



**TransGrid**



Project  
**EnergyConnect**

# Environmental Scoping Report

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Project EnergyConnect - SA/NSW border to Buronga

October 2019

# Executive Summary

TransGrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity distributor in South Australia (SA)) are currently investigating the proposed construction and operation of a new electrical interconnector and network support options between NSW and SA.

The interconnector is aimed at reducing the cost of providing secure and reliable electricity transmission between NSW and SA in the near term, while facilitating the longer-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

The current preferred option involves constructing a high voltage electricity interconnector of approximately 900 kilometres between the power grids of SA (starting at Robertstown) and NSW (finishing in Wagga Wagga), known collectively as Project EnergyConnect.

Project EnergyConnect has been identified as a priority transmission project in the NSW Transmission Infrastructure Strategy (DP&E 2018), linking the SA and NSW energy markets and assisting in transporting energy from the South-West Energy Zone to major demand centres.

TransGrid is the proponent and is responsible for obtaining environmental planning approvals for those components located in NSW.

This Environmental Scoping Report refers to Project EnergyConnect - SA/NSW border to Buronga (the proposal). TransGrid will seek subsequent and separate environmental planning approvals for the remainder of Project EnergyConnect in NSW. Furthermore, environmental planning approvals under the relevant jurisdictions would be sought (by ElectraNet) for the sections of Project EnergyConnect that are located in SA.

As part of the early works for Project EnergyConnect, TransGrid and ElectraNet have proceeded with preliminary investigations into transmission line corridor options, combining various corridor selection criteria together with a broad range of environmental, heritage, land use and social constraints and opportunities. This process initially identified a 10 kilometre-wide preliminary alignment corridor within which more detailed environmental and social studies and community and landholder engagement has been undertaken leading to development of an approximate one kilometre wide proposal study area.

## Project EnergyConnect - SA/NSW border to Buronga

Project EnergyConnect – SA/NSW border to Buronga would involve the construction and operation of new high voltage (HV) electricity transmission lines between the NSW-SA border at Chowilla and Buronga; and the expansion of the existing substation facilities at Buronga NSW.

The scope of the application made by TransGrid under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the basis for the Scoping Report for the proposal includes:

- > About 130 kilometres of new 330 kV double circuit transmission line and associated infrastructure between the SA and NSW border in the vicinity of Chowilla, and the existing Buronga 220 kV substation
- > The expansion of the existing Buronga 220 kV substation to an operating capacity of 330 kV
- > Establishment and upgrade of access tracks and roads to the new substation and transmission line structures, as required
- > Other ancillary works required to facilitate the construction of the proposal e.g. laydown and staging areas, concrete batching plants, brake/winch sites, site offices and accommodation camps.

## The proponent

NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid) is the operator and manager of the main HV transmission network in NSW and the Australian Capital Territory (ACT), enabling more than three million homes and businesses to access a safe, reliable and affordable supply of electricity. Its system transports electricity from sources of generation including wind,

coal, solar, gas and hydro to large industrial customers and to the distribution networks which deliver it to homes and businesses. Comprising over 100 substations and more than 13,000 kilometres of HV transmission lines, cables, and interconnections with Queensland and Victoria, the network is instrumental to the electricity system and economy and facilitates energy trading across the National Electricity Market.

Further information on TransGrid can be found at [www.transgrid.com.au](http://www.transgrid.com.au).

### **Preliminary environmental assessment**

The proposal is subject to environmental assessment under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Under clause 14 of State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), the proposal is State Significant Infrastructure (SSI). The proposal requires approval from the NSW Minister for Planning under Division 5.2 of the EP&A Act. In addition, the Minister has declared the proposal to be Critical State Significant Infrastructure under Schedule 5 (clause 15) of the SRD SEPP.

This Environmental Scoping Report has been prepared to inform the preparation of Secretary's Environmental Assessment Requirements (SEARs) for an Environmental Impact Statement (EIS) for the proposal.

A preliminary environmental assessment was undertaken primarily at a desktop level, with the addition of some ecological field studies, and determined that that most environmental issues would require some level of assessment in the EIS. Key issues for the environmental planning and impact assessment of the proposal, identified on the basis that they are both most likely to occur and represent the greatest change to the existing environment, are as follows:

- > Biodiversity
- > Aboriginal heritage
- > Non-Aboriginal heritage
- > Landuse and property
- > Landscape character and visual amenity
- > Fire risk
- > Socio-economic
- > Surface water and hydrology.

Other issues requiring assessment but considered less likely to result in significant impacts, either based on lower likelihood of occurrence or absence of likely receptors, are as follows:

- > Electro Magnetic Fields (EMF)
- > Air quality and greenhouse gas
- > Noise and vibration
- > Traffic and access
- > Soils and water quality
- > Waste management and resource use.

As part of the preparation of the EIS, additional assessments would be carried out in conjunction with further development of the proposal design. In assessing the proposal, the key focus would be avoidance and minimisation of impacts on the environment and local communities, where reasonable and feasible. The assessment would also identify mitigation and management measures to minimise impacts on the environment during construction and operation of the proposal.

# Glossary

Term/Acronym	Description
ACHA	An Aboriginal cultural heritage assessment
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AHIMS	Aboriginal heritage information management system
ANO	Authorised Network Operator
AOBV	Area of Outstanding Biodiversity Value
APZ	Asset protection zone
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
Biodiversity study area	A 25 kilometre buffer on the centreline of the preliminary alignment corridor was used for the preliminary ecological constraints assessment (Jacobs, 2019)
BFMC	Bushfire Management Committee
BFMP	Bush Fire Management Plan
CSSI	Critical State significant infrastructure
DEE	Australian Department of the Environment and Energy
DPI	Department of Primary Industry, be referred to as the Department of Planning, Industry and Environment from the 1 July 2019
DPIE	Department of Planning, Industry and Environment
DRP	Darling Riverine Plains
EEC	Endangered ecological community
EIA	Environmental impact assessment
EIS	Environmental impact statement
EMF	Electro Magnetic Fields

Term/Acronym	Description
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environmental protection licence
FTE	Full time equivalent
GDE	Ground water dependent ecosystem
HV	High voltage
HVDC	HV direct current
IBRA	Interim Biogeographical Regionalisation of Australia
ICNIRP	International Commission on Non-Ionizing Radiation Protection
KFH	Key fish habitat
LALC	Local Aboriginal Land Council
LEP	Local environmental Plan
LGA	Local government area
MDD	Murray Darling Depression
MNES	Matters of National Environmental Significance
NEM	National Electricity Market
NSW	New South Wales
OEH	NSW Office of environment and heritage to be referred to as the DPIE from the 1 July 2019
PCT	Plant Community Types
PMST	Protected Matter Search Tool
Preliminary alignment corridor	a 10 kilometre corridor identified during the initial assessment of transmission line corridor options
Project EnergyConnect	An interconnector of approximately 895 kilometres between the power grids of SA and NSW
Proposal study area	The study area for this Scoping Report comprises the transmission line corridor between the NSW-SA border at Chowilla and the existing Buronga substation. The width of this corridor is generally about one kilometre
RAP	Registered Aboriginal Parties
REZ	Renewable Energy Zones

Term/Acronym	Description
SEPP	State environmental planning policy
SHR	State heritage register
SRD	State regional development
SSI	State significant infrastructure
TEC	Threatened ecological community
The proposal	Project EnergyConnect – SA/NSW border to Buronga

# Contents

<b>Executive Summary</b> .....	<b>iii</b>
<b>Glossary</b> .....	<b>v</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1 Project EnergyConnect.....	1
1.2 Overview of the proposal.....	2
1.3 Report terminology .....	2
1.4 The Proponent.....	4
1.5 Proposal objectives .....	4
1.6 Purpose and structure of the report.....	4
1.7 Limitations.....	5
<b>2. Strategic context and justification</b> .....	<b>6</b>
2.1 Existing transmission network.....	6
2.2 Strategic planning context .....	8
2.3 Need for Project EnergyConnect.....	10
2.4 Need for the proposal .....	11
2.5 Key benefits of Project EnergyConnect .....	11
2.6 Project EnergyConnect options.....	12
2.7 Corridor and site selection for the proposal .....	13
<b>3. The proposal</b> .....	<b>22</b>
3.1 Proposal study area.....	22
3.2 Proposal context and location .....	22
3.3 Key components of the proposal.....	23
3.4 Proposal timeframes.....	24
3.5 Construction of the proposal .....	25
3.6 Pre-commissioning, commissioning and operation.....	26
<b>4. Planning and assessment process</b> .....	<b>27</b>
4.1 Permissibility.....	27
4.2 NSW environmental planning legislation and approvals.....	27
4.3 Commonwealth legislation.....	33
<b>5. Engagement</b> .....	<b>36</b>
5.1 Introduction .....	36
5.2 Engagement considerations and principles .....	36
5.3 Engagement undertaken as part of route selection methodology .....	37
5.4 Stakeholders.....	37
5.5 Opportunities for participation .....	39
5.6 Summary of feedback received.....	42

5.7	How feedback has been used .....	43
5.8	Future engagement .....	44
<b>6.</b>	<b>Identification of key assessment issues .....</b>	<b>45</b>
6.1	Approach to identification of key assessment issues.....	45
6.2	Initial environmental risk assessment .....	45
6.3	Identification of key environmental issues.....	45
<b>7.</b>	<b>Preliminary environmental assessment .....</b>	<b>47</b>
7.1	Biodiversity .....	47
7.2	Aboriginal heritage.....	63
7.3	Non-Aboriginal heritage.....	64
7.4	Land use and property.....	68
7.5	Landscape character and visual amenity.....	72
7.6	Fire risk .....	73
7.7	Socio-economic .....	74
7.8	Surface water and hydrology.....	75
<b>8.</b>	<b>Other issues .....</b>	<b>77</b>
8.1	Electro magnetic fields (EMF) .....	77
8.2	Air quality and greenhouse gas.....	78
8.3	Noise and vibration .....	79
8.4	Traffic and access .....	80
8.5	Soils and water quality.....	81
8.6	Waste management and resource use .....	86
<b>9.</b>	<b>Conclusions .....</b>	<b>88</b>
<b>10.</b>	<b>References .....</b>	<b>89</b>
	Appendix A Preliminary Ecological Constraints Assessment.....	90
	Appendix B Preliminary Archaeological Assessment Report .....	91

## List of Tables

Table 2-1: Environmental constraints and opportunities .....	17
Table 2-2 Summary of engagement activities (landholders) – March to June 2019.....	21
Table 3-1: Summary of key components of the proposal.....	23
Table 4-1: Environmental planning instruments of potential relevance to the proposal.....	30
Table 4-2: Other typical planning related legislation of potential relevance to the proposal.....	32
Table 4-3: MNES under the EPBC Act.....	34
Table 5-1: Stakeholder groups for Project EnergyConnect (NSW).....	37
Table 5-2: Engagement activities.....	39
Table 5-3: Engagement participation for the proposal.....	42
Table 5-4: Feedback themes .....	42
Table 7-1: Interim Biogeographical Regionalisation of Australia (IBRA) area statistics for biodiversity study area .....	48
Table 7-2: PCTs identified within the preliminary field survey area (indicative centre line).....	58
Table 7-3: List of NSW non-Aboriginal heritage items within the proposal study area .....	64

## List of Figures

Figure 1-1: Overview of Project EnergyConnect – Robertstown, SA to Wagga Wagga NSW .....	1
Figure 1-2: Locality and proposal study area.....	3
Figure 2-1: TransGrid’s electricity network map (source: TransGrid, 2019) .....	7
Figure 2-2: NSW Priority Transmission Projects (DP&E, 2018).....	9
Figure 2-3: Overview of the options (and variations) assessed (source: ElectraNet, 2019).....	13
Figure 2-4: Corridor selection process.....	14
Figure 2-5: Project EnergyConnect - SA/NSW border to Buronga - Tier 1 and 2 constraints .....	18
Figure 3-1: Indicative concept design for the transmission line structures.....	24
Figure 4-1: Assessment and approval process for the proposal.....	29
Figure 7-1: Ecology values of the proposal study area .....	51
Figure 7-2: Non-Aboriginal heritage items in or crossing the proposal study area .....	65
Figure 7-3: Land use in the proposal study area .....	69
Figure 8-1: Land systems in the proposal study area.....	82

# 1. Introduction

## 1.1 Project EnergyConnect

TransGrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity distributor in South Australia (SA)) are currently investigating the proposed construction and operation of a new electrical interconnector and network support options between NSW and SA.

The interconnector is aimed at reducing the cost of providing secure and reliable electricity transmission between NSW and SA in the near term, while facilitating the longer-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

The current preferred option involves constructing a new high voltage electricity interconnector approximately 900 kilometres (km) long between the power grids of SA (starting at Robertstown) and NSW (finishing in Wagga Wagga). Collectively, the proposed interconnector is known as Project EnergyConnect (refer to **Figure 1-1**).

Project EnergyConnect has been identified as a priority transmission project in the NSW Transmission Infrastructure Strategy (DP&E 2018), linking the SA and NSW energy markets and to assist in transporting energy from the South-West Energy Zone to major demand centres.

TransGrid is responsible for obtaining environmental planning approvals for those components located in NSW being:

- > Project EnergyConnect – SA/NSW border to Buronga
  - About 130 km of new 330 kilovolt (kV) double circuit transmission line and associated infrastructure between the NSW-SA border in the vicinity of Chowilla, and the existing Buronga 220 kV substation
  - The expansion of the existing Buronga 220 kV substation to an operating capacity of 330 kV
- > Project EnergyConnect – Buronga to Wagga Wagga
  - About 550 km of new 330 kV transmission line and associated infrastructure between the expanded Buronga 330 kV substation and Wagga Wagga.
  - A new 220 kV transmission line connection between the expanded Buronga 330 kV substation and the NSW/Victorian border at Monak, adjacent to the Red Cliffs 220 kV substation in Victoria.



Figure 1-1: Overview of Project EnergyConnect – Robertstown, SA to Wagga Wagga NSW

## 1.2 Overview of the proposal

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This Environmental Scoping Report refers to Project EnergyConnect - SA/NSW border to Buronga (the proposal). TransGrid will seek subsequent and separate environmental planning approvals for the remainder of Project EnergyConnect in NSW. Furthermore, environmental planning approvals under the relevant jurisdictions would be sought (by ElectraNet) for the sections of Project EnergyConnect that are located in SA.

The proposal is subject to environmental assessment under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Under clause 14 of State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), the proposal is State Significant Infrastructure (SSI). The proposal requires approval from the NSW Minister for Planning under Division 5.2 of the EP&A Act. In addition, the Minister has declared the proposal to be Critical State Significant Infrastructure under Schedule 5 (clause 15) of the SRD SEPP.

It is expected that construction of the proposal would commence in mid-2021 and take around 24 months to complete. It is anticipated that the energisation of the proposal would occur around mid 2023.

The key components of the proposal include:

- > About 130 km of new 330 kV double circuit transmission line and associated infrastructure between the SA/NSW border in the vicinity of Chowilla, and the existing Buronga 220 kV substation
- > The expansion of the existing Buronga 220 kV substation to an operating capacity of 330 kV
- > Establishment and upgrade of access tracks and roads to the Buronga substation and transmission line structures, as required
- > Other ancillary works required to facilitate the construction of the proposal e.g. laydown and staging areas, concrete batching plants, brake/winch sites, site offices and accommodation camps.

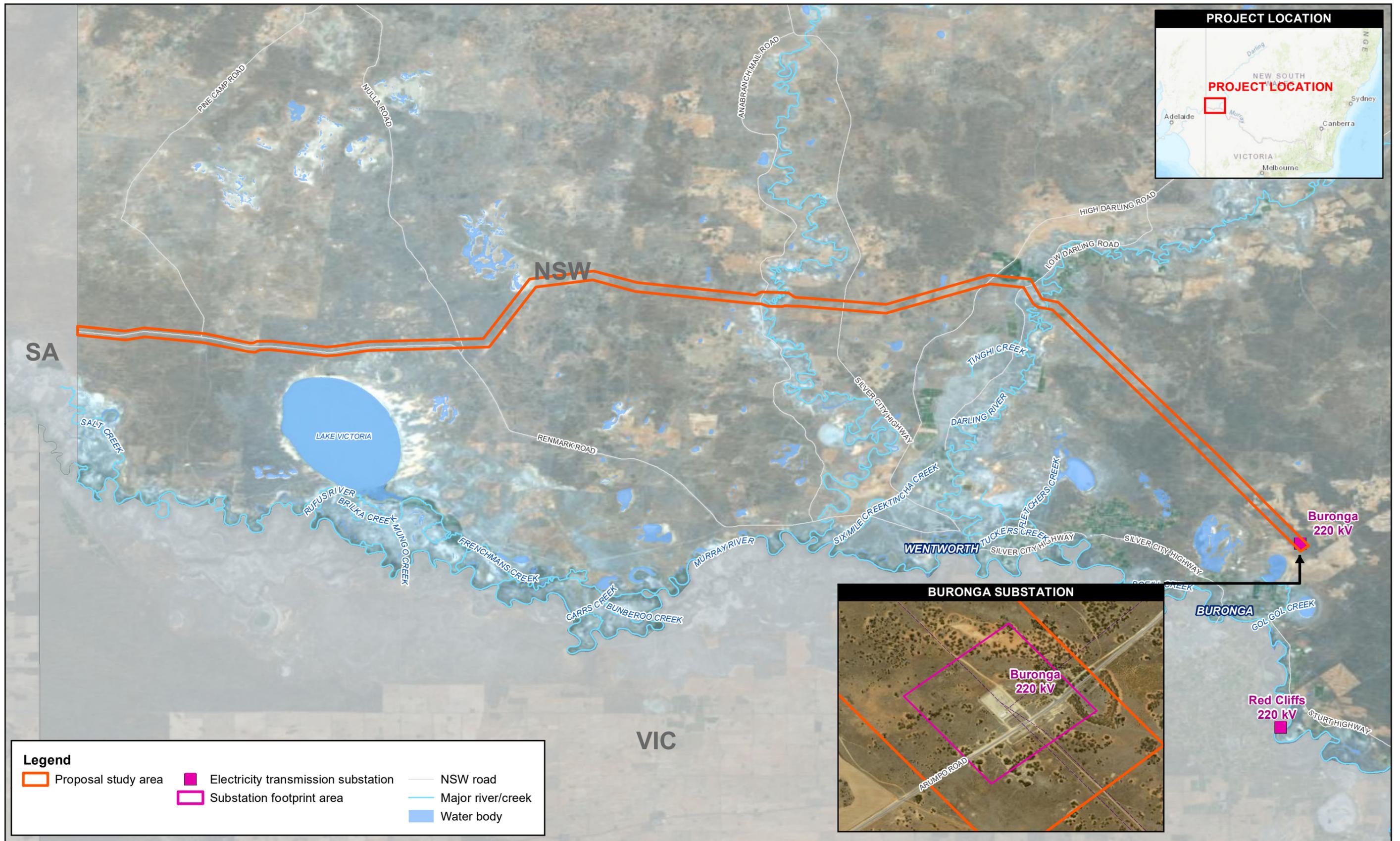
Further details of the key infrastructure components of the proposal are provided in Chapter 3.

## 1.3 Report terminology

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The following terms are discussed throughout this ESR and are defined as:

- > **Project EnergyConnect:** An interconnector of about 900 km between the power grids of SA and NSW
- > **The proposal:** Project EnergyConnect – SA/NSW border to Buronga
- > **Preliminary alignment corridor:** a 10 km corridor identified during the initial assessment of transmission line corridor options which is generally based on desktop assessments only (further details are described in **Section 2.7**)
- > **Proposal study area:** The study area for this ESR typically comprises a one kilometre wide corridor between the SA/NSW border at Chowilla and the existing Buronga substation. In some locations, a slightly wider corridor has been provided to allow for ongoing design refinement and to avoid potential environmental and land use conflict. This is within the preliminary alignment corridor. The majority of ancillary activities associated with the proposal (including brake and winch sites, crane pads, site compounds and equipment laydown areas) would be undertaken within this corridor. Additional locations that may be required for specific uses (such as access tracks and accommodation camps) would be identified during design development as required. The proposal study area is shown in **Figure 1-2**
- > **Biodiversity study area:** 25 km corridor, centred on the preliminary alignment corridor, used for the preliminary ecological constraints assessment (Jacobs, 2019), refer to **Figure 7-1**.
- > **Transmission line easement:** an area surrounding and including the transmission lines which is a legal 'right of way' and allows for ongoing access and maintenance of the lines and will be acquired from landholders. The easement width will be up to 80 m wide.



**Legend**

- Proposal study area
- Substation footprint area
- Electricity transmission substation
- NSW road
- Major river/creek
- Water body

Map: PS113770_BtoB_Scoping_001_A1	Author: AUTB501486		
Date: 30/10/2019	Approved by: - A.Garrett		
<small>Data source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community</small>			
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Transgrid

**BORDER TO BURONGA SCOPING STUDY**  
**Figure 1-2**  
 Locality and proposal study area

## 1.4 The Proponent

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The proposal is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid). TransGrid is the operator and manager of the main high voltage (HV) transmission network in NSW and the Australian Capital Territory (ACT), and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*.

TransGrid's network enables more than three million homes and businesses to access a safe, reliable and affordable supply of electricity. Comprising more than 100 substations and more than 13,000 km of high voltage transmission lines, underground cables, and interconnections with Queensland and Victoria. The network is instrumental to the electricity system and, therefore, the economy and facilitates energy trading across the National Electricity Market (NEM). Further information on TransGrid can be found at [www.transgrid.com.au](http://www.transgrid.com.au).

## 1.5 Proposal objectives

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The primary objective for the proposal is to reduce the cost of providing secure electricity transmission between NSW and SA in the near term, and facilitate the longer-term transition of the energy sector across the NEM to low emission energy generation sources.

More specifically, the proposal aims to:

- > Lower power prices
- > Improve energy security
- > Increase economic activity
- > Support the transition to a lower carbon emission energy system
- > Support a greater mix of renewable energy in the NEM.

## 1.6 Purpose and structure of the report

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This ESR has been prepared and finalised on behalf of TransGrid. The purpose of this report is to describe the proposal and present the preliminary environmental assessment of the potential environmental issues that would be covered as part of an environmental impact statement (EIS) for the proposal.

This report is intended to provide sufficient information to allow for the preparation of Secretary Environmental Assessment Requirements (SEARs) to guide the preparation of an EIS for the proposal in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the requirements of clause 192 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), which apply to applications seeking approval of the NSW Minister for Planning to carry out state significant infrastructure.

The information and recommendations in this ESR would be used to further inform the options investigations and ongoing design process for the proposal with an aim to avoid or minimise environmental, economic and social impacts wherever possible.

The structure and content of this report is as follows:

- > **Section 1 – Introduction:** Outlines the background and need for the proposal, and the purpose of this report
- > **Section 2 – Strategic context, need and justification:** Provides an overview of the strategic and regulatory context for the proposal, the wider Project EnergyConnect and the anticipated benefits of the proposal. An overview of the options assessment that lead to the preferred option is also presented
- > **Section 3 – The proposal:** Provides an outline of the key features of the proposal
- > **Section 4 – Planning and legislation:** Provides an overview of the relevant statutory approvals framework for the proposal, including applicable legislation and planning policies
- > **Section 5 – Stakeholder and community consultation:** Provides an overview of the stakeholder engagement and consultation activities that have been undertaken to date with regards to the proposal. An overview of the proposed future consultation activities is also provided
- > **Section 6 – Identification of key environmental assessment issues:** Provides the approach to the assessment and identification of key assessment issues
- > **Section 7 – Preliminary environmental assessment:** Provides a preliminary assessment of the potential key environmental impacts associated with the proposal
- > **Section 8 – Other environmental issues:** Provides a preliminary assessment of the other potential environmental impacts associated with the proposal
- > **Section 9 – Summary and conclusions:** Outlines the key conclusions of this report
- > **Section 10 – References:** Identifies the key reports and documents used to generate this report.

Appendices to this report includes:

- > **Appendix A – Preliminary Ecological Constraints Assessment (Jacobs, 2019)**
- > **Appendix B – Preliminary Archaeological Assessment Report (Jacobs, 2019).**

## 1.7 Limitations

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The assessment undertaken for this report has been based on publicly available data and predominately desktop specialist investigations. Preliminary ecological field verifications have commenced within the biodiversity study area, refer to **Figure 7-1**.

More detailed, investigations of potential environmental issues, including field inspections for relevant environmental issues, will be undertaken during the preparation of the EIS for the proposal.

## 2. Strategic context and justification

### 2.1 Existing transmission network

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The National Electricity Markets (NEM) incorporates around 40,000 km of transmission lines and cables across Queensland, NSW, ACT, Victoria, SA and Tasmania.

The NEM involves wholesale electricity generation, which is transported via high-voltage (HV) transmission lines from generators to large industrial energy users and to distribution networks in each region, which deliver energy to homes and businesses.

The transport of electricity from generators to consumers is facilitated through a 'pool', or spot market, where the output from all generators is aggregated and scheduled at five-minute intervals to meet demand. The Australian Energy Market Operator (AEMO) manages the market through procedures including the National Electricity Rules.

TransGrid operates and manages the HV electricity transmission network in NSW and the ACT. The network connects more than three million homes, businesses and communities to a safe, reliable and affordable supply of electricity.

The existing transmission network (refer to **Figure 2-1**) was established to transport electricity primarily from generators in fossil-fuel rich areas to load centres, such as residential or industrial areas. As the supply mix evolves, transmission networks will need to be reconfigured to connect regions with high-quality renewable energy resources to load centres, and incorporate dispatchable capacity, including energy storage, to firm intermittent supplies.

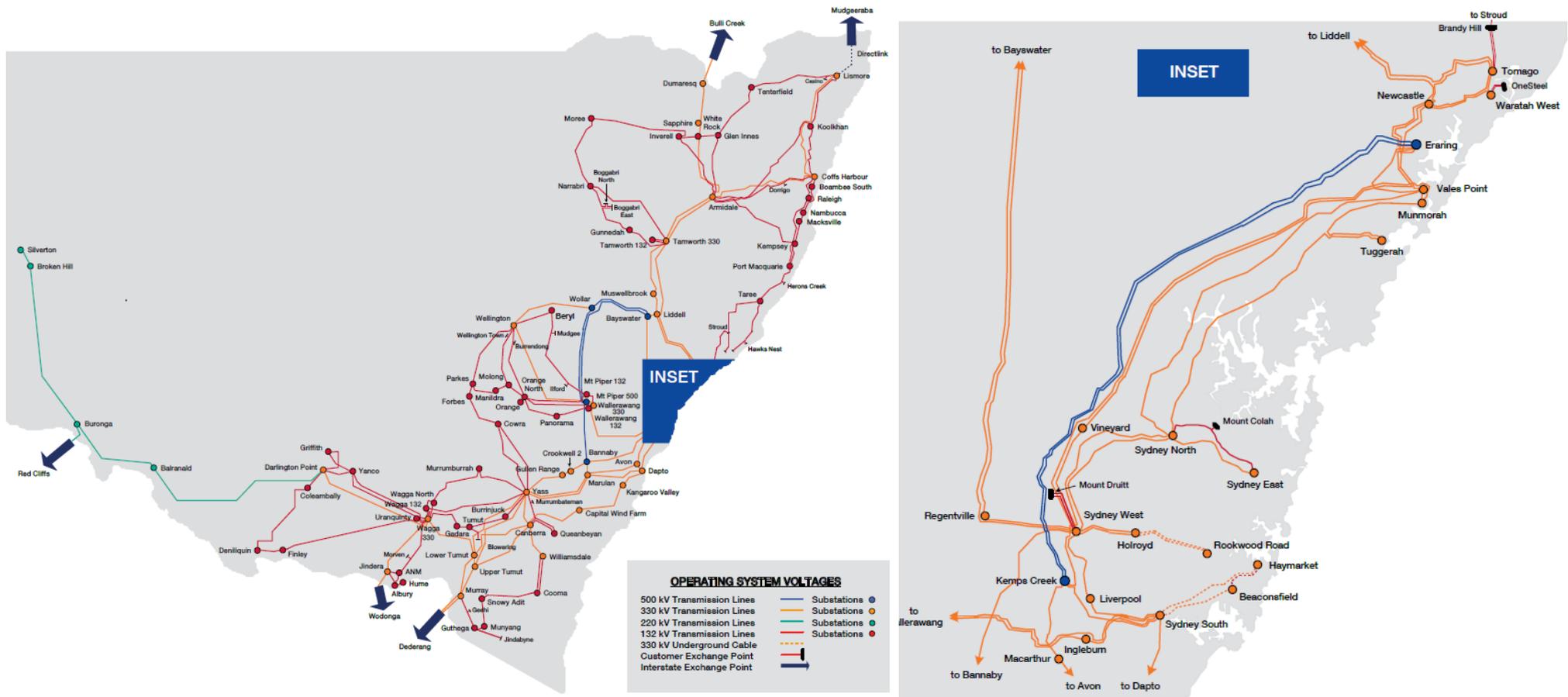


Figure 2-1: TransGrid’s electricity network map (source: TransGrid, 2019)

## 2.2 Strategic planning context

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Australia's power system is experiencing its largest transformation since it was established. The forecast retirement of existing generation, in conjunction with significant reductions in the cost of new sources of generation, is driving the transition to the energy system of the future. Electricity consumption in NSW has increased consistently over the last three years, and is forecast to continue to increase over the next ten years (TransGrid, 2018).

### 2.2.1 Integrated System Plan

Responding to a recommendation in the 2018 *Independent Review into the Future Security of the NEM* (Finkel Review), in July 2018 AEMO released the first Integrated System Plan (ISP) to deliver a strategic infrastructure development plan, based on sound engineering and economics, which can facilitate an orderly energy system transition under a range of scenarios.

The ISP confirms that the NEM is undergoing a fundamental transformation with large amounts of coal generation expected to close over the next 20 years, to be replaced with wind and both small and large-scale solar generation. The ISP identifies that significant investment in transmission, energy storage, flexible thermal capacity and distributed energy resources will be required to support this transformation, and in particular the diversity and intermittency of the future generation mix.

The ISP identifies a new interconnector between SA and NSW as an important element of the 'roadmap' for the NEM and an immediate priority that would deliver positive net market benefits as soon as it can be built (ElectraNet, 2019).

