material from the site in a cut fill operation for general fill to establish the pad foundation of the substation. This will limit the requirement to import specialised quarry products to gravels, which will be required on the surface of the substation and materials for the creation of the driveway.

The driveway has been designed to provide access for construction plant, supplies, and vehicles around the substation construction site, and access for 4WD service vehicles and periodic heavy vehicle maintenance equipment post construction. The driveway will be constructed to an all-weather pavement surface, with an asphalt wearing surface.

Local road users may be subject to minor delays during the delivery of equipment or materials to the proposal site. During operation, the proposal would only be accessed irregularly by maintenance personnel. The proposal would not strain the capacity of the road system.

6.13.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measure will be employed:

- The need for a traffic management plan (TMP) for the construction phase would be determined and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction.

6.13.4 CONCLUSION

The proposal would have traffic and access impacts during construction and maintenance operations. The impacts would be short-term and minor. Upon implementation of the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.14 Land Use

6.14.1 EXISTING ENVIRONMENT

The proposal is located on rural land, that is zoned RU1- Primary production in the Dubbo Regional LEP. The majority of the proposal site is cultivated and cropped, while the southwestern portion of the proposed ZS site has been subject to clearing and is used for grazing of native vegetation. Residential dwellings in the locality are limited given the rural nature of the area. An Essential Energy owned substation exists to the north of the proposal site. The overhead feeder powerlines to this existing substation travel approximately east and west in the immediate vicinity.

6.14.2 ASSESSMENT OF IMPACT

The construction of the ZS will reduce the footprint of available land for cropping and grazing, the current uses of the land in this location. However, the reduction of agricultural land from what will remain available is minor. The positioning of the proposed ZS is adjoining the existing Geurie ZS, consolidating electrical infrastructure in the locality. The location is setback from the Mitchell Highway, and is within a rural area, with limited sensitive receivers in the vicinity, the closest of which is 180m to the west.

6.14.3 ENVIRONMENTAL MITIGATION MEASURES

The following measures should be adhered to during the construction phase of the proposed activity:

- The site should be left in a tidy condition at the conclusion of construction activities

6.14.4 CONCLUSION

Any impacts on land use are likely to be low and manageable. Given the nature of existing land uses, the overall environmental risk is considered to be low.

6.15 Social and Economic

6.15.1 EXISTING ENVIRONMENT

The proposal site is located in the Dubbo Regional Council LGA, within the Central West and Orana region of NSW. The population with the LGA is 52,000 people, covers 7,536 square kilometres (km^2) and includes the city of Dubbo, the town of Wellington and the villages of:

- Geurie
- Wongarbon
- Stuart town
- Mumbil
- Ballimore
- Elong Elong and
- Eumungerie (Dubbo 2020)

Dubbo is expected to be the place of highest growth as the major urban centre for the Orana region. Dubbo is well serviced by road, rail and air transport. The main industries in the Dubbo Regional LGA are health, retail, education, government services, tourism, manufacturing, construction, agriculture, business services and transport. The region is also well positioned as a growing mining services centre with mining and exploration projects, both established and emerging, across the surrounding region (DRC 2020).

Dubbo 2020, characterises the social profile of the local area, identifying:

- Projected population growth between 2016 to 2036 is from 51,018 to 60,866 people
- median age within the Dubbo region is 37
- 4.6% speak languages other than English
- 15.1% identify as Aboriginal and/or Torres strait islander
- Has an unemployment rate of 3.5%, below the NSW average of 4.99%
- Largest employer is health care and social assistance
- Largest number of businesses are in the agriculture, forestry and fishing sector

6.15.2 ASSESSMENT OF IMPACT

An improvement to the electricity supply network provides many benefits to the broader community through a secure and reliable electricity supply.

In the absence of further augmentation to the high voltage supply network, there is an increased risk of supply interruptions. This would detrimentally impact on economic and social development of the region and potentially prove to be disruptive to existing commercial enterprises and to residences throughout the local area.

The proposal would support the energy transition, including solar power, and connections into the National Electricity Grid outlined as part of the vision and planning priorities in the DRC Local Strategic Planning Statement 2020 (DRC, 2020). The proposal, through the connection of a new solar farm, supports Objective 2 of the Central West and Orana Regional Plan 2041 (DPE, 2022b) by supporting the State's transition to Net Zero by 2050.

The proposal is unlikely to affect community resources; this may include the use of community infrastructure roads, water, and waste management services. The proposal is unlikely to cause substantial change or disruption to the community through loss of neighbourhood cohesion, access to facilities, community identity, or cultural character.

Electricity is an essential service in the human environment, by virtue of enhancing productivity, comfort, safety, health and the economy. The benefits of a secure and reliable electricity supply are evident in every aspect of our lives. Construction and operation of the proposed new ZS and associated augmentation of the associated powerline network will enable the connection of a number of new major customers to the grid, whilst ensuring a safe and reliable electricity supply to the broader Central-west Orana region.

6.15.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to manage and minimise potential negative social and economic impacts:

- Management of construction traffic in the vicinity of construction works, including communication with existing local residents and road users
- Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk.

6.15.4 CONCLUSION

Construction will be temporary in nature, and apart from some changes to the visual amenity and the minor reduction of land available for agricultural purposes, long-term impacts are not expected.

Negative social impacts would be short-term and minor. Longer term positive impacts are expected due to the proposal supporting the Central-west Orana REZ, the economic and social opportunities that will flow from that development, and the security and reliability of electricity supply with increasing demand. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.16 Cumulative Impacts

6.16.1 CONNECTION WITH THE PROPOSED ZS

Aboveground 132kV powerlines are proposed to connect with the proposed ZS. Two feeders within an easement of approximately 95m are proposed from the proposed ZS for a distance of 1.5km to the south to connect with the existing 132kV aboveground powerline (94F). A 132kV feeder is proposed between this confluence point to the Transgrid 330kV Bulk Supply Point at Wellington. This will span an approximate distance of 16.6km and have an easement of 45m.

An additional proposed 132kV aboveground powerline is to travel east from the proposed substation in the vicinity (or within where practicable) of the Mitchell Highway road reserve and connect into the Maryvale Solar Farm substation.

These aboveground powerlines are subject to separate environmental assessment upon completion of the proposed concept designs.

The Mitchell Highway in the vicinity of the Dubbo to Wellington is slated for upgrade to improve safety conditions through road widening activities. The extent and timeframe for delivery is unknown at this stage.

Based on the range of environmental impacts associated with the proposal subject to assessment in this REF, and the known existing and proposed developments in the locality, the potential for cumulative

impacts related to the proposal include biodiversity; construction dust and noise; visual amenity; loss of / impact to agricultural land; and traffic impacts during construction. However, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases of the proposal, the potential cumulative impact to other environmental factors during construction and operation of the proposal has been minimised to the greatest extent possible, and would not be significant. Any residual, minor impacts identified in this section of the REF can be mitigated and managed through the range of measures outlined in this section and summarised in **Table 14.**

6.17 Summary of Environmental Mitigation Measures

The environmental mitigation measures outlined in this document would be incorporated into the Project Construction Environmental Management Plan (CEMP). These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The mitigation measures are summarised in **Table 14**.

Table 14: Summary of Mitigation Measures

ASPECT	ENVIRONMENTAL MITIGATION MEASURES	TIMING
General	All environmental mitigation measures must be incorporated within the Construction Environmental Management Plan (CEMP), or relevant works plan as applicable for the proposed works.	Pre-works.
Consultation	Consultation has been undertaking, and is on-going in accordance with Table 5.	Project planning and re-works. Project planning and re-works. During works.
Licences, Permits, Approvals and Notifications	Notification to the local council and occupiers of adjoining land in accordance with clause 2.45 of State Environmental Planning Policy (Transport and Infrastructure) 2021.	21 days notification required for works involving new or existing substations. Essential Energy's Design Services will be responsible for this notification. These notifications have been sent.
	Notification to the local council in accordance with clause section 45 of the Electricity Supply Act 1995.	40 days notice of the proposed works must be given. Essential Energy's Design Services will be responsible for this notification. This notification has been sent.
	Section 68 approval under the Local Government Act 1994 may be required for construction and extension of water supply and any sewerage service pipes or fittings or fixtures communicating or intended to communicate, directly or indirectly, with any water supply and sewer of a council.	Prior to commissioning of ZS
	Section 90 AHIP from Heritage NSW under the National Parks and Wildlife Act 1974 for harm to three Aboriginal objects	Prior to construction
Air Quality	Any potential dust-borne materials transported to and from the activity site will be covered at all times during transportation	During works

	Any temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions All vehicles and machinery will be well maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits. Substation equipment, including circuit breakers, are the subject of regular inspection and maintenance to ensure equipment is operating as per the manufacturer's requirements.	Operation
Geology and Soil	Risks associated with sediment and erosion will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). In particular, controls including, but not limited to the following, will be implemented: Diversion of upslope runoff around the proposal site in a way that minimises erosion Sediment control fences or other measures shall be installed at the downslope perimeter of disturbed areas, including any temporary stockpiles. Maintenance of all erosion control measures at operational capacity until land is stabilised. Disturbed areas will be stabilised as soon as practicable following construction activities A site specific erosion and sediment control plan will be included as part of the Construction Environmental Management Plan (CEMP). Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials	During works.

Water Quality and Hydrology	Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling Transformers will be housed inside appropriately bunded areas Disturbed areas will be managed in accordance with the requirements of the Blue Book to minimise potential impacts to waterways. Sediment fencing will be erected, where required, downslope of disturbed areas, and impacts would be minimised where practicable. The implementation of overland discharge of sediment laden water across grassed areas. Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment sock. All options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway	During works (Operation only)
Noise and Vibration	Work that has the potential to create and audible noise at the nearest sensitive receiver, will be between 7am and 6pm Monday to Saturday. On occasions works outside these hours may be undertaken with agreement from adjacent landowners or where the following requirements are met: Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and Where the works are required to take place in the vicinity of private access ways or driveways, consultation with individual residents would be undertaken to advise residents of the planned timing of the works. All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. Any noise complaint will be investigated with additional control measures put in place if required.	During works

Flora and Fauna	Any change in design affecting land outside the proposal site assessed in this report will require further ecological survey - notwithstanding minor changes where the ecological value have been assessed for this proposal Erosion and Sediment Control measures will be established in accordance with Landcom's Managing Urban Stormwater, Soils & Construction Guidelines (The Blue Book, Landcom 2004) and documented in a Construction Environmental Management Plan (CEMP) to be prepared for the work. Stockpile and compound sites will be located using the following criteria: ▸ At least 40 m away from the nearest waterway ▸ In areas of low ecological conservation significance (i.e., previously disturbed land) ▸ On relatively level ground Essential Energy has a general biosecurity duty under the Biosecurity Act 2015 to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable. Field crews shall follow procedures as outlined in Essential Energy's Operational Guideline: Biosecurity Risk Management (CERM1000.96) to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable, with particular reference to vehicle and equipment hygiene practises Prior to clearing, inspect trees with bird nests or hollows before pushing or felling to ensure the nests are vacant. Inspection would occur immediately before pushing or felling. If a bird is in the nest, clear the trees around it first to see if the animal will disperse. If the bird is a nestling (baby bird confined to the nest) all measures would be taken to collect the bird and remove to a safe location Immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling the area of clearing work is to be inspected for fauna	Pre-works, during works and post works.

	If fauna is detected, the animal is to be allowed to leave the site without any coercion or a local wildlife rescue service is to be contacted to facilitate the safe removal of the animal from the worksite Do not refuel, store or decant chemicals within 50m of a waterway All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, dogs and cats.	
Aboriginal Heritage	Aboriginal heritage items identified during the EIA process will be managed in accordance with the conditions an AHIP that will be sought prior to construction In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken If human remains are uncovered, works must immediately cease and the NSW Police department and Essential Energy's Environmental Services team will be notified.	During works
Non-Aboriginal Heritage	All construction work would be undertaken within the assessed areas of the proposal site only In the unlikely event that a previously unknown heritage site or object is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken.	During works
Contamination	It is intended to reuse surplus spoil beneficially on site, where possible	During works

	Essential Energy's *CEOP8064 Management of Excavated Material; Guideline for Construction Sites* will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) *Waste Classification Guidelines*, and then disposed of at a facility that is lawfully able to accept the waste Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling Sediment and erosion control structures will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses.	
Electric and Magnetic Fields	The proposal will comply with all relevant national and international guidelines Siting the location of the proposed new ZS away from sensitive residential receivers greatly minimises any potential residual EMF exposure risk	Project planning and design
Waste	All wastes that are generated as a result of the project will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste.	During works
Bushfire	Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained for around the ZS perimeter.	Post construction
Traffic and Access	The need for a traffic management plan (TMP) for the construction phase would be determined and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction	Pre-works and during works
Land Use	The site should be left in a tidy condition at the conclusion of construction activities.	During works

Social and Economic	Management of construction traffic in the vicinity of construction works, including communication with local residents and road users Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk.	Pre-works and during works

7. Ecologically Sustainable Development

Ecologically sustainable development (ESD) is an attempt to provide the best outcomes for the human and natural environments both now and into the indefinite future. One of the most often cited definitions of sustainability is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainability relates to the continuity of economic, technical, social, institutional and environmental aspects of human society, as well as the non-human environment.

The existing environment has been described throughout **Section 6** this REF for the various aspects of the natural environment assessed as part of this proposed activity.

The proposal has been assessed against the following four principles of ESD listed in the Protection of the Environment Administration Act 1991.

The four principles of ESD are:

- The precautionary principle: section 6(2)(a)(i)(ii)
- The principle of inter-generational equity: section 6(2)(b)
- The principle of biological diversity and ecological integrity: section 6(2)(c)
- The principle of improved valuation of environmental resources: section 6(2)(d)(i)(ii)(iii).

An assessment of the proposal against the principles is provided below.

7.1 Precautionary Principle

The precautionary principle states that:

'If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

1) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and

2) an assessment of the risk weighted consequence of various options.'

For the precautionary principle to be applicable, two pre-conditions must be satisfied; "*first it is not necessary that serious or irreversible environmental damage has actually occurred – it is the threat of such damage that is required. Secondly, the environmental damage threatened must attain the threshold of being serious or irreversible*"[5].

If there is no threat of serious or irreversible environmental damage, there is no basis upon which the precautionary principle can apply.

Environmental investigations, including ecological assessment, Aboriginal heritage assessment, and a visual impact assessment supported by a site inspection, have been undertaken during the preparation of this REF to ensure that the potential environmental impacts are understood with a high degree of certainty. The spatial scale of impacts would be local and isolated to the immediate construction area. Therefore, it can be concluded that this proposal will not result in a threat of serious or irreversible damage.

Mitigation measures have also been proposed in this REF to minimise the identified potential impacts of the project. A Construction Environmental Management Plan (CEMP) will be developed and implemented as a

[5] Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133, Preston CJ at 129

precautionary measure, and no mitigation measures have been deferred due to a lack of scientific certainty. The proposal is therefore consistent with the precautionary principle.

7.2 Principle of Inter-generational Equity

The principle of inter-generational equity states that:

'The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'

To the extent possible, all environmental impacts and appropriate mitigation measures have been identified. The proposal would not harm the health, diversity and productivity of the environment to such an extent that future generations would not be able to benefit. The proposal will have the positive benefit of facilitating the connection of renewable energy projects into the grid.

The proposal is therefore consistent with the principle of inter-generational equity.

7.3 Principle of Biological Diversity and Ecological Integrity

The principle of biological diversity and ecological integrity states that:

'*Conservation of biological diversity and ecological integrity should be a fundamental consideration.*'

The proposal comprises the construction of a new Geurie ZS on predominately cleared land historically used for cropping, and an area of native vegetation that has historically been used for grazing. An ecological impact assessment, supported by site inspections has been prepared, which concluded the proposal will not result in a significant impact to the ecological values present in the proposal site. Impacts upon ecological integrity would therefore be negligible, as described in **Section 6.5**.

7.4 Improved Valuation of Environmental Resources

The principle of improved valuation of environmental resources states that:

'*Environmental factors should be included in the valuation of assets and services such as:*

- *Polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement*
- *The users of goods and services should pay prices based on the full life cycle of costs of providing those goods and services, including the use of natural resources and assets and the ultimate disposal of any waste*
- *Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise cost to develop their own solutions and responses to environmental problems.'*

The proposal has been designed taking into consideration the least possible impact on the environment. All costs associated with the containment, avoidance and abatement of pollution have been factored into the design of this proposal. The proposal will have the positive benefit of facilitating the connection of renewable energy projects into the grid.

8. Construction Environmental Management Plan

8.1 Introduction

A Construction Environmental Management Plan (CEMP) outlines the environmental objectives of a project, the environmental mitigation measures to be implemented, the timing of implementation, responsibilities for implementation and management, and a review process to determine the effectiveness of the strategies.

The construction contractor(s) would be required to develop a project-specific CEMP that addresses the scope of works to be undertaken. The CEMP would detail how the works would be undertaken to comply with all environmental laws, Essential Energy's environmental policy, and the environmental mitigation measures described in this REF.

The key objectives of the CEMP would include:

- Ensuring that the works are carried out in accordance with legislative requirements and relevant non-statutory policies
- Ensuring that the works are carried out in accordance with the requirements detailed in this REF, including all requirements outlined in any relevant approvals, permits or licences and the mitigation measures described in **Section 6** and **Table 14**.
- Ensuring that employees engaged to undertake the works comply with the conditions detailed in the CEMP
- Identifying management responsibilities and reporting requirements to demonstrate compliance with the CEMP

It is also noted that the CEMP would be a working document and may be amended over the course of the project.

If a particular activity falls outside the scope of the REF and CEMP, and it would increase the environmental impact, the activity is not permitted to continue without an appropriate environmental assessment under the EP&A Act.

8.2 Implementation of the CEMP

The CEMP would be a working document and would be amended should strategies initially implemented be found to be inadequate to manage environmental impacts. The CEMP would typically:

- Establish environmental goals and objectives
- Detail the conditions of approval
- List actions, timing and responsibilities for implementation that arise from the mitigation measures recommended in this REF
- Detail statutory requirements
- Provide a framework for reporting on relevant matters on an ongoing basis
- Detail training requirements for personnel in environmental awareness and best practice environmental management systems
- Outline emergency procedures, including contact names and corrective actions
- Detail process surveillance and auditing procedures
- List complaint handling procedures

- Detail quality assurance procedures.

8.2.1 AUDITING SCHEDULE OF THE CEMP

Auditing of the proposal would be undertaken to establish whether the contractor is conducting activities in accordance with their current environmental management plans and whether the management plans are providing an effective tool to control adverse environmental impacts.

The following activities are proposed to achieve the audit's purpose:

- Review the on-site implementation of the contractor's CEMP
- Review the documentation process to determine if planned works have received endorsement to proceed
- Monitor the compliance of construction activities with the project determination and environmental legislation
- Review the outcomes of any previous audit(s) and determine if there has been any change in the environmental performance of the construction contractor
- Identify opportunities to improve on-site environmental management practices.

The benefits of conducting the environmental audit are to allow:

- Feedback on the CEMP implementation process to assist both the contractor and project manager to improve the future preparation of site environmental management documentation
- Improve the planning of construction projects through documentation and impact assessment to ensure best environmental management practices are implemented on site
- Improve environmental management processes on site.

9. Environmental Checklist

In accordance with section 5.5 of the EP&A Act and clause 171 of the EP&A Reg, Essential Energy, when assessing the environmental impact of an activity on the environment, must consider the factors identified in **Table 15** and **Table 16** below.

Table 15: Section 5.5 requirements

REQUIREMENT	SECTION REFERENCE
For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity	Section 2, 6, 7 and 8
Without limiting the above, a determining authority shall consider the effect of an activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on	N/A – there are no wilderness areas within or close to the activity area

Table 16: Clause 171 Checklist

SECTION 171	SECTION REFERENCE
The environmental impact on a community *The works are located in what is currently a predominately rural landscape, with very few sensitive receivers, adjoining an existing substation site. Impacts on the community have been considered by this REF. These include noise, dust, social and visual impacts. With the exception of noise and visual, these have been assessed to be low. In accordance with the visual impact matrix, the proposed activity is likely to result in a moderate visual impact for the two closest receivers.*	Sections 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13 6.14 and 6.15
The transformation of a locality *The proposal has been determined to have a moderate visual impact in accordance with the visual impact matrix, this is not the same as a significant impact. Electrical infrastructure, including ZS are considered to be relatively low impact due to their size, scope and intensity. The ZS will not block significant amounts of sunlight, and will not significantly impede views, or impact upon privacy.* *The proposed activity is unlikely to result in a significant transformation of the locality.*	Sections 6.10, 6.14 and 6.15
The environmental impact on the ecosystems of the locality *The proposed ZS will be located within a predominantly cleared and heavily modified and disturbed land. Impacts to threatened species, populations and ecological communities from the construction, operation and maintenance of the ZS have been assessed in this REF, and will be minor, and not likely to result in a significant impact.*	Sections 6.5 and 7
Reduction of the aesthetic, recreational, scientific, or other environmental quality or value of a locality	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8,

The proposed activity is likely to result in a moderate visual impact from the current amenity of a rural landscape, The ZS will cause a minor reduction in available agricultural land that is predominately used for cropping, though vast areas of surrounding land is available for on-going agricultural use. Environmental impacts can be managed through implementation of mitigation measures in this REF.	6.9, 6.10, 6.14, 6.15 and 6.16
The effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations *A review of non-Aboriginal heritage databases, registers and LEPs indicated no sites of world, national, state, or local heritage were located at or within close proximity to the proposal site.* *The proposal will have a direct impact on three identified Aboriginal objects. An AHIP has been sought for the three objects. With implementation of conditions of the AHIP, and mitigation measures outlined in this REF, it is considered unlikely the proposal will have a significant impact upon on Aboriginal heritage.*	Sections 6.6, 6.7
The impact on the habitat of protected fauna (within the meaning of the *Biodiversity Conservation Act*, 2016) *The proposed activity is not likely to significantly impact threatened fauna species and their habitat.*	Section 6.5
The endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air *It is not anticipated that the proposal will endanger any species of animal, plant or other form of life, whether living on land, in water, or in the air.*	Section 6.5
Long-term effects on the environment *Long-term adverse environmental effects are not anticipated.*	Section 6 and 7
Degradation of the quality of the environment *With the exception of a moderate visual impact to the two adjoining residences, the risk to environmental degradation is considered low with the implementation of the management measures included in this REF.*	Sections 6.1, 6.2, 6.3, 6.5 and 6.8.
Risk to the safety of the environment *There is the potential risk to the environment from spillage of materials during construction of the proposal. Implementation of the mitigation measures contained in Section 6 of this REF will ensure that potential environmental risks are minimised.*	Sections 6.1, 6.2, 6.3, 6.8, 6.11, 6.12, 6.13, 6.14 and 7
Reduction in the range of beneficial uses of the environment *No long-term reduction in the range of beneficial uses of the environment is anticipated as a result of the proposal.*	Section 6 and 7
Pollution of the environment *Risk of pollution to the environment is considered low and can be managed with implementation of mitigation measures provided in this REF.*	Section 6
Environmental problems associated with the disposal of waste *Waste generated by the proposed works will be minor. All wastes that are generated by the project will be appropriately disposed of in accordance with the Waste Classification Guidelines (EPA, 2014).*	Section 6.11
Increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	Section 6

The proposal is unlikely to increase demands upon rare natural resources.	
The cumulative environmental effect with other existing or likely future activities *Based on the range of environmental impacts associated with the proposal subject to assessment in this REF, and the interaction of elements within or in connection with the proposal, or with other existing or proposed developments within the locality, the potential for some cumulative impacts exists. However, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases of the proposal, the potential cumulative impact to other environmental factors during construction and operation of the proposal has been minimised to the greatest extent possible, and would likely not be significant. Any residual, minor impacts identified in this section of the REF can be mitigated and managed through the range of measures outlined in this Chapter 6 and summarised in Table 14.*	Section 6.16
The impact on coastal processes and coastal hazards, including those under projected climate change conditions *The proposal is not located on the coast.*	Section 3.3 and 6.3
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1 *The proposal would support the push for renewables, including solar power, and connections into the National Electricity Grid outlined as part of the vision and planning priorities in the DRC Local Strategic Planning Statement 2020 (DRC, 2020). The proposal, through the connection of a new solar farm, supports Objective 2 of the Central West and Orana Regional Plan 2041 (DPE, 2022b) by supporting the State's transition to Net Zero by 2050 and deliver the Central–West Orana Renewable Energy Zone.*	Section 6.15
Other relevant environmental factors *No other relevant environmental factors have been identified during the preparation of this REF*	N/A

10. Conclusion

This REF has been prepared to assess the environmental impacts associated with the construction, operation and maintenance of the new Geurie 132/11kV ZS. Essential Energy is a determining authority as defined in the EP&A Act. As such, the activity has been assessed under Part 5, Division 5.1 of the EP&A Act.

The proposal would enable the upgrade of the local electricity network to allow connection to the Maryvale solar farm, and increase overall network capacity, placing Essential Energy in a better position to meet customers' future electricity needs.

The proposal complies with the provisions of section 5.5 of the EP&A Act and clause 171 of the EP&A Reg as shown in **Section 9**.

The proposal and its associated environmental impacts are unlikely to have a significant impact on the environment. The proposal would strengthen Essential Energy's electricity network in the broader area, maximising the social and economic benefits, whilst minimising any adverse environmental impacts.

11. References

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2015, *Extremely Low Frequency Electric and Magnetic Fields.*

Bureau of Meteorology (BoM), 2019, *Groundwater Dependent Ecosystems Atlas*, http://www.bom.gov.au/water/groundwater/gde/map.shtml, Accessed 6 March 2025.

Commonwealth DCCEEW, 2024a, *Protected Matters Search Tool*, https://pmst.awe.gov.au/#/map?lng=131.52832031250003&lat=-28.6905876542507&zoom=5&baseLayers=Imagery,ImageryLabels, Accessed 12 June 2024

Commonwealth DCCEEW, 2024b, *Australia's World Heritage List*, https://www.dcceew.gov.au/parks-heritage/heritage/places/world-heritage-list, Accessed 7 March 2025.

Commonwealth DCCEEW, 2024c, *Australia's National Heritage List*, https://www.dcceew.gov.au/parks-heritage/heritage/places/national-heritage-list, Accessed 7 March 2025.

Department of Environment, Climate Change and Water (DECCW), 2010, *Mitchell Landscapes NSW OEH v3 2011*. Bioregional Assessment Source Dataset.

DECCW, 2010b, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*, DECCW, 13 September 2010.

Department of Planning and Environment (DPE), 2023, *NSW State Vegetation Type Map*, 2023, NSW DPE

DPE, 2022, *Guidelines for Division 5.1 assessments*, June 2022, NSW DPE.

Dubbo Regional Council, 2020, Local Strategic Planning Statement

EnergyCo 2025, *Central-West Orana Renewable Energy Zone*, https://www.energyco.nsw.gov.au/cwo-rez, Accessed 6 March 2025

Environmental Protection Authority (EPA), 2014, *Waste Classification Guidelines*, Sydney, NSW EPA, November 2014.

EPA, 2024a, *Contaminated land - record of notices*, https://app.epa.nsw.gov.au/prclmapp/searchregister.aspx, Accessed 7 March 2025.

EPA, 2024b, *List of NSW contaminated sites notified to EPA*, https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites, Accessed 7 March 2025.

Forestry Commission of Tasmania, 1983, *Visual Management System*.

Heritage NSW, 2024, State Heritage Inventory, *State Heritage Inventory*, NSW Environment and Heritage, Accessed 7 March 2025.

International Commission on Non-Ionising Radiation Protection (ICNIRP), *Guidelines for Limiting Exposure to Time-varying Electric and Magnetic Fields (1Hz to 100kHz)*, Health Physics 99(6):818-836; (2010).

ICNIRP, 2010, *Fact Sheet on the guidelines for limiting exposure to time-varying electric, and magnetic fields (1Hz-100kHz)* published in Health Physics 99(6): 818-836; 2010, accessed 10 May 2016, http://www.icnirp.org/cms/upload/publications/ICNIRPFactSheetLF.pdf.

Landcom, 2004, *Managing Urban Stormwater: Soils and Construction*, 4th edition.

Murphy, B.W. & Lawrie, J.W. 1998, *Soil Landscapes of the Dubbo 1:250 000 Sheet* - Department of Land & Water Conservation.

National Radiological Protection Board (UK), 2001, *ELF Electromagnetic Fields and the Risk of Cancer, Report of an Advisory Group on Non-Ionising Radiation*, Chairman, Sir Richard Doll, NRPB Vol. 12 No. 1, 2001.

New Zealand Ministry of Health, 2009, *Electric and Magnetic Fields and Your Health*.

Peach HG, Bonwick WJ and Wyse T, 1992, *Report of the Panel on Electromagnetic Fields and Health to the Victorian Government (Peach Panel Report)*. Melbourne, Victoria: September 1992.

United States Department of Agriculture Forest Service, 1974, *National Forest Landscape Management*, Volume 2.

United State of America (USA) National Institute of Environmental Health Sciences, National Institutes of Health, (USA), 1999, *NIEHS report on health effects from exposure to power-line frequency electric and magnetic fields*, NIH Publication No. 99-4493, 1999.

WHO 2001, International Agency for Research on Cancer, Lyon, France: *IARC Monographs on the evaluation of carcinogenic risks to humans. Non-Ionising Radiation Part 1: Static and Extremely Low Frequency (ELF) Electric and Magnetic Fields.*

World Health Organisation (WHO), 2007, *Environmental Health Criteria Vol. 238: Extremely low frequency fields.*

WKC Group, 2025, *Logarithmic Addition of Sound Levels*, https://www.wkcgroup.com/tools-room/logarithmic-addition-sound-pressure-levels/, Accessed 7 March 2025

Appendix A: Design Plans

GENERAL

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DOCUMENTATION INCLUDING BUT NOT LIMITED TO, THE REVIEW OF ENVIRONMENTAL FACTORS (REF), THE GEOTECHNICAL INVESTIGATION REPORT, RELEVANT STANDARDS & SPECIFICATIONS AND ANY OTHER DRAWINGS. ANY DISCREPANCIES, DOUBT OR CONFLICT SHALL BE REFERRED TO THE PRINCIPALS AUTHORISED PERSON FOR CLARIFICATION AND DIRECTION PRIOR TO CONSTRUCTION.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON-SITE PRIOR TO CONSTRUCTION. DO NOT OBTAIN DIMENSIONS BY SCALING THESE DRAWINGS.
4. ORIGIN OF LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.
5. THE CONTRACTOR SHALL OBTAIN ALL PERMISSIONS AND APPROVALS AS NECESSARY PRIOR TO CONSTRUCTION.
6. ALL MATERIALS & WORKMANSHIP SHALL BE IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS, REGULATIONS, NATIONAL CONSTRUCTION CODE, GUIDELINES AND INDUSTRY STANDARD BEST PRACTICES.
7. SETOUT INFORMATION TO BE PROVIDED BY ESSENTIAL ENERGY IN ELECTRONIC FORMAT UPON REQUEST TO THE ENGINEERING SURVEYOR AT THE TIME OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY SETOUT AND IS TO BE UNDERTAKEN BY A REGISTERED SURVEYOR OR APPROVED ENGINEERING SURVEYOR.
8. NO VEGETATION SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT UNLESS NOTED ON THE DRAWINGS OR SCHEDULED IN THE REVIEW OF ENVIRONMENTAL FACTORS (REF). CONTRACTOR IS TO ESTABLISH TREE PROTECTION ZONES AROUND EXISTING TREES PRIOR TO COMMENCEMENT.
9. AN EROSION AND SEDIMENTATION CONTROL PLAN IN ACCORDANCE WITH THE "BLUE BOOK" MUST BE PREPARED AND IMPLEMENTED BY THE CONTRACTOR PRIOR TO AND MAINTAINED DURING CONSTRUCTION. THE "BLUE BOOK" REFERS TO THE DEPARTMENT OF HOUSING PUBLICATION, "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION".
10. THE CONTRACTOR SHALL DESIGN (BY A SUITABLY QUALIFIED PERSON), OBTAIN APPROVAL (FROM RELEVANT AUTHORITY) AND IMPLEMENT TEMPORARY TRAFFIC CONTROL MEASURES AS REQUIRED, IN ACCORDANCE WITH ALL RELEVANT AUTHORITY REQUIREMENTS.
11. AS CONSTRUCTED DETAILS SHALL BE RECORDED BY A REGISTERED SURVEYOR OR APPROVED ENGINEERING SURVEYOR AT THE CONTRACTOR'S COST. AS CONSTRUCTED DETAILS SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION.

EXISTING SERVICES & INFRASTRUCTURE

1. THE LOCATION AND DEPTH OF SERVICES SHOWN ON THESE PLANS HAVE BEEN ESTABLISHED BY FIELD OBSERVATION AND/OR FROM RELEVANT SERVICE AUTHORITY PLANS AND ARE TO BE CONSIDERED AS INDICATIVE ONLY. PRIOR TO CONSTRUCTION, THE ACTUAL DEPTH AND LOCATION OF ALL SERVICES ARE TO BE CONFIRMED BY THE CONTRACTOR BY APPROPRIATE MEANS, AND BY LIAISON WITH THE RELEVANT SERVICE AUTHORITY.
2. NOT ALL EXISTING SERVICES INFORMATION MAY BE SHOWN DUE TO LACK OF ACCESS, VISIBILITY AND/OR UNAVAILABILITY OF SERVICE AUTHORITY PLANS.
3. HAND EXCAVATION ONLY (NO MECHANICAL EXCAVATIONS) SHALL BE UNDERTAKEN OVER ELECTRICAL, GAS, COMMUNICATION AND/OR WATER SERVICES.
4. ENSURE ESSENTIAL ENERGY ASSETS ARE PROTECTED/MAINTAINED AT ALL TIMES. ALL DAMAGE TO ESSENTIAL ENERGY ASSETS SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF ESSENTIAL ENERGY AT NO COST TO ESSENTIAL ENERGY.
5. ENSURE A SMOOTH TRANSITION FREE FROM ABRUPT CHANGE WHERE NEW WORKS ABUT EXISTING.
6. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS (PAVED, COVERED, GRASSED AND LANDSCAPED AREAS, ROAD PAVEMENTS, FOOTPATHS AND KERBS ETC) TO THEIR ORIGINAL CONDITION (OR AS DIRECTED BY THE SUPERINTENDENT) ON COMPLETION OF WORKS.
7. ENSURE THAT AT ALL TIMES SERVICES TO ANY BUILDINGS AND INFRASTRUCTURE NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.

