Renew estate.

Buronga Energy Station

Preliminary Environmental Assessment

July 2018

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ABBREVIATIONS

AEMO	Australian Energy Market Operator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CEMP	Construction Environmental Management Plan
DCP	Development Control Plan
DoP	NSW Department of Planning (now DP&E)
DP&E	NSW Department of Planning and Environment
DPI	Department of Primary Industry
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
kV	Kilovolt
LEP	Local Environment Plan
MW	Megawatt
MWac	Megawatt alternating current
MWp	Megawatt peak
NER	National Electricity Rules
NSW	New South Wales
O&M	Operation and Maintenance
OEH	Office of Environment and Heritage (formerly DECCW, DECC, DEC)
PCU	Power Conversion Unit
PV	Photovoltaic
RU1	Primary Production
SCADA	Supervisory control and data acquisition
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development

1. INTRODUCTION

1.1 Overview

Renew Estate Pty Ltd (Renew Estate) is proposing to develop the Buronga Energy Station comprising a large scale photovoltaic (PV) solar farm and battery energy storage system in Wentworth, New South Wales (NSW), approximately 12 km northeast of Mildura, Victoria (VIC). The proposed site for the development is approximately 1,200 hectares in size.

Key elements of the proposed infrastructure include PV modules mounted on tracking arrays, power conversion units (PCUs) containing inverters and electrical switchgear, a battery energy storage system, operation and maintenance (O&M) facilities, an onsite electrical substation, and a 220 or 330 kilovolt (kV) transmission line for connection to the existing Buronga Switching Station (the 'proposal', also referred to as 'Buronga Energy Station').

The SA Energy Transformation Regulatory Investment Test for Transmission (RIT-T) Project Assessment Draft Report (ElectraNet, June 2018) identifies a new 330 kV interconnector between mid-north South Australia (SA) and NSW as the highest net market benefit and preferred option to provide secure and reliable electricity to SA. The proposed Buronga Energy Station is perfectly situated adjacent to the Buronga Switching Station to provide low-cost, low-emission electricity across three National Electricity Market (NEM) regions; NSW (via Buronga Switching Station), VIC (via Red Cliffs Substation) and SA (via the proposed 330kV link to Robertstown Substation). The detailed design of the project will be informed by the evolution of the potential interconnector project.

Pending the detailed assessment of site constraints and design of the final development footprint, the capacity of the proposed solar farm would be up to approximately 400 MWac (500 MWp), and the output and storage capacity of the proposed energy storage system would be up to approximately 250 MW / 500 MWh.

The proposal is classified as a State Significant Development (SSD) under *State Environmental Planning Policy (State and Regional Development) 2011* and is subject to assessment and determination by the NSW Minister for Planning and Environment (Minister). SSD projects comprise developments that are deemed to have State significance due to their size, economic value or potential impacts. Applications for SSD must be accompanied by an Environmental Impact Statement (EIS) which is prepared in accordance with Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment (DP&E).

1.2 Purpose of this report

This Preliminary Environmental Assessment (PEA) has been prepared to support Renew Estate's request to DP&E for the SEARs in relation to the proposal. The EIS must address the SEARs.

The PEA will assist DP&E's development of the SEARs through providing:

- an overview of the proposal, including justification and alternatives considered;
- an outline of the planning and statutory framework;
- a description of the stakeholder and community consultation undertaken to date;
- characterisation of the existing environment and site constraints;
- a preliminary assessment of key potential environmental issues and risks; and
- identification of further assessments likely required during the EIS.

1.3 The Proponent

Renew Estate is an Australian company focused on developing high-quality renewable energy projects that will create long term and enduring benefits for asset owners, energy users and the wider nation. Renew Estate maintains strong community values and is passionate about working with stakeholders to deliver an appropriate and considerate uses of land, technology and investment. Renew Estate's goal is to embed sustainable energy into our nation's energy supply chain whilst enhancing energy security and affordability. Renew Estate develops

utility scale solar farms and energy storage systems that are flexibly designed to work with the natural and built environments.

Renew Estate's largest shareholder, Wirsol Energy (Wirsol), is an international renewable energy company specialising in the development, financing, construction and operation of solar projects across Europe, the UK and Australia. Wirsol was officially recognised by SERAnalytics (SERA) as the largest developer actively building solar assets in Australia (SERAnalytics, November 2017) and has plans to deploying develop more than one gigawatt of solar generation in Australia by 2020. The company is currently the owner of five solar farm projects totalling 397 MWp in Australia as well as the joint owner of the 25 MW / 50 MWhr Tesla Gannawarra Energy Storage System project.

Beast Solutions is also a shareholder of Renew Estate. The Beast Solutions team provides advisory, due diligence and design management support for property and renewable generation developments, low carbon precincts, smart grids and microgrids. Beast Solutions has played a key role in some of the most advanced and recognisable projects in the field.

2. THE PROPOSAL

2.1. Site Description

2.1.1. The Site

The proposal site is located in the suburb of Wentworth within the Wentworth Shire Council area in south-western NSW, approximately 5 km northeast of the Buronga and Gol Gol townships, 30 km east of the Wentworth township, and approximately 12 km northeast of the town of Mildura in VIC (Figure 1).

The proposal site is approximately 1,200 hectares in size, located on the following lots (Figure 2):

- Lot 2 DP1195524 (part) – proposed solar farm and battery energy storage development area, and part of the proposed transmission line corridor.
- Lot 1 DP717938 – existing Buronga Switching Station which the proposal would connect into.
- Lot 1 DP1174934 (part) – part of the proposed transmission line corridor.

The proposal site is currently used for agriculture (cropping and grazing) and is zoned Primary Production (RU1) under the *Wentworth Local Environmental Plan 2011* (LEP).

The land on which the proposal site is located is currently Crown Land, owned by the Department of Industry – Lands and Water (DPI), and is held under a Western Lands Lease. The current lessee of the land is in the process of converting the leasehold land into freehold title. It is anticipated that this will occur prior to lodgement of the SSD application for the proposal. As secured through an option agreement, Renew Estate intends to lease or purchase the proposal site from the landowner, should the proposal receive development consent. The SSD application will include the proposed subdivision of Lot 2 DP1195524 to enable the long-term lease or purchase of the proposal site which affects part of the lot.

Approximately 50% of the proposal site has been cleared from cropping and grazing, with the remainder consisting of a mosaic of five vegetation communities. The terrain of the proposal site is generally flat and does not contain any watercourses.

The surrounding area is rural with very limited development or infrastructure, particularly to the north, south and east. The closest sensitive receiver is a residential dwelling approximately 4.5 km southwest of the proposal site (Figure 3). Further residential dwellings are located approximately 5 km southwest of the proposal site in the townships of Gol Gol and Buronga. There is a residential dwelling approximately 2.5 km southwest of the proposal site, however the owner and occupier of the dwelling is involved in the proposal and therefore is not considered a sensitive receiver (Figure 3).

2.1.2. The Locality

The proposal site is located within the Wentworth Shire Council area, approximately 5 km northeast of the Buronga and Gol Gol townships. With a population of 2,900, the 2017-2027 Community Strategic Plan for Wentworth Shire Council identifies the Buronga – Gol Gol community as the growth area of the Wentworth Shire (WSC,2017a).

Located in the far south-west of NSW close to the border of VIC and SA, Wentworth Shire is a strategic hub at the intersection of important national freight and transport corridors as well as national electrical transmission infrastructure.

The townships of Buronga and Gol Gol have boundaries with the Murray River whilst the Wentworth township is at the confluence of the Murray and Darling Rivers. These rivers combined make up the fourth largest river system in the world. These rivers are a great attraction to the region and provide both significant amenity to local residents and the benefits of tourism to the local economy.

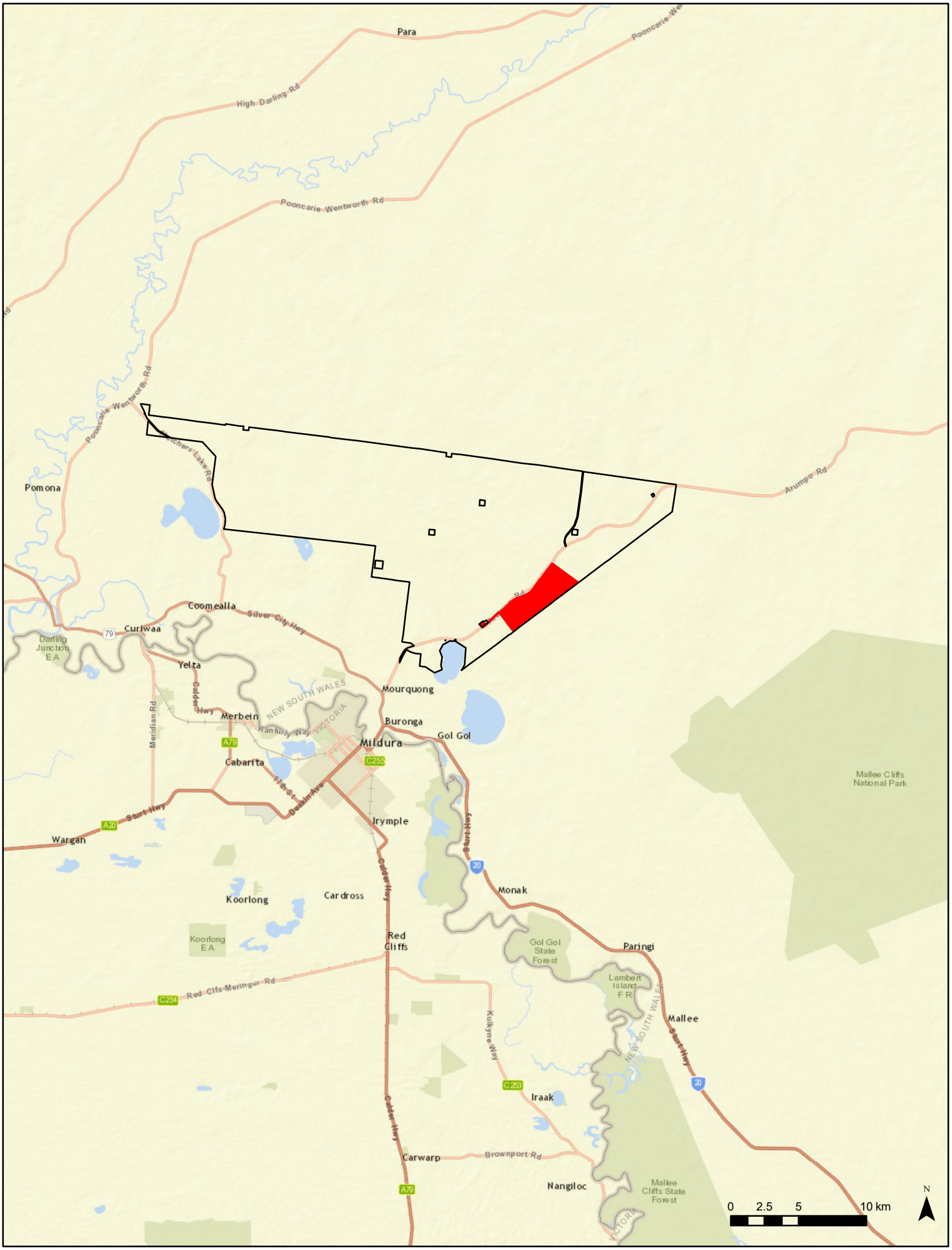
While tourism is a strong growth opportunity, the top three industry sectors in Wentworth Shire are agriculture, mining, and manufacturing which contributed 52% of the Gross Regional Output (GRP) (WSC, 2017a). The GRP for the Wentworth Shire was approximately $855 million in 2016 (WSC, 2017a).

Wentworth Shire Council (Council) has outlined its vision of Wentworth as a thriving region, supported by a robust economic base, with distinctive open spaces, and strong local governance and leadership. To this end,

the Council identified four primary goals based around economic, social, environmental development as well as good governance (WSC, 2017a).

Similarly, the 2016/17 Wentworth Shire Council Annual Report to the Community highlighted the specific objective of encouraging the diversification and expansion of business and industry (WSC, 2017b). Together with tourism, mining, recycling and aquaculture, the Annual Report specifically references the solar industry as one that can be encouraged to support growth and development.

The proposal will bring significant economic activity to the region in a manner which diversifies the economic base and paves the way for long-term, resilient growth. In addition to placing downward pressure on local energy prices through increasing energy supply in the NSW NEM region, the project will provide the opportunity to establish energy supply agreements with local large energy users. The proposal is considered consistent and supportive of the strategies outlined in current planning documents. It will provide essential infrastructure to support the growth and longevity of Wentworth Shire.