### 2.2.2 NSW Transmission Infrastructure Strategy

The *NSW Transmission Infrastructure Strategy* (NSW Department of Planning and Environment (DP&E), 2018) is the NSW Government's plan to unlock private sector investment in priority transmission infrastructure projects, which can deliver least-cost energy to customers through to 2040 and beyond. The Strategy forms part of the Government's broader plan to make energy more affordable, secure investment in new generation sources and network infrastructure, and ensure new technologies deliver benefits for consumers. Building on existing programs to reduce household and business energy bills and secure energy supplies, the Strategy aims to:

- > Boost interconnection with Victoria, SA and Queensland, and unlock more power from the Snowy Hydro Scheme
- > Increase NSW's energy capacity by prioritising Energy Zones in the Central West, South West and New England regions of NSW, which will become a driving force to deliver affordable energy into the future
- > Work with other states and regulators to streamline regulation and improve conditions for investment. By increasing transmission capacity and low-cost generation, NSW will support an orderly transition of the energy sector over the next two decades.

NSW already has a substantial investment pipeline of new wind, solar, gas and generator upgrade projects that have received or are seeking planning approval, driving the energy transformation across the state. As traditional generators retire, these new projects will provide the cheapest available energy to supply households, businesses, schools and essential services. The existing network will continue to play an important role. However, it only has enough capacity to connect around one in 20 of these projects.

The SA/NSW border to Buronga is one of four priority transmission projects identified in the strategy to be accelerated to access existing and committed low-cost energy supplies in other regions within the NEM. These priority projects are intended to meet energy needs prior to the retirement of existing coal-fired generation in NSW.

In July 2018, AEMO's ISP estimated that greater transmission investment and connection between states could deliver a net benefit across the NEM of \$1.2 billion.

The strategy also identifies three Energy Zones (refer **Figure 2-2**). These are areas with high energy potential where planned transmission infrastructure upgrades could allow multiple generation projects to connect to the network at lower cost.

AEMO forecasts these Energy Zones will provide the bulk of the state's future energy supply, with up to 17,700 MW of new generation projects expected to connect to the grid. This could support an average of up to 2,000 construction jobs each year and inject up to \$23 billion in investment into regional NSW.

Historically, new energy projects have typically been built alongside the existing network. However, as the existing transmission network becomes constrained, Energy Zones will require transmission projects to unlock energy resources in new regions of the state.

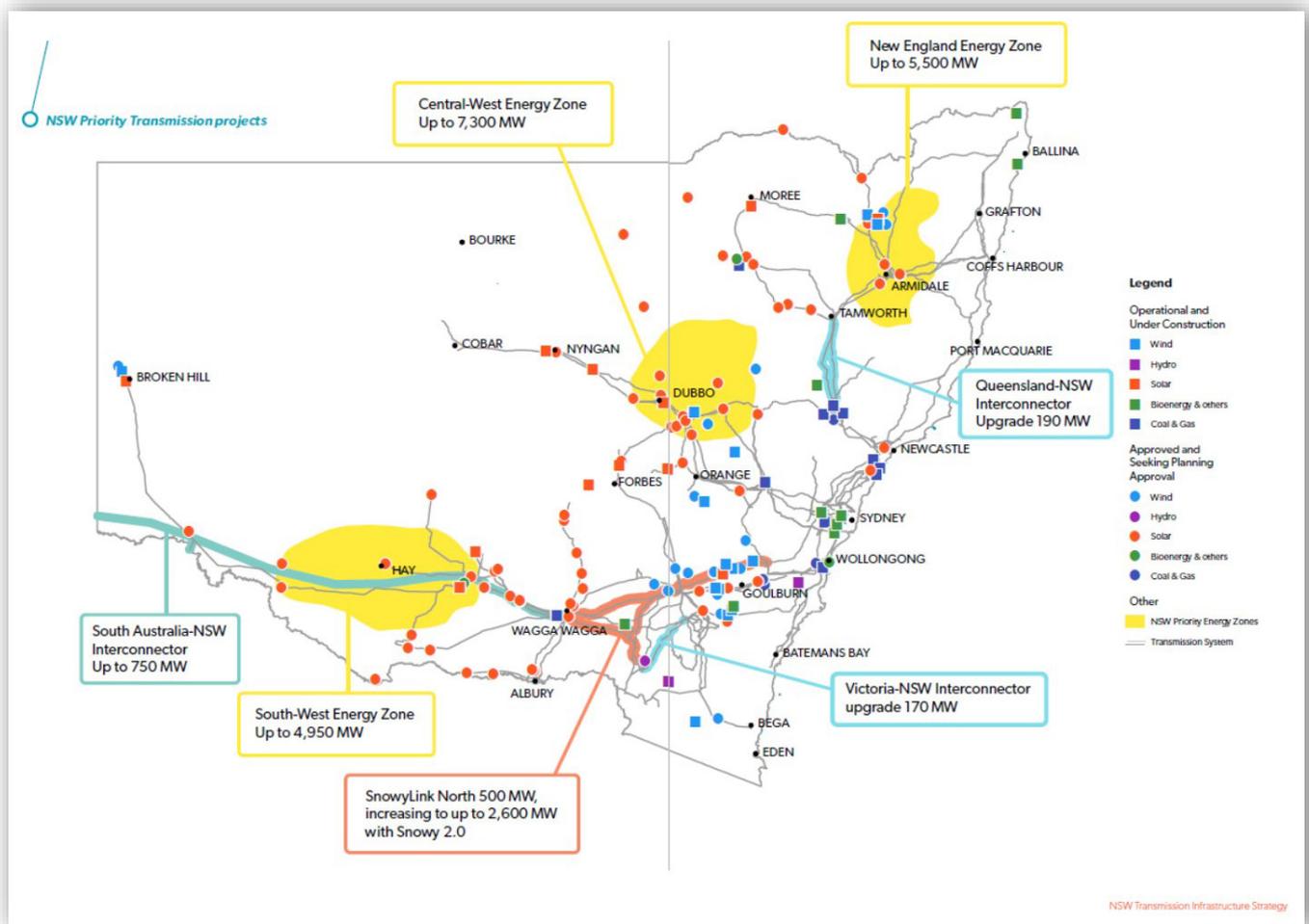


Figure 2-2: NSW Priority Transmission Projects (DP&E, 2018)

### 2.2.3 Commonwealth policy context

At the Paris Climate Conference COP21 (COP21) agreement was reached "to achieve a balance between anthropogenic (human induced) emissions by sources and removals by sinks of greenhouse gases in the second half of this century".

On 10 November 2016, Australia ratified the Paris Agreement and the Doha Amendment to the Kyoto Protocol, representing the Australian Government commitment to action on climate change.

In 2017, the Government reviewed its climate change policies to ensure they remain effective in achieving Australia's 2030 target and Paris Agreement commitments. A final report was released on 19 December 2017 which generally indicated the Government's policies were on course to meet Australia's international climate change commitments.

Project EnergyConnect is consistent with the Commonwealth Government's climate change initiatives and facilitates the continued expansion of renewable energy generation by facilitating the longer-term transition of the energy sector across the NEM to low-emission energy sources.

## 2.3 Need for Project EnergyConnect

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Australia's energy markets are undergoing rapid change as the sector transitions to generating lower carbon emissions, with a greater uptake of renewable generation and emerging technologies. These changes have brought with them a number of challenges, including:

- > A reliance on high-cost gas plant in SA to meet peak demand in certain conditions
- > Increased variability of demand and supply due to growth of intermittent renewable generation, both at grid-scale and due to household rooftop PV.

This, in turn, has led to periods of high wholesale electricity prices in SA and a reduction in contract market liquidity fuelling affordability concerns for customers. In addition, the SA region is seen as continually vulnerable to extreme weather events and system disturbances.

The progressive retirement of around half of the NSW coal fleet by 2035 (or sooner) means that alternative low-emission supply sources will be required to fill this gap whilst meeting Australia's carbon emissions reduction commitments.

A new interconnector between SA and NSW is needed to:

- > Lower dispatch costs, initially in SA, through increased access to supply options across regions
- > Facilitate the transition to a lower carbon emissions future in the NEM and the adoption of new technologies by improving access to high quality renewable resources across all regions
- > Enhance the security of electricity supply in SA.

By expanding, and in the case of SA and NSW establishing power transfer capability between regions, interconnectors enable the efficient sharing of generation resources between regions in the NEM, and can encourage more efficient investment in low-cost generation sources, allowing overall demand and system reliability requirements to be met at lowest cost.

A new interconnector would put downward pressure on wholesale market electricity costs in SA, as soon as it can be built, by enabling electricity demand in SA to be met using low-cost generating capacity that currently exists on the east coast of Australia. This would have a substantive impact in reducing the total dispatch costs in SA, providing an overall market benefit.

In the longer term, an enhanced ability to import low-cost power from NSW, including significant high-quality renewables, provides market benefits by enabling supply in NSW to be met at a lower overall cost as existing coal-fired plant retires. This is particularly the case for the new interconnection between SA and NSW, as NSW is forecast by AEMO to experience the greatest retirement of coal plant after 2030, and would otherwise rely on higher-cost sources of generation to fill the resulting supply gap.

Allowing for a greater sharing of resources across regions will help smooth demand and supply fluctuations, and in particular reduce reliance on increasingly expensive gas generation, reducing price volatility and trading risk.

## 2.4 Need for the proposal

---

Project EnergyConnect - SA/NSW border to Buronga is required to complete the missing link between the SA and NSW transmission networks, connecting the outreaches of the state networks at Chowilla in SA and Buronga in NSW.

This connection would relieve system constraints and allow for NSW and SA consumers to benefit from significant amounts of low-cost, large-scale solar generation in south west NSW. The proposal is an essential component of Project EnergyConnect.

## 2.5 Key benefits of Project EnergyConnect

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TransGrid and ElectraNet have investigated interconnector and network support options aimed at reducing the cost of providing secure and reliable electricity in the near term, while facilitating the longer-term transition across the NEM to low-emission energy sources.

Economic cost-benefit analysis prepared as part of the Regulatory Investment Test for Transmission (RIT-T) process for the Australian Energy Regulator (AER) shows that the new interconnector is expected to:

- > Deliver net market benefits of approximately \$900 million over 21 years (in present value terms) including wholesale market fuel cost savings in excess of \$100 million per year as soon as it is energised (primarily from avoided expensive gas-fired generation in SA)
- > Provide diverse low-cost renewable generation sources to help service NSW demand going forward, particularly as existing coal-fired generators retire
- > Avoid substantial capital costs associated with enabling greater integration of renewables in the NEM
- > Generate sufficient benefits to recover the project capital costs within nine years of completion
- > Reduce annual residential bills by about \$66 in SA and \$30 in NSW, and annual small business customer bills by \$132 in SA and \$71 in NSW
- > Deliver flow on economic benefits to the wider economy totalling over \$6 billion across SA and NSW (in present value terms)
- > Generate over 200 regional jobs in SA and over 800 regional jobs in NSW during construction, and create around 250 and 700 ongoing jobs in SA and NSW, respectively
- > Improve the ability of parties to obtain hedging contracts in SA and help relieve the tight liquidity in hedging markets currently.

With regard to job creation, over the period 2021 to 2040, it is projected that approximately 18,800 employee years of full time equivalent (FTE) direct and indirect jobs would be created. More specifically, it is estimated that Project EnergyConnect would increase employment by the following:

- > 4,947 employee years in SA (approximately 250 FTE jobs a year on an ongoing basis)
  - With 470 employee years in the SA region during the two year construction phase.
- > 13,841 employee years in NSW (approximately 700 FTE jobs a year on an ongoing basis)
  - with 1,650 employee years in the NSW region during the two year construction phase (Acil Allen, 2019).

The new interconnector is estimated to cost about \$1.5 billion across both SA (\$400 million) and NSW (\$1.1 billion) and could be delivered by 2022 to 2024.

As indicated in **Section 2.2**, Australia's COP21 commitment to reduce carbon emissions has substantial implications for the future operation of the NEM. Meeting this commitment will lead to further replacement of some of Australia's emissions-intensive generators with lower-emission alternatives, such as renewable energy sources (ElectraNet, 2019).

A new interconnector between SA and NSW would allow renewable energy trade between the states to assist in meeting national carbon emission and renewable energy targets at lowest long-run cost.

## 2.6 Project EnergyConnect options

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Four main options were identified to address the need for greater sharing of energy sources across the NEM. The options consisted of both a predominantly SA 'no-interconnector' option (consisting of both network and non-network components) as well as options involving new interconnectors to each of the three neighbouring states. These options were investigated as part of the Project EnergyConnect RIT(T) assessment process. The options investigated as described are shown in **Figure 2-3** and are as follows:

- > **No interconnector:**
  - Option A: Non-Interconnector. Consisting of a range of network support initiatives
- > **An interconnector to Queensland:**
  - Option B: A 400 kV high voltage direct current (HVDC) line between north SA and Queensland. The indicative route would be between Davenport in SA, crossing into NSW and connecting with the Queensland network at Western Downs. This path would be around 1,450 km long. This option is assumed to provide 700 MW of transfer capacity
- > **NSW interconnector options:**
  - Option C.3: A 330 kV line (alternating current) between Robertstown in mid-north SA and Wagga Wagga in NSW, via Buronga, plus a 220 kV line between Buronga and Red Cliffs, in Victoria. The indicative route would be approximately 916 km in length. This option is assumed to provide 800 MW of transfer capacity
  - Option C.3ii: A 330 kV line between Robertstown in mid-north SA and Wagga Wagga in NSW, via Buronga, Red Cliffs, Kerang and Darlington Point. This option is a variant of the above 330 kV option that increases interconnection between Robertstown SA and Wagga Wagga in NSW via Buronga, but which is also routed via Kerang in Victoria and Darlington Point in NSW. The indicative route runs approximately 1,016 km in length. This option is assumed to provide 800 MW of transfer capacity.
  - Option C.3iii: A variant of Option 3, which uses a HVDC link for the Robertstown – Darlington Point portion
- > **An interconnector to Victoria:**
  - Option D: A 275 kV line from Tungkillo in SA to Horsham and Ararat in Victoria. This option uses a connection from Tungkillo to Horsham to strengthen SA's connection to the east coast by providing an increase in export and import capability. The indicative route runs approximately 510 km in length. This option is assumed to provide 650 MW of transfer capacity.

The RIT-T assessment concluded that of all options considered, a new 330 kV interconnector between Robertstown in mid-north SA and Wagga Wagga in NSW, via Buronga and with an augmentation between Buronga and Red Cliffs (referred to as Option C.3), is expected to deliver the highest net market benefits and is therefore the current preferred option.

This ESR deals with the SA/NSW border to Buronga portion of Project EnergyConnect only. All other portions would be dealt with in separate approvals.



Figure 2-3: Overview of the options (and variations) assessed (source: ElectraNet, 2019)

## 2.7 Corridor and site selection for the proposal

The identification of the Project EnergyConnect preliminary alignment corridor and proposal study area from the SA/NSW border to Buronga, has been based on the analysis of extensive geospatial data, preliminary environmental survey and stakeholder engagement undertaken between November 2018 and June 2019.

### 2.7.1 Alignment corridor selection methodology

While the most cost-effective option for linear infrastructure projects is to take a straight line approach from point to point, this option is not generally feasible due to a range of environmental, social, land use and engineering constraints.

The environmental and social constraints affecting linear projects can be categorised into the following hierarchy:

#### 2.7.1.1 Hierarchy of constraints

- > No-Go Areas where the transmission line cannot be located
- > Avoid Areas that are to be avoided wherever possible
- > Minimise Areas where impacts should be minimised and mitigated
- > Opportunities Areas that improve / benefit the proposal outcomes.

A comprehensive analysis of constraints was undertaken to inform the corridor selection process through corridor identification workshops involving specialists from environmental, land access, community engagement, GIS/spatial analysis and engineering/design disciplines.

The corridor selection process is summarised in **Figure 2-4**.

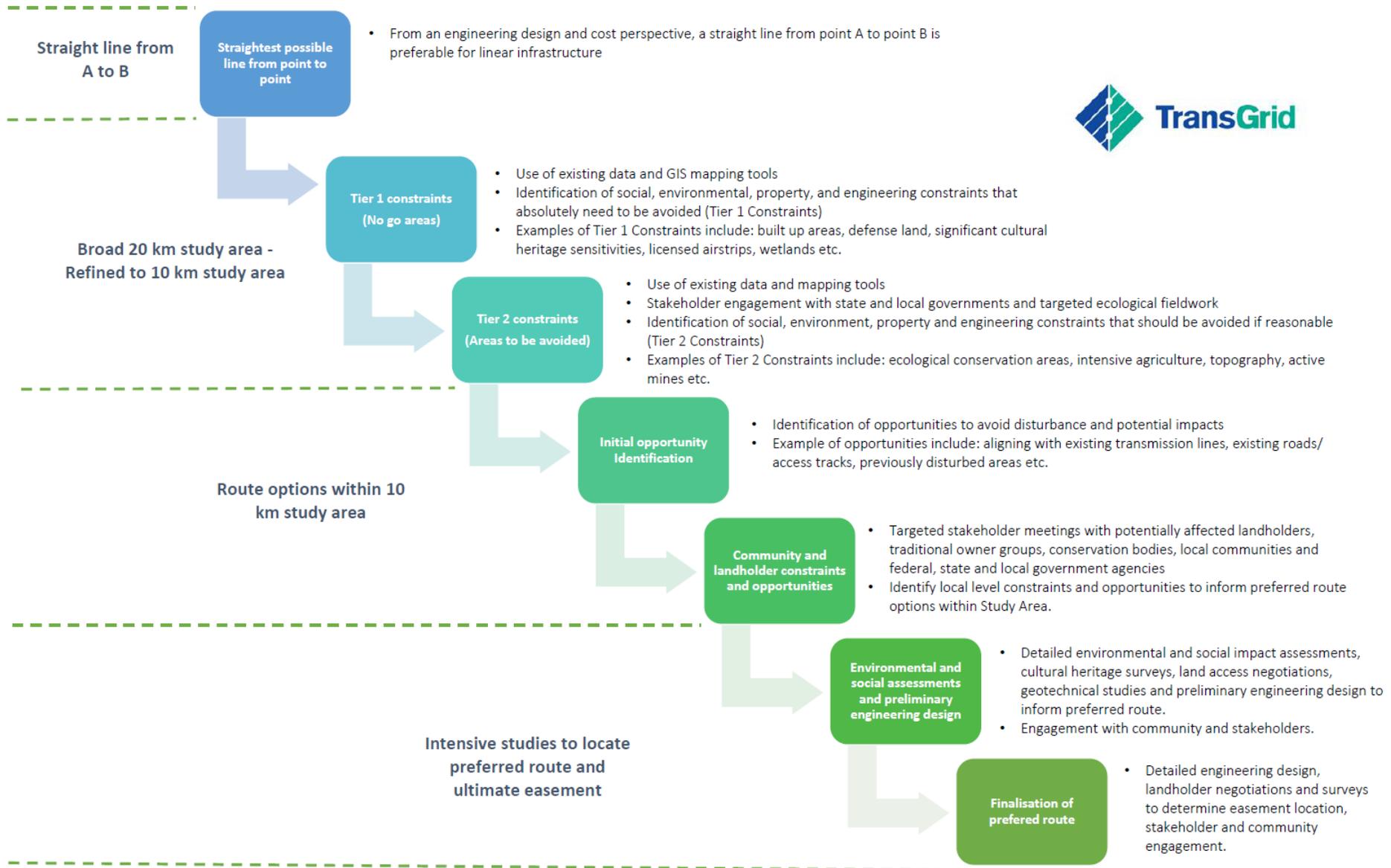


Figure 2-4: Corridor selection process

### 2.7.1.2 Key objectives and selection criteria

The following key objectives and selection criteria were established for the transmission line corridor options investigations:

- > Broadly acceptable to stakeholders, balancing the various environmental and social aspects with engineering limitations and project cost
- > Meet all regulatory obligations relevant under State and Commonwealth legislation
- > Avoid areas of particular environmental sensitivity and restricted access where planning approvals and access are considered unlikely
- > Avoid (if reasonable) or minimise impacts on areas of particular environmental sensitivity and where environmental planning approvals are potentially complex
- > Preference to follow areas of existing disturbance (e.g. utility easements, roads, tracks, fence lines and cadastral boundaries) and target narrow crossing points of waterways and flood out areas (and their associated riparian habitats eg around the Darling River and Great Darling Anabranch)
- > Maximise buffer distances to dwellings, inhabited areas and other sensitive land uses
- > Cost effective and provide best value for money
- > Ease of construction using current and available technology
- > Accessible and able to be safely maintained.

Further, the selection criteria identified for each constraint have been informed by engagement and the incorporation of feedback to ensure what is important to stakeholders and community is recognised in the methodology used. The engagement undertaken includes:

- > Engagement with local and regional communities
- > Targeted engagement with key stakeholders including local government, State and Federal government agencies, landholders, Traditional Owners groups and other directly affected parties.

To ensure a robust and structured approach, feedback was recorded in a systematic manner and incorporated into the selection methodology (see **Section 5** Consultation).

A range of primary constraints and opportunities (**Table 2-1**) were identified and considered during the identification of the preliminary alignment corridor.

### 2.7.1.3 Identification of the preliminary alignment corridor

Existing, publicly available geospatial datasets for the tiered constraints and opportunities listed in **Table 2-1** together with the feedback received from early engagement activities were used to identify a 10 km preliminary alignment corridor. This corridor does not intersect any Tier 1 constraints and significantly minimises interaction with Tier 2 constraints as shown in **Figure 2-5**.

Further analysis of constraints and opportunities within the preliminary alignment corridor was assisted with field-based survey work to validate a number of assumptions made around extent and quality of key biodiversity features. Various opportunities identified at a local level were reviewed to significantly reduce environmental, social/land use and Aboriginal cultural heritage impacts within Tiers 2 and 3 and included use of existing utility easements, formed roads and informal access tracks, cleared fence lines and cadastral boundaries, areas of degraded vegetation and narrow sections of the Darling River and Anabranch and their associated flood zones.

The primary opportunities that influenced the preliminary alignment corridor included:

- > The existing TransGrid X2 220 kV transmission line running north west from the Buronga Substation towards Broken Hill
- > The Renmark-Wentworth Road in the western extent of the corridor
- > Various minor roads, tracks, fence lines and cadastral boundaries trending east/west through the preliminary alignment corridor.

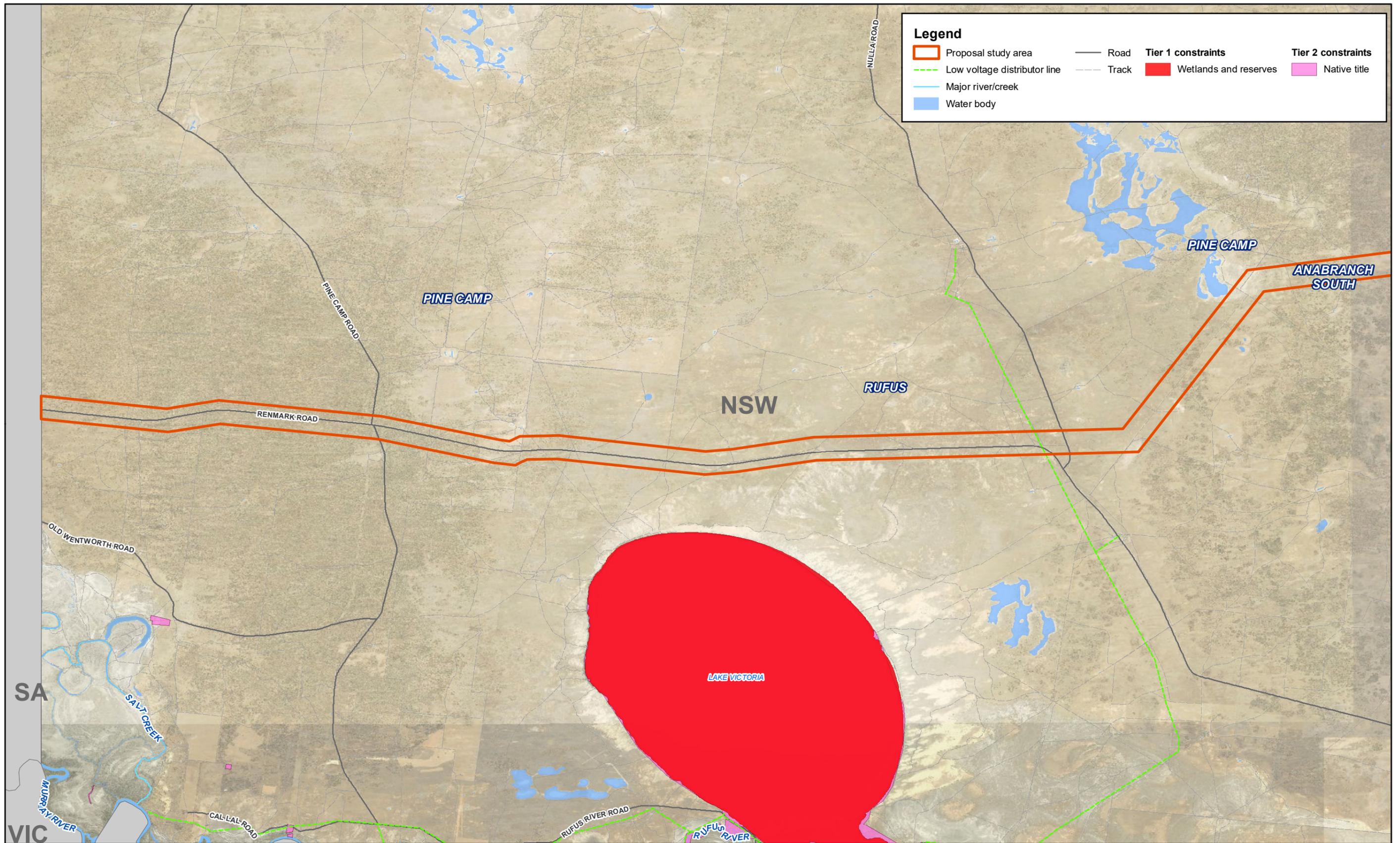
These existing features offered various opportunities for the co-location of transmission infrastructure and were understood to offer some reduction in the extent of impacts arising from transmission line construction and operations maintenance.

An extensive community engagement program was conducted between November 2018 and June 2019 to collect feedback on the priority issues for the area to test the preliminary alignment corridor and to inform its narrowing.

Feedback collected during this period of engagement confirmed the underlying assumption that the avoidance/minimisation strategy together with consolidation of new infrastructure next to existing easements and the use of existing disturbances to reduce potential and actual environmental, land use and other impacts was a sensible approach to the identification of the preliminary alignment corridor. Further details of outcomes of the community engagement can be found in Chapter 5 of this ESR.