SURVEY

1. ANY STATE SURVEY MARK (E.G. PM, SS ETC) OR BOUNDARY REFERENCE MARK MUST NOT BE DESTROYED OR DAMAGED UNLESS THE MARKS ARE ASSESSED BY A REGISTERED SURVEYOR AND APPROVAL HAS BEEN GIVEN BY THE SURVEYOR GENERAL. ALL OTHER SURVEY MARKS ARE NOT TO BE DISTURBED OR DESTROYED UNTIL ASSESSED BY THE SITE SURVEYOR.
2. ANY STATE SURVEY MARK (E.G. PM, SS ETC.) THAT HAS APPROVAL TO BE DESTROYED IS TO BE REPLACED WITH ANOTHER STATE SURVEY MARK AS PER THE SURVEYOR GENERALS DIRECTION NO. 11: PRESERVATION OF SURVEY INFRASTRUCTURE, AND ANY CONDITION OUTLINED IN THE SURVEYOR GENERAL'S APPROVAL AT CONTRACTORS COST.
3. A PLAN OF SURVEY INFORMATION ONLY MUST BE PREPARED BY A REGISTERED SURVEYOR AT THE CONTRACTORS COST PRIOR TO ANY BOUNDARY REFERENCE MARK BEING DESTROYED OR DISTURBED.
4. THE CONTRACTOR SHALL CHECK SUSTAINABILITY OF THE STATED COORDINATES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
5. ONLY ESTABLISHED STATE SURVEY MARKS ARE TO BE USED TO ESTABLISH HORIZONTAL AND HEIGHT CONTROL UNLESS THE MARK HAS BEEN APPROVED BY PRINCIPAL'S AUTHORISED PERSON PRIOR TO CONSTRUCTION.
6. THE POSITION OF ANY SURVEY MARKS WITHIN 1.0 METRE OF CONSTRUCTION ARE TO BE IDENTIFIED ON SITE AND ADEQUATELY PROTECTED FROM INADVERTENT DAMAGE.

EARTHWORKS

1. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH AS 3798 AND GEOTECHNICAL INVESTIGATION REPORT BY FORTIFY GEOTECH, DATED 7 MARCH 2024 (REFERENCE UK/C15021).
2. SITE FENCING, DRAINAGE AND EROSION & SEDIMENTATION CONTROL TO BE ESTABLISHED PRIOR TO ANY EARTHWORKS ON SITE. DUST GENERATION IS TO BE CONTROLLED AT ALL TIMES DURING CONSTRUCTION.
3. ALL VEGETATIVE MATTER TO BE STRIPPED AND REMOVED FROM THE CUT / FILL AREA, STRIP TOPSOIL & UNCONTROLLED FILL AND STOCKPILE SEPARATELY FOR LATER REUSE, GRUB OUT ALL ROOTS GREATER THAN 75mm DIAMETER TO 500mm BELOW SUBGRADE OR FOUNDATION LEVEL AND BACKFILL WITH APPROVED SELECT MATERIAL. THE MAXIMUM HEIGHT OF STOCKPILED MATERIAL SHALL NOT EXCEED 2.5m AND MAXIMUM BATTER SLOPE SHALL NOT EXCEED 1V:2H.
4. SCARIFY AND COMPACT THE EXPOSED GROUND SURFACE TO MIN 150mm DEPTH. PROOF ROLL AND REMOVE ALL SOFT, WET OR UNSUITABLE MATERIAL.
5. IN FINAL BENCH AREAS WHERE CUT SURFACE IS THE FINISHED SURFACE LEVEL RIP AND RECOMPACT SURFACE TO A DEPTH OF 1m.
6. PRIOR TO PLACEMENT OF FILL SLOPING GROUND GREATER THAN 1V:8H IS TO BE BENCHED TO A DEPTH NOT LESS THAN 100mm HOWEVER GENERALLY IN THE ORDER OF 300mm DEPENDANT UPON THE SLOPE OF THE GROUND.
7. CONTROLLED FILL SHALL BE APPROVED SUITABLE SITE WON MATERIAL OR APPROVED IMPORTED SELECT MATERIAL, FREE OF ORGANIC MATERIAL AND PARTICLE SIZES GREATER THAN 75mm COMPACTED IN LAYERS NOT EXCEEDING 200mm TO NOT LESS THAN 98% STD MDD AT ABOUT OMC.
8. IMPORTED MATERIAL S SHOULD BE OF VIRGIN EXCAVATED NATURAL MATERIALS OR CERTIFIED CONTAMINATION FREE EXCAVATED NATURAL MATERIAL, BE FREE FROM ORGANIC MATERIAL WITH LOW PI BETWEEN 6-15%, LIQUID LIMIT < 50%, CBR > 8, CONTAINING BETWEEN 10 - 80% FINES LESS THAN 0.075mm IN SIZE (SILT AND CLAY) AND MAXIMUM PARTICLE SIZE 75mm.
9. MINIMUM RELATIVE COMPACTION (%):

LOCATION	MIN DRY DENSITY RATIO (1) (COHESIVE SOIL)	MIN DENSITY INDEX (2) (COHESIONLESS SOIL)
COMMERCIAL (ESSENTIAL ENERGY SUBSTATION BENCHES)	98%	75%
FILL TO SUPPORT PAVEMENTS - GENERAL FILL	95%	70%
FILL TO SUPPORT PAVEMENTS - SUBGRADE (TO A DEPTH OF 300mm)	98%	75%

(1) MINIMUM DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1
(2) MINIMUM DENSITY INDEX DETERMINED IN ACCORDANCE WITH AS1289.5.6.1

10. FILL PLACEMENT AND CONTROL TESTING TO BE OVERVIEWED AND CERTIFIED BY A GEOTECHNICAL ENGINEER AT LEVEL 1 INVOLVEMENT AS PER AS 3798. FIELD DENSITY TESTING AS PER TYPE 1 EARTHWORKS IN TABLE 8.1 OF AS 3798.
11. FINAL EARTHWORKS BATTER SLOPES TO HAVE A ROUGHENED SURFACE TO REDUCE RUNOFF VELOCITY AND AID REVEGETATION.
12. EXCESS FILL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LAWFUL MANNER AT THE CONTRACTORS COST.
13. ANY CONTAMINATED MATERIAL SHALL BE MANAGED AND DISPOSED OF ACCORDING TO LOCAL AUTHORITY AND EPA REQUIREMENTS (AT CONTRACTORS COST WHERE KNOWN PRIOR TO COMMENCEMENT).
14. ALL DISTURBED SURFACES AND BATTERS OUTSIDE THE FINAL BENCH AREA SHALL USE SITE WON CLAY AS A CAPPING LAYER (WHERE AVAILABLE), HAVE A MINIMUM OF 150mm TOPSOIL APPLIED AND BE HYDROMULCHED WITH AN APPROVED SEED MIX APPROPRIATE FOR THE LOCALITY. BATTERS STEEPER THAN 1:4 SHALL HAVE EROSION CONTROL MATTING PLACED PRIOR. EXCESS SITE WON ROCK MAY BE USED AS EROSION CONTROL ON BATTERS WHERE THEY DO NOT POSE A SAFETY RISK.

STORMWATER

1. ALL DRAINAGE PIPES TO BE CLASS SN8 POLYPROPELYENE SUCH AS BLACKMAX, STORMPRO OR APPROVED EQUIVALENT UNLESS OTHERWISE NOTED.
2. ALL DRAINAGE PIT ACCESS COVERS AND GRATES TO BE CLASS B IN SWITCHYARD NON TRAFFICABLE AREAS AND CLASS D IN TRAFFICABLE AREAS IN ACCORDANCE WITH AS 3996.
2. STORMWATER PITS AND HEADWALLS ARE TO BE CUSTOM PRECAST ONLY SUBJECT TO THE FOLLOWING:
- PITS MUST BE CUSTOM MADE AND INCLUDE ALL PENETRATIONS CAST INTO THE PIT AT TIME OF MANUFACTURE AT THE CORRECT HEIGHT, SIZE AND ORIENTATION. KNOCK OUT STYLE PRECAST PITS ARE NOT PERMITTED.
- PITS MUST BE DESIGNED AND CERTIFIED BY A SUITABLY QUALIFIED STRUCTURAL ENGINEER TO COMPLY WITH THE RELEVANT PROVISIONS OF AS 3600 CONCRETE STRUCTURES.
- PITS MUST BE RATED BY THE MANUFACTURER FOR THE PRVAILING LOAD AND EXPOSURE CLASSIFICATION.
- CULVERT JOINTS MUST PROVIDE A WATERTIGHT SEAL.
- PITS SHALL HAVE A DESIGN LIFE IN EXCESS OF 80 YEARS.
3. ALL REINFORCED CONCRETE STORMWATER PITS OR STRUCTURES BELOW 1.9m AHD SHALL HAVE SALT WATER COVER.
4. EXCAVATION, BEDDING AND BACKFILL TO BE IN ACCORDANCE WITH THE SELECTED PIPE MANUFACTURERS RECOMMENDATIONS.
5. GROUTED STONE PITCHED SCOUR PROTECTION IS REQUIRED AT ALL STORMWATER DISCHARGE LOCATIONS.
6. SUBSOIL DRAINAGE IN ROADS OR ACCESS WAYS WHERE INDICATED ON PLANS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

REFERENCES

AS 1726 - GEOTECHNICAL SITE INVESTIGATIONS
AS 3798 - GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS
AS 3996 - ACCESS GRATES AND COVERS

CONCRETE

1. ALL WORKMANSHIP & MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600.
2. CONCRETE PROPERTIES AND COVER TO REINFORCING:

ELEMENT	SLUMP (mm)	MAX. AGGREGATE SIZE (mm)	F'c AT 28 DAYS (MPa)	MAX. 56 DAY DRY SHRINKAGE (STRAIN)	COVER (mm)	EXPOSURE CLASS.
BUND WALL/SLAB	80	20	25	650 MICRONS	50	A2
FOOTINGS	80	20	N32	650 MICRONS	50	A2
PAD FOOTINGS	80	20	N32	-	50	-
PIERS	100	20	N32	650 MICRONS	60	A2
SLAB ON GROUND (NON TRAFFICABLE)	80	20	25	650 MICRONS	TOP 40 BTM 40	B1

3. ALL CONCRETE MIXES SHALL BE DESIGNED BY A RECOGNISED TESTING LAB.
4. ADMIXTURES SHALL NOT BE USED IN CONCRETE WITHOUT WRITTEN APPROVAL FROM THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
5. COMPACT ALL CONCRETE USING A SUITABLY SIZED MECHANICAL VIBRATOR.
6. ALL CONCRETE SHALL BE CONTINUOUSLY CURED FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT. CURING SHALL COMMENCE IMMEDIATELY AFTER FINISHING.
7. CONCRETE PROFILES:
- ALL FORMED AND UNFORMED EXPOSED SURFACES SHALL HAVE A CLASS 2 FINISH IN ACCORDANCE WITH AS3610.
- SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL FROM THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
- CONDUITS, PIPES ETC SHALL NOT BE PLACED WITHIN CONCRETE COVER.
8. TEST REPORT(S) / DELIVERY DOCKET(S) FROM THE CONCRETE BATCH PROCESSING PLANT CONFIRMING THE CONCRETE CHARACTERISTIC COMPRESSIVE STRENGTH AND SLUMP SHALL BE PROVIDED TO ESSENTIAL ENERGY.
9. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED & USED ONLY WHERE SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE CIVIL ENGINEER. PLACE CONCRETE CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS. DO NOT BREAK OR INTERRUPT SUCCESSIVE POURS SUCH THAT COLD JOINTS OCCUR.
10. FALLS IN THE SLAB ARE SHOWN ON THE DRAWINGS. MINIMUM SLAB THICKNESSES SHALL BE MAINTAINED IN SLABS WITH FALL.
11. SETDOWNS OR FALLS IN FLOOR SURFACES ARE NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY ESSENTIAL ENERGY STRUCTURAL ENGINEER.
12. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN THE TRUE POSITION.
13. SITE BENDING OF REINFORCEMENT BARS SHALL BE DONE USING SUITABLE BENDING TOOL, WITHOUT HEATING.
14. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS PROVIDED AT MAXIMUM 1m CENTRES EACH WAY. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
15. MESH REINFORCEMENT SHALL BE LAPPED A MINIMUM OF 2 CROSS WIRES + 25mm.
16. STEEL REINFORCEMENT IS TO BE ELECTRICALLY CONNECTED TO THE EARTH GRID WHERE SPECIFIED.
17. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
18. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
19. REINFORCEMENT SYMBOLS:

N - NORMAL DUCTILITY, STRENGTH GRADE 500MPa, DEFORMED BAR TO AS 4671.
R - NORMAL DUCTILITY, STRENGTH GRADE 250MPa, PLAIN ROUND BAR TO AS 4671.

NOTE: THE NUMBER FOLLOWING THE BAR SYMBOL N AND R IS THE NOMINAL BAR DIAMETER IN MILLIMETRES.

20. ALL REINFORCING BARS SHALL BE D500N AND ALL REINFORCING MESH SHALL BE D500L TO AS4671 UNLESS NOTED OTHERWISE OR AS OTHERWISE APPROVED BY THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
21. FORMWORK SHALL BE DESINGED & CONSTRUCTED IN ACCORDANCE WITH AS 3610 - 199.
22. ALL PENETRATIONS TO HAVE 2/N16 TRIMMER BARS TOP AND BOTTOM TO EACH FACE UNLESS NOTED OTHERWISE. BARS SHALL EXTEND MINIMUM 600mm BEYOND PENETRATION.

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No. 807587	COMMENTS	DESIGNED	G.Every
DATE OF ISSUE	31/05/2024			DRAWN	T.Close
PURPOSE OF ISSUE	CONSTRUCTION			REVIEWED	M.Turvey
				APPROVED	J.Streatfeild

GEURIE
66/11kV ZONE SUBSTATION
GENERAL NOTES AND SPECIFICATIONS

CIVIL DRAWING

SUPERSEDES:

DRAWING NUMBER	SHT	VER
GUE501	2/27	0

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= TREES SHOWN IN RED TO BE REMOVED

MITCHELL HIGHWAY

A

2
DP 1186092

E

EXISTING SEPTIC SYSTEM TO BE RELOCATED OR DIVERTED TO NEW SEPTIC SYSTEM FOR NEW BUILDING

PROPOSED SUBSTATION SITE

1
DP 1186092

MAINTAIN ACCESS TO EXISTING SUBSTATION

EXISTING FENCE TO BE REMOVED FROM ACCESS ROAD AREA

EXISTING FENCE TO BE REMOVED WITHIN PROPERTY BOUNDARY

EXISTING SUBSTATION

UNDERGROUND TELEPHONE CABLE

EXISTING FENCE TO BE RELOCATED TO BOUNDARY LINE

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE	PROJECT No. 807587	COMMENTS	DESIGNED G.Every	GEURIE 66/11kV ZONE SUBSTATION VEGETATION CLEARING AND DEMOLITION PLAN CIVIL DRAWING	© 2019 Essential Energy
DATE OF ISSUE 31/05/2024			DRAWN T.Close		SUPERSEDES:
PURPOSE OF ISSUE CONSTRUCTION			REVIEWED M.Turvey		DRAWING NUMBER GUE501 SHT 4/27 VER 0
			APPROVED J.Streatfeild		

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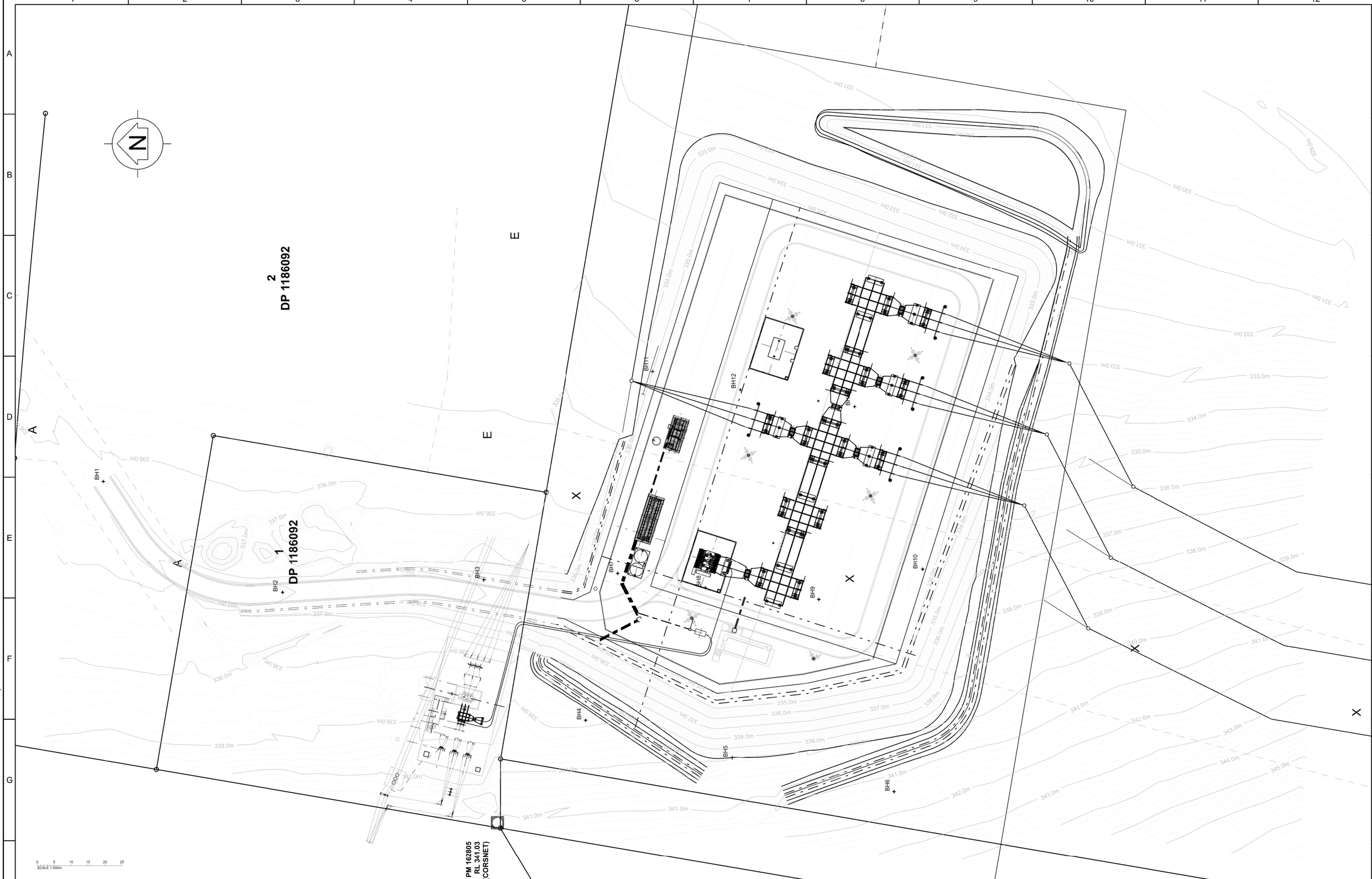

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DATE OF ISSUE: 31/05/2024				DRAWN	T.Close
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				APPROVED	J.Streatfeild

GEURIE
66/11kV ZONE SUBSTATION
OVERALL GENERAL ARRANGEMENT

CIVIL DRAWING

SUPERSEDES:

essential energy

DRAWING NUMBER	SHT	VER
GUE501	5/27	0

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PROVIDE GABION MATTRESS SLOPE PROTECTION ON BATTER WHERE CUT OFF DRAIN OUTLETS

PROVIDE CUT OFF DRAIN

PROVIDE SHOTCRETE LINING SCOUR PROTECTION TO BENCH OPEN DRAIN - INVERT TO TOP OF BATTER OR MIN. 1m HEIGHT

N

Name = INLT-A1
Ground Elev = 335.53678m
Invert Elev = 334.42236m

225 mm - 4.70686m
Slope = 1.652 % - PVC

Name = INLT-A2
Ground Elev = 335.45900m
Invert Elev = 334.34816m

225 mm - 30.21707m
Slope = 0.500 % - PVC

Name = INLT-A3
Ground Elev = 335.45900m
Invert Elev = 334.25974m
Internal Road CL

DRAINAGE LINE A

225 mm - 30.00000m
Slope = 0.500 % - PVC

Name = INLT-A4
Ground Elev = 335.45900m
Invert Elev = 334.07317m

300 mm - 20.01752m
Slope = 0.500 % - PVC

Name = INLT-A5
Ground Elev = 335.45906m
Invert Elev = 333.93644m

300 mm - 11.10282m
Slope = 0.516 % - PVC

Name = INLT-A6
Ground Elev = 335.37046m
Invert Elev = 333.84257m

300 mm - 22.14622m
Slope = 0.500 % - PVC

Name = INLT-A7
Ground Elev = 335.14900m
Invert Elev = 333.69527m

SEDIMENT BASIN - REFER TO BULK EARTHWORKS PLAN FOR LEVEL DETAIL

Name = INLT-B1
Ground Elev = 335.24041m
Invert Elev = 334.12710m

225 mm - 25.70991m
Slope = 1.000 % - PVC

Name = INLT-C1
Ground Elev = 335.06672m
Invert Elev = 333.95401m

225 mm - 4.95786m
Slope = 1.681 % - PVC

DRAINAGE LINE C

Name = INLT-B2
Ground Elev = 334.98340m
Invert Elev = 333.87009m

225 mm - 17.04167m
Slope = 0.800 % - PVC

Name = INLT-D1
Ground Elev = 334.83268m
Invert Elev = 333.85795m

DRAINAGE LINE D

Name = INLT-B3
Ground Elev = 334.86250m
Invert Elev = 333.75166m

300 mm - 30.98785m
Slope = 0.500 % - PVC

DRAINAGE LINE B

300 mm - 30.84284m
Slope = 0.500 % - PVC

225 mm - 4.63328m
Slope = 0.485 % - PVC

Name = INLT-B4
Ground Elev = 334.86250m
Invert Elev = 333.60738m

Name = INLT-E1
Ground Elev = 334.83172m
Invert Elev = 333.50669m

DRAINAGE LINE E

Name = NLT-B5
Ground Elev = 334.86250m
Invert Elev = 333.41659m

375 mm - 4.60694m
Slope = 3.659 % - PVC

300 mm - 9.10506m
Slope = 9.547 % - PVC

300 mm - 22.64914m
Slope = 0.500 % - PVC

Name = INLT-A8
Ground Elev = 334.92251m
Invert Elev = 333.54544m

Name = MHSW-A10
Ground Elev = 331.40000m
Invert Elev = 330.19996m

300 mm - 34.12553m
Slope = 0.500 % - PVC

300 mm - 10.49412m
Slope = 5.081 % - PVC

Name = INLT-B6
Ground Elev = 334.86250m
Invert Elev = 333.20939m

300 mm - 19.07998m
Slope = 12.000 % - PVC

450 mm - 6.94087m
Slope = 2.161 % - PVC

Name = HW-A11
Ground Elev = 331.00000m
Invert Elev = 330.08556m

Name = MHSW-A9
Ground Elev = 334.91390m
Invert Elev = 332.63957m

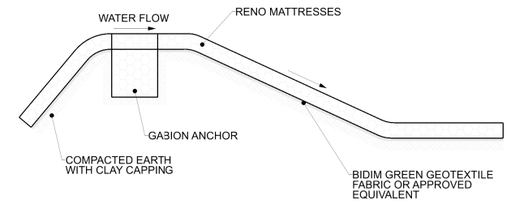
PROVIDE CUT OFF DRAIN

ENSURE ROUTE FOR BENCH DRAINAGE TO OPEN DRAIN

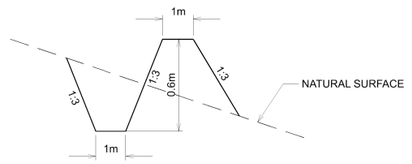
PROVIDE GABION BLOCK ANCHOR AND MATTRESS TO WEIR AND APRON OF SEDIMENT BASIN - REFER DETAIL

LEGEND

- SUBSOIL DRAINAGE
- DRAINAGE LINE / PIT
- GABION



SEDIMENT POND WEIR DETAIL



TYPICAL CUT OFF DRAIN

NOTE: TYPICAL DIMENSIONS ONLY, EDGES SHOULD BE ROUNDED TO CREATE A MORE NATURAL APPEARANCE

PIT SCHEDULE

PIT NUMBER	PIT TYPE	INLET SIZE
A1	GRATED INLET	600 x 600
A2	GRATED INLET	600 x 600
A3	GRATED INLET	600 x 600
A4	GRATED INLET	600 x 600
A5	GRATED INLET	600 x 600
A6	GRATED INLET	600 x 600
A7	GRATED INLET	600 x 600
A8	GRATED INLET	600 x 600
A9	JUNCTION	900 x 900
A10	JUNCTION	900 x 900
A11	HEADWALL	450
B1	GRATED INLET	600 x 600
B2	GRATED INLET	600 x 600
B3	GRATED INLET	600 x 600
B4	GRATED INLET	600 x 600
B5	GRATED INLET	600 x 600
B6	GRATED INLET	600 x 600
C1	RAISED GRATE	600 x 600
D1	RAISED GRATE	600 x 600
E1	RAISED GRATE	600 x 600

0 5 10 15 20
SCALE 1:400m

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PURPOSE OF ISSUE: CONSTRUCTION				APPROVED	J.Streatfeild

GEURIE
66/11kV ZONE SUBSTATION
DRAINAGE PLAN

CIVIL DRAWING

SUPERSEDES:

DRAWING NUMBER	SHT	VER
GUE501	24/27	0

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Appendix B: Ecological Assessment (AREA 2024)

AREA Environmental & Heritage Consultants ABN: 29 616 529 867

- ✓ Environmental impact assessments and approvals: REFs, MW REFs, PEAs
- ✓ Ecology, Aboriginal and historic heritage assessments
- ✓ Biodiversity assessment method (BAM) assessments (BDAR) and offsetting (BSAR)
- ✓ Plans of Management
- ✓ Aboriginal community engagement
- ✓ Stakeholder and community engagement
- ✓ Peer review / project briefs / budgeting assistance / expert witness
- ✓ Commercial external landscape designs for built or natural environments
- ✓ Vegetation Management Plans
- ✓ Stakeholder and community engagement

Geurie Zone Substation Ecological Impact Assessment

NSW Dubbo Regional Council Local Government Area

Essential Energy

March 2025

Document Controls

Client	Essential Energy
Proponent	Essential Energy
Document Description	Ecological Impact Assessment Report
Clients Representative Managing this Document	Tim Haydon
AREA Person(s) Managing this Document	Addy Watson
Cover image	View south towards the Subject Land

Document Status		
DRAFT: Series V1.X AREA internal edits	**Date**	**Action**
V1.0	1/08/2024	Internal review and edits
DRAFT Series V2.X Client / AREA internal edits	**Date**	**Action**
V2.0	30/08/2024	QMS
V2.1	02/09/2024	AREA to Client
V2.1	11/03/2025	Client edits and returned to AREA
FINAL (Draft approved by client)	**Date**	**Action**
V3.0	19/03/2025	Final to client

Prepared for Essential Energy	Tim Haydon – Environmental Senior Specialist **Essential Energy** **M:** 0401 008 181 **E:** tim.haydon@essentialenergy.com.au PO Box 5730 Port Macquarie NSW 2444
Prepared by AREA	Thomas Carter - Environmental Consultant **AREA Environmental & Heritage Consultants Pty Ltd** 72 Brisbane Street Dubbo NSW 2830 ABN:29 616 529 867

1. The proposal

1.1 Introduction

Essential Energy propose to construct a Zone Substation (ZS) at Lot 41 DP754313, Lot 1 DP1186092 and Lot 2 DP1186092 Mitchell Highway at Geurie, NSW. AREA Environmental & Heritage Consultants (AREA) has been engaged by the proponent to assess the proposal's potential ecological impacts.

This report considers the relevant requirements under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act), *Biodiversity Conservation Act 2016* (BC Act) and NSW *Fisheries Management Act 1994* (FM Act) and *Matters of National Environmental Significance Significant impact guidelines 1.1* under the *Environment Protection and Conservation Act 1999 (Cth)* (EPBC Act).

Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides for a public authority assessing the environmental impact of certain activities that they are either carrying out themselves or approving. The proponent must fulfil their duties under section 5.5 of the EP&A Act to consider, to the fullest extent possible, all matters affecting or likely to affect the environment, including impacts to biodiversity. This Ecological Impact Assessment (EIA) has been prepared for this proposal and combines a desktop review with field survey to assess the potential impact of the proposal to biodiversity. This EIA will be used to inform a Part 5 (Division 5.1) assessment (i.e., REF), which Essential Energy will prepare in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Assessment under the NSW Biodiversity Offset Scheme is not required for this proposal as the proposal is under Part 5 of the EP&A Act and the proposal does not impact an area of Outstanding Biodiversity Value.

This purpose of this report is to determine if the development will potentially have a significant impact to the environment by documenting the potential impact to threatened species, populations and ecological communities protected under the BC Act and FM Act as well as nationally listed threatened species, ecological communities, and migratory species protected under the EPBC Act.

This report also aims to address relevant requirements under the:

- *Biosecurity Act 2015* (NSW) and
- *Local Land Services Act 2013* (LLS Act) (NSW).

In summary, this assessment concluded there will be no significant environmental impact from the proposal and no referral or additional assessment is required.

1.2 Scope of Work

The work involves the establishment of a pad to facilitate the substation development. The material to establish this pad is currently proposed to be site-won, with a cut operation to occur in the adjoining hillslope, to provide the fill material for the pad establishment. The proposal also includes the redevelopment of the current access track.

A 3.95 hectare subject land area was assessed for the proposal. It is currently proposed that paddock trees within the construction footprint will require removal to facilitate the pad, and the cut/fill operation. Vegetation removal will be kept to a minimum required to complete the work, however, for the purposes of this ecological assessment, a worst-case scenario of

removal of the trees indicated on the attached plans has been assumed, regardless of whether it is indicated as trimming only, or potential removal is required. See Figure 1-2 for design detail.

1.3 Location

The project location is in the Dubbo Regional Council Local Government Area within Lot 41 DP754313, Lot 1 DP1186092 and Lot 2 DP1186092, on the Mitchell Highway south of Geurie, NSW. The 3.95 hectares of land with potential to be impacted by the proposal is referred to as the subject land in this report. A 1500 metre landscape assessment area buffer around the subject land is used to consider landscape context, undertake desktop database searches and assess the potential impact of the proposal.

The land is zoned as RU1 – primary production zoning according to NSW Planning Portal. There is a small portion of SP2 Classified Road land beside the Mitchell Highway.

The location of the subject land is shown in Figure 1-1.

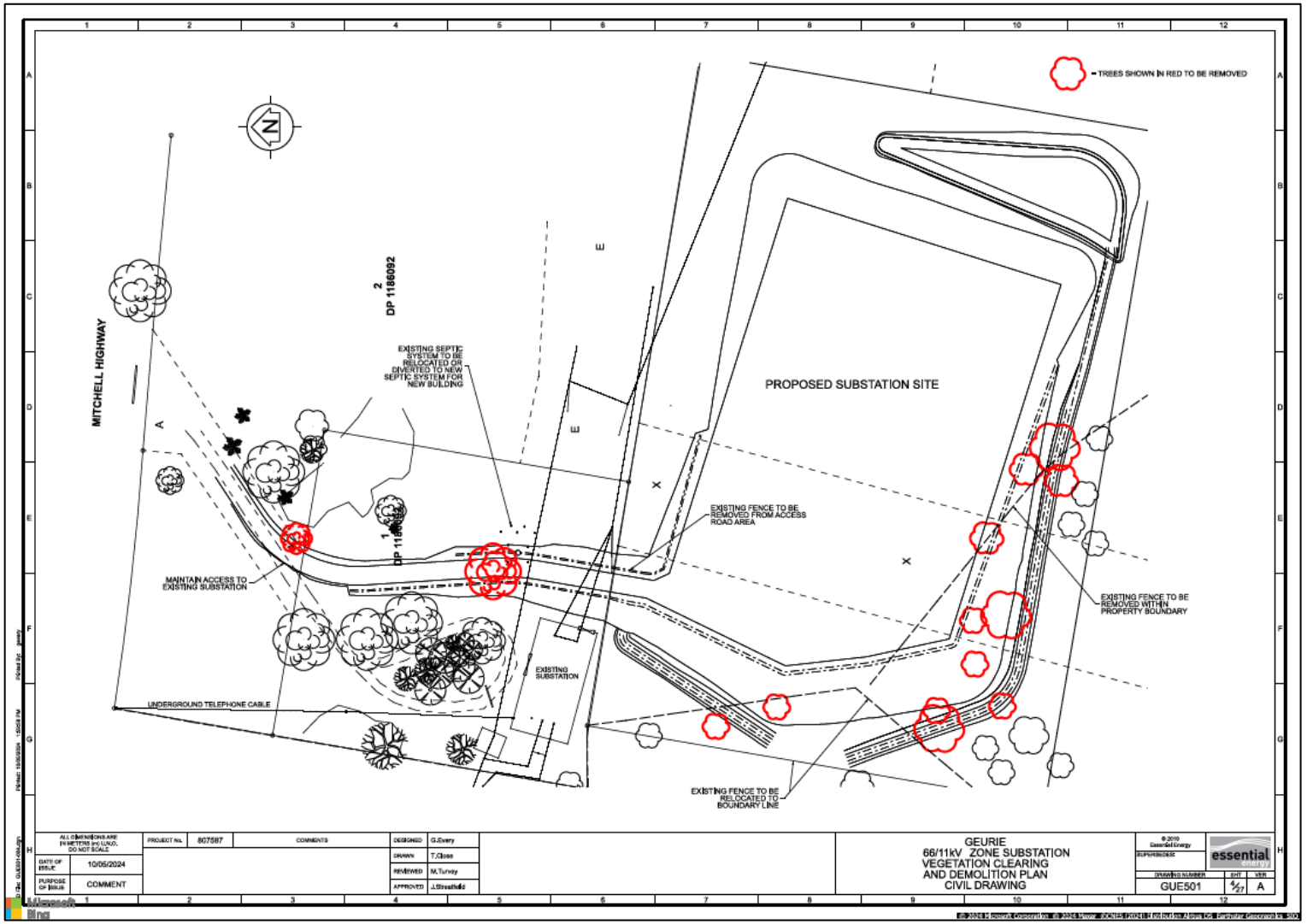
1.4 Definitions

The following terms are used in this report to describe the proposal:

- **the proposal:** includes all the proposed activities described in section 1.2 and shown in Figure 1-2
- **the construction footprint:** land directly affected by the proposal (including ancillary and temporary impacts)
- **subject land:** area where field survey was conducted,
- **landscape assessment area:** search parameter for listed species and bioregional context, defined by a 1500 metre buffer around the construction footprint.

Figure 1-1: Subject land

Figure 1-2: Design Detail (Source: Essential Energy)



2. Landscape context and desktop assessment

Assessing the landscape context involves identifying a range of landscape features that may occur within the landscape assessment area and surrounding region. These features may include biodiversity values that are important for:

- establishing the context of the subject land in relation to the region
- identifying the likely habitat suitability of the subject land for threatened entities.

AREA conducted a landscape assessment to inform the field investigations. The landscape assessment comprised a desktop review of historical records, predictive spatial modelling, scientific literature, and databases.

2.1 Landscape context

The subject land is entirely within the NSW South Western Slopes IBRA bioregion and the Inland Slopes IBRA subregion. The subject land is also within the Dubbo Regional Council Local Government Area, on the southern edge of Geurie, see Figure 2-1.

NSW (Mitchell) landscapes (developed by Mitchell 2004) are used to help classify vegetation communities in NSW. They include analysis of geology and vegetation communities. The subject land is entirely within the Molong Ridges NSW landscape (See Figure 2-2).

The terrain of the subject land is undulating, and the surrounding landscape contains woodland and agricultural areas. The immediate subject land contains roads, cultivated and woodland areas.

Soils are important because some plant communities are confined to some soil types such as clay soils. The soil type according to the Australian Soil Classification (ASC) Soil Type Map of NSW is Chromosols. These soils have a strong contrast between A horizons and B horizons and the B horizons are not strongly acid or sodic. The soils are widely used for agriculture.

