New England Solar Farm

Request for Secretary's Environmental Assessment Requirements

Prepared for UPC Renewables Australia Pty Ltd | 18 April 2018

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Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500
F +61 2 9493 9599
E info@emmconsulting.com.au

www.emmconsulting.com.au

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Final

Report J17300RP1 | Prepared for UPC Renewables Australia Pty Ltd | 18 April 2018

Prepared by	**David Richards**	Approved by	**Claire Burnes**
Position	Environmental scientist	Position	Associate
Signature		Signature	
Date	18 April 2018	Date	18 April 2018

Document Control

Version	Date	Prepared by	Reviewed by
1	2 March 2018	D Richards	C Burnes
2	27 March 2018	D Richards	C Burnes
3	6 April 2018	D Richards	C Burnes
4	18 April 2018	D Richards	C Burnes

T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

www.emmconsulting.com.au

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1 Introduction

1.1 The project

UPC Renewables Australia Pty Ltd (UPC) proposes to develop the New England Solar Farm; a significant grid-connected solar farm along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale in the Uralla Shire local government area (LGA) (Figure 1.1) (the project).

The project is likely to be developed across three separate arrays of photovoltaic (PV) modules (commonly referred to as 'solar panels'); incorporating transmission infrastructure between each of the three arrays and a centralised grid-interfacing substation (Central Substation) to enable connection into the existing electricity transmission network (refer Figure 1.2). The project will have a targeted 'sent out' electricity generating capacity of up to 800 MW (AC) and depending on its final size and design, the project will have an estimated capital investment value in the order of $0.6–$1 billion.

The project will support the Commonwealth and New South Wales (NSW) governments to achieve their respective renewable energy and climate change mitigation targets. The aim of the Commonwealth Government's *Renewable Energy Target* (RET) policy is to ensure that at least 33,000 gigawatt hours (GWh) of Australia's electricity is derived from renewable sources by 2020. In 2016, renewable energy provided 17,500 GWh, indicating that Australia was approximately half way towards achieving this target (Clean Energy Council 2016). The Commonwealth Goverment is also committed to reducing Australia's greenhouse gas (GHG) emissions by 26-28% on 2005 levels by 2030. Investment in renewable energy including large-scale, grid-connected wind and solar projects, must play an increasing role in helping to meet this GHG abatement target. Furthermore, the intent of the NSW Government's Renewable Energy Action Plan (REAP) is to increase the proportion of electricity derived from renewable sources in NSW by up to 20% by 2020.

The project will provide a number of direct and indirect social, economic and environmental benefits throughout its life. Once operational, the project will generate up to 2,000,000 megawatt hours (MWh) of electricity annually, depending on its final size and design. This is the equivalent of the electricity required to power approximately 250,000 NSW households. The project will also contribute to an increase in energy security by creating a more diverse energy mix.

The project would represent a major injection of capital investment into the New England North West region and the Uralla Shire LGA. The regional economy would benefit from the project through the creation of employment opportunities and other indirect economic benefits. Direct employment opportunities generated by the project could include approximately 500-800 full-time equivalents (FTEs) at the peak of construction, depending on how the construction phase of the project is scheduled, and up to 15 FTEs during operations. The project will also result in a diversification of the income earned by the landholders involved in the project, most of whom will continue farming on their properties within the region.

The project is a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). Therefore, a development application (DA) for the project is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning (Minister), or the Minister's delegate, is the consent authority.

1.2 Site and surrounds

1.2.1 Regional context

UPC proposes to develop the project on a site within the Uralla Shire LGA. At its closest extent, the project boundary is located approximately 5 km south-east of the township of Uralla, and the northern most area starts approximately 8.6 km south of Armidale (refer to Figure 1.1). The site falls within the New England Tablelands Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, which is located between the North Coast and Nandewar bioregions in the inner north-east region of NSW and extends just north of the Queensland border. It encompasses parts of the MacIntyre, Clarence, Gwydir, Macleay, Namoi and Manning River catchments (OEH 2016a).

The New England Tablelands bioregion is within the temperate to cool temperate climate zone of NSW, and tends to have warm summers and high summer rainfall (OEH 2016a). The New England Tablelands bioregion is characterised by a stepped plateau of hills and plains, at elevations from 600-1500 m, with diverse vegetation prevalent throughout the region (OEH 2016a).

The site lies within Regional Development Australia's (RDA's) Northern Inland (NI) region of NSW, which is defined by 12 LGAs in northern NSW and is dominated by agricultural activities (RDANI 2016a). In 2016, the total population within the region was estimated to be approximately 180,000, which is expected to grow to more than 200,000 by 2031 (RDANI 2016a). The townships of Armidale, Tenterfield, Tamworth, Inverell and Uralla are expected to experience a significant proportion of this growth.

1.2.2 Local context

The majority of the site is within the Armidale Plateau subregion which encompasses approximately 290,000 ha within the southern part of the New England Tableland bioregion and is characterised by an undulating to hilly plateau at an elevation of approximately 1,100 m. The site is within the Macleay Catchment. Elevation across the site is variable at approximately 986-1,149 m above sea level (MASL).

The landform pattern within and surrounding the site can be described as a mix of low rolling hills and flatter areas that are frequently dissected by drainage networks and their adjacent flood plains, terraces and foot slopes. Perennial watercourses within the site and surrounds include Salisbury Waters, Cook Station Creek, Dog Trap Creek and Julia Gully (refer Figure 1.2).

Climate data from the Bureau of Meteorology (BoM) indicates that close to the site, average monthly solar exposure ranges between 9.9–25.2 megajoules/m^2 (MJ/m^2), with an annual average of 18.1 MJ/m^2, which equates to approximately 5 kWh/m^2 and an average of 7–8 hours of sunshine per day (BoM 2018).

1.2.3 Site

The three areas of the site are located within a larger project investigation area that covers approximately 11,622 hectares (ha), which has been the subject of preliminary environmental constraints identification, engineering assessments, discussions with landholders and investigations of the grid connection potential of the project (refer Figure 1.3). The preliminary investigations within the project investigation area have led to significant refinements to the project boundary, hereafter referred to as the 'site'.

The site encompasses a total area of 4,244 ha, which includes three distinct land areas, a northern area (2,028 ha), central area (794 ha) and southern area (1,422 ha), which are separated by significant amounts of agricultural land. The site intersects land legally described and identified in Table 1.1 and Figure 1.3. Based on the current indicative design and lease agreements between UPC and the project landholders, no subdivision is proposed on the lots identified within the project boundary.

Should it be required, subdivision will be addressed within the environmental impact statement (EIS) and will be the subject of further consultation with the NSW Department of Planning and Environment (DPE) and Uralla Shire Council (Council).

Table 1.1 Involved lots within the project boundary

Lot number	Deposited plan (DP)	Label (refer Figure 1.3)	Site area
221	755814	1	Northern
21	1167870	2	Northern
23	1171290	3	Northern
24	1171290	4	Northern
2	567937	5	Northern
2	174053	6	Northern
83	755814	7	Northern
84	755814	8	Northern
79	755814	9	Northern
78	755814	10	Northern
B	172594	11	Northern
4	172594	12	Northern
91	755827	13	Northern
90	755827	14	Northern
89	755827	15	Northern
101	755827	16	Northern
102	755827	17	Northern
103	755827	18	Northern
6	172594	19	Northern
1	405515	20	Northern
1	127777	21	Northern
2	127777	22	Northern
5	127777	23	Northern
38	755827	24	Northern
37	755827	25	Northern
39	755827	26	Northern
8	173619	27	Central
183	755827	28	Central
123	755827	29	Central
124	755827	30	Central
125	755827	31	Central
126	755827	32	Central
296	755827	33	Central
182	755827	34	Central
181	755827	35	Central
154	755827	36	Central
1	227322	37	Central / Southern
2	817891	38	Southern
2	1107854	39	Southern

Table 1.1 Involved lots within the project boundary

Lot number	Deposited plan (DP)	Label (refer Figure 1.3)	Site area
1	171781	40	Southern
263	755846	41	Southern
505	755846	42	Southern
246	755846	43	Southern
160	755846	44	Southern
245	755846	45	Southern
142	1135106	46	Southern
214	755836	47	Southern
2	1018290	48	Southern
1	1122757	49	Southern
2	1122757	50	Southern
6	1122757	51	Southern
2	11311	52	Southern

During the preparation of the EIS, the development footprint within the project boundary and the size of the project in terms of its electricity generating capacity will be refined on the basis of further stakeholder engagement, environmental assessment and constraints identification, detailed grid connection studies, engineering assessment and financing considerations.

Once this refinement has been undertaken, the development footprint for the project is expected to encompass a total area of up to 2,400 ha across the three areas, all contained within the project boundary (Figure 1.2), consisting of approximately 1,000 ha required for the rows of PV modules and the remaining area associated with inverters, space between the rows, internal access tracks and associated infrastructure. This excludes land required for connection infrastructure between the three solar arrays which would involve easements across land owned by landholders involved in the project, as well as land required for new internal roads to enable access to the site from the surrounding road network and the battery and energy storage system (BESS). The required land area is driven primarily by the need for a project of sufficient electricity generating capacity to achieve economies of scale in output, justifying the substantial grid connection costs and thus being able to achieve a competitive price for the electricity supplied to households.