**Table 2-1: Environmental constraints and opportunities**

<b>Tier 1 Constraints (No-Go)</b>	<b>Tier 2 Constraints (avoid)</b>	<b>Tier 3 Constraints (minimise and mitigate)</b>	<b>Opportunities (Areas that improve / benefit the proposal outcomes)</b>
<ul style="list-style-type: none"> <li>&gt; Areas of particular environmental sensitivity and for which environmental approvals are considered unachievable (e.g. Ramsar wetlands and water sources for migratory birds, World Heritage Places, declared wilderness areas, areas subject to international conservation agreements)</li> <li>&gt; Land types predicted to retain particular indigenous heritage sensitivity (e.g. lunettes surrounding Lake Victoria)</li> <li>&gt; Lands that carry particular safety and security concerns (e.g. Commonwealth Defence lands)</li> <li>&gt; Land use types that carry public safety and amenity concerns (e.g. built up areas, townships, villages, schools and hospitals, designated urban, residential or neighbourhood zonings)</li> <li>&gt; Areas with particular engineering and constructability challenges (e.g. large water bodies)</li> <li>&gt; Lands surrounding other incompatible land uses (e.g. licensed aerodromes).</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Areas of environmental sensitivity and for which environmental approvals are considered complex (e.g. EPBC MNES, wetlands and other high value habitats for migratory, threatened and vulnerable species listed under State and Commonwealth legislation, ecological conservation areas including national park estate, reserves, biosphere and wilderness protection areas)</li> <li>&gt; Lands subject to “exclusive use” Native Title determinations</li> <li>&gt; Other incompatible land uses (e.g. intensive agricultural/horticultural activity, viticulture, mining, minerals extraction, wind farms, solar farms)</li> <li>&gt; Areas with engineering and constructability challenges that will significantly increase construction costs (e.g. slopes greater than 15 degrees)</li> <li>&gt; Areas of known naturally occurring asbestos.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Other EPBC MNES (e.g. migratory flyways, known records listed species)</li> <li>&gt; Known habitat for records of threatened species and ecological communities listed under State and Commonwealth legislation.</li> <li>&gt; Large, contiguous/intact areas of moderate or better quality vegetation</li> <li>&gt; Groundwater Dependant Ecosystems (GDE) and persistent water bodies</li> <li>&gt; Key Fish Habitat</li> <li>&gt; Known/recorded sites and places of Aboriginal and Non-Aboriginal heritage significance</li> <li>&gt; Main channels of rivers and tributaries</li> <li>&gt; Flood out areas around Darling River and Anabranch</li> <li>&gt; Groundwater recharge areas</li> <li>&gt; Homesteads and other infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Areas of existing and permanent disturbance (e.g. existing roads and tracks, utility easements, fence lines, cadastral boundaries, biosphere, degraded grazing lands)</li> <li>&gt; Narrow sections of the Darling River and Anabranch and flood out zones (NSW)</li> <li>&gt; Target areas with existing crossings/access (including bridges) across the permanent/semi-permanent watercourses (NSW).</li> </ul>



**Legend**

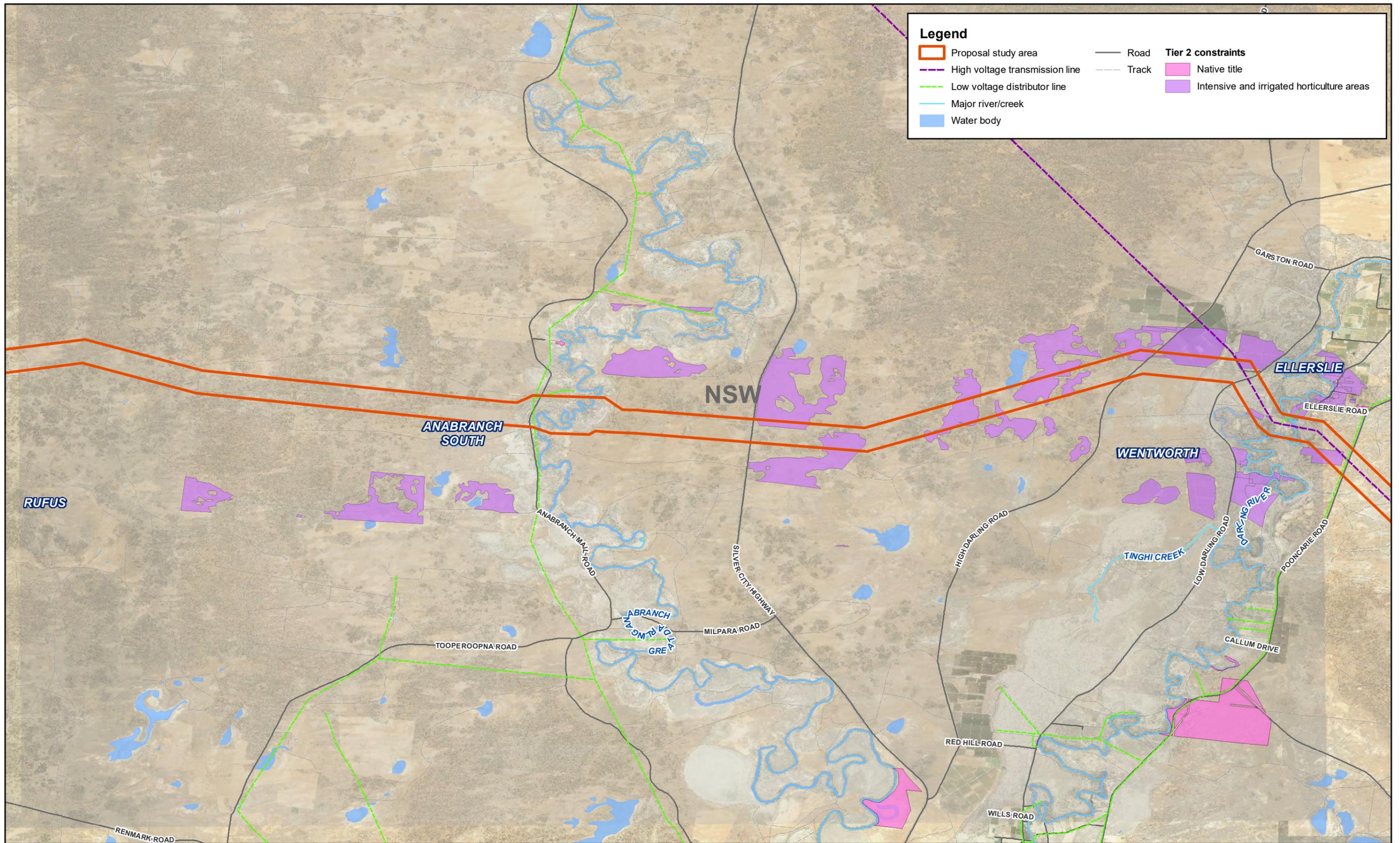
Proposal study area	Road	<b>Tier 1 constraints</b>	<b>Tier 2 constraints</b>
Low voltage distributor line	Track	Wetlands and reserves	Native title
Major river/creek			
Water body			

Map: PS113770\_BtoB\_Scoping\_007\_A2    Author: AUTB501486  
 Date: 30/10/2019    Approved by: - A.Garrett

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 Scale ratio correct when printed at A3

**BORDER TO BURONGA SCOPING STUDY**  
**Figure 2-5a**  
 Project EnergyConnect (Border to Buronga)  
 - Tier 1 and 2 constraints within  
 the proposal study area

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**Legend**

Proposal study area	Road	<b>Tier 2 constraints</b>
High voltage transmission line	Track	Native title
Low voltage distributor line		Intensive and irrigated horticulture areas
Major river/creek		
Water body		

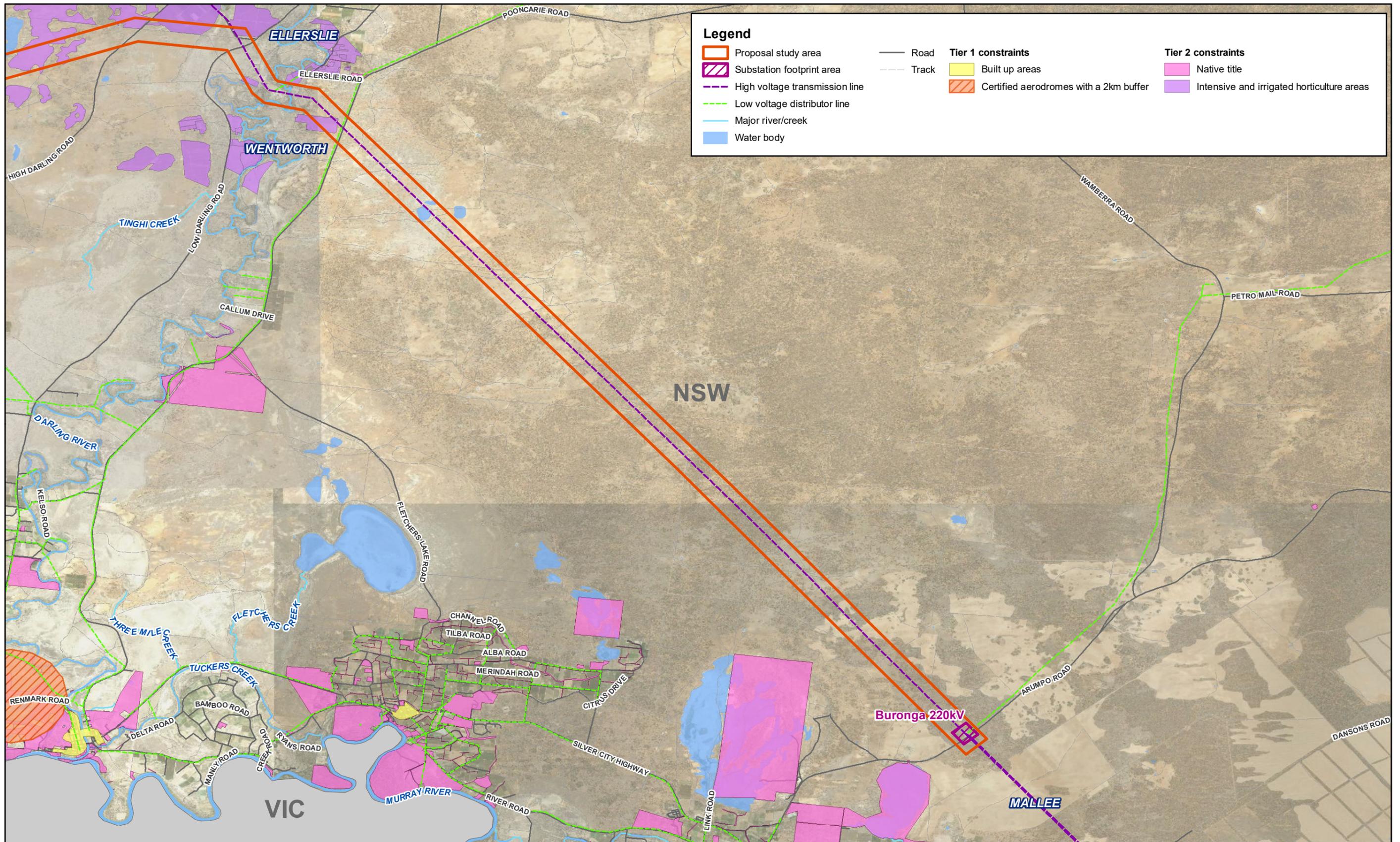
Map: PS113770\_BtoB\_Scoping\_007\_A2    Author: AUTB501486  
 Date: 30/10/2019    Approved by: - A.Garrett

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**BORDER TO BURONGA SCOPING STUDY**

**Figure 2-5b**  
 Project EnergyConnect (Border to Buronga)  
 - Tier 1 and 2 constraints within  
 the proposal study area

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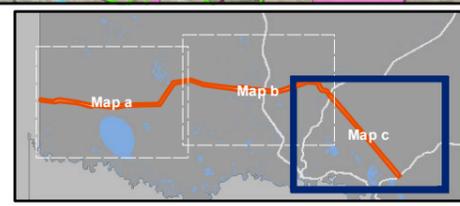


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 Data source:

Author: AUTB501486  
 Approved by: - A.Garrett



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**BORDER TO BURONGA SCOPING STUDY**

**Figure 2-5c**  
 Project EnergyConnect (Border to Buronga)  
 - Tier 1 and 2 constraints within  
 the proposal study area

#### 2.7.1.4 Identification of the proposal study area

Direct engagement with potentially affected landholders within the 10 km preliminary alignment corridor has been the primary influence in the identification of the proposal study area. Using a structured approach to landholder engagement supported by a range of engagement methods, TransGrid was able to establish contact with potentially affected landholders to introduce Project EnergyConnect, discuss the criteria used to identify the preliminary alignment corridor and to facilitate face to face meetings to identify further constraints and opportunities on an individual property basis.

The potentially affected landholders were identified through further analysis of constraints and opportunities, early ecological surveys across the biodiversity study area and in particular along the existing transmission line easements and roads.

The objectives of this targeted engagement were to:

- > Collect feedback on the methodology used to identify the preliminary alignment corridor including the section criteria and tiered constraints/opportunities (landscape level)
- > Collect additional information on constraints and opportunities (local property level) and current, near term and future development plans that may influence corridor refinement
- > Discuss both general and specific views hosting new transmission infrastructure including seeking preferences as to where this may be located in context of the property level constraints and opportunities.

**Table 2-2** summarises the engagement with directly affected landholders between March and June 2019.

**Table 2-2 Summary of engagement activities (landholders) – March to June 2019**

Engagement Activity	Number
Letters	47
Phone Calls	156
Emails	90
Meetings	28
Media Advertisements	2
Drop-in Sessions	2

This feedback was used to establish the criteria to reduce the preliminary alignment corridor down to the proposal study area within which environmental survey and transmission infrastructure design processes can be focused (**Figure 1-2**).

#### 2.7.2 Substation site selection

The existing Buronga 220 kV substation is located at 993 Arumpo Road in the Wentworth Shire Local Government Area (Wentworth LGA), refer to **Figure 1-2**.

The site is the existing marshalling point for TransGrid transmission lines and provides ancillary services for operation and maintenance activities. Due to the absence of constraints immediately surrounding the facility, it provides an ideal location for the addition of 330 kV substation equipment.

The expanded substation would require about 75 ha of land, located generally within 500 m of the existing substation facility. The general arrangement of the expanded substation will be finalised during detailed design however it is anticipated that the existing 220 kV and new 330 kV substations will be integrated into one combined facility at completion.

No alternative locations for the proposed expanded substation have been considered.

# 3. The proposal

## 3.1 Proposal study area

---

The proposal would involve the construction and operation of new high voltage electricity transmission lines between the NSW-SA border in the vicinity of Chowilla, and the existing Buronga 220 kV substation and the expansion of the existing Buronga 220 kV substation to an operating capacity of 330 kV.

The proposal study area is a one kilometre wide corridor derived from the corridor identification process summarised in section 2.7.1.2.

This ESR focuses on the proposal study area, as shown in **Figure 1-2**.

## 3.2 Proposal context and location

---

The proposal is located in regional western NSW, approximately 800 km south-west of Sydney and within the Wentworth LGA. It would traverse around 155 km, typically in an east-west alignment between the SA/NSW border and the existing Buronga 220 kV substation refer to **Figure 1-2**). The proposal traverses two main bioregions, being the:

- > Murray Darling Depression
- > Darling Riverine Plains.

While each of these regions present generally distinct characteristics including landforms (typically ranging from dune fields, sandplains and undulating plains of brown calcareous soils to lower lying floodplains confined between sandplains and dunefield), biodiversity and climates, the proposal would typically traverse areas of rural land, and land that has been developed primarily for agricultural uses such as dryland grazing with some areas of irrigated horticulture around the Darling River. While large areas have been heavily modified and disturbed, the proposal study area also contains areas of remnant vegetation including Mallee Woodlands of mixed age, Low Open Chenopod shrub land dominated by stretches of heavily grazed and degraded to highly degraded low open chenopod of Black-bush (*Maireana pyramidata*) with a notable absence of palatable species.

The preliminary alignment corridor contains no other key land uses of note, namely National Parks reserves or state forests. There are no certified aerodromes, defence or Commonwealth lands or mining tenements.

There are no major population and service centres located within the preliminary alignment corridor or proposal study area. The townships of Wentworth and Buronga are situated along the Darling and Murray Rivers respectively and to the south of the proposal study area. The proposal is expected to cross the Silver City Highway and a number of other local roads. Two key waterways are present within the preliminary alignment corridor and proposal study area, the Darling River and Great Darling Anabranch.

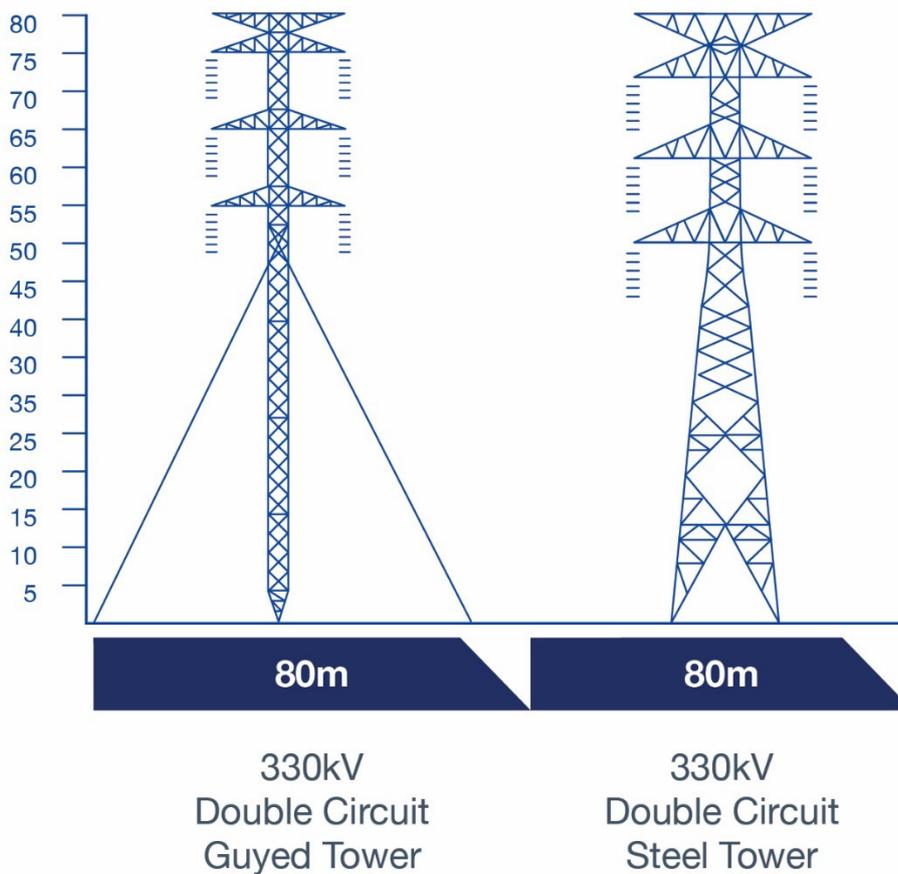
### 3.3 Key components of the proposal

The key components of the proposal are summarised in **Table 3-1**.

**Table 3-1: Summary of key components of the proposal**

Component	Description
<b>330 kV transmission line</b>	A new 330 kV double-circuit transmission line would be constructed from the NSW-SA border at Chowilla eastwards towards the existing Buronga substation. The nominal distance would be about 130 km. The transmission lines would enter NSW at Chowilla, cross the Darling Anabranch and Darling River before turning southeast and running parallel to the existing TransGrid X2 220 kV transmission line running from Buronga substation. The type and arrangement of the structures will be refined during detailed design.
<b>Transmission line easements</b>	The transmission lines would be located within an easement about 80 metres wide, which provides a right of access to construct, maintain and operate the transmission line and other operational assets. The easement also identifies the zone of initial vegetation clearance and on-going vegetation management to ensure safe electrical clearances during the operation of the lines.
<b>Transmission line structures</b>	It is proposed that free standing and possibly guyed structures are used to support the new transmission line. The structures would be up to 80 metres tall and spaced between 300 metres and 600 metres along the easement. The type and arrangement of the structures will be refined during detailed design. The indicative concept design for the structures is shown in <b>Figure 3-1</b> .
<b>Expansion of the Buronga substation</b>	It is proposed that the existing Buronga 220 kV substation on Arumpo Road is expanded to an operating capacity of 330 kV. The expanded substation would be located generally within 500 m of the existing substation facility.
<b>Access</b>	Access to each structure and each brake/winch sites would be required during construction and, to a lesser extent, during operation and maintenance. Wherever possible, existing roads tracks and other existing disturbed areas would be used to minimise vegetation clearing. In areas where there are no existing roads or tracks, suitable access would be constructed.
<b>Ancillary sites</b>	Various ancillary sites will be required during the construction of the new transmission lines including staging/laydown, concrete batching and workforce accommodation. Staging and laydown areas would be required along the transmission alignment for the temporary storage of materials, plant and equipment required to construct the various elements of the proposal. A helipad and helicopter support facilities may also be required. These areas would be preferentially located on existing disturbed land not subject to inundation and a reasonable distance from watercourses and drainage lines. The location of ancillary sites will be refined during detailed design.

Component	Description
<b>Earthworks (including blasting)</b>	<p>Earthworks would be for various purposes at the substation and along the transmission line:</p> <ul style="list-style-type: none"> <li>&gt; Bulk earthworks will be required for the expansion of the Buronga substation</li> <li>&gt; Foundation preparation at each transmission line structure will be required</li> <li>&gt; Some earthworks may be required where suitable access to transmission line structures and ancillary sites does not already exist.</li> </ul> <p>The extent of earthworks required for the proposal will be refined during detailed design. Where subsurface rock is encountered during the excavation of structure or substation footings, blasting may be required.</p>



**Figure 3-1: Indicative concept design for the transmission line structures**

*Note: Structure height and easement width of 80m may vary on a case by case basis. Figure not to scale*

### 3.4 Proposal timeframes

Construction of the proposal would commence in mid-2021, subject to NSW Government and, if required, Commonwealth planning approvals. Once construction has commenced, the proposal is estimated to take approximately 24 months to construct. The proposal is expected to be commissioned/energised (i.e. become operational) in mid-2023. This program is indicative and is based on the current design and preliminary construction staging. The program would continue to be refined and would be further considered as part of the EIS.

### 3.5 Construction of the proposal

Construction activities would be undertaken within the identified proposal study area (refer to **Figure 1-2**). Construction works for the proposal would typically include the following components of work:

- > Early works (critical upfront activities with long lead times), which may include (but not be limited to):
  - establishment of construction site(s), access tracks and service relocations
  - vegetation clearance.
- > Civil works associated with the proposed transmission lines, which would include (but not be limited to):
  - construct access tracks to accommodate safe access of construction machinery and materials to each transmission line structure site
  - earthworks and establishment of construction pads for each transmission line structure
  - construction of footings and foundation works for the new transmission line structures including boring and/or excavation, steel fabrication works and concrete pours
  - erection of the new transmission line structure using crane(s) and or helicopter(s)
  - stringing of the conductors and overhead earth wires and OPGW
  - installation of earthing conductors.
- > Civil and building works associated with the upgrade of the Buronga substation to 330 kV would generally include (but not be limited to):
  - earthworks and slab construction at the existing substation site
  - electrical fit out with new substation equipment
  - testing and commissioning of the new substation equipment.

Earthworks associated with the proposal may require blasting. This would be subject to further ground condition investigations and identified as part of the EIS.

The construction workforce would vary depending on the stage of construction and associated activities. During peak construction activities, the proposal could employ around 115 to 125 workers, with an average workforce anticipated to be around 25 to 35 workers (depending on the stage of construction works).

#### 3.5.1 Construction plant and equipment

An indicative list of construction plant and equipment likely to be required for the key construction elements is provided below. Not all the equipment identified below would be required for all phases of the proposed construction of the substation and transmission lines.

- |  |   |
|--|---|
| > Air compressors  | > Fuel trucks                                       |
| > Backhoes   | > Generators  |
| > Blasting   | > Graders   |
| > Bob cats   | > Helicopter and associated support plant/equipment |
| > Bulldozers   | > Piling rig  |
| > Drill and blast units and associated support plant/equipment | > Pneumatic jackhammers                             |
| > Concrete agitator  | > Rigid tippers                                     |
| > Concrete pump  | > 10-15 tonne rollers                               |
| > Cranes (various sizes up to 200 tonnes)                      | > 12-15 tonne rollers                               |
| > Crawler crane with grab attachments                          | > Semi-trailers                                     |
| > Dumper trucks  | > Tilt tray trucks                                  |
| > EWP  | > Trenchers   |
| > Excavators (various sizes)                                   | > Transport trucks                                  |
| > Flatbed Hi-ab truck  | > Watercarts  |

### 3.5.2 Construction hours

It is proposed that the works would be undertaken across a seven (7) day work week and during both standard and non-standard construction hours where necessary. As the details of construction methodology and proposal needs are developed, these hours will be refined for certain activities and addressed in the EIS.

### 3.5.3 Construction traffic

Construction vehicle movements would comprise vehicles transporting equipment, waste, materials and spoil, as well as worker's vehicles. Larger volumes of heavy vehicles would occur during the main civil construction works associated with the construction of the new substation.

For the proposed Buronga Substation expansion, about five non-standard or oversized loads could be required. For the transmission line, additional oversized loads may be required for the transportation of transmission line structure materials.

The haulage (transit) routes for proposal related vehicle trips would use much of the surrounding road network between Buronga and the NSW/SA border and in particular Arumpo Road, Silver City Highway (B79/SR22), Fletchers Lake Road, Pooncarie Road (RR68), Pomona Rd/Low Darling Road, High Darling Road and The Renmark Road (RR68). Haulage routes would be confirmed as part of the EIS process.

## 3.6 Pre-commissioning, commissioning and operation

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### 3.6.1 Pre-commissioning and commissioning phases

Prior to energisation of the proposal, a series of pre-commissioning activities would be conducted. This would include testing the new transmission line and expanded substation components. Key activities that would be undertaken during the pre-commissioning phase would include:

- > Point to point testing of substation and transmission line equipment
- > Earthing testing
- > HV testing
- > HV equipment operational checks
- > Protection, control, and metering system testing.

### 3.6.2 Operation phase

The expanded substation and transmission lines would be inspected by field staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). Likely maintenance activities would include:

- > Regular inspection (ground and aerial) and maintenance of electrical equipment
- > General building, Asset protection zone and landscaping maintenance
- > Fire detection system inspection and maintenance
- > Stormwater maintenance.

# 4. Planning and assessment process

Environmental planning approval for the proposal will be required in accordance with EP&A Act. A referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) will also be submitted and may trigger a requirement for Commonwealth approval.

## 4.1 Permissibility

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The proposal is permissible without development consent under clause 41 of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) being “development for the purpose of an electricity transmission or distribution network, carried out by, or on behalf of, an electricity supply authority or public authority without consent on any land”.

The proposal is characterised as an electricity transmission network under the Infrastructure SEPP which defines an “electricity transmission or distribution network” to include:

- > Above or below ground electricity transmission or distribution lines (and related bridges, cables, conductors, conduits, poles, towers, trenches, tunnels, ventilation and access structures)
- > Above or below ground electricity kiosks or electricity substations, feeder pillars or transformer housing, substation yards or substation buildings.

TransGrid is defined as an electricity supply authority under cl.40 of the Infrastructure SEPP being both an energy services corporation under the *Energy Services Corporations Act 1995* and also a transmission operator under the *Electricity Supply Act 1995*. Therefore, the proposed electricity transmission and distribution works is permissible without consent pursuant to cl.41 of the Infrastructure SEPP.

## 4.2 NSW environmental planning legislation and approvals

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The EP&A Act and the EP&A Regulation are the primary pieces of legislation regulating land use planning and development assessment in NSW. This legislation is supported by a range of environmental planning instruments including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).

Section 5.13 of the EP&A Act provides for the declaration of State Significant Infrastructure (SSI) and Critical State Significant Infrastructure (CSSI), while Part 5.2 of the EP&A Act establishes the assessment and approval regime for SSI and CSSI (refer to Section 4.1.3).

The requirements of Clause 192 of the EP&A Regulation for applications seeking approval of the Minister for Planning to carry out SSI are also addressed in the following sections.

### 4.2.1 NSW State Significant Infrastructure (SSI)

As stated above, Clause 41 of *State Environmental Planning Policy (Infrastructure) 2007* permits development for the purpose of an electricity transmission or distribution network to be carried out by, or on behalf of, a public authority without consent, provided that the project is not carried out on land reserved under the *NSW National Parks and Wildlife Act 1974* (NP&W Act).

Therefore, the proposal can be assessed under Part 5 of the EP&A Act. Development consent (under Part 4 of the EP&A Act) from the relevant Council is not required.

TransGrid, as the proponent, has formed the view that the proposal is likely to significantly affect the environment (as a result of potential impacts including, but not limited to, biodiversity, Aboriginal heritage, land use and visual impacts) and therefore requires the preparation of an EIS under Part 5, Division 5.2 of the EP&A Act.

The proposal has been declared to be SSI and CSSI under sections 5.12 (4) and 5.13 of the EP&A Act respectively. Schedule 5 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) has been amended to include the project as CSSI under clause 15.

On this basis, the proposal is to be assessed as CSSI and subject to Division 5.2 of the EP&A Act.

#### **4.2.2 Planning approval process under Part 5.1 of the EP&A Act**

Following the receipt of the Secretary's environmental assessments requirements, TransGrid would prepare and publicly exhibit an EIS in accordance with the Secretary's environmental assessment requirements and the requirements of the EP&A Regulation (as per section 5.16 of the EP&A Act).

The NSW Department of Planning, Infrastructure and Environment (DPIE) would place the EIS on public exhibition for a minimum of 30 days (as per section 5.17 of the EP&A Act). During the exhibition period, government agencies, proposal stakeholders and the community would be able to review the EIS and would have an opportunity to make a written submission to the DPIE for consideration in its assessment of the proposal.

At the completion of the public exhibition period, the DPIE would collate and provide TransGrid with a copy of all submissions received during the exhibition period. After reviewing the submissions, TransGrid would prepare a submissions report for the proposal that responds to the relevant issues raised. If changes are required as a result of the issues raised or to minimise environmental impact, a preferred infrastructure report may also be required. If this is required, TransGrid would prepare the report to address the changes to the design to minimise impacts and submit this for review to the DPIE. This report may be available for public review.

The assessment and approval process for the proposal is shown in **Figure 4-1**.

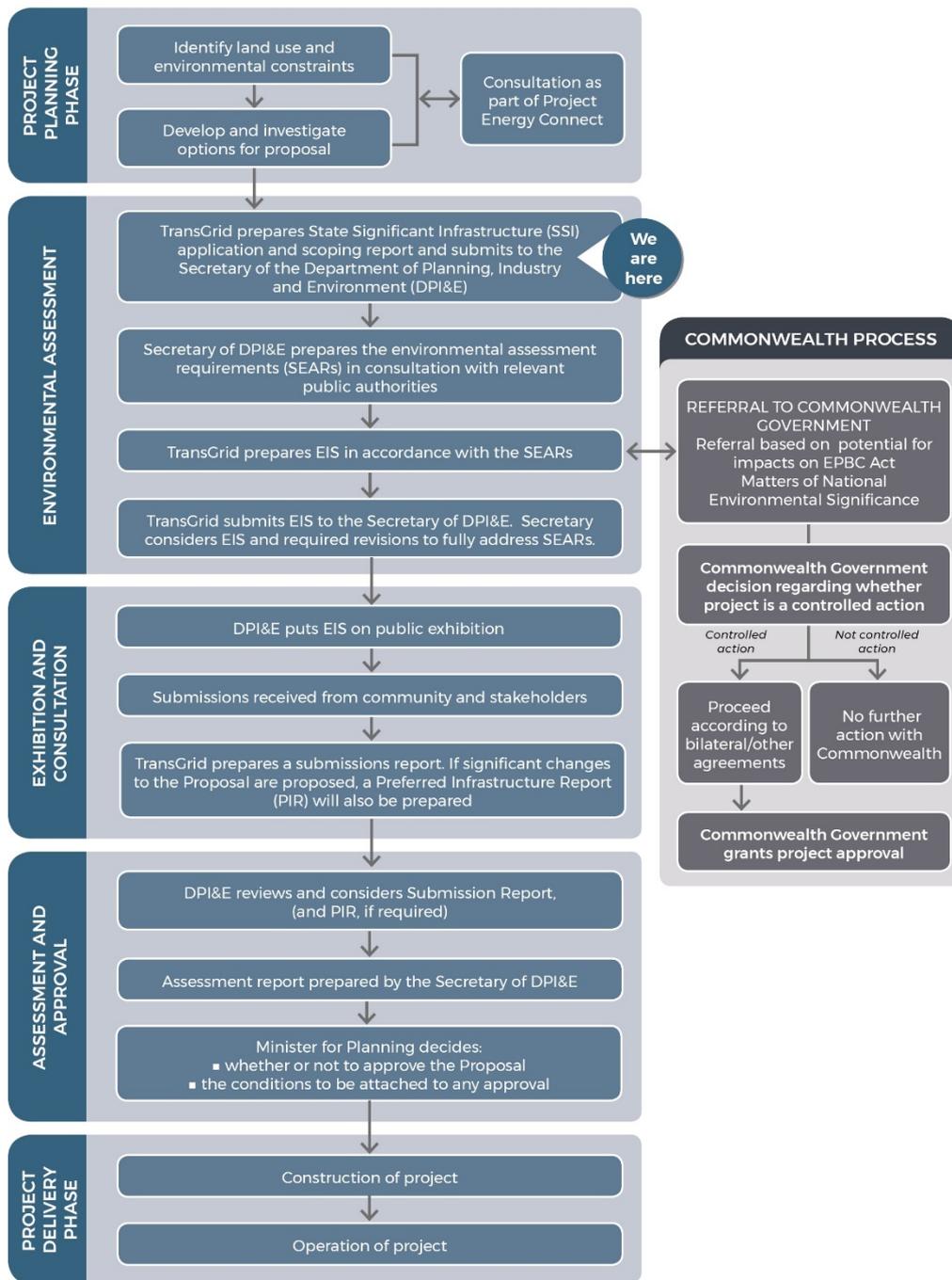


Figure 4-1: Assessment and approval process for the proposal

### 4.2.3 NSW environmental planning instruments

Section 5.22 of the EP&A Act provides that environmental planning instruments (such as Local Environmental Plans (LEPs) and State Environmental Planning Policies (SEPPs)) do not apply to State significant infrastructure projects. Notwithstanding, the key environmental planning instruments have been considered with respect to the proposal for consistency. These instruments are discussed in **Table 4-1**.