The nearest waterway is Geurie Creek to the west, which is located outside of the subject land, but within the broader 1500 metre landscape assessment area.

The NSW Landuse 2017 map captures how land in the state is utilized across various sectors such as residential, commercial, agricultural, industrial, and conservation. Two land uses are mapped with the subject land; ‘Grazing Native Vegetation’ is mapped in non-cropped land, while ‘Cropping’ is mapped in the cropped paddock, see Figure 2-3.

The Native Vegetation Regulatory Map NSW is a spatial dataset that shows where regulations related to native vegetation management apply[1]. Cropped land is mapped as Category 1- exempt land, while the remaining vegetation is mapped as Category 2- regulated land Figure 2-4.

Most of the land (excepting road entry point) is zoned RU1 – primary production according to the NSW Planning portal.

[1] https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/native-vegetation-regulatory-map

Figure 2-1: Landscape context - IBRA

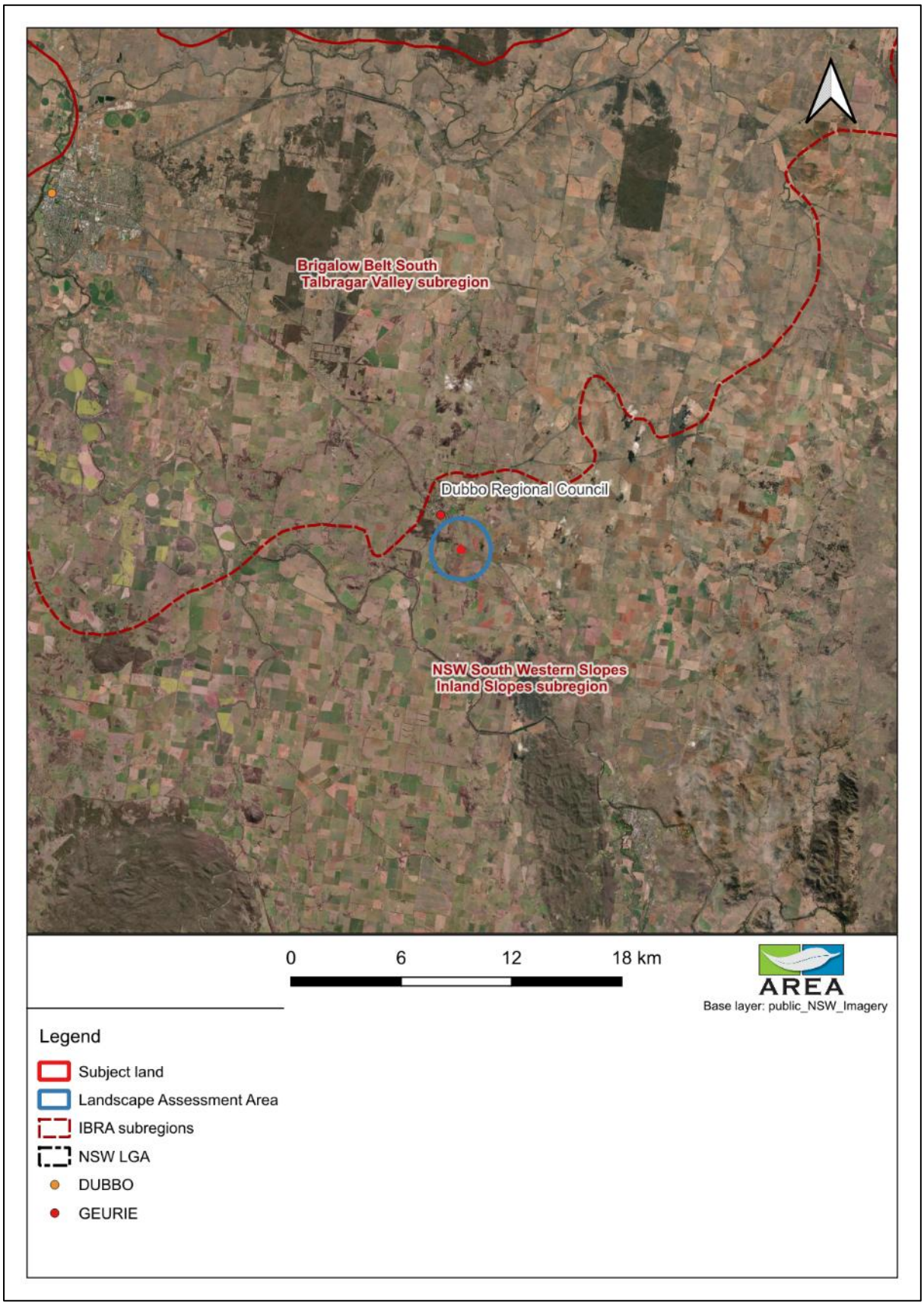


Figure 2-2: Landscape context – Mitchell Landscapes

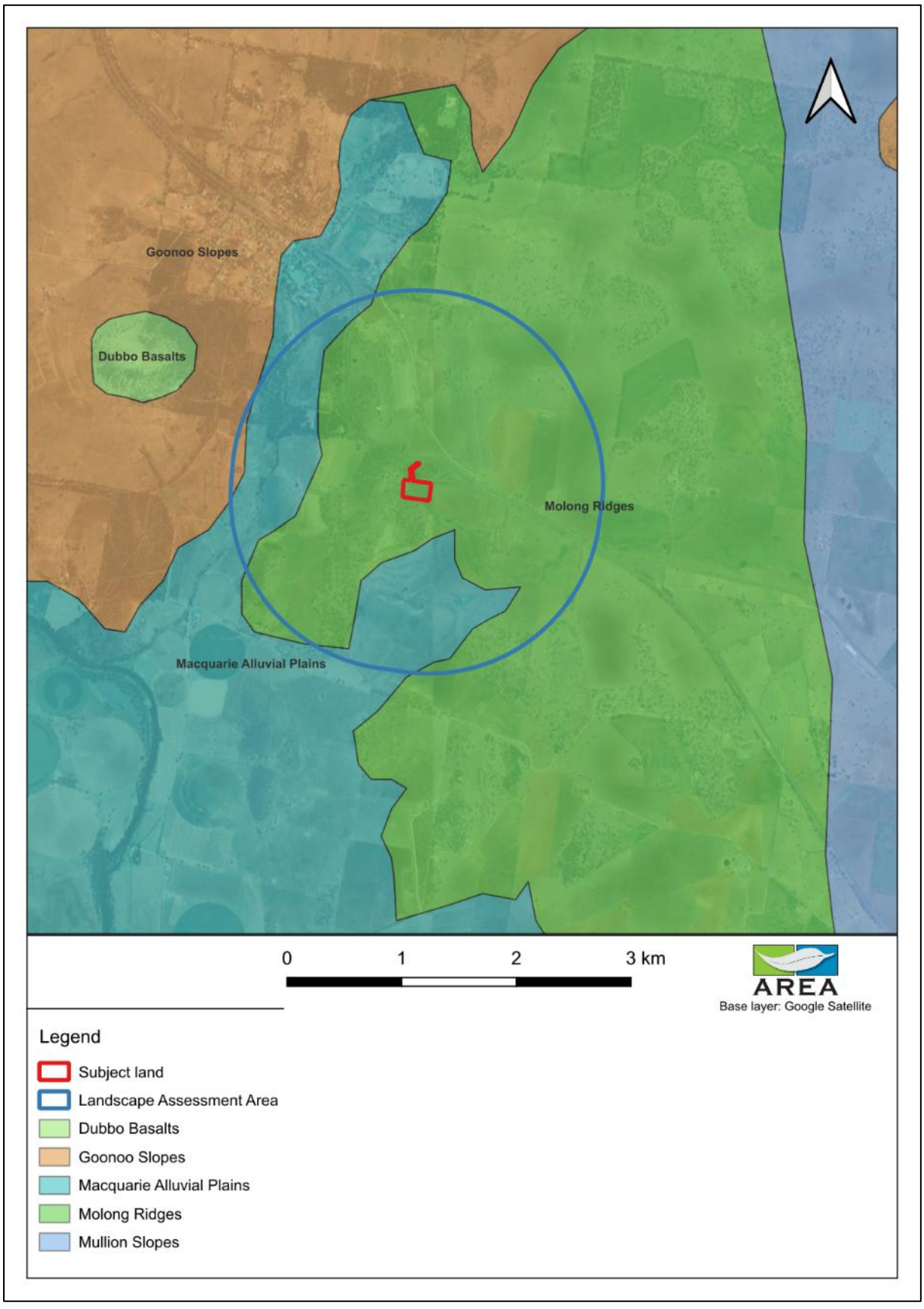


Figure 2-3: Landscape context - Landuse

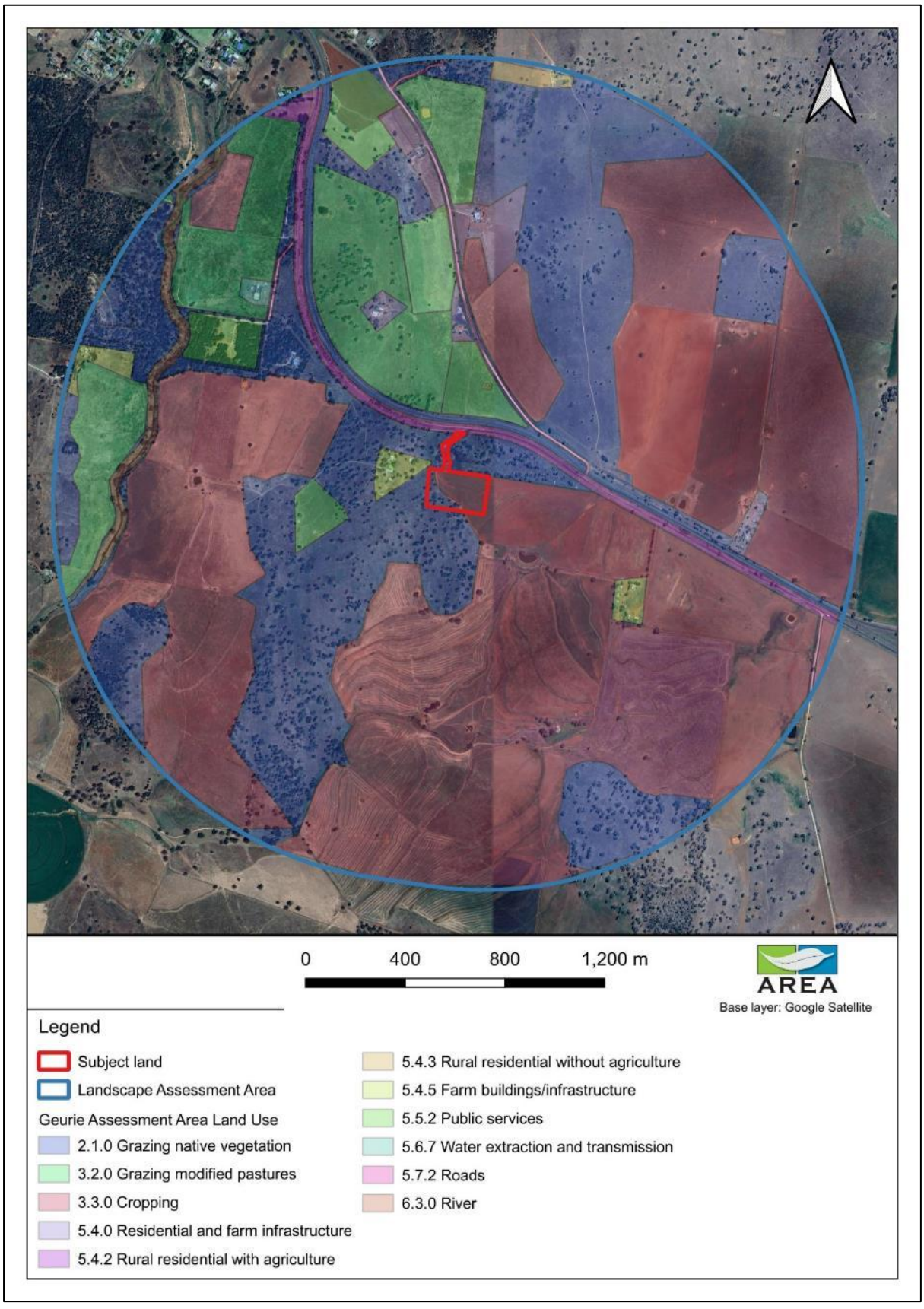
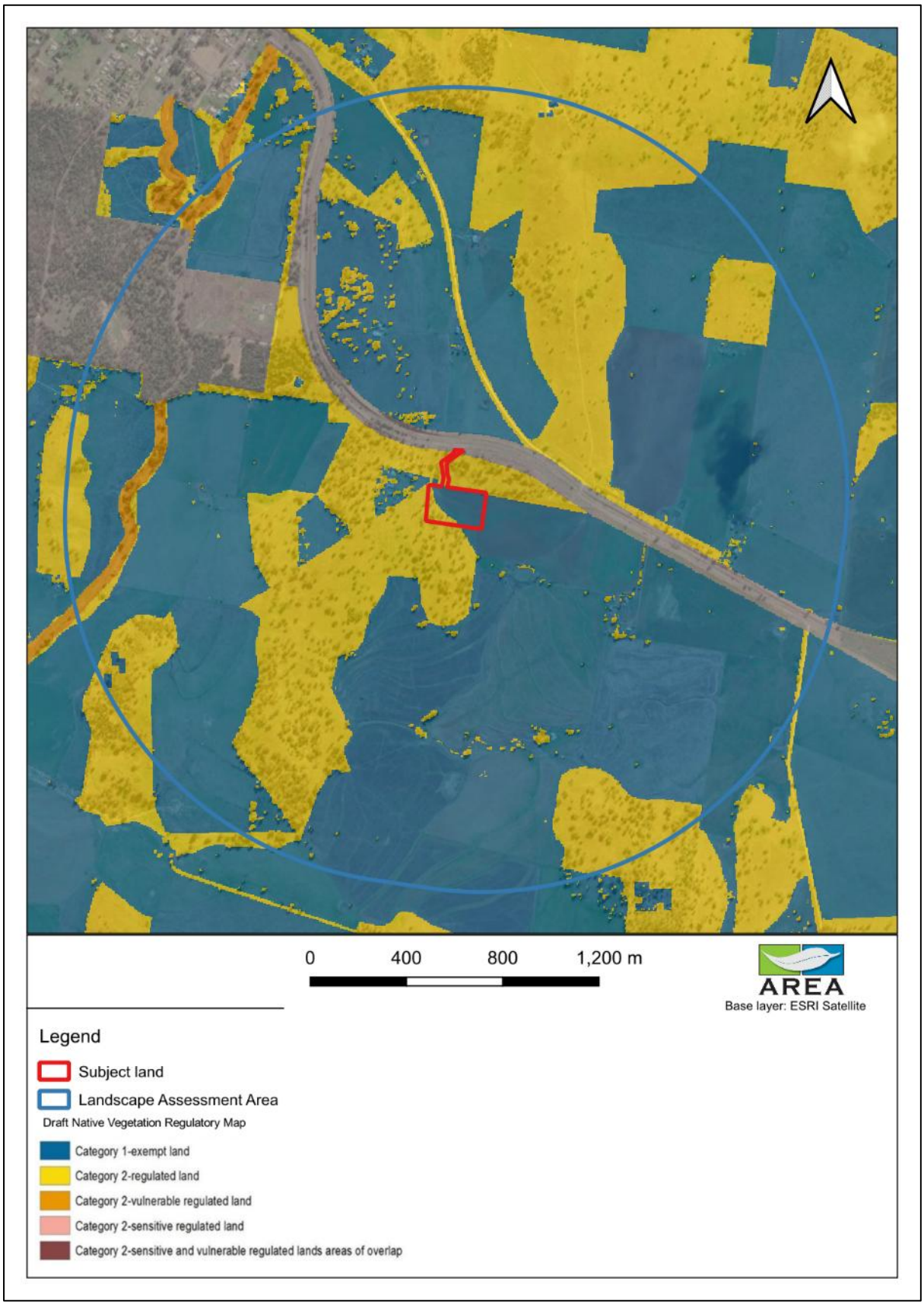


Figure 2-4 Native Regulatory Map



2.2 State Vegetation Mapping

Locally mapped Plant Community Types (PCTs) were identified using State Vegetation Type Map (SVTM) map sourced from the NSW SEED website. This map is not necessarily correct within any given subject land; however, it can be reliably used as an indication of PCTs likely to occur in the local landscape and the subject land, see Figure 2-5.

PCTs mapped on the above-mentioned spatial layer within 1500 metres of the subject land include:

- **PCT 266 White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion**

  Tall woodland with trees to 25 metre high dominated by White Box (*Eucalyptus albens)*. The shrub layer is usually sparse, or absent ground cover typically contains grasses such as *Themeda australis*, *Poa sieberiana, Elymus scaber* var. *scaber*. Forbs include *Wurmbea dioica, Gonocarpus elatus*, and *Microseris*.

- **PCT 267 White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion**

  Tall or mid-high woodland or open woodland with trees to about 15 metre high dominated by White Box (*Eucalyptus albens*), White Cypress Pine (*Callitris glaucophylla*) and often Western Grey Box (*Eucalyptus microcarpa*) The shrub layer is sparse Grass species include *Austrostipa densiflora*, *Austrostipa bigeniculata*, *Austrostipa verticillata*, *Austrodanthonia caespitosa*, *Themeda australis*, *Enteropogon acicularis* and *Bothriochloa macra*. Forb species include *Xerochrysum viscosa*, *Dianella revoluta* and *Dichopogon strictus*. Occurs on red-brown loamy soils or loamy sandy soils.

- **PCT 511 Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion**

  Derived tussock grassland dominated by Queensland Bluegrass (*Dichanthium sericeum subsp. sericeum),* Queensland Panic (*Panicum queenslandicum*), Redleg Grass (*Bothriochloa decipiens* or *Bothriochloa macra*), Rats-tail Grass (*Sporobolus creber*) and spear grasses (*Austrostipa scabra*) with other grass species.

- **PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions**

  Tall woodland to 25 metre high dominated by Western Grey Box (*Eucalyptus microcarpa*). A mid-dense or dense grass ground cover is present composed of *Austrodanthonia caespitosa*, *Austrodanthonia setacea, Austrostipa scabra* subsp. *falcata*, *Paspalidium constrictum*, etc. The small scrambler *Einadia nutans* subsp. *nutans* is usually present. Native forbs include *Sida corrugata, Wahlenbergia gracilis* and *Vittadinia*. Occurs on texture contrast red or brown earths or grey clay soils.

- **PCT 81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion**

  Tall Western Grey Box (*Eucalyptus microcarpa*) woodland commonly 20 metre high, often with scattered White Cypress Pine (*Callitris glaucophylla*). Usually contains a very sparse shrub layer. The ground cover is mid-dense to dense and is dominated by grass and forb species. Native grass species include *Austrostipa scabra, Austrostipa verticillata, Austrodanthonia fulva* and *Enteropogon acicularis*. Occurs on well drained alluvial brown sandy loam to loam soil.

- **PCT 201 Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion**

  Tall woodland or open forest dominated by Fuzzy Box (*Eucalyptus conica*) often growing with Western Grey Box (*Eucalyptus microcarpa*), Yellow Box (Eucalyptus melliodora) or Kurrajong (*Brachychiton populneus* subsp. *populneus*). Shrubs are generally sparse. The ground it is usually mid-dense and may be dominated by weed species. Native forbs include *Calotis cuneifolia, Eremophila debilis, Sida corrugata* etc. Native grasses include *Austrostipa scabra subsp. scabra, Chloris truncata, Elymus scaber var. scaber, Themeda australis* etc.

Areas not shown as a PCT on Figure 2-5 are mapped as not-native vegetation.

Figure 2-5: State Vegetation Map

2.3 Predicted Threatened Ecological Communities

Database searches (NSW predicted threatened species search by IBRA region, Matters of National Environmental Significance [MNES] protected matters search and PCT TEC associations, see Appendix A) predicted eleven Threatened Ecological Communities (TECs) listed under the BC and EPBC Acts likely to occur in the subject land. These are shown in Table 4 below.

Table 2-1:Predicted TECs

Threatened Ecological Community	BC Act	EPBC ACT
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Endangered Ecological Community	N/A
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered Ecological Community	N/A
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered Ecological Community	N/A
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Endangered Ecological Community	N/A
White Box - Yellow Box - Blakelys Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered Ecological Community	N/A
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	N/A	Endangered
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	N/A	Critically Endangered Ecological Community
Weeping Myall woodlands	Endangered Ecological Community	Endangered Ecological Community
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	N/A	Critically Endangered Ecological Community
Poplar Box Grassy Woodland on Alluvial Plains	N/A	Endangered Ecological Community
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	N/A	Endangered Ecological Community

The presence of these predicted TECs is considered further following field survey results in section 3.2.2.

2.4 BioNet species records

Eight listed fauna species and no flora species were recorded on the NSW BioNet species sightings database within 1500 metres of the subject land, see Figure 2-6. All fauna species recorded were birds as shown in Table 2-2 below.

Table 2-2: Species recorded on BioNet within 1500 metres

Scientific name	Common Name	Status BC Act	Status EPBC Act
Chthonicola sagittata	Speckled warbler	V	N/A
Climacteris picumnus victoriae	Brown Treecreeper	V	N/A

Scientific name	Common Name	Status BC Act	Status EPBC Act
Daphoenositta chrysoptera	Varied Sittella	V	N/A
Hieraaetus morphnoides	Little Eagle	V	N/A
Melanodryas cucullata cucullata	Hooded Robin	E	E
Stagonopleura guttata	Diamond Firetail	V	V
Melithreptus gularis gularis	Black-chinned honeyeater	V	N/A
Pomatostomus temporalis temporalis	Grey-crowned Babbler	V	N/A

2.5 Predicted threatened species

Field assessment was informed by a list of predicted threatened species, generated by combining the NSW threatened species predicted to occur within the IBRA subregion, the threatened species listed within the EPBC Act Protected Matters Report, and BioNet records (Appendix A). The resulting list is considered further in section 3.4 to determine species with potential to use the habitat within the subject land, and their likelihood to be impacted by this proposal.

Figure 2-6: BioNet records within 500m of subject land

3. Field results and impact assessment

The field component of this assessment was undertaken on 16 June 2024 by Dave Sturman from AREA Environmental, field survey effort is shown in Figure 3-1.

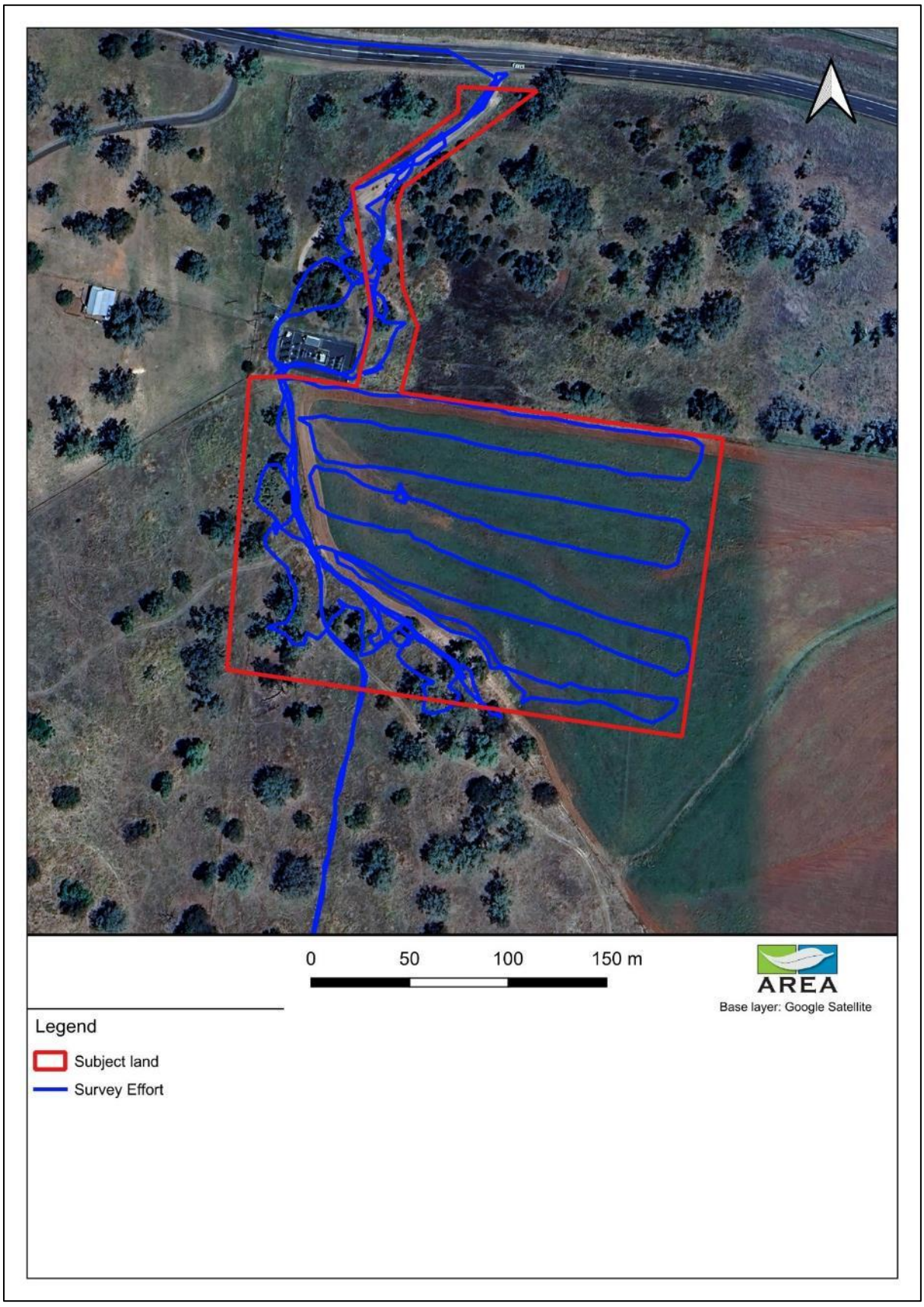
The aim of the assessment was to describe the subject land and nature and extent of direct and indirect impacts from the proposal on native vegetation, threatened species, populations, or communities under the EPBC Act, BC Act, or FM Act.

Database searches were used to inform the field assessment through the identification of predicted threatened species, plant community types and any associated threatened ecological communities with potential to occur in the subject land. The field assessment using pedestrian survey methods was used to verify these and identify any habitat constraints.

Using both database and field observations, the likelihood of presence of, and impact to, protected matters was determined and where required a ‘test’ and or ‘assessment’ of significance was undertaken as per the relevant legislation to determine if a *significant* impact from the proposal was likely. Results are presented in the following sections.

In summary, assessment concluded there will be no significant environmental impact from the proposal and no referral or additional assessment is required.

Figure 3-1: Survey effort



3.2 Vegetation

Vegetation on site consisted of a combination of native vegetation and ploughed agricultural land.

The majority of the subject land comprised cleared land consisting of non-native vegetation. A variety of weeds were present, some were common. Weeds included Green Cestrum (*Cestrum parqui*) Variegated thistle (*Silybum marianum*), Patterson's curse (*Echium plantagineum*), *Bidens pilosa* and clover (*Trifolium* sp.).

Where native vegetation exists, the tree layer was dominated by White Box (*Eucalyptus albens*) and also included White Cypress Pine (*Callitris glaucophylla*) and Kurrajong (*Brachychiton populneus*). The shrub layer was largely absent, however *Senna barclayana* was present.

The ground layer was diverse and was dominated by native species, however there were also numerous clumps of exotics scattered throughout. The ground layer included native grasses including red-leg grass (*Bothriochloa macra*) and purple wire grass (*Aristida ramosa*) and *Austrostipa verticillata.* Native forbs included *Acaena novae-zealandiae, Geranium solanderi, Stackhousia monogyna* and *Solanum esuriale.* Native groundcover species such as *Eremophila debilis* and *Einadia nuta*ns were also present.

Vegetation within the subject land was assessed for:

- **Vegetation integrity**—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state
- **Habitat suitability**—being the degree to which the habitat needs of threatened species are present at a particular site.

Approximately 2.92 hectares of the subject land is contained to a single paddock of ploughed agricultural land, devoid of native flora and mapped as Category 1-exempt land on the Draft Native Vegetation Regulatory Map (NVR). Field surveys concluded the draft NVR map was correct and that the paddock was consistent with Category 1 exempt land.

1.03 hectares of land was mapped as Plant Community Type 266 *White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion*. This PCT is found both along the access road to the proposed substation site from the Mitchell Highway and in farmland at the south and west end of the subject land.

3.2.1 Plant Community Types

Plant Community Type (PCT) mapping was corrected in the subject land based on field observations of floristic composition and landscape position. White Box woodland occurs in the southwestern portion of the subject land with some small sections in the northern entrance to the property. The rest of the subject land comprises ploughed land and roads. Outside of the ploughed areas the tree layer was intact, shrub layer mostly absent and ground layer diverse.

Of the six PCTs previously mapped in the landscape assessment area, one was confirmed to be present, PCT 266 *White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion*, which is a Western Slopes Grassy Woodland vegetation class. This PCT was mapped where native vegetation occurred in the subject

land and the remaining disturbed land was mapped as PCT 0 Not native. PCT 266 is described below.

PCT 266 *White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion*

PCT 266 *White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion* presence was determined using the NSW BioNet Vegetation Classification database filter tool.

Indicators for this PCT were.

- PCT is found in the Inland Slopes Bioregion
- Vegetation is consistent with the Vegetation Class *Western Slopes Grassy Woodland.*
- Presence of *Brachychiton populneus* as the sub-dominant tree.
- Sparse to absent shrub layer
- The ground layer included native grasses including red-leg grass (*Bothriochloa macra*) and purple wire grass (*Aristida ramosa*) and *Austrostipa verticillata.*
- PCT is typically found on hills/low hills.
- Landform element typically associated with this PCT is Hillslopes and Valley Flats.

The above features are all consistent with the vegetation determined to occur in the subject land. Vegetation areas mapped are shown in Table 3-1 and Figure 3-2 and photos of example vegetation in the subject land can been seen in Plate 1 and Plate 2.

Table 3-1: Impacted vegetation

PCT	Class	Formation	Area (hectares)
PCT 266 White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion	Western Slopes Grassy Woodland	Grassy woodland	1.03
PCT 0 Not Native	N/A	N/A	2.92
Total			**3.95**

Plate 1: PCT 266

Plate 2: PCT 0 Not Native

Figure 3-2: Ground truthed vegetation within subject land

3.2.2 Threatened Ecological Communities

Predicted TECs (Section 2.3) were further considered following field survey. Nine TECs identified in the databases searches are not associated with PCT 266 and were not identified in the subject land (Table 3-2).

PCT 266 is associated with two listed Threatened Ecological Communities (TECs):

- Listed BC Act as Critically Endangered: *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, Southeastern Highlands, NSW Southwestern Slopes, Southeast Corner and Riverina Bioregions.*
- Listed EPBC Act as Critically Endangered*: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*

Justification for TEC presence is identified in the table below and TECs are mapped in Figure 3-3. All of PCT 266 within the subject land meets BC Act criteria (no area requirements) and two larger patches of PCT 266 met EPBC Act criteria (Larger than 0.1 ha), see Figure 3-3:

- Under the EPBC Act, 0.94 hectares of this CEEC will be potentially impacted.
- Under the BC Act, 1.03 hectares of this CEEC will be potentially impacted.

Tests of significance for impact to both these TECs are provided in Appendix C. These concluded there will be no significant impact – the same vegetation is well represented outside of the subject land and any impact from the proposal will not substantially modify the composition of the CEEC to the extent that there is a risk of extinction.

Table 3-2: Threatened Ecological Communities

Threatened Ecological Community	BC Act	EPBC ACT	**Likely to occur in the subject land**	**Likely to be impacted**	**Test of Significance required**
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Endangered Ecological Community	N/A	Unlikely: Key indicator species of *Allocasuarina verticillata* and *Acacia implexa* were not present in the upper and mid stratum.	No	No
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered Ecological Community	N/A	Unlikely: No Fuzzy box was identified in the subject land	No	No
Inland Grey Box Woodland in the Riverina, NSW South Western	Endangered Ecological Community	N/A	Unlikely: No Grey Box was identified in the subject land	No	No

Threatened Ecological Community	BC Act	EPBC ACT	Likely to occur in the subject land	Likely to be impacted	Test of Significance required
Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions					
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Endangered Ecological Community	N/A	Unlikely: Site was open woodland, not consistent with this EEC. Subject land does not occur on a sandhill.	No	No
White Box - Yellow Box - Blakelys Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered Ecological Community	N/A	**Yes.** This community was recorded within the construction footprint. The community was deemed present as areas within the site marked as PCT 266 meet all the following criteria according to NSW Guidelines: 1. The Slope is in the NSW Southwest Slopes Bioregion 2. There are native species in the understorey 3. The site has trees 4. White Box is present The site is predominantly Grassy.	Yes	Yes
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	N/A	Endangered	Unlikely: No Coolabah or Black Box was identified in the subject land	No	No
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	N/A	Critically Endangered Ecological Community	Unlikely: Soil profile (cracking clay soils) and position in the landscape (mid slope) was unsuitable for this CEEC.	No	No
Weeping Myall woodlands	Endangered Ecological Community	Endangered Ecological Community	Unlikely: No Weeping Myall was identified in the subject land	No	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	N/A	Critically Endangered Ecological Community	Yes. This community was recorded within the construction footprint. The community was deemed present as areas within the site marked as PCT 266 meet all of the following criteria according to National Guidelines: 1. The ecological community is in the NSW Southwest slopes IBRA region 2. It has an overstory dominated by *Eucalyptus albens* 3. It has a predominantly native ground layer 4. Tussock grasses are conspicuous in the ground layer. 5. A range of broad-leaved forbs occur. 6. Shrub cover is not more than 30%	Yes	Yes

Threatened Ecological Community	BC Act	EPBC ACT	**Likely to occur in the subject land**	**Likely to be impacted**	**Test of Significance required**
			7. The area is greater than 0.1 ha 8. The understorey contains at least 12 listed native species 9. The understorey contains at least one species listed as important (yes- *Austrostipa verticillata*) The patch contains 10 or more mature trees per hectare.		
Poplar Box Grassy Woodland on Alluvial Plains	N/A	Endangered Ecological Community	Unlikely: No Poplar Box was identified in the subject land	No	No
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	N/A	Endangered Ecological Community	Unlikely: No Grey Box was identified in the subject land	No	No

Figure 3-3: TECs in the subject land

3.2.3 Weeds

There were substantial areas dominated by exotic species within the subject land. This includes listed weed Green Cestrum (*Cestrum parqui*), see Figure 3-4. All pest plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Exotic species included, but are not limited to the following list:

- Green Cestrum-*Cestrum parqui* (priority weed) **High threat weed**
- Clover – *Trifolium sp.*
- Farmer's Friends – *Bidens pilosa* **High threat weed**
- Wild Sage-*Salvia verbenaca*
- Patterson's Curse – *Echium plantagineum*
- Variegated Thistle- *Silybum marianum*
- Stink Grass- *Eragrostis cillianensis*
- Mustard- *Brassica rapa*
- Shepherd's purse – *Capsella bursa-pastoris*
- Wireweed- *Polygonum aviculare*
- Saffron Thistle- *Carthamus lanatus* **High threat weed**
- Spikey Melon-*Cucumis myriocarpus*
- Whtie Horehound- *Marrubium vulgare*
- Paspalum- *Paspalum dilatatum* **High threat weed**

Implications for Project Management

For infrastructure projects in NSW, it is essential to:

- Comply with Legislation: Understand and follow the specific requirements of each piece of legislation relevant to weed management.
- Implement Management Plans: Develop and implement weed management and disposal plans, as well as Pesticide Use Notification Plans when applicable.
- Ensure Qualified Personnel: Ensure that those applying pesticides are properly trained and qualified, in compliance with the *Pesticides Regulation 2017*.
- Engage with Local Authorities: Work closely with local control authorities for guidance and to ensure compliance with the Biosecurity Act and regional strategies.
- Protect Biodiversity: Recognise the role of weed management in conserving biodiversity, as outlined in the Biodiversity Conservation Act and the NSW Invasive Species Plan.