1.2.4 Site features

Electricity transmission line infrastructure traverses the site and surrounds and includes:

- TransGrid's existing 330 kV transmission line between Armidale and Tamworth, which passes through the site;
- Essential Energy's existing 66 kV sub-transmission line between Armidale and Walcha/Uralla tee , which runs east-west close to the northern boundary of the southern area (refer Figure 1.2); and
- a number of Essential Energy 11 kV local supply lines.

The site is zoned RU1 Primary Production under the Uralla Local Environmental Plan 2012 (Uralla LEP) (Figure 1.4). As identified within Table 1.1, the site for the project will encompass 52 lots (Figure 1.3), the majority of which have been modified by historical land use practices and past disturbances associated with land clearing, cropping and intensive livestock grazing.

The properties that make up the site are currently primarily used for sheep grazing for production of wool and lambs, with some cattle grazing for beef production.

Parts of the site are mapped as biophysical strategic agricultural land (BSAL) as defined by the Strategic Agricultural Land Map – New England North West regional mapping presented in State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Mining SEPP) (refer Figure 6.4 and Section 6.5.1).

The site has access to the regional road network; including the New England Highway and Thunderbolts Way (refer Figure 1.2). A number of local roads traverse the site and surrounds, including Gostwyck Road; Salisbury Plains Road; The Gap Road; Carlon Menzies Road; Munsies Road; Saumarez War Service Road; Hillview Road; Elliots Road and Big Ridge Road, and would provide access to the the site from the regional road network throughout the construction and operation of the project (refer Figure 1.2).

Photographs 1.1, 1.2 and 1.3 illustrate the general condition of the site.

Photograph 1.1 General condition of the northern area of the site looking north-east

Photograph 1.2 General condition of the central area of the site looking north-west

Photograph 1.3 General condition of the southern area of the site looking north-west

1.3 Applicant

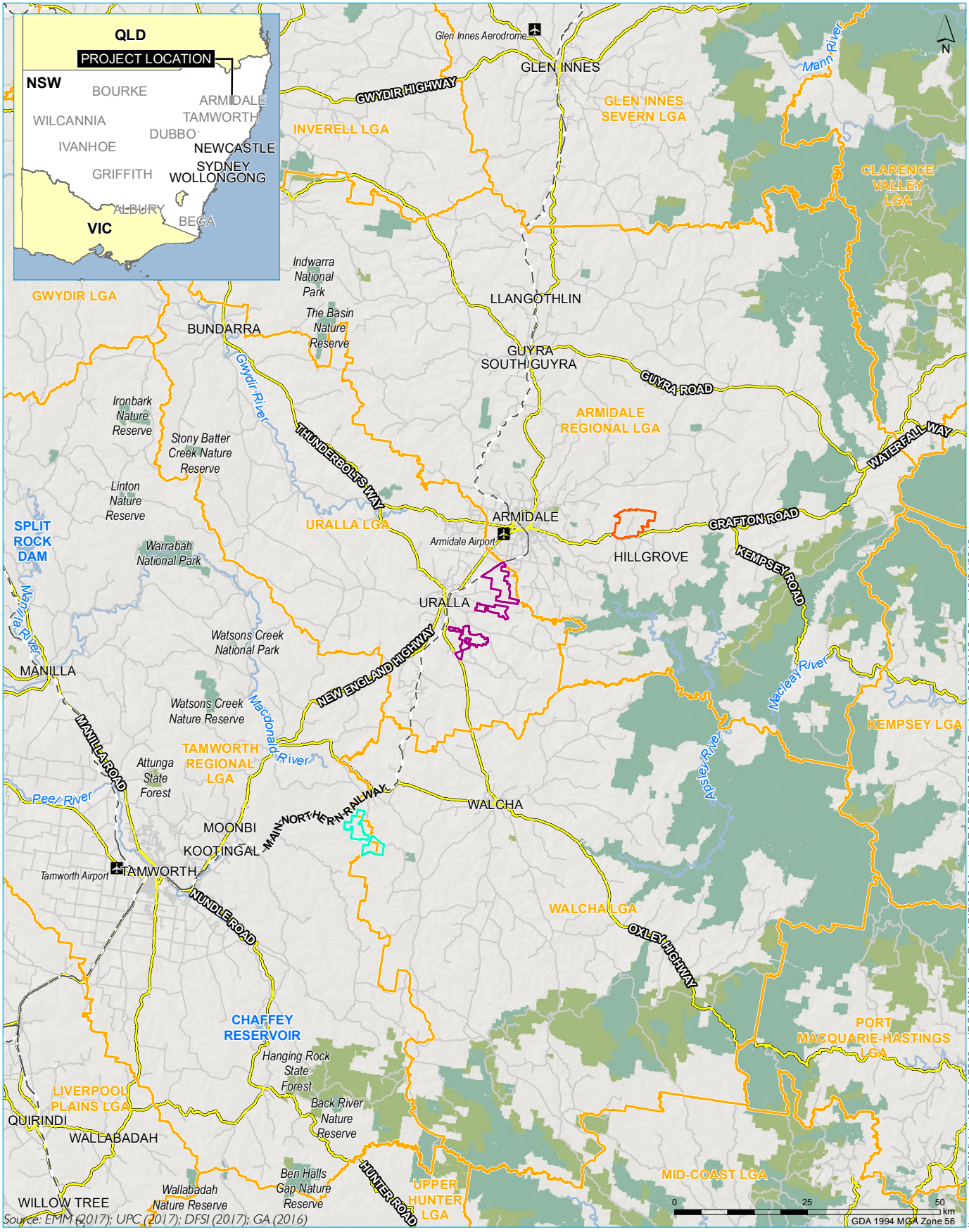
UPC is a leading renewable energy development company that has been operating globally since the 1990s with experience in North America, Europe, Asia and Africa. To date, UPC companies have developed more than 3,500 MW of operating wind and solar projects with an estimated investment value of over $6 billion. In recent years, UPC has demonstrated its ability to enter new markets with advanced technology and creative local business strategies, helping to accelerate renewable energy deployment around the world.

In Australia, UPC is developing both the Robbins Island Wind Farm and Jim's Plain Wind Farm in Tasmania. UPC is focused on supplying renewable energy at the lowest possible price in a socially responsible way. UPC independently develops, builds, owns and operates its wind and solar assets as an Independent Power Producer (IPP). Within Australia, the UPC management team has extensive experience in the development, financing and construction of large-scale wind, solar and hydro projects both in Australia and overseas.

1.4 Purpose of report

The purpose of this report is to request, and inform the content of, the Secretary's Environmental Assessment Requirements (SEARs) for the project. The SEARS will identify the requirements and the level of environmental assessment required to accompany the DA.

This report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of UPC.



KEY

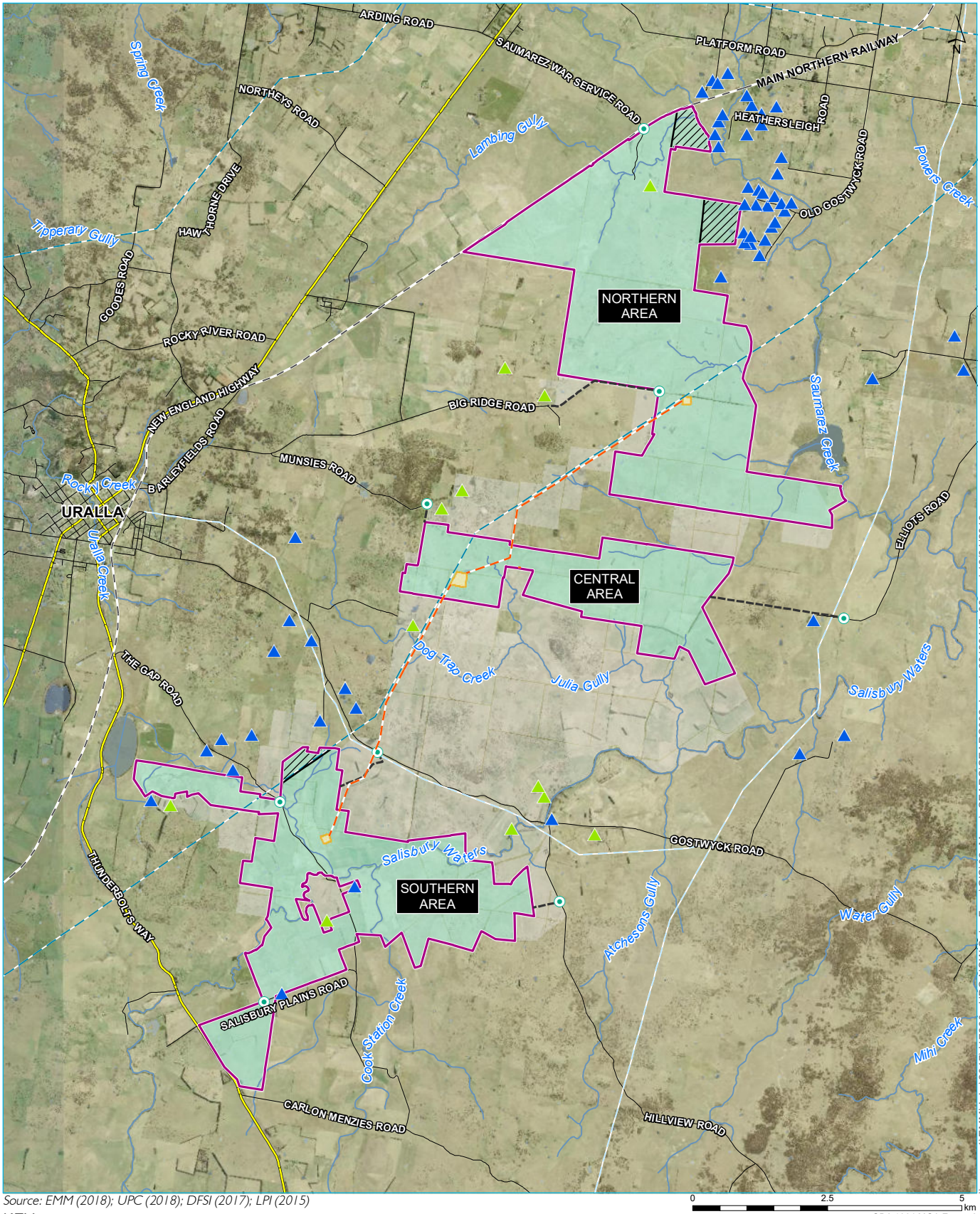
- Project boundary*
- Metz Solar Farm proposed project area
- Woolbrook Wind Farm proposed project area
- Local government area (LGA) boundary
- Airport
- Rail line
- Main road
- Local road
- Major waterway
- Waterbody
- NPWS reserve
- State forest