**Table 4-1: Environmental planning instruments of potential relevance to the proposal**

Environmental planning instruments	Relationship to Project EnergyConnect
<p><i>State Environmental Planning Policy (State and Regional Development) 2011</i></p>	<p>This SEPP identifies development that is State significant development (SSD), SSI and CSSI. As outlined in Section 4.1.2, due to the potential impacts associated with the proposal, it is considered that the proposal would fall within SSI.</p> <p>The proposal has been declared as CSSI, by Ministerial order, under section 5.13 of the EP&amp;A Act. Schedule 5 of the SRD SEPP has been amended to include the proposal as CSSI.</p>
<p><i>State Environmental Planning Policy No 44 – Koala Habitat Protection</i></p>	<p>This SEPP aims to encourage the proper conservation and management of natural vegetation areas that provide habitat for koalas to ensure that permanent, free living areas are maintained over their present range. The policy applies to a number of LGAs across NSW, including Wentworth.</p> <p>While the requirements of SEPP 44 would not apply to the proposal (as it would not be subject to council consent), TransGrid would consider the relevant SEPP 44 criteria as part of the EIS process and biodiversity impact assessment for the proposal.</p>
<p><i>State Environmental Planning Policy No. 55 – Remediation of Land</i></p>	<p>This SEPP provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. In accordance with Clause 7(1) of SEPP 55, a consent authority must not consent to the carrying out of development on any land unless:</p> <ul style="list-style-type: none"> <li>&gt; It has considered whether the land is contaminated</li> <li>&gt; If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out</li> <li>&gt; If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land would be remediated before the land is used for that purpose.</li> </ul> <p>A Phase 1 contamination investigation would be undertaken in accordance with the <i>Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land</i> (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) to inform the design of the proposal and EIS process.</p>
<p><i>State Environmental Planning Policy (Primary Production and Rural Development) 2019</i></p>	<p>This SEPP aims to facilitate the orderly economic use and development of land for primary production, and reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources. The SEPP is also intended to identify land which has been declared to be State Significant agricultural land (currently no land identified by the SEPP).</p> <p>As the proposal would likely impact on areas of primary production and agriculture, the provisions of this SEPP would be further considered as part of the EIS process for the proposal.</p>

## 4.2.4 Local environmental plans

The proposal would be located within Wentworth local government areas (LGA) and thus fall within Wentworth local environmental plan (LEP).

While the LEP guides development within the LGA, the EP&A Act expressly provides that LEPs do not apply to State significant infrastructure projects. Therefore the LEP is not further referenced.

## 4.2.5 Other NSW environmental planning approvals

### 4.2.5.1 Approvals or authorisations that are not required or cannot be refused

In accordance with Section 5.23 of the EP&A Act some planning legislation does not apply to critical State significant infrastructure or must be applied consistently with an approved critical infrastructure project

Approvals of potential relevance to the proposal include:

- > Permits under Sections 201, 205 and 219 of the *Fisheries Management Act 1994* (FM Act)
- > Approvals under Part 4, excavation permits under Section 139 and Division 8 of Part 6 of the *Heritage Act 1977*
- > Aboriginal heritage impact permits under Section 90 of the NP&W Act
- > Various approvals under the *Water Management Act 2000*, including water use approvals under Section 89, water management work approvals under Section 90, and activity approvals (other than aquifer interference approvals) under Section 91.

Similarly, Section 5.3 of the EP&A Act specifies directions, orders or notices cannot be made or given so as to prevent or interfere with the carrying out of approved CSSI. Of relevance to the proposal would be:

- > An interim protection order (within the meaning of the NP&W Act or the *Biodiversity Conservation Act 2016*)
- > An order under Division 1 (Stop work orders) of Part 6A of the NP&W Act, Division 1 (Stop work orders) of Part 7 of the *Threatened Species Conservation Act 1995* or Division 7 (Stop work orders) of Part 7A of the FM Act
- > An environment protection notice under Chapter 4 of the *Protection of the Environment Operations Act 1997* (PoEO Act)
- > An order under section 124 of the *Local Government Act 1993*.

Section 5.24 of the EP&A Act identifies approvals or authorisations that cannot be refused if they are necessary for carrying out approved State significant infrastructure and are substantially consistent with the Part 5.2 approval, including:

- > Environment protection licences (EPLs) under Chapter 3 of the PoEO Act
- > Consent (Road Occupancy Licence) under Section 138 of the *Roads Act 1993* from the relevant roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a road.

With respect to EPLs, Schedule 1 of the PoEO Act, does not define electrical transmissions lines or substations as a scheduled activity requiring an EPL.

With respect to Road Occupancy Licences, the proposal would potentially require temporary/partial closure of classified and unclassified roads for the construction of the proposal. TransGrid is a private entity and would therefore require consent to undertake work on roads under clause 5(1) of Schedule 2 of the *Roads Act 1993*. The contractor would be responsible for this.

#### 4.2.5.2 Other NSW legislation

**Table 4-2** discusses other NSW legislation that would be, or may be, applicable to the proposal regardless of the proposal being declared CSSI. The applicability would be confirmed in the EIS.

**Table 4-2: Other typical planning related legislation of potential relevance to the proposal**

Legislation	Requirement
<i>National Parks and Wildlife Act 1974</i>	In general terms, for a use to be authorised to occur on land reserved under the NP&W Act, it needs to be consistent with the object of the Act and with any plan of management for the reserve.
<i>Water Management Act 2000</i>	<p>The NSW <i>Aquifer Interference Policy</i> (Department of Primary Industries, 2012) documents the NSW Government's intention to implement the requirement for approval of 'aquifer interference activities' under the <i>Water Management Act 2000</i>.</p> <p>It is not anticipated that the proposal would interfere with any aquifers as the proposal would not likely require excavation to a sufficient depth to intercept an aquifer or result in drawdown. This would be confirmed as part of the ongoing design development including the final alignment details, transmission line structure locations and depth of groundwater.</p>
<i>Contaminated Land Management Act 1997</i>	This Act outlines the circumstances in which notification of the NSW Environment Protection Authority (EPA) is required in relation to the contamination of land. This may become relevant during construction and / or operation of the proposal and would be discussed in greater detail in the EIS.
<i>Crown Land Act 1989</i>	<p>Ministerial approval is required to grant a 'relevant interest' (i.e. a lease, licence, permit, easement or right of way) over a Crown Reserve if required.</p> <p>The alignment of the proposal includes areas of Crown Land. Any impacts to Crown Land would be discussed in greater detail in the EIS.</p>
<i>Biodiversity Conservation Act 2016</i>	<p>This Act aims to conserve threatened species, populations and ecological communities through ensuring appropriate assessment, management and regulation of actions that may damage critical or other habitat for a listed threatened species, or may otherwise significantly affect a threatened species, population or ecological community.</p> <p>The EIS for the proposal would include an assessment of biodiversity impacts (refer to section 7.1).</p>
<i>Noxious weeds Act 1993</i>	This Act would apply to the control of all noxious weeds encountered during the construction of the proposal. As discussed above, the EIS for the proposal would include an assessment of biodiversity impacts (refer to section 7.1).
<i>Native Title (NSW) Act 1994</i>	<p>This Act provides for native title in relation to land or waters. The <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW 2010a) stipulates that where relevant, consultation must be conducted with Native title holders or registered native title claimants in accordance with the Native Title Act 1994.</p> <p>The EIS for the proposal would include an assessment of native title and Aboriginal heritage impacts (refer to section 7.2).</p>

Legislation	Requirement
<i>Heritage Act 1977</i>	The Heritage Council must be notified if a relic is uncovered during construction and if it is reasonable to believe that the Heritage Council is unaware of the location of the relic. The Heritage Council must also be notified if an item listed on a Government Agency's Section 170 Heritage Register is demolished.  The EIS for the proposal would include an assessment of potential heritage impacts (refer to section 7.3).
<i>Aboriginal Land Rights Act (NSW) 1983</i>	This Act applies to Crown lands that are not lawfully needed for an essential public purpose; referred to as claimable Crown land. No claimable Crown lands have been identified that would be affected by the proposal. This would be confirmed as part of the preparation of the EIS.
<i>Waste Avoidance and Resource Recovery Act 2001</i>	This Act encourages the most efficient use of resources in order to reduce environmental harm.  Waste and resource impacts associated with the proposal would be considered as part of the EIS.

### 4.3 Commonwealth legislation

The EPBC Act requires referral to the Commonwealth Minister for the Environment and Energy for any actions that are likely to have a significant impact on the following:

- > Matters of National Environmental Significance (NES)
- > An action by the Commonwealth or a Commonwealth agency which has, will have or is likely to have a significant impact on the environment
- > An action which has, will have or is likely to have a significant impact on the environment on Commonwealth land, no matter where it is to be carried out.

TransGrid is not a Commonwealth agency and a preliminary assessment of the proposal indicates no Commonwealth land would be affected.

As discussed in the sub-sections below, there is potential for the proposal to have an impact on Matters of NES, being a listed threatened species or ecological community.

### 4.3.1 Matters of National Environmental Significance (MNES)

A search of the EPBC Act Protected Matter Search Tool (PMST) for the preliminary alignment corridor was conducted in July 2019 to identify potential matters of MNES that may trigger the need for referral of the action to the Australian Department of the Environment and Energy (DEE). The results are presented in **Table 4-3**.

**Table 4-3: MNES under the EPBC Act**

MNES	Matters within the preliminary alignment corridor
World heritage properties	None
National heritage places	None
Wetlands of international importance	<p>None</p> <p>The PMST identified three Wetlands of International Importance (Ramsar) near the preliminary alignment corridor:</p> <ul style="list-style-type: none"> <li>&gt; Riverland located within Chowilla Game Reserve in SA. This is located approximately 2.5 km to the south-west of the western end of the proposal study area.</li> <li>&gt; Banrock Station Wetland Complex in SA. This Wetland Complex is located approximately 25 km west of the NSW border</li> </ul> <p>These wetlands have not been considered further in this report.</p>
Great Barrier Reef Marine Park	None
Commonwealth listed threatened species and ecological communities	<p>Twenty-five listed threatened species (19 fauna and six flora) and two Threatened Ecological Communities (TECs) are listed as likely to occur or have modelled habitat that is known from the preliminary alignment corridor, and may potentially occur. The TECs include:</p> <ul style="list-style-type: none"> <li>&gt; Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions</li> <li>&gt; Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions.</li> </ul>
Commonwealth listed migratory species	Thirteen listed migratory species may occur in the preliminary alignment corridor.
Nuclear action	The proposal would not result in any nuclear action nor would any nuclear activity need to be undertaken.
Commonwealth marine area	None

Based on the current proposed design for the proposal and understanding of site conditions, it is anticipated that the proposal could potentially result in significant impacts on Commonwealth listed threatened species.

An EPBC Act referral would be made to DEE to consider whether the proposal would be considered to be a controlled action. The DEE will then be able to determine if the proposal is considered to be a 'controlled' action on the basis of potential impacts to the listed threatened species.

### 4.3.2 Native Title Act 1993

The main objective of the Commonwealth *Native Title Act 1993* is to recognise and protect native title. Section 8 states that the *Native Title Act 1993* is not intended to affect the operation of any law of a State or a Territory that is capable of operating concurrently with the Act.

The Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010a) stipulates that where relevant, consultation must be conducted with Native title holders or registered native title claimants. The potential impacts of the proposal on this title would be considered as part of the preparation of the EIS.

### 4.3.3 Aboriginal Land Rights Act 1983

The Commonwealth *Aboriginal Land Rights Act 1983* establishes the NSW Aboriginal Land Council and local Aboriginal land councils. The Act requires these bodies to:

- > Take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law
- > Promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The preamble of the *Aboriginal Land Rights Act 1983* states that land was traditionally owned and occupied by Aboriginal people and accepts that as a result of past government decisions, the amount of land set aside for Aboriginal people was reduced without compensation. To redress the loss of land, Aboriginal land councils can claim Crown land which, if granted, is transferred as freehold title.

'Claimable Crown lands' includes Crown lands that are not lawfully used or occupied and that are not needed, nor likely to be needed, for an essential public purpose.

No claimable Crown lands have been identified that would be affected by the proposal. This would be confirmed as part of the preparation of the EIS.

# 5. Engagement

## 5.1 Introduction

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TransGrid is committed to an engagement process that is proactive, transparent and represents a genuine desire to work with our stakeholders. TransGrid recognises that a two-way feedback process is the key to understanding the needs and views of stakeholders and communities that are directly and indirectly affected by its operations. Throughout the development of the proposal, TransGrid will engage with affected and interested parties so that project planning is informed by input from stakeholders and communities in line with both regulatory requirements and TransGrid internal policies and standards.

Engagement during the development of the Scoping Report has been focused on developing feasible route options through direct dialogue with the relevant landholders, Local Government, Traditional Owners groups and other key stakeholders.

## 5.2 Engagement considerations and principles

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TransGrid has based its approach to engagement on a structured process to ensure consistent, targeted and meaningful engagement. A Community and Stakeholder Engagement Plan (CSEP) was developed in broad alignment with the *Draft Environmental Impact Assessment Guidance Series: Community Guide to EIA* (DPEa, 2017) to set Project EnergyConnect (including the proposal) up with an appropriate framework that will be tailored further as the approvals process and associated requirements are defined.

To ensure alignment with leading practice, in addition to the *Draft Environmental Impact Assessment Guidance Series* a range of TransGrid and industry standards and guidelines for community and stakeholder engagement were also considered including:

- > TransGrid Stakeholder Engagement Charter (2015)
- > TransGrid Landholder Easement and Compensation Guide (2019)
- > International Association for Public Participation (IAP2) *Quality Assurance Standard* (IAP2, 2015)
- > Clean Energy Council *Community Engagement Guidelines* (CEC, 2018).

TransGrid recognises the importance of early and effective engagement with communities and stakeholders and is committed to the following:

- > Undertaking a structured, transparent and meaningful approach to working with stakeholders indirectly and directly affected by the Project EnergyConnect (including the proposal)
- > Tailoring engagement and communications to consider different stakeholder needs and expectations, particularly for directly affected stakeholders
- > Enabling stakeholder participation into the route selection process in a manner that is clear and transparent and ensures stakeholders understand how their feedback will be utilised / influence the process
- > Providing stakeholders with opportunities to participate and providing sufficient and timely information to enable them to provide informed feedback
- > Providing stakeholders with information on how their feedback has been utilised in the decision-making process.

### 5.3 Engagement undertaken as part of route selection methodology

A robust approach to route selection based on a “hierarchy of constraints” model was developed to inform route narrowing and eventual selection. The route selection assessment methodology was framed based on the desired outcomes and objectives outlined below. Critical to the development of an appropriate methodology was meaningful stakeholder participation in both the development and implementation of the methodology.

Refer to **Figure 2-4** which demonstrates the route selection process and integration with stakeholder engagement at critical stages.

### 5.4 Stakeholders

TransGrid has identified relevant stakeholders across the NSW Project EnergyConnect corridor, including the proposal, and for the project lifecycle. **Table 5-1** provides an initial list of stakeholder groups who have been/will be engaged throughout Project EnergyConnect and specifically for the proposal. The focus is on stakeholders relevant to the scope of the Community and Stakeholder Engagement Plan. This will assist in ensuring the engagement and communications approach considers the broader Project EnergyConnect context and appropriately manages stakeholder and reputational risks from the outset of engagement and communications activities.

**Table 5-1: Stakeholder groups for Project EnergyConnect (NSW)**

Stakeholder Group	Description
Government – Political Representatives	<ul style="list-style-type: none"> <li>&gt; Government of South Australia (Department for Energy and Mining, Department of the Premier and Cabinet)</li> <li>&gt; Minister for Energy and Mining, the Hon Dan van Holst Pellekaan Member of Parliament (MP) (SA)</li> <li>&gt; The Hon Premier Steven Marshall (SA)</li> <li>&gt; The Hon Premier Gladys Berejiklian (NSW)</li> <li>&gt; Minister for Energy and Environment, The Hon Matthew Kean (NSW)</li> <li>&gt; The Hon Angus Taylor, Minister for Energy (Cwth).</li> </ul>
Energy Regulator / Operator	<ul style="list-style-type: none"> <li>&gt; AEMO</li> <li>&gt; Australian Energy Regulator</li> <li>&gt; Australian Energy Market Commission</li> <li>&gt; Energy Security Board.</li> </ul>
Federal Members	<ul style="list-style-type: none"> <li>&gt; Member for Riverina, The Hon Michael McCormack MP</li> <li>&gt; Member for Farrer, The Hon Sussan Ley MP.</li> </ul>
State Members	<ul style="list-style-type: none"> <li>&gt; Member for Murray, Helen Dalton MP</li> <li>&gt; Member for Cootamundra, Steph Cooke MP.</li> </ul>

Stakeholder Group	Description
Local government – Elected Officials/ Executive Staff	<ul style="list-style-type: none"> <li>&gt; Balranald Shire Council</li> <li>&gt; Carrathool Shire Council</li> <li>&gt; Edward River</li> <li>&gt; Griffith Shire Council</li> <li>&gt; Hay Shire Council</li> <li>&gt; Lockhart Shire Council</li> <li>&gt; Murray River Council</li> <li>&gt; Murrumbidgee Council</li> <li>&gt; Narrandera Shire Council</li> <li>&gt; Wagga Wagga City Council</li> <li>&gt; Wentworth Shire Council.</li> </ul>
Government – Departmental	<ul style="list-style-type: none"> <li>&gt; DEE</li> <li>&gt; DPIE</li> <li>&gt; NSW Crown Lands</li> <li>&gt; NSW Environment, Energy and Science</li> <li>&gt; Department of Premier and Cabinet (heritage))</li> <li>&gt; Centre for Property Acquisition</li> <li>&gt; Department of Finance, Services and Innovation,</li> <li>&gt; SafeWork NSW.</li> </ul>
Major developments	<ul style="list-style-type: none"> <li>&gt; Major developments (existing, under approval and future) that may be impacted by Project EnergyConnect (including the proposal).</li> </ul>
Directly impacted landholders (in corridor)	<ul style="list-style-type: none"> <li>&gt; Landholders (owners, occupiers, lease and other interest holders in the corridor).</li> </ul>
Traditional Owners and other Aboriginal Groups	<ul style="list-style-type: none"> <li>&gt; Barkandji Traditional owners (Native Title Group)</li> <li>&gt; Barkindji Maroura Elders Council</li> <li>&gt; Ta-Ru Board of Management / Maraura Barkintji Traditional Owners</li> <li>&gt; Barkindji-Maraura Elders Environmental Team</li> <li>&gt; Dareton Local Aboriginal Land Council</li> <li>&gt; Local Aboriginal Land Councils – Dareton.</li> <li>&gt; NSW ALC</li> </ul>
Local land users	<ul style="list-style-type: none"> <li>&gt; Local land users e.g. irrigators, farmers within above mentioned Council area not considered directly impacted or adjacent landholders.</li> </ul>
Local Community	<ul style="list-style-type: none"> <li>&gt; Local communities within Council areas.</li> </ul>
Local Suppliers	<ul style="list-style-type: none"> <li>&gt; Local suppliers within the Riverina.</li> </ul>
Other Suppliers	<ul style="list-style-type: none"> <li>&gt; NSW and Australian suppliers.</li> </ul>
Industry Groups	<ul style="list-style-type: none"> <li>&gt; NSW Farmers Association.</li> </ul>
Interest Groups	<ul style="list-style-type: none"> <li>&gt; Local progress associations, issue-specific interest groups.</li> </ul>
Media	<ul style="list-style-type: none"> <li>&gt; Local, State and National print, radio and television including: Sunraysia Daily, The Mildura Weekly, ABC Radio Riverina.</li> </ul>
General Public	<ul style="list-style-type: none"> <li>&gt; General members of the public who may take an interest in Project EnergyConnect (including the proposal).</li> </ul>

## 5.5 Opportunities for participation

A wide-ranging engagement program was developed to consider the range of stakeholders who may be potentially impact by or interested in Project EnergyConnect and the proposal. **Table 5-2** outlines the range of engagement opportunities provided to date.

**Table 5-2: Engagement activities**

Activity/consultation method	Summary
Toll free community enquiry number	A dedicated toll-free telephone number (1800 490 666) has been created to receive and respond to enquiries from the community and interested stakeholders.
Email address	A dedicated email address ( <a href="mailto:pec@transgrid.com.au">pec@transgrid.com.au</a> ) has been created to receive and respond to enquiries from the community and interested stakeholders.
Project EnergyConnect Website	The Project EnergyConnect website provides information on the project background and need, project milestones and timelines, and links to get involved. During route selection, information and opportunities have been provided to enable stakeholder participation in the route selection process, including. an interactive map.
Online interactive map	A digital engagement tool that allows stakeholders to provide comments on opportunities and constraints for the proposed route across a number of topics (environment, social, existing and future land use, visual amenity etc). This is a transparent tool that displays the comments provided.
E-newsletter	Project EnergyConnect e-newsletter is available for the public to sign up and keeps the community informed on latest information regarding the project. Sign up is easy and via the webpage.
Stakeholder briefings	Briefings and presentations have been conducted with relevant local Councils and key industry stakeholders. The briefings have included presentations and discussions on the need for the Project EnergyConnect, any upcoming planning issues that all parties should be aware of, how stakeholders would like to be engaged, and any other topics of interest. Workshops have also been held with Councils to secure their feedback into the route selection process.
One-on-one Meetings	Face to face meetings occurred with potentially affected landholders within the preliminary alignment corridor from the SA/NSW border to Buronga, and all landholders affected by the refined proposal study area. These meetings have focused on securing landholder input into the route selection process and have focused on understanding their properties, current or future land use, and their views regarding potential constraints and opportunities. This feedback was captured on holding maps and recorded in TransGrid's stakeholder management system.

Activity/consultation method	Summary
Media and advertisements	<p>Print advertisements were run in The Sunraysia Daily and the Mildura Weekly to advertise the community drop-in sessions.</p> <p>An interview was also given by TransGrid to ABC Mildura broadcast on 9 May 2019. The focus of communication via media was to raise general awareness of the project and opportunities for stakeholders to participate.</p> <p>Print advertisements placed in the Koori Mail and the Sunraysia Daily on the 27 February 2019 requesting registration of Aboriginal stakeholders interested in Project EnergyConnect (including the proposal).</p>
Factsheets	<p>Two factsheets were developed for Project EnergyConnect:</p> <p><b>General project factsheet:</b> explained the Project EnergyConnect (including the proposal) and context. The focus was to provide stakeholders with a general understanding of the Project EnergyConnect and how stakeholders could participate in Project EnergyConnect.</p> <p><b>Selection methodology factsheet:</b> to illustrate the route selection methodology from the Border to Buronga with background information on the Project EnergyConnect. This factsheet is available for download online, in hardcopy at the drop-in sessions and was also provided at face to face meetings.</p> <p>The development of this factsheet is aligned to the current stage of the proposal and the particular focus of the community, as is evident by the frequency of this topic being the main focus of feedback received to date (refer Table 5.4).</p> <p>As the project progresses, additional factsheets will be developed, for example land access and acquisition, environmental studies and cultural heritage.</p>
Feedback form/Online Survey	<p>Hardcopy feedback forms were made available at each drop-in session as well as online on the project website. The purpose was to secure both general stakeholder feedback regarding the Project and more specific feedback on the route selection process.</p>
Community drop-in sessions	<p>Two community information sessions were held to provide information regarding Project EnergyConnect:</p> <ul style="list-style-type: none"> <li>&gt; Wentworth on 7 May 2019</li> <li>&gt; Buronga on 8 May 2019.</li> </ul> <p>Both sessions lasted for five hours and were focused on providing general project information, information regarding route selection and enabling stakeholder feedback generally and more specifically regarding route selection.</p>

Activity/consultation method	Summary
Social media	<p>TransGrid's Facebook page has shared various updates in relation to the project. This includes advertising community drop-in sessions and online resources and participation options. The focus of the posts has been to increase general awareness of the Project and opportunities for stakeholders to participate.</p> <p>TransGrid's Facebook page is at:  <a href="https://www.facebook.com/TransGrid/?ref=br_rs">https://www.facebook.com/TransGrid/?ref=br_rs</a></p> 
Community hubs	<p>A digital display was set up at the Midway Centre at Buronga to provide an introduction to Project EnergyConnect and encourage interested parties to visit the interactive feedback tool to find out more and provide their feedback. At this stage of the project the focus is on enabling stakeholders to provide their feedback into route selection and comment on Project EnergyConnect more generally.</p>

### 5.5.1 Participation

Over 300 hundred engagement activities have been undertaken since November 2018 for the proposal, ranging from community drop-in sessions and council briefings to face-to-face meetings with directly affected landowners, to phone calls and direct correspondence via email. Consultation was carried out with the following NSW Government agencies:

- > Environment Energy and Science (EES) (previously referred to as Office of Environment and Heritage (OEH)) in regard to biodiversity
- > Department of Premier and Cabinet (formerly Heritage office in OEH) for heritage matters
- > NSW Crown Lands
- > DPIE.

**Table 5-3** outlines the range and number of activities undertaken and the stakeholder involved.

**Table 5-3: Engagement participation for the proposal**

Engagement Activity	Quantity	Stakeholder Group
Phone Calls (Incoming/Outgoing)	186	> Landholders
Emails (Incoming/Outgoing)	90	> Landholders
Meetings	58	> Local Government: Wentworth Shire Council. > State Government: OEH and NSW Crown Lands > Local MPs > Landholders > Registered Aboriginal Parties (RAP) > NSW Aboriginal Land Council
Letters	47	> Landholders
Drop in sessions	Two: > 7 May 2019 (Wentworth) > 8 May 2019 (Buronga)	> Landholders > Community
Public events	Wentworth Agricultural Show	> Landholders > Community
Interactive Map	Two comments	> Community
Media advertisements	Four	> Community > RAPs
Survey online/hardcopy	One response	> Community > Landholders

## 5.6 Summary of feedback received

Stakeholders have provided a variety of feedback across numerous themes. **Table 5-4** provides an overview of the feedback received by theme, the frequency that feedback within the theme was received and a high-level overview of the feedback focus, since November 2018.

**Table 5-4: Feedback themes**

Theme	Frequency	Focus of feedback
Corridor selection methodology/proposed alignment	284	Opportunities for alignment, preferences for alignment, known and unknown constraints.
Acquisition (easement and property)	47	Pending agreement and alignment: requirement for easement. What having an easement involves.
Structure design	21	Size and shape of proposed structures.
Construction impacts	15	Access to property for construction, potential impacts arising during construction (Noise, dust, work hours, behaviour, parking and traffic, safety etc).

Theme	Frequency	Focus of feedback
Land use and property	14	Current and future land use planning, existing farm infrastructure.
Landscape character and visual amenity	13	Impact of structures on sightlines, especially on river views; impact on property value if visual amenity reduced.
Soil and water	11	Wentworth to Broken Hill pipeline, access to water for construction.
EMF	6	Concerns about EMF in proximity to residences.
Traffic and access	6	Haulage routes, access to towns and property for constructions and work camps.
Non-Aboriginal heritage	5	Identification of historical buildings, farm houses, shearing sheds etc.
Biodiversity	4	Vegetation identification and potential impacts to native vegetation.
Socio-economic	3	Economic impacts and benefits of construction on towns, job and supplier opportunities.
Aboriginal heritage	3	Identification and protection of heritage items.
Interruption to electricity supply	1	Impact on supply during any rebuilding existing infrastructure

## 5.7 How feedback has been used

Feedback received has been used to inform route alignment from the NSW/SA border to Buronga. At a general level feedback from non-landholder stakeholders was used to test existing assumptions regarding Tier 1, Tier 2 and Tier 3 constraints and to ensure no Tier 1 and 2 constraints had been missed. Feedback regarding potential opportunities to minimise disturbance was used to assist in identifying potential areas where existing infrastructure is located, or disturbance has occurred.

At a directly affected landholder level more specific and targeted feedback was secured. Holding maps were drafted and used to record feedback from landholders so that landholders could identify opportunities and constraints specific to their properties. This information was then used to refine the alignment, both on specific properties and through the corridor more generally. On each occasion, updated holding maps were created to illustrate the feedback given and to show how landholder feedback changed the alignment.

In combination with the engineering, environmental, land use and social studies, the feedback received has enabled the narrowing of the original 10 km preliminary alignment corridor to the proposal study area.

## 5.8 Future engagement

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Engagement will continue on specific issues and opportunities relevant to the proposal to inform the preparation of the EIS, as well as general engagement regarding Project EnergyConnect more broadly. The next stage of community and stakeholder engagement will build on relationships established through early engagement activities and will complement formal consultation required under planning regulations, including activities that may be stipulated in the SEARs.

The following community and stakeholder engagement mechanisms and activities will continue to occur during the preparation of the EIS:

- > One-on-one meetings
- > Stakeholder briefings
- > Community information sessions/attendance at community organised events
- > Stakeholder and community group presentations and briefings
- > Project toll free community inquiry number
- > Project email address
- > Project webpage
- > Interactive Project EnergyConnect map focused on collecting stakeholder feedback on the proposed route
- > Communications materials (newsletters, letters and fact sheets)
- > E-Newsletter
- > Media and advertisements
- > Social media.

All stakeholder engagement will continue to be collected and recorded in a structured and formal manner, through the use of TransGrid's internal database system. Engagement approaches will be evaluated and reviewed on a quarterly basis to ensure these are providing adequate participation opportunities and responding to stakeholder needs and expectations.

# 6. Identification of key assessment issues

TransGrid recognises the need to carefully consider potential impacts on the environment and local communities, and to minimise these impacts wherever reasonable and feasible to do so. In taking this approach, the benefits of the proposal can be realised with the least net cost to the environment and the public.

## 6.1 Approach to identification of key assessment issues

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An initial review (including desktop assessment and mapping from information currently available) of potential issues for consideration in the EIS has been undertaken with the aim of determining, in general terms, the likely level of assessment required to adequately and appropriately address each issue. In undertaking the initial review, consideration has been given to the significance of each potential environmental impact and also to the likely level of stakeholder interest in each issue. Inclusion of stakeholder perceptions of potential environmental impacts is considered an important part of determining the level of assessment that would be applied given that key stakeholder concerns may not necessarily align with a purely technical analysis of environmental risks. By combining the likely significance of each environmental impact with the expected level of stakeholder interest or concern, an assessment has been made of whether each issue is key to the assessment of the proposal, and whether a detailed specialist investigation or desktop analysis would be appropriate. Where a high level of stakeholder interest is expected, the potential environmental impact has been considered a key issue requiring detailed assessment irrespective of the outcomes of environmental mapping and review.