Figure 3-4: Exotic species in the subject land. Priority weed Green Cestrum (*Cestrum parqui*)

3.3 Habitat values

Field assessment strongly considered habitat suitability – being the degree to which the habitat needs of threatened species were present at the subject land. The following core habitat features were identified within the subject land:

- The area of White Box woodland (1.03 ha) has value as habitat as it contains mature native trees with a mostly native understorey. Food and shelter may be provided to native animals in the remnant woodland. The ploughed area does not have significant habitat value.
- Ten hollow-bearing trees are in the subject land that may contain habitat for threatened hollow-dependent species. There was not a significant number of logs and woody debris in the area.

The area does not contain aquatic habitat relevant to the FM Act as there are no major watercourses in the subject land, see following section.

3.3.1 Hydrological features supporting terrestrial species

There are no watercourses in the subject land. There is a watercourse in the west of the landscape assessment area, Geurie Creek, and a small unnamed watercourse south of the subject land. Overall, there are few hydrological features that may support terrestrial species.

3.3.2 Trees and Hollows

Large mature trees were recorded within the subject land. Trees containing hollows were older specimens of White Box (*Eucalyptus albens*).

The large hollows provide suitable nesting habitat for several large species of bird including the Barking Owl (*Ninox connivens*), and smaller species of bird including the Turquoise Parrot (*Neophema pulchella*). Bats and mammals would be capable of utilising smaller hollows as roosting habitat. The decorticating bark provides shelter for invertebrates, as well as bat and reptile species. These trees also provide a food resource for a range of species, for example, insects found under the bark are a food for various species such as the Grey-crowned Babbler (*Pomatostomus temporalis temporalis*).

Ten large trees containing hollows are located within the construction footprint. All trees recorded in the subject land are shown by size class below Table 3-3.

Table 3-3 Tree species, size and number recorded within the subject land.

Scientific name	Class 1 (DBH <5cm)	Class 2 (DBH 5-9 cm)	Class 3 (DBH 10-19cm)	Class 4 (DBH 20-29cm)	Class 5 (30-49cm)	Class 6 (50-79cm)	Large Tree (DBH >80cm)
Eucalyptus albens (WB)	0	0	0	0	2	2	8
Callitris glaucophylla (WCP)	0	0	0	4	4	3	0
Brachychiton populneus (K)	0	0	0	1	0	2	1
Total	**0**	**0**	**0**	**5**	**6**	**7**	**9**

3.4 Threatened Species

No threatened flora or fauna were recorded during the field assessment.

A list of predicted threatened species has been generated by combining the NSW threatened predicted species based on the IBRA subregion and the threatened species listed within the EPBC Act Protected Matters Report (Appendix A) as well as consideration of species recorded on BioNet in the landscape assessment area. The resulting list is considered further in Appendix B 'Predicted threatened species likelihood assessment' with the results of this assessment discussed below. This assessment determines threatened matters with potential to use the habitat within the study area, and, if so, potential to be impacted by the proposal.

Although threatened species were not located during the field survey, 31 threatened species were determined to have potential occur within the subject land and/or use habitat in the construction footprint. The threatened species, habitat and potential impacts are outlined in Table 5-2.

Assessment of the significance have been completed for these species as per the required BC Act test questions and EPBC Act significant impact criteria, relative to each species conservation listing status and requirements. Based on the results of the tests of significance, impact is unlikely to be significant, see Appendix C.

Table 3-4: Potential impact to threatened species.

Scientific Name	Common Name	Habitat	Potential impact	Significant impact?
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Hollow nesting. May sally for insects.	This species uses tree hollows	No
Scoteanax	Greater	Hollow nesting. May	This species uses tree hollows	No

Scientific Name	Common Name	Habitat	Potential impact	Significant impact?
rueppellii	Broad-nosed Bat	sally for insects.		
Aphelocephala leucopsis	Southern Whiteface	Undisturbed grassy woodland with litter cover.	May be affected by loss of Grassy Woodland Habitat. Little litter cover present.	No
Artamus cyanopterus	Dusky Woodswallow	Grassy Woodland	May be affected by loss of Grassy Woodland Habitat.	No
Burhinus grallarius	Bush Stone-curlew	Open woodland with fallen timber.	May be affected by loss of Grassy Woodland Habitat. Little fallen timber.	No
Chthonicola sagittata	Speckled Warbler	Undisturbed Grassy Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Circus assimilis	Spotted Harrier	Grassy Woodand	May be affected by loss of Grassy Woodland Habitat.	No
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Grassy woodland. Fallen timber. Hollow nesting.	May be affected by loss of Grassy Woodland Habitat. Little fallen timber. This species uses tree hollows	No
Daphoenositta chrysoptera	Varied Sittella	Grassy Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	Grassy Woodland. Hollow nesting	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows	No
Hieraaetus morphnoides	Little Eagle	Eucalypt woodland. Tall trees.	May be affected by loss of Grassy Woodland Habitat.	No
Lophoictinia isura	Square-tailed Kite	Dry woodland particularly timbered watercourses.	May be affected by loss of Grassy Woodland Habitat.	No
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Eucalypt Woodland	May be affected by loss of Grassy Woodland Habitat.	No
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Box Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Neophema pulchella	Turquoise Parrot	Edges of Eucalypt woodland. Hollow nesting.	This species uses tree hollows	No
Ninox connivens	Barking Owl	Woodland and partly cleared farmland. Hollow nesting.	This species uses tree hollows	No
Petroica boodang	Scarlet Robin	Eucalypt woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Petroica phoenicea	Flame Robin	In winter open woodland. Breeds in forest further east. Doesn't breed in woodland habitat	Unlikely to be affected. Migratory, doesn't breed in the area. Can find other sources of food during migration.	No
Polytelis swainsonii	Superb Parrot	Box-Gum Woodland. Tree hollows.	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows.	No
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Box woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Stagonopleura guttata	Diamond Firetail	Box-Gum Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Tyto novaehollandiae	Masked Owl	Woodlands, edge of forest. Tree	May be affected by loss of Grassy Woodland Habitat. This species uses	No

Scientific Name	Common Name	Habitat	Potential impact	Significant impact?
		Hollows.	tree hollows	
Cercartetus nanus	Eastern Pygmy-possum	Woodlands. Tree hollows	May be affected by loss of Grassy Woodland Habitat. This species uses tree hollows.	No
Phascolarctos cinereus	Koala	Eucalypt trees	There will be some loss of eucalypt feed trees.	No
Dicanthium setosum	Bluegrass	Disturbed Grassy woodland	May be affected by loss of Grassy Woodland Habitat.	No
Swainsona recta	Small Purple-pea	Grassy Woodlands understorey.	May be affected by loss of Grassy Woodland Habitat.	No
Swainsona sericea	Silky Swainson-pea	Box-Gum Woodland.	May be affected by loss of Grassy Woodland Habitat.	No
Thesium australe	Austral Toadflax	Grassland and Grassy Woodland. Kangaroo Grass (*Themeda triandra*)	Minimal. Kangaroo grass was not present.	No

Measures to avoid and minimise any potential residual impacts from the proposal are outlined in the following section.

3.5 Key threatening processes

The list of Key Threatening Processes (KTPs) provided in the NSW BC Act, FM Act and EPBC Act has been reviewed, with reference to impacts associated with the proposal, have been assessed in Table 3-5. Six KTPs will be negligibly exacerbated by the proposal:

- BC Act: Anthropogenic Climate Change
- BC Act: Clearing of native vegetation
- BC Act: Invasion of native plant communities by exotic perennial grasses
- BC Act: Loss of Hollow-bearing Trees
- EPBC Act: Land clearance
- EPBC Act: Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases.

Mitigation measures recommended in Section 4 will minimise any potential impact to KTPs.

Table 3-5: Key threatening processes associated with the proposal

KTP	Implication for proposal
BC Act KTPs	
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	Neutral. The proposal would avoid impact to named waterways and unnamed ephemeral drainage lines. Control measures would be followed to Manage and minimise the risk preventing alternation of waterways.
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*	Neural. The proposal is unlikely to influence Noisy Miner abundance
Alteration of habitat following subsidence due to longwall mining	Not applicable
Anthropogenic Climate Change	Negligibly. The proposal would result in the loss of a carbon sink consisting of native vegetation. The proposal would generate CO2 emissions from construction machinery.
Bushrock Removal	Neutral. Bush rock would be left in the immediate vicinity of the proposal if disturbed.
Clearing of native vegetation	Increased. Approximately 1.03 ha of native vegetation will be cleared.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)	Neutral. The proposal is unlikely to influence feral rabbit numbers.
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	Neutral. The proposal is unlikely to influence feral goat numbers.
Competition from feral honeybees, Apis mellifera L.	Neutral. The proposal is unlikely to influence feral bee numbers.
Death or injury to marine species following capture in shark control programs on ocean beaches	Not applicable
Entanglement in, or injection of anthropogenic debris in marine and estuarine environments	Not applicable
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Not applicable
Habitat degradation and loss by Feral Horses (brumbies, wild horses), *Equus caballus* Linnaeus 1758	Neutral. The proposal is unlikely to influence feral horses.
Herbivory and environmental degradation caused by feral deer	Neutral. The proposal is unlikely to influence feral deer numbers.

KTP	Implication for proposal
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Neutral. The proposal is low impact and is unlikely to result in accidental fire and associated disruption to native vegetation.
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	Neutral. The proposal is unlikely to increase the abundance of Red Imported Fire Ants.
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species	Neutral. The proposal is unlikely to influence any part of the beak and feather disease life cycle.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Neutral. The proposal does not have potential to result in transmission of this fungus. No waterways or ephemeral drainage lines would be impacted by this proposal.
Infection of native plants by *Phytophthora cinnamomi*	Neutral. The proposal is unlikely to result in the introduction or spread of Phytophthora cinnamomic. It is not known to occur in the study area.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	Neutral. The proposal is unlikely to result in the spread of Exotic Rust Fungi as the proposal footprint is outside the area of occupation for these fungi.
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	Neutral. The proposal is unlikely to result in the spread of Bombus terrestris as this species is not known to occur in NSW.
Invasion and establishment of exotic vines and scramblers	Neutral. The proposal is unlikely to result in the invasion and establishment of exotic vines and scramblers as the main species of this KTP are not present in the study area and weed control measures would be followed to prevent invasion and establishment of exotic vines and scramblers.
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	Neutral. The proposal is unlikely to result in the invasion and establishment of Scotch Broom as it is not known to occur in the study area. Standard weed control measures would be followed to prevent invasion and establishment of Scotch Broom.
Invasion and establishment of the Cane Toad (*Rhinella marina*)	Neutral. The proposal is unlikely to result in the invasion and establishment of the Cane Toad (Rhinella marina).
Invasion of native plant communities by African Olive *Olea europaea subsp. cuspidata* (Wall. ex G. Don) Cif.	Neutral. The proposal is unlikely to result in the invasion and establishment of African Olive. Standard weed control measures would be followed to prevent invasion and establishment of African Olive.
Invasion of native plant communities by *Chrysanthemoides monilifera*	Neutral. The proposal is unlikely to result in the importation of Boneseed or Bitou Bush and these species are not known to occur in the study area. Standard control measures would be followed to prevent importation.
Invasion of native plant communities by exotic perennial grasses	Negligibly. The proposal will possibly result in the introduction and establishment of exotic novel weeds only. Exotic grasses already dominate the subject land.
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	Neutral. The proposal is unlikely to result in the invasion the Yellow Crazy Ant is not known to occur in the study area, they are more likely to occur in Northern Australia.
Invasion, establishment and spread of *Lantana camara*	Neutral. The proposal is unlikely to result in the invasion and establishment of Lantana camara as this species was not present in the study area and weed control measures would be followed to prevent invasion and establishment of all exotic vines and scramblers.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Neutral. The proposal is unlikely to result in the invasion and establishment of escaped garden plants. However, weed control measures would be followed to prevent establishment.
Loss and/or degradation of sites used for hill-topping by butterflies	Not relevant
Loss of Hollow-bearing Trees	**Increased.** Multiple hollow bearing trees will be impacted by the proposal. Mitigation measures will ensure impact is minimal and dead wood and trees disturbed by the proposal

KTP	Implication for proposal
	would not be removed from the immediate environment.
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	Not relevant
Predation by the European Red Fox	Neutral. The proposal is unlikely to influence European red fox numbers.
Predation by the Plague Minnow (*Gambusia holbrooki*)	Neutral. The proposal is unlikely to influence Plague Minnow numbers, no key fish habitat occurs within the study area.
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island	Not relevant
Predation by feral cats	Neutral. The proposal is unlikely to influence feral cat numbers.
Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	Neutral. The proposal is unlikely to influence feral pig numbers.
Removal of dead wood and dead trees	Neutral. Dead wood and trees disturbed by the proposal would be used in landscaping the development and would not be removed from the immediate environment.
FM Act KTPs	
Alteration to the Natural Flow Regimes of Rivers and Streams	Neutral. The proposal is unlikely to influence flow regimes of rivers and streams provided control measures are followed to prevent alternation of waterways.
Alteration to the Natural Temperature of Rivers and Streams	Neutral. The proposal is unlikely to influence the temperature of rivers and streams.
Increased Sediment Input to Rivers and Streams Due to Human Activities	Neutral. Soil disturbance as a result of the proposal would be managed to prevent movement of sediment, and the likelihood of active erosion establishing.
Introduction of Live Fish into Waters Outside their Natural Range after 1770	Neutral. The proposal is unlikely to influence introduction of Live Fish into Waters Outside their Natural Range after 1770.
Removal of Large Woody Debris from Rivers and Streams	Neutral. The proposal will not result in removal of large woody debris from rivers and streams.
The Prevention of Passage of Aquatic Biota as a Result of the Presence of Instream Structures	Neutral. The proposal is unlikely to prevent aquatic biota passage.
EPBC Act KTPs	
Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)	Neutral. The proposal is unlikely to increase exclusion by Noisy Miners.
Competition and land degradation by rabbits	Neutral. The proposal is unlikely to influence feral rabbit numbers.
Competition and land degradation by unmanaged goats	Neutral. The proposal is unlikely to influence feral goat numbers.
Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	Neutral. The proposal is unlikely to result in the introduction or spread of Phytophthora cinnamomic due to elevation above area of occupation.
Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28 degrees South	Not applicable
Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations	Not applicable
Infection of amphibians with chytrid fungus resulting in chytridiomycosis	Neutral. The proposal does not have potential to result in transmission of this fungus. No named waterways or ephemeral drainage lines would be impacted by this proposal.
Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris	Not applicable
Invasion of northern Australia by Gamba Grass and other introduced grasses	Not applicable

KTP	Implication for proposal
Land clearance	Increased. A potential 3.95 ha of native and non-native vegetation will be impacted. Land proposed for impact largely includes groundcover in historically cleared for agricultural, cropping or grazing activities.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Neutral. The proposal is unlikely to result in the invasion and establishment of escaped garden plants. Mitigation measures will minimise the potential impact of this key threatening process.
Loss of biodiversity and ecosystem integrity following invasion by the Yellow Crazy Ant (Anoplolepis gracilipes) on Christmas Island, Indian Ocean	Not applicable
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	Negligible. The proposal would result in minor, temporary loss of a carbon sink consisting of native vegetation. The proposal would generate CO^2 emissions.
Novel biota and their impact on biodiversity	Neutral. The proposal is unlikely to influence novel biota numbers. All relevant weeds, invasive species, pathogens etc have been discussed in their specific KTP.
Predation by European red fox	Neutral. The proposal is unlikely to influence European red fox numbers.
Predation by exotic rats on Australian offshore islands of less than 1000 km2 (100,000 ha)	Not applicable
Predation by feral cats	Neutral. The proposal is unlikely to influence feral cat numbers.
Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs	Neutral. The proposal is unlikely to influence feral pig numbers.
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species	Neutral. The proposal is unlikely to influence any part of the beak and feather disease life cycle.
The biological effects, including lethal toxic ingestion, caused by Cane Toads (Bufo marinus)	Not relevant
The reduction in the biodiversity of Australian native fauna and flora due to the red imported fire ant, Solenopsis invicta (fire ant)	Neutral. Fire ants are not known to occur in the study area and the proposal is unlikely to result in the importation of Fire Ants. Control measures would be followed to prevent importation.

4. Mitigation measures and recommendations

The following mitigation measures in Table 4-1 are recommended to reduce the potential impact on threatened matters with potential to occur in the subject land, and reduce other environmental impact such as erosion or loss of habitat features:

Table 4-1: Mitigation measures

Impact	Mitigation measures	Responsibility	Timing
General	• Any change in design affecting land outside the subject land assessed in this report will require further ecological survey - notwithstanding minor changes where the ecological values have been assessed for this proposal.	Proponent	Pre-construction, construction, operation
Clearing and prevention of over-clearing	• All personnel would be inducted to be aware any stand of native vegetation outside the subject land has legislative consequences if deliberately or accidentally impacted without approval. Evidence of all personnel receiving an induction would be kept on file (signed induction sheets etc.). • Vegetation within the subject land would be removed in such way to avoid damage to surrounding vegetation. Ensure groundcover disturbance would be kept to a minimum.	Contractor	Pre-construction
Removal of Native Vegetation and Hollow - Bearing Trees.	• Minimise removal of native vegetation and fauna habitat to proposed project extent. • Clearing of vegetation and/or removal of bush rock does not go beyond the approved clearing limits for the project. • Carefully clear vegetation so as not to mix topsoil with debris and to avoid impacts to surrounding native vegetation. • Where reasonable and feasible, retain mature and hollow bearing habitat trees, including dead stags. • • Staged habitat removal process is to be used when identified habitat trees are be removed, where practicable • Prior to clearing, inspect trees with bird nests or hollows before pushing or felling to ensure the nests are vacant. Inspection would occur immediately before pushing or felling. If a bird is in the nest, clear the trees around it first to see if the animal will disperse. If the bird is a nestling (baby bird confined to the nest) all measures would be taken to collect the bird and remove to a safe location. • Immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling the area of clearing work is to be inspected for fauna	Proponent/ Contractor	Construction and post-construction

Impact	Mitigation measures	Responsibility	Timing
	• If fauna is detected, the animal is to be allowed to leave the site without any coercion or a local wildlife rescue service is to be contacted to facilitate the safe removal of the animal from the worksite • Groundcover disturbance will be kept to a minimum and within the assessed areas • Where possible, vegetation to be removed will be mulched on-site and re-used to stabilise disturbed areas • Erosion and Sediment Control measures will be established in accordance with Landcom's Managing Urban Stormwater, Soils & Construction Guidelines (The Blue Book. Landcom 2004) and documented in a Construction Environmental Management Plan (CEMP) to be prepared for the work. • Segments of trees removed from tree lopping to be placed in adjoining habitat without damaging it, where agreed upon with landowner • Refer to Fauna handling and rescue procedure in Appendix E if required.		
Water pollution - fuel, chemical spills and hazardous materials	• Store fuels, chemical and hazardous materials in secure, bunded areas • Capture and dispose of spill and contaminated materials from construction ancillary facilities at a licensed facility. • Provide spill kits around temporary construction ancillary facilities.	Contractor	Pre-construction and during construction
Introduction and spread of noxious weeds and pathogens	• Essential Energy has a general biosecurity duty under the Biosecurity Act 2015 to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable. Field crews shall follow procedures as outlined in Essential Energy's Operational Guideline: Biosecurity Risk Management (CERM1000.96) to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable, with particular reference to vehicle and equipment hygiene practises	Contractor	Construction
Attracting fauna to the subject land	• All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, dogs and cats. • .	Contractor	Construction
Fauna management	• Refer to Fauna handling and rescue procedure in Appendix E if required.	Contractor	Construction

5. Conclusion

The proposal is unlikely to have a significant impact on any threatened species, populations or TECs within the subject land and is not located on land mapped as outstanding biodiversity value. The proposal therefore does not require assessment under the Biodiversity Offset Scheme, or preparation of a Species Impact Statement.

To ensure minimal harm to the environment, mitigation measures have been recommended. to avoid, minimise any potential residual impacts from the proposal.

Based on the assessment, no referral or additional assessment is required. No required offsetting for the proposal will be necessary.

6. References

Benson, J. (2009). *New South Wales Vegetation Classification and Assessment, NSWVCA batabase.* Sydney: NSW DEC.

DoE. (2013). *Matters of National Environmental Significance - Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999.* Department of the Environment. Canberra, ACT: Commonwealth of Australia . Retrieved April 2015, from http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf

DPIE, Department of Planning and Environment. (2022). *Guidelines for Division 5.1 assessments.* NSW Government.

Environment, D. o. (2017). *Species Profiles and Threats Database (SPRAT), (online)*. Retrieved from Species Profiles and Threats Database (SPRAT), (online): http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Environment, D. o. (2024). *Protected Matters Search Tool (online)*. Retrieved from https://pmst.awe.gov.au/#/map?lng=131.52832031250003&lat=-28.671310915880834&zoom=5&baseLayers=Imagery,ImageryLabels

Government, NSW. (2024). *Environmental Planning and Assessment Act 1979 No 203, Part 5 Infrastructure and environmental impact assessment.*

Office of Environment & Heritage. (2024). *Threatened biodiversity profile search*. Retrieved from https://threatenedspecies.bionet.nsw.gov.au/

Office of Environment and Heritage. (2017). *Threatened Species Profile Database (online)*. Retrieved from Threatened Species Profile Database (online): http://www.environment.nsw.gov.au/asmslightprofileapp/account/login?ForceLogin=1

Appendix A – Database searches

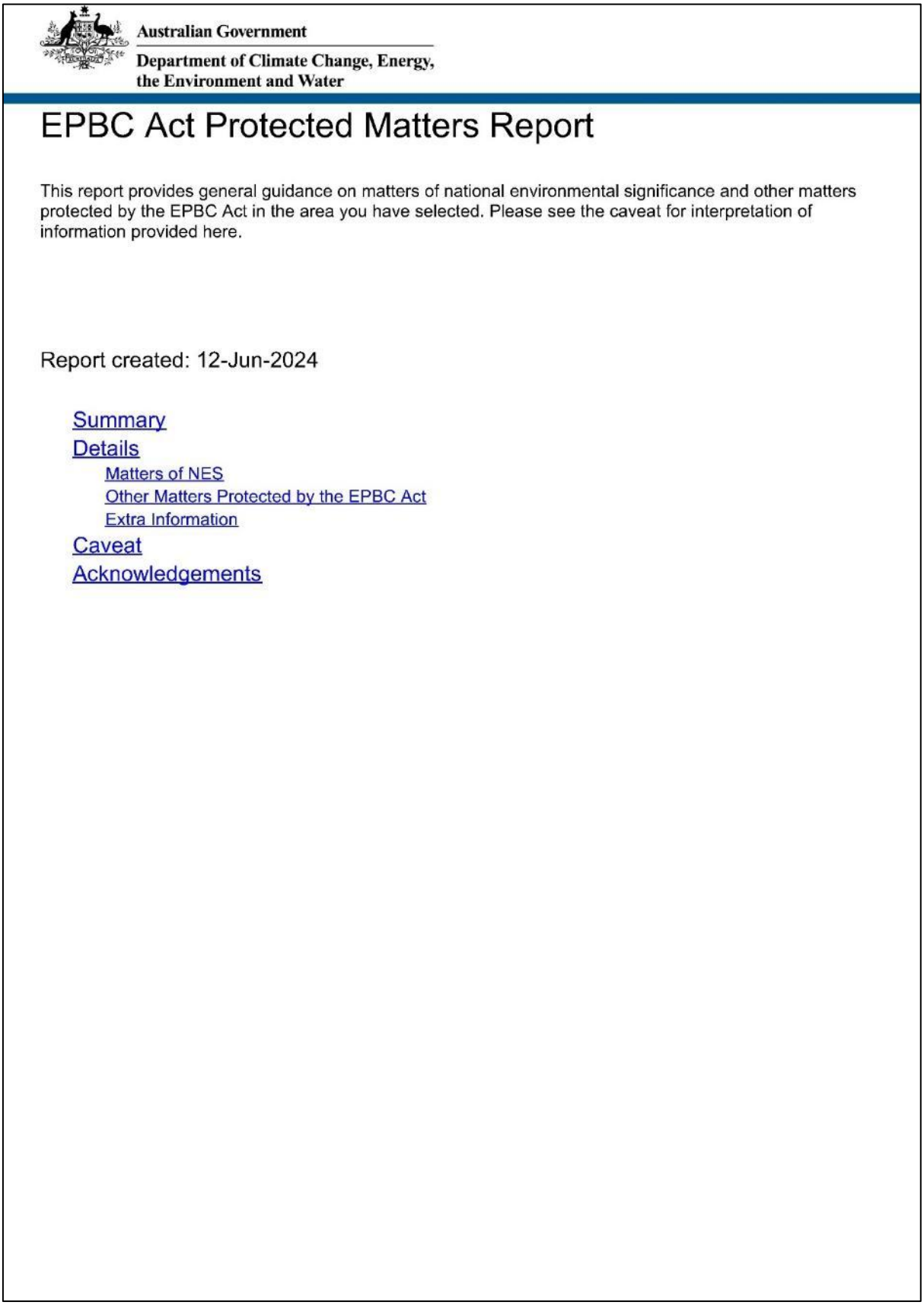
NSW predicted threatened species – Lower Slopes IBRA subregion.

Scientific Name	Common Name	NSW status
Amphibians		
Crinia sloanei	Sloane's Froglet	E
Litoria booroolongensis	Booroolong Frog	E
Litoria raniformis	Southern Bell Frog	E
Reptiles		
Aprasia parapulchella	Pink-tailed Legless Lizard	V
Delma impar	Striped Legless Lizard	V
Varanus rosenbergi	Rosenberg's Goanna	V
Birds		
Leipoa ocellata	Malleefowl	E
Anseranas semipalmata	Magpie Goose	E
Oxyura australis	Blue-billed Duck	V
Stictonetta naevosa	Freckled Duck	V
Hirundapus caudacutus	White-throated Needletail	V
Botaurus poiciloptilus	Australasian Bittern	E
Ixobrychus flavicollis	Black Bittern	V
Circus assimilis	Spotted Harrier	V
Haliaeetus leucogaster	White-bellied Sea-Eagle	V
Hamirostra melanosternon	Black-breasted Buzzard	V
Hieraaetus morphnoides	Little Eagle	V
Lophoictinia isura	Square-tailed Kite	V
Pandion cristatus	Eastern Osprey	V
Falco hypoleucos	Grey Falcon	V
Falco subniger	Black Falcon	V
Grus rubicunda	Brolga	V
Ardeotis australis	Australian Bustard	E
Burhinus grallarius	Bush Stone-curlew	E
Rostratula australis	Australian Painted Snipe	E
Calidris ferruginea	Curlew Sandpiper	E
Callocephalon fimbriatum	Gang-gang Cockatoo	E
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V
Lophochroa leadbeateri	Pink Cockatoo	V
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	V
Lathamus discolor	Swift Parrot	E
Neophema chrysostoma	Blue-winged Parrot	V
Neophema pulchella	Turquoise Parrot	V
Polytelis swainsonii	Superb Parrot	V
Ninox connivens	Barking Owl	V
Ninox strenua	Powerful Owl	V
Tyto novaehollandiae	Masked Owl	V
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V
Pycnoptilus floccosus	Pilotbird	P
Aphelocephala leucopsis	Southern Whiteface	V
Chthonicola sagittata	Speckled Warbler	V
Anthochaera phrygia	Regent Honeyeater	E
Certhionyx variegatus	Pied Honeyeater	V

Scientific Name	Common Name	NSW status
Epthianura albifrons		V
Grantiella picta	Painted Honeyeater	
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V
Daphoenositta chrysoptera	Varied Sittella	V
Pachycephala inornata	Gilbert's Whistler	V
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E
Petroica boodang	Scarlet Robin	V
Petroica rodinogaster	Flame Robin	V
Stagonopleura guttata	Pink Robin	V
Mammals		
Dasyurus maculatus	Spotted-tailed Quoll	V
Macrotis lagotis	Bilby	E
Phascolarctos cinereus	Koala	E
Cercartetus nanus	Eastern Pygmy-possum	V
Petaurus australis	Yellow-bellied Glider	V
Petaurus norfolcensis	Squirrel Glider	V
Petauroides volans	Southern Greater Glider	E
Bettongia leseur graii	Boodie, Burrowing Bettong	E
Petrogale penicillata	Brush-tailed Rock Wallaby	E
Pteropus poliocephalus	Grey-headed Flying Fox	V
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat	V
Chalinolobus dwyeri	Large-eared Pied Bat	V
Chalinolobus picatus	Little Pied Bat	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V
Myotis macropus	Southern Myotis	V
Nyctophilus corbeni	Corben's long-eared bat	V
Scoteanax rueppellii	Greater Broad-nosed bat	V
Miniopterus orianae oceanensis	Large bent-winged Bat	P
Pseudomys novaehollandiae	New Holland Mouse	V
Insects		
Synemon plana	Golden Sun moth	V
Keyacris scurra	Key's matchstick grasshopper	E
Plants		
Caesia parviflora	Small Pale Grass-lily	E
Tylophora linearis	Null	V
Ammobium craspedioides	Yass Daisy	V
Brachyscome muelleroides	Claypan Daisy	V
Leucochrysum albicans subsp. tricolor	Hoary Sunray	E
Senecio garlandii	Woolly Ragwort	V
Carex raleighii	Raleigh Sedge	E
Bossiaea fragrans	Null	E
Cullen parvum	Small Scurf-pea	E
Pultenaea humilis	Dwarf Bush-pea	V
Indigofera efoliata	Leafless Indigo	E
Swainsona recta	Small Purple-pea	E
Swainsona sericea	Silky Swainson-pea	V

Scientific Name	Common Name	NSW status
Acacia ausfeldii	Ausfeld's Wattle	V
Acacia phasmoides	Phantom Wattle	V
Pilularia novae-hollandiae	Austral Pillwort	E
Eucalyptus aggregata	Black Gum	V
Eucalyptus alligatrix subsp. alligatrix	Null	V
Eucalyptus cannonii	Capertee Stringybark	V
Caladenia arenaria	Sand-hill Spider Orchid	E
Caladenia concolor	Crimson Spider Orchid	E
Caladenia rosella	Rosella Spider Orchid	E
Caladenia tessellata	Thick Lip Spider Orchid	E
Diuris tricolor	Pine Donkey Orchid	V
Prasophyllum petilum	Tarengo Leek Orchid	E
Euphrasia arguta	Null	E
Amphibromus fluitans	Floating Swamp Wallaby-grass	V
Dichanthium setosum	Bluegrass	V
Grevillea wilkinsonii	Tumut Grevillea	E
Pomaderris queenslandica	Scant Pomaderris	E
Zieria ingramii	Keith's Zieria	E
Zieria obcordata	Granite Zieria	E
Thesium australe	Austral Toadflax	V
Pimelea bracteata	Null	E

EPBC Act – Protected Matters Report



Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 12-Jun-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	33
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity
Banrock station wetland complex	600 - 700km upstream from Ramsar site
Hattah-kulkyne lakes	400 - 500km upstream from Ramsar site
Riverland	500 - 600km upstream from Ramsar site
The coorong, and lakes alexandrina and albert wetland	600 - 700km upstream from Ramsar site

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat may occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
FISH		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
FROG		

Scientific Name	Threatened Category	Presence Text
Crinia sloanei		
Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area
MAMMAL		
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat may occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
PLANT		
Austrostipa wakoolica		
[66623]	Endangered	Species or species habitat may occur within area
Caladenia arenaria		
Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area
Lepidium aschersonii		
Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium monoplocoides		
Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area
Swainsona murrayana		
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Hemiaspis damelii		
Grey Snake [1179]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Communications, Information Technology and the Arts - Telstra Corporation Limited	
Commonwealth Land - Telstra Corporation Limited [15361]	NSW

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Appendix B – Predicted threatened species likelihood assessment

Predicted Threatened Species – likelihood of impact by the proposal

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
Amphibians						
Crinia sloanei	Sloane's Froglet	E	E	Unlikely. Not near a watercourse or periodically inundated grassland. On edge of range.	No	No
Litoria booroolongensis	Booroolong Frog	E	E	Unlikely. No permanent streams in the subject land.	No	No
Bats						
Chalinolobus dwyeri	Large-eared Pied Bat	V	E	Unlikely. No caves or cliffs nearby.	No	No
Chalinolobus picatus	Little Pied Bat	V	N/A	Unlikely. Occurs further inland.	No	No
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	N/A	Unlikely. Occurs in moister habitats further east.	No	No
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	N/A	Unlikely. No caves nearby.	No	No
Myotis macropus	Southern Myotis	V	N/A	Unlikely. No streams, pools or caves nearby.	No	No
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Unlikely. Occurs in ironbark woodland and box woodland further west and north.	No	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Possible. Previously sited at Geurie (BioNet).	No. Roosting camps were not identified in the subject land.	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	N/A	Likely. May nest in hollows in woodland areas.	Yes. Removal of hollows may impact this species	Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	V	N/A	Likely. May occur in woodland remnants.	Yes	Yes
Birds						
Anseranas semipalmata	Magpie Goose	V	N/A	Unlikely. No wetlands in the subject land.	No	No
Anthochaera phrygia	Regent Honeyeater	E	CE	Unlikely, The key eucalypt species of Mugga Ironbark, Yellow Box, and Swamp Mahogany were not recorded in the subject land. The subject land also does not occur within a key breeding area for this species	No	No

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
				There are no areas for this species mapped on the important habitat map. Therefore, occurrence of and impact to this species within the subject land is unlikely.		
Aphelocephala leucopsis	Southern Whiteface	V	V	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Ardeotis australis	Australian Bustard	E	N/A	Unlikely. Outside of range. Not a tussock or hummock grassland. No sandy ridges for nesting.	No	No
Artamus cyanopterus	Dusky Woodswallow	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Botaurus poiciloptilus	Australasian Bittern	E	E	Unlikely. No wetlands in the subject land.	No	No
Burhinus grallarius	Bush Stone-curlew	E	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Calidris acuminata	Sharp-tailed Sandpiper	N/A	v	Unlikely. Mostly coastal. No wetlands nearby.	No	No
Calidris ferruginea	Curlew Sandpiper	E	CE	Unlikely. Mostly coastal. No swamps nearby.	No	No
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	Unlikely. No wet sclerophyll or old growth forests nearby.	No	No
Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	V	N/A	Unlikely. Occurs further inland. Prefers coolabah and river red gum lined watercourses.	No	No
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	Unlikely. No casuarina in the subject land.	No	No
Certhionyx variegata	Pied Honeyeater	V	N/A	Unlikely. Not an acacia, spinifex or mallee scrub.	No	No
Chthonicola sagittata	Speckled Warbler	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Circus assimilis	Spotted Harrier	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes.	Yes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Daphoenositta chrysoptera	Varied Sittella	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Ephippiorhynchus asiaticus	Black-necked Stork	E	N/A	Unlikely. No wetlands in the subject land.	No	No
Epthianura albifrons	White-fronted Chat	V	N/A	Unlikely. No wetlands in the subject land.	No	No
Falco hypoleucos	Grey Falcon	V	V	Unlikely. Occurs in more arid environments.	No	No
Falco subniger	Black Falcon	V	N/A	Unlikely. Occurs in more arid environments.	No	No
Gallinago hardwickii	Latham's Snipe	N/A	V	Unlikely. There are no mudflats in the subject land.	No	No
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	V	N/A	Possible. Eucalypt trees in subject land may be used for feeding and nesting.	Yes	Yes
Grantiella picta	Painted Honeyeater	V	V	Unlikely,	No	No