Lot 2 DP1195524

Proposal site

Drawing Title:
Figure 1:
Site context

Scale:
1:350,000@ A4

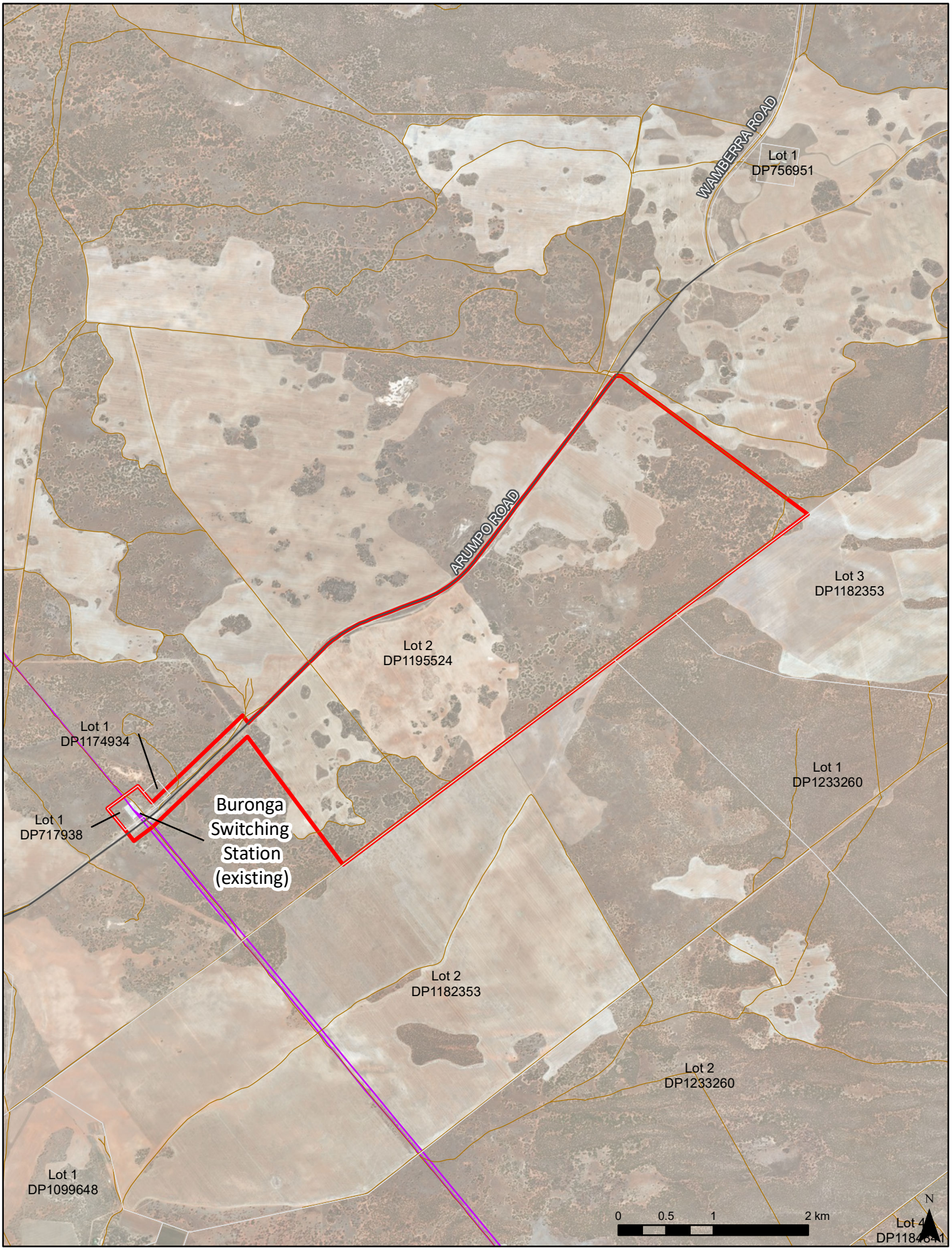
Drawn by:
LL

Date:
Jun 2018

Rev:
A

Renew estate.

BEAST SOLUTIONS



Proposal site
Lot boundary
Sealed road
Unsealed road
Existing 220kV transmission line

Drawing Title:
Figure 2:
Proposal site location

Scale:
1:50,000 @ A4

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LL

Date:
Jul 2018

Rev:
A

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Proposal site
5 km buffer
2 km buffer
Residential dwelling
Note only receptors within 5 km have been mapped.

Drawing Title:
Figure 3:
Sensitive receptors within 5 km

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Date: Jul 2018
Rev: A

Renew estate.
BEAST SOLUTIONS

2.2. Description of the proposal

The proposal includes up to approximately 400MWac of solar generation equipment and 250MW / 500MWh of battery energy storage. The key components of the proposal include:

- PV solar modules (modules)
- Single-axis tracking system mounted on steel piles (trackers)
- PCUs containing the electrical switchgear, inverters and medium voltage (MV) transformers (Figure 4)
- Onsite electrical switchyard and substation including the high voltage (HV) power transformer(s) (onsite substation)
- Battery energy storage system
- Overhead or underground transmission line (220kV or 330kV) and associated easement
- Internal direct current (DC) and alternating current (AC) cabling for electrical reticulation
- O&M building including office and staff amenities, SCADA system, maintenance workshop facilities and spare parts storage
- Internal all-weather access tracks
- Bushfire asset protection zones as required
- Security features, including fencing
- Meteorological station(s)
- potential site access upgrade works as required
- Subdivision of Lot 2 DP1195524 to enable the long term lease or purchase of the proposal site.

The modules will be mounted on trackers, with the indicative tracking angle ranging from +60 to -60 degrees to the horizontal each day. The modules will be oriented to face east for first light in the morning and will track to follow the position of the sun throughout the course of the day. At solar noon, the position of the modules will be zero degrees (parallel to the ground) and they will finish facing west in the late afternoon.

The tracking system will have the capability to respond to weather events, with local weather conditions including average and gusting winds speeds monitored by the onsite meteorological station 24 hours a day.

The tracking structures will be mounted on piles, which will be screwed or pile driven depending on final geotechnical analysis and detailed design. During operation groundcover vegetation would be maintained under the arrays and is intended to be managed by sheep grazing where possible.

An example of a constructed single-axis tracking system is provided in Figure 5.

Figure 4: Indicative PCU (SMA 2750-EV MVPS)

Figure 5: Example of a single axis tracking system (Wirsol owned Hamilton Solar Farm in QLD)

The proposal includes a battery energy storage system to provide firming, reduce network constraints and provide frequency control and ancillary services into the NEM. The battery energy storage system consists of modular units (Figure 6) on pad mounted foundations, located adjacent to the onsite electrical switchyard and substation. The storage system will be containerised and bunded.

The output and storage capacity of the battery energy storage system is notionally 250 MW and 500 MWh respectively, however the evolving of government policy agenda, network attributes and potential for new network infrastructure in the region will influence the final design of the proposal. The battery technology type, system size and location will be further refined during the EIS and design process. Currently there are a number of suitable technologies in the market that provide a range of benefits to the proposal and the wider electricity market.

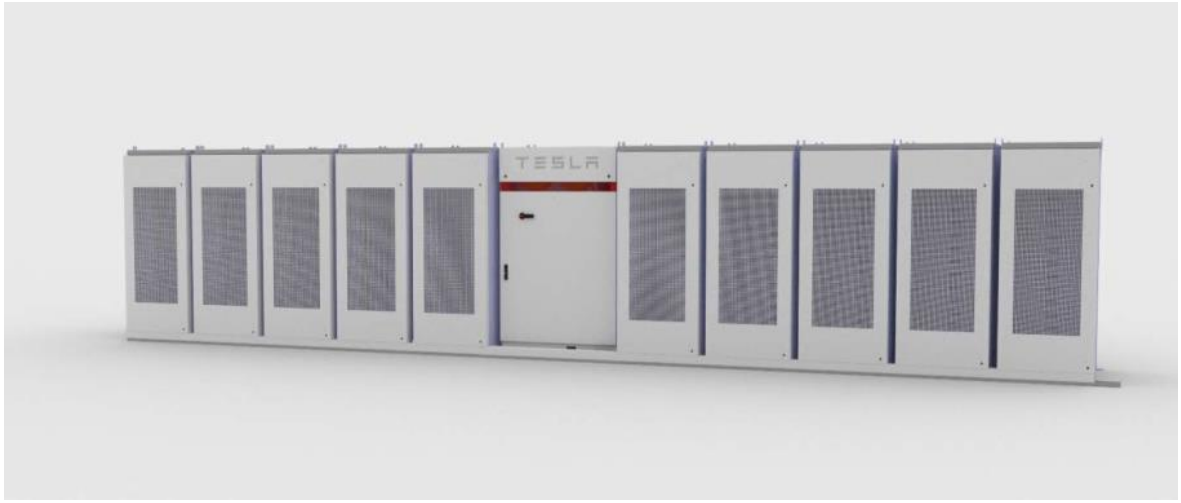


Figure 6: Indicative battery energy storage system (Tesla Lithium Ion Powerpack and Inverter Block).

Connection of the proposal into the NEM will be made through the Buronga Switching Station via a new overhead or underground transmission line. The proposed transmission line will be approximately 1.5 km long. The final voltage of the transmission line be either 220kV or 330kV depending on the final design of the

proposed interconnector and associated upgrade works to the Buronga Switching Station (refer Section 3.3). The Buronga Switching Station forms part of the TransGrid Transmission Network.

Site access would be via Arumpo Road from the west via Silver City Highway. Site access would be in accordance with the requirements of the relevant road authorities following an assessment of the adequacy of the access route.

The O&M building and substation would both have dedicated septic systems and rainwater tanks for water supply.

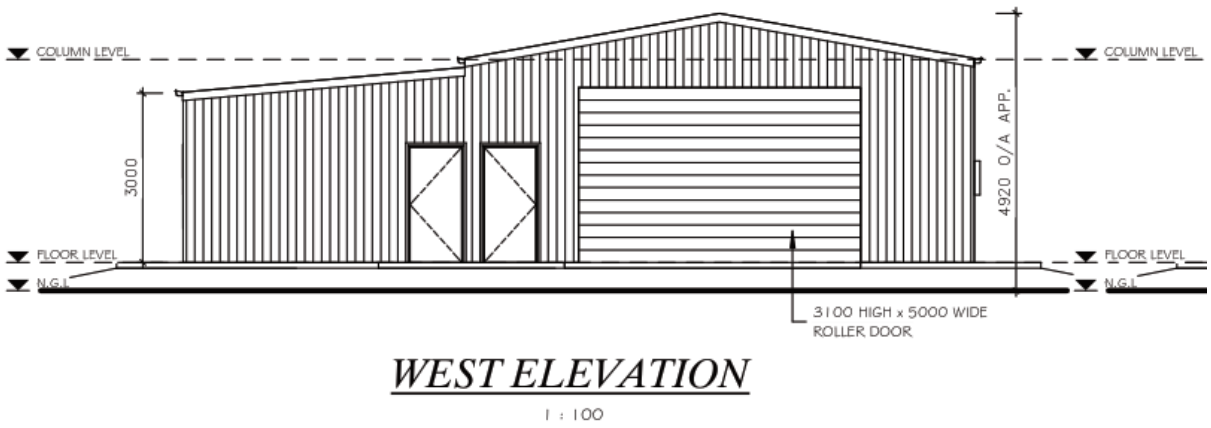


Figure 7: Indicative O&M building elevation

The construction schedule for the proposal is approximately 18 to 24 months from site establishment to completion.

The operational lifetime of the solar farm would be about 30-40 years.

3. PROPOSAL JUSTIFICATION AND ALTERNATIVES

3.1. Supporting Regional Development, Employment and Industry

3.1.1. Supporting residents and industry

The Council has identified the Buronga – Gol Gol community as an area of future population growth in several strategy and planning documents, including the Wentworth Community Plan (WSC, 2017a) and the Wentworth Development Control Plan (WSC, 2011). Similarly, the 2016/17 Wentworth Shire Council Annual Report to the Community highlighted the specific objective of encouraging the diversification and expansion of business and industry (WSC, 2017b). Together with tourism, mining, recycling and aquaculture, this report specifically references the solar industry as one that should be encouraged to support regional growth and development.

The above plans also highlight the objective of attracting investment in the region, which have the potential to increase population growth and help offset an aging population. The regional investment provided by the proposal will bring economic activity to the region during the construction and operational phases. Similarly, diversifying the economic base of the region will have other benefits for long-term and resilient growth, which is less susceptible to drought or international markets..

The proposal will also indirectly support industry in the region by placing downward pressure on local energy prices through increasing energy supply in the NSW NEM region, as well as the opportunity for establishing energy supply agreements with large energy users. Power prices are now regularly identified as a major concern to industry groups, and growing threat to NSW industry and employment; for example, the recent Energy Shock report, Australian Industry Group (AIG, 2017). Significant increases in the cost of energy over recent years have been paralleled by significant reductions in the cost of renewable energy, providing industry with the opportunity to secure substantial energy cost savings while improving their environmental footprint.

To ensure the local community and industry can fully benefit from potential upgrades in electricity infrastructure between NSW, VIC and SA new generation sources must be built close to local energy consumers. Wholesale electricity prices are uniform across NSW and upgrades to electrical infrastructure in isolation are not guaranteed to reduce local electricity prices.