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Regional project location

New England Solar Farm
Request for SEARs
Figure 1.1

EMM



Source: EMM (2018); UPC (2018); DFSI (2017); LPI (2015)

0 2.5 5 km

GDA 1994 MGA Zone 56

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KEY

- Project boundary*
- Areas to exclude project infrastructure
- Involved Lots
- Preliminary substation sites
- Preliminary array connection
- Indicative site access road
- Preliminary site access locations
- 66kV transmission line
- 330kV transmission line
- Main road
- Local road
- Rail line
- Watercourse / drainage line
- Waterbody

Sensitive receptors

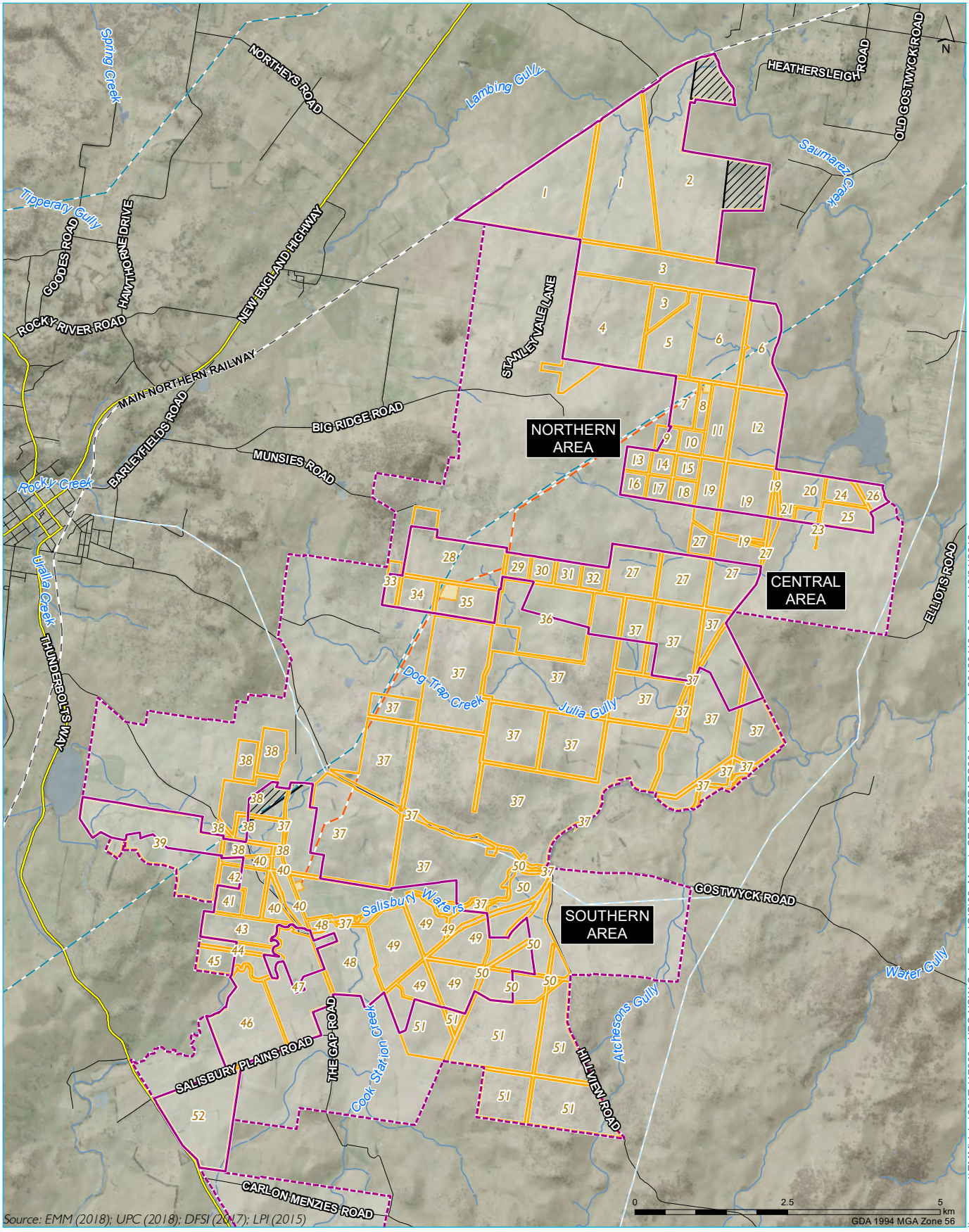
- Project-related
- Non-project related

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Location of the New England Solar Farm

New England Solar Farm
Request for SEARs
Figure 1.2

EMM



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KEY

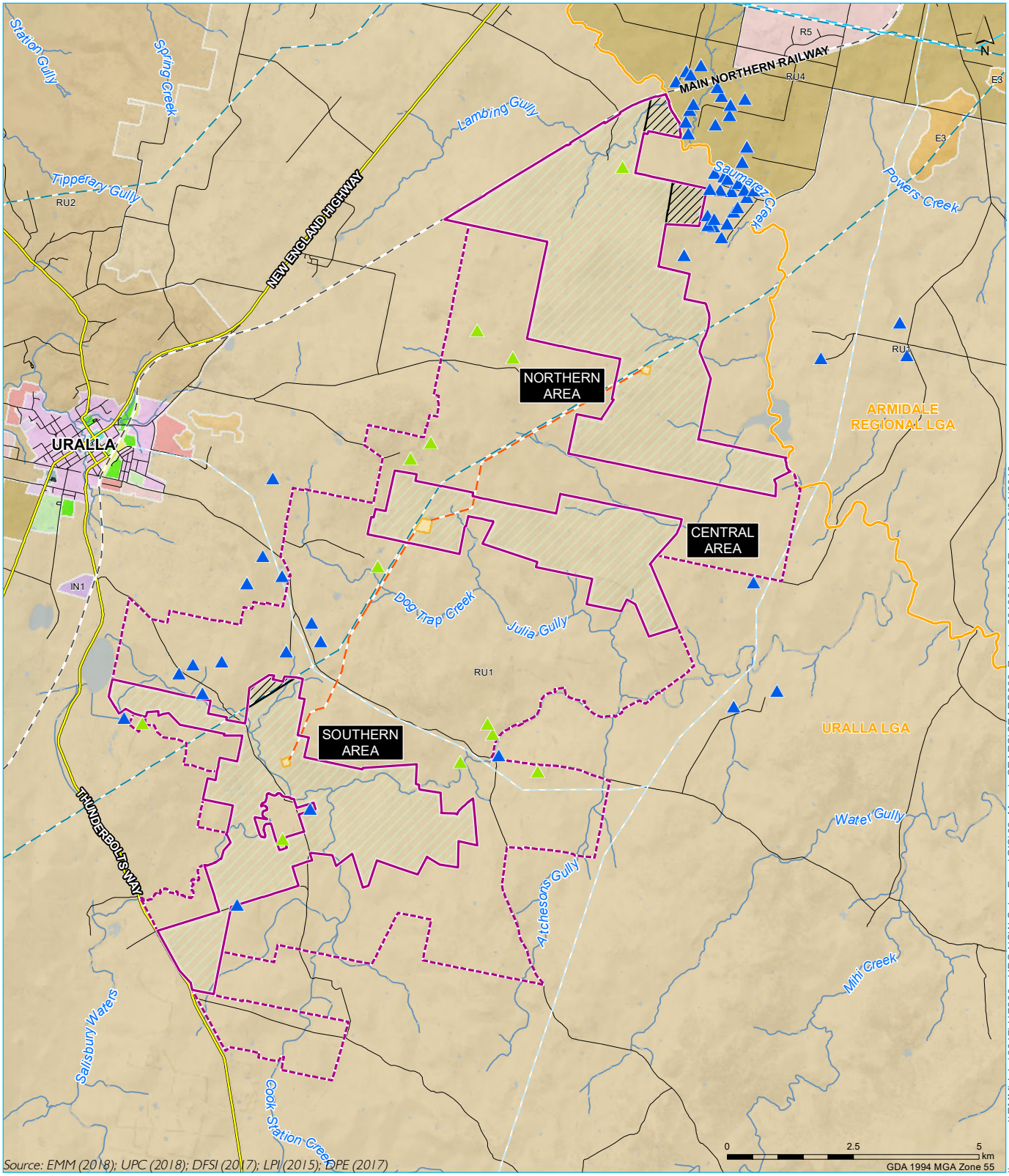
- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary array connection
- Preliminary substation sites
- Cadastre (relevant to site boundary)
- 66kV transmission line
- 330kV transmission line
- Rail line
- Main road
- Local road
- Watercourse / drainage line
- Waterbody