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
				This species can inhabit Box-Gum Woodlands and Box-ironbark Forests. This species is a specialist feeder, it feeds on the fruits of mistletoes (prefers *Amyema sp* mistletoes) growing on eucalypts and acacias. No mistletoe was recorded during the field survey, this species requires a density of greater than five mistletoes per hectare. This required density of mistletoe does not occur within the subject land therefore, occurrence of and impact to this species is unlikely.		
Grus rubicunda	Brolga	V	N/A	Unlikely. No wetlands in the subject land.	No	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	N/A	Unlikely. No major waterways near the subject land.	No	No
Hamirostra melanosternon	Black-breasted Buzzard	V	N/A	Unlikely. Occurs in more arid environments.	No	No
Hieraaetus morphnoides	Little Eagle	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Hirundapus caudacutus	White-throated Needletail	V	V	Unlikely. More often coastal, aerial and migratory.	No	No
Ixobrychus flavicollis	Black Bittern	V	N/A	Unlikely. No wetlands in the subject land.	No	No
Lathamus discolor	Swift Parrot	E	CE	Unlikely, This species does not breed in Australia, it breeds in Tasmania. There are no areas for this species mapped on the important habitat map. Therefore, occurrence of and impact to this species within the subject land is unlikely.	No	No
Leipoa ocellata	Mallee fowl	E	V	Unlikely. Subject land is not Mallee and does not contain Sandy soil.	No	No
Limosa limosa	Black-tailed Godwit	V	E	Unlikely. Mostly a coastal species and no wetlands nearby.	No	No
Lophochroa leadbeateri	Pink Cockatoo	V	E	Unlikely. Occurs in more arid environments.	No	No
Lophoictinia isura	Square-tailed Kite	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes.	Yes
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E	E	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Neophema chrysostoma	Blue-winged Parrot	V	V	Unlikely. Outside know distribution.	No	No
Neophema pulchella	Turquoise Parrot	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
Nettapus coromandelianus	Cotton Pygmy-Goose	E	N/A	Unlikely. No large bodies of water nearby.	No	No
Ninox connivens	Barking Owl	V	N/A	Possible. Appropriate Grassy Woodland habitat. May nest in hollows.	Yes	Yes
Ninox strenua	Powerful Owl	V	N/A	Unlikely. Occurs in wetter areas further east.	No	No
Oxyura australis	Blue-billed Duck	V	N/A	Unlikely. No large bodies of water nearby.	No	No
Pachycephala inornata	Gilbert's Whistler	V	N/A	Unlikely. Occurs in arid and semi-arid zones further west.	No	No
Pandion cristatus	Eastern Osprey	V	N/A	Unlikely. Subject land away from the coast or large waterbodies.	No	No
Pedionomus torquatus	Plains-wanderer	E	CE	Unlikely. Found in grassland in the semi-arid zone further west.	No	No
Petroica boodang	Scarlet Robin	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Petroica phoenicea	Flame Robin	V	N/A	Possible. Occurs in woodland areas in winter.	Yes	Yes
Petroica rodinogaster	Pink Robin	V	N/A	Unlikely. Occurs in wetter forest further south.	No	No
Polytelis swainsonii	Superb Parrot	V	V	Possible. Appropriate Grassy Woodland habitat. Nesting habitat in hollows.	Yes	Yes
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	N/A	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Pycnoptilus floccosus	Pilotbird	N/A	V	Unlikely. Not a dense forest.	No	No
Rostratula australis	Australian Painted Snipe	E	E	Unlikely. No Swamps nearby.	No	No
Stagonopleura guttata	Diamond Firetail	V	V	Possible. Appropriate Grassy Woodland habitat.	Yes	Yes
Stictonetta naevosa	Freckled Duck	V	N/A	Unlikely. No Swamps nearby.	No	No
Tyto novaehollandiae	Masked Owl	V	N/A	Possible. Appropriate Grassy Woodland habitat. May nest in hollows	Yes	Yes
Marsupials						
Antechinomys laniger	Kultarr	E	N/A	Unlikely. The site is outside the arid or semiarid zone.	No	No
Cercartetus nanus	Eastern Pygmy-possum	V	N/A	Possible. Appropriate Grassy Woodland habitat. Hollows present for nesting. This species has been sighted in the Dubbo area.	Yes	Yes
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Unlikely. The habitat patch is too small. This species usually occurs further east.	No	No
Petauroides volans	Southern Greater Glider	E	E	Unlikely. The subject land is open woodland. This species rarely occurs outside of forest.	No	No
Petaurus australis	Yellow-bellied Glider	V	V	Unlikely. Occurs in wetter forest types.	No	No

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	Unlikely. The subject land is not rocky.	No	No
Phascolarctos cinereus	Koala	E	E	Possible. Has been seen in eucalypt forest in the Wellington and Dubbo regions.	Yes	Yes
Sminthopsis macroura	Stripe-faced Dunnart	V	N/A	Unlikely. The subject land is not a grassland or shrubland and lies outside the known distribution.	No	No
Rodents						
Pseudomys novaehollandiae	New Holland Mouse	N/A	V	Unlikely. There is no heathy understorey in this woodland.	No	No
Reptiles						
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	Unlikely. The subject land lacks rocks.	No	No
Delma impar	Striped Legless Lizard	V	V	Unlikely. The subject land is not a grassland.	No	No
Hemiaspis damelii	Grey Snake	E	E	Unlikely. There are no floodplains or wetlands in the Subject land.	No	No
Tympanocryptis lineata	Canberra Grassland Earless Dragon	E	CE	Unlikely. This species occurs further south.	No	No
Varanus rosenbergi	Rosenberg's Goanna	V	N/A	Unlikely. The subject land is outside this species distribution.	No	No
Fish						
Bidyanus bidyanus	Silver Perch, Bidyan	N/A	E	Unlikely. There are no major populations nearby and there are no major waterways in the subject land.	No	No
Galaxias rostratus	Flathead Galaxias	N/A	CE	Unlikely. Occupies the southern Murray-Darling Basin.	No	No
Macquaria australasica	Macquarie Perch	N/A	E	Unlikely. Not known from the Macquarie River Basin in recent history.	No	No
Invertebrates						
Keyacris scurra	Key's Matchstick Grasshopper	E	E	Unlikely. Outside distribution.	No	No
Synemon plana	Golden Sun Moth	V	V	Unlikely. Outside distribution.	No	No
Plants						
Acacia ausfeldii	Ausfeld's Wattle	V	N/A	Unlikely. Occurs in sandy soil.	No	No
Acacia phasmoides	Phantom Wattle	V	V	Unlikely. Well outside Range	No	No
Ammobium craspedioides	Yass Daisy	V	V	Unlikely. Outside Range.	No	No
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	V	Unlikely. Outside Range.	No	No
Androcalva procumbens	Null	N/A	V	Unlikely. Occurs in sandy soils.	No	No

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
Atriplex infrequens	A saltbush	V	V	Unlikely. Occurs on far western plains.	No	No
Austrostipa wakoolica	A speargrass	E	E	Unlikely. Outside range. Not a floodplain.	No	No
Bossiaea fragrans	Null	E	CE	Unlikely. Outside Range. Geology not appropriate.	No	No
Brachyscome muellerioides	Claypan Daisy	V	V	Unlikely. No claypans in subject land. Outside distribution.	No	No
Caesia parviflora	Small Pale Grass-lily	E	N/A	Unlikely. Area not heathland or closed forest.	No	No
Caladenia arenaria	Sand-hill Spider Orchid	E	E	Unlikely. Area not sandy, outside of range.	No	No
Caladenia concolor	Crimson Spider Orchid	E	V	Unlikely. Area not a granite ridge. Outside distribution.	No	No
Caladenia rosella	Rosella Spider Orchid	E	E	Unlikely. Well outside range.	No	No
Caladenia tessellata	Thick Lip Spider Orchid	E	V	Unlikely. Occurs further east.	No	No
Carex raleighii	Raleigh Sedge	E	N/A	Unlikely. Not a mountainous area. No sphagnum bogs.	No	No
Cheilanthes sieberi subsp. pseudovellea		E	N/A	Unlikely. Not an arid mountain range.	No	No
Cullen parvum	Small Scurf-pea	E	N/A	Unlikely. Outside Distribution.	No	No
Dicanthium setosum	Bluegrass	V	V	Possible. May occur in disturbed woodland remnants.	Yes	Yes
Diuris tricolor	Pine Donkey Orchid	V	N/A	Unlikely. Associated species lacking.	No	No
Eucalyptus aggregata	Black Gum	V	V	Unlikely. Occurs on the tablelands further south.	No	No
Eucalyptus alligatrix subsp. alligatrix	Null	V	V	Unlikely. Occurs only in the Rylstone area.	No	No
Eucalyptus cannonii	Capertee Stringybark	V	N/A	Unlikely. Found on tablelands further to the east.	No	No
Euphrasia arguta	Null	E	CE	Unlikely. Only known from Nundle area in the New England Region.	No	No
Grevillea wilkinsonii	Tumut Grevillea	E	CE	Unlikely. Occurs further south.	No	No
Indigofera efoliata	Leafless Indigo	E	E	Unlikely. While known from Geurie area, this species is associated with stony ground and the subject land is not stony ground.	No	No
Lepidium aschersonii	Spiny Peppercress	V	V	Unlikely. Subject land lacks any associated flora species.	No	No
Lepidium monoplocoides	Winged Peppercress	E	E	Unlikely. Subject land is not a seasonally moist plain and the species occurs further west.	No	No
Leucochrysum albicans subsp. tricolor	Hoary Sunray	E	E	Unlikely. Occurs on the southern tablelands further south.	No	No
Persicaria elatior	Tall Knotweed	V	V	Unlikely. Occurs in damper areas closer to the coast.	No	No

Scientific name	Common name	BC Act	EPBC Act	Likely to occur in the subject land	Likely to be impacted by the proposal	Test of significance required?
Pilularia novae-hollandiae	Austral Pillwort	E	N/A	Unlikely. Area not near a waterway or swamp.	No	No
Pimelea bracteata	Null	E	CE	Unlikely. Subject land is not a wetland. Species occurs further south.	No	No
Pomaderris queenslandica	Scant Pomaderris	E	N/A	Unlikely. Found in moister forest.	No	No
Prasophyllum petilum	Tarengo Leek Orchid	E	E	Unlikely. Occurs in temperate grassland and the subject land is outside the distribution.	No	No
Pterostylis cobarensis	Greenhood Orchid	V	N/A	Unlikely. Associated species lacking.	No	No
Pultenaea humilis	Dwarf Bush-pea	V	N/A	Unlikely. Outside range.	No	No
Senecio garlandii	Woolly Ragwort	V	N/A	Unlikely. No rocky outcrops.	No	No
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	V	V	Unlikely. Area is not a saltbush, black box or grassland community. Occurs further west.	No	No
Swainsona recta	Small Purple-pea	E	E	Possible. Occurs in Grassy Woodland areas.	Yes	Yes
Swainsona sericea	Silky Swainson-pea	V	N/A	Possible. Occurs in Grassy Woodland areas.	Yes	Yes
Thesium australe	Austral Toadflax	V	V	Possible if kangaroo grass present. Unlikely otherwise.	Yes	Yes
Tylophora linearis	Null	V	E	Unlikely. Lacks most associated species. Found in scrub and open forest not grassy woodlands.	No	No
Zieria ingramii	Keith's Zieria	E	E	Unlikely. Grows in sclerophyll forest rather than woodland.	No	No
Zieria obcordata	Granite Zieria	E	E	Unlikely. Not a rocky hillside.	No	No

Appendix C – Tests and Assessments of significance

EPBC Act Assessments of Significance

EPBC Act Critically Endangered and Endangered Communities

EPBC Act Critically Endangered and Endangered communities: • *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*	
Significant impact criteria: An action is likely to have a significant impact on a threatened community if there is a real chance or possibility that it will:	
Statement	**Response**
• reduce the extent of an ecological community	The proposal will negligibly reduce the extent of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived grassland.
• fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The proposal will not increase fragmentation of this CEEC. Vegetation removed will be 0.94 hectares representing this TEC along the outer edge of a much larger patch.
• adversely affect habitat critical to the survival of an ecological community	The proposal will reduce the extent of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived grassland but not to the extent that the survival of the ecological community is threatened. 0.94 hectares will be removed in a patch of approximately 90 hectares
• 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	The proposal will not modify or destroy abiotic factors necessary for an ecological community's survival. The proposal is on the lower slope side of the CEEC, as such surface drainage patterns will not be impacted. Groundwater levels are not anticipated to be altered by the proposal.
• 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	The proposal will not cause a substantial change in the species composition of an occurrence of an ecological community. Fire regimes will not be altered by the proposal, nor will it contribute to further disturbance in remnant CEEC patches.
• cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	The proposal will not cause a substantial reduction in the quality or integrity of an occurrence of this ecological community. The risk of spreading of weeds, mainly exotic grasses, will have to be carefully mitigated to avoid the reduction in quality or integrity as the community regenerates.
• interfere with the recovery of an ecological community.	The proposal will not interfere with the recovery of an ecological community.
Summary statement: The proposal will not result in a significant impact to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.	
What is an important population of a 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.	
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming	

EPBC Act Critically Endangered and Endangered communities: • *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*
established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.
What is habitat critical to the survival of a species or ecological community? 'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Endangered and Critically Endangered Species

EPBC Act Endangered (Bird) species: • *Melanodryas cucullata cucullata* South-eastern Hooded Robin	
Significant impact criteria	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of a population	The proposal is unlikely to lead to a long-term decrease in the size of a population of this bird species. No individuals were recorded within the subject land. No populations are known to inhabit the area.
• reduce the area of occupancy of the species	The proposal will slightly affect the area of occupancy of this species by 1.03 hectares. This reduction is not significant compared to the viable area of occupancy in surrounding area. No individuals were identified to occur within the impact area at the time of the survey. Suitable foraging habitat is represented in the surrounding areas.
• fragment an existing important population into two or more populations	The proposal does not have potential to fragment existing populations into two or more populations. The proposal will not contribute to landscape fragmentation.
• adversely affect habitat critical to the survival of a species	Breeding habitat will be impacted as will foraging habitat. Impacted vegetation is not critical for the long-term maintenance of this species. Impact will not inhibit genetic diversity nor long-term evolutionary development. Species are agile, as such, foraging, breeding, roosting or dispersal will not be significantly impacted.
• disrupt the breeding cycle of a population	The proposal will not disrupt the breeding cycle of this species as impact will be to a small portion of the local viable patch of vegetation.
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that this species is likely to decline. Suitable habitat within the patch will remain with only 1.03 hectares of a potential 90 hectares of vegetation removed. this species highly mobile. The proposal will not decrease available habitat nor inhibit movement.
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposal will not result in the introduction of disease that may cause the species to decline. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• interfere with the recovery of the species.	The proposal will not interfere substantially with the recovery of the species. Any impacts will be minor, suitable habitat will be largely avoided, and measures will be taken to minimise impact from key threatening processes.
Summary statement: The proposal will not result in a significant impact to this bird species. The proposal largely avoids suitable habitat.	
What is an important population of a 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.	
What is an invasive species?	

EPBC Act Endangered (Bird) species:
An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.
What is habitat critical to the survival of a species or ecological community?
'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Endangered (Flora) species: • *Swainsona recta* Small Purple-pea	
Significant impact criteria	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of a population	The proposal is unlikely to lead to a long-term decrease in the size of an important population of this species. This species was not previously recorded in the subject site, nor was it recorded during the field survey. A history of agricultural grazing and subject site dominated by exotic weeds make it unlikely that any remnants of this species exists. It is unlikely that a previously undiscovered important population of any of these species occurs within the subject land.
• reduce the area of occupancy of the species	The proposal will reduce the area of potential occupancy of this species to a small extent. Species was surveyed for and not identified. It is unlikely that a previously undiscovered important population of any of these species occurs within the subject land.
• fragment an existing important population into two or more populations	It is unlikely that a previously undiscovered important population of any of these species occurs within the subject land. Surveys did not detect this species. The proposal will not increase fragmentation.
• adversely affect habitat critical to the survival of a species	No habitat critical for survival was identified in the subject land. The history of land use decreases the likelihood of suitable conditions to be present.
• disrupt the breeding cycle of a population	Species was surveyed for and not identified. It is unlikely that a previously undiscovered important population of any of these species occurs within the subject land.
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Current land management regimes have already resulted in modified quality of habitat. The proposal may remove a small portion of available habitat however quality is already reduced. Where known populations of these species exist in the region, they will remain undisturbed by the proposal.
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject land is already highly altered and disturbed however no signs of disease were identified.
• interfere with the recovery of the species.	The proposal will not interfere substantially with the recovery of this species. This species was not observed within the subject land. There is more suitable habitat represented outside the construction footprint.
Summary statement: The proposal will not result in a significant impact to this species.	
What is an important population of a 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.	
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.	
What is habitat critical to the survival of a species or ecological community?	

EPBC Act Endangered (Flora) species:
'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Endangered (mammal) species: • *Phascolarctos cinereus* Koala	
Significant impact criteria	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of a population	Koala have rarely been sighted in the broader Wellington Area and are unlikely to use the subject land, however if they do it is likely they could move to adjacent habitat that is much more extensive. Absence of this species in the subject land should be confirmed prior to clearing native vegetation
• reduce the area of occupancy of the species	The proposal will slightly reduce the potential area of occupancy of the Koala however there is no important population and given the limited extent of and change to available suitable habitat which would be impacted.
• fragment an existing important population into two or more populations	The loss of a small proportion of potential habitat from the locality is considered unlikely to impact the species.
• adversely affect habitat critical to the survival of a species	The project will involve the removal of approximately 1.03 hectares of potential Koala habitat within the subject area. While individual Koala feed-tree species may be removed, no Koalas have been identified on the site, and the area is not deemed critical to the species' survival.
• disrupt the breeding cycle of a population	The subject land does not host a significant Koala population, and there have been no sightings of breeding females. It is unlikely that the proposed work will disrupt the breeding cycle of any important Koala population.
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will remove approximately 1.03 hectares of potential habitat. Suitable habitat remains in the residual patch in the landscape assessment area. Impact from the proposal is unlikely to causes the species to decline
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposed works would not introduce disease that may cause the species to decline.
• interfere with the recovery of the species.	A key threatening process for this species is habitat loss or degradation. The proposal has potential to impact up to 1.03 hectares of potential habitat. Up to 90 hectares of suitable contiguous habitat will remain, making the proposal unlikely to interfere with the recovery of this species.
Summary statement: The proposal will not result in a significant impact to this species.	
What is an important population of a 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.	
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.	
What is habitat critical to the survival of a species or ecological community?	

EPBC Act Endangered (mammal) species:
'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Vulnerable Species

EPBC Act Vulnerable fauna species: Non-Hollow dependent birds:

- *Aphelocephala leucopsis* Southern Whiteface
- *Stagonopleura guttata* Diamond Firetail

Significant impact criteria

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

Statement	Response
• lead to a long-term decrease in the size of an important population of a species	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• reduce the area of occupancy of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• fragment an existing important population into two or more populations	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• adversely affect habitat critical to the survival of a species	The vegetation in the subject land is unlikely to provide habitat critical to the survival of these species. Whilst these species may utilise the subject land, there is adequate suitable habitat within the local area to support these species.
• disrupt the breeding cycle of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. Only a small area of suitable foraging habitat will potentially be impacted.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject land is already highly altered and disturbed.
• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of these species. Any impacts will be minimal, and suitable habitat occurs in the surrounding habitat. Mitigation measures recommended will be taken to minimise impact from key threatening processes for these species.

Summary statement:

The proposal will not result in a significant impact to these species.

What is an important population of a 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.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Vulnerable flora species:

• *Dichanthium setosum* Bluegrass • *Thesium australe:* Austral Toadflax
Significant impact criteria
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

Statement	Response
• lead to a long-term decrease in the size of an important population of a species	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• reduce the area of occupancy of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• fragment an existing important population into two or more populations	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• adversely affect habitat critical to the survival of a species	1.03 hectare of an approximate 90 hectare patch will be removed. Native vegetation removed exists in an agriculturally modified state. Habitat potentially impacted is not critical for the survival of these species.
• disrupt the breeding cycle of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. A small area of suitable woodland would be impacted.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject land is already highly altered and disturbed.
• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of these species. These species were not observed within the subject land. Any impacts will be temporary, with more suitable habitat represented outside the study area.

Summary statement:
The proposal will not result in a significant impact to these species.

What is an important population of a 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.

What is an invasive species?
An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?
'Habitat critical to the survival of a species or ecological community' 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.

EPBC Act Vulnerable fauna species: Hollow dependent birds

- *Polytelis swainsonii* Superb Parrot
- *Climacteris picumnus* Brown Treecreeper

Significant impact criteria

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

Statement	Response
• lead to a long-term decrease in the size of an important population of a species	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• reduce the area of occupancy of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• fragment an existing important population into two or more populations	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• adversely affect habitat critical to the survival of a species	Hollows may be removed by the proposal however they are in abundance within the landscape assessment area. The habitat within the subject land is typical of habitat with proximity to the subject land. The loss of habitat is not anticipated to be significant.
• disrupt the breeding cycle of an important population	The subject land does not have an important population of these species, as defined in the EPBC Act Significant Impact Guidelines 1.1.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	A small area suitable foraging habitat would be impacted. A small number of hollows will be removed. However, the proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposal will not result in invasive species that are harmful to threatened species becoming established in the threatened species' habitat. The subject land is already disturbed in places and mitigation measures discussed in Section 4 will reduce the likelihood of these factors increasing from current levels of risk.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject land is already highly altered and disturbed.
• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of these species. These species were not observed within the subject land. Any impacts will be temporary, with more suitable habitat represented outside the construction footprint.

Summary statement:

The proposal will not result in a significant impact to this species.

What is an important population of a 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.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' 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.

BC Act Tests of Significance

BC Act listed Flora and Fauna

BC Act Test of Significance for Bat species: • *Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat • *Scoteanax rueppellii* Greater Broad-nosed Bat	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No viable local population of these species is known to exist in the subject land. The proposal will remove approximately 1.03 ha of Box-Gum woodland. Approximately 90 ha of similar vegetation is adjacent and contiguous with the landscape assessment area (Appendix D) The amount to be removed is minimal compared to the size of this patch, and these species could move to utilise the adjacent habitat outside the subject land. Consequently, there is sufficient habitat to support the life cycle of this species. These species are known hollow using species and hollows will be removed in this project. However, the extent of the removal is such that it will not put a viable local population at risk of local extinction
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	(i) The proposal would removal approximately 1.03 ha of Box-Gum woodland grassy woodland habitat: (ii)The proposal will not increase fragmentation as the subject land is already on the edge of a substantial fragment and the area to be cleared is small. This will not hamper the movement of the species. (iii) These species are known hollow-using species and hollows will be removed as part of the project. Approximately 90 ha of similar vegetation is adjacent and contiguous with the landscape assessment area (Appendix D) The amount to be removed is minimal compared to the size of this patch, and these species could move to utilise the adjacent habitat outside the subject land. Consequently, there is sufficient habitat to support the life cycle of this species.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or	The proposal will not have an adverse effect on any declared area of outstanding biodiversity value.

BC Act Test of Significance for Bat species: • *Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat • *Scoteanax rueppellii* Greater Broad-nosed Bat	
indirectly)	
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.
Summary statement: The proposal will not have a significant impact on these bat species.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Test of Significance for non-hollow dependant bird species:

- *Aphelocephala leucopsis* Southern Whiteface
- *Chthonicola sagittate* Speckled Warbler
- *Melanodryas cucullata* South-eastern Hooded Robin
- *Melithreptus gularis* Black-chinned Honeyeater
- *Daphoenositta chrysoptera* Varied sittella
- *Petroica boodang* Scarlet Robin
- *Petroica phoenicea* Flame Robin
- *Pomatostomus temporalis temporalis* Grey-crowned Babbler
- *Stagonopleura guttata* Diamond Firetail
- *Burhinus grallarius* Bush Stone-Curlew

Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:

Statement	Response
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No viable local population of these species is known to exist in the subject land. Foraging habitat for these species may be impacted by this proposal but not to the extent where the impact to the life cycles of these birds will be affected. Breeding habitat will not be impacted. Suitable breeding and foraging habitat would persist in abundance outside the subject land.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Adverse impacts on habitat to the extent the species would become locally extinct are unlikely. The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. No individuals would be excluded from suitable habitat at any time.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal will not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.

Summary statement: The proposal will not result in a significant impact to these species.

In determining the nature and magnitude of an impact, matters were considered such as:

- pre-construction, construction and occupation/maintenance phases
- all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones
- all direct and indirect impacts
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected, and over time

- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

BC Act Test of Significance for hollow dependant bird species:

- *Artamus cyanopterus* Dusky Woodswallow
- *Climacteris picumnus victoriae* Brown Treecreeper
- *Glossopsitta porphyrocephala* Purple Crowned Lorikeet
- *Neophema pulchella* Turquoise Parrot.
- *Ninox connivens* Barking Owl
- *Polytelis swainsonii* Superb Parrot
- *Tyto novaehollandiae* Masked owl

Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:

Statement	Response
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No viable local population of these species is known to exist in the subject land. Foraging habitat for these species may be impacted by this proposal but not to the extent where the impact to the life cycles of these birds will be affected. Breeding habitat will not be impacted. Suitable breeding and foraging habitat would persist in abundance outside the subject land.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Adverse impacts on habitat to the extent the species would become locally extinct are unlikely. The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. No individuals would be excluded from suitable habitat at any time.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal will not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.

Summary statement: The proposal will not result in a significant impact to these species.

In determining the nature and magnitude of an impact, matters were considered such as:

- pre-construction, construction and occupation/maintenance phases
- all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones
- all direct and indirect impacts
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected, and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

BC Act Threatened Species Test of Significance for mammal: • *Phascolarctos cinereus* Koala • *Cercartetus nanus* Eastern Pygmy-possum	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No viable local population of these species is known to exist in the subject land. The proposal will remove approximately 1.03 ha of Box-Gum woodland, suitable habitat for these species. Approximately 90 ha of White Box Grassy Woodland is adjacent and contiguous with the subject land. However, the amount of habitat to be removed is minimal compared to the size of this patch, and these species could move to utilise the adjacent habitat outside the subject land. Consequently, there is sufficient habitat to support the life cycle of this species throughout the project.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not Applicable
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Habitat: the area occupied or used, including areas periodically or occasionally occupied or used, by any threatened species or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycles. The proposal would removal approximately 1.03 ha of Box-Gum woodland grassy woodland which is suitable habitat for these species. The proposal will not increase fragmentation, as the subject land is already on the edge of a substantial fragment and the area to be cleared is small. This will not hamper the movement of the species to adjacent areas, that also contain feed trees. While all habitat has value, the small area of woodland in the subject land is not significant when compared with the adjacent patch. The species affected could utilise this adjacent habitat.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.
Summary statement: Approximately 1.03 ha of suitable habitat for these species will be potentially impacted. However, these species were not recorded in the subject land and there is 90 ha of adjacent white box habitat these species could move to if disturbed. Impact will not be significant	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases	

- all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones
- all direct and indirect impacts
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected, and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

BC Act Test of Significance for hollow dependant bird species: • *Hieraaetus morphnoides* Little Eagle • *Lophoictinia isura* Square-tailed Kite • *Circus assimilis* Spotted Harrier	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No viable local population of these species is known to exist in the subject land. Foraging habitat for these species may be impacted by this proposal but not to the extent where the impact to the life cycles of these birds will be affected. Breeding habitat will not be impacted. Suitable breeding and foraging habitat would persist in abundance outside the subject land.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Adverse impacts on habitat to the extent these species would become locally extinct are unlikely. (i)The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. The proposal would remove approximately 1.03 ha of White Box grassy woodland habitat. (ii) The proposal will cause fragmentation of the connecting habitat to the subject land. However, the proposal will not hamper the movement of these species between habitat fragments. The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. The amount to be removed is minimal compared to the size of this patch, and these species could move to utilise the adjacent habitat outside the subject land. Thus, there is sufficient habitat to support the life cycle of these species. No individuals would be excluded from suitable habitat at any time.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal will not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation however area of impact to native vegetation is minor. The proposal will also result in the removal of a small number of hollow bearing trees. The proposal will have a negligible contribution to human made climate change.

Summary statement: The proposal will not result in a significant impact to these species.
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

BC Act Threatened Species Test of Significance for flora species: • *Dichanthium setosum* Bluegrass • *Swainsona recta* Small Purple Pea • *Thesium australe* Austral Toadflax • *Swainsona sericea* Silky Swainson pea	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The local population of resident flora species comprises those individuals known or likely to occur in the subject land. No viable local population of these species is known to exist in the subject land.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not Applicable
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Adverse impacts on habitat to the extent these species would become locally extinct are unlikely. (i)The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. The proposal would remove approximately 1.03 ha of White Box Grassy Woodland. (ii) The proposal will not cause fragmentation of the connecting habitat to the subject land. The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. (iii) The habitat to be removed, modified, fragmented or isolated is dominated by exotic species. The ground stratum which these species occur are unlikely to provide critical habitat for the long-term survival of these flora species.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal would exacerbate the KTPs listed in Section 3.2. The exacerbations are unlikely to result in significant impacts to these species.
Summary statement: The proposal will not result in a significant impact to these species.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts	

- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected, and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

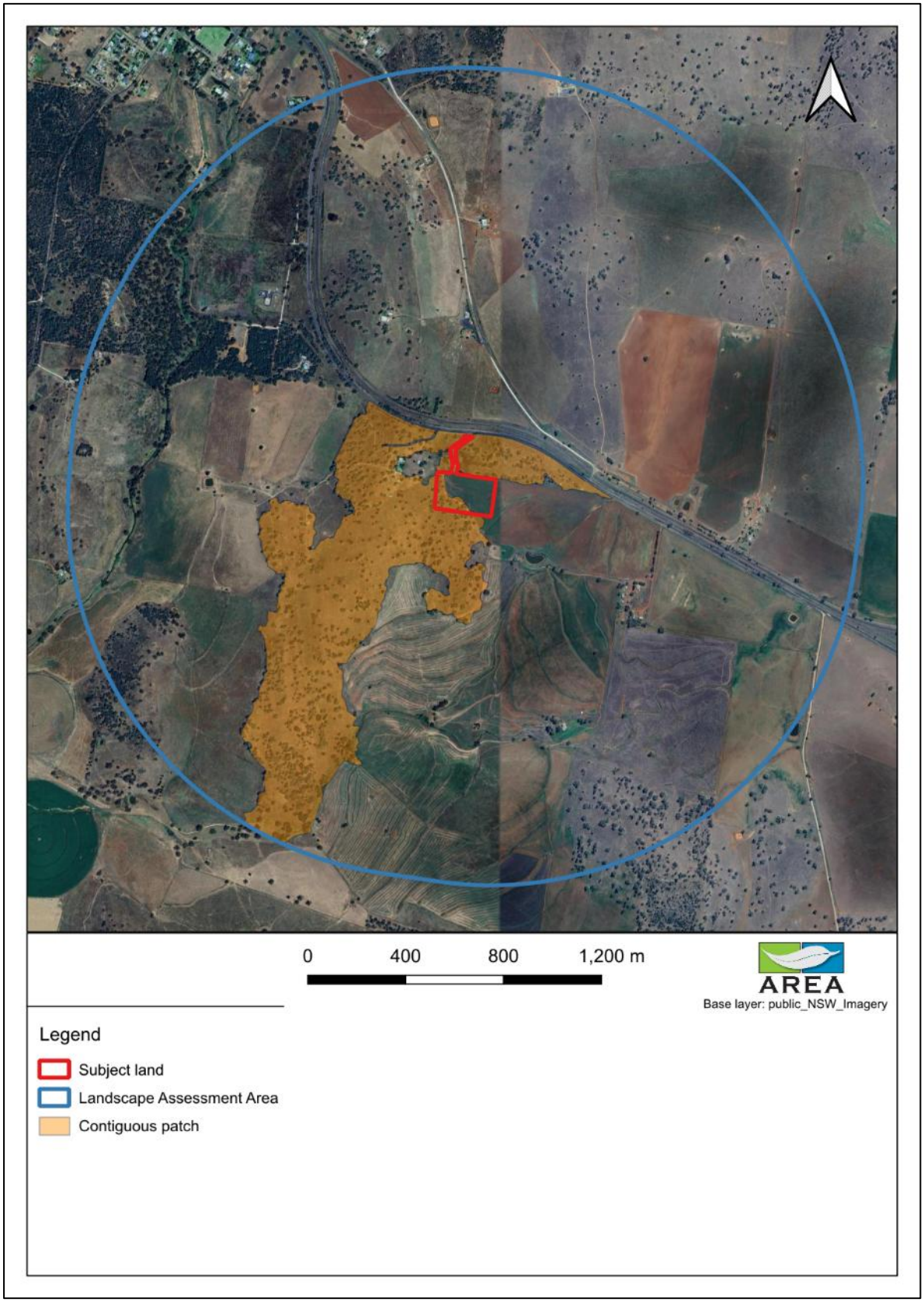
BC Act Listed TECs

BC Act Test of Significance for threatened ecological communities: • *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, Southeastern Highlands, NSW Southwestern Slopes, Southeast Corner and Riverina Bioregions.*	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	N/A
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	It is unlikely that the proposed action will negatively impact the localized presence of the White Box, Yellow Box, and Blakely's Red Gum Woodland to the extent that it will be put at risk of local extinction. The proposal will ensure that the remaining areas of this ecological community in the immediate vicinity is not impacted by the proposal. 1.03 hectares of this CEEC will be impacted on the edge of a patch size of approximately 90 hectares (See Appendix D additional figures). The CEEC is well represented outside of the subject land. As such, any impact from the proposal will not substantially modify the composition of the CEEC to the extent that there is a risk of extinction.
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	(i) This EIA indicates that this vegetation within the subject land already been altered ecologically due to both historical and current land use practices in the region. (ii) Fragmentation will not be increased by the proposal as the areas impacted are on the outer edge of the patch, bordering highly modified farm land. (iii) the area of CEEC to be impacted is not considered to be of high importance given the size of the residual patch.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposed action will not negatively impact the critical habitat of the White Box, Yellow Box, and Blakely's Red Gum Woodland—a critically endangered ecological community—since no critical habitat has been designated for this community at this time.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation, however the area of impact to native vegetation is minor. The proposal would exacerbate the KTPs listed in Section 3.5. The exacerbations are unlikely to result in significant impacts to this Threatened Ecological Community. The proposal will have a negligible contribution to human made climate change.