## 6.2 Initial environmental risk assessment

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The preliminary environmental risk assessment for the proposal has included consideration of the likelihood of an environmental impact occurring and the unmitigated consequence of that impact. It is noted that mitigation measures may or may not be available to treat each relevant risk.

## 6.3 Identification of key environmental issues

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Based on the review, data available and mapping undertaken so far, key issues for the environmental planning and EIA of the proposal have been identified and are summarised below. These issues are considered in further detail in **Section 7** and **Section 8** of this ESR.

For each of the issues an assessment of the significance of the issue has been made based on the knowledge and understanding of the issue, which took into account both the assessment of environmental significance and assumed level of stakeholder interest. Based on this, issues were categorised as to whether they represented a key issue or a more general issue.

These environmental assessment categorisations would be reviewed and updated where relevant as more detailed environmental investigations are undertaken to inform the preparation of the EIS for the proposal.

### 6.3.1 Summary of environmental issues

Given the largely undeveloped nature of the locality and predominant agricultural, recreational and tourist uses of the area, most environmental issues will require some level of assessment in the EIS. Key issues for the environmental planning and impact assessment of the proposal, identified on the basis that they are both most likely to occur and represent the greatest change to the existing environment, are as follows:

- > Biodiversity
- > Aboriginal heritage
- > Non-Aboriginal heritage
- > Landuse and property
- > Landscape character and visual amenity
- > Fire risk
- > Social-economic
- > Surface water and hydrology.

Other issues requiring assessment but considered less likely to result in significant impacts, either based on a lower likelihood of occurrence or the absence of potential receivers, are as follows:

- > EMF
- > Air quality and Greenhouse Gas
- > Noise and vibration
- > Traffic and access
- > Soils and water quality
- > Waste management and resource use.

# 7. Preliminary environmental assessment

This section considers the key environmental assessment issues for the proposal, describing the general features of the existing environment, detailing how each issue is potentially impacted and specifying the assessment methodology for further assessment. For the purposes of this ESR, the preliminary alignment corridor and proposal study area was used for the preliminary environmental assessment. A wider 25 km buffer on the centreline of the preliminary alignment corridor was used for the biodiversity assessment – the biodiversity study area.

## 7.1 Biodiversity

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### 7.1.1 Existing environment

A preliminary ecological constraints assessment was undertaken (Jacobs 2019, **Appendix A**) that involved background database searches, literature review and site visits to preliminarily identify important biodiversity values including plant community types and habitat for threatened species. Full details of the methodology and results of these investigations are provided in **Appendix A**.

The biodiversity study area does not intersect with an area that has been declared an Area of Outstanding Biodiversity Value (AOBV) in accordance with the NSW *Biodiversity Conservation Act 2016* (BC Act). Following European settlement intensive land use resulted in the degradation of the natural environment via impacts such as land clearing, resultant higher salinity levels, and greater rates of erosion. The introduction of exotic flora and fauna has also impacted native flora and fauna and their habitats.

Database searches for the biodiversity assessment considered a 25 km buffer from the centreline of the preliminary alignment corridor. The following databases were reviewed:

- > BioNet - Office of Environment and Heritage (OEH) Threatened Species Profile Database (species records and threatened species profiles)
- > NSW Department of Primary Industries (DPI) freshwater threatened species distribution maps
- > The federal Department of Environment's Protected Matters Search Tool (PMST)
- > OEH BioNet Vegetation Classification database
- > Atlas of Living Australia (ALA)
- > The federal Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (GDE)
- > Department of Environment's Directory of Important Wetlands
- > Interim Biogeographical Regionalisation of Australia (IBRA).

The results of the database searches are summarised below.

#### 7.1.1.1 Database search findings

The proposal is located across three IBRA Bioregions and six IBRA subregions as summarised in **Table 7-1**. These bioregions are geographically distinct and based on common climate, geology, landform, native vegetation and species information.

Table 7-1: Interim Biogeographical Regionalisation of Australia (IBRA) area statistics for biodiversity study area

IBRA Region	IBRA Subregion
Darling Riverine Plains (DRP)	Great Darling Anabranh (DRP08)
	Pooncarie-Darling (DRP09)
Murray Darling Depression (MDD)	South Olary Plain (MDD01)
	Murray Mallee (MDD02)
Riverina (RIV)	Murray Scroll Belt (RIV06)
	Robinvale Plains (RIV05)

Conservation areas and important habitat around the biodiversity study area include Lake Victoria, and Mallee Cliffs National Park. No conservation areas are located within the proposal study area in NSW.

The major waterways of the Murray River, the Darling, Great Darling Anabranh River and Lake Victoria that occur within the biodiversity study area, are all considered key fish habitats (KFH). These waterways are shown in **Figure 1-2**. The proposal study area intersects only the Darling River and Great Darling Anabranh.

### 7.1.1.2 Commonwealth matters

The PMST indicated that six EPBC listed threatened flora, or their preferred habitat, have the potential to occur within the preliminary alignment corridor. Of these, four flora species are considered to possibly occur, with the remainder considered unlikely to occur (refer to **Appendix A** for further information and justification). These four species include *Atriplex infrequens* (A saltbush), *Swainsona murrayana* (Slender Darling-pea), *Swainsona pyrophila* (Yellow Swainson-pea), *Lepidium monoplacoides* (Winged Pepper-cress).

The PMST also identified 19 EPBC listed threatened fauna species (including one frog, 11 birds, two mammals and five fish species) as potentially occurring (or with suitable habitat occurring) within the preliminary alignment corridor. As the proposal would span across, and not directly impact, aquatic habitats (e.g. Darling Anabranh and Darling River), the five EPBC listed threatened fish species (*Bidyanus bidyanus* (Silver Perch), *Ceratocephalus fluviatilis* (Murray Hardyhead), *Galaxia rostratus* (Flathead Galaxia), *Maccullochella peelii* (Murray Cod) and *Macquaria australasica* (Macquarie Perch)) were not considered further in the preliminary ecological constraints assessment (**Appendix A**). However, these matters will be considered further as additional alignment and design information becomes available.

Of the 14 species considered further, four are considered likely to occur:

- > *Manorina melanotis* (Black-eared Miner)
- > *Litoria raniformis* (Southern Bell Frog)
- > *Leipoa ocellate* (Malleefowl)
- > *Polytelis anthopeplus monarchoides* (Regent Parrot).

Eight are considered as possible occurrences:

- > *Nyctophilus corbeni* (South-eastern Long-eared Bat or Corben's Long-eared Bat)
- > *Phascolarctos cinereus* (Koala combined populations of Qld, NSW),
- > *Pachycephala rufogularis* (Red-lored Whistler)
- > *Botaurus poiciloptilus* (Australian Bittern)
- > *Calidris ferruginea* (Curlew Sandpiper)
- > *Rostratula australis* (Painted Snipe)
- > *Grantiella picta* (Painted Honeyeater)
- > *Pedionomus torquatus* (Plains-wanderer)

Two are considered unlikely to occur in the preliminary alignment corridor:

- > *Numenius madagascariensis* (Eastern Curlew)
- > *Pezoporus occidentalis* (Night Parrot).

In addition, the PMST identified 13 EPBC listed migratory bird species, of which two species (*Numenius madagascariensis* (Eastern Curlew) and *Calidris ferruginea* (Curlew Sandpiper)) are also listed as threatened species under the EPBC Act and discussed above. Of the 11 remaining migratory species, only one (*Calidris acuminata* (Sharp-tailed Sandpiper)) is considered likely to occur, seven possibly to occur and three are unlikely to occur, primarily in salt lake, wetland / riverine habitats within the preliminary alignment corridor.

The PMST identified that the following EPBC Act listed TECs may occur in the preliminary alignment corridor (**Figure 7-1** shows the location of these in relation to the proposal study area which is within the preliminary alignment corridor):

- > Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (Endangered)
- > Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions (Endangered).

### 7.1.1.3 NSW State Matters

The preliminary database searches (presented in **Appendix A**) also identified around 52 threatened fauna and flora species listed under the BC Act that have the potential to occur within the biodiversity study area. The likelihood of these species occurring and potential for impacts as a result of the proposal would be considered further in the EIS phase, however a brief summary of the data follows.

There are records within the last 20 years within the biodiversity study area for 32 birds, eight mammals, five reptiles and one frog. The frog (Southern Bell Frog) also has a Commonwealth rating, and is listed above. The five reptiles are listed under the BC Act:

- > *Pachycephala rufogularis* (Red-lored Whistler)
- > *Pseudonaja modesta* (Ringed Brown Snake)
- > *Tiliqua occipitalis* (Western Blue-tongued Lizard)
- > *Aprasia inaurita* (Mallee Worm-Lizard)
- > *Delma australis* (Marble-faced Delma).

Of the six mammals, two have Commonwealth ratings and were listed above (Koala, Corben's Long-eared Bat). Of the 32 birds, seven are listed in under the Commonwealth EPBC Act and are listed above (Australian Painted Snipe, Black-eared Miner, Malleefowl, Painted Honeyeater, Plains Wanderer, Red-lored Whistler and Regent Parrot).

There are records for six state-listed flora within the last 20 years within the biodiversity study area, of which two species are also listed under the EPBC Act (*Solanum karsense*, Menindee Nightshade (Vulnerable); *Senecio behrianus* (Endangered)). *Senecio behrianus* is rated as presumed extinct in NSW and is known from specific locations with specific hydrological regimes. Refer Appendix A for further detail.

Several fish listed under the *Fisheries Management Act* also occur within the biodiversity study area:

- > *Pachycephala rufogularis* (Red-lored Whistler)
- > Murray Crayfish (*Euastacus armatus*),
- > Murray-Darling Basin Population of Eel Tailed Catfish (*Tandanus tandanus*)
- > Western Population of Olive Perchlet (*Ambassis agassizii*).

Key locations of fish are provided in **Figure 7-1**.

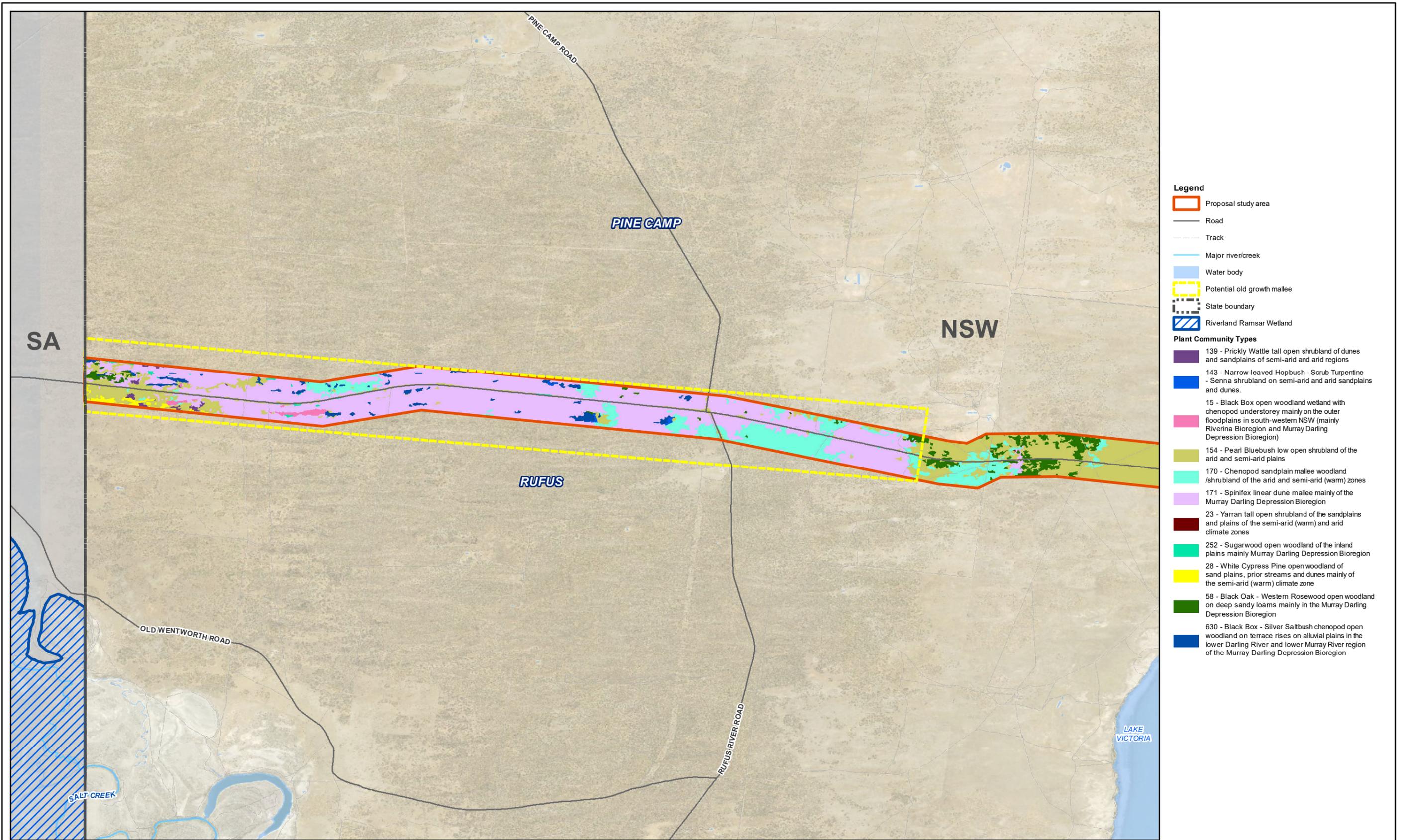
#### 7.1.1.4 Plant Community Types

Due to the diversity of landscapes within the biodiversity study area, the native vegetation is also variable. Fifty-one Plant Community Types (PCTs) have been identified as mapped in the proposal study area, based on available regional vegetation OEH mapping, these are illustrated in **Figure 7-1**. This regional mapping has not been ground-truthed across the whole buffer area and provides an indication of the diversity of PCTs that could be expected.

Of the list of PCTs identified from the preliminary desktop work (**Appendix A**), four of these are TECs listed under the BC Act and includes:

- > *Acacia loderi* shrublands
- > *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions
- > *Halosarcia lylei* low open-shrubland in the Murray Darling Depression Bioregion
- > Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions.

The location of these TECs (state and federal), based on available regional mapping are illustrated in **Figure 7-1**. None of these TECs have been recorded within preliminary surveys of the biodiversity study area to date (see below).



**Legend**

- Proposal study area
- Road
- Track
- Major river/creek
- Water body
- Potential old growth mallee
- State boundary
- Riverland Ramsar Wetland

**Plant Community Types**

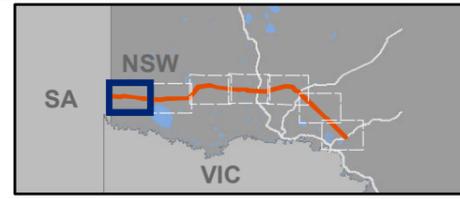
- 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
- 143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
- 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
- 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
- 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
- 23 - Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
- 252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
- 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
- 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
- 630 - Black Box - Silver Saltbush chenopod open woodland on terrace rises on alluvial plains in the lower Darling River and lower Murray River region of the Murray Darling Depression Bioregion

Map: PS113770\_BtoB\_Scoping\_005\_A2 Author: AUTB501486  
 Date: 30/10/2019 Approved by: - T.Lambert

1:80,000  
 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3

Data source: OEH, NSWSS, TransGrid;

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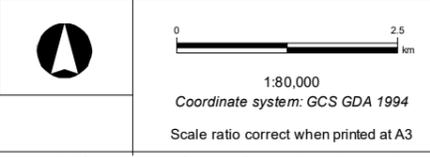


**BORDER TO BURONGA SCOPING STUDY**  
**Figure 7.1a**  
 Ecological values of the proposal study area



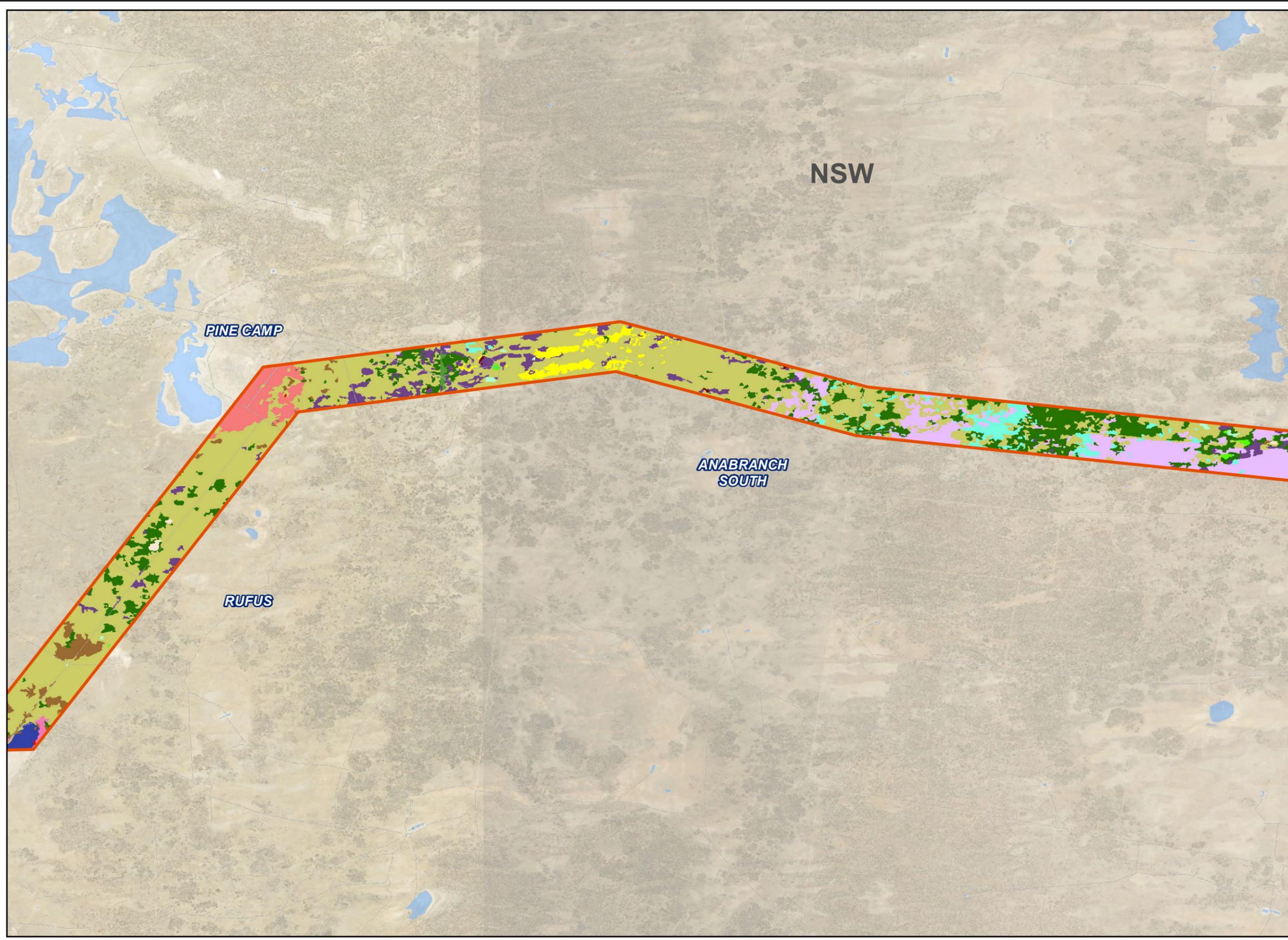
- Legend**
- Proposal study area
  - Road
  - Track
  - Water body
  - State boundary
- Plant Community Types**
- 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
  - 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
  - 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 156 - Bladder Saltbush shrubland on stony plains and downs of the arid zone
  - 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
  - 160 - Nitre Goosefoot shrubland wetland on clays of the inland floodplains
  - 165 - Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 253 - Gypseous shrubland on rises in the semi-arid and arid plains
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Map: PS113770\_BtoB\_Scoping\_005\_A2    Author: AUTB501486  
 Date: 30/10/2019    Approved by: - T.Lambert  
 Data source: OEH, NSWSS, TransGrid;



**BORDER TO BURONGA SCOPING STUDY**  
**Figure 7.1b**  
 Ecological values of the proposal study area

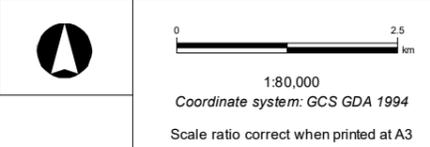
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- Legend**
- Proposal study area
  - Track
  - Water body
  - State boundary
- Plant Community Types**
- 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
  - 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
  - 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
  - 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
  - 160 - Nitre Goosefoot shrubland wetland on clays of the inland floodplains
  - 165 - Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
  - 191 - Snap and Rattle Mallee - Moonah open mallee shrubland in the Murray Darling Depression Bioregion
  - 221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
  - 23 - Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
  - 253 - Gypseous shrubland on rises in the semi-arid and arid plains
  - 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
  - 64 - Samphire - Water Weed - Sea-Heath shrubland saline wetland of depressions of the arid and semi-arid (warm) zones

Map: PS113770\_BtoB\_Scoping\_005\_A2  
 Date: 30/10/2019  
 Data source: OEI, NSWSS, TransGrid;

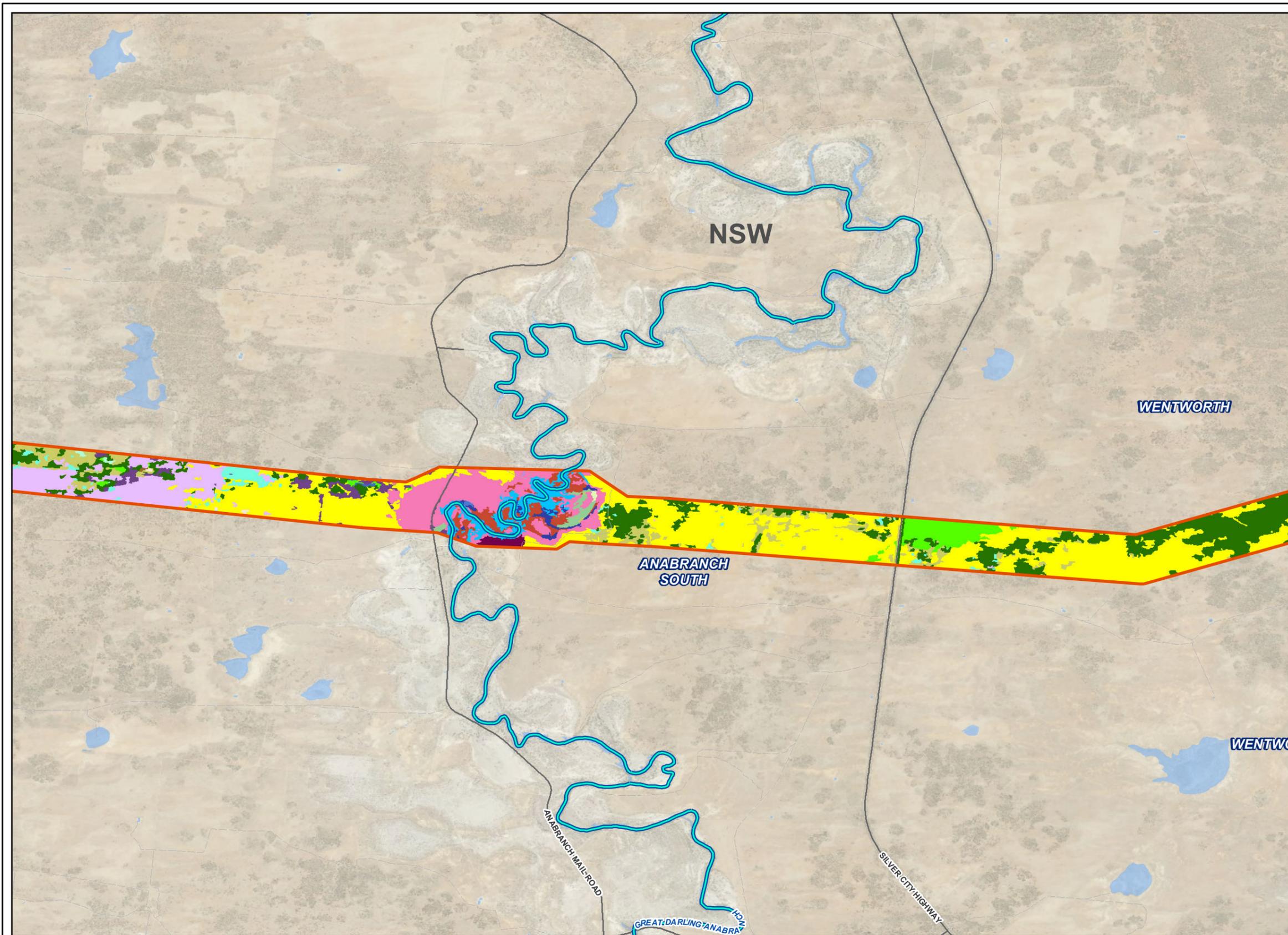
Author: AUTB501486  
 Approved by: - T.Lambert



**BORDER TO BURONGA SCOPING STUDY**

**Figure 7.1c**  
 Ecological values of the proposal study area

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**Legend**

- Proposal study area
  - Road
  - Track
  - Major river/creek
  - Water body
  - EPBC listed fish habitat
  - State boundary
- Plant Community Types**
- 104 - Gum Coolabah woodland on sedimentary substrates mainly in the Cobar Penepain Bioregion
  - 11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
  - 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 152 - Lunette chenopod shrubland mainly of the Murray Darling Depression Bioregion
  - 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
  - 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
  - 160 - Nitre Goosefoot shrubland wetland on clays of the inland floodplains
  - 165 - Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone
  - 166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
  - 191 - Snap and Rattle Mallee - Moonah open mallee shrubland in the Murray Darling Depression Bioregion
  - 221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
  - 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
  - 43 - Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
  - 63 - Spiny Lignum - Slender Glasswort open forbland saline wetland on lake edges in the semi-arid and arid climate zones

Map: PS113770\_BtoB\_Scoping\_005\_A2

Author: AUTB501486



1:80,000

Coordinate system: GCS GDA 1994

Scale ratio correct when printed at A3

Date: 30/10/2019

Approved by: - T.Lambert

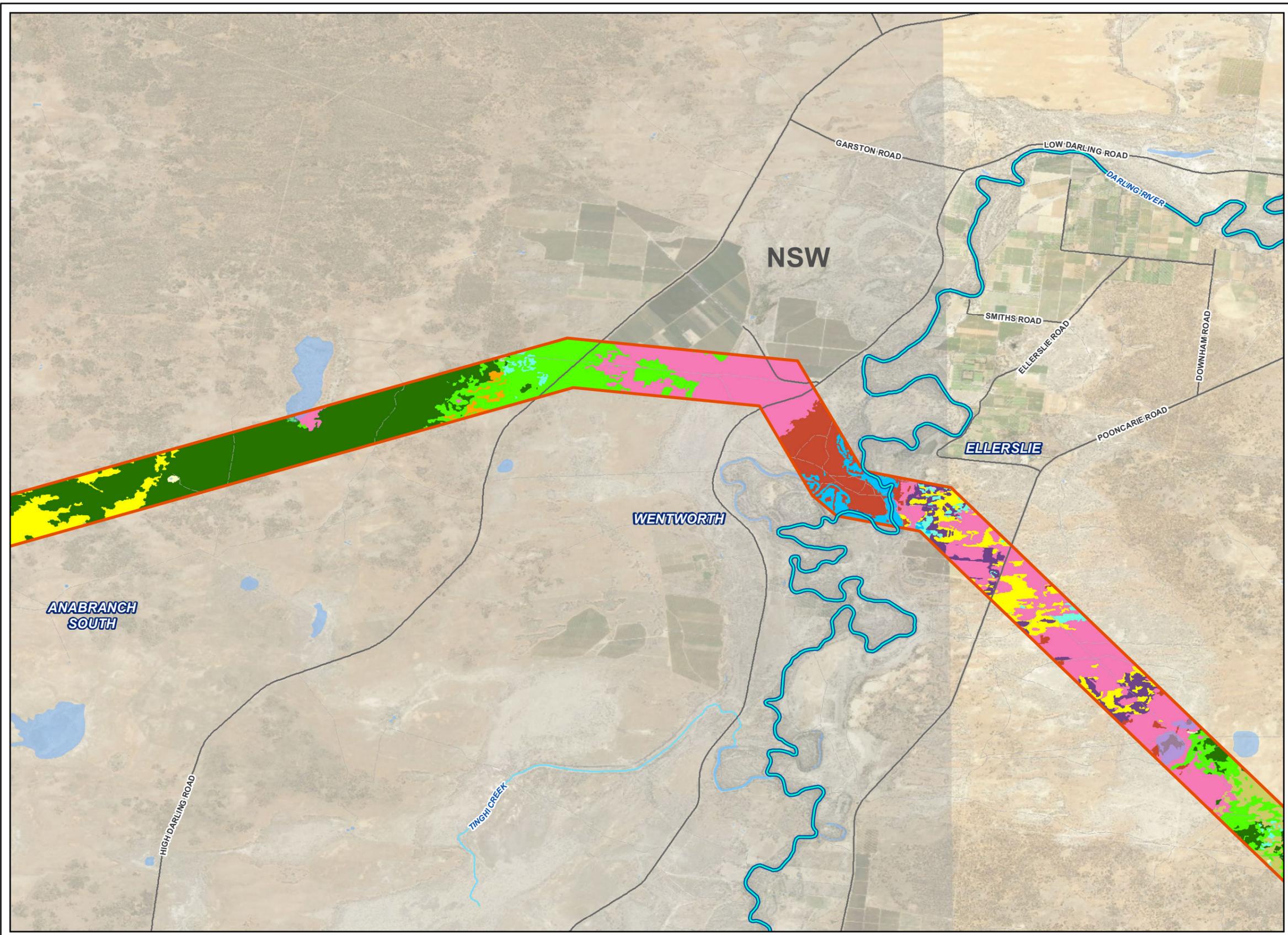
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**BORDER TO BURONGA SCOPING STUDY**