Although wholesale electricity prices are uniform across NSW, local areas are subject to varying transmission “loss factor” adjustments that are charged by energy retailers to all customers. “Loss factor” charges reflect the extra energy that was sourced to account for transmission losses resulting from the transfer of energy from the distant generators to consumers. By locating a solar farm in the heart of Wentworth Shire, associated loss factors will be notably suppressed, yielding energy savings for all consumers regardless of whether they secure energy directly from the solar farm.

The proposal also has the ability, and intent, to establish energy supply agreements with local-industrial scale energy users to sell energy at a significantly lower cost than is currently achievable through grid-energy purchasing. Energy savings can be provided directly via a power-purchase agreement (PPA) mechanism. Under this mechanism, users can contract power from the solar farm and use an energy retailer to perform the function of ‘transmitting’ the energy from the solar farm to the local load using the existing electrical network charges. The proposed energy storage component will provide for ‘firmed’ energy supply source which will enable energy supply to be maintained independent of solar farm generation...

3.1.2. Contribution to regional development and employment

The proposal is expected to provide a significant contribution to regional development and employment, as well as ongoing economic benefits to the local region. Local industries including freight and logistics, hospitality and business services sectors are expected to benefit in line with those directly employed during the construction and operation phases. Renewable energy infrastructure projects have the potential create lasting employment and skills in regional areas and can contribute to keeping electricity costs down for local businesses.

3.2. Alignment with national energy and climate change policy objectives

There is a growing global recognition of the mounting imperative to mitigate the environmental impacts associated with fossil fuel-based energy generation. This growing realisation has manifested into international,

national and state-wide commitments from government and industry in support of the development of clean renewable energy projects.

In addition to the environmental imperative for reducing energy sector related emissions, the economic benefits of renewable energy projects have also been highlighted. Federal, state and local governments understand the importance of regional investment and job creation offered by renewables energy projects, which will also help to put downward pressure on energy prices currently impacting household budgets and industry.

3.2.1. National Electricity Supply

In Australia, energy security is defined as "the adequate, reliable and competitive supply of energy to support the functioning of the economy and social development" (DRET, 2011). A National Energy Security Assessment (NESA) carried out in 2011 (DRET, 2011) found that Australia's energy security was deemed 'moderate'. In addition, significant amounts of new capacity will be needed over the medium to long term to compensate for the retirement of emissions intensive coal plants.

Significant increases in energy prices in recent years has highlighted the vulnerability of households and industry to energy supply costs. Renewable energy projects represent a key mechanism for putting downward pressure on the energy prices currently impacting our vulnerable households and industries.

The vulnerability of our nation's reliance on aging coal-fired power generation has been highlighted in recent months, with the failure of four coal units in a single week of December 2017. Reports of failures at the Eraring power station (a 700MW unit) in NSW, Milmerran power station (a 420MW unit) in QLD, Mt Piper power station (a 700MW unit) in NSW and Loy Yang A Power Station (560MW unit) in VIC, were identified over week-long high temperatures and demands (Renew Economy 2017). Without the introduction of new supply, these aging assets will likely pose a continuing, and increasing, risk of energy security for our nation.

3.2.2. NSW Renewable Energy Action Plan

The NSW Government's Renewable Energy Action Plan was released in 2013 (NSW Government, 2013) in support of the Australian Government's Renewable Energy Target (RET) and to guide renewable energy development in NSW to achieve maximum benefits to the State. The Renewable Energy Action Plan comprises 24 actions to achieve the goals of:

- attract renewable energy investment and projects;
- build community support for renewable energy; and
- attract and grow expertise in renewables.

3.2.3. NSW Climate Change Policy Framework

The NSW Government has developed the NSW Climate Change Policy Framework (OEH, 2016) in support of Australia's COP21 commitments and to demonstrate action on climate change. The Framework outlines the Government's long-term objectives to achieve net-zero emissions by 2050 and to make NSW more resilient to a changing climate.

The Framework highlights the new opportunities in 'advanced energy' sectors which will help the world adapt to climate change. The NSW Government will seek and support opportunities to grow these emerging industries in NSW.

3.2.4. Australian Renewable Energy Target and the National Energy Guarantee

The large-scale RET is a Federal Government policy which commenced in 2001 to ensure that at least 20% of Australia's electricity consumption comes from renewable sources by 2020. Following review, the RET was confirmed in early 2015 as 33,000 gigawatt hours (GWh) by 2020. To meet the RET, significant new renewable energy capacity is needed.

To assist in achieving the RET and emphasise the imperative to invest in clean energy technologies, the Federal Government has committed funding of $1.5 billion to the Solar Flagships program. The program has been designed to accelerate the delivery of large scale solar power stations into the NEM, demonstrating the Federal Government's commitment to large scale solar projects and cleaner energy generation.

In October 2017 the Energy Security Board (ESB) proposed a National Energy Guarantee (NEG) that focussed on system reliability, emissions reduction, and low-cost generation. Although unclear as to its final form, this policy demonstrates the governments continued commitment to the goal of emissions reduction and the vital role that renewable energy will have.

3.2.5. COP21

At the COP21 climate talks in Paris in December 2015, the Federal Government committed an emissions target of a 26-28% reduction by 2030 compared to 2005 levels. The Federal Government announced at the end of 2016 that the Australian climate and energy policies will be reviewed in 2017 to ensure the 2030 targets are met.

3.3. National Electricity Market Context

The proposal is located adjacent to the existing 220kV Buronga Switching Station on the NEM regional boundary between VIC and NSW. Buronga Switching Station forms part of the TransGrid network and is connected to Broken Hill via the 220KV feeder X2, to Balranald via the 220kV feeder X5/3 and to VIC via the 220kV feeder OX1 (into Red Cliffs).

Interconnection between regional boundaries has played a key role in NEM since its commencements as a wholesale spot market for electricity in December 1998.

Power flows between regions are highly dynamic; for example the 2018 Victoria Annual Planning Report (VAPR) (AEMO, 2018) outlines that during maximum operational demand in VIC (4pm on 19th Jan 2018) net flow from NSW (Buronga) to VIC (Red Cliffs) was 148MW, with an additional 60MW flowing from VIC (Red Cliffs) to SA (Monash). Whilst during the high export snapshot (4am on 24th September 2017), 145MW of power was flowing in the other direction from VIC back into NSW, whilst 174MW was flowing between SA and VIC via Murraylink.

The proposal has been designed to provide the following benefit and services to the region and wider NEM:

- Battery energy storage system sized to match the thermal rating of feeder OX1 (265MVA) between Buronga to Red Cliffs in both directions, providing firm, immediate response electricity in either direction to meet current energy demands under all snapshot scenarios.
- Solar farm design to provide low cost, clean electricity into two NEM regions
- Flexibility between the solar power plant and battery system to meet future additional firm electrical demand of the three NEM regions should an additional interconnector be constructed, similar to that identified in the ElectraNet draft RIT-T (ElectraNet, June 2018).
- The opportunity to provide Frequency Control and Ancillary Services into the NEM providing additional security of supply whilst also meeting the climate and environmental objectives outlined above in Section 3.2.

Figure 8 below shows the location of the proposal in the context of the NEM. Figure 9 below shows the existing high voltage network around the proposal location.

REGIONAL BOUNDARIES
for the
NATIONAL ELECTRICITY MARKET

TRANSMISSION INFRASTRUCTURE

- Power Station
- Wind Farm
- Solar Farm
- Transmission Substation
- 500 kV Transmission Line
- 330 kV Transmission Line
- 275 kV Transmission Line
- 220 kV Transmission Line
- 132 / 110 kV Transmission Line
- 66 kV Transmission Line
- DC Link
- Sydney West Regional Reference Node

REGIONAL BOUNDARIES

- Queensland
- New South Wales
- Victoria
- South Australia
- Tasmania

Proposed Buronga Energy Station

Key to Adelaide

1	Torrens Island
2	Quarantine
3	Pelican Point
4	New Osbourne
5	Dry Creek
6	Kilburn
7	Northfield
8	Parafield Gardens West
9	Magill
10	East Terrace
11	City West

Key to Melbourne

1	Somerton	11	Heatherton
2	Laverton North	12	Malvern
3	Newport	13	Richmond
4	Altona	14	Brunswick
5	South Morang	15	Thomastown
6	Templestowe	16	Fishermans Bend
7	Ringwood	17	West Melbourne
8	Rowville	18	Brooklyn
9	East Rowville	19	Keilor
10	Springvale	20	Sydenham

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

This map is intended to be a high-level representation only, interested parties should always consult with their relevant transmission network service provider (or equivalent) for more accurate information.

FIGURE 8:
Location of the proposal in the context of the NEM

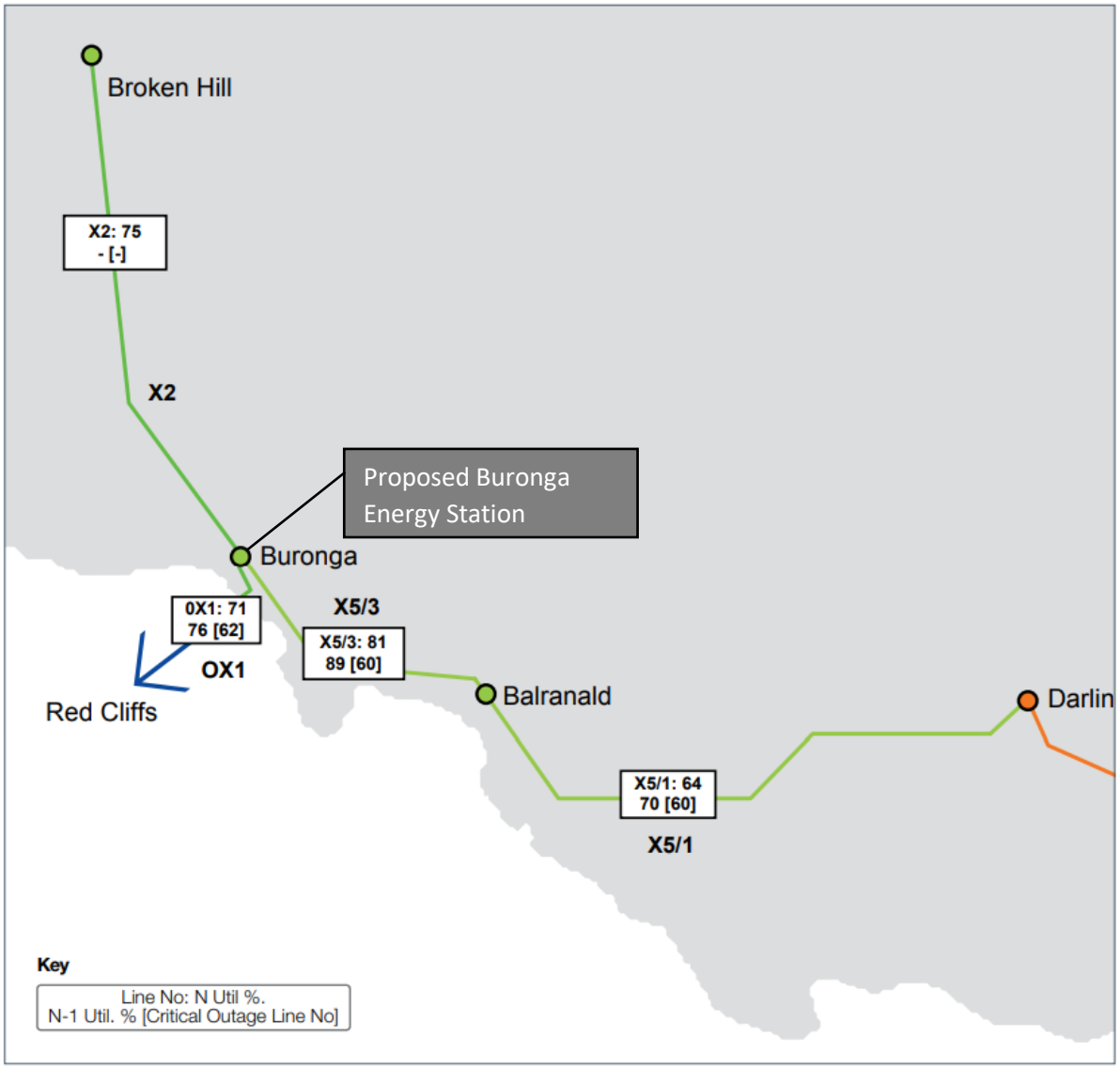


Figure 9 Existing high voltage network around the proposal (Source: TransGrid TAPR 2016)

3.4. Alternatives to the proposal

The Council has identified the diversification and expansion of business and industry as a strategic goal. The proposal will support the Council's vision of fostering a vibrant, growing and prosperous economy while maintaining Wentworth as a desirable Shire to visit, live work and invest.

The proponent has considered the following alternates to undertaking the proposed development:

- a 'do nothing' approach; and
- alternative site location.

The 'do-nothing' approach would fail to deliver additional regional investment, employment and economic growth in south-western NSW and represent a missed opportunity to deliver on local planning and economic growth policies. Local industry would suffer from high energy prices without mitigation and potential future capacity shortfalls.