Summary statement: Impact to this CEEC is not considered to be significant by the implementation of the proposal.
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker

Appendix D - Additional Figure

Contiguous vegetation in the landscape assessment area



Appendix E: Fauna handling and rescue procedure

Purpose

This procedure explains the actions to be taken if an animal or eggs are discovered in the subject land that require handling or rescue during vegetation and soil clearance and ongoing construction activities. The procedure relates primarily to injured shocked and juvenile individuals but also applies to nocturnal fauna or slow-moving species that may not be capable of moving away from mobile plant and equipment.

Scope

This procedure is applicable to all native and introduced fauna species that are found in the subject land. Construction staff and contractors will attend the project induction, which will include a section on Fauna.

Procedure

In the event wildlife (including shocked, juvenile animals or eggs) are discovered in the subject land during vegetation and soil clearance and ongoing construction activities the following steps shall be taken:

1. STOP ALL WORK in the vicinity of the fauna and immediately notify the Works Supervisor, who will then notify a member of the Environmental Services team.

2. If required, contact project ecologist to obtain positive identification of the subject species.

3. Preferably allow fauna to leave the area without intervention.

4. If immediately available, use a licensed fauna ecologist or wildlife carer with specific animal handling experience to carry out any fauna handling.

5. To minimise stress to native fauna and remove the risk of further injury an appropriately competent person shall:

    a. If time permits call ecologist or fauna rescue for advice.

    b. Attempt to herd animal into adjoining vegetation, outside construction area.

    c. If capture is necessary cover larger animals with a towel or blanket and place in a large cardboard box and/or cotton/calico bag

    d. Place smaller animals in a cotton/calico bag tied at the top

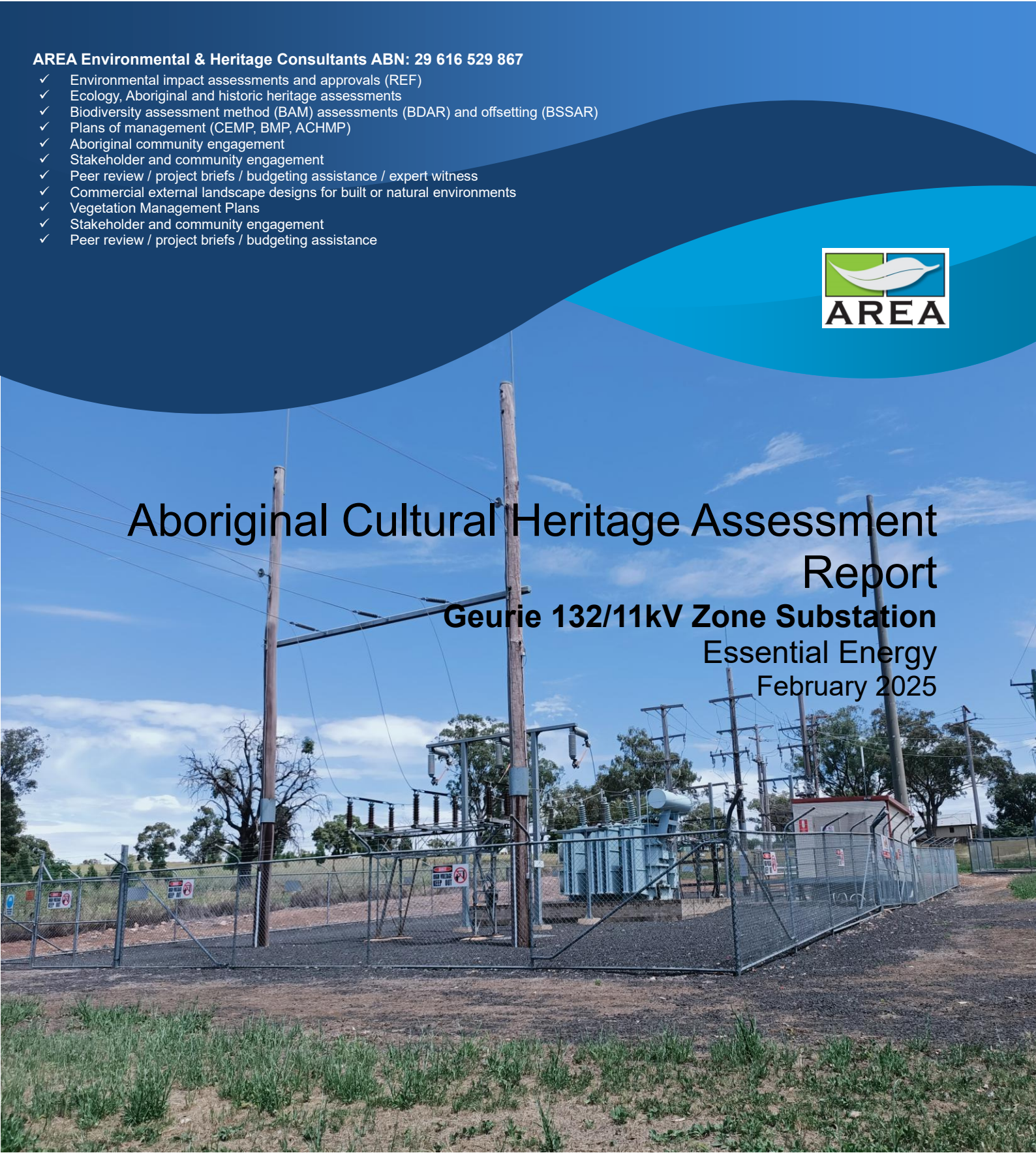
    e. Keep the animal in a quiet, warm, ventilated, and dark place away from noisy construction activities.

    f. Aquatic fauna are to be placed in plastic aquaria or a moistened plastic bag. Frogs will be transported in moistened plastic bags (one frog per bag) with a small amount of leaf litter. Handling and translocation of frogs shall be in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC 2008).

Appendix C: Aboriginal Cultural Heritage Assessment Report (AREA 2025)

AREA Environmental & Heritage Consultants ABN: 29 616 529 867

- ✓ Environmental impact assessments and approvals (REF)
- ✓ Ecology, Aboriginal and historic heritage assessments
- ✓ Biodiversity assessment method (BAM) assessments (BDAR) and offsetting (BSSAR)
- ✓ Plans of management (CEMP, BMP, ACHMP)
- ✓ Aboriginal community engagement
- ✓ Stakeholder and community engagement
- ✓ Peer review / project briefs / budgeting assistance / expert witness
- ✓ Commercial external landscape designs for built or natural environments
- ✓ Vegetation Management Plans
- ✓ Stakeholder and community engagement
- ✓ Peer review / project briefs / budgeting assistance



Aboriginal Cultural Heritage Assessment Report

Geurie 132/11kV Zone Substation

Essential Energy

February 2025

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AREA Environmental & Heritage Consultants acknowledges Traditional Owners of the country on which we work

Document controls

Proponent	Essential Energy
Client	Essential Energy
AREA reference	QU 1419 and QU 1360
Client reference	806993
Document description	Geurie ZS - Aboriginal cultural heritage assessment report
Client representative	Tim Haydon
AREA representative	Phil Cameron
Cover image	Geurie 66/11kV Zone Substation

DOCUMENT STATUS		
DRAFT: Series V1.X AREA internal edits	**Date**	**Action**
V1.0	05/12/2024	First draft submitted for edit
V1.1	06/12/2024	Internal edit (KN)
DRAFT Series V2.X Client / AREA internal edits	**Date**	**Action**
V2.0 V2.1 V2.2	9/12/2024 10/12/2024 16/12/2024	AREA to client Client Edits RAP Review
FINAL (Draft approved by client)	**Date**	**Action**
V3.0 V3.1 V3.2	11/02/2025 12/02/2025 17/02/2025	Finalised (AD) Internal edit (KN) Final to client

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Prepared by	Anna Darby Archaeologist **AREA Environmental and Heritage Consultants Pty Ltd** ABN: 29 616 529 867 **A** 'The Old Macquarie Brewery' c 1876 72 Brisbane Street Dubbo, NSW 2830 **E** anna@areaenv.com.au **W** www.areaenvironmental.com.au

Executive summary

Background

AREA Environmental & Heritage Consultants (AREA) were engaged by Essential Energy (the proponent) to complete an Aboriginal heritage due diligence assessment to inform a proposed construction of a 132/11kV Zone Substation (the proposal) adjacent to the existing substation south of Geurie NSW (Figure 1-1). A due diligence survey was undertaken by Kim Newman of AREA on 17 June 2024. One Aboriginal site (Geurie IF01) was recorded during the survey and will be impacted by the project.

The proponent then engaged AREA to undertake a second survey of the proposal and consult with the Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010a)*. The second survey was conducted in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b).

The aim of this report is to identify Aboriginal objects or areas of archaeological potential that would be impacted by the proposal and to support the application for an Aboriginal Heritage Impact Permit (AHIP).

Project description

Essential Energy is proposing to construct a 132/11kV Zone Substation south of Geurie, NSW. The work involves the establishment of a pad to facilitate the substation development. The material to establish this pad is currently proposed to be site-won, with a cut operation to occur in the adjoining hillslope, to provide the fill material for the pad establishment. The proposal also includes the redevelopment and extension of the current 66/11kV Zone Substation access track, to provide site access from the Mitchell Highway to the proposed 132/11kV Zone Substation. It is currently proposed that paddock trees within the footprint of the detailed design will require removal to facilitate the pad, and the cut/fill operation.

Survey

A due diligence survey of the study area was conducted by Kim Newman of AREA on 17 June 2024. A secondary survey was conducted 31 October 2024 by Anna Darby of AREA with Greg Kennedy and Rodger Ebsworth of Dubbo LALC.

One Aboriginal site (Geurie IF01) was recorded during the June 2024 due diligence survey. Two Aboriginal sites (Geurie IF02 and Geurie IF03) were recorded during the October 2024 survey. All sites will be impacted by the proposal.

Recommendations

Based on the assessment, the following recommendations are made:

- Continue consultation as per *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a). An Aboriginal Heritage Impact Permit (AHIP) is needed for three Aboriginal sites.
- If an AHIP is granted, surface collection of Geurie IF01, Geurie IF02 and Geurie IF03 in accordance with the conditions of the AHIP.
- Placement of the artefacts in the long-term care of Dubbo LALC, under a Care Agreement.
- If any objects of suspected Aboriginal heritage origin be encountered during the proposed work, activity in the immediate area of the find should cease and the unanticipated finds protocol (Appendix C) should be implemented.

- If changes are made to the proposal which could impact locations outside of the current study area, further archaeological investigation may be required.
- If suspected human remains are located during any stage of the proposed works, activity must stop immediately, and the NSW police must be notified.

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Glossary

Term	Meaning
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AREA	AREA Environmental and Heritage Consultants
ASL	Above Sea Level
BOM	Bureau of Meteorology
Code of Practice	Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW
DECCW	Department of Environment, Climate Change and Water
Development site	The total area impacted by the development, including temporary and ancillary facilities
DPE	Department of Planning, and the Environment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Ephemeral	Not permanent, lasting only short periods of time
GPS	Global positioning system
GSV	Ground Surface Visibility
ICOMOS	(International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
RAP	Registered Aboriginal Party
Study area	The area assessed for the presence of Aboriginal cultural heritage, including the Development site

1. Introduction

1.1. Background

AREA Environmental & Heritage Consultants (AREA) were engaged by Essential Energy (the proponent) to complete an Aboriginal heritage due diligence assessment to inform a proposed construction of a 132/11kV Zone Substation (the proposal) adjacent to the existing 66/11kV zone substation south of Geurie NSW (Figure 1-1). A due diligence survey was undertaken by Kim Newman of AREA on 17 June 2024. One Aboriginal site (Geurie IF01) was recorded during the survey and will be impacted by the project.

The proponent has engaged AREA to undertake a second survey of the proposal and consult with the Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010a)*. The survey was conducted in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b)

The aim of this report is to identify Aboriginal objects or areas of archaeological potential that would be impacted by the proposal and to support the application for an Aboriginal Heritage Impact Permit (AHIP).

1.2. Project description

Essential Energy is proposing to construct a 132/11kV Zone Substation south of Geurie. The work involves the establishment of a pad to facilitate the substation development. The material to establish this pad is currently proposed to be site-won, with a cut operation to occur in the adjoining hillslope, to provide the fill material for the pad establishment. The proposal also includes the redevelopment and extension of the current 66/11kV Zone Substation access track, to provide site access from the Mitchell Highway to the proposed 132/11kV Zone Substation. It is currently proposed that paddock trees within the footprint of the detailed design will require removal to facilitate the pad, and the cut/fill operation (Figure 1-2 and Figure 1-3).

1.3. Project location

The proposal is located south of the township of Geurie, NSW. The regional context of the project is provided in Table 1-1.

Table 1-1: Regional geographic context of the study area.

Criteria	Study area
Address	South of Geurie off the Mitchell Highway
Local Government Area	Dubbo Regional Council
Local Aboriginal Land Council	Dubbo LALC
Schedule of Native Title Determination Applications	NA
Parish	Geurie
County	Lincoln
Central coordinates (GDA2020) z55	673206 E,6411748 N
Interim Biogeographic Regionalisation for Australia (IBRA)	NSW South Western Slopes, Inland Slopes Subregion
Nearest hydrological feature	Geurie Creek
Elevation	340 metres Australian Height Datum

Criteria	Study area
Surrounding land use	Residential, farming and road corridor
Study area land use	Farming

1.4. Assessment requirements

The objectives of the cultural heritage assessment are as follows:

- Identify any recorded Aboriginal archaeological sites using database searches and assess the likelihood for such sites using background information
- Consult with the Aboriginal community regarding the proposal and seek out any relevant information about the study area they may have
- Undertake a physical inspection of the study area to identify any unrecorded sites of Aboriginal heritage and assess the possible need for further investigation
- Evaluate the significance of any sites of cultural heritage within the study area with the advice of the Aboriginal community, as well as the potential impact that the proposal will have on them
- Provide recommendations for the treatment of any cultural heritage remains within the study area.

1.5. Report structure

This report corresponds with the reporting requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (NSW Department of Environment Climate Change and Water (DECCW) 2010) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Heritage in NSW* (NSW Office of Environment and Heritage (OEH) 2011), and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010a)*.

Table 1-2: Report structure

Section reference	Section heading	Description
1	Introduction	background to the project and purpose of the report
2	Legislative Context	overview of relevant legislation regarding heritage
3	Aboriginal Community Consultation	details of consultation with the Aboriginal community regarding the project
4	Landscape Features	environmental information that is relevant to the presence and survival of heritage items in the study area
5	Archaeological Context	local and regional archaeological information that is relevant to assessing the potential for archaeological remains and their significance
6	Archaeological fieldwork	description of the archaeological survey and results
7	Assessment of significance	summary of the results of the fieldwork
8	Impacts and Management	impacts that the proposal will have on any identified heritage items and proposed management
9	Recommendations	suggested steps for the Proponent to take with regards to heritage
10	References	list of reports, books, websites, and other resources used to produce this report

Figure 1-1: Location of the study area.

Figure 1-2: Proposed site plan

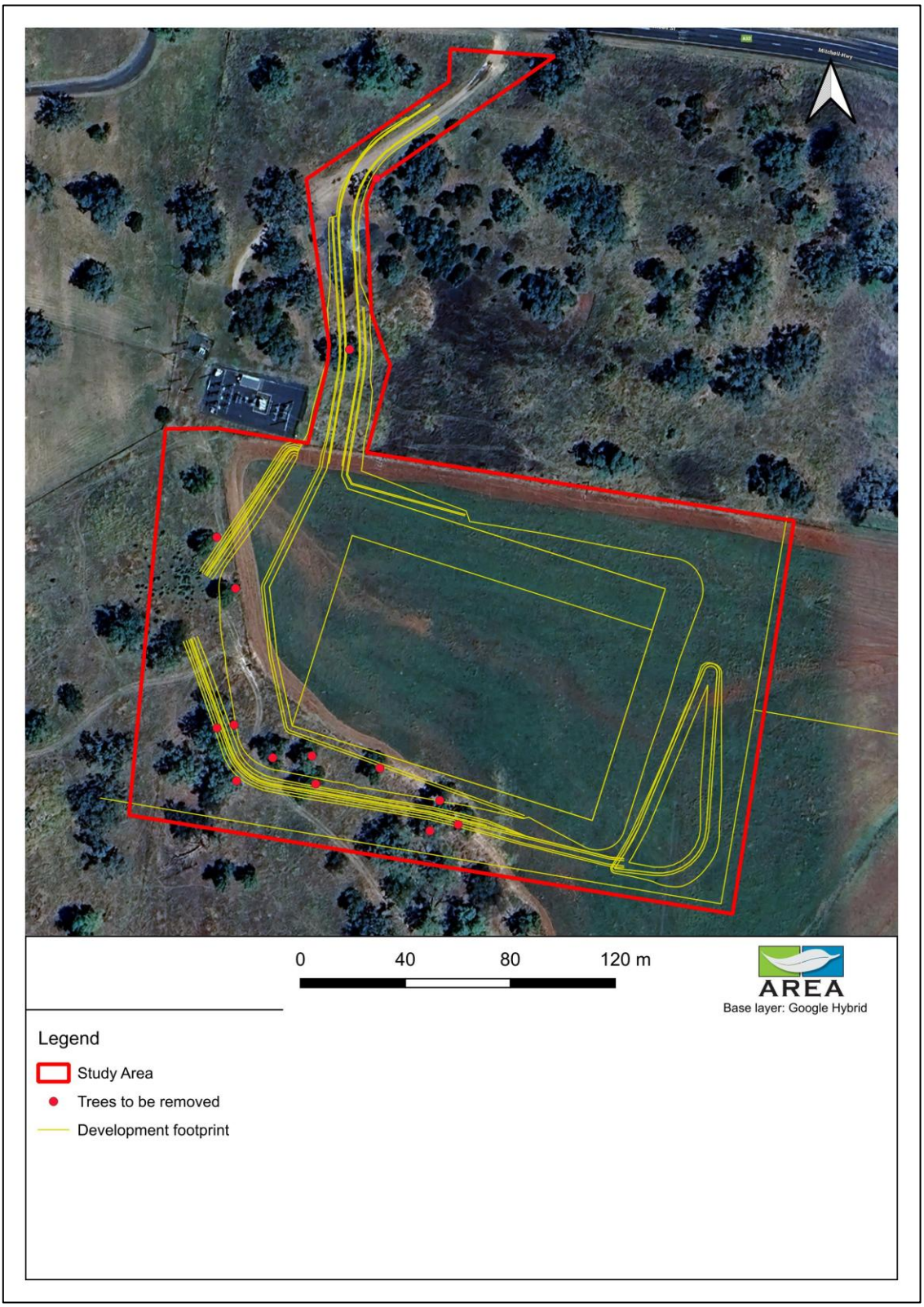
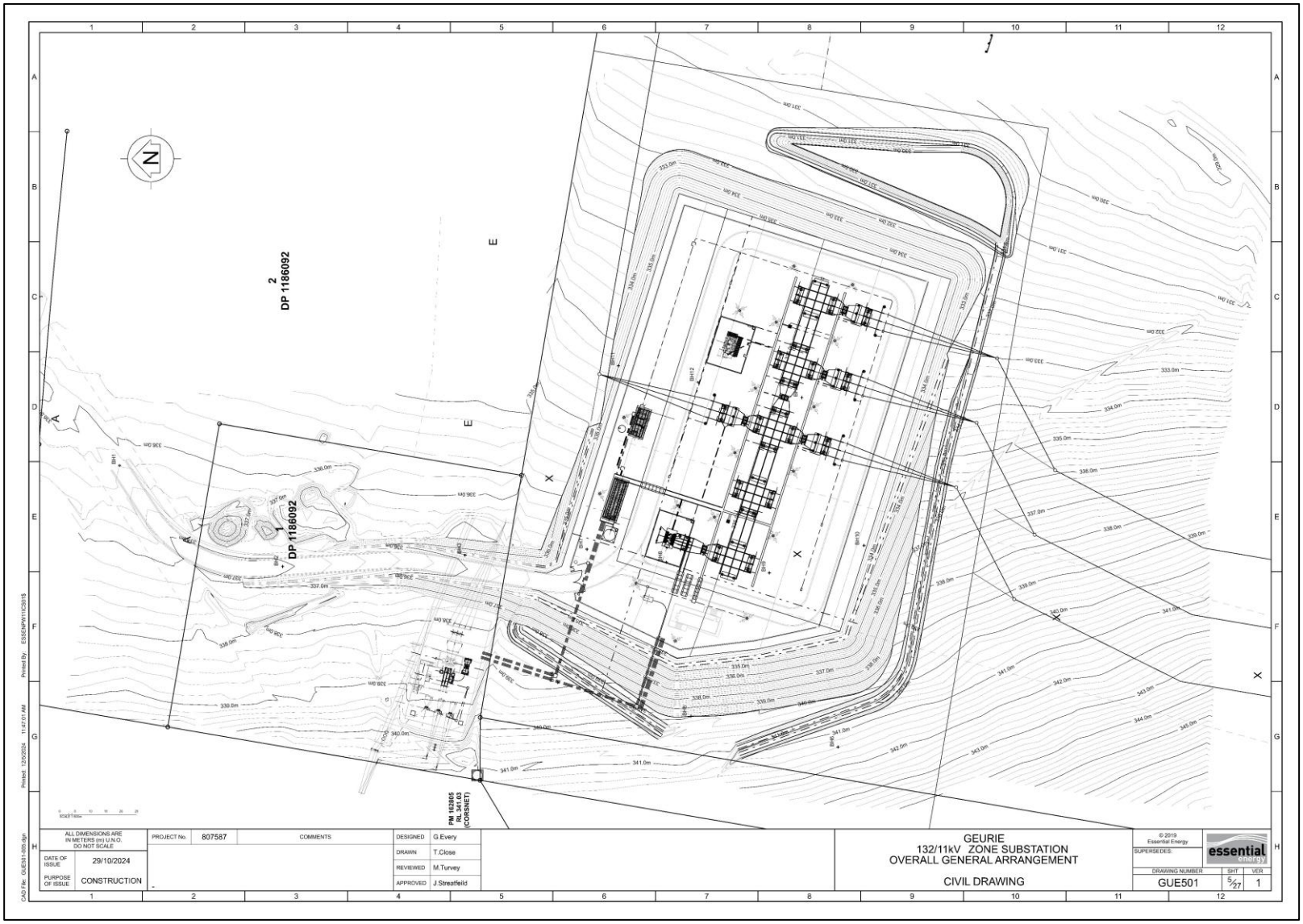


Figure 1-3: Proposed site layout



1.6. Project personnel

This assessment was carried out by appropriately experienced or qualified staff (Table 1-3). Kim Newman conducted the preliminary site inspection. Anna Darby undertook the survey with Dubbo LALC and wrote this report. Addy Watson provided project management and Kim Newman reviewed this report.

Table 1-3: Summary of the project teams' qualifications

Person	Role	Experience and suitability
Anna Darby Archaeologist	Undertook the survey and wrote this report.	• Bachelor of Arts and Bachelor of Science (Archaeology, Palaeoanthropology and Forensic Science) University of New England. • Bachelor of Science (Honours). University of New England. • Graduate Certificate in Project Management. Southern Cross University.
Kim Newman Archaeologist	Undertook the preliminary site inspection and reviewed the report	• Bachelor of Archaeology (Honours) University of New England. • Master of Science (Archaeology). University of New England. • PhD candidate (Archaeology). Griffith University.
Addy Watson Senior Consultant	Provided project management	• Grad. Dip. Captive Vertebrate Management, Charles Sturt University • Grad. Cert. Social Impact, University of NSW • B. Env. Sc. University of New England. • NSW Biodiversity Assessment Method Accredited Assessor (BAAS19066) • Diploma Project Management • NSW Biodiversity Assessment Method • Lean Six Sigma Certificate (Sydney University)

2. Legislative context

Key points:

- Aboriginal cultural heritage is protected by a legislative framework comprised of Commonwealth and State laws.
- It is a requirement to identify, assess, and attempt to avoid potential impacts of a proposal to Aboriginal cultural heritage.
- In certain circumstances, where harm cannot be avoided, approval may be granted to harm Aboriginal objects.

2.1. The Burra Charter (Australia ICOMOS 2013)

Australia ICOMOS (International Council on Monuments and Sites) has developed a set of principles and practices for the management of cultural heritage in Australia. Local government authorities including the NSW DCCEEW have used the Burra Charter to guide their own heritage management documents. The charter promotes the conservation of places of cultural significance (Australia ICOMOS, 2013:3). It placed an emphasis on understanding significance as the basis for managing the heritage values for a place, as well as the importance of consulting with community groups to achieve this understanding (Australia ICOMOS, 2013:4, 8).

2.2. Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) is the primary framework of legislation for the protection of nationally significant ecological communities and heritage places. Heritage items are protected through their inscription on the World Heritage List, Commonwealth Heritage List or the National Heritage List. There are no items listed on the above registers within the study area.

The Act also has jurisdiction over environmental impacts other than those of national significance where they occur on commonwealth-owned land. The EPBC Act becomes the primary piece of legislation for the approval of a project when a proposal may significantly impact a matter of national environmental significance. In this case, the assessment is referred to the Department of Agriculture, Water and Environment.

2.3. Native title

The NSW *Native Title Act 1994* was introduced to work in conjunction with the *Commonwealth Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.

There are no Native Title claims currently registered in the study area.

2.4. The Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) establishes a framework for the formal assessment of cultural heritage values within the land use planning and development consent process. The EP&A Act comprises three key parts directly pertaining to Aboriginal cultural heritage:

- Part 3: This section governs the preparation of planning instruments, which include policies and regulations related to land use planning.

- Part 4: Part 4 of the EP&A Act specifically pertains to the processes involved in assessing developments that require consent. This part outlines the requirements and procedures for evaluating development proposals.
- Part 5: relates to developments that can be carried out without consent and state significant infrastructure.

This proposed project will be assessed in accordance with Part 5, Division 5.1 as being permissible without development consent and requiring the approval of a public authority.

2.5. National Parks and Wildlife Act 1974

Under the National Parks and Wildlife Act 1974 (NPW Act), the Director-General of the National Parks and Wildlife Service is responsible for the care and protection of Aboriginal objects and places in NSW. An Aboriginal object means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains. An Aboriginal place means any place of special significance with respect to Aboriginal culture as declared by the Minister.

Under Section 86 of the Act, a person must not harm an Aboriginal object or place. However, the Chief Executive may issue an Aboriginal Heritage Impact Permit (AHIP) subject to conditions. Penalties are in place for anyone who breaches these conditions or knowingly defaces or destroys and Aboriginal object or place without a permit.

3. Aboriginal community consultation

Key points

- Consultation commenced by public notice on 9 August 2024
- 21 registered Aboriginal parties (RAPs) are involved in the assessment.
- One RAP requested that if any artefacts need to be removed a smoking ceremony be carried in way of showing respect to the ancestors.
- Artefacts salvaged to be kept in a safe and secure location at Dubbo LALC

Consultation has been carried out with the local Aboriginal community according to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). For details of the consultation process, see Appendix B.

3.1. Stage 1 – notification of project and registration

In accordance with step 4.1.2, AREA corresponded with the following organisations by email on the 9 August 2024 requesting the details of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or places within the local area:

- Heritage NSW
- Dubbo Local Aboriginal Land Council (Dubbo LALC)
- Central West Local Land Services
- Dubbo Regional Council
- The National Native Title Tribunal
- The Native Title Services Corporation (NTSCorp)
- Office of the Registrar, Aboriginal Land Rights Act 1983 (NSW)

An advertisement was placed in the Dubbo Photo News on 5 September 2024 (Figure 3-1), inviting the participation of Aboriginal people who might hold cultural knowledge relevant to the Geurie region.

Figure 3-1: Advertisement in Dubbo Photo News

CLASSIFIED ADVERTISING CLOSES

PUBLIC NOTICES

Notification of a Project Proposal and Registration of Cultural Heritage Interest

AREA Environmental & Heritage Consultants (AREA) are seeking expressions of interest from Aboriginal groups or individuals who hold specific cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) and who wish to be consulted over a proposed Zone Substation south of Geurie NSW. The proposal will impact Lots 41 DP754313, Lot 1 DP665022, Lot 1 DP1186092 and Lot 2 DP1186092 within the Dubbo Regional Local Government Area.

AREA has been commissioned by Essential Energy to produce an Aboriginal Cultural Heritage Assessment Report and prepare an Aboriginal Heritage Impact Permit. The purpose of community consultation is to assist the proponent in identifying and describing the Aboriginal cultural heritage values within the Proposal area and aid in the preparation of an application for an AHIP that will assist the regulator in their consideration and determination of the application.

The contact details for the Essential Energy representative are:

Tim Haydon
Environmental Senior Specialist
Essential Energy
E: tim.haydon@essentialenergy.com.au
P: 0401 008 181

Stakeholders are asked to register their interest to be consulted for the proposal by contacting AREA:

Sarah Cooke
AREA Environmental and Heritage Consultants
72 Brisbane St, Dubbo NSW 2830
E: sarah@areaenv.com.au
P: 0408 367 306

The closing date for all submissions will be 19 September 2024.

If you are registering interest in the proposal your contact details will be forwarded to Heritage NSW and the Local Aboriginal Land Council unless you specify otherwise.

The Aboriginal persons or organisations identified by the agencies above were contacted by AREA on 9 September 2024 and were provided with details about the location and nature of the proposal, as well as an invitation to register as an Aboriginal stakeholder and participate in community consultation for the project. Table 3-1 lists the organisations and individuals who registered their interest in the project. Two RAPs requested their details be removed from the report and not be shared.

Table 3-1: Registered Aboriginal Parties (RAPs)

Organisation	Contact
Wellington Valley Wiradjuri Corporation	Bradley R Bliss J.P.
[redacted]	[redacted]
Girragirra Murun Aboriginal Corporation	Diana Astin
Wiradjuri Council of Elders	Robert Clegg

Organisation	Contact
[redacted]	[redacted]
Yurwang Gundana Consultancy Cultural Heritage Services.	Dean Bell and Merekai Bell
Geoffrey Toomey	Geoffrey Toomey
Sonione Wakabut Rogers	Sonione Wakabut Rogers
Timothy Stubbs	Timothy Stubbs
Thomas Dahlstrom	Thomas Dahlstrom
Binjang Wellington Wiradjuri Allodial Heritage Surveys	Jamie Gray
George Flick	George Flick
Wingarra Wilay	Wingarra Ray Moon
Natasha Rodgers	Natasha Rodgers
Ngagga Ngagga	Raiwyn Towney
Dubbo LALC	Keith Redman
Cindy Foley	Cindy Foley

3.2. Stage 2 – presentation of information and review of survey methodology

In accordance with step 4.4.2, a copy of the proposed survey and assessment methodology was sent to the Registered Aboriginal Parties (RAPs) on 26 September 2024 requesting feedback by the 24 October 2024. Responses received are outlined in Table 3-2.

Table 3-2: Summary of proposed survey and assessment methodology comments

Organisation	Contact	Comments
Wellington Valley Wiradjuri Corporation	Bradley R Bliss J.P.	Wellington Valley Wiradjuri represent traditional families with identified apical ancestry pre European occupation with our known Traditional Lands. We know our culture, country and continue with our association with our traditional lands (Ngurangbang). WVWAC object to any other non-traditional aboriginal organizations or people taking part in site surveys, consultation and assessments within our defined Traditional Lands. These non-traditional people and groups are outsiders under Traditional Lore and have no right to advise on or to be present during consultation or site visits as they do not possess the specific traditional knowledge in relation to these lands or sites. These participants

		may be indigenous and may live locally within the region however, this still does not give them the right to disregard Traditional Lore and values.
Wiradjuri Council of Elders	Robert Clegg	Thanked AREA for the methodology
Yurwang Gundana Consultancy Cultural Heritage Services.	Dean Bell and Merekai Bell	Agree to the proposed methodology
Wingarra Wilay	Ray Moon	Our Elders and our families live in Geurie and we will be discussing this area with them over the next few days. If there are any artifacts that have been found in the area that will need to be removed, we ask that a smoking ceremony be carried in way of showing respect to our ancestors and that they be locked in a secure location and when the time comes, they can be returned and reburied on their lands away from potential disturbances.

3.3. Archaeological field survey

An archaeological survey was conducted on 31 October 2024 with Greg Kennedy and Rodger Ebsworth of Dubbo LALC.

During the survey preliminary management and mitigation measures were discussed with the site officers:

- Aboriginal test excavations not warranted due to the highly disturbed land and shallow soil profile from historical ploughing activities
- Removal of the artefacts under an AHIP and possible display at an appropriate keeping place.

3.4. Stage 4 – Review of draft cultural heritage assessment report

A draft copy of the ACHAR was sent to the RAPs on 16 December 2024 asking for input on the significance of the artefacts. Due to the Christmas shut down period an extra two weeks were added to the 28-day review period. The RAPs were also asked for their feedback regarding the placement of the artefacts post surface collection. The responses are outlined in table

Table 3-3: Summary of feedback regarding the draft ACHAR

Organisation	Contact	Comments
Wellington Valley Wiradjuri Corporation	Bradley R Bliss J.P.	Mr Bliss raised his objections via email and phone about Dubbo LALC partaking in the survey and not WVWC.
Wingarra Wilay	Ray Moon	Elders and Families in Geurie and survey area discussed with them. He requested smoking ceremony if artefacts are found and to be removed "*locked in a secure location and when the time comes, they can be returned and reburied on their lands away from potential disturbances*". Also expressed his disappointment at not being selected, requested the list of selected RAPS (not

		given). AREA response via email and explained number of interested parties and ability to contribute through the ACHAR.
Thomas Dahlstrom	Thomas Dahlstrom	Disappointed that he was not involved in the fieldwork. AREA explained unsuccessful selection as he was selected for fieldwork on another project on the same dates. He then explained he has other workers for our future reference
Geoff Toomey	Geoff Toomey	Email received stating the following: The worrying thing for me here is when I read that ALL site's will be impacted. I wasn't involved with the surveys for this project, so I don't know what those finds were. I don't know the significance of these finds, but I see that it was attended by two people from off country. I see the decision on what is to be done with the finds will be decided by off country reps, we don't do that. Things of this matter need to be dealt with by people from country, in this case Wiradjuri. Kind regards Geoff Toomey via email 17.1.25". AREA replied that no decisions, just recommendations had been made regarding the protection or management of the artefacts. The draft report describes the Aboriginal sites and the landscape context. AREA provided Mr Toomey more time to review the report and asked if he could provide us with any ideas or thoughts he may have about how to manage the artefacts. AREA also noted that they rely on input from the RAPs, and review of the report is an important opportunity to provide that input and they would be very grateful if Mr Toomey could share with us your recommendations for the management of these finds for these to be incorporated into the feedback in the final report." No reply received.

4. Landscape features

4.1. Overview

Environmental features such as landforms, topography, water sources, geology, soils, and vegetation are also relevant for an archaeological assessment. A review of the landscape of the study area and surrounds allows for comparison with other areas that have been archaeologically investigated. Landscape review also assists in assessing existing and previous disturbances which may have affected the integrity of archaeological remains.

The study area is in the NSW South Western Slopes Bioregion, Inland Slopes IBRA Subregion.