**Figure 7.1d**  
Ecological values of the proposal study area

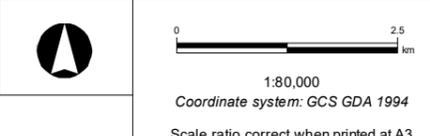
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- Legend**
- Proposal study area
  - Road
  - Track
  - Major river/creek
  - Water body
  - EPBC listed fish habitat
  - State boundary
- Plant Community Types**
- 11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
  - 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
  - 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 156 - Bladder Saltbush shrubland on stony plains and downs of the arid zone
  - 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
  - 166 - Disturbed annual saltbush forland on clay plains and inundation zones mainly of south-western NSW
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
  - 24 - Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
  - 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Map: PS113770\_BtoB\_Scoping\_005\_A2  
 Date: 30/10/2019  
 Data source: OEI, NSWSS, TransGrid;

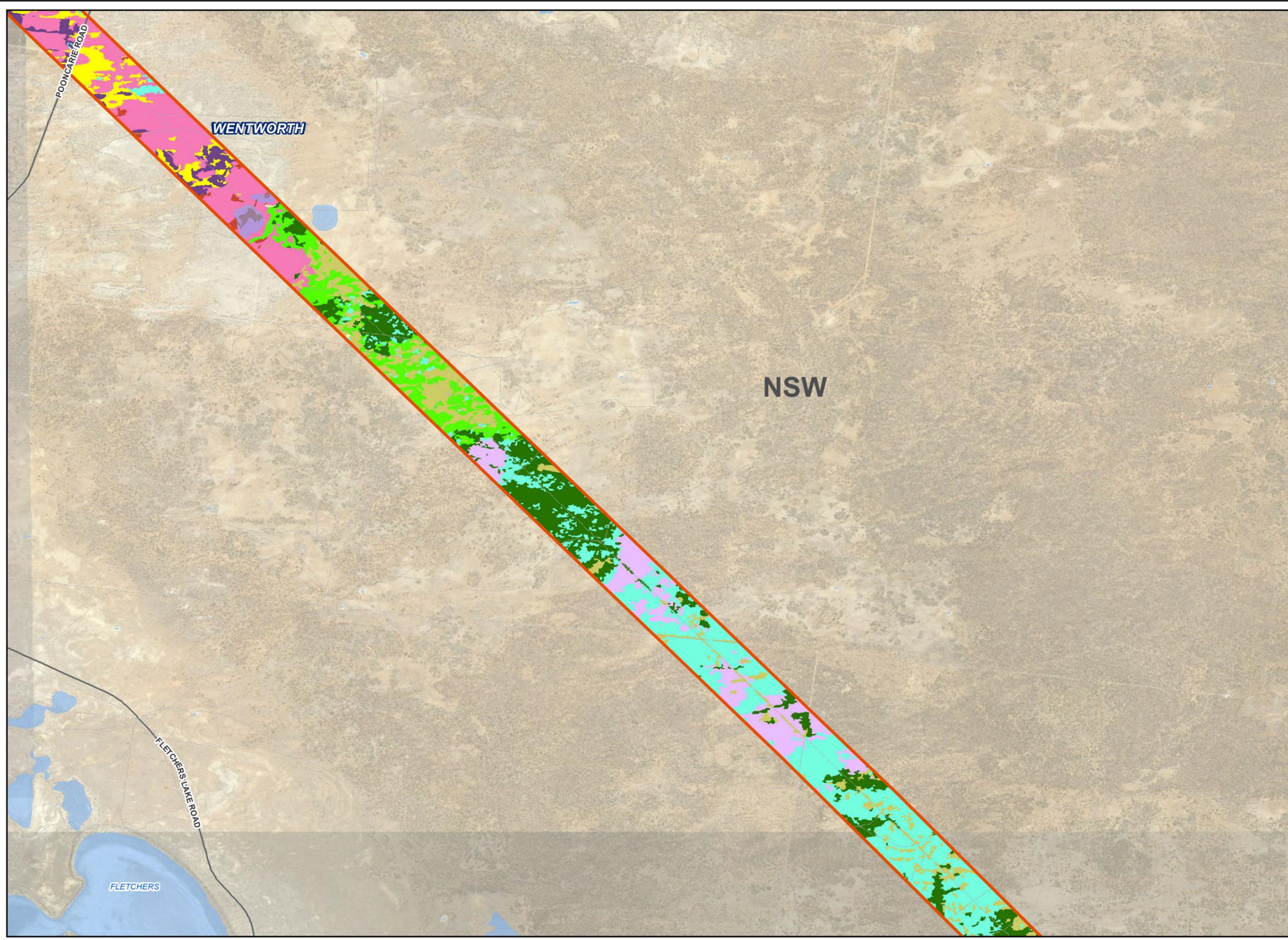
Author: AUTB501486  
 Approved by: - T.Lambert



**BORDER TO BURONGA SCOPING STUDY**

**Figure 7.1e**  
 Ecological values of the proposal study area

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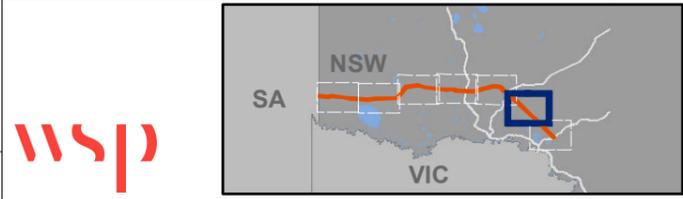
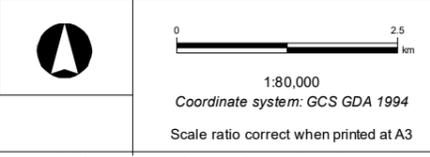


- Legend**
- Proposal study area
  - Road
  - Track
  - Water body
  - State boundary
- Plant Community Types**
- 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 139 - Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
  - 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
  - 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
  - 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
  - 166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
  - 24 - Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
  - 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Map: PS113770\_BtoB\_Scoping\_005\_A2    Author: AUTB501486

Date: 30/10/2019    Approved by: - T.Lambert

Data source: OEI, NSWSS, TransGrid;

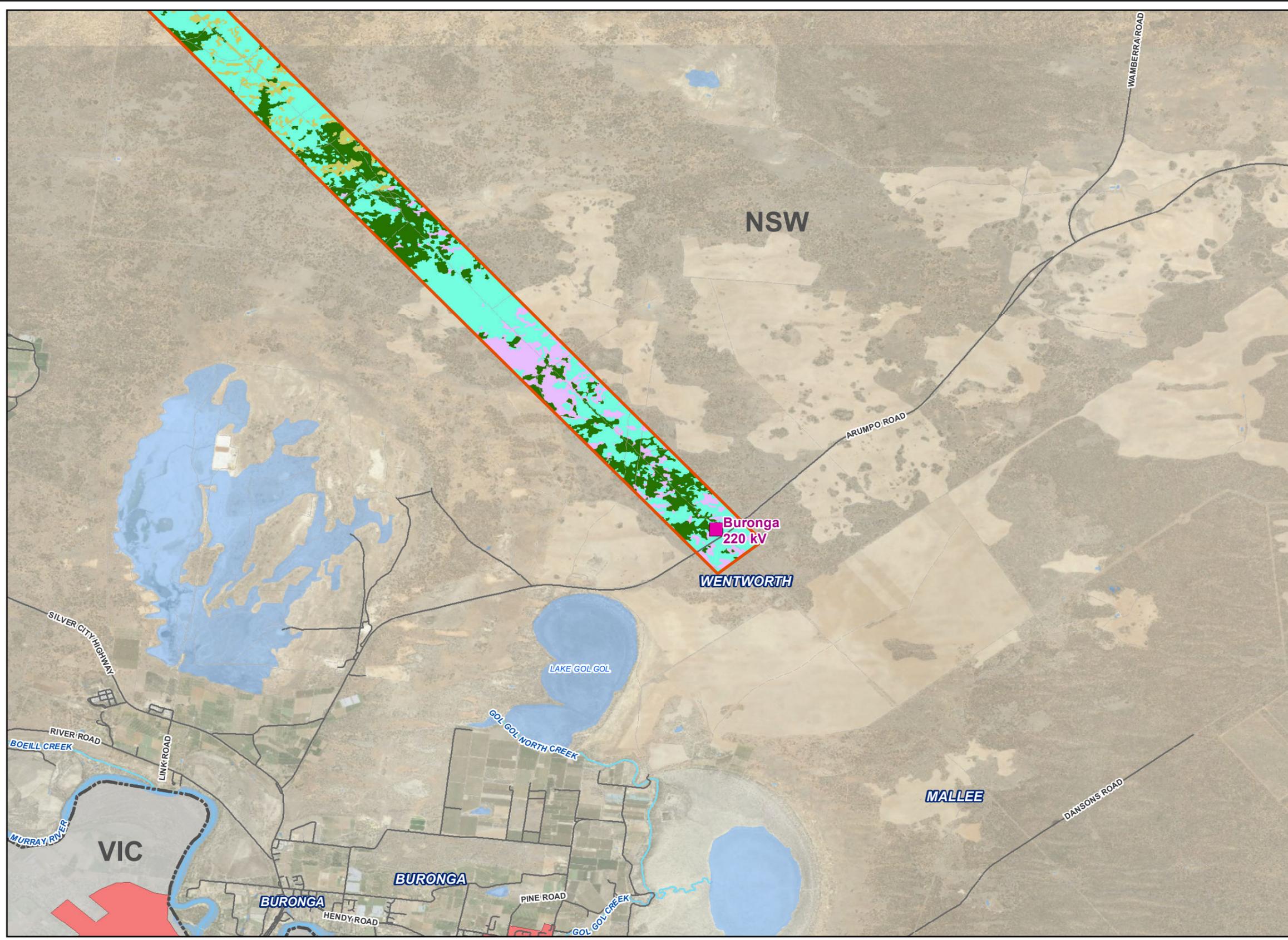


**BORDER TO BURONGA SCOPING STUDY**

**Figure 7.1f**  
Ecological values of the proposal study area

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- Legend**
- Proposal study area
  - Electricity transmission substation
  - Road
  - Track
  - Major river/creek
  - Water body
  - State boundary
- Plant Community Types**
- 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
  - 170 - Chenopod sandplain mallee woodland /shrubland of the arid and semi-arid (warm) zones
  - 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
  - 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Map: PS113770\_BtoB\_Scoping\_005\_A2  
 Date: 30/10/2019  
 Data source: OEI, NSWSS, TransGrid;

Author: AUTB501486  
 Approved by: - T.Lambert

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 Coordinate system: GCS GDA 1994  
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**BORDER TO BURONGA SCOPING STUDY**

**Figure 7.1g**  
Ecological values of the proposal study area

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### 7.1.1.5 Preliminary survey

Preliminary field verification surveys were undertaken in spring 2018 and January 2019 to ground-truth regional vegetation mapping. These surveys sought to develop a preliminary dataset of confirmed Plant Community Type (PCTs) and important habitat to inform project scoping.

The survey found that the vegetation condition ranges from medium to high predominately within areas of conservation reserves, but also within larger areas of intact remnant vegetation outside of reserves. Remaining areas comprise of low value vegetation within cleared agricultural land-use areas and heavily grazed land where cover and diversity of plants is lower.

The preliminary surveys identified ten PCTs described in **Table 7-2** (with further detail presented in **Appendix A**).

**Table 7-2: PCTs identified within the preliminary field survey area (indicative centre line)**

Plant Community Type (PCT)	Photo of indicative PCT
<p>154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains.</p>	
<p>16 - Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion).</p>	

Plant Community Type (PCT)	Photo of indicative PCT
<p>15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion).</p>	
<p>13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone.</p>	
<p>170 - Chenopod Sandplain mallee woodland / shrubland of the arid and semi-arid (warm) zones.</p>	

Plant Community Type (PCT)	Photo of indicative PCT
<p>171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion.</p>	
<p>21 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones.</p>	
<p>11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone.</p>	

Plant Community Type (PCT)	Photo of indicative PCT
221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones.	
155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones.	

The field assessments did not identify any vegetation which meets the criteria of the TECs identified previously as per the database search results. However as stated there were limitations to the survey in terms of accessibility to private lands, and the results are intended to be preliminary only.

Important habitat values and notable features were identified, which include:

- > Old growth mallee and intact mallee habitats, predominantly along the western portion of the NSW alignment, near the SA border. Although there was evidence of some grazing within the understorey at sites assessed, these habitats take many years to develop, and within adjacent habitat in SA they are characterised as critical habitat for the EPBC listed Black-eared Miner. Old growth continuous mallee also represents important habitat for a number of other conservation significant species
- > The Darling River and Darling Anabranh crossings, and associated riparian habitat, represent important habitat features in the proposal study area. Parts of the riparian floodplain have been subjected to heavy grazing impacts and were suffering from impacts as a result of drought conditions following the time of the survey, but these areas still reflect ecotonal transitions in habitat across the landscape, and therefore are likely to support elevated biodiversity.

### 7.1.2 Issues for consideration

As summarised in **Section 7.1.1**, and detailed in **Appendix A**, a number of threatened flora and fauna species, TECs, important habitat values and notable features occur, or have the potential to occur, within the biodiversity study area. The primary ecological concerns with the proposal relate to clearing of native vegetation, associated impacts on habitat for listed threatened species, populations and communities, including potentially MNES.

The key ecological constraints are outlined in **Figure 7-1** and include:

- > Areas of TEC listed under the EPBC Act
- > Riparian areas and buffer zones
- > Threatened flora and fauna species.

The proposal study area encompasses areas of native vegetation in good to poor condition. In addition to determining the ecological values of the proposal study area in greater detail, field survey efforts will also seek to identify areas of vegetation in good condition so that avoidance strategies can be developed. Further, areas of existing disturbance such as utility easements, roads and tracks, fence lines etc will be identified as potential opportunities for the co-location of the transmission line, structures, access tracks and laydown/staging areas. While some impacts to native vegetation and habitat for threatened species are anticipated, opportunities to avoid and minimise impacts wherever possible will be considered during the EIS. As the proposal has been declared SSI, all impacts to threatened species will be required to be offset.

### 7.1.3 Method of assessment

Biodiversity impacts, and opportunities for avoidance or mitigation, will be a key consideration in the assessment. Assessments undertaken during the EIS phase will be based on the Biodiversity Assessment Method (BAM) and field work will be guided by the following documents:

- > DPIE BAM
- > Commonwealth EPBC 1.1 Significant Impact Guidelines - Matters of National Environmental Significance Commonwealth Department of the Environment survey guidelines for nationally threatened species, where relevant
- > Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (working draft)
- > Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians
- > NSW Guide to Surveying Threatened Plants.

The EIS would identify mitigation and management measures proposed to reduce the biodiversity impacts.

A biodiversity development assessment report (BDAR) would be prepared as part of the EIS, which would further identify and clarify the potential significance of biodiversity impacts and identify the proposal biodiversity offset obligations. Potential measures would be identified to minimise any adverse effects and inform further detailed design with the aim of minimising the overall amount of vegetation required to be removed. Potential biodiversity impacts in relation to threatened fauna and flora are considered to be a key issue for the proposal.

As the proposal has been declared SSI and CSSI, it will be assessed in accordance with the BAM under the framework of the BC Act, 2016. All impacts to native vegetation will be required to be offset in accordance with NSW Biodiversity Offsets Scheme. Avoidance and minimisation must be demonstrated at an early stage and this preliminary assessment can be used as a guide to commence this process and as supporting evidence that avoidance has been considered. Key to minimising impacts to native vegetation will be designing the proposal to avoid the important biodiversity values, while being as short as practicable. Wherever practicable, the location of access tracks and compounds would aim to avoid the most valuable vegetation types and habitats.

A referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) will be submitted for the proposal's potential impact on MNES.

## 7.2 Aboriginal heritage

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### 7.2.1 Existing environment

A preliminary Archaeological Assessment Report (Jacobs, 2019) has been undertaken and is attached as **Appendix B**. This preliminary Archaeological Assessment was based on desktop data only and provides the heritage context for the proposal. Field surveys and consultation would be undertaken as part of the EIS.

A search of Aboriginal objects, sites and places registered on Aboriginal Heritage Information Management System (AHIMS) was carried out on 9 November 2018 and 25 January 2019. The search identified about 135 previously recorded sites within the preliminary alignment corridor. The recorded sites include burial sites, scarred trees, campsites, hearths, middens, quarry and numerous artefact sites, either singly (isolated find) or in a group of more than one (artefact scatter). Many of the sites comprised multiple features with two or more site elements.

The AHIMS sites, ethnographic information and previous investigations have resulted in a pattern of recorded sites within the landscape. This information allows for the development of a predictive model, which can be used to identify areas of Aboriginal archaeological sensitivity. Based on the results of the desktop assessment, the following areas of sensitivity were identified within the preliminary alignment corridor:

- > Highly sensitive:
  - River and creek margins – possess extensive linear deposits of midden and possibly burials, as well as scarred trees and hearths
  - Source bordering dunes, lunettes and sand dunes located near water sources – nearly always contain burials and campsites
  - The sandplain, where it abuts the floodplain, particularly if there are high cliffs or embankments present.
- > Moderately sensitive:
  - Slightly elevated box plains where they occur near ephemeral water sources – relics are sparsely distributed
  - Dune crests, within several kilometre radius of Lake Victoria – likely to contain shell middens.
- > Low sensitive:
  - Low lying floodplain/wetlands – scarred trees may be found in these areas. Most of the sites in the preliminary alignment corridor are situated adjacent to a water source i.e. rivers and creeks, relict lakebeds, depressions, claypans, swamps and scalds.

Based on the recorded history and sites, the preliminary Archaeological Assessment concluded that there are many areas of Aboriginal heritage sensitivity within the preliminary alignment corridor. Previously identified Aboriginal heritage is broadly clustered around the major waterways.

The proposal study area falls within the Dareton Local Aboriginal Land Council (LALC) boundary and the Barkindji Native Title Group traditional lands.

A search of the Native Title register indicated that there is one active native title claims (NC1997/032 Barkandji Traditional Owners #8) in the proposal study area.

### 7.2.2 Issues for consideration

The proposal has the potential to impact on known and previously unrecorded Aboriginal items. The mechanisms by which these impacts could occur include surface disturbance and excavations associated with ground disturbance activities, including the construction of access tracks, work compounds, transmission line structures, substation extension and ancillary activities.

The *Native Title (New South Wales) Act 1994* would apply to land affected by native title claims in NSW. Under clause 103 of the Act, there is a requirement to notify native title claimants affected by the proposal.

Any active Native Title Claim which affects the proposal would need to be considered during the EIS phase, with consultation undertaken with relevant Aboriginal representatives.

### 7.2.3 Method of assessment

Further Aboriginal cultural heritage assessments, including archaeological surveys, focussing on areas of high and medium Aboriginal heritage sensitivity, will be undertaken as part of the EIS, to ensure that Aboriginal cultural heritage values are properly identified, assessed and avoided where possible. An Aboriginal cultural heritage assessment (ACHA) will be required in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (DECCW, 2011), *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW DECCW 2010b).

Formal Aboriginal community consultation will allow accurate and effective identification of Aboriginal cultural values and knowledge holders associated with the proposal study area. The consultation would follow the process outlined in the ACHCRP.

## 7.3 Non-Aboriginal heritage

### 7.3.1 Existing environment

A list of NSW non-Aboriginal heritage items identified within the proposal study area are provided in **Table 7-3** and shown on **Figure 7-2**.

**Table 7-3: List of NSW non-Aboriginal heritage items within the proposal study area**

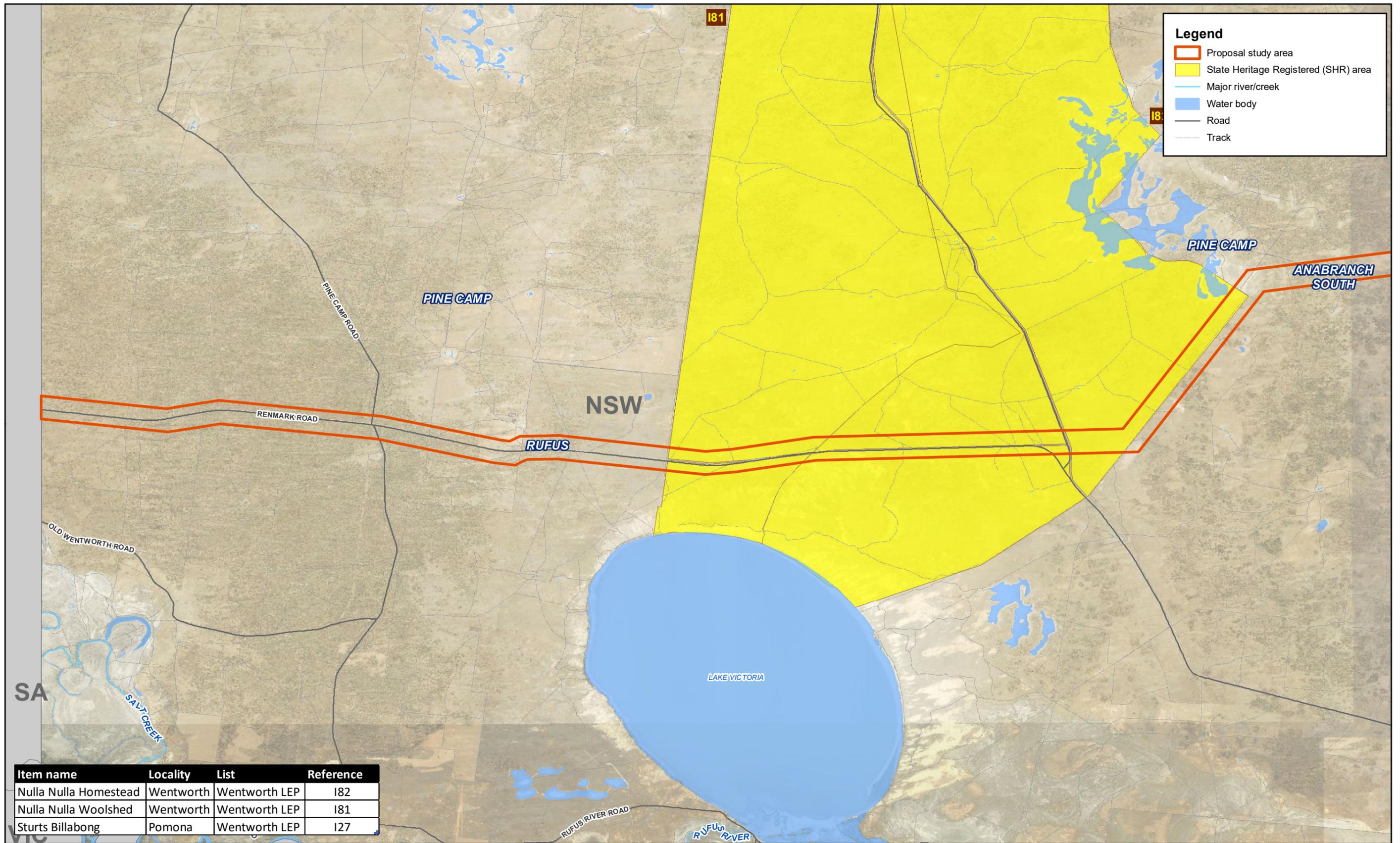
Item name	Locality	List	Reference
Nulla Nulla Homestead	Wentworth	Wentworth LEP	I82
Nulla Nulla Woolshed	Wentworth	Wentworth LEP	I81
Sturts Billabong	Pomona	Wentworth LEP	I27

### 7.3.2 Issues for consideration

The proposal has the potential to impact on known and previously unrecorded non-Aboriginal heritage items. The mechanisms by which these impacts could occur include surface disturbance and excavations associated with the construction of access tracks, work compounds, transmission line structures, substation extension and ancillary activities.

### 7.3.3 Method of assessment

A non-Aboriginal heritage assessment will be undertaken as part of the EIS and would include the consideration of potential impacts on the values, settings and integrity of heritage areas and items and archaeological resources in the proposal study area. The assessment would be undertaken in accordance with principles of The Australian International Council on Monuments and Sites, Charter for Places of Cultural Significance (also known as the Burra Charter, Australian ICOMOS 2013) and the NSW Heritage Manual (Heritage Office 1996 and 2006).



**Legend**

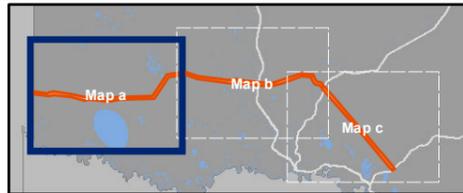
- Proposal study area
- State Heritage Registered (SHR) area
- Major river/creek
- Water body
- Road
- Track

Item name	Locality	List	Reference
Nulla Nulla Homestead	Wentworth	Wentworth LEP	182
Nulla Nulla Woolshed	Wentworth	Wentworth LEP	181
Sturts Billabong	Pomona	Wentworth LEP	127

Map: PS113770\_BtoB\_Scoping\_003\_A3    Author: AUTB501486  
 Date: 30/10/2019    Approved by: - A.Garrett



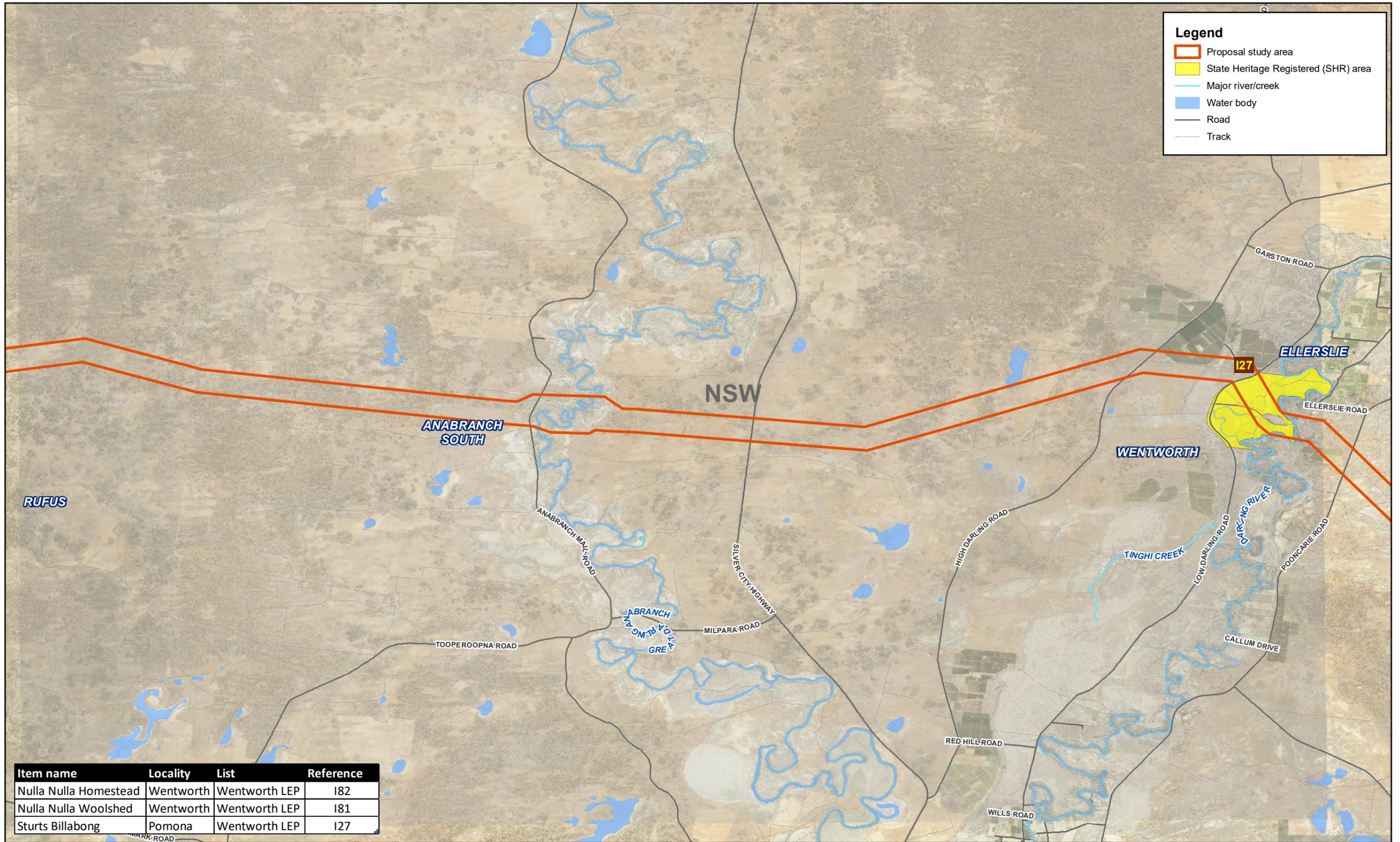
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**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-2a**  
 Non-Aboriginal heritage items in or crossing the proposal study area

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**Legend**

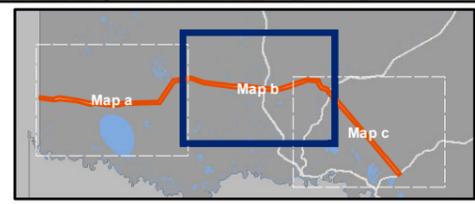
- Proposal study area
- State Heritage Registered (SHR) area
- Major river/creek
- Water body
- Road
- Track

Item name	Locality	List	Reference
Nulla Nulla Homestead	Wentworth	Wentworth LEP	I82
Nulla Nulla Woolshed	Wentworth	Wentworth LEP	I81
Sturts Billabong	Pomona	Wentworth LEP	I27

Map: PS113770\_BtoB\_Scoping\_003\_A3  
 Date: 30/10/2019  
 Data source:

Author: AUTB501486  
 Approved by: - A.Garrett

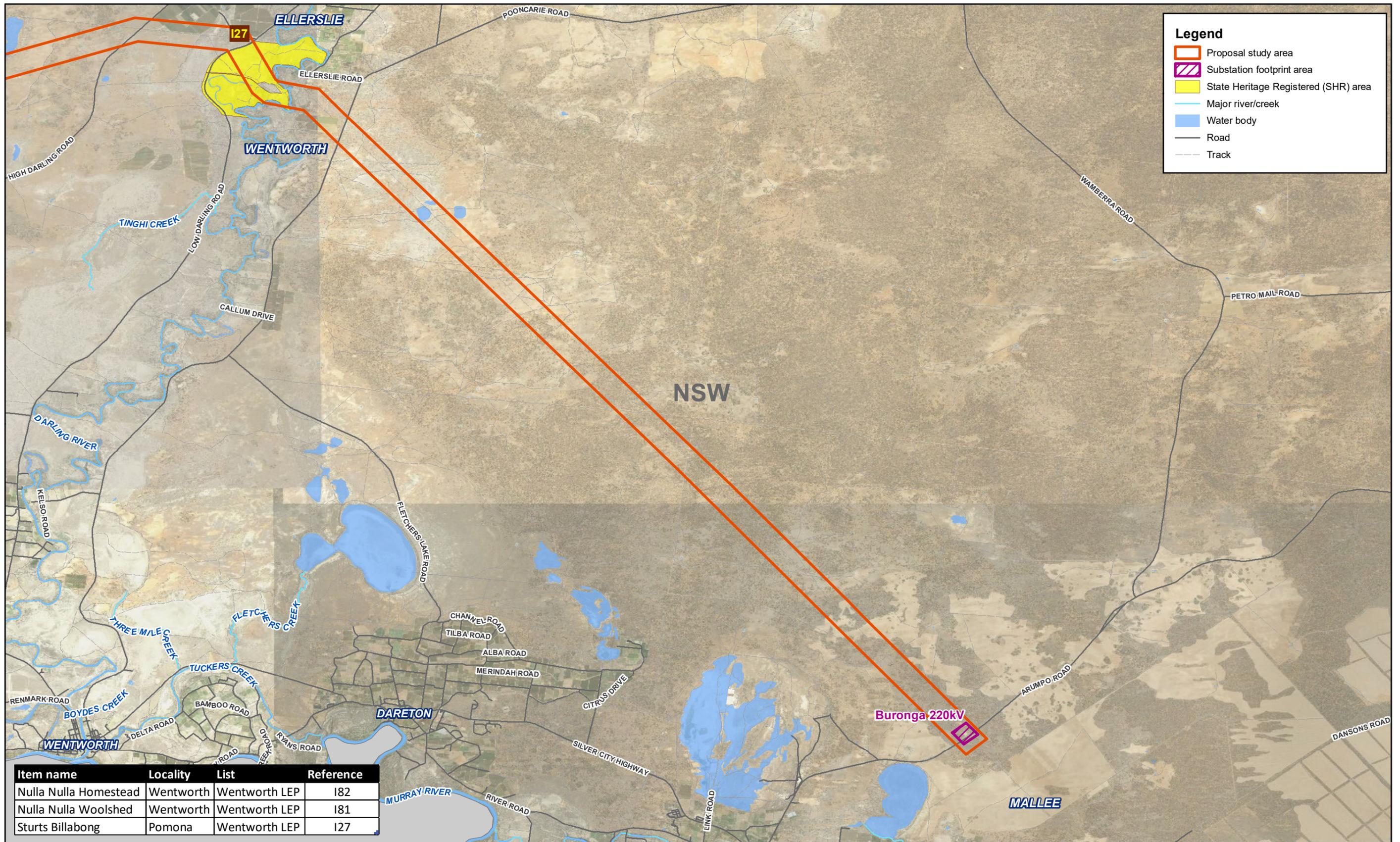
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**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-2b**  
 Non-Aboriginal heritage items in or crossing the proposal study area

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**Legend**

- Proposal study area
- Substation footprint area
- State Heritage Registered (SHR) area
- Major river/creek
- Water body
- Road
- Track

Item name	Locality	List	Reference
Nulla Nulla Homestead	Wentworth	Wentworth LEP	182
Nulla Nulla Woolshed	Wentworth	Wentworth LEP	181
Sturts Billabong	Pomona	Wentworth LEP	127

Map: PS113770\_BtoB\_Scoping\_003\_A3    Author: AUTB501486  
 Date: 30/10/2019    Approved by: - A.Garrett



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 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3



**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-2c**  
 Non-Aboriginal heritage items in or crossing the proposal study area

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## 7.4 Land use and property

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### 7.4.1 Existing environment

The proposal is located within the Wentworth LGA to the immediate north of the Murray River and Lake Victoria. Land use adjacent to and within the proposal study area is predominantly for agricultural purposes. Other land uses within and surrounding the proposal study area include: farm buildings and infrastructure, roads and road reserves, broad acre rural residential development, drainage channels for irrigation and existing transmission line easements. The land uses of the preliminary alignment corridor are shown on **Figure 7-3**.