In addition to the regional implications, a 'do-nothing' approach would fail to contribute to achieving the strategic targets and goals of the NSW and Federal Governments outlined in Section 3.2. Industry, businesses and household energy users would fail to benefit from the proposal's potential to put downwards pressure on wholesale electricity prices in the NEM and regional loss factors. The resilience of the NEM could not be improved by the addition of essential energy generation as well as enhanced system strength provided by energy storage.

While an alternative site location may still support the strategic targets and goals of the NSW and Federal Governments outlined in Section 3.2, it would fail to meet the needs of local industry and the local planning intent of the precinct. Alternate site locations for a project of this scale and strategic significance are extremely limited due to challenges in topography, necessary site scale and proximity to necessary energy infrastructure such as high-voltage transmission lines, substations and NEM-region interconnection opportunities.

4. PLANNING CONTEXT

4.1. NSW Legislation

4.1.1. Environment Planning and Assessment Act

The *Environmental Planning and Assessment Act 1979* (EP&A Act), *Environmental Planning and Assessment Regulation 2000* and associated environmental planning instruments (including State Environmental Planning Policies and Local Environmental Plans) (EPIs) provide the framework for the assessment of environmental impacts and approval of development in NSW.

The EP&A Act authorises the making of environmental planning instruments such as *State Environmental Planning Policy (State and Regional Development) 2011* (S&RD SEPP) including the scope, power and content of plans. The EP&A Act also establishes the process for the assessment and approval of development which requires consent under Part 4.

Relevantly to this proposal, section 89C of the EP&A Act provides for a process where development can be declared as SSD either by a SEPP or Ministerial order published in the Gazette. Section 89D of the EP&A Act provides that the Minister is the consent authority for SSD. Part 4.1 of the EP&A Act sets out provisions which apply to the assessment and determination of SSD.

4.1.2. State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (S&RD SEPP) identifies development that is classified as SSD. Clause 20 of Schedule 1 of the S&RD SEPP states that the following is SSD for the purposes of s89D of the EP&A Act:

Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that:

> *(a) has a capital investment value of more than $30 million, or*
>
> *(b) has a capital investment value of more than $10 million and is located in an environmentally sensitive area of State significance.*

The proposal would have an estimated capital investment cost greater than $30 million, and therefore the proposal is classified as SSD and is subject to assessment and determination under Part 4 of the EP&A Act. The Minister or his delegate is the consent authority for SSD.

4.1.3. State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across NSW. Clause 34(7) of ISEPP states that development for the purpose of a solar energy system may be carried out by any person with consent on any land (except land in a prescribed residential zone). The proposal is located on land zoned Primary Production (RU1) under the LEP.

As Primary Production (RU1) is not a "prescribed residential zone" for the purposes of Division 4, Part 3 of the ISEPP, the proposal is permissible with consent pursuant to subclause 34(7) of the ISEPP.

4.1.4. State Environmental Planning Policy No 55 - Remediation of Land

Clause 7 of State Environmental Planning Policy No 55 - Remediation of Land (SEPP 55) requires that a consent authority take into consideration whether the land is contaminated. The contaminated land planning guidelines, *Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land* (DUAP 1998), identifies activities with the potential to cause contamination. These guidelines list "agricultural/horticultural activities" as an activity which potentially causes contamination. Agricultural/horticultural activities have occurred on and in the vicinity of the proposal site. Therefore, agriculturally derived contaminants could be present within the proposal site. Contamination risk is further discussed in Section 6.10.2.

4.1.5. Crown Land Management Act 2016

The land on which the proposal site is located is currently Crown Land, owned by the Department of Industry – Lands and Water (DPI), and is held under a Western Lands Lease. As such, the land is subject to the provisions of

the *Crown Land Management Act 2016*. The *Crown Land Management Act 2016* contains provisions which regulate the occupation, use, sale, lease and licence of Crown land, along with its proper management having regard to the principles contained in the *Crown Land Management Act 2016*.

Development Applications on Crown Land require authorisation for lodgement by the DPI as the owner of the land.

The current lessee of the land is in the process of converting the leasehold land into freehold title. It is anticipated that this will occur prior to lodgement of the SSD application for the proposal and therefore the DPI will not be required to authorise the lodgement of the DA.

As secured through an option agreement, Renew Estate intends to lease or purchase the proposal site from the landowner, should the proposal receive development consent. The SSD application will include the proposed subdivision of Lot 2 DP1195524 to enable the long term lease purchase of the proposal site which affects part of the lot.

4.1.6. Other relevant NSW legislation

Roads Act 1993	The *Roads Act 1993* (Roads Act) regulates the carrying out of various activities on public roads, and provides for the declaration of RMS and other public authorities including local Councils as a roads authority for different types of roads (classified and unclassified). Under section 138 of the Roads Act, the consent of the appropriate roads authority (Council, DPI or Roads and Maritime Service (RMS)) is required before a person can, for example, erect a structure or carry out a work in, on or over a public road, or dig up or disturb the surface of a public road. The potential need for upgrade works on local roads would be further investigated during the design and preparation of the EIS. If required, approval and concurrence from the relevant roads authority and concurrence body would be sought under section 138 of the Roads Act.
Local Land Services Act 2013 (LLSA)	The LLSA regulates the clearing of native vegetation on land in rural areas (generally being, land other than urban areas as defined in *State Environmental Planning Policy (Vegetation in Non-Rural Area) 2017*). Section 60O of the LLSA provides that the clearing of native vegetation is authorised for the purposes of the LLSA if that clearing was authorised by a development consent under Part 4 of the EP&A Act. As such, any clearing which forms part of the approved proposal does not require further approval or authorisation under the LLSA.
Biodiversity Conservation Act 2016	The Biodiversity Conservation Act 2016 (BC Act) commenced on 25 August 2017, repealing and replacing the *Threatened Species Conservation Act 1996* (TSC Act). The BC Act now contains provisions for the assessment of impacts on biodiversity values of a proposed development, calculating measures to offset those impacts and establishing market-based conservation measures, including biodiversity credits. Pursuant to Section 79B of the EP&A Act, for SSD concurrence by the Chief Executive of the Office of Environment and Heritage is not required for development that is likely to significantly affect a threatened species, population, or ecological community, or its habitat. Biodiversity values within the proposal site is discussed in Section 6.3 of this PEA.
National Parks and Wildlife Act 1974	Under the *National Parks and Wildlife Act 1974* (NP&W Act), the Director-General of the National Parks and Wildlife Service is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas and state game reserves. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW. A permit is required under section 90 of the NP&W Act before harming or desecrating an Aboriginal object, otherwise, such action is an offence under the NP&W Act. Although a permit is required for development under Part 4, because the proposal is SSD, section 89J of the EP&A Act provides that such permit is not required for SSD. The closest nature reserve is approximately 12km southeast of the proposal site. The potential impacts to Aboriginal heritage and native fauna and flora are discussed in Section 6.5 and 6.3 of this PEA respectively.

Heritage Act 1977	The *Heritage Act 1977* (Heritage Act) aims to conserve heritage values. Heritage items are listed on the State Heritage Register which is established under the Heritage Act. Items of local heritage significance are also found in local environmental plans, which contain provisions to ensure the protection of such items. Under Section 89J of the EP&A Act, an approval under Part 4 or an excavation permit under section 139 of the Heritage Act is not required for SSD. The potential for impacts to heritage is discussed in Section 6.5 and Section 6.6.
Water Management Act 2000	Water use approval, water management work approval and activity approvals are required under Sections 89, 90 and 91 of the *Water Management Act 2000* (WM Act). Pursuant to Section 89J of the EP&A Act, these approvals are not required for SSD.
Contaminated Land Management Act 1997	Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) imposes a duty on landowners to notify OEH, and potentially investigate and remediate land if contamination is above levels set by the Environmental Protection Authority (EPA). The CLM Act also contains provisions relating to the regulation of 'significantly contaminated land' by the EPA. The potential for contamination at the proposal site is discussed in Section 6.10.
Protection of the Environment Operations Act 1997	The *Protection of the Environment Operations Act 1997* (POEO Act) contains provisions relating to pollution offences committed in respect of land, water and air. The POEO Act also contains provisions relating to need to obtain an environment protection licence (EPL) for certain scheduled activities. Solar energy generation does not fall within the definition of electricity generation under Schedule 1 of the POEO and therefore does not require an EPL.
Waste Avoidance and Resource Recovery Act 2001	The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) introduces a scheme to promote extended producer responsibility for the life-cycle of a product. The WARR Act outlines the resource management hierarchy principles of priority as: - avoidance of unnecessary resource consumption; - resource recovery (including reuse, reprocessing, recycling and energy recovery); and - disposal. Waste is discussed in Section 6.12.

4.2. Local Government

4.2.1. Wentworth Local Environmental Plan 2011

The LEP sets out the framework for the planning and development of land within the Wentworth Shire Council area. The aims of the LEP are as follows:

1) This Plan aims to make local environmental planning provisions for land in Wentworth in accordance with the relevant standard environmental planning instrument under section 33A of the Act.
2) The particular aims of this Plan are as follows:
    a) to encourage and manage ecologically sustainable development within Wentworth,
    b) to encourage the retention and enhancement of land that supports the primary economic activities within Wentworth for productive agriculture and other primary production purposes,
    c) to conserve and protect items of European and Aboriginal cultural heritage,
    d) to conserve and protect areas of environmental significance, particularly conservation parks, reserves and the Murray and Darling River systems.

The proposal is located on land zoned Primary Production (RU1) under the LEP. Electrical generation is not listed as permissible with consent in these zones, however, the ISEPP takes precedence over the LEP to the extent of any inconsistency and permits solar developments with development consent in the RU1 zones (refer Section 4.1.3).

4.3. Commonwealth Legislation

4.3.1. Environmental Protection and Biodiversity Conservation Act 1999

The *Environmental Protection Biodiversity and Conservation Act* 1999 (EPBC Act) aims to protect matters of national environmental significance (MNES) which include:

- World Heritage properties;
- National Heritage places;
- wetlands of international importance (listed under the Ramsar Convention);
- listed threatened species and ecological communities;
- migratory species protected under international agreements;
- nuclear actions (including uranium mines);
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park; and
- a water resource, in relation to coal seam gas development and large coal mining development.

Approval from the Commonwealth Minister for the Environment is required if an action is likely to have a significant impact on a MNES (a 'controlled action'). Assessments of significance are based on criteria listed in the Significant Impact Guidelines 1.1 issued by the Commonwealth (DoE, 2013).

A search of matters protected by the EPBC Act was undertaken in June 2018 using the EPBC Act Protected Matters Search Tool (PMST) (DOEE, 2018). A search radius of 10km was applied. The results of the search are summarised in Table 1 and a copy of the PMST report is provided in Appendix B. Potential impacts to threatened species and ecological communities are further discussed in Section 6.3.

Table 1 Results of the EPBC Act Protected Matters Search

Matters of National Environmental Significance	
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Significance (Ramsar)	3 (note the closest Ramsar site is 100-150km upstream)
Great Barrier Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	1
Listed Threatened Species	23
Listed Migratory Species	9
Other Matters Protected by the EPBC Act	
Commonwealth land	1 (the proposal site does not contain Commonwealth land)
Commonwealth Heritage places	None
Listed Marine Species	14 (note the proposal site is not near a marine environment)
Whale and Other Cetaceans	None
Critical habitats	None
Commonwealth reserves Terrestrial	None
Commonwealth reserves Marine	None

If further investigations identify that the proposal is likely to have a significant impact on a MNES, a referral will be submitted to the Commonwealth Department of the Environment and Energy (DOEE). DOEE would then determine whether the proposal is a 'controlled action' requiring approval from the Commonwealth Environment Minister or their delegate.

4.3.2. Native Title Act 1993

The *Native Title Act 1993* (Native Title Act) provides a legislative framework for the recognition and protection of native title rights. Native title is the recognition that, in certain circumstances, Indigenous people continue to hold rights to their land and waters, which come from their traditional laws and customs.

The Native Title Act sets up processes to determine whether native title exists, how future activity impacting upon native title may be undertaken, and to provide compensation where native title is impaired or extinguished.

When a native title claimant application is registered by the National Native Title Tribunal, the people seeking native title recognition gain a right to consult or negotiate with anyone who wants to undertake a project on the area claimed.

A search of the National Native Title Tribunal identifies that the proposal site is within the determination area relating to a Native title registered to the Barkandji Traditional Owners (Tribunal file no. NCD2015/001). The proposal site is within an Extinguished Area of that determination area.

5. CONSULTATION

5.1. Engagement and Consultation Strategy

Renew Estate has developed an Engagement and Consultation Strategy (ECS) for the proposal to ensure a broad, exemplar and authentic engagement process with all government and community stakeholders relevant to the proposal, throughout the life of the proposal. The ECS is informed by a range of resources, including the NSW Government report "Community Attitudes to Renewable Energy in NSW" (OEH, 2015).

Consultation will continue and increase throughout the development process to ensure all stakeholders have a deep understanding of the nature and scope of the proposal.