4.2. Landforms and topography

The South Western Slopes Bioregion is a large area of foothills and ranges comprising the western fall of the Great Dividing Range to the edge of the Riverina Bioregion (NSW National Parkes and Wildlife 2003). The geology of the Inland Slopes Subregion is characterised by Ordovician to Devonian folded and faulted sedimentary sequences with inter-bedded volcanic rocks and large areas of intrusive granites. The study area is located on the mid slope of a gentle rise.

4.3. Geology and soils

The South Western Slopes Bioregion lies wholly within the eastern part of the Lachlan Fold Belt which consists of a complex series of north to north westerly trending folded bodies of Cambrian to Early Carboniferous sedimentary and volcanic rocks (NSW National Parkes and Wildlife 2003).

The study area is within the Arthurville Soil Landscape (Figure 4-1). This Soil Landscape is characterised by largely duplex or texture contrast soils with a light textured surface soil over a clay subsoil (Murphy and Lawrie 1999). These soils include, Red-brown Earths with some Yellow Podzolic-Solodic Soils in depressions and on lower slopes. Yellow Solodic soils occur in drainage line. Hillocks contain shallow soils and Red Podzolic Soils.

4.4. Hydrological features

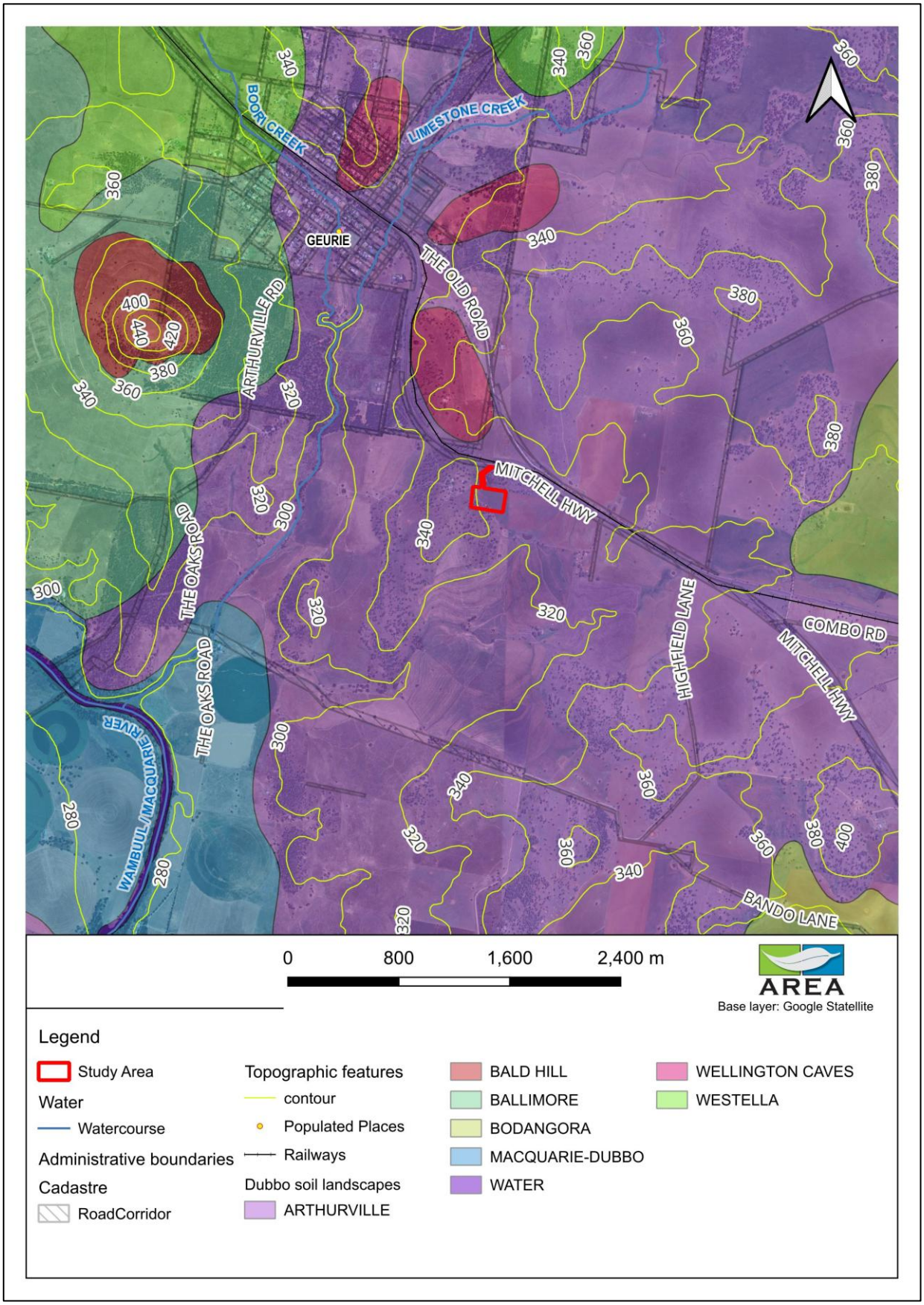
The study area is located 1.1 kilometres east of Geurie Creek a tributary of the Macquarie-Wambuul River. The Macquarie-Wambuul River is one of the main inland rivers of New South Wales and is part of the Macquarie – Barwon River catchment.

To the east of the study area, an ephemeral drainage line runs northeast to southwest, however most physical traces of this have been obscured by historic agricultural activities. This includes the flattening out of the drainage line by ploughing.

4.5. Vegetation

Vegetation within the region is characterised by Black cypress pine (*Callitris endlicheri),* Blakely's red gum (*Eucalyptus blakelyii),* red stringybark (*Eucalyptus macrorhyncha*) and red ironbark (*Eucalyptus sideroxylon*) with numerous shrubs on crests, grey box (*Eucalyptus microcarpa*), apple box (*Eucalyptus bridgesiana*) and white box (*Eucalyptus albens*) on slopes, yellow box (*Eucalyptus melliodora*) and grey box on flats, river red gum (*Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) on larger streams, scattered kurrajong (*Brachychiton populneus*) and white box on limestones.

Figure 4-1: Overview of the landscape context of the study area



4.6. Climate

Geurie is subject to a climate of hot summers and mild winters with consistent rainfall throughout the year (BOM, 2022) (Table 4-1).

Table 4-1: Summary climate data, Dubbo Airport

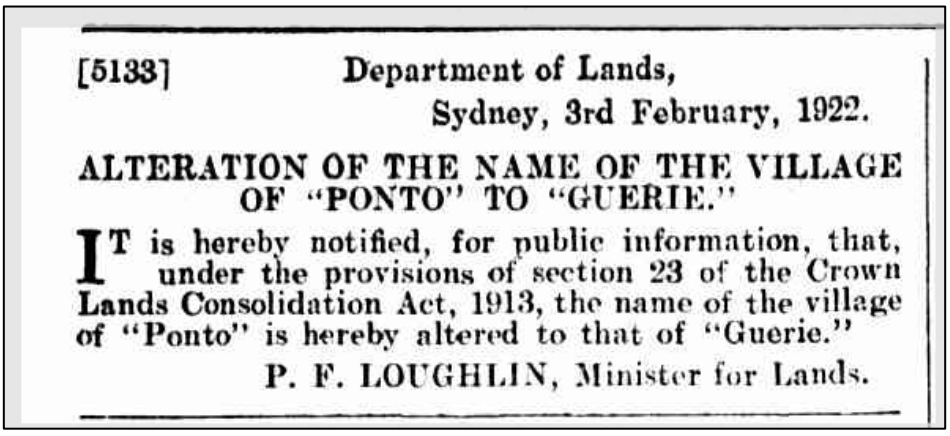
Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	
	Temperature														
Mean maximum temperature (°C)	33.0	32.1	29.4	24.8	19.8	16.0	15.2	17.3	20.8	25.1	29.0	31.9	24.5	129	1871 1999
Mean minimum temperature (°C)	17.9	17.6	15.1	10.6	6.5	4.1	2.7	3.5	6.0	9.6	13.2	16.2	10.2	128	1872 1999
Decile 5 (median) rainfall (mm)	19.1	23.7	28.2	13.6	23.8	24.6	20.7	17.6	17.4	27.4	22.8	19.5	375.6	58	1962 2020
Mean number of days of rain ≥ 1 mm	4.1	3.3	3.6	2.8	3.6	4.4	3.9	3.7	3.6	4.1	4.2	3.6	44.9	58	1962 2020

4.7. Land use history

John Oxley was the first European explorer to travel up the Macquarie-Wambuul River from Wellington Valley in 1817. On 7 June 1818 he camped on the northern bank of the river approximately 2.7 kilometres southwest of the study area (Whitehead 2003). Geurie was established in 1885 and was originally called Ponto, the name was changed in 1922 to Geurie (Figure 4-2). An 1880 parish map shows the land surrounding the study area once belonged to a John Giddings (Figure 4-3).

The study area is 50 metres south of the Main Western Railway line. This railway line is one of the major railways in New South Wales, connecting Sydney and Bourke. The land has historically been used as agricultural land. Historical aerial photographs indicate that a section of the study area has been utilised for crops since 1964, while the northern and western sections remain the same (Plate 4-1 and Plate 4-2).

Figure 4-2: clipping from the Government Gazette of the State of New South Wales (Government Gazette of the State of New South Wales 1922)



[5133] Department of Lands,
Sydney, 3rd February, 1922.

ALTERATION OF THE NAME OF THE VILLAGE OF "PONTO" TO "GUERIE."

IT is hereby notified, for public information, that, under the provisions of section 23 of the Crown Lands Consolidation Act, 1913, the name of the village of "Ponto" is hereby altered to that of "Guerie."

P. F. LOUGHLIN, Minister for Lands.

Figure 4-3: 1880 Parish map of Geurie, approximate study area in red (Surveyor General 1880)

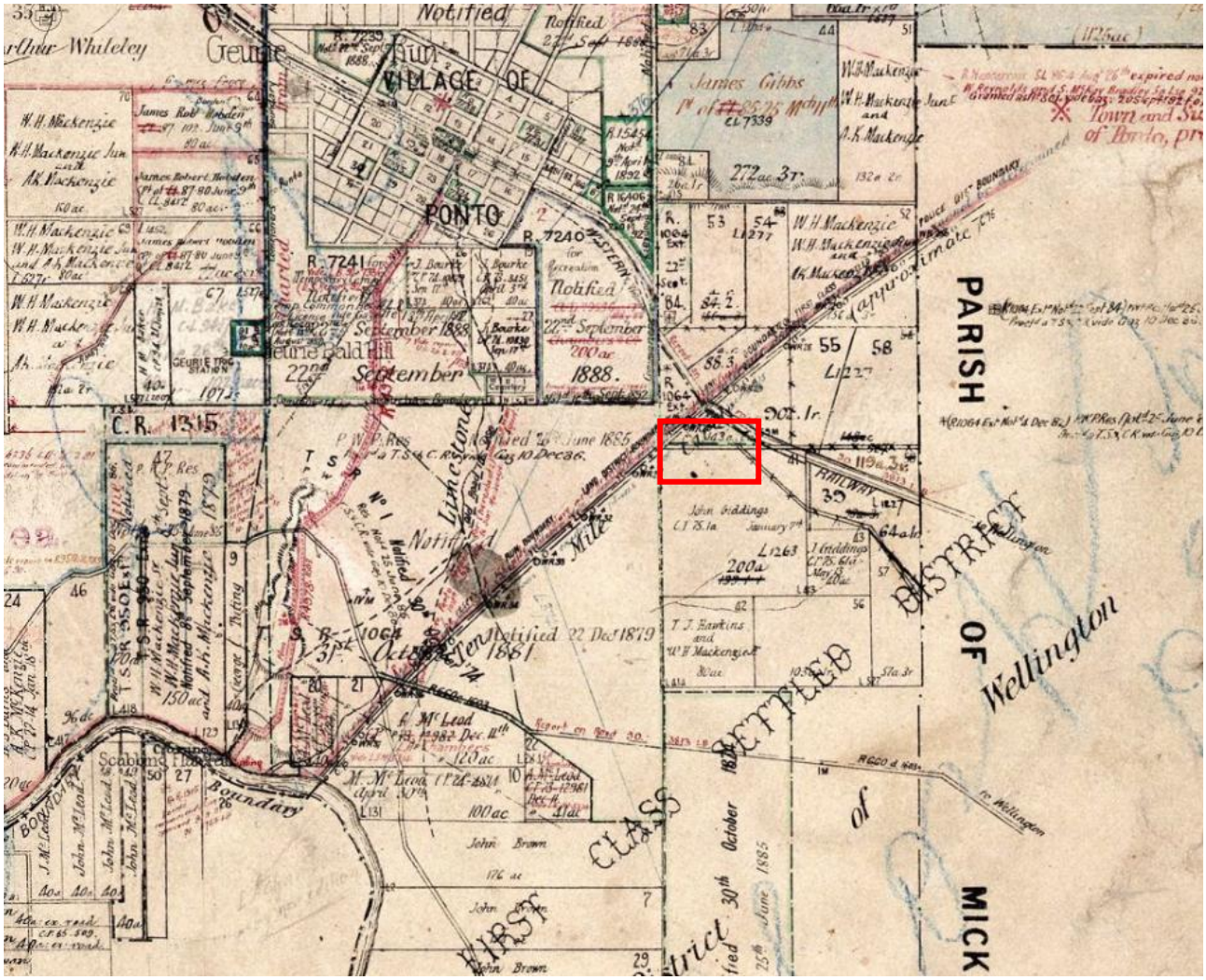


Plate 4-1: Historic aerial photo showing the study area 1964 (study are shown in red) (NSW Historical Imagery)

Plate 4-2: Historic aerial photo showing the study area 1991 (study are shown in red) (NSW Historical Imagery)

5. Archaeological context

Keys points

- Aboriginal people have been present in Australia for approximately 60,000 years
- The study area is within the traditional lands of the Wiradjuri people
- No Aboriginal sites are recorded on the AHIMS database within the study area

5.1. Aboriginal cultural heritage

Aboriginal people have been present in Australia for approximately 60,000 years. The archaeological record provides evidence of a dynamic culture coupled with a long occupation of the land. Aboriginal occupation of the Darling Basin (the Wiradjuri occupy the portion of the basin to the west) has been dated to c. 40,000 years BP (Bowler et al., 2003). Within the region, the period of occupation of several sites dates to c. 7,000 years BP. These Aboriginal sites are Granites 2 shelter near Manildra (Pearson, 1981) and the skeletal remains of a male individual near Cowra (Pardoe and Webb, 1986).

While the boundaries of language groups, as defined by people like Tindale (1974) should be taken as indicative (Attenbrow, 2010), the study area is within the traditional lands of the Wiradjuri peoples (Tindale, 1974). The Wiradjuri are the people of the three rivers, inhabiting a widespread area which extended from the Great Dividing Range, west to the Macquarie-Wambuul, Lachlan (*Kalare*) and the Murrumbidgee (*Murrumbidjeri*) rivers (Coe, 1989, Bamblett, 2013).

The Wiradjuri is one of the largest language groups in Australia with an estimation of between 12,000 and 100,000 people at the time of European arrival (Bamblett, 2013). Wiradjuri people maintained connections across the long distances, through ceremonial cycles which moved around the tribal area (Tindale, 1974). The name Wiradjuri is an antonym derived from *wirraay* meaning 'no' and *-thuurray* or *tyuuray* meaning 'having' (Donaldson, 1984). Differences in dialect have been recorded amongst the Wiradjuri (Tindale, 1974) including the Tubba-gah dialect spoken in the Dubbo region which differed significantly with the broader Wiradjuri language. The Tubba-gah dialect was spoken as far north as Gilgandra, west to Narromine, and east to Wellington (Mal Burns pers. com. 2022).

John Oxley was the first European explorer to travel up the Macquarie-Wambuul River from Wellington Valley in 1817. This expedition was the first encounter many Wiradjuri people had with the new European invaders. An entry from 14 August 1817 details an encounter at Tanners creek near Tomingley between the party and a Wiradjuri man who had climbed a tree to catch possums. He was joined by a friend and the account records their shock and fear at meeting the party of white explorers and their excitement at trading for a metal tomahawk (Oxley, 1820:79, Whitehead, 2003:309). Despite low population densities, word of the White explorers spread quickly and at an encounter the next day people were less scared of these strangers in their land. During the expedition Oxley observed many natural resources including fish, swans, ducks, and kangaroos, as well as stone resources including sandstone, iron-stone, agate and jasper (Oxley, 1820). Oxley's expedition continued down the east bank of the Macquarie-Wambuul River crossing the Erskine (Talbragar) River on the 11 June 1818 and continuing towards Narromine.

Group sizes among the Wiradjuri could vary. Accounts from Wellington Valley recorded groups contained between 60-70 people, and near Lake Buddah, Stuart (1833) recorded groups of between 20-30 people (Koettig, 1985:21). In the Dubbo region Garnsey (1942:6) reported these groups consisted of between 30-40 people.

Scarred and carved culturally modified trees were a significant part of the Geurie landscape. Scarred trees were produced from the removal of bark for the construction of containers, water crafts and shelters. Carved trees contained complex designs and were produced for a number of reasons including to mark burial grounds, bora grounds or mark other important locations (Etheridge, 1918). To the south of Dubbo, Garnsey (1942:4) recorded an area of *wooroon* (graves) which were marked by carved trees known as *Cobba-da* (blood brother trees) and a *Eula-da* (big or chief man tree). These are possibly the same trees recorded in Etheridge (1918:35) as being located about two miles from the Dubbo Railway station and calculated as being at least 150 years old. Etheridge recorded at least eight locations between Wellington, Narromine, Dubbo and Tomingley with carved trees. These sites were mostly located along the Macquarie-Wambuul River. While limited information accompanied the recording of these sites, they are either associated with burials or contained no contextual information.

5.2. Local archaeological context

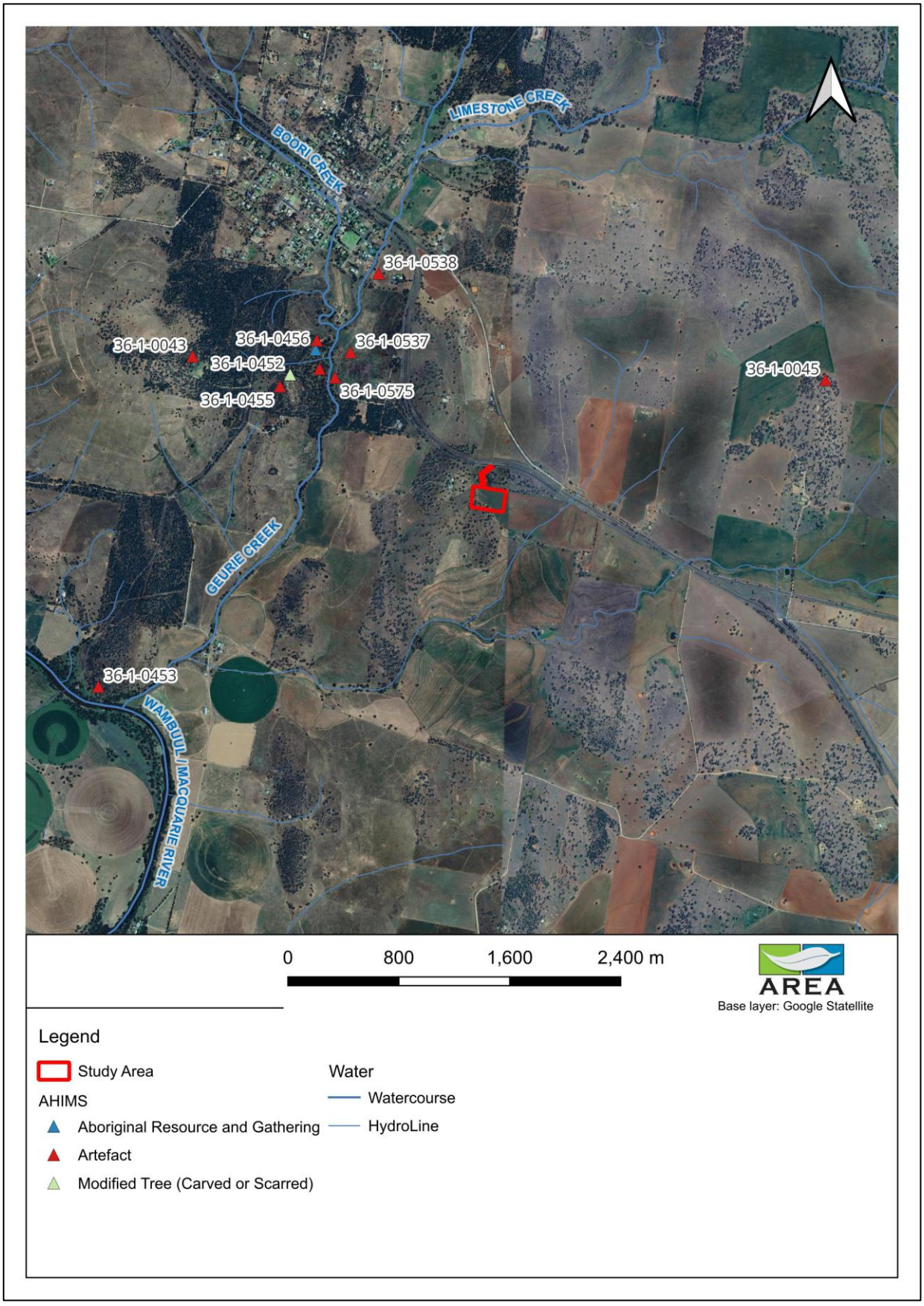
An extensive search of the AHIMS database was conducted on 25 September 2024 (Client ID: 934125). The AHIMS search provides archaeological context for the area and identifies whether any previously recorded Aboriginal sites are located within or near the study area. The extensive search revealed 11 Aboriginal sites recorded within the search area. Nine of these sites are recorded as 'Artefact' (n=9) with one recording of each 'Modified Tree (carved or scarred)' and 'Aboriginal Resources and Gathering' site types. No Aboriginal sites are recorded on AHIMS within the study area.

The distribution of recorded AHIMS sites is shown in Figure 5-1 and presented in Appendix A.

Table 5-1: Summary of database searches for Aboriginal heritage.

Database	Date of search	Parameters	Results
Aboriginal Heritage Information Management System (AHIMS)	25/09/2024	Lat, Long From : -32.4321, 148.8085 - Lat, Long To : -32.3959, 148.8703	11 Aboriginal sites were recorded within the search area. No sites were recorded within the study area
Dubbo LEP 2022	25/09/2024	Schedule 5: Environmental Heritage	No items relating to Aboriginal heritage are recorded on the LEP within the study area.
Native Title Vision https://nntt.maps.arcgis.com/	25/09/2024	NSW	There are no native title claims or determinations within the study area.
State Heritage Register	25/09/2024	Dubbo LGA	No items relating to Aboriginal heritage are recorded on the State heritage register within the study area.

Figure 5-1: Results of Extensive AHIMS search



5.3. Previous assessments

Southlakes Estate Super DA (AREA, 2022)

AREA was contracted to assess the southern portion of the South-East Dubbo Residential Urban Release Area, Lot 407 DP1248682 and Lot 2 DP880413 for a proposed subdivision. The Southlakes assessment area is located 25 kilometres from the current study area. Three Aboriginal sites (Southlakes IF01 (AHIMS ID 36-1-0786), Hillview-IF1 (AHIMS ID 36-1-0707) and K-OS-3 (AHIMS ID 36-1-0188)) were recorded in the assessment area during this and a previous survey. A test excavation on the banks of Eulomogo Creek recorded one additional site (Southlakes AS01 (AHIMS ID 36-1-0789)). These Aboriginal sites are all stone artefact sites, located in close proximity to Eulomogo Creek a permanent water source. This was a pattern that was predicted by previous researchers. In addition, Eulomogo Creek was identified as the boundary of the Tubba-gah possibly making Eulomogo Creek an important meeting place between groups.

Maryvale Solar Farm (KNC, 2018)

Kelleher Nightingale Consulting Pty Ltd (KNC) conducted an Aboriginal cultural heritage assessment on behalf of Photon Energy for the Maryvale Solar Farm located approximately 7.3 kilometres southeast of the study area.

Aboriginal sites recorded included four surface artefact scatters (Maryvale Road AFT 1, Maryvale Road AFT 2, Seatonville Road AFT 1 and Seatonville Road AFT 2), two isolated surface artefacts (Maryvale Road IF 1 and Seatonville Road IF 1) and one culturally modified tree (Maryvale Road TRE 1). KNC determined that the raw materials used to make the artefacts are not found within the local geology and must have been imported. The spatial distribution of sites within the project area indicated that Bodangora Creek and the unnamed tributary of Maryvale Creek were focal points for past Aboriginal land use and may have functioned as pathways between the Macquarie River and the inland creek systems further to the east. The presence of two ground stone artefacts and a culturally modified tree with a bark removal scar also indicate that the areas adjacent to larger creeks in the region were being utilised for a range of activities including the procurement of raw materials.

These Aboriginal sites were located outside the project footprint and would not be impacted by Maryvale Solar Farm or proposed road upgrade works. The remainder project footprint was assessed as exhibiting low archaeological potential due to combinations of archaeologically unfavourable topography, agricultural activity, previous road construction activities and contemporary disturbance of the land.

Proposed Bodangora Wind Farm (New South Wales Archaeology, 2011)

New South Wales Archaeology Pty Ltd (2011) conducted a European and Aboriginal cultural heritage assessment for the Bodangora Wind Farm north of Wellington NSW and approximately 16 kilometres east of the current study area. Two Aboriginal sites (an artefact scatter and a stone procurement area) were recorded in disturbed contexts. The area surveyed was thickly grassed within minimal ground exposures, this caused low effective survey coverage.

Brigalow Belt South, Stage 2 (NPWS, 2002)

The New South Wales National Parks and Wildlife Service (NPWS) undertook an Aboriginal cultural heritage assessment project for the Resource and Conservation Assessment Council (RACAC). The assessment was conducted in two stages, with Stage 1 focusing on the Pilliga and Goonoo State Forests and Stage 2 assessing the remainder of the Brigalow Belt South Bioregion (BBSB). Part of the project was to undertake a cultural heritage field survey. The survey team in

conjunction with the local Aboriginal community used registered sites and landform assessment of the bioregion to determine areas which would be most useful to investigate for the purpose of locating and recording Aboriginal sites and other features of cultural significance. 1,110 Aboriginal sites were recorded because of Stage 1 and Stage 2 assessments, of which six Aboriginal sites in the AHIMS search were recorded during this assessment.

Two of the Aboriginal sites contain a large number of artefacts. BBS; Dubbo LALC; Geurie Flora Reserve 1 (AHIMS ID 36-1-0454) has 30 artefacts while BBS; Dubbo LALC; Scabby Flat Reserve (AHIMS ID 36-1-0453) has 50 artefacts.

The Proposed "Keswick' Housing Sub-Division, Dubbo, NSW (Kelton, 1995)

In 1995 Central West Archaeological and Heritage Services were contracted to assess 290ha of rural land for Dubbo City Council for the purposes of constructing a housing subdivision. Six Aboriginal sites were recorded as part of this research, one site is an historic Communications Bunker located outside of the study area while the remaining five recorded sites were Aboriginal scarred trees included K-ST-2 (AHIMS ID 36-1-0181), K-ST-4 (AHIMS ID 36-1-0180) and K-ST-6 (AHIMS ID 36-1-0213).

Kelton observed that the pattern of Aboriginal sites was typical of the area and representative of a 'casual level' of occupation across the study area reflecting the distance the study area is to permanent water.

5.4. Predictive model

A predictive model combines the archaeological context for the study area with landscape information to propose likely site types, distributions, and intactness within the area.

Areas of archaeological potential are regarded as any sensitive landform with a reasonable level of intactness (i.e. little to no disturbance or minor ground surface disturbance only and in areas not on self-mulching soils). The definition of disturbance used here follows that of the *National Parks and Wildlife Regulation 2019* (Clause 58). Sensitive landforms follow the definitions supplied in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010b):

- Within 200 metres of waters
- Located within a sand dune system
- Located on a ridge top, ridge line or headland
- Located within 200 metres below or above a cliff face
- Within 20 metres of or in a cave, rock shelter, or a cave mouth.

Pearson (1981) conducted a comprehensive study of the upper Macquarie region in relation to his PhD dissertation. Through excavation and extensive research, he determined Wiradjuri functioned primarily in small groups of variable size, dependent on the season. These groups were comprised of immediate relations, the smallest being the basic family unit. During feasting and ceremonies these family groups gathered in numbers possibly between 80-150 people. Pearson (1981: also developed a pattern of Aboriginal occupation through the analysis of just over 40 open sites within four regions between Bathurst and Dubbo. His findings indicated archaeological sites can be grouped into two main types, occupation sites, and non-occupation sites, which can include scarred or carved trees, ceremonial sites, grinding grooves and burial sites.

Through analysis of the location of these sites, Pearson (1981) suggested that occupation sites would range from between 10 to 500 metres from water sources. However larger sites were generally located closer, at an average of 90 metres to water. Site locations that provided shelter,

were protected from prevailing wind and cold air drainage, with well-drained soil, and views of watercourses were favoured. These sites also tended to be situated in open woodlands and were rarely used for longer than three nights. Sites that showed evidence of dense archaeological deposits therefore represent accumulations from multiple occupation events. Non-occupation sites like scarred or carved trees, burial sites and grinding grooves were in close proximity to these occupation sites. However, grinding grooves were also raw material dependent, occurring only where there are suitable sandstone outcrops. Scarred or carved trees were also distinguished by their close proximity to occupation sites and watercourses. While quarry sites were located at places with stone of serviceable knapping quality. Unlike these sites, ceremonial sites such as earth rings and stone arrangements were situated away from campsites, in isolated places, generally on small hills or knolls, although they could occur on flat land.

The close proximity of Aboriginal sites to drainage lines is supported by the research of Pearson (1981), Purcell (2002), and Koettig (1985) who showed that distance to water was an important feature in camp site selection and those landscapes in a protected position, close to permanent water showed the highest intensity of occupation. The broader archaeological context indicates that Aboriginal sites are very unlikely to occur unless there are landscape features that are at least able to hold water for short periods of time following heavy inundation.

If present, site types are most likely to be stone artefact sites or culturally modified trees based on the regional archaeological context. The geology of the study area indicates that, with the exception of volcanic basalts, stone for artefacts would likely need to be brought into the area rather than locally manufactured. However, many tools and other objects were made from wood, bone and shell which do not survive into the archaeological record as well as stone (Clarke, 2011).

Culturally modified trees can occur anywhere on old growth trees to produce suitable bark to create carrying dishes (commonly known as coolamons), canoes and other items. Trees may also be modified as markers or other types of communication. Other site types may occur but within the landscape context of the study area they are not likely to exist. Hearths are reasonably common but tend to deteriorate and be destroyed more easily. Quarries are possible where raw material is available. Ochre quarries and stone arrangements are unlikely to occur.

6. Fieldwork

6.1. Overview

A due diligence survey of the study area was conducted by Kim Newman of AREA on 17 June 2024. A second survey was conducted 31 October 2024 by Anna Darby of AREA with Greg Kennedy and Rodger Ebsworth of Dubbo LALC. The below sections refer to the second survey.

6.2. Methodology

The field methods used to assess the study area, follow those described in the OEH's *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b).

The purpose of the field survey was to identify any previously undetected Aboriginal sites, places or areas with cultural heritage values and evaluate the possible need for further investigation. The study area was assessed by pedestrian survey. The survey was conducted by walking a series of transects at 10 metres apart, at a pace that allowed opportunity to identify any features or objects (Figure 6-1: Survey Units and Aboriginal sites

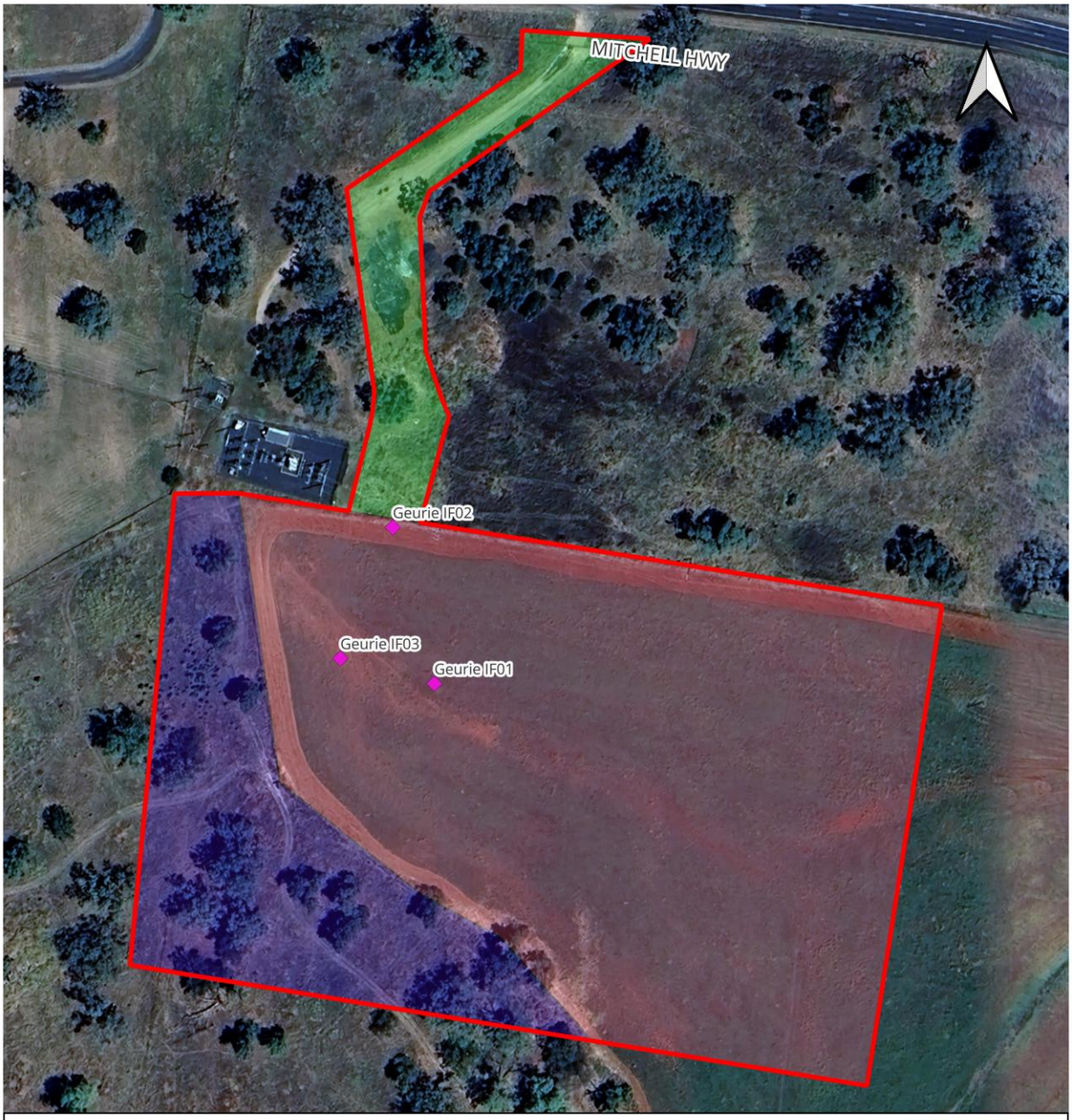

MITCHELL HWY
Geurie IF02
Geurie IF03
Geurie IF01
0
40
80
120 m
AREA
Base layer: Google Hybrid
Legend
Study Area
Survey units
1
2
3
Aborignal sites

Figure 6-2). It is important to note the tracks for the survey represent only one person from the survey team (AREA staff). Variations in the transects were made depending on local disturbances and the location of dirt stockpiles.