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Cadastral details

New England Solar Farm
Request for SEARs
Figure 1.3

EMM



KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary array connection
- Preliminary substation sites
- Local government area (LGA) boundary

Sensitive receptors

- Project-related
- Non-project related

- 66kV transmission line
- 132kV transmission line
- 330kV transmission line
- Rail line
- Main road
- Local road
- Watercourse / drainage line
- Waterbody

Land zoning (Uralla LEP)

- B2 Local Centre
- B4 Mixed Use
- B6 Enterprise Corridor
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- SP2 Infrastructure

Land use zoning

New England Solar Farm
Request for SEARs
Figure 1.4

EMM

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

2 Planning framework

2.1 NSW Environmental Planning and Assessment Act 1979

2.1.1 Approval process

The EP&A Act and the NSW Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for environmental planning and assessment in NSW. Part 4 of the EP&A Act relates to development assessment and consent; Part 4, Division 4.7 relates to the assessment of development deemed to be significant to the State (or SSD).

Section 4.36(2) (previously Section 89C(2)) of the EP&A Act states that a:

> ...State environmental planning policy may declare any development, or any class or description of development, to be State significant development.

The SRD SEPP identifies development that is SSD. Clause 8 of the SRD SEPP states:

> (1) Development is declared to be State significant development for the purposes of the Act if:
>
> (a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and
>
> (b) the development is specified in Schedule 1 and 2.

The project meets both these requirements; it requires development consent, and is a development specified in Schedule 1 of the SRD SEPP. Permissibility of the project is described below.

Schedule 1 of the SRD SEPP defines the following as SSD:

> Electricity generating works and heat or co-generation
>
> Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, waste, hydro, wave, solar or wind power) that:
>
> (a) has a capital investment value of more than $30 million.

The project is development for the purpose of electricity generation and will have a capital investment value of more than $30 million. Consequently, the project is SSD.

2.1.2 Permissibility

The relevant local planning instrument is the UrallaLEP. Under the Uralla LEP, the site is zoned RU1 Primary Production. The objectives of this zone are:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base;
- to encourage diversity in primary industry enterprises and systems appropriate to the area;
- to minimise the fragmentation and alienation of resource lands;

- to minimise conflict between land uses within this zone and land uses within adjoining zones; and
- to permit development of non-agricultural land uses that are compatible with the character of the zone.

Additionally, the Uralla LEP permits development with consent for the purpose of electricity generation in the RU1 Primary Production zoned land.

The project encourages sustainable primary industry production as it involves harnessing a natural resource, namely solar energy. It is acknowledged that the development of the project will reduce the utilisation of the site for agricultural production; however, this impact will be mitigated by a number of factors, which are described in detail in Section 6.5 of this report.

Once operational, the project will yield positive environmental, social and economic outputs providing ongoing support to the local and regional community.

Additionally, clause 34 (7) of State Environmental Planning Policy (Infrastructure) 2007 states that:

> ...development for the purpose of a solar energy system may be carried out by any person with consent on any land.

Therefore, development for the purpose of a solar energy system may be carried out on the site with development consent.

Section 4.12(8) (previously Section 78A (8)) of the EP&A Act requires a DA for SSD to be accompanied by an EIS. Schedule 2 of the EP&A Regulation outlines the requirements in undertaking an environmental assessment, specifies the form and content of an EIS, and requires an EIS to be prepared in accordance with the SEARs issued for the project.

2.2 Other state legislation

2.2.1 Protection of the Environment Operations Act 1197

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) is the principal NSW environmental protection legislation and is administered by the NSW Environment Protection Authority (EPA). Section 48 of the POEO Act requires an environment protection licence (EPL) to undertake scheduled activities at any premises. Scheduled activities are defined in Schedule 1 of the POEO Act and include the following premise-based activities that apply to the project:

17 Electricity generation

> (1) ...general electricity works, meaning the generation of electricity by means of electricity plant that, wherever situated, is based on, or uses, any energy source other than wind power or solar power.
>
> (2) Each activity referred to in Column 1 of the Table to this clause is declared to be a scheduled activity if it meets the criteria set out in Column 2 of that Table.

The table referred to in Schedule 1, Clause 17 specifies 'general electricity works' with 'capacity to generate more than 30 megawatts of electrical power'. The project will have a capacity that is greater than 30 MW and therefore requires an EPL. Under the provisions of the EP&A Act, an EPL cannot be refused if it is necessary to carrying out a SSD authorised by a development consent (refer Section 2.2.6).

2.2.2 Water Management Act 2000

The NSW *Water Management Act 2000* (WM Act) regulates the use and interference with surface and groundwater in NSW where a water sharing plan has been implemented. The Water Sharing Plan for the Gwydir Unregulated and Alluvial Water Sources applies to the region in which the site is located and will be considered in the EIS.

2.2.3 Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, which repealed the following:

- NSW Threatened Species Conservation Act 1995;
- Sections of the NSW National Parks and Wildlife Act 1974 (NPW Act); and
- NSW Native Vegetation Act 2003.

The BC Act established a new regulatory framework for assessing and offsetting biodiversity impacts for proposed developments. Where development consent is granted, the consent authority may impose as a condition of consent, an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (BAM).

The BC Act is also supported by the Biodiversity Conservation Regulation 2017 and the Biodiversity Conservation (Savings and Transitional) Regulation 2017, which outline the methods to be used in applying the BAM, and specific consideration for transitional projects immediately following commencement of the new framework.

Preliminary field surveys were completed by EMM in January and March 2018. The purpose of these field surveys were to undertake preliminary mapping and classification of vegetation to plant community type (PCT) and a high-level assessment of threatened species habitat within the site. In addition, a number of plots were completed in accordance with the BAM. Additional field surveys will be conducted during the preparation of the biodiversity development assessment report (BDAR) and EIS.

Substantial work has already been undertaken to avoid and minimise impacts to biodiversity, largely by restricting the site to predominantly cleared areas of lower quality ecological values within the project investigation area. A key objective of the project design will be to use the information from the biodiversity field surveys to avoid and minimise potential impacts on biodiversity values as far as practical and, subsequently, avoid or minimise offset obligations for the project under the BAM.

2.2.4 Roads Act 1993

The NSW *Roads Act 1993* is administered by Roads and Maritime Services (RMS), local government or NSW Land and Property Information (NSW LPI). The RMS has jurisdiction over major roads, local government over minor roads, and NSW LPI over Crown roads. The NSW *Roads Act 1993* sets out the rights of the public in regard to access to public roads.

Under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993*, a person must not undertake any works that impact on a road, including connecting a road (whether public or private) to a classified road, without approval of the relevant authority, being either RMS or local council, depending upon classification of the road.

The interaction of the project with the local and regional road network will be addressed in the EIS. Under the provisions of the EP&A Act, an approval under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993* cannot be refused if it is necessary for carrying out a SSD authorised by a development consent (see Section 2.2.6).

2.2.5 Rural Fires Act 1997

The NSW *Rural Fires Act 1997* (RF Act) aims to prevent, mitigate, and suppress bush and other fires in local government areas of the State, Section 63 (2) of the RF Act requires the owners of land to prevent the ignition and spread of bushfires on their land. Under Section 4.42 of the EP&A Act, a bush fire safety authority under Section 100B of the RF Act is not required for SSD that is authorised by a development consent.

The NSW Rural Fire Service (RFS) Bush Fire Phone Land online mapping tool indicates that the site is not bush fire prone.

2.2.6 Other State approvals required

Section 4.41 (previously 89J) of the EP&A Act states that the following relevant authorisations are not required for SSD that is authorised by a development consent:

> (c) an approval under Part 4, or an excavation permit under Section 139, of the NSW Heritage Act 1977 (Heritage Act),
>
> (d) an Aboriginal heritage impact permit under Section 90 of the NPW Act,
>
> (e) (repealed)
>
> (d) a bush fire safety authority under Section 100B of the NSW RF Act,
>
> (f) a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the WM Act.

In addition, Section 4.41 states that Division 8 of Part 6 of the Heritage Act does not apply to, prevent or interfere with the carrying out of SSD that is authorised by a development consent.

Section 4.42 (previously 89K) of the EP&A Act lists the authorisations that must be obtained but cannot be refused if they are necessary for carrying out SSD that is authorised by a development consent. These authorisations include (as relevant to the project):

- an EPL under the POEO Act; and
- a consent under Section 138 of the NSW Roads Act 1993 from the relevant road authority.

2.3 Commonwealth legislation

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of national environmental significance (MNES) including:

- world heritage properties;
- national heritage places;

- Ramsar wetlands of international importance;
- nationally threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

A search of the Commonwealth Protected Matters Search Tool indicates that there are no World Heritage Properties or National heritage places within the vicinity of the site.