The land use zoning of the proposal study area is predominantly RU1 Primary Production. The other land zonings in the preliminary alignment corridor include:

- > E2 Environmental Conservation
- > E3 Environmental Management
- > R5 Large Lot Residential
- > SP1 Special Activity
- > SP2 Infrastructure
- > W1 Natural Waterways
- > W2 Recreation Waterways.

No existing or proposed railways appear to be within the proposal study area. There are a number of existing transmission lines that cross and run through the proposal study area.

There are a number of Commonwealth land holdings in the preliminary alignment corridor across various Australian Government agencies. Some of the largest Commonwealth land holdings include the following:

- > Australia Telecommunications Commission
- > Commonwealth Trading Bank of Australia
- > Commonwealth Land - Commonwealth Trading Bank of Australia & Moya Grace Murphy.

Land tenure in the proposal study area is predominantly Western Division Land Lease with small areas of freehold property. Land use within the proposal study area is predominantly sheep grazing for wool and meat. There is also some cattle grazing and cereal cropping and limited areas of irrigation along the Darling River. The local waterway and their banks in the proposal study area are generally used for recreational purposes.

Key protected environments surrounding the preliminary alignment corridor include the Mallee Cliffs National Park located about five km to the east.

The nearest major town is Mildura (Victoria) located about 15 km from the eastern end of the proposal study area. Buronga (NSW) is located just under 10 km from the closest point of the proposal study area, refer to **Figure 1-2**.

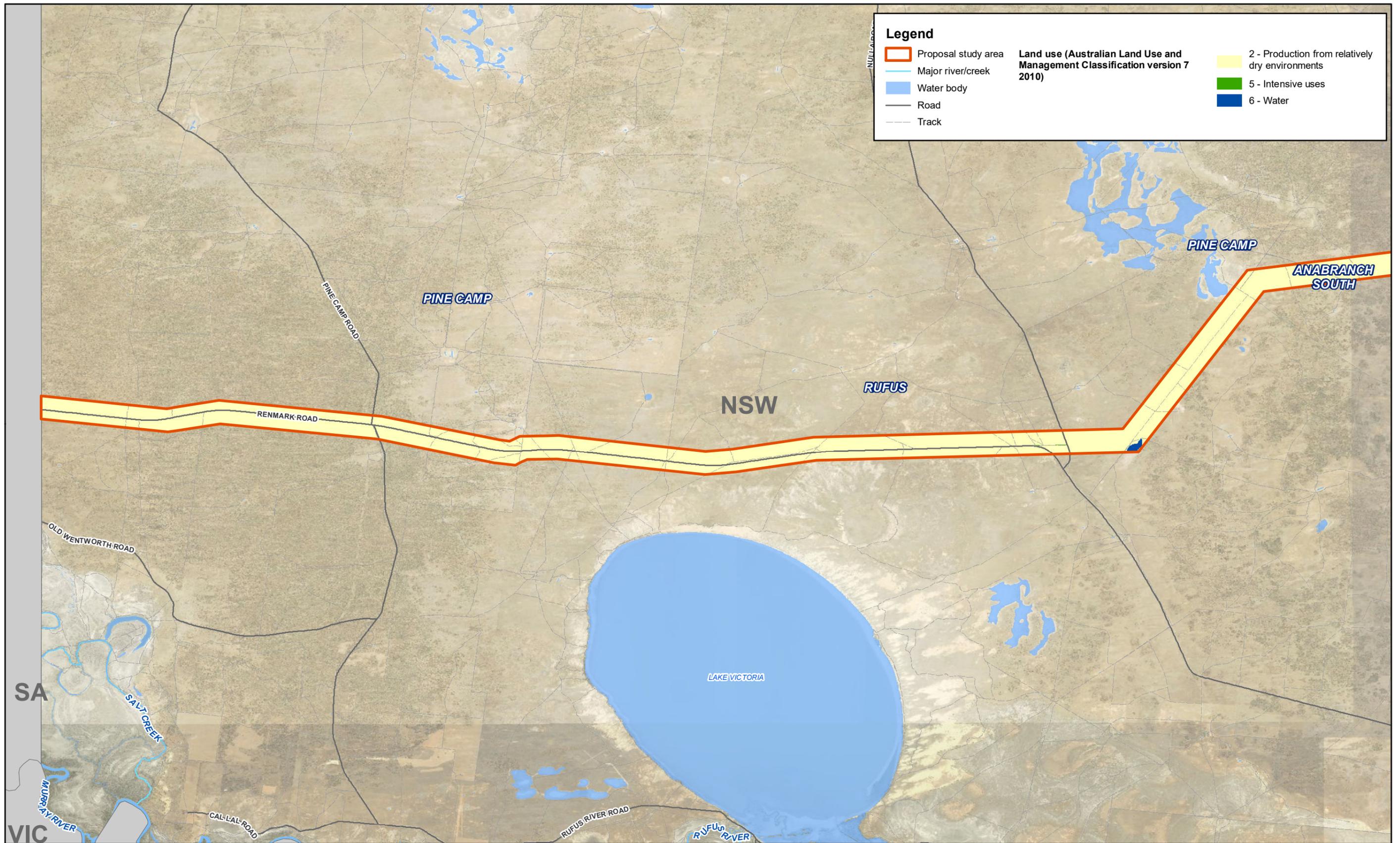
### 7.4.2 Issues for consideration

The proposed final location and footprints of permanent and temporary sites (see section 3.3) developed as part of the proposal would be confirmed and assessed as part of the EIS.

In addition to the easement for the transmission line, freehold land would be acquired for the proposed expansion of the Buronga substation. The proposal is not expected to impact on Commonwealth land.

### 7.4.3 Method of assessment

Land use and property would be considered as part of the EIS. The assessment would take into consideration feedback received from landholders.



**Legend**

- Proposal study area
- Major river/creek
- Water body
- Road
- Track

**Land use (Australian Land Use and Management Classification version 7 2010)**

- 2 - Production from relatively dry environments
- 5 - Intensive uses
- 6 - Water

Map: PS113770\_BtoB\_Scoping\_004\_A3    Author: AUTB501486

Date: 30/10/2019    Approved by: - A.Garrett

Data source:

1:150,000

Coordinate system: GCS GDA 1994

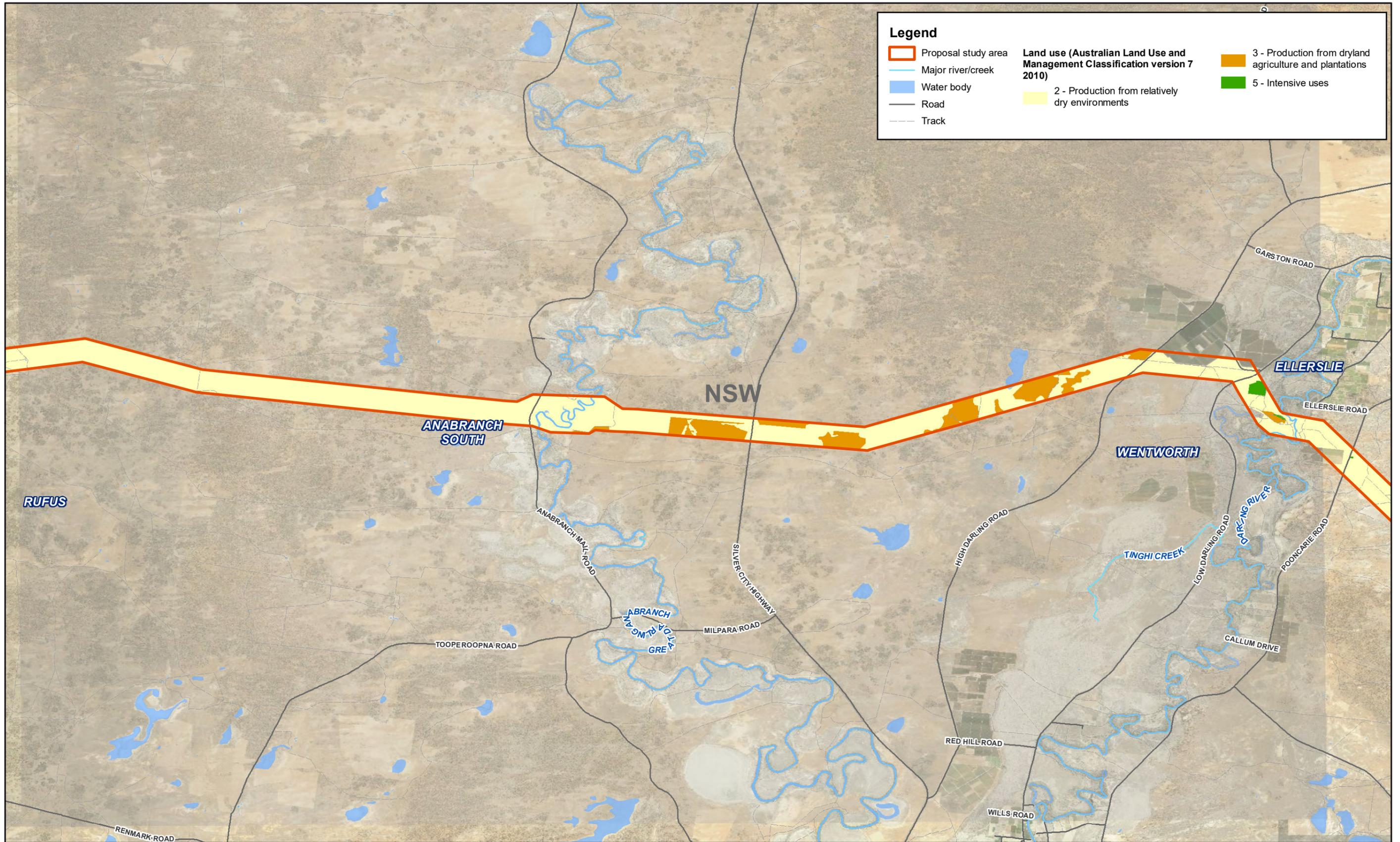
Scale ratio correct when printed at A3

**wsp**

**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-3a**  
Land use in the proposal study area

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**Legend**

- Proposal study area
- Major river/creek
- Water body
- Road
- Track

**Land use (Australian Land Use and Management Classification version 7 2010)**

- 2 - Production from relatively dry environments
- 3 - Production from dryland agriculture and plantations
- 5 - Intensive uses

Map: PS113770\_BtoB\_Scoping\_004\_A3    Author: AUTB501486

Date: 30/10/2019    Approved by: - A.Garrett

Data source:

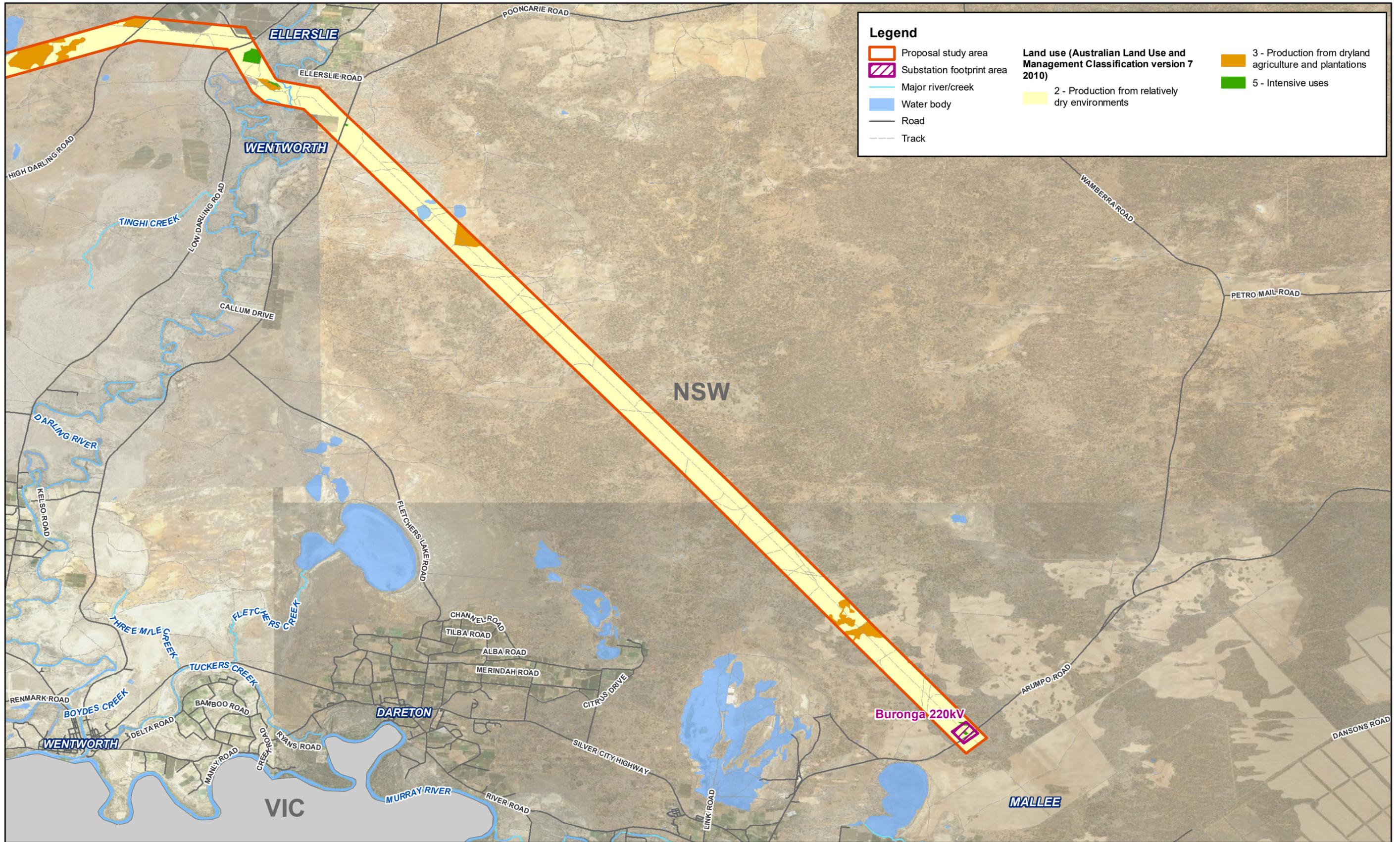
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Scale ratio correct when printed at A3

**wsp**

**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-3b**  
Land use in the proposal study area

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**Legend**

- Proposal study area
- Substation footprint area
- Major river/creek
- Water body
- Road
- Track

**Land use (Australian Land Use and Management Classification version 7 2010)**

- 3 - Production from dryland agriculture and plantations
- 2 - Production from relatively dry environments
- 5 - Intensive uses

Map: PS113770\_BtoB\_Scoping\_004\_A3  
 Date: 30/10/2019  
 Data source:

Author: AUTB501486  
 Approved by: - A.Garrett



0 2.5 5 km  
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 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3



**BORDER TO BURONGA SCOPING STUDY**

**Figure 7-3c**  
 Land use in the proposal study area

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## **7.5 Landscape character and visual amenity**

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### **7.5.1 Existing environment**

Much of the land within the proposal study area and the visual catchment is used for agriculture purposes including broad acre cropping and grazing. The landscape is predominantly flat and comprises a mixture of vegetation including broad acre cropping, finer grained high value horticultural plantings and native bushland. Existing HV and distribution transmission lines with structures between 25 and 30 metres in height and existing substations on Arumpo Road and Pooncarie Road are currently part of this visual landscape. Due to the flat topography landscape views are generally vast. There is a limited number of residential dwellings located within 500 metres of the proposal study area.

Main roads and tourist routes within the proposal study area include the Sturt Highway and the Silver City Highway. There are no major or regional towns within the proposal study area and there is a limited number of sensitive receptors in around the proposal study area.

### **7.5.2 Issues for consideration**

As the landscape is relatively flat the scale of the proposal would be visible for mid to long distances. Hence the visual impacts would need to be considered during the EIS phase.

During construction, the presence of plant and vehicles may result in short-term temporary visual impacts for sensitive receptors. The clearing of vegetation and ground disturbance during construction of the transmission lines (and easement), substation (and APZ) and access tracks would result in long-term localised visual impacts. The main sensitive receptors during construction and operation would be residences within 500 metres from the proposal.

The proposal would introduce large steel lattice structures up to 80 metres in height into the landscape. In this landscape, there is the potential for the structures to be visually noticeable from distances of around 6.5 km. The structures would be visible beyond this distance however they would not be visually dominant.

The exact location of each structure will be identified during the detailed design phase, however, they would generally be placed approximately 300-600 metres apart along the alignment. The long span length between structures will minimise the effect of the proposal as a visual barrier.

The proposal seeks to minimise visual impacts by locating the transmission line as far as possible from viewing locations. However, there is a need to balance visual impact mitigation with avoidance of impacts on other environmental values and for this reason the proposal study area represents the maximum separation distance between the proposal and sensitive receptors.

### **7.5.3 Method of assessment**

The EIS would include an assessment of visual impacts during construction and operation, including a description of existing landscape character and potential sensitive receptors, and identification of measures to be used to minimise visual impacts.

## 7.6 Fire risk

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### 7.6.1 Existing environment

The proposal is located within the Lower Western Bushfire Management Zone, incorporating the Wentworth LGA, and is overseen by the Lower Western Zone Bushfire Management Committee (BFMC).

The Lower Western Zone Bush Fire Management Plan (BFMP) (Lower Western Zone Bush Fire Management Committee, 2016) identifies community assets at risk and sets out a five-year program of coordinated multi-agency treatments to reduce the risk of bush fire to the assets. Treatments may include such things as hazard reduction burning, grazing, community education, fire trail maintenance and establishing community fireguard groups.

The typical / average climate in the Lower Western Zone is characterised by warm to hot summers averaging 31 degrees and cool to mild winters averaging 17 degrees with regular frosts. Temperature variation is distinct with summer temperatures exceeding forty degrees Celsius, and cool to mild winters with frosts occurring on a regular basis. The annual historical mean rainfall for the Wentworth area is 268 millimetres.

Substantial variations from these figures have occurred in the last ten years with both areas experiencing prolonged drought conditions followed up by above average rainfall totals in 2010 & 2011. These drought conditions have caused a reduction in the fuel loads across the landscape. The BFMP indicates that the bushfire season in the plan area generally runs from October to March.

Prevailing weather conditions associated with the bush fire season in the Lower Western Zone BFMC area are strong westerly to northerly winds in spring, with high temperatures occurring throughout spring, summer and extending into autumn at times. High temperatures combined with thunderstorm activity through the bush fire season can initiate significant fire events.

### 7.6.2 Issues for consideration

Hot works undertaken as part of the proposal could potentially start a fire, such as sparks from plant or equipment. The density of vegetation across the preliminary alignment corridor is highly variable, with heavily grazed paddocks, cultivation, Black Box open woodland, riparian zones dominated by River Red Gum, Mallee woodland vegetation and open chenopod shrub land each presenting a distinct bushfire risk.

Bushfires pose an ever present risk to life, property and the environment. Bushfires can be caused by a variety of factors, including lightning strikes, sparks from farm machinery and incinerators, vehicle crashes, and electrical incidents such as fallen power lines. TransGrid's risk approach to asset management assumes that every transmission line has the potential to be impacted by fire, or to initiate fire, including bush fire. The design, operation and maintenance of the proposal would consider vegetation management within the transmission line easement, and APZs around the substation.

### 7.6.3 Method of assessment

TransGrid's risk approach to asset management is to minimise the likelihood that an asset will initiate a fire, irrespective of the location of that asset. The EIS will consider the bushfire hazard and risks of ignition associated with the proposal.

## 7.7 Socio-economic

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### 7.7.1 Existing environment

The proposal study area is located in the Wentworth LGA. The population of the Wentworth LGA in 2017 was 6,972, with a population density of about 0.3 person per square kilometre. The largest industry of employment in Wentworth LGA is agriculture, forestry and fishing. The unemployment rate for Wentworth LGA in 2016 was 6.1 per cent, which was lower than the regional NSW unemployment rate (6.3 per cent) at the time. The median weekly household income in the Wentworth LGA was \$692 which is below the Australian and NSW median weekly household incomes (ABS, 2016).

Given the remoteness of the proposal location, there is limited access to existing infrastructure, including road, rail, gas, electricity, water and sewerage services.

### 7.7.2 Issues for consideration

As a result of Project EnergyConnect, a significant amount of expenditure will be spent within the local, regional and NSW economies during the construction phase over a relatively short period of time. The expenditure for the NSW portion of the project is estimated to be approximately \$1.1 billion. In addition, the construction phase will generate about 1,650 employee years (direct and indirect) in the NSW region during the two year construction period. Opportunities for local employment generation would also be considered in the preparation of the EIS and project delivery.

Negative impacts to the local community and the majority of local businesses are unlikely as a result of the proposal, given the remoteness of the location of the proposal.

The provision of accommodation and services for the combined construction workforce associated with the proposal may put pressure on available accommodation and services. However, the distance from towns of sufficient size to support the required workforce would likely require the establishment of one or more temporary workers camps to allow the safe and accessible accommodation of workers and support staff.

An employment and accommodation strategy for the proposal would be developed as part of construction planning and described in the EIS.

When fully completed, Project EnergyConnect would facilitate enhanced security and reliability of energy supply with associated social and economic benefits to consumers across the NEM in SA and NSW. Key benefits of the overall project would include:

- > Improvement of security and continuity of energy supply to NSW and the NEM during periods of maximum hourly and daily demand
- > Reduce reliance of high cost gas plants in SA
- > Unlock renewable generation development en-route and allows great market access
- > Creation of additional capacity of 235 MW in a heightened period with energy security being a critical issue for NSW and Australia
- > Opportunities for local construction employment and additional spend to boost local business.

Construction activities that interact with publicly assessable areas (ie along public roads) could potentially result in adverse hazards and risks to public safety if not managed appropriately. As described in **Section 7.5.2**, consideration of the proposal's potential impact on agriculture should be considered during the EIS phase.

### 7.7.3 Method of assessment

An assessment of the potential social impacts and benefits of the proposal would be included in the EIS. The assessment would include potential social impacts on both a broader regional and local scale, and consideration of the ability of local social infrastructure to accommodate the construction workforce.

Substantial economic and cost benefit analysis has gone into the planning and justification of Project EnergyConnect, as detailed in **Section 2**. Detailed economic impact assessment to support the EIS is not considered necessary given the extensive government economic assessment process through the RIT(T), however the direct and indirect socio economic benefits of the construction and operation of the proposal would be considered and summarised in the EIS.

## 7.8 Surface water and hydrology

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### 7.8.1 Existing environment

The proposal study area is intersected by two waterways the Darling and Great Darling Anabranch River. The locality is watered by a number of natural watercourses, both permanent and ephemeral. These waterways are shown in Figure 1-2.

The proposal study area is located within the *Lower Murray Darling Unregulated and Alluvial Water Sources 2011 water sharing plan*. The proposal area is not within land mapped as a flood planning area under the Wentworth LEP. There is limited water availability within the proposal study area as the region is currently drought affected.

### 7.8.2 Issues for consideration

Water use and access to water during construction for activities associated with the proposal such as concrete batching, dust suppression and minor uses such as ablutions for workers, could potentially be an issue for the proposal due to the water scarcity issues which are ongoing in this region. Water sources and the amount of water to be used for the proposal will form part of the consideration of the EIS.

Potential causes of water quality impacts would be associated with erosion and sedimentation associated with vegetation clearing and earthworks for benching, brake and winch sites, access tracks and structure footings.

Erosion and sedimentation, if uncontrolled, would have the potential to increase the amount of sediment and organic matter entering nearby waterways. This has the potential to increase turbidity and result in a decline in the water quality of these waterways. Without the implementation of mitigation measures there is a potential for sediment to be mobilised where work is carried out at or near waterways.

A search of the Bureau of Meteorology's Australia Groundwater Explorer on 3 June 2019, indicated the ground water level across the proposal study area is variable from two to 40 metres. In the event that groundwater is encountered during the construction works (e.g. during the boring for the installation of new structures or the expansion of Buronga substation), minor temporary dewatering may be required. The impacts of dewatering on groundwater would be considered as part of the EIS.

It is expected that watercourse crossing works, where required, would involve the placement of rock on the bed of the watercourse to enable access of heavy vehicles hauling plant and equipment between the structure locations during construction. It is assumed that a number of the waterway crossings would be retained for operation of the proposal. The placement of rock within the watercourse has the potential to alter stream flows, these impacts would need to be considered during the EIS phase.

Surface water impacts from the proposal would potentially be associated with increases in non-permeable surfaces, increasing surface water run-off. This would be primarily associated with the proposed substation expansion and the structure footings. The impacts of the proposal are anticipated to be manageable though the application of standard environmental management measures.

Potential impacts on flooding relate to structures and infrastructure (such as the substation expansion) creating obstructions. Structures would generally be located outside floodplains with the exception of the Darling River and Anabranh crossings. No structures would be located within the major water sources, however they may be located within the floodplain. Structures would be designed to not impede flood flow.

### **7.8.3 Method of assessment**

Impacts of the proposal on water supply and use during construction as well as surface water quality, flooding and groundwater would be considered during the EIS phase. The EIS also would identify mitigation measures to be applied to works to manage potential impacts. The EIS will also consider the proposal's operation impacts related to managing and maintaining access tracks and waterway crossing.

# 8. Other issues

## 8.1 Electro magnetic fields (EMF)

---

### 8.1.1 Existing environment

EMF is part of the natural environment and electric fields are present in the atmosphere while static magnetic fields are created by the earth's core. EMF is also produced wherever electricity or electrical equipment is in use. Transmission lines, electrical wiring, household appliances and electrical equipment all produce power frequency EMF. An electric field is produced every time voltage runs through a wire. The higher the voltage, the stronger the electric field. Electric fields are strongest closest to the wires and their level reduces quickly with distance.

Magnetic fields are produced by the flow of an electric current through a wire. The higher the current, the greater the magnetic field. Like electric fields, magnetic fields are highest closest to the wire and their level reduces quickly with distance. Together, the electric and magnetic fields are referred to as EMF.

The proposal study area contains existing HV (220kv) transmission lines, low-voltage distribution lines and substations of varying operating capacities which are all current sources of EMF.

### 8.1.2 Potential impacts

The proposal would introduce new high voltage transmission lines between the NSW/SA border and Buronga. Consequently, there would be additional increases to electric and magnetic fields. However, the proposed transmission lines would be designed and built to ensure that exposure levels are within the limits recommended by the ICNIRP Guidelines (2010).