A GPS was used to ensure the survey covered the study area. Photographic and written records were made of the landscape features relevant to archaeological potential. These features include disturbance levels, Ground Surface Visibility (GSV) and landforms of higher archaeological potential (see Section 5.4).

All ground exposures were examined for Aboriginal objects (stone artefacts, imported shell, or other traces of Aboriginal occupation). All trees of an age to possess a cultural scar were examined. Any Aboriginal sites recorded used AREA's criteria conforming with Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b).

6.3. Constraints

Tall grasses and thick ground cover affected ground surface visibility (GSV). GSV is significant in detecting the presence of surface sites such as stone artefact scatters and isolated finds. GSV was low across SU1 and SU3, and moderate within SU2 (50-60%).

6.4. Survey results

The study area was divided into three survey units (SU) based off vegetation and land use elements (Figure 6-1).

6.4.1. Survey unit 1

Survey unit 1 (SU1) is 0.35 hectares and is comprised of the proposed access road (Plate 6-1) from the proposed substation to the Mitchel Highway. SU1 is highly disturbed by the construction of the existing substation, access track and existing underground services (Plate 6-2 and Plate 6-3). The survey unit also contains the Transport for NSW DUB06: Geurie Substation stockpile site, piles of blue metal, miscellaneous stockpiles of soil, and concrete culverts (Plate 6-4). Vegetation comprised of several mature Grey Boxes, patches of Cypress Pine and thick ground cover of grasses. GSV was high (80%) along the edges of the track but low (10%) across the rest of the survey unit.

No Aboriginal objects or areas of archaeological potential were observed within SU1.

Plate 6-1: View south from Mitchell Highway towards Geurie Substation

Plate 6-2: Existing underground services

Plate 6-3: View south showing existing substation

Plate 6-4: View southwest showing stockpiles and culverts

6.4.2. Survey unit 2

Survey unit 2 (SU2) is 2.7 hectares and contains a paddock previously used for cropping (Plate 6-5). The land gently slopes towards the east and is comprised of exotic agricultural weeds (Plate 6-6), GSV within SU2 was moderate (50-60%). SU2 is moderately disturbed due to consistent ploughing, sowing and harvesting practices (Plate 6-7). Soils within the survey unit were dark brown sandy silts and large farrows made deeper by water runoff were observed in the survey unit (Plate 6-8).

Three Aboriginal sites (Geurie IF01, Geurie IF02, and Geurie IF03) were recorded in SU2 and are described in Section 6.6.

Plate 6-5: View east downhill across SU2

Plate 6-6: View west uphill towards the Geurie Substation

Plate 6-7: View northwest across SU2

Plate 6-8: View east showing imported gravels and disturbance

6.4.3. Survey Unit 3

Survey unit 3 (SU3) is 0.89 hectares and is comprised of a section of grassy woodland south of the existing substation (Plate 6-9). SU3 is on a mid-slope with vegetation comprising of mature White Cypress Pine, White Box, Grey Box and Kurrajong trees, with an understory of young Cypress Pine (Plate 6-10 and Plate 6-11). GSV was low (10%) due to dense ground cover of native grasses and weeds (Plate 6-12). Soils within the survey unit are shallow brown sandy silts with basalt outcrops along the slope.

No Aboriginal objects or areas of archaeological potential were observed within SU3.

Plate 6-9: View west uphill showing basalts

Plate 6-10: View south across SU3 showing vegetation

Plate 6-11: View east across SU3 towards SU2

Plate 6-12: GSV within SU3

6.5. Survey Coverage

A summary of survey coverage is provided in Table 6-1 and landform summary Table 6-2. Transects walked are showing in Figure 6-2. Effective survey coverage was moderate.

Table 6-1: Survey coverage summary – survey units

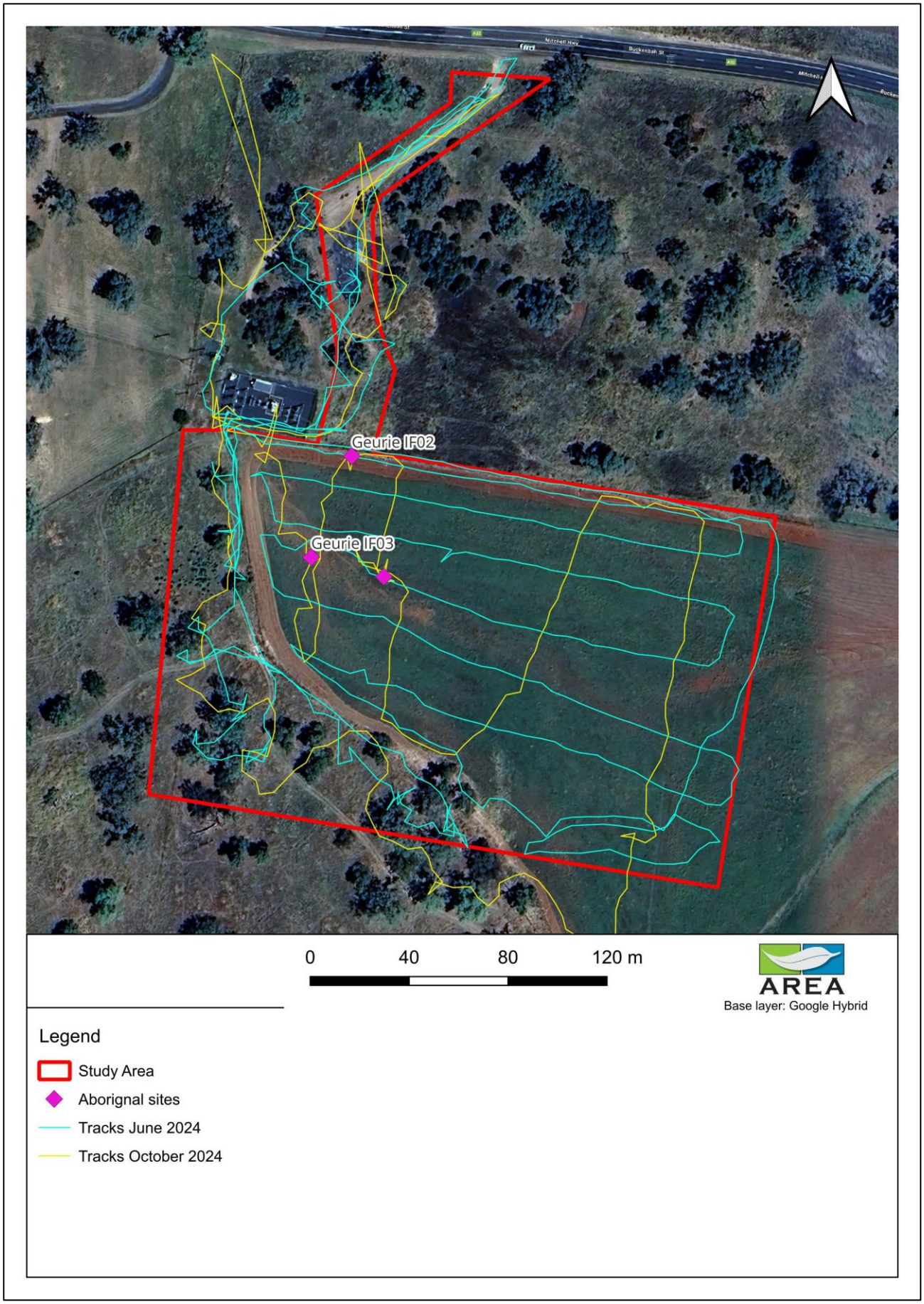
Survey unit	Landform	Survey unit area (m^2)	Visibility %	Exposure %	Effective survey coverage (m^2)	Effective Survey Coverage (%)
1	Rolling hills	3555	60	20	426.6	12
2	Rolling hills	27051	60	100	16230.6	60
3	Rolling hills	8934	10	10	89.34	1

Table 6-2: Landform summary – sampled areas

Landform	Landform area (m^2)	Area effectively surveyed (sq m)	% of landform effectively surveyed	Number of sites	Number of features
Rolling hills	39540	16746.54	42.3%	3	3 artefacts

Figure 6-1: Survey Units and Aboriginal sites

Figure 6-2: Survey transects and Aboriginal sites



6.6. Aboriginal sites

One Aboriginal site (Geurie IF01) was recorded during the June 2024 due diligence survey. Two Aboriginal sites (Geurie IF02 and Geurie IF03) were recorded during the October 2024 survey.

6.6.1. Geurie IF01 (AHIMS ID 36-1-0871)

Site type: Isolated stone artefact
Centroid: GDA 94 Zone 55 673187 mE 6411780 mN
Site length: 1m
Site width: 1m

Geurie IF01 (AHIMS ID 36-1-0871) is located within a historically cleared and ploughed paddock. The artefact is a multiplatform core of fine-grained basalt, with 30% cortex. The core measures 64 millimetres long, 52 millimetres wide and 32 millimetres thick. Vegetation was sparse and comprised of mostly agricultural weeds, GSV was moderate (60%). Geurie IF01 is located 50 metres southeast of Geurie IF02, on a slight slope.

Plate 6-13: Geurie IF01

Plate 6-14: Geurie IF01

Plate 6-15: View east across Geurie IF01

Plate 6-16: View west across Geurie IF01

6.6.2. Geurie IF02 (AHIMS ID 36-1-0872)

Site type: Isolated stone artefact
Centroid: GDA 94 Zone 55 673174 mE 6411831 mN
Site length: 1m
Site width: 1m

Geurie IF02 (AHIMS ID 36-1-0872) is a complete flake with a feather termination, and retouch along the edge (Plate 6-17). The material is fine-grained basalt with 20 % cortex (Plate 6-18). The artefact measures 55 millimetres long, 21 millimetres wide and 5 millimetres thick. Geurie IF02 is located 50 metres northwest of Geurie IF01 (Plate 6-19), two metres south of the fence line and 14 metres from the existing substation (Plate 6-20 and Plate 6-21). While Geurie IF01 and Geurie IF02 are of the same fine-grained basalt, Geurie IF02 is lighter in colour. GSV within Geurie IF02 was moderate with ground cover comprising of mostly agricultural weeds. Soils are comprised of a dark brown sandy silt (Plate 6-22).

Plate 6-17: Geurie IF02

Plate 6-18: Geurie IF01 and Geurie IF02

Plate 6-19: View south towards Geurie IF01

Plate 6-20: View south across Geurie IF02

Plate 6-21: View west showing existing substation in background

Plate 6-22: Geurie IF02 *in situ*

6.6.3. Geurie IF03 (AHIMS ID 36-1-0870)

Site type: Isolated stone artefact
Centroid: GDA 94 Zone 55 673158 mE 6411790 mN
Site length: 1m
Site width: 1m

Geurie IF03 (AHIMS ID 36-1-0870) is an isolated stone artefact located on the mid slope and is 44 metres south-southwest of Geurie IF02 (Figure 6-1). The artefact is a fine grained basalt flake measuring 33 millimeters long, and 21 millimeters wide and five millimeters thick (Plate 6-23 and Plate 6-24). Vegetation was sparse and comprised of mostly agricultural weeds (Plate 6-25 and Plate 6-26), GSV was high (80%). Geurie IF02 and Geurie IF03 are located in an area of washout and have possibly been washed down from further up the slope.

Plate 6-23: Geurie IF03

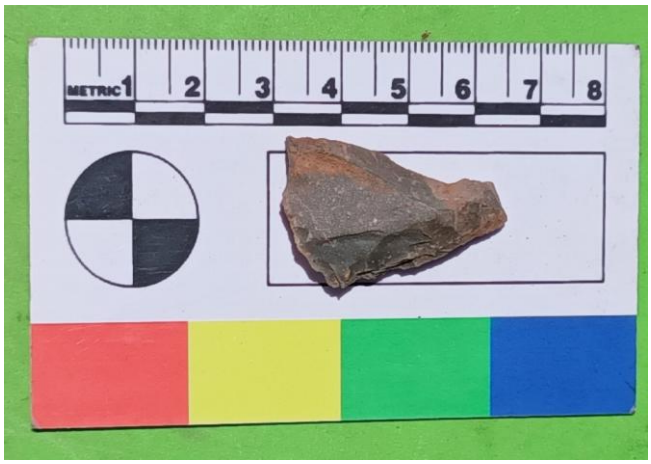


Plate 6-24: Geurie IF03

Plate 6-25: Geurie IF03 *in situ*

Plate 6-26: View east across Geurie IF03

Plate 6-27: View north across Geurie IF03 (scale bar) towards Geurie IF02 (yellow arrow)

6.7. Discussion

The study area is within the NSW South Western Slopes Bioregion and Inland Slopes Subregion. Geurie Creek is a tributary of the Macquarie River a major waterway in the region. A desktop AHIMS search determined that while no Aboriginal sites had been recorded within the study area, 11 Aboriginal sites had been recorded within five kilometres. The majority these Aboriginal sites are stone artefact scatters.

Geurie IF01, Geurie IF02 and Geurie IF03 are all of the same fine grained basalt material but have varying colour palettes. While basalt outcrops were observed in SU3, this was not the same material as the artefacts and there was no evidence of quarrying, or flaking. The artefacts were recorded in the heavily disturbed paddock that has been historically utilised for cropping activities. It is possible that the artefacts have been washed down from the hillcrest in the north.

7. Significance

Key points:

- The presence of Aboriginal sites provides evidence of connection to country
- The Aboriginal sites have low social, aesthetic, historic and scientific significance.

Significance forms the basis for the management of Aboriginal cultural heritage. There are four main criteria for assessing the significance of Aboriginal cultural heritage sites listed in the *Guide to investigating, assessing, and reporting on Aboriginal cultural heritage in NSW (NSW Office of Environment and Heritage (OEH), 2011)*. These are Social or Cultural significance, Aesthetic significance, Historic significance, and Scientific significance.

Each criteria of significance are rated low, moderate, or high. The following questions can be asked to help guide this rating (OEH, 2011):

- **Research potential:** does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- **Representativeness:** how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- **Rarity:** is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- **Education potential:** does the subject area contain teaching sites or sites that might have teaching potential?

The level of significance of each site is summarised in Table 7-1.

Table 7-1: Summary of significance for sites recorded.

Site ID	Social Significance	Aesthetic Significance	Historic Significance	Scientific Significance
Geurie IF01 (AHIMS ID 36-1-0871)	Low	Low	Low	Low
Geurie IF02 (AHIMS ID 36-1-0872)	Low	Low	Low	Low
Geurie IF03 (AHIMS ID 36-1-0870)	Low	Low	Low	Low

7.1. Social or cultural significance

Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people (OEH, 2011). It relates to a contemporary connection that Aboriginal people have with events that have taken place in that location or general area.

In general, presence of Aboriginal sites provides evidence of connection to country. The Aboriginal sites within the study area are not a rarity and no not demonstrate a distinct way of life. The Aboriginal sites have **low** social significance.

7.2. Aesthetic significance

This refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Australia ICOMOS, 2013, OEH, 2011).

The artefacts recorded are of a similar material, do not conjoin and consist of typical stone artefact types recorded within the region. The Aboriginal sites were assessed as having **low** aesthetic significance.

7.3. Historic significance

Historic value refers to the associations of a place with a historically important person, event, phase, or activity in an Aboriginal community. Historic places do not always have physical evidence of their historical importance (OEH, 2011).

There are Elders and members of the Aboriginal community still living in and around Geurie and have connections to the land. There is no record of the study area having an association with a historically important person or community event. The study area has been assessed as having **low** historic significance.

7.4. Scientific significance

This refers to the importance of a landscape, area, place or object because of its rarity, representativeness, and the extent to which it may contribute to further understanding and information (Australia ICOMOS, 2013, OEH, 2011).

The distribution of the sites conformed to the predictive model set out in Section 5.4. On this level, the recorded sites are considered to be representative of these site types but are not rare. The sites offer low potential for research and increasing understanding of archaeological values. Based on the factors discussed above, the scientific significance of the remaining sites within the study area is rated as **low**.

8. Impact management

Key points:

- All three Aboriginal sites will be impacted by the proposal.

Cultural heritage values require management for any proposal where they have been identified. Whether an impact is direct, indirect, or possible, Aboriginal sites will require some level of intervention to avoid harm where possible. Section 5 of the NPW Act defines harm as:

> "*an object or place includes any act or omission that--*
>
> *(a) destroys, defaces or damages the object or place, or*
>
> *(b) in relation to an object--moves the object from the land on which it had been situated, or*
>
> *(c) is specified by the regulations, or*
>
> *(d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c)".*

The Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011) requires that both direct and indirect harm to Aboriginal objects and Aboriginal places be considered. Generally, direct harm is defined as any activity that may physically impact an Aboriginal site or objects. Indirect harm is usually taken to mean harm stemming from secondary consequences of the activity and may affect sites or objects as an indirect consequence of the activity.

8.1. Impacts to Aboriginal heritage

Three Aboriginal sites were recorded during the survey and will be directing impacted by the proposal.

Table 8-1: Summary of impacts to Aboriginal heritage under current design.

Site ID	Type of harm	Degree of harm	Consequence of harm
Geurie IF01 (AHIMS ID 36-1-0871)	Direct	Total	Total loss of value
Geurie IF02 (AHIMS ID 36-1-0872)	Direct	Total	Total loss of value
Geurie IF03 (AHIMS ID 36-1-0870)	Direct	Total	Total loss of value

8.2. Cumulative impacts

A cumulative impact is an impact on Aboriginal cultural heritage resulting from the incremental impact of the action/s of a development when added to other past, present and reasonably foreseeable future actions. Artefact sites comprise 81 per cent of the sites registered on AHIMS within a five kilometres search area. Of those two sites are artefact scatters with 30 and 50 artefacts recorded.

The identified sites will be impacted by the proposal and have been assessed in light of its relationship to the archaeological landscape as a whole. The removal of Geurie IF01, Geurie IF02 and Geurie IF03 will not result in a significant cumulative impact.

8.3. Ecologically sustainable development

In accordance with the Heritage Guidelines (OEH, 2011) the Ecologically Sustainable Development (ESD) principles should be considered when preparing a cultural assessment. The principles of ESD include the precautionary principle and the principle of inter-generational equity.

These principles of ESD are detailed in the NSW *Protection of the Environment Administration Act 1991*. The principles relevant to the assessment of the project as it relates to Aboriginal cultural heritage are considered:

- The precautionary principle - Full scientific certainty about the threat of harm should never be used as a reason for not taking measures to prevent harm from occurring.
- The principle of inter-generational equity - The present generation should make every effort to ensure that the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations.

A number of considerations and investigations have been completed to understand the degree of impact. Effort includes completing detailed pedestrian surveys across the site, assessing previous archaeological studies, reviewing geological formations and landscape values and reviewing historical site data. Those measures, carried out consistent with guidelines and codes of practice, ensure that potential impacts to Aboriginal heritage are understood with a high degree of certainty.

Regarding the principle of inter-generation equity, the Aboriginal sites that have been identified for harm are well presented through other sites within the broader locality. RAPs have been provided the opportunity to discuss long term conservation measures, including taking procession under a care agreement, or long term conservation on land through re-burial on country. The objects will still exist with only their movement from the land and away from harm during the construction of the new substation.

8.4. Management measures

As a general principal, avoidance of impact to sites of Aboriginal cultural heritage is the preferred method of management. This is advocated in the Burra Charter as well as various other guidelines and codes of practice (Section 2.1). Total avoidance of all sites of heritage value is not always feasible. In the case avoidance presents a proponent with considerable difficulties, they may apply to damage or destroy a site.

In this particular case, avoidance is not feasible due to the location of the new substation. Reburial of artefacts on country was requested by several of the RAPs, however this is not favourable due to likelihood of future developments in the surrounding area i.e possible Mitchell Highway upgrade, possible future substation augmentation and construction of potential future powerlines. As such the following mitigation measures are recommended (pending approval):

- An Aboriginal Heritage Impact Permit (AHIP) is required prior to any impact to the recorded sites.
- Salvage of artefacts would include surface collection and include relocation of impacted items in accordance with the conditions of the AHIP.
- Site supervisors should be informed that cultural heritage sites are protected under the NPW Act and no harm is to come to them.

The information provided in this report is based upon recent information made available to AREA. Any changes made to the proposal should be assessed by an archaeologist in consultation with the RAPs. Any changes that may impact on Aboriginal cultural heritage may warrant further investigation and may result in changes to the recommended management and mitigation measures.

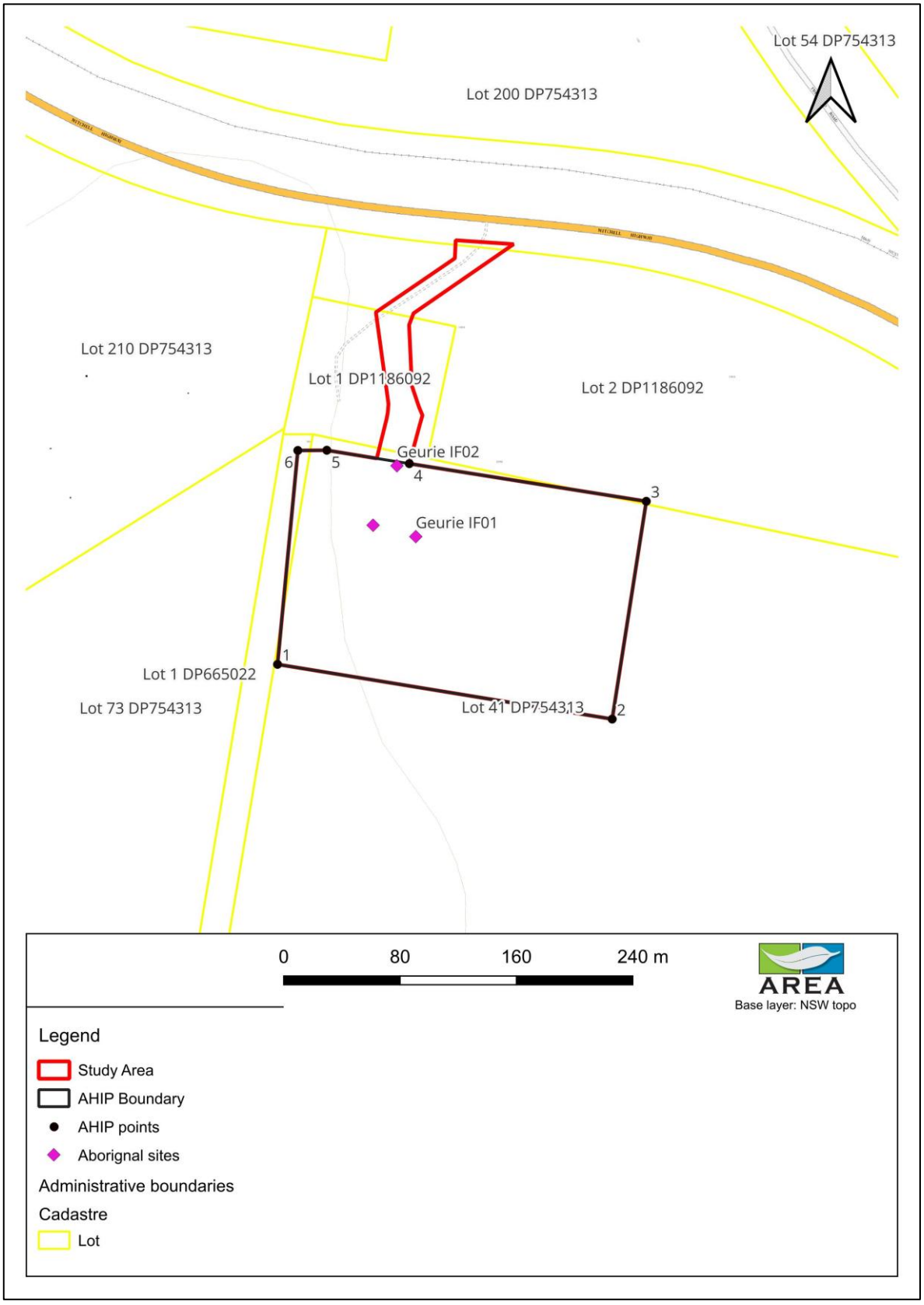
8.5. Aboriginal Heritage Impact Permit

To undertake the proposed works an area based Aboriginal Heritage Impact Permit (AHIP) will be necessary. An AHIP must be obtained to manage harm prior to harm occurring to any Aboriginal objects within the project area. The AHIP boundary is shown in Figure 8-1 with corresponding AHIP points in Table 8-2.

Table 8-2: List of AHIP points

Point	Easting GDA 94 zone 55	Northing GDA 94 zone 55
1	673092	6411694
2	673322	6411656
3	673346	6411806
4	673183	6411832
5	673126	6411841
6	673106	6411841

Figure 8-1: Proposed AHIP Boundary



9. Recommendations

Cultural heritage values require management for any proposal where they have been identified. Whether an impact is direct, indirect, or possible, Aboriginal sites will require some level of intervention to avoid harm where possible.

The following recommendations are based on the consideration of:

- The requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010b)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2011a)
- The results of the background research and fieldwork
- The likely impacts of the proposed development footprint.

Three Aboriginal sites, Geurie IF01, Geurie IF02 and Geurie IF03, were recorded during the survey and will be impacted by the proposal.

Based on the assessment, the following recommendations are made:

- Continue consultation as per Aboriginal *Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a).
- An Aboriginal Heritage Impact Permit (AHIP) is needed to impact the three Aboriginal sites
- If an AHIP is granted, surface collection of Geurie IF01, Geurie IF02 and Geurie IF03 in accordance with the conditions of the AHIP.
- Placement of the artefacts in the long-term care of Dubbo LALC, under a Care Agreement.
- If any objects of suspected Aboriginal heritage origin be encountered during the proposed work, the unanticipated finds protocol (Appendix C) should be implemented.
- If changes are made to the proposal which could impact locations outside of the current study area, further archaeological investigation may be required.
- If suspected human remains are located during any stage of the proposed works, activity must stop immediately, and the NSW police must be notified.

10. References

Dubbo Regional Local Environmental Plan 2022

Environment Protection and Biodiversity Conservation Act (Cth) 1999

National Parks and Wildlife Act (NSW) 1974

Native Title Act 1993 (Cth)

Native Title Act 1994 (NSW)

Environmental Planning and Assessment Act 1979 (NSW)

ALTERATION OF THE NAME OF THE VILLAGE OF "PONTO" TO "GUERIE." (1922, February 3). *Government Gazette of the State of New South Wales (Sydney, NSW : 1901 - 2001)*, p. 988. Retrieved February 17, 2025, from http://nla.gov.au/nla.news-article220075961

AREA ENVIRONMENTAL & HERITAGE CONSULTANTS (AREA) 2022. Southlakes Estate Super DA - Aboriginal Cultural Heritage Report. Report to MAAS.

ATTENBROW, V. 2010. *Sydney's Aboriginal Past: Investigating the archaeological and historical records,* Sydney, UNSW Press.

AUSTRALIA ICOMOS 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Burra Charter)*.

BAMBLETT, L. 2013. *Our Stories are Our Survival,* Canberra, Aboriginal Studies Press.

BOM. 2022. *Monthly climate statistics - Dubbo* [Online].

BOWLER, J. M., JOHNSTON, H., OLLEY, J. M., PRESCOTT, J. R., ROBERTS, R. G., SHAWCROSS, W. & SPOONER, N. A. 2003. New ages for human occupation and climatic change at Lake Mungo, Australia. *Nature,* 421**,** 837-840.

CLARKE, P. A. 2011. *Aboriginal people and their plants,* Dural, Rosenberg Publishing Pty Ltd.

COE, M. 1989. *Windradyne: a Wiradjuri Koorie,* Canberra, Aboriginal Studies Press.

DONALDSON, T. 1984. What's in a Name? An etymological view of land, language and social identification from central western New South Wales. *Aboriginal History,* 8.

ETHERIDGE, R. J. 1918. *The dendroglyphs, or "carved trees" of New South Wales.*

GARNSEY, E. J. 1942. A Treatis on the Aborigines of Dubbo and District. Dubbo: Dubbo Museum & Historical Society.

KELLEHER NIGHTINGALE CONSULTING PTY LTD. 2018.Maryvale Solar Farm Aboriginal Archaeological Assessment Report. Report to Photon Energy.

KELTON, J. 1995. An archaeological survey for the proposed Keswick Housing subdivision, Dubbo, NSW. Report to Dubbo City Council.

KOETTIG, M. 1985. Assessment of the Aboriginal Sites in the Dubbo City Area: Report in conjunction with planing study undertaken by Cameron McNamara Pty Ltd.

MURPHY, B. W. & J. W. LAWRIE .1999. Soil Landscapes of the Dubbo 1:250000 Sheet. [Sydney, New South Wales] :, Department of Land and Water Conservation.

NEW SOUTH WALES ARCHAEOLOGY PTY LTD. 2011. Proposed Bodangora Wind Farm European and Aboriginal Cultural Heritage Assessment Report. Report to Bodangora Wind Farm Pty Ltd.

NSW DEPARTMENT OF ENVIRONMENT CLIMATE CHANGE AND WATER (DECCW) 2010a. Aboriginal cultural heritage consultation requirements for proponents. Sydney.

NSW DEPARTMENT OF ENVIRONMENT CLIMATE CHANGE AND WATER (DECCW) 2010b. Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales. Sydney.

NSW DEPARTMENT OF ENVIRONMENT CLIMATE CHANGE AND WATER (DECCW) 2010c. Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. Sydney.

NSW HISTORICAL IMAGERY 1964. Historic Aerial Photos: Dubbo, Sheet number 8633 (4290_05_030). *In:* DUBBO (ed.).

NSW HISTORICAL IMAGERY 1991. Historic Aerial Photos: Dubbo Sheet number 8633 (4290_04_072).

NSW NATIONAL PARKS AND WILDLIFE SERVICE. 2003. *The Bioregions of New South Wales – their biodiversity, conservation and history,* Hurstvilli, National Parks and Wildlife Service (NSW).

NSW NATIONAL PARKS AND WILDLIFE SERVICE. Aboriginal cultural heritage assessment: NSW western regional assessments: Brigalow Belt South Bioregion (stage 2)

NSW OFFICE OF ENVIRONMENT AND HERITAGE (OEH) 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. Sydney.

OXLEY, J. J. W. M. 1820. *Journals of two expeditions into the interior of New South Wales: Undertaken by order of the British Government in the years 1817-18,* London, John Murray.

PARDOE, C. & WEBB, S. 1986. Prehistoric Human Skeletal Remains from Cowra and the Macquarie Marsh, New South Wales. *Australian Archaeology,* 22**,** 7-25.

PEARSON, M. 1981. *Seen through different eyes: Changing land use and settlement patterns in the Upper Macquarie River Region of N.S.W. from prehistoric times to 1860.* PhD, ANU.

SURVEYOR GENERAL (1880). Parish of Geurie County of Lincoln Sydney, Government Printing Office.

STURT, C. 1833. *Two Expeditions into the Interior of Southern Australia - During the years 1828, 1829, 1830, and 1831: with observations on the soil, climate, and general resources of the colony of New South Wales.,* London, Smith, Elder and Co.

TINDALE, N. B. 1974. *Aboriginal Tribes Of Australia: Their Terrain, Environmental Controls, Distribution, Limits, and Proper Names,* Canberra, ANU Press.

WHITEHEAD, J. 2003. *Tracking and mapping the explorers - Volume 1 The Lachlan River, Oxley, Evans and Cunningham 1817,* Lismore, Southern Cross University Press.

Appendix A: Database search results

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Geurie ZS
Client Service ID : 934125

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-1-0455	BBS; Dubbo LALC; Geurie Flora Reserve 2	AGD	55	671602	6412382	Open site	Valid	Artefact : 4		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		
36-1-0457	BBS; Dubbo LALC; Geurie Flora Reserve 4	AGD	55	671888	6412508	Open site	Valid	Artefact : 3		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		
36-1-0452	BBS; Dubbo LALC; Geurie Flora Reserve	AGD	55	671676	6412467	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		
36-1-0045	Geurie;Bald Hill;	AGD	55	675538	6412428	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Fettell					Permits		
36-1-0453	BBS; Dubbo LALC; Scabby Flat Reserve	AGD	55	670292	6410215	Open site	Valid	Artefact : 50		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		
36-1-0537	GC-OS1	AGD	55	672111	6412628	Open site	Valid	Artefact : 8		
	Contact Searle	Recorders	OzArk Environmental and Heritage Management - Dubbo					Permits		
36-1-0538	GC-OS2	AGD	55	672314	6413196	Open site	Valid	Artefact : 8		
	Contact Searle	Recorders	OzArk Environmental and Heritage Management - Dubbo					Permits		
36-1-0456	BBS; Dubbo LALC; Geurie Flora Reserve 3	AGD	55	671859	6412647	Open site	Valid	Aboriginal Resource and Gathering : 1		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		
36-1-0575	GC-OS1 - Geurie	GDA	55	672111	6412628	Open site	Valid	Artefact : 8		
	Contact Searle	Recorders	OzArk Environmental and Heritage Management - Dubbo					Permits		
36-1-0043	Geurie;Bald Hill;	AGD	55	670972	6412599	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Fettell					Permits		
36-1-0454	BBS; Dubbo LALC; Geurie Flora Reserve 1	AGD	55	671868	6412714	Open site	Valid	Artefact : 30		99169
	Contact	Recorders	Phil Purcell,Dubbo LALC					Permits		

**** Site Status**
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 25/09/2024 for Kim Newman for the following area at Lat, Long From : -32.4321, 148.8085 - Lat, Long To : -32.3959, 148.8703. Number of Aboriginal sites and Aboriginal objects found is 11

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 1

Appendix B: Aboriginal community consultation

Information withheld due to personal and business details being included in the consultation log

Appendix C: Unanticipated finds protocol

The protocol to be followed in the event previously unrecorded or unanticipated Aboriginal object(s) are encountered during the proposed works is as follows:

- All ground surface disturbance in the area of the finds should cease immediately the finds are uncovered. Relevant project staff to be notified immediately, including the project manager and Environmental Services team. The Environmental Services team will determine an appropriate buffer zone to allow for the assessment and management of the find. All site personal will be informed about the buffer zone with no further works to occur within the buffer zone.
- If the finds are of human remains, the environmental manager or other nominated senior staff member will contact the NSW Police on the non-emergency line (02) 131 444.
- A Heritage specialist will be engaged to assess the Aboriginal place or object encountered, representative(s) from the registered Aboriginal Stakeholders for the Project may also be engaged to assess the cultural significance of the place or object.
- If the Aboriginal heritage places or objects are found to be included in the existing approvals to impact Aboriginal heritage within the development footprint, works may continue to be conducted in accordance with mitigation measures and approval requirements.
- If the Aboriginal heritage places or objects are found to not be included in the existing approvals to impact Aboriginal heritage within the development footprint, works will not recommence at the heritage place or object until advised to do so by Heritage NSW.
- If the heritage place or object can be managed in situ, works at the heritage location will not recommence until appropriate heritage management controls have been implemented, such as protective fencing.
- For historic relics, work must cease in the affected area and the Heritage Council must be notified in writing (heritagemailbox@environment.nsw.gov.au). This is in accordance with section 146 of the *Heritage Act 1977.*
- Depending on the nature of the discovery, additional assessment may be required prior to the recommencement of work in the area. At a minimum, any find should be recorded by an archaeologist.

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