The preliminary biodiversity field surveys indicate there is limited potential for listed threatened species and listed migratory species to occur within the site. Further field surveys are required and will be undertaken to determine whether the PCTs identified within the site are representative of threatened ecological communities (TECs) listed under the EPBC Act.

If an action would, or is likely to, have a significant impact on any MNES, it is deemed to be a 'controlled action' and requires approval from the Commonwealth Environment Minister or the Minister's delegate. To determine whether a proposed action will or is likely to be a controlled action, a Referral, or a Proposed Action, is submitted to the Commonwealth Department of the Environment and Energy (DoEE) for assessment.

3 Project description

3.1 Overview

The project involves the development, construction and operation of a solar PV electricity generation facility, which consists of PV modules, inverters and associated infrastructure.

As noted in Section 1.2.3, a planning and environmental constraints analysis of the project investigation area (11,622 ha) has been undertaken, which identified the key risks and constraints based on the preliminary project design, the planning and assessment framework and the environment both within and surrounding the project investigation area.

The outcomes of the constraints assessment have informed the selection of the site for the project, which currently encompasses a project boundary with a total area of approximately 4,244 ha (Figure 1.2). The project boundary provided on Figure 1.2 incorporates the land required for the three solar arrays, three internal solar array substations and the Central Substation, an associated BESS and operations and maintenance (OM) infrastructure including OM buildings, car parking facilities and other infrastructure such as security fencing. Connection transmission infrastructure between the three arrays will also be required (refer Figure 1.2). In addition, the project will require a new internal road network to enable access from surrounding local roads to the site during construction and operations. Indicative site access locations are provided on Figure 1.2.

As noted in Section 1.2, once further refinement has been undertaken the development footprint for the project will encompass a total area of up to approximately 2,400 ha within the project boundary identified on Figure 1.2 (ie approximately 55% of the entire area within the project boundary), consisting of approximately 1,000 ha required for the rows of PV modules and the remaining area associated with inverters, space between the rows, internal access tracks and associated infrastructure. This excludes land required for connection infrastructure between the three solar arrays which would involve easements across land owned by landholders involved in the project, as well as land required for new internal roads to enable access to the site from the surrounding road network and the BESS. The required land area is driven primarily by the need for a project of sufficient electricity generating capacity to achieve economies of scale in output, justifying the substantial grid connection costs and thus being able to deliver competitive electricity prices for households.

The design and location of the development footprint and project infrastructure within it will be refined on the basis of further detailed grid connection studies that will determine the exact project size in terms of electricity generating capacity, and through further stakeholder engagement, environmental assessment and constraints identification, detailed engineering assessment and financing considerations.

The project will have a targeted ‘sent out’ electricity generating capacity of up to 800 MW (AC). The final number of PV modules within the development footprint will be dependent on detailed design, availability and commercial considerations at the time of construction.

Electricity generated by the project will be injected into the grid via TransGrid’s 330 kV transmission line that traverses the site (refer Figure 1.2). Further details about the proposed network connection are provided in Section 3.2.3.

3.2 Project infrastructure

3.2.1 Solar arrays, PV modules, medium voltage cable network and inverters

The project will involve the development of three separate arrays of PV modules and inverters. The total land area required to achieve the targeted capacity for each array will be refined on the basis of further detailed grid connection studies, stakeholder engagement, environmental assessment and constraints identification and detailed engineering assessment. The number of PV modules and inverters required will be dependent on the final detailed design of the project.

PV modules will be installed in a series of rows to maximise the energy yield that is achievable given the solar resource and the ground area available within the project boundary. The modules will be fixed to, and supported by, a ground-mounted framing structure, aligned in rows (refer Photograph 3.1). Assuming single axis tracking technology is used, the rows of PV modules will be aligned in a north-south direction and spaced out approximately 5-8 m apart. The use of single axis tracking technology would enable the PV modules to rotate from east to west during the day tracking the sun's movement.

Photograph 3.1 Example of the potential PV module layout

An alternative configuration for the PV modules may be considered for the project, namely a fixed tilt system, with the rows aligned east-west and the PV modules facing north. However, it is noted that single axis tracking is considered more likely due to the recent fall in technology costs and the superior energy yield associated with this technology.

The PV modules will be supported on mounting frames consisting of vertical posts ('piles') and horizontal rails ('tracking tubes'). Rows of piles will be driven or screwed into the ground, depending on the geotechnical conditions, and the supporting racking framework will be mounted on top. Pre-drilling and/or cementing of foundations will be avoided if allowed by the geotechnical conditions.

The height of the PV modules at their maximum tilt angle (typically up to 60 degrees) will be no more than approximately 4 m. Additional site-specific clearance of up to around 500 mm may be required to avoid flooding risk or to allow sheep to graze underneath the PV modules.

An underground medium voltage (MV) cable reticulation network will also be required to transport the electricity around each of the three arrays. Underground cables of either 22 kV or 33 kV will be installed at a depth of at least 600 millimetres (mm) and will be designed and fitted in accordance with relevant Australian industry standards. Electricity from the underground cable network will be stepped up to high voltage (HV) at each of the three internal solar array substations.

3.2.2 Solar array substations

Up to three substations will be required (ie one at each of the three solar arrays) to step the MV up to HV. Based on preliminary designs, each substation will require transformers to step up from 33 kV to 132 kV. Each substation will likely consist of an indoor switch room, to house MV circuit breakers and an outdoor switch yard to house the transformer(s), gantries and associated infrastructure. The total pad area for each solar array substation is likely to be in the order of approximately 2-3 ha. Indicative locations for the solar array substations are provided in Figure 1.2.

3.2.3 Collector network and central substation

Three new overhead transmission lines will transport electricity from each of the internal solar array substations to the Central Substation. Where possible, UPC will look to align the three new overhead transmission lines with TransGrid's 330 kV transmission line. Based on preliminary designs, the anticipated voltage is 132 kV, single circuit. The total estimated length of these transmission lines is approximately 12.7 km, which would include transmission lines from the southern (5.2 km), central (1.7 km) and northern (5.8 km) areas to the Central Substation. The alignment of the overhead transmission lines and design, height and style of the structures required to support them will be determined during the detailed design stage of the project; however, it is unlikely that the height of the structures will exceed 45 m. Based on preliminary designs, single concrete poles are anticipated rather than steel lattice towers. The easement required for the overhead transmission lines will be dependent on the type of structure selected but is unlikely to be more than 45 m in width.

The Central Substation will be adjacent to TransGrid's 330 kV transmission line, which traverses the site and surrounds (Figure 1.2). At the Central Substation, the electricity generated by the three solar arrays will be stepped up to 330 kV and injected into the grid via TransGrid's 330 kV transmission line. The Central Substation will require a pad area of up to 6 ha. An envelope providing adequate flexibility for design and siting of the Central Substation is provided on Figure 1.2. The exact dimensions will be refined during the detailed design stage of the project.

3.2.4 Battery energy storage system

It is anticipated that a central BESS will be installed as part of the project, with this being located as close as possible to the Central Substation to minimise losses.

The specific technology, MW rated capacity and MWh of storage of the proposed BESS will be determined during the detailed design stage of the project and will be dependent on a number of commercial and financial considerations during the development phase. The sizing of the BESS is also likely to be driven by government policy, given the current focus on mechanisms to ensure reliability and dispatchability of renewable energy power generation. The BESS will be housed in a secure compound. Should any additional land be required for the BESS, this will be described within the EIS.

3.2.5 Supporting infrastructure

In addition to the infrastructure described above, the project will also require:

- one or more OM buildings and associated infrastructure;
- a number of new internal roads to enable access to the site from the surrounding road network (namely Gostwyck Road, The Gap Road, Salisbury Plains Road, Hillview Road, Munsies Road, Saumarez War Service Road, Elliots Road and Big Ridge Road – refer Figure 1.2);
- parking and internal access roads/tracks within the site to allow for construction and ongoing maintenance; and
- fencing and landscaping around the solar arrays, substations and BESS.

Temporary infrastructure during the construction phase of the project including laydown and storage areas and a site compound may also be required.

Detailed layout configuration will be informed by technical assessments performed during the preparation of the EIS and the detailed design stage of the project. Project infrastructure will be positioned, where possible, to avoid identified constraints.

3.3 Construction

The construction phase of the project is anticipated to take up to 24 months depending on scheduling of the construction works across the three arrays and is anticipated to commence in the first half of 2019. During the construction phase of the project, a peak workforce in the order of 500-800 FTEs will be required. Construction activities will be undertaken during standard daytime construction hours.

Workers accommodation is anticipated to be sourced through a combination of establishing workers camps and relying on surrounding townships and regional centres (eg Uralla, Armidale, Walcha and Tamworth).

The need for heavy civil works such as grading/levelling and compaction of the site will be minimised, as the flattest land areas within the project boundary which are already mostly cleared of vegetation have been selected. Civil works will be required to prepare the site by installing fencing, internal access tracks, and minor earth works. Some heavier earth moving will be required for certain project infrastructure (eg substations) in those instances where a level pad is necessary.

As part of site establishment works, management measures will be introduced to mitigate potential impacts on the environment and sensitive receptors within close proximity of the development footprint. Where required, additional or improved drainage channels, sediment control ponds and dust control measures will be implemented. Further, laydown areas and waste handling, fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during the construction phase of the project.