For community stakeholders, implementation of the ECS will ensure:

- broad dissemination of information on both the impact and the benefits of the proposal for those stakeholders; and
- genuine opportunities to provide input throughout the planning and assessment phases.

It is noted that agency consultation will also be undertaken in accordance with SSD application process.

The ECS will provide for the ongoing and effective liaison with community stakeholders, landowners and applicable government agencies throughout the life of the proposal.

5.2. Government and other agencies

Meetings/engagement activities undertaken with government agencies to date include:

- Meeting with Wentworth Shire Council in June 2018
- Discussions with NSW Department of Industry – Lands and Water (DPI) in May 2018
- Pre-application meeting with NSW DP&E in July 2018
- Discussions with Transgrid in August 2017 and April 2018
- Formal connection enquiry lodged with Transgrid in August 2017.

5.3. Community Engagement

Renew Estate is commencing initial consultation with community members and groups. Estate will proactively engage with the community throughout the preparation of the EIS.

6. PRELIMINARY ENVIRONMENTAL ASSESSMENT

6.1. Methodology

This Section provides a preliminary environmental assessment of the proposal to identify key environmental issues and risks that will require a more detailed assessment within the EIS. The assessment is based on desktop review and site inspections and covers construction, operational and decommissioning phases of the proposal.

The risk rating is a function of the likelihood of the impact occurring and the consequence of the impact, as determined through the risk rating matrix in Table 2. Risks rated High to Extreme warrant a more detailed investigation than risks rated Low to Medium. Where there is a higher degree of uncertainty, a higher rating has been applied as a precaution.

This preliminary risk assessment identifies pre-mitigation risk, assessing potential impacts without the implementation of any controls. An assessment of residual risk following the implementation of proposed mitigation measures will be undertaken as part of the EIS.

Table 2: Risk rating matrix

		Consequence				
		Negligible	Minor	Moderate	Major	Catastrophic
Likelihood	Remote	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	High	High
	Possible	Low	Medium	High	Very High	Very High
	Likely	Medium	High	Very High	Very High	Extreme
	Almost certain	Medium	High	Very High	Extreme	Extreme

6.2. Summary of Preliminary Risk Assessment Results

Table 3 summarises the results of the preliminary risk assessment. Key identified environmental risks associated with the proposal are Aboriginal heritage and Biodiversity.

Table 3: Results of the Preliminary Risk Assessment (unmitigated risks)

Environmental risk	Likelihood	Consequence	Risk rating (unmitigated)
Aboriginal Heritage	Likely	Moderate	Very High
Biodiversity	Likely	Moderate	Very High
Bushfire	Possible	Moderate	High
Visual amenity	Unlikely	Moderate	Medium
Soils	Possible	Minor	Medium
Contamination	Possible	Minor	Medium
Waste	Likely	Negligible	Medium
Traffic and access	Possible	Minor	Medium
Land use	Likely	Negligible	Medium
Non-Aboriginal Heritage	Unlikely	Moderate	Medium
Utilities	Unlikely	Minor	Low
Noise and vibration	Unlikely	Minor	Low
Air quality	Possible	Negligible	Low
Electromagnetic Fields	Unlikely	Negligible	Low

6.3. Biodiversity

6.3.1. Existing Environment

The proposal site consists of approximately 1,200 hectares of land of which approximately 50% has been cleared for cropping and grazing of volunteer pastures with the remainder consisting of a mosaic of five vegetation communities, all of which have been used for grazing of native pastures for the past 120 years.

The most common vegetation community is Chenopod Sandplain Mallee Woodland followed by Black Oak - Western Rosewood Open Woodland. The two are frequently interspersed with Spinifex Linear Dune Mallee in what is often referred to as Mallee Mosiac with Chenopod Mallee grading into Spinifex Mallee on the sandy dunes and Black Oak- Western Rosewood communities on loamy soils in the swales between dunes and plains areas.

Smaller areas of Spinifex Linear Dune Mallee, Black Box Woodland and a degraded grassland most likely derived from Chenopod Shrubland make up the remaining areas of remnant vegetation.

All the vegetation communities are degraded due to a long history of timber cutting for use as a fuel and for construction purposes in the first part of last century, combined with the impact of traditional early 1900's grazing practises. The result is a much diminished overstorey layer (particular of the older habitat tress), total loss of the midstorey in many areas, a diminished and weedy understorey or groundcover, a low species diversity.

Approximately 50% of the proposal site has been cleared (or approved to be cleared) for dryland cropping in two distinct zones or paddocks. The cleared area is primarily used for cropping of cereals or legumes with supplementary grazing of stubble and volunteer pastures.

A number of small remnant patches Black Oak – Western Rosewood and Mallee communities remain within the cleared cropping area. These areas are generally degraded due to stock grazing and camping in them, and the resultant weed infestations [particularly Match-head (*Psilocaulon tenue*)].

Vegetation communities known to occur within the proposal site

Chenopod Sandplain Mallee Woodlands

Chenopod Sandplain Mallee Woodland is the most common vegetation community in the proposal site. Generally an open woodland ranging from 6 to 10 m tall, it is dominated by several mallee species including Red Mallee (*Eucalyptus socialis*), Acorn Mallee (*Eucalyptus oleosa*) and White Mallee (*Eucalyptus gracilis*).

In the proposal site the mid-storey is largely absent whilst the understorey which would have initially consisted of a diverse range of chenopods shrubs now lacks diversity and structural complexity as a result of grazing, now consisting predominantly grasses (*Austrostipa* and *Austrodanthonia* species) , *Scerolaena spp* and *Zygophyllum spp.*

Black Oak - Western Rosewood Open Woodland

Not as common as the Chenopod Mallee, clumps or patches of Black Oak - Western Rosewood low open woodland (about 7 m high) with either a shrubby or grassy understorey are scattered throughout the Mallee woodland.

Dominated by Black Oak (*Casuarina pauper*) and Western Rosewood (*Alectryon oleifolius)*, other low trees including Sugarwood (*Myoporum platycarpum*) and *Pittosporum angustifolium* are also present.

In a number of areas the Black Oak has been partially cleared to obtain timber for fences and structures, or to increase stock carrying capacity. In these areas trees are sparse with a grassy ground cover or clumps of Western Rosewood. Significant infestations of weed species such as Wards Weed (*Carrichtera annua*), Onion Weed (*Asphodelus fistulosus)* are to be found in these areas.

Whilst the shrub layer is normally sparse, species such *Senna spp*, Leafless Ballart (*Exocarpos aphyllus*), *Olearia muelleri*, *Eremophila glabra*, *and Acacia colletioides*, which would normally expected to be present are absent due to grazing. Species diversity and thus habitat quality is therefore low.

Spinifex Linear Dune Mallee

A small patch of Spinifex Linear Dune Mallee is present on the southern boundary of the proposal site. From 5 m to 8 m tall this area represents more of a whipstick habit than the Chenopod Mallee. It is dominated by a number of mallee species including Dumosa Mallee (*Eucalyptus dumosa*), Red Mallee (*Eucalyptus socialis*) and Acorn Mallee (*Eucalyptus oleosa*).

The area contains an understorey dominated by Porcupine Grass (*Triodia scariosa*). Spinifex Mallee is normally species-rich with a mid-storey which includes *Acacia colletioides, Dodonaea viscosa, Eremophila glabra, Olearia pimelioides*, and *Grevillea huegeilii* and a ground cover including *Austrostipa sp*p, copperburrs many ephemeral species which germinate after rain including daisies and other forbs.

Due to its grazing history and fire management this community has low species diversity and is considered to be in only poor to moderate condition.

Chenopod Shrubland/Derived Grassland

In the centre of the proposal site there is an area of what is assessed to be Grassland that has been derived from Chenopod Shrublands as a result of the presence of an extensive area of borrow pits used to extract calcrete used for maintenance of local Shire roads from about 2000 to 2012.

Initially the area would have had a sparse tree layer of scattered *Casuarina pauper* (Belah), and *Eucalypt* species with a shrub layer dominated by *Maireana, Atriplex,* and *Chenopodium spp.* The ground layer would have included Spear Grass *(*Stipa spp.), Ruby Saltbush (*Enchylaena tomentosa*) and *Sclerolaena* spp.

Following extraction of the calcrete the borrow pits were left largely rehabilitated and left to naturally regenerate. As a result much of this area now consist primarily of weed species such as Wards Weed (*Carrichtera annua*), Onion Weed (*Asphodelus fistulosus)* and Match-head (*Psilocaulon tenue*) along with *Austrostipa* and *Maireana* spp.

Black Box grassy open woodland of rarely flooded depressions in south western NSW

A small open woodland dominated by Black Box *(Eucalyptus largiflorens)* with little understorey is to be found along the proposed transmission line corridor.

The original understorey may have contained perennial saltbushes that have been grazed out.

Database searches

The following database searches were undertaken:

- A search of matters protected by the EPBC Act was undertaken in June 2018 using the EPBC Act Protected Matters Search Tool (PMST) (DOEE, 2018). A search radius of 10 km was applied.
- A search of the Atlas of NSW Wildlife (a NSW Bionet database administered by NSW OEH, 2018a) was undertaken in June 2018. The minimum search extent of 10 km X 10 km was used. The NSW Bionet databases include species and communities listed under the EPBC Act as well as the BC Act.

The PMST identified that the following threatened ecological community is likely to occur in the 10 km search area:

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions.

The PMST identified 23 threatened species as potentially occurring in the 10 km search area. NSW Bionet returned 5 records of 3 threatened species within the 10 km x 10 km search area. No records were located within the proposal site, however one record (*Lophoictinia isura,* Square-tailed Kite) was located approximately 50 m north of the proposal site, near the existing Buronga Switching Station.

The threatened species identified through the searches are listed in Table 4.

Table 4 Threatened flora and fauna species potentially occurring in the search area as indicated in database searches.

Scientific name	Common name	Status		Indicated in Search?	
		Commonwealth	NSW	PMST	NSW Bionet
Birds					
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered	✓	X
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Endangered	✓	X
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	✓	X
Leipoa ocellata	Malleefowl	Vulnerable	Endangered	✓	X
Manorina melanotis	Black-eared Miner	Endangered	Critically Endangered	✓	X
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered	-	✓	X
Pedionomus torquatus	Plains-wanderer	Critically Endangered	Endangered	✓	X
Pezoporus occidentalis	Night Parrot	Endangered	-	✓	X
Polytelis anthopeplus monarchoides	Regent Parrot (eastern)	Vulnerable	Endangered	✓	X
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	✓	X
Lophoictinia isura	Square-tailed Kite	-	Vulnerable	X	✓
Frogs					
Litoria raniformis	Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog	Vulnerable	Endangered	✓	X

Scientific name	Common name	Status		Indicated in Search?	
		Commonwealth	NSW	PMST	NSW Bionet
Mammals					
Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	Vulnerable	Vulnerable	✓	X
Phascolarctos cinereus	Koala	Vulnerable (combined populations of QLD, NSW, ACT)	Endangered	✓	X
Ningaui yvonneae	Southern Ningaui	-	Vulnerable	X	✓
Reptiles					
Aprasia inaurita	Mallee Worm-lizard	-	Endangered	X	✓
Plants					
Caladenia tensa	Greencomb Spider-orchid, Rigid Spider-orchid	Endangered	-	✓	X
Lepidium monoplocoides	Winged Pepper-cress	Endangered	Endangered	✓	X
Solanum karsense	Menindee Nightshade	Vulnerable	Vulnerable	✓	X
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Vulnerable	✓	X
Swainsona pyrophila	Yellow Swainson-pea	Vulnerable	Vulnerable	✓	X

The PMST additionally identified 9 migratory species protected under the EPBC Act as potentially occurring within the 10 km search area. A copy of the PMST report is provided in Appendix A.

6.3.2. Further Assessment

A detailed assessment of potential impacts to biodiversity will be undertaken as part of the EIS, in accordance with the Biodiversity Assessment Method, as established under the *Biodiversity Conservation Act 2016*. This will include characterisation of the plant community types within the proposal site, assessment of the presence or potential presence of threatened species and communities, assessment of whether the proposal has the potential for significant, serious or irreversible impacts, and identification of measures to avoid, minimise or offset impacts.

6.4. Visual amenity

6.4.1. Existing Environment

There are limited visual receptors of the proposal site. The proposal site and surrounding landscape consists of generally flat terrain, and the closest residential dwelling is involved in the proposal, and is approximately 4.5 km southwest of the proposal site (Figure 3). Further residential dwellings are located approximately 5 km southwest of the proposal site in the townships of Gol Gol and Buronga.

The closest visual receptors would be users of Arumpo Road which runs in a northeast-southwest direction along the north-western boundary of the proposal site. This road has very low existing traffic volumes.

6.4.2. Further Assessment

Due to the lack of visual receptors, there is limited potential for adverse impacts to visual amenity as a result of the proposal.

A landscape and visual impact assessment would be undertaken for the EIS to further investigate potential impacts and mitigation measures such as vegetation screening.