### 8.1.3 Scope for further assessment

For a transmission line, the strength of the electric field varies generally with the operating voltage of the line (measured in volts), while the magnetic field strength is related to the current flowing in the line (measured in amps). The current flowing in the line is dependent upon the load or power flow, and would vary with consumer demand (which varies on a daily and seasonal basis). The EMF strengths at ground level below the conductors, are also dependent on the height of the wires above the ground and their geometric arrangements as supported by the transmission structures.

The scientific literature on EMF exposure is extensive, complex and inconclusive. In addressing the question of adverse health effects expert advice on EMF from competent health authorities in Australia and from around the world is relied upon. This includes the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), which is the Federal Government agency responsible for providing health assessments and recommendations to the Government on matters relating to EMF. ARPANSA has adopted the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for limiting exposure to EMF, published in 2010.

Potential impacts of EMF from the proposal would be considered as part of the EIS. This would include consideration of potential health risks for adjacent residents resulting from EMF associated with the development of a high voltage transmission line.

## 8.2 Air quality and greenhouse gas

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### 8.2.1 Existing Environment

Ambient air quality within the proposal study area would be characteristic of a rural area and is affected by a number of factors including topography, prevailing meteorological conditions and local and regional sources of potential air pollution.

Existing sources of air pollution within the local setting are limited, consisting primarily of dust and vehicle/machinery exhaust emissions associated with agriculture practices and transport along the major roads within the proposal study area. The region surrounding the site is sparsely populated, with most of the land comprised of rural properties and agricultural land.

### 8.2.2 Issues for consideration

During construction, local air quality within the proposal study area may be temporarily affected by particulate (dust) and exhaust emissions from activities such as earthworks. The main sensitive receptors during construction would be residences within 100 metres from the proposal. There are limited sensitive receptors located within 500 metres of the proposal study area.

Due to the relatively small scale of construction works required at each structure location, and the progressive nature of the construction works, the effects of any dust generated would be localised and short term.

Gaseous emissions associated with the combustion of fuel and combustion-related pollutants from construction plant and machinery would be manageable through the effective implementation of appropriate environmental management measures.

The use of construction equipment and manufacture of materials for use in the proposal would consume resources associated with greenhouse gas emissions. In addition, substation equipment and switchgear such as circuit breakers, disconnectors and transformers may contain sulphur hexafluoride (SF<sup>6</sup>) which is a greenhouse gas.

During operation, the proposal is not anticipated to generate a substantial amount of additional air quality or greenhouse gas impacts. A minor amount of greenhouse gases would be anticipated due to the operation of machinery for maintenance activities, however these impacts are anticipated to be minimal.

The proposal would be unlikely to have a significant impact on local air quality. Construction and operational air quality impacts would be manageable through the application of standard environmental management measures. Overall, air quality, climate change and greenhouse gases are not considered to be key issues for the proposal.

### 8.2.3 Method of assessment

The EIS would include an assessment of air quality impacts during construction in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2016). The EIS would also recommend mitigation and management measures to reduce construction emissions and associated impacts, where reasonable and feasible.

As the proposal would be unlikely to generate significant air quality impacts during operation, an operational air quality impact assessment is not proposed.

The use of the SF<sup>6</sup> containing substation equipment would need to be managed to prevent inadvertent release into the environment. The greenhouse gas emissions for the proposal would be quantified and presented in the EIS. This would include potential impacts of the SF<sup>6</sup> contained in substation equipment.

## 8.3 Noise and vibration

---

### 8.3.1 Existing environment

The proposal study area is located in a remote, rural area to the north and east of the regional townships of Buronga, Dareton and Wentworth, NSW. There are limited residential dwellings located within 500 metres of the proposal study area.

Existing noise conditions in the majority of the proposal study area are expected to be influenced by environmental noise (e.g. wildlife calls, wind-blown vegetation), agricultural machinery and vehicles travelling on the surrounding road network (namely Silver City Highway, Sturt Highway and other arterial and minor public roads proximate to the proposal study area).

### 8.3.2 Issues for consideration

The proposal would generate noise and vibration throughout the construction phase due to various activities including operation of heavy vehicles, helicopters (if required), vegetation clearing, bulk earthworks and excavations (for foundations and helipads (if required)), and the construction of access tracks, stringing of the lines, road upgrades and increased traffic volumes. The expansion of the Buronga substation would result in both construction and operational noise in the area immediately surrounding the facility.

However, for the majority of the proposal study area, these activities would not be expected to cause significant noise and vibration impacts due to the short duration of work at each location and distance from sensitive receptors. Works at these locations would be likely to have a minor and temporary nuisance noise impact on the closest sensitive receptors. No vibration impacts are expected from the proposal due to the distance from sensitive receptors. This would be confirmed during the noise the vibration assessment once the preferred alignment is selected.

The operation of the proposal would have minimal noise impacts.

### 8.3.3 Method of assessment

Impacts of the proposal on the surrounding environment would be assessed in a noise and vibration impact assessment to be included in the EIS. The assessment would be conducted in accordance with the Interim Construction Noise Guideline (DECC, 2009) and Assessing Vibration: A Technical Guideline (DEC, 2006) and include:

- > Identification of sensitive receptors that may be affected by noise and vibration impacts and identification of background noise levels
- > Identification of construction and operation noise and vibration goals in accordance with relevant guidelines and legislation
- > Predictions of noise and vibration emission levels from construction and operation activities
- > Assessment of potential noise and vibration impacts
- > Recommendation of mitigation measures to minimise construction noise and vibration impacts, where reasonable and feasible.

## 8.4 Traffic and access

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### 8.4.1 Existing environment

The proposed activity crosses a number of major roads (Pine Camp Road, Nulla Road / Renmark Roads, Anabranche Mail Road, Silver City Highway, High Darling Road, Low Darling Road and Sturt Highway) in addition to numerous local and access roads. The major roads are shown on **Figure 1-2**.

### 8.4.2 Issues for consideration

An increase in local and regional traffic would be likely to occur during the construction of the proposal including over-size and non-standard loads. Bulk movements of spoil and fill would be required in particular for works proposed at the substation. Estimates of truck and vehicle movements would be confirmed during subsequent stages of the proposal development and will depend on the adopted construction methodology and staging plans and would be described as part of the EIS.

There may be some temporary disruptions to traffic movements along roads within the proposal study area during the stringing works above the road corridor. Whilst road access may be required, impacts on traffic would be temporary in nature and would unlikely cause considerable disruptions to other road users. It is assumed that access would be maintained for the public at all times.

Access to existing properties is not anticipated to be substantially affected by the construction of the proposal. Some minor impacts to access may occur where access tracks are required for the construction and operation of the proposal. The location of any required access tracks would be identified as part of the EIS process and any proposed temporary or permanent changes would be developed in consultation with the relevant land owners.

During operation of the proposal, traffic and transport impacts are expected to be minimal and would typically be limited to occasional vehicle travel by maintenance staff.

The potential traffic, transport and access issues associated with the proposal would be considered as part of the preparation of the EIS.

### 8.4.3 Method of assessment

The EIS would include an assessment of traffic and access impacts during construction and operation, including a description of existing road network, assessment of construction and operational traffic impacts, need for additional access roads and connection to the road network and identification of measures to be used to minimise traffic and access impacts. The traffic assessment would consider the movements of large equipment and large components (transformer), pre-fabricated buildings as well as spoil and waste on the local and wider road network. The EIS would also consider management measures for traffic impacts on the road network (including council and NPWS roads).

## 8.5 Soils and water quality

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### 8.5.1 Existing environment

#### 8.5.1.1 Soils

The preliminary alignment corridor lies within the Murray Darling Depression which occupies southwest NSW, crosses into Victoria, SA, and spreads over 19,000,000 hectares. It is bounded in the north by Broken Hill and the Murray River to the south. The proposal study area is characterised by flat inland topography.

The Murray Darling Basin lies on Tertiary and Quaternary sediments. These are subsequently overlain with the Woorinen Formation which are formed from windblown sands, silts, and calcareous clays from Quaternary deposits, and the Coonambidgal formation which is comprised of alluvial deposits, and channel sands from the Holocene.

Geological maps on a 1:250,000 scale, provided by Geoscience Australia, identified seven geological soil units and five land systems were within the preliminary alignment corridor, refer to **Figure 8-1**. These land systems can be placed into four major geomorphic categories as follows:

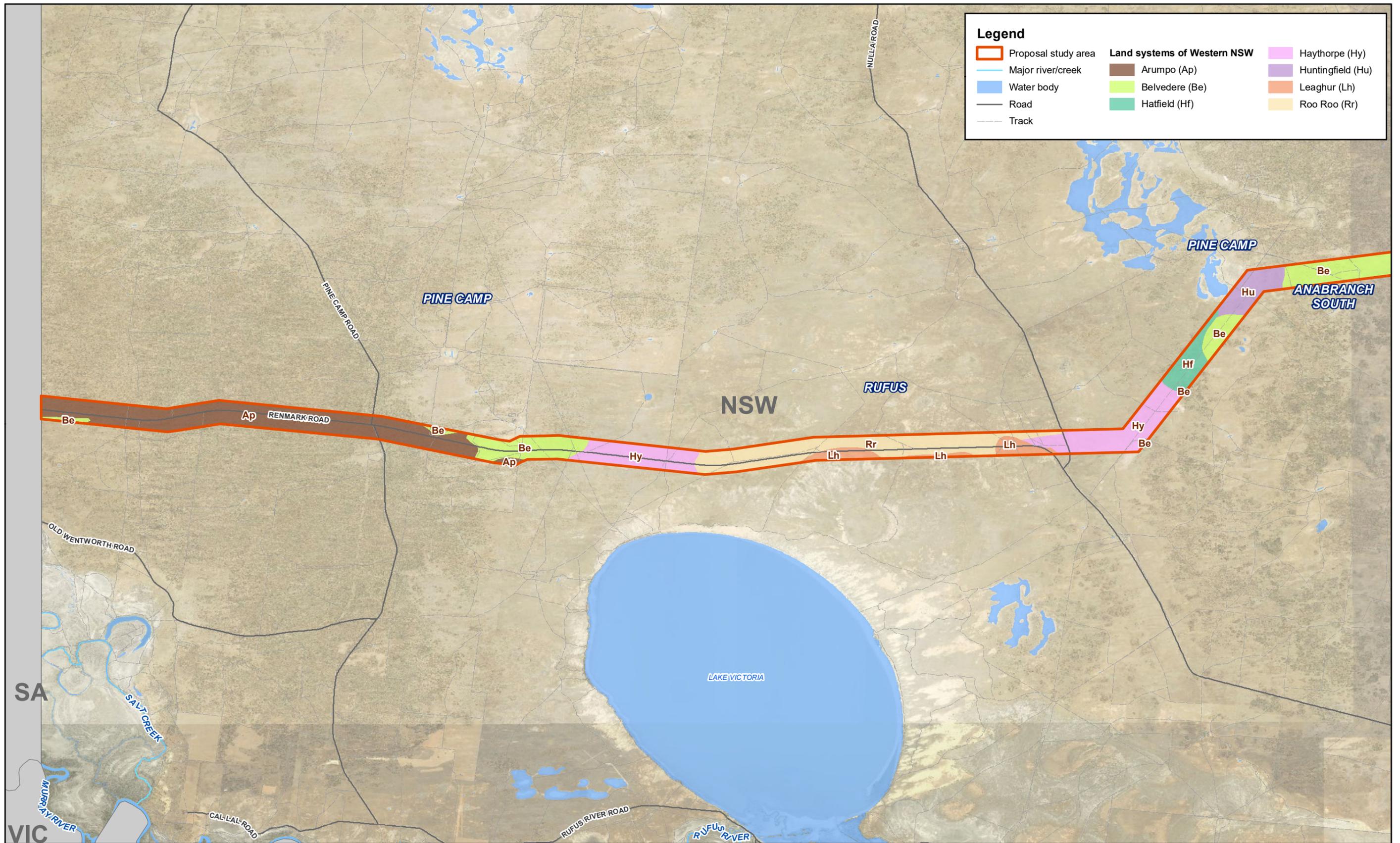
- > Sandplains - Belvedere, Bulgamurra, Hatfield, Menilta, Overnewton, Roo Roo, Trelega and Huntingfield
- > Dunefields - Arumpo, Haythorpe, Mandleman and Marona
- > Alluvial Plains - Anabranh, Canally, Darling, Murrumbidgee, and Leaghur
- > Playas and Basins – Dalmoreve and Quambie.

The NSW Land and Soil Capability (LSC) assessment scheme (2012) defines LSC classes based on biophysical features of the land, including soil type, slope, landform position, acidity, salinity, drainage, rockiness and climate. The purpose of the LSC class is to provide an indication of the land management practices that can be applied to a parcel of land without causing degradation of the land and soil on-site, and to the environment, ecosystems and infrastructure off-site. The proposal study area is predominately LSC class 5 (Severe limitations) and LSC class 6 (Very severe limitation). There are also scattered pockets of LSC class 4 (moderate to severe limitation) and LSC class 8 (Extreme limitations).

These LSC Class areas are noted to have high limitations for high-impact land uses, and land uses should be restricted to low-impact practices such as grazing, forestry and nature conservation. Soil erosion can be severe without adequate erosion control measures.

Based on an understanding of local geology there is a low risk of encountering geological units with naturally occurring asbestos within the proposal study area.

Given the existing site characteristics consist of predominately undeveloped rural land, it is anticipated that existing on site contamination risks would be minimal. A search of the list of NSW contaminated sites notified to the EPA for Wentworth LGA on 2 May 2019, found three contaminated sites notified to the EPA near the proposal. These sites are located in the surrounding suburbs of Rufus River, Buronga, and Wentworth. None of these sites are within the proposal study area. The closest location is about five kilometres from the proposal study area boundary at Buronga. A search of the public contaminated land record of notices database was undertaken on 2 May 2019, which did not identify any properties that are currently or formerly regulated under the *Contaminated Land Management Act 1997*.



**Legend**

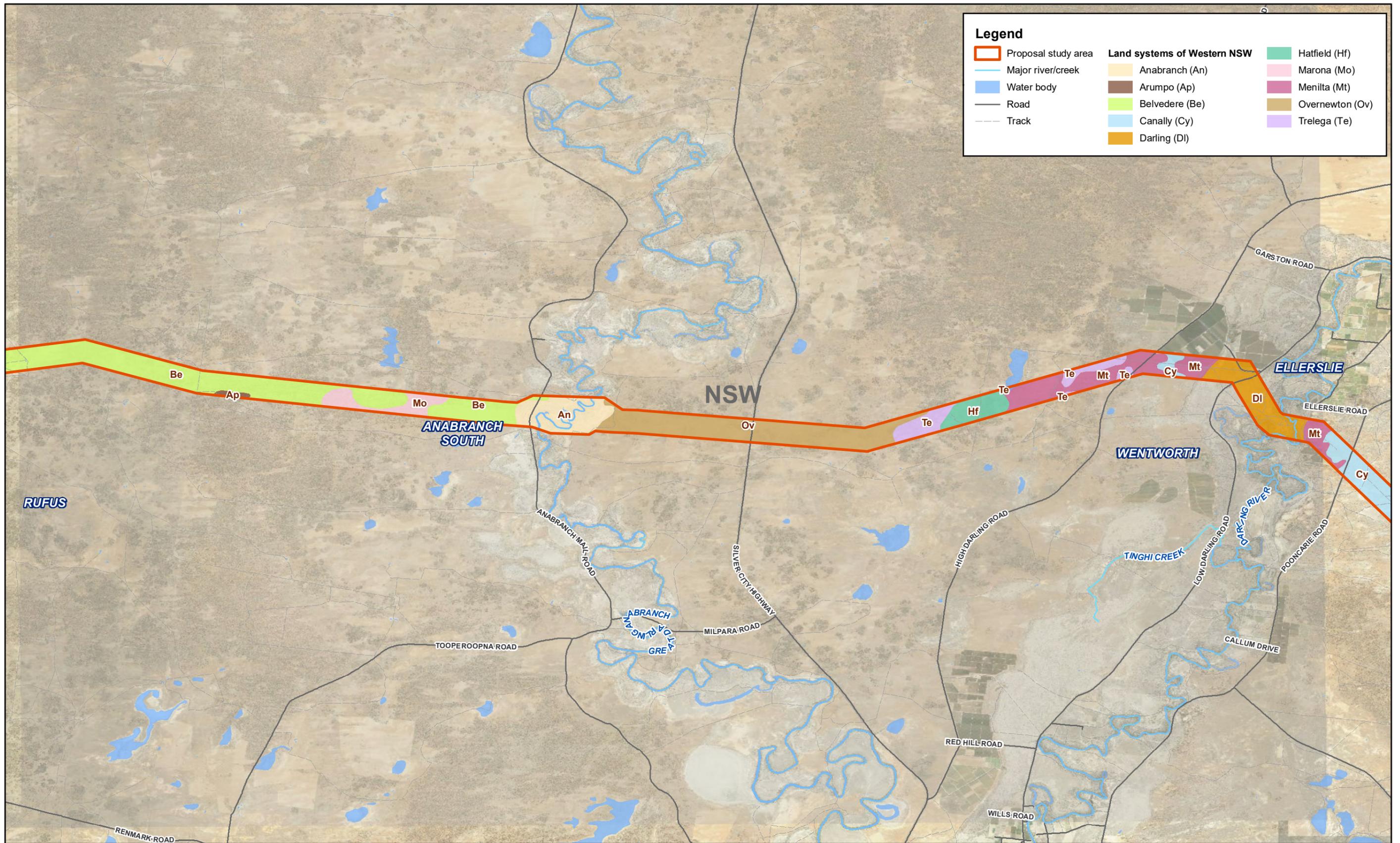
Proposal study area	<b>Land systems of Western NSW</b>	Haythorpe (Hy)
Major river/creek	Arumpo (Ap)	Huntingfield (Hu)
Water body	Belvedere (Be)	Leaghur (Lh)
Road	Hatfield (Hf)	Roo Roo (Rr)
Track		

Map: PS113770\_BtoB\_Scoping\_002\_A3 Author: AUTB501486  
 Date: 30/10/2019 Approved by: - A.Garrett

0 2.5 5 km  
 1:150,000  
 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3

**BORDER TO BURONGA SCOPING STUDY**  
**Figure 8-1a**  
 Land systems in the proposal study area

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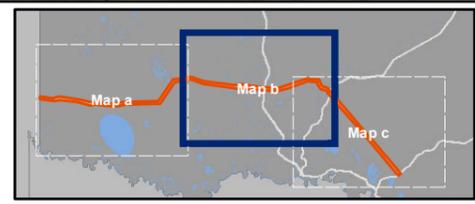
**Legend**

Proposal study area	<b>Land systems of Western NSW</b>	Hatfield (Hf)
Major river/creek	Anabanch (An)	Marona (Mo)
Water body	Arumpo (Ap)	Menilta (Mt)
Road	Belvedere (Be)	Overnewton (Ov)
Track	Canally (Cy)	Trelega (Te)
	Darling (DI)	

Map: PS113770\_BtoB\_Scoping\_002\_A3  
 Date: 30/10/2019  
 Data source:

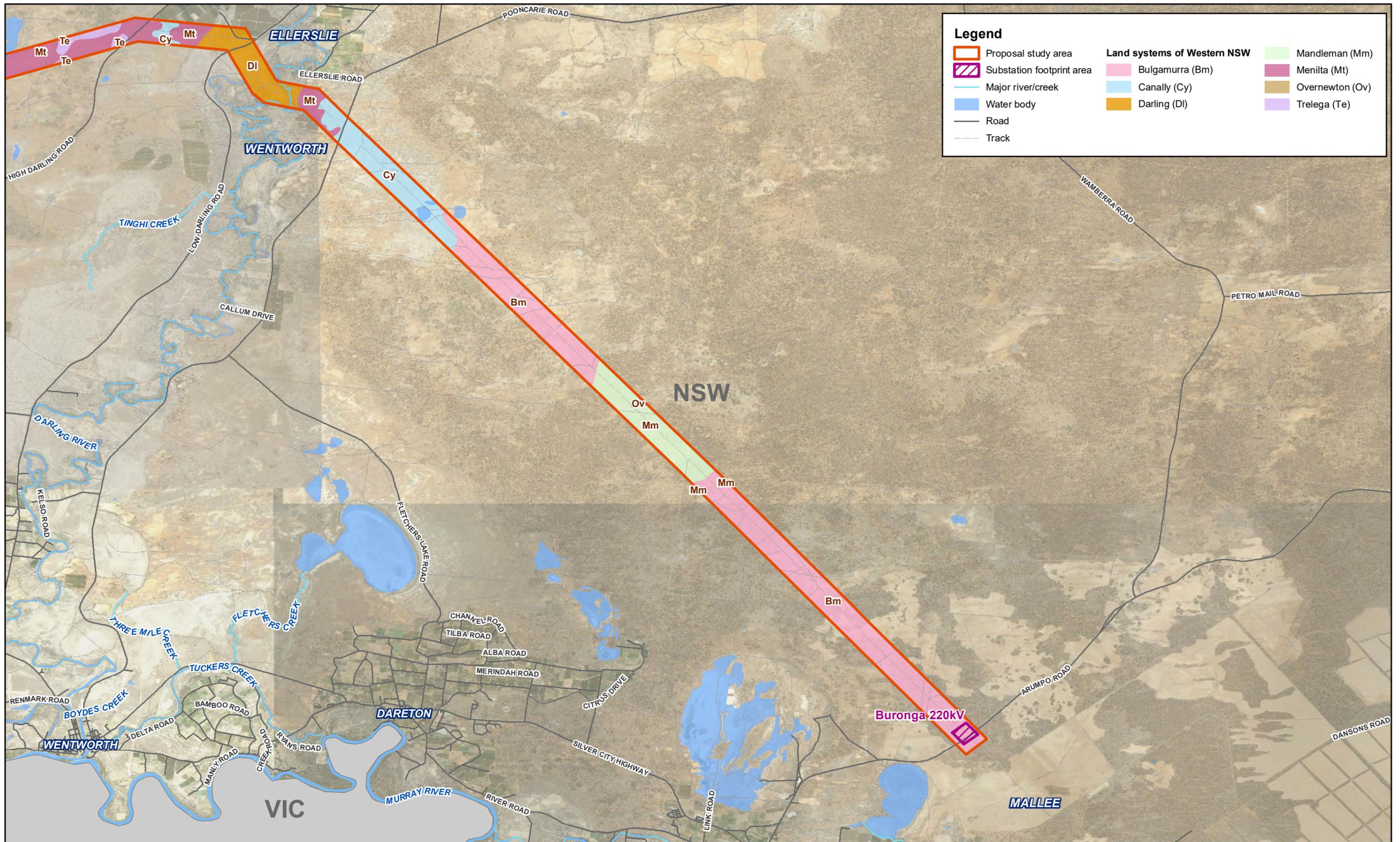


0 2.5 5 km  
 1:150,000  
 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3



**BORDER TO BURONGA SCOPING STUDY**  
**Figure 8-1b**  
 Land systems in the proposal study area

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**Legend**

Proposal study area	<b>Land systems of Western NSW</b>	Mandleman (Mm)
Substation footprint area	Bulgamurra (Bm)	Menilta (Mt)
Major river/creek	Canally (Cy)	Overnewton (Ov)
Water body	Darling (DI)	Trelega (Te)
Road		
Track		

Map: PS113770\_BtoB\_Scoping\_002\_A3  
 Date: 30/10/2019  
 Data source:

Author: AUTB501486  
 Approved by: - A.Garrett



0 2.5 5 km  
 1:150,000  
 Coordinate system: GCS GDA 1994  
 Scale ratio correct when printed at A3



**BORDER TO BURONGA SCOPING STUDY**  
**Figure 8-1c**  
 Land systems in the proposal study area

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### 8.5.1.2 Water quality

Water quality within the proposal study area is expected to be influenced by existing agricultural operations with substances such as pesticides, herbicides, fertilisers and sedimentation of waterways resulting in poor water quality.

Water quality impacts have the potential to occur during construction if fuel or chemical spills from construction vehicles enter waterways. If not managed appropriately, the introduction of pollutants could result in the following impacts to the water quality of the local waterways:

- > Changes to pH, electrical conductivity, dissolved oxygen and temperature
- > Reduced light penetration due to increased turbidity
- > Increased sediment load, organic matter and turbidity of water
- > Increase in gross pollutants
- > Introduction of toxic pollutants such as construction fuels, oils and grease and chemicals.

### 8.5.2 Issues for consideration

#### 8.5.2.1 Soils

The main impacts on soils from the proposal would generally be from excavation works during construction. Soil disturbance activities, such as excavation works, may lead to erosion and sediment transfer offsite, which may result in potential sedimentation of surrounding land and drainage lines.

Where possible, spoil generated would be used on site to provide the required levels. Some excavated material may also be suitable for reuse for elements such as access tracks. This would be determined during the detailed design of the proposal. There may be excess spoil which is not suitable for reuse which will need to be disposed of offsite to an appropriately licenced facility.

Construction of the Buronga substation expansion is expected to require substantial volumes of imported fill in order to achieve the required design specifications. The EIS would identify potential sources.

Depending on the final detailed design and site levels, some fill may need to be imported to site to assist with achieving required levels on new access tracks.

Although localised terrain may impact the location of structures and ancillary facilities during construction, topography is unlikely to be a key factor in the impact assessment. Landscape features that are likely to affect structure location include the water bodies of the Darling River and Darling Anabranch.

Structure placement would need to consider existing and future land use in particular around the Darling River.

Contamination may occur from hydrocarbon spills from the operation of plant during construction. While it is anticipated that existing on site contamination risks would be minimal, there is the potential that former land uses such as sheep and cattle dips, or buried asbestos materials may be encountered.

During the operation of the expanded substation as part of the proposal, there would be potential to release contaminants into the environment from hydrocarbon leaks / spills from machinery and oil filled equipment (such as the substation transformers) as well as site drainage, sewerage and waste water. The final design would include oil spill containment systems in accordance with the legislation and standards.

Any potential impacts would be identified as part of the EIS and effectively managed through the identification and implementation of appropriate mitigation measures.

### 8.5.2.2 Water quality

Potential erosion and sedimentation impacts may result from ground disturbance during construction activities, vegetation removal, and poor construction management during storm events.

If not adequately managed, the proposed structures may result in minor impact to local surface run-off and flow regimes.

The establishment of access tracks may require crossing of various natural waterways. Many of these access tracks would need to be maintained during the operational stage of the proposal.

### 8.5.3 Method of assessment

Geotechnical assessment would be undertaken to inform the design of the proposal and would identify any necessary management measures for soil types encountered. The EIS will consider the risk of encountering contaminated soils during construction of the proposal. This would include a review of the site history, identification of current or historical contaminating activities and the potential for site sampling to confirm contamination or risks.

The EIS also would consider the potential impacts to water features and site run-off, and identify mitigation measures to be applied to works to manage these potential impacts. The EIS will also consider the proposal's operational impacts related to managing and maintaining access tracks as well as substation related risks such as hydrocarbon leaks / spills from the transformers.

## 8.6 Waste management and resource use

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### 8.6.1 Existing environment

Given the remoteness of the proposal, there is poor access to existing waste management facilities.

### 8.6.2 Issues for consideration

#### 8.6.2.1 Waste management

The construction of the proposal would result in a range of typical waste materials including:

- > Spoil from excavation and access track works
- > Surplus construction materials
- > Vegetation
- > General domestic waste from construction and maintenance personnel
- > Waste from construction compounds and workers camp/s.

Waste anticipated to be generated by the operation of the proposal would include general domestic waste from operation and maintenance personnel and minor levels of waste from maintenance activities (such as the replacement of fittings, equipment etc).

The disposal of waste generated during the construction and operation of the proposal is not anticipated to result in significant adverse environmental impacts. Removal of waste generated during construction and operation would be addressed through the application of standard environmental management measures which would be identified as part of the EIS.

Excavation works required for construction of the structure footings and access tracks would generate some excess spoil which may require the identification and establishment of a long-term spoil emplacement sites. Options to re-use excavated material for the construction works would be investigated during detailed design.

### 8.6.2.2 Resource use

Resources used during the construction and operation of the proposal would include:

- > Water (construction and operational phases)
- > Electricity (construction and operational phases)
- > Fuel (construction and operational phases)
- > Concrete (primarily construction phase)
- > Steel (primarily construction phase).

While the proposal would result in some increased demand on local and regional resources, it would be unlikely that the proposal alone would result in any resource becoming scarce or in short supply. The source of water to be used during construction would be determined during the EIS phase. It is expected that the community would be highly sensitive to any impacts on local water supplies, especially given the current drought conditions.

Environmental management measures would be developed to reduce the proposal's demand on resources and identified in the EIS.

### 8.6.3 Method of assessment

The EIS would identify potential waste streams associated with construction of the proposal, and would include standard management practices compliant with the *Waste Avoidance and Resource Recovery Act 2001* and other relevant policies and guidelines.

# 9. Conclusions

Project EnergyConnect – SA/NSW border to Buronga is subject to assessment under Division 5.2 of the *Environmental Planning & Assessment Act 1979* and as such, this document supports an application seeking the SEARs for the EIS. In addition, the proposal has been declared CSSI under Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011*.

The key environmental assessment issues identified for Project EnergyConnect – SA/NSW border to Buronga, and which would be assessed in more detail during the preparation of the EIS are:

- > Biodiversity
- > Aboriginal heritage
- > Non-Aboriginal heritage
- > Land-use and property
- > Landscape character and visual amenity
- > Fire risk
- > Socio-economic
- > Surface water and hydrology.

Other issues requiring assessment but considered less likely to result in significant impacts, either based on lower likelihood of occurrence or absence of likely receptors, are as follows:

- > EMF
- > Air quality and greenhouse gas
- > Noise and Vibration
- > Traffic and Access
- > Soils and water quality
- > Waste management and resource use.

As part of the preparation of the EIS, further assessments (as proposed in **Sections 7 and 8** of this Scoping Report) would be carried out in conjunction with the further development of the proposal design. In assessing the proposal, the key focus would be avoidance and minimisation of impacts on the environment and local communities, where reasonable and feasible, when taking into consideration engineering constraints and cost implications.

The assessment would also identify mitigation and management measures to minimise impacts on the environment.

Consultation with affected property owners, stakeholders and the local community will continue throughout the proposal assessment, design and construction phases.

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## Appendix A Preliminary Ecological Constraints Assessment

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## Appendix B Preliminary Archaeological Assessment Report

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