3.4 Operation and decommissioning

The operational lifespan of the project will be in the order of 30 years, unless the facility is re-powered at the end of the PV modules' technical life. The decision to re-power the plant will depend on the economics of solar PV technology and energy market conditions at that time. Should the PV modules be replaced during operations, the lifespan of the project may extend to up to 50 years. Throughout operations, a workforce of up to 15 FTEs will be required.

It is anticipated that the facility will require regular maintenance throughout its operational life. This will generally include maintaining fencing, vegetation management, upgrading drainage channels and maintaining internal roads. Additional activities, such as replacement of faulty PV modules and inverters may also be required. Regular light vehicle access will be required throughout the operations phase. Heavy vehicles may be required occasionally for replacing larger components of project infrastructure including inverters, transformers or components of the BESS. OM activities will typically be undertaken by specialist subcontractors and/or equipment manufacturers.

UPC is currently in discussions with a number of the landholders to enable sheep grazing to resume on portions of the three areas following the completion of the construction of the project. A detailed protocol will be developed to ensure biosecurity is maintained and that grazing does not impact on the safe and efficient operation of the project or result in injury to farm workers or OM staff.

Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and the site returned to its pre-existing land use, namely suitable for grazing of sheep and cattle, or another land use as agreed by the project owner and the landholder at that time.

Project decommissioning will require disturbance of the site during the removal of equipment. A significant number of FTEs, including both staff and contractors, and vehicle movements will be required during the decommissioning phase of the project.

UPC will attempt to recycle all dismantled and decommissioned infrastructure and equipment, where possible. Structures and equipment that cannot be recycled will be disposed of at an approved waste management facility.

4 Justification

4.1 Strategic context

This chapter provides the strategic justification of the project in the context of Commonwealth and State Government policies, initiatives and regional plans, as well as international agreements.

4.1.1 National context

Once constructed, the project will be an eligible generation category under the Commonwealth Government's RET scheme and will help meet the objectives of the international climate change agreements to which Australia is a party, including the Paris Climate Agreement.

Since January 2011, the Commonwealth Government's RET scheme has operated in two parts, of which, the large-scale renewable energy target (LRET) is relevant. The primary objective of the LRET scheme is to ensure that at least 33,000 GWh of Australia's electricity is derived from renewable sources by 2020. In 2016, a total of approximately 17,500 GWh of renewable energy was generated in Australia, less than 55% of the 33,000 GWh LRET target (Clean Energy Council 2016). Significant developments occurred in 2017 with more than 4,000 MW of new projects being committed, towards a requirement of approximately 7,000 MW which is needed to meet the 2020 target. Figure 4.1 tracks project developments since 2016 and includes probable, committed and accredited projects.

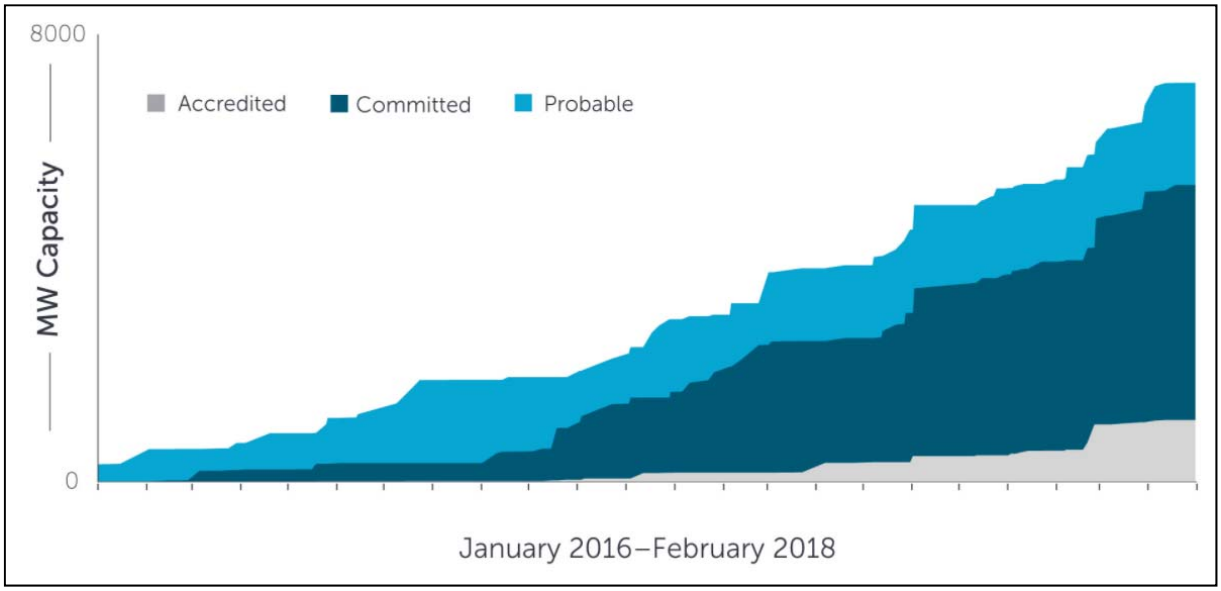


Figure 4.1 Renewable energy project pipeline progress (Source: Clean Energy Regulator 2018)

Once operational, the project will generate up to approximately 2,000 GWh of electricity annually. Under the LRET scheme, this would result in the order of 2,000,000 large-scale generation certificates being created annually, which will make significant contributions towards meeting the established targets.

In addition, the electricity generated by the project will contribute to Australia's targets as part of its commitments under the United Nations Paris Agreement on Climate Change. As part of the Paris Agreement, Australia will seek to reduce emissions by 26-28% below 2005 levels by 2030.

It is noted that an emissions reduction trajectory consistent with the Paris Agreement's aim to limit global mean temperature rise to 2° Celsius above 1990 levels would require far more aggressive emissions reductions from Australia's national power sector. A number of carbon market and energy analysts acknowledge that the current policy setting within Australia is inadequate and would not meet the required emissions reductions (Campbell 2017; Shah 2017). For example, the Commonwealth Government's RET scheme only requires 23.5% of Australia's electricity to be generated by renewable sources from 2020-2030.

It is estimated that, once operational, the project will contribute to annual GHG emissions reductions in the order of 1–1.5 million tonnes per annum (Mtpa). This amount will be dependent on the capacity of the project and the emissions intensity of the grid during the project's operations.

The project will make considerable contributions towards meeting not only the RET target but also towards Australia's broader climate change goals.

4.1.2 Energy market context

i Closure of coal-fired generators

Recent media coverage has emphasised the high risk that the closure of coal-fired generators presents to energy security in NSW. As noted by the Australian Energy Market Operator (AEMO) in the *Integrated System Plan Consultation* (AEMO 2017), approximately 70% of Australia's existing coal generation fleet, with a generation capacity of 16 GW, will approach the end of its intended operating life by 2040. Within the next 15 years, more than 9 GW of coal-fired generators are scheduled to close, which includes more than 6 GW in NSW (ie Liddell, Vales Point and Eraring).

As noted by AEMO (2017), prior to the withdrawal of material amounts of electricity generation from coal-fired generators, new supply resources and transmission assets are required in order to deliver continued power system reliability and security. The development of large-scale renewable energy projects has potential to fill the need for replacement power as ageing coal-fired generators encounter an increasing number of failures (particularly during the hotter summer months). The development of such projects will take considerable time and, subsequently, needs to proceed well in advance of the impending closure of coal-fired generators.

Of particular relevance to the project, recent media coverage has indicated that the closure of AGL Energy's Liddell Power Station, a coal-fired generator in the Hunter region of NSW with capacity of 2,000 MW, is anticipated to take place in 2022 and could contribute to large-scale blackouts across NSW households unless further commitments to replace the capacity of the outgoing facility are made (MacDonald-Smith & Ludlow 2018; Packham 2018). The risk of this occurring will continue to grow as electricity demand increases in line with forecast population and economic growth. It has been reported that there is currently insufficient interconnector capability to replace the capacity loss from the closure of Liddell Power Station via supply from other regions into NSW. Therefore, to eliminate the identified shortfall, a significant increase in power generation within NSW will be required.

Due to the difference in capacity factors of the relative technologies, the replacement of coal-fired generators with wind and solar renewable energy projects means that for every MW of coal-fired electricity generation that is retired, approximately 2–3 MW of wind and solar energy generation is required.

ii Integrated System Plan

Aligning with the *New England North West Regional Plan 2036* (NSW Government 2017) and the vision for accelerated renewable energy development in the region, the New England region has also been identified by AEMO in the *Integrated System Plan Consultation* (AEMO 2017) as having high potential for a renewable energy zone (REZ).

As noted within the *Integrated System Plan Consultation* (AEMO 2017), REZs are areas where clusters of large-scale renewable energy projects can be developed to promote economies of scale in higher-resource areas. TransGrid's *Renewable Energy Hub Sharing Report* (TransGrid 2016) also identified the potential for the New England region to become a REZ. In addition, the NSW Government's submission on AEMO's *Integrated System Plan Consultation* (AEMO 2017) emphasised the New England region's suitability as a REZ given the availability of outstanding energy resources within the region, reduced environmental and planning constraints and close proximity to existing transmission and distritbution infrastructure and load centres (NSW Government 2018).