6.5. Aboriginal Heritage

6.5.1. Existing Environment

The Barkandji people are the traditional owners of the land, who were predominant around the lower Darling extending from Wentworth in the Riverina Bioregion, northward through the Murray Darling Depression Bioregion and into the Darling Riverine Plains Bioregion beyond Wilcannia (OEH, 2017).

Wentworth Shire contains some of the most significant known sites of Aboriginal occupation in Australia (WSC, 2018). The Murray River (approximately 18 km southwest of the proposal site), its foreshores, tributaries and adjacent lakes comprise a large distribution of aboriginal artefacts, middens, burials and the like (WSC, 2018). Some of the oldest known burials in Australia and the earliest recorded cremation in the world are located in the Shire. Some of the significant sites include Lake Nitchie, Rufus Creek, Snaggy Bend and Lake Mungo, of which the closest to the proposal site is Snaggy Bend, more than 20 km to the west.

In June 2018, a Basic Search of the online NSW Aboriginal Heritage Information Management System (AHIMS) (OEH, 2018b) database was undertaken for each lot subject of the proposal site. The number of Aboriginal sites returned by the search is provided in Table 5.

Table 5: AHIMS Basic Search Results

Lot	Results Returned	
	Within 1km	**Within lot**
LOT 2 DP1195524	61	5
LOT 1 DP717938	0	0
LOT 1 DP1174934	0	0

As shown in Table 5 a total of 5 records exist within Lot 2 DP1195524 and 61 records exist within 1km radius of this lot. The AHIMS Basic Search does not disclose location information, therefore it is not known whether any of the 5 records within Lot 2 PD1195524 are within the proposal site.

6.5.2. Further Assessment

Potential impacts to Aboriginal heritage include damage to Aboriginal heritage items during construction or indirect impacts to Aboriginal heritage sites due to changes to the landscape.

An assessment of potential impacts to Aboriginal heritage will be undertaken as part of the EIS, in accordance with the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011).

6.6. Historic Heritage

6.6.1. Existing Environment

European occupation in the Wentworth Shire began in the late 1840s with the expansion of pastoralism into the area (WSC, 2018). Rural settlement intensified after the 1850's when a regular river boat trade passed through Wentworth on the Murray and Darling rivers (WSC, 2018). The Wentworth township, located on the confluence of the Murray and Darling rivers, served as a vital port.

A search of the following heritage registers and databases was undertaken in June 2018:

- Australian Heritage Database (including the Commonwealth and National Heritage Lists)
- NSW State Heritage Register
- Schedule 5 of the Wentworth Shire LEP (Environmental heritage)

The review identified that there are no historic heritage items recorded within 5 km of the proposal site.

The closest historic heritage items are approximately 10km from the proposal site, near the town of Mildura to the southwest.

6.6.2. Further Assessment

The proposal is considered unlikely to impact any historic heritage items due to the significant distance of the proposal site from any listed historic heritage items.

The EIS will detail the historic heritage sites in the local area, however as impacts are unlikely, a detailed historic heritage assessment is not considered necessary.

6.7. Traffic and Access

6.7.1. Existing Environment

The proposal site is accessed from Arumpo Road which a two-lane sealed road. Existing traffic volumes on Arumpo Road are very low.

The construction traffic is likely to travel along Arumpo Road to the proposal site from the west, from the network of roads servicing Buronga on the northern side of the Murray River, and Mildura on the southern side of the Murray River (Figure 10). Arumpo Road can be accessed from Silver City Highway and Sturt Highway (via Silver City Highway), which are both Classified State roads, managed by RMS.

Proposal site

Drawing Title:
Figure 10
Surrounding road network

Scale:
1:125,000@ A4

Drawn by:
LL

Date:
Jul 2018

Rev:
A

Renew estate.

BEAST SOLUTIONS

6.7.2. Further Assessment

During construction and decommissioning there would be an increased number of heavy and light vehicles on the road network travelling to and from the proposal site. This would include delivery vehicles carrying components, parts, equipment and machinery, as well as light vehicles carrying workers, small parts and equipment. At the peak of construction there could be up to 400 construction workers travelling to and from the proposal site each day.

Traffic generated during operation would be negligible, limited to approximately five to ten operations staff travelling to and from site each day. With a negligible amount of traffic being generated by the proposal during operation, any impacts to the road infrastructure, traffic flow, or safety, would be negligible.

The EIS would assess the adequacy of the access roads to cater for the construction and operation of the proposal, whether any road upgrades are likely to be needed. An assessment of potential impacts to traffic volumes and flow during construction will also be included.

Road authorities may require road upgrades or other road works to be undertaken to facilitate the traffic movements generated by the proposal.

6.8. Hydrology

6.8.1. Existing Environment

The proposal site is located within the Lower Murray Darling Catchment Management Area. The Murray River is located approximately 12 km southwest of the proposal site where it flows past the townships of Gol Gol, Buronga and Mourquong on its northern bank, and Mildura on its southern bank. The proposal site is not within the river's flood plain. The proposal site is also not within a flood planning area under the LEP.

There are no watercourses within the proposal site (Figure 11). Reflective of the generally flat nature of the landscape, there are also no watercourses in proximity of the proposal site, with the exception of small drainage lines associated with isolated dams or depressions.

The abovementioned site characteristics indicate that there is no flood risk at the site, which is supported by anecdotal evidence from the landowner who has not observed flooding at the site.

A search of the DPI's groundwater database identified one groundwater monitoring bore within the proposal site (GW6000111). The recorded depth to standing water in 2005 was 30.810 m. The next closest groundwater monitoring bore with recorded standing water levels is approximately 1.3 km to the, north, with a standing water level of 34 m.

6.8.2. Further Assessment

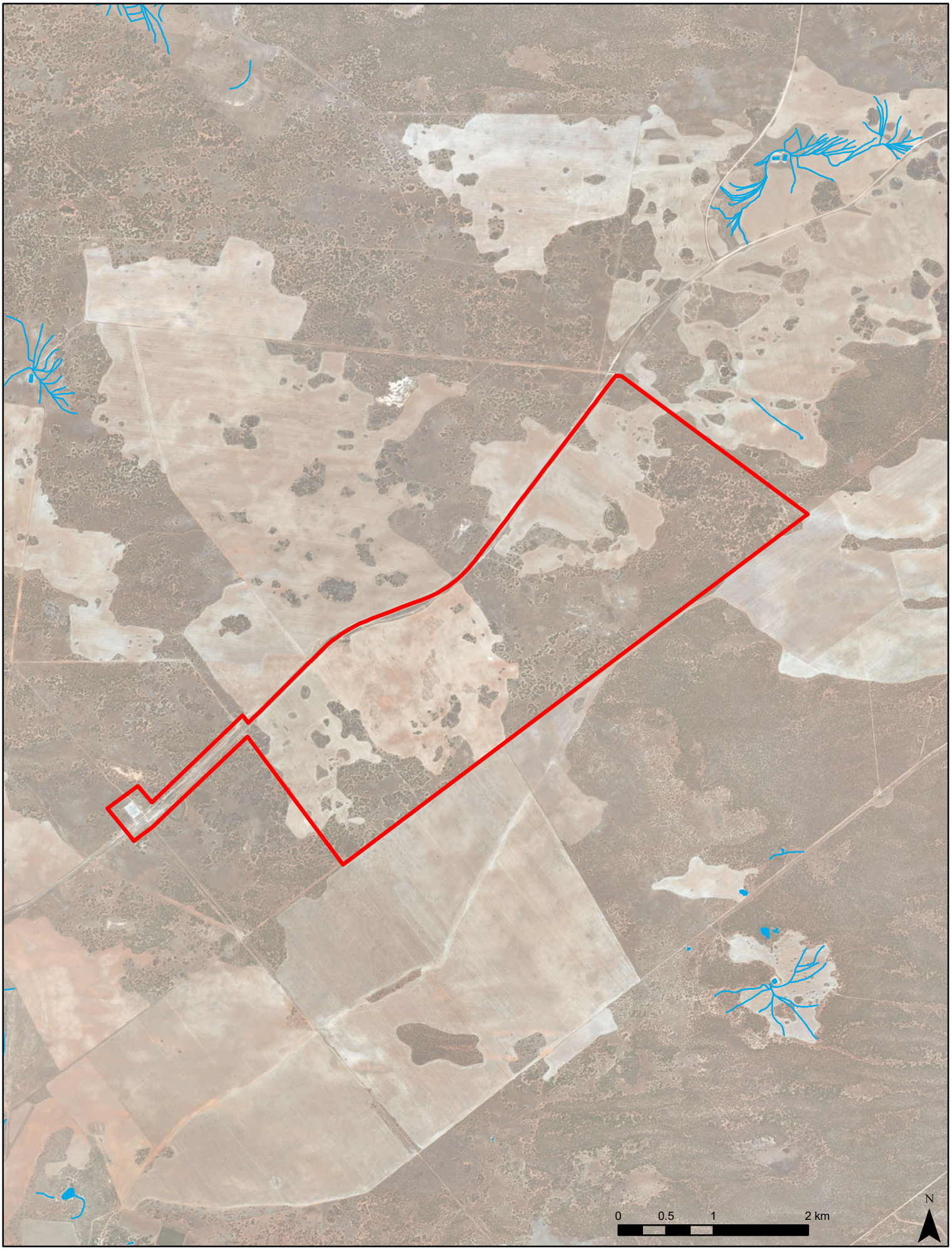
Due to the lack of surface water within the site, there is limited potential for impacts to surface water quality during construction and operation of the proposal. Based on the recorded significant depth to groundwater within the proposal site, groundwater is unlikely to be encountered during construction.

Water would be trucked in during construction for dust suppression and earthworks.

During operation, the proposal would require water for cleaning solar arrays and staff amenities. The water would be sourced from rainwater tanks filled by rainfall and supplemented by trucks as required. A separate static tank water supply would also be provided for firefighting, filled by trucks.

The proposal would result in a marginal increase in the amount of impervious area within the proposal site due to the establishment of hardstand for the substation, battery energy storage system, internal access roads, O&M building and power conversion stations. This would have a negligible impact on rainfall runoff rate and volume due to the existing soil and vegetation characteristics, and the small relative increase in impervious surface area.

The EIS will further consider the potential impacts to surface and groundwater during construction and operation.



Proposal site
Watercourse
Water body

Drawing Title:
Figure 11:
Watercourses and water bodies

Scale:
1:50,000 @ A4

Drawn by:
LL

Date:
Jul 2018

Rev:
A

Renew estate.

BEAST SOLUTIONS

6.9. Noise and Vibration

6.9.1. Existing Environment

Existing noise levels are likely to be in low at the proposal site consistent with typical rural environments. The predominant existing noise source would be the occasional vehicle movements on Arumpo Road, and occasional use of farm equipment.

There are no noise sensitive receivers within 2 km of the proposal site. The closest sensitive receiver is a residential dwelling approximately 4.5km south of the proposal site.

6.9.2. Further Assessment

Noise generated by construction activities and construction traffic has the potential to impact nearby receivers. The activity expected to generate the most noise is the piling for the installation of the steel posts which support the solar arrays.

During operation minimal noise would be generated from the proposal site from the inverters, onsite substation, trackers, and occasional light vehicle movements on internal access roads.

Traffic associated with the operation of the proposal will be limited to around five to ten light vehicles travelling to and from the site each day.

Due to the significant distance to sensitive receivers, any vibration associated with construction activities is unlikely to result in adverse vibration impacts.

A construction noise and vibration assessment in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), *NSW Noise Policy for Industry (EPA, 2017), NSW Road Noise Policy (DECCW 2011)* and relevant vibration guidelines, will be undertaken as part of the EIS. This assessment will determine the potential noise and vibration impacts from the proposal and identify any required mitigation measures.

The Construction Environmental Management Plan (CEMP) prepared for the proposal would include a component for noise management which includes controls such as standard working hours, an out of hours protocol, and noise minimisation measures.

6.10. Land

6.10.1. Existing Environment

Terrain

The proposal site consists of generally flat terrain. The elevation is approximately 67 metres above sea level across most of the site, decreasing to approximately 55 metres in the northeast portion of the site (Figure 12).