4.1.3 State context

The NSW REAP, prepared by the NSW Government in 2013, continues to play an important role in the State's energy future, seeking to increase the diversity of the State's energy mix by encouraging investment in renewable energy sources, including large-scale grid-connected solar farms. The NSW REAP aims to facilitate the sustainable transition of electricity generation in NSW to a more reliable, more affordable and cleaner energy future. One of the defined targets within the NSW REAP is to increase the proportion of electricity derived from renewable sources in NSW by up to 20% by 2020. In 2016, the proportion of electricity derived from renewable sources in NSW was approximately 20% (McDonald 2017).

As noted in Section 4.1.1, once operational, the project will generate up to 2,000 GWh of electricity annually, depending on its final capacity, thus helping the State to meet its policy objectives. This is the equivalent of the electricity required to power up to 295,000 NSW households.

4.1.4 Local and regional context

i New England North West Regional Plan 2036

The New England North West region encompasses a total of 12 LGAs in regional NSW including the Uralla Shire LGA. The intent of the *New England North West Regional Plan 2036* (NSW Government 2017) is to guide the NSW Government's land use planning priorities and decisions in the New England North West region to 2036.

One of the primary goals of the *New England North West Regional Plan 2036* is to diversify the region's economy. To achieve this goal, the plan identifies nine directions, one of which is to grow New England North West as the renewable energy hub of NSW. Large-scale renewable energy projects, such as the New England Solar Farm, have potential to generate new employment opportunities and investment from construction, operations and connection to the State's electricity grid.

The plan establishes priorities for local councils within the New England North West Region to help achieve its overarching goals. One of the priorities identified for Uralla Shire Council is to investigate the potential for wind and solar production and encourage renewable energy opportunities.

The region has potential sources of solar energy, receiving 1920 megajoules daily of solar exposure, making it the second highest solar penetration region in NSW (NSW Government 2017). As noted previously, the site has favourable conditions for a solar PV power generation project having high solar irradiance and elevation of more than 1,000 MASL.

The project will contribute to the diversification of the energy sector while strengthening the New England North West region's economy.

ii Northern Inland Regional Plan 2016-2019

RDA is an Australian network of 55 committees working with all levels of government, business and communities to support the development of regional Australia. The Uralla Shire LGA sits within RDA's NI region, which consists of 12 LGAs. The region is dominated by resource-based agricultural activities and is concentrated around the regional cities of Tamworth and Armidale (RDANI 2016a).

As noted within the *Northern Inland Regional Plan 2016-2019*, RDANI's primary objective is to, "ensure the long-term sustainable growth and development of the region by driving and contributing to initiatives that will support economic development and jobs" (RDANI 2016a). One of the opportunities identified within the plan to help achieve this objective is the development of renewable energy industries with regional economic benefits (RDANI 2016a). As acknowledged within the plan, the region has a number of favourable conditions to facilitate the development of renewable energy, namely, land, sunshine, wind and agricultural/forestry/municipal residues. The renewable energy sector would also bring positive economic and environmental outcomes to the region (RDANI 2016a).

The *Northern Inland Regional Plan 2016-2019* also identifies priorities for local councils within the NI region, of which the increased use of renewable/green energy is identified. Uralla Shire Council's *Community Strategic Plan 2017-2027* does not make any direct reference to the renewable energy sector (USC n.d.). However, it does define Uralla Shire Council's mission and the values of the Uralla Shire LGA community, which include references to job opportunities for a wide range of skills and aptitudes, a diverse economy and sustainability. As noted in Section 1.1, the project would provide a number of direct and indirect social, economic and environmental benefits that align with these values, including the creation of employment opportunities, diversification of revenue streams and significant reductions in GHG emissions.

4.2 Project benefits

The project is intended to have benefits including:

- significant capital investment in the region in the order of $0.6–$1 billion;
- direct and indirect benefits for both the local economy within the Uralla Shire LGA and, more broadly, the regional economy within the New England North West region;
- potential for significant employment opportunities, including a peak construction workforce in the order of 500–800 FTEs (a number of which could be partially supported locally from Uralla Shire LGA and surrounding areas) and an operational workforce of up to 15 FTEs;
- reductions in GHG emissions in the order of 1–1.5 Mtpa;
- generation of enough clean energy to power the equivalent of up to 295,000 NSW households, annually; and

- contributions to energy security in NSW by diversifying the State's energy mix and helping to prepare for the retirement of large-scale coal-fired power generation.

4.3 Site selection

The project investigation area was first identified by UPC as having high potential for a major grid-connected solar PV power generation project as a result of it having a combination of:

- relatively high solar irradiance in the order of 1,830 kWh/m^2 global horizontal irradiance (GHI);
- elevation of more than 1,000 MASL across the site, which reduces heat losses and improves energy yield; and
- access to the existing 330 kV electricity transmission network and adequate thermal capacity available for a project of the intended size.

UPC performed a preliminary assessment of the available land located within 5 km of TransGrid's 330 kV transmission line with an initial focus on a desktop assessment of the topography and easily identifiable constraints, such as patches of remnant vegetation and surface water features (eg creeks).

Alternatives to the project boundary were considered by UPC as part of the site identification process. The New England region was selected due to the fact that other regions with favourable characteristics for large-scale solar projects, such as the Riverina region of south-west NSW or areas around Wellington in central NSW, have already experienced a significant level of solar development with multiple approved projects and projects under construction. This increases the risks relating to grid connection and power evacuation compared with the New England region, where relatively limited large-scale solar development has taken place. Further, UPC also considered areas west of the New England Highway and north of the township of Uralla. Due to less favourable topography and high levels of remnant vegetation, these areas were considered to be less suitable than the project boundary for a large-scale solar development.

As noted in Section 1.2.3, the project investigation area was also the subject of planning and environmental constraints analyses, which identified the key risks and constraints to the project based on preliminary design considerations, the planning and assessment framework and the environment both within and surrounding the project investigation area. The results of these analyses informed the basis for subsequent surveys and assessment.

Subsequent biodiversity field surveys, preliminary Aboriginal cultural and historical heritage assessments and consultation with regulatory, industry and community stakeholders have further informed the site selection process, the result of which was selection of the site as defined in Figure 1.2.

As noted in Section 1.2.3, the project boundary encompasses a total area of 4,244 ha (Figure 1.2). In addition to the characteristics listed above, the site is considered favourable for the development of a solar PV power generation project for a number of reasons, including:

- the site is mostly flat with minimal slope across large sections of the three areas identified in Figure 1.2;
- the site has been modified by past disturbances associated with clearing, cropping and livestock grazing; and

- the site incorporates a mix of large-scale and small-scale farms from within the local community, with high potential for continuation of sheep grazing activities within the project boundary during the project's operations, as well as continuation of farming activities on land in between the three areas identified in Figure 1.2.

As noted in Section 1.2.3, the development footprint for the project is expected to encompass a total area of approximately 2,400 ha within the project boundary (Figure 1.2). The design and location of the development footprint and the project infrastructure within it will be refined on the basis of detailed grid connection studies, stakeholder engagement, environmental constraints identification, engineering assessment and financing considerations.

5 Stakeholder engagement

5.1 Background

Expectations from both regulators and community for meaningful stakeholder engagement have increased in recent years, and consultation requirements are likely to be a key feature of the SEARs for the project. Guideline 6 of the draft environmental impact assessment (EIA) guidance series, *Community and Stakeholder Engagement* (the guidelines) (DPE 2017a), describes how DPE expect proponents to engage with the community and other stakeholders during the EIA process for State significant projects. It emphasises the importance of earlier engagement, commencing during the scoping stage of a project, as well as improved participation throughout the EIA process.

Based on the level of detail provided within the guidelines, it appears that the outcomes of consultation during the scoping stage of a project would likely play a major role in defining the level of consultation required during the preparation of any future EIS. At a minimum, this would likely include the preparation of a Community and Stakeholder Engagement Plan (CSEP).

5.2 Stakeholder engagement strategy

As part of the scoping stage of the project, UPC has developed a stakeholder engagement strategy for the project. The stakeholder engagement strategy would form the basis of any such required CESP and will evolve as the project moves through the various stages of the EIA process. The stakeholder engagement strategy will be maintained as a dynamic document that responds to issues identified during the consultation process and will act as a record of consultation undertaken as part of the project.

The purpose of the stakeholder engagement strategy is to:

- identify stakeholders relevant to the project;
- describe the overall objective for consultation with each stakeholder (or stakeholder group);
- recommend timing, methods, and key matters to be discussed/resolved with each stakeholder; and
- consider the potential impacts on this strategy of the guidelines, which are part of the draft EIA guidance series being developed by DPE as part of the EIA improvement project, as well as the Draft Large-Scale Solar Energy Guideline (DPE 2017b) (Draft Solar Guideline).

The key messages to be addressed in all consultation for the project include:

- an overview of the project, including the preferred layout;
- an overview of key issues and proposed mitigation/management measures to address these issues;
- communicate the approval pathway and opportunities to provide feedback (ie consultation activities, direct feedback to project team via phone/email, submission during public exhibition);
- outline the regional and local benefits created by the project;
- seek feedback and identification of issues of concern for assessment in EIS; and
- identify opportunities for further consultation (as required).

5.3 Stakeholder identification

To identify the relevant community, regulatory and other stakeholders, the guidelines encourage proponents to consider the following questions:

- What is the nature of the project and the extent of its environmental impacts?
- Who will be interested in the outcomes of the project?
- Who may have information that could be of value to the project?
- Who is directly affected by the project or might think they are affected by the project, and in what way?
- Who is likely to be upset if they are not informed or invited to participate?
- Who might be a person that others will look to for their opinions?

The stakeholders identified to date for consultation, including overarching objectives for this consultation, are listed in Table 5.1.

Table 5.1 Stakeholder identification and consultation objectives

	Stakeholder	Consultation objectives
Regulatory	**NSW Government agencies**	Introduce the project, including the preferred layout and timeline. Address matters raised by each of the listed agencies in correspondence provided with the SEARs, as well as any other matters that arise during consultation.
	Department of Planning and Environment (DPE)	
	DPE Division of Resources and Geoscience (DRG)	
	Office of Environment and Heritage (OEH)	
	Environment Protection Authority (EPA)	
	Department of Primary Industries (DPI)	
	Roads and Maritime Services (RMS)	
	Northern Tablelands Local Land Services (LLS)	
	Department of Industry – Crown Lands and Water (CLAWD)	
	Forestry Corporation of NSW (Forestry NSW)	
	Commonwealth Government	
	Department of Environment and Energy (DoEE)	
	Local Government	
	Uralla Shire Council (Council)	
	Armidale Regional Council	

Table 5.1 Stakeholder identification and consultation objectives

	Stakeholder	Consultation objectives
Community	Project landholders	Introduce the project, including the preferred layout and timeline. Where relevant, request information about on-site agricultural operations (including historical and potential agricultural productivity); aerial spraying; weed and pest management practices; and bushfire protection management measures. Demonstrate avoidance of highly productive agricultural land parcels. Address any concerns about the project. Clearly define and illustrate the approval process.
	Adjoining landholders (ie non-project related receptors)	Introduce the project, including the preferred layout and timeline. Where relevant, request information about on-site agricultural operations; aerial spraying; weed and pest management practices; and bushfire protection management measures implemented on adjoining land. Provide an opportunity for stakeholders to raise any concerns about the project. Clearly define and illustrate the approval process. Outline regional and local benefits from the project. Present the findings of key technical assessments (eg traffic and visual) and discuss potential mitigation/management measures to address impacts (if required).
	Local community (including the townships of Uralla and Armidale)	Introduce the project, including the preferred layout and timeline. Clearly define and illustrate the approval process. Inform the general public about the appropriate avenues for input into the project. Determine whether there are any concerns about the project and, if so, address any concerns about the project. Outline the regional and local benefits from the project.
	Local businesses	Introduce the project, including the preferred layout and timeline. Clearly define and illustrate the approval process. Determine whether there are any concerns about the project and, if so, address any concerns about the project. Address enquiries about potential construction material requirements and employment opportunities.
	Local radio, television and newspaper	Introduce the project, including the preferred layout and timeline. Encourage media coverage of important project milestones. Invite attendance at community workshop and request advertisements be placed in relevant bulletins.
Aboriginal stakeholders	Registered Aboriginal parties (RAPs) Other Aboriginal stakeholders	Introduce the project, including the preferred layout, its need and the project timeline. Address any concerns about the project. Clearly define and illustrate the proposed Aboriginal cultural heritage assessment process and the proposed methodology.

Table 5.1 Stakeholder identification and consultation objectives

	Stakeholder	Consultation objectives
		Clearly define and illustrate the approval process. Provide an opportunity for RAPs and Aboriginal stakeholders to comment on the proposed methodology for the Aboriginal cultural heritage assessment and to raise any concerns about the potential impacts of the project on Aboriginal cultural heritage.
Industry and other stakeholders	NSW Rural Fire Service (RFS)	Introduce the project, including the preferred layout and project timeline. Clarify whether the project investigation area is on bushfire prone land and discuss suitable bushfire protection measures for the project.
	Civil Aviation Safety Authority (CASA)	Introduce the project, including the preferred layout and timeline. Clarify whether there is potential for the project to present a hazard to aviation. Obtain correspondence from CASA confirming absence of hazards associated with the project (if required).
	Fire & Rescue NSW	Introduce the project, including the preferred layout and project timeline. Determine whether there are any concerns about the project and, if so, address any concerns about the project.
	Mining/mineral exploration license holders	Introduce the project, including the preferred layout and project timeline. Determine whether there is any potential for cumulative impacts and/or conflicting land uses. Address any concerns about the project.
	Special interest groups (eg Zero Net Energy Town (Z-Net) and Regional Development Australia Northern Inland (RDANI)	Introduce the project, including the preferred layout and timeline. Clearly define and illustrate the approval process. Determine whether there are any concerns about the project and, if so, address any concerns about the project.
	Members of Parliament (including State and Federal Members and opposition)	Introduce the project, including the preferred layout and timeline. Clearly define and illustrate the approval process. Determine whether there are any concerns about the project and, if so, address any concerns about the project.
	NSW Renewable Energy Advocate (REA)	Introduce the project, including the preferred layout and timeline. Determine whether there are any concerns about the project and, if so, address any concerns about the project. Build support for the project and, where relevant, engage with the NSW REA to help resolve issues as they may arise.
	NSW Regional Clean Energy Team Leader	Introduce the project, including the preferred layout and timeline. Determine whether there are any concerns about the project and, if so, address any concerns about the project.

Table 5.1 Stakeholder identification and consultation objectives

Stakeholder	Consultation objectives
NSW Farmers Association	Introduce the project, including the preferred layout and timeline. Clearly define and illustrate the approval process. Determine whether there are any concerns about the project and, if so, address any concerns about the project.
Electricity network service providers (NSPs) (ie TransGrid and Essential Energy)	Introduce the project, including the preferred layout and timeline. Determine whether there are any concerns about the project and its interactions with existing infrastructure and easements and, if so, address any concerns. Note: Grid and connection-related matters will be addressed separate to this strategy by UPC.
University of New England (UNE)	Project introduction and assessment pathway. Potential concerns about the project. Potential opportunities for ongoing involvement in the project.
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Project introduction and assessment pathway. Potential concerns about the project. Potential opportunities for ongoing involvement in the project.
Transport for NSW (TfNSW)	Project introduction and assessment pathway. Potential concerns about the project. Interactions with level crossings on Barleyfields Road, Gostwyck Road and Thunderbolts Way and potential upgrade requirements.
Armidale Business Chamber	Project introduction and assessment pathway. Potential concerns about the project. Potential opportunities for ongoing involvement in the project.

Aboriginal stakeholders will need to be identified and consulted in accordance with OEH's *Aboriginal Cultural Heritage Consultation* R*equirements for Proponents* (DECCW 2010). Consultation with Aboriginal stakeholders will be managed as part of a separate consultation strategy in conjunction with a detailed Aboriginal Cultural Heritage Assessment (ACHA) for the project.

5.4 Stakeholder engagement outcomes

As part of project scoping and during the preparation of this report, UPC has engaged with Council, DPE, OEH, DPI, the NSW REA, the Honourable Adam Marshall (Member for Northern Tablelands) and representatives of the Uralla Zero-Net ('Z-Net') programme. In addition, UPC has engaged with a number of adjoining landholders within close proximity to the project investigation area to introduce the project, discuss the assessment pathway and, where relevant, discuss each stakeholder's preliminary concerns about the project.

As part of preliminary discussions with Council, Council suggested that UPC engage with the community, including community-led initiatives such as Z-Net, to explore options for a community-focused energy project. UPC has engaged in preliminary discussions with Z-Net and is currently investigating a number of different options and will continue to progress their investigations alongside the preparation of the EIS and the detailed design of the project.

Outcomes of these preliminary engagement activities, as well as, ongoing consultation during the preparation of the EIS will be outlined in the EIS and relevant technical studies.

6 Preliminary environmental impact assessment

6.1 Issues identification

An initial review of environmental constraints has been undertaken to identify the issues that require detailed consideration as part of the project design process and technical studies supporting the EIS for the project.

6.2 Biodiversity

6.2.1 Existing environment

The site is within the New England Tableland IBRA bioregion, which covers an area of more than 3,000,000 ha. The majority of the site is within the Armidale Plateau subregion, which is characterised by a gently undulating to hilly plateau at an elevation of approximately 1,100 m. A broad scale assessment of vegetation in NSW by Morgan and Terrey (1992) indicates that the following vegetation communities occur within the Armidale Plateau subregion:

- open Ribbon Gum forest and woodland with Snow Gum and Black Sallee on basalt;
- Yellow box, Blakely's Red gum, Rough-barked Apple, Apple box on sedimentary rocks;
- Silver-top Stringybark, New England Stringybark on dry aspects;
- Blakely's Red Gum, Yellow Box and Apple Box on moist, well-drained slopes; and
- New England Peppermint with ribbon gum on flats.

A preliminary desktop environmental constraints analysis across the project investigation area was performed in 2017 and included a review of regional vegetation mapping and biodiversity database searches, including OEH's *Atlas of NSW Wildlife* and DoEE's *Protected Matters Search Tool* (PMST). Regional vegetation mapping within the project investigation area identified a total of 1,153 ha of native vegetation (ie approximately 10% of the project investigation area), which is indicative of the predominantly cleared nature of the landscape. As part of the constraints analysis, native vegetation likely to represent White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland, a critically endangered ecological community (CEEC), listed under the BC Act and EPBC Act, was