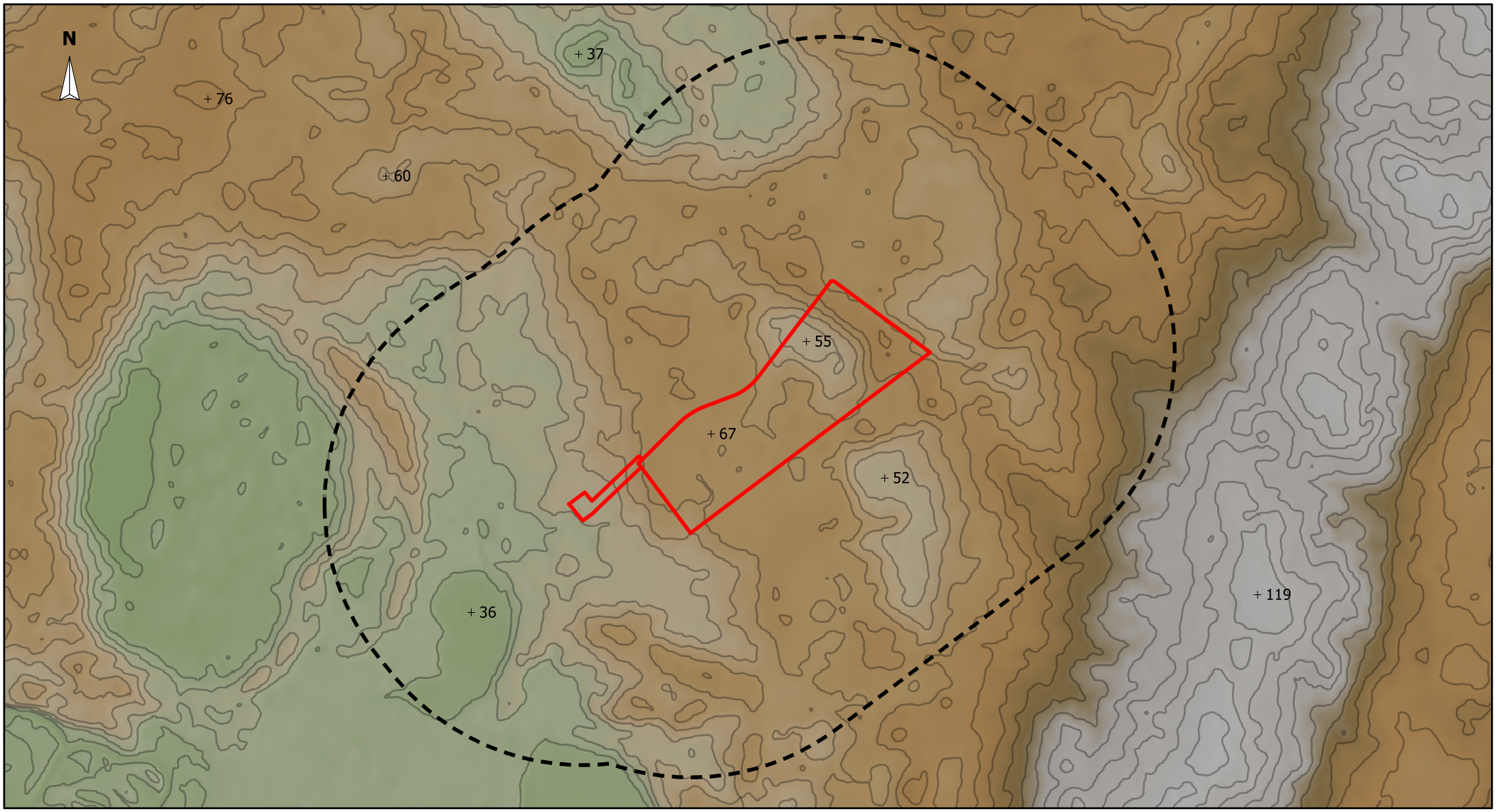
Soil landscape and land capability

The proposal is predominantly located within the Overnewton land system of the Land Systems of Western NSW (OEH, 1991). This land system is characterised as extensive open sandplains with loamy solonised brown soils, dunes and rise of deep brownish sands. Erosion within this land system is described as minor windsheeting.

The majority of the proposal site has been rated Class 5 under the land and soil capability (LSC) assessment scheme established by OEH. Class 5 and is land characterised as having severe limitations, not capable of sustaining high impact land uses except were resources allow for highlight specialised land management practices to overcome limitations (e.g. high value crops). Lower impact land uses (e.g. grazing) can be managed by readily available practices.

A small portion of land in the eastern portion of the proposal site is rated Class 7 which is characterised as having extremely severe limitations, incapable of sustaining most land uses.

A search of the OEH eSPADE viewer did not identify any soil profiles recorded within the proposal site.



LEGEND

+ Spot Height (metres above sea level)

5km Buffer

5m Contour

Project Boundary

Digital Terrain Model Source: Geoscience Australia. SRTM Derived Hydrologically Enforced, 1 arc second

SCALE BAR 0 5 km

PROJECT	TAPIO ENERGY STATION		Renew estate.
TITLE	FIGURE 12 TERRAIN MAP		
DATE 2 JUN 2018		SCALE 1:110000	REV A
DRAWN BY W STONE		SHEET 1 OF 1	SIZE A4

Land use

The proposal site currently used for agricultural activities (cropping and grazing) consistent with its Primary Production (RU1) land use zoning under the LEP.

A mineral, coal and petroleum title search through the DP&E's MinView application identified a minerals exploration licence over the majority of the proposal site (EL6744) for metallic minerals. This license covers two large land areas (shown in Figure 13). The western licence area is approximately 11,000 ha and the eastern licence area is approximately 5,000 ha. The licence expires on 2 April 2019.

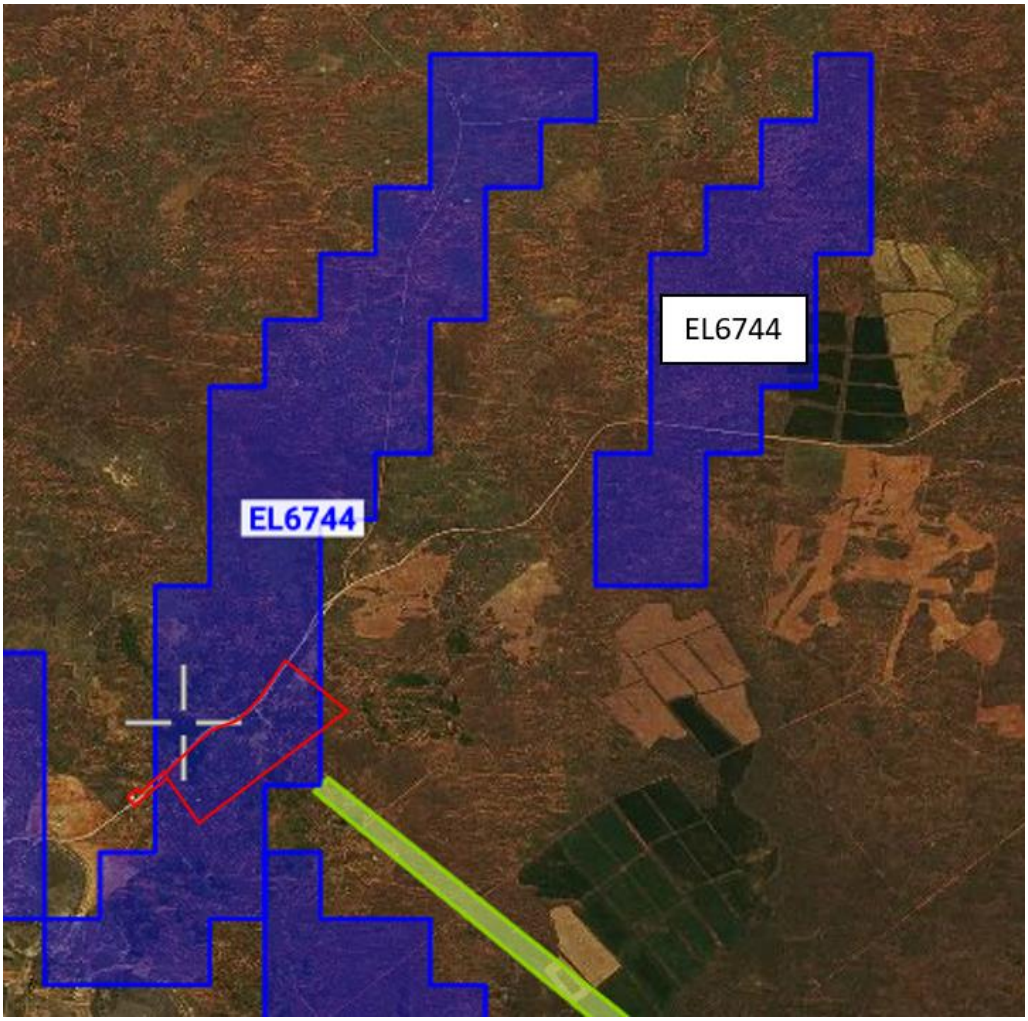


Figure 13: Mineral exploration licenses in the vicinity of the proposal site (Source: MinView).

Contamination

In June 2018 searches of the NSW EPA Contaminated Land Public Record and List of NSW Contaminated sites Notified to the EPA were undertaken. One result was returned for the suburb of Wentworth on the List of NSW Contaminated sites Notified to the EPA, relating to a Caltex service station approximately 30km west of the proposal site.

Due to the proposal site's land use history, potential sources of contamination within the site are those associated with agricultural activities (e.g. pesticides, herbicides, cattle/sheep dips etc).

6.10.2. Further Assessment

Land use

The temporary (approximately 30 years) reduction of agricultural production at the proposal site is unlikely to have any significant impact on the agricultural productivity of the region. Further, at the end of the operational life of the proposal, the solar farm will be decommissioned and rehabilitated, making the site available for agriculture once again.

Soil erosion

During construction, the proposal would disturb soils through minimal earthworks for the following activities:

- Potential grading and minimal levelling of ground in some areas to prepare it for solar array construction.
- Excavation for the construction of footings and foundations for the onsite substation, battery energy storage system, O&M building and power conversion stations.
- Excavation and grading for the construction of internal access roads
- Excavating cable trenches for onsite cabling
- If the transmission line is overhead, excavation for overhead line pole footings.
- If the transmission line is underground, excavating the cable trench and/or underboring.

The above activities have the potential to result in erosion and sedimentation, if not managed appropriately.

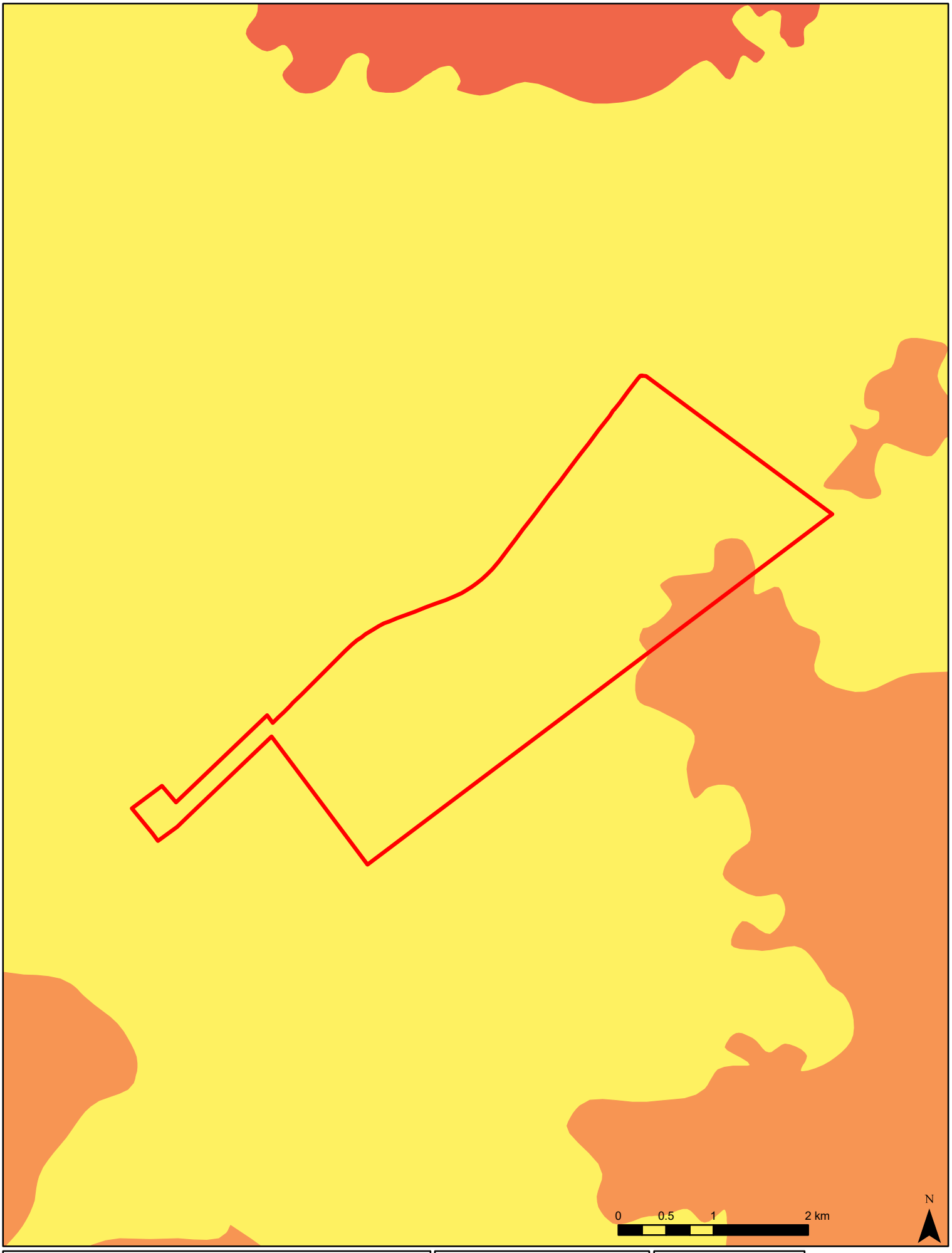
Further assessment of potential soil impacts will be undertaken for the EIS to identify appropriate mitigation during the construction and operation. At minimum the CEMP would incorporate erosion and sediment controls and the Operational Environmental Management Plan (OEMP) would include the maintenance of groundcover vegetation to mitigate erosion.

Contamination

Due to the flat site terrain and therefore minimal earthworks required during construction, there is a low likelihood of encountering contamination during construction, if present.

Risks associated with contamination are considered low. The CEMP prepared for the proposal would include an unexpected finds protocol for the event that any contamination is discovered during construction works.

The EIS will further consider contamination risk.



Land and Soil Capability Class
Proposal site
5
7
8

Drawing Title:

Figure 14:
Land and Soil Capability

Scale:
1:50,000 @ A4

Drawn by:
LL

Date:
Jul 2018

Rev:
A

Renew estate.

BEAST SOLUTIONS

6.11. Hazards

6.11.1. Existing Environment

Bushfire

The proposal site is in an area identified as bushfire prone as identified through the NSW Rural Fire Service bush fire prone land online map (RFS, 2018). As such, the proposal will need to comply with *Planning for Bush Fire Protection 2006* and *AS3959 – 2009*.

Approximately 50% of the proposal site has been cleared, with most of the remainder consisting of open mallee woodland with overstorey height ranging from 6 to 10 m tall (refer Section 6.3.1).

The Lower Western Zone Bush Fire Management Committee (LWZBFMC) has set out a five year strategic management plan to reduce bush fire risk within the LWZBFMC area, which includes the proposal site (LWZBFMC, 2016). No specific treatment measures are identified for the proposal site.

The Lower Western Zone is semi arid, and as such the availability of fuel is a significant factor in influencing bushfire frequency (LWZBFMC, 2016). The local bushfire season generally occurs between October and March (LWZBFMC, 2016). Prevailing weather conditions associated with the bushfire season are strong westerly to northerly winds in spring, with high temperatures occurring throughout spring, summer and extending into autumn at times (LWZBFMC, 2016). The Lower Western Zone BFMC has on average five bushfires per year of which none are considered major fires. The predominant causes of ignition are lighting, escaped camp fires and road side ignition from vehicle accidents or malfunctions.

Electromagnetic Fields

Electromagnetic fields (EMF) are part of the natural environment. Electric fields are present in the atmosphere and 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.

Existing sources of EMF in the vicinity of the proposal site include the Buronga Switching Station and existing transmission lines which connect into it. One 220kV transmission line runs in a northwest direction from the Buronga Switching Station, and two parallel 220kV lines run in a southeast direction from the switching station. During construction, workers would be unlikely to be working in close vicinity to the Buronga Switching Station and existing 220kV transmission lines for an extended period of time.

During operation the following sources of EMF would be present on the proposal site:

- existing Buronga Switching Station
- proposed transmission line connecting the proposal to the Buronga Switching Station
- proposed on-site substation
- solar arrays including associated cabling

Glare risk to aviation

The potential for glare associated with non-concentrating photovoltaic systems is considered to be relatively limited. Photovoltaic solar panels are designed to reflect as little sunlight as possible, resulting in negligible glare. This is because photovoltaic panels are designed to absorb as much solar energy as possible to generate the maximum amount of electricity or heat. The panels would not generally create noticeable glare when compared with an existing roof or building surface (DoP 2010).

The closest airstrip is approximately 14 km south of the proposal site, likely used for agricultural operations. The closest commercial airport is Mildura Airport located 22 km southwest of the proposal site. Due to the low levels of glare expected to result from the proposal, impacts to aviation are considered unlikely.

6.11.2. Further Assessment

Bushfire

Due to the predominance of westerly winds, a bushfire or grassfire would most likely enter the proposal site from the south-west, west or north-west under hot dry winds.

The proposal also has the potential to cause bushfire, particularly if fuel loads are not managed, presenting risk of impacts to surrounding land if a fire moves off site.

An assessment of bushfire risks to the proposal and the potential for the proposal to cause a fire, would be undertaken as part of the EIS in accordance with *Planning for Bush Fire Protection 2006* and *AS3959 – 2009*. The assessment would recommend management measures to mitigate the identified risks.

Electromagnetic Fields

The proposal proposes a qualitative approach to assessing the sites contribution to electromagnetic fields (EMF), guided by the World Health Organisation (WHO) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

Glare risk to aviation

A qualitative consideration of glare is proposed to be undertaken as part of the EIS.

6.12. Waste

6.12.1. Existing Environment

The proposal has the potential to generate the following wastes:

- surplus materials used during site establishment such as safety fencing and barriers which may include plastics and metal. The volume of waste is expected to be minimal as it is likely that prefabricated structures would be used.
- general construction waste such as excess concrete, timber, paper, plastic, metal and packaging materials.
- vegetation waste from the clearance of vegetation on site.
- domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by site construction personnel.
- surplus spoil from earthworks required on site. Any excess spoil is likely to be reused elsewhere on site.
- waste from onsite amenities. This waste would be collected by the supplier of any such systems in line with general practices.
- wastewater generated from the construction compounds.

All construction waste would be transported and disposed of in accordance with the 'Waste Classification Guidelines' (EPA 2014) and the *Protection of the Environment Operations Act 1997*.

During operation, the generation of wastes would be limited to maintenance activities and would include redundant equipment and general waste from maintenance workers. All waste during maintenance activities would be removed from site by appropriately licensed contractors.

6.12.2. Further Assessment

The EIS would detail measures to avoid, re-use and recycle to minimise waste, which would be incorporated into the CEMP prepared for the proposal.

6.13. Air Quality

6.13.1. Existing Environment

The climate of the WSC is semi-temperate, with a mean monthly maximum temperature of 32.9C in summer and 15.9 C in winter, and an average rainfall of 284 mm (WSC, 2017).

This existing local air quality is expected to be good, due to the rural nature of the region. Existing sources of air pollution are expected to include dust and vehicle emissions from farm machinery on agricultural properties and vehicles travelling on the road network.

6.13.2. Further Assessment

During construction, potential impacts to local air quality include dust generation from earthworks and vehicle movement, and emissions from construction equipment and vehicles.

Impacts to air quality during operation would be minor, limited to potential minor dust generation from maintenance vehicles.

The EIS would detail measures to minimise dust generation and vehicle emissions, which would be incorporated into the CEMP prepared for the proposal.

6.14. Utilities and Easements

6.14.1. Existing Environment

A search of the deposited plans pertaining to the proposal site, and Dial Before You Dig (DBYD) database, has identified the following existing easements within the transmission line connection component of proposal site:

- 50 m wide easement for transmission line/s, running northwest and southeast from Lot 1 DP717938 (Buronga Switching Station lot). The northwest easement contains one 220kV transmission line, owned by TransGrid. The southeast easement contains two parallel 220kV transmission lines, also owned by TransGrid.
- 10 m wide right of access through Lot 2 DP1195524, running in a northwest-southeast direction, south of Lot 1 DP717938 to benefit Lot 1 DP717938 (Buronga Switching Station lot).

No easements have been identified within the solar farm and battery energy storage development area component of the proposal site.

6.14.2. Further Assessment

Renew Estate is working with Transmission Network Service Providers (TNSPs) on the connection arrangement and interaction with transmission assets. The interconnection of the proposal to the NEM will be subject to the National Electricity Rules (NER) and assessed by the relevant TNSP and AEMO.

7. CONCLUSION

This report has established the environmental and planning context of the proposed Buronga Energy Station in Wentworth, NSW and identified possible environmental impacts which require further assessment.

Classified as SSD under the S&RD SEPP, the proposal is subject to assessment and determination by the Minister under Part 4 of the EP&A Act.

Environmental issues considered in this preliminary assessment include:

- Biodiversity
- Flooding and Hydrology
- Visual Amenity
- Air Quality
- Noise and Vibration
- Traffic and Access
- Non-Aboriginal Heritage
- Hazards (bushfire, electromagnetic fields and glare)
- Land (soils, contamination and land use)
- Waste
- Utilities and easements

The PEA identifies that the key issues associated with the proposal are likely to be Aboriginal Heritage and Biodiversity. Risks associated with these issues are expected to be able to be effectively managed.

These key issues, along with other environmental risks identified in this report, will be detailed in the EIS prepared for the proposal. The EIS will assess the potential impacts, identify appropriate mitigation measures and assess the residual risks with the implementation of the identified controls. The EIS will be developed in accordance with the SEARs issued by DP&E.

If further assessment of impacts identify that the proposal is likely to have a significant impact on any MNES, the proposal may also need approval by the Commonwealth Minister for the Environment, or their delegate.

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APPENDIX A – PROTECTED MATTERS SEARCH TOOL REPORT

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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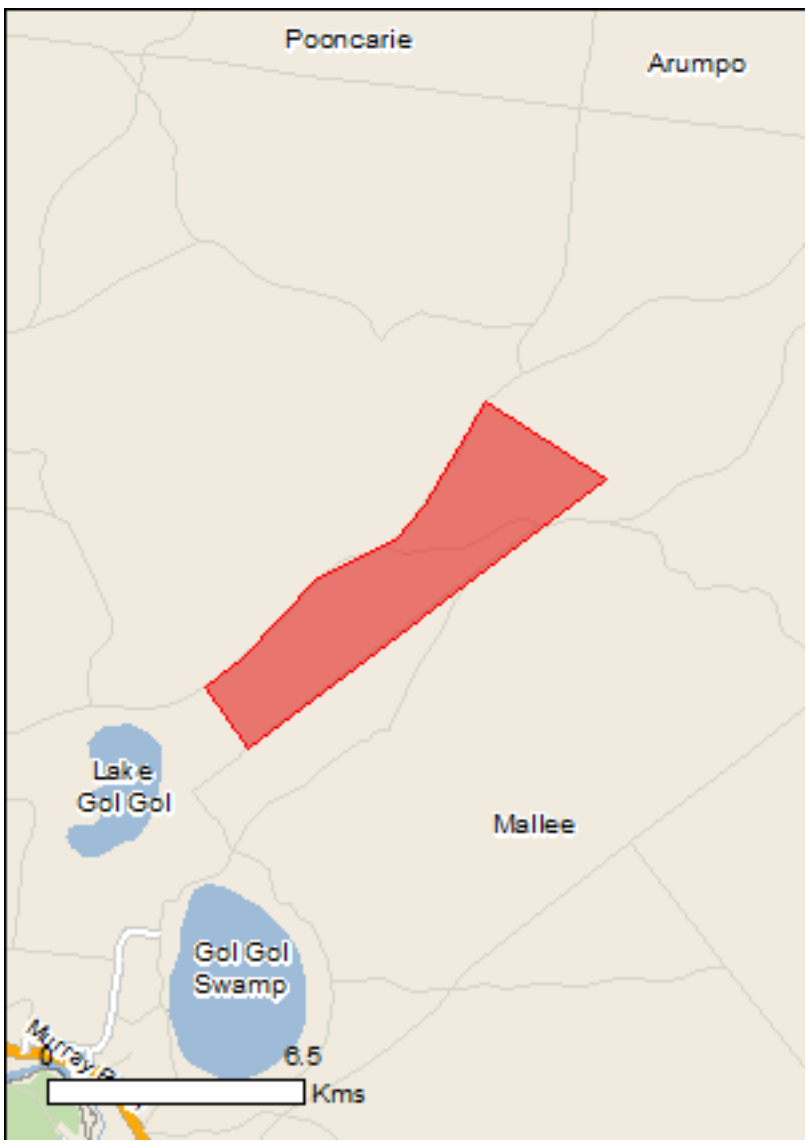

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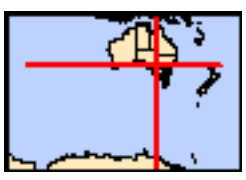

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	23
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	28
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Banrock station wetland complex	150 - 200km upstream
Riverland	100 - 150km upstream
The coorong, and lakes alexandrina and albert wetland	200 - 300km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Manorina melanotis Black-eared Miner [449]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Extinct within area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Fish		
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat known to occur within area
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat likely to occur within area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area
Solanum karsense Menindee Nightshade [7776]	Vulnerable	Species or species habitat may occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land - Australian Telecommunications Corporation

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kings Billabong Park	VIC
River Murray Reserve	VIC
Southern Mallee	NSW

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat may occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area

Nationally Important Wetlands

[Resource Information]

Name	State
Kings Billabong Wetlands	VIC

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-34.055565 142.316593,-34.07007 142.344059,-34.120677 142.262691,-34.109307 142.253078,-34.103622 142.261661,-34.088838 142.278484,-34.081445 142.295994,-34.075189 142.302517,-34.055565 142.316593,-34.055565 142.316593,-34.055565 142.316593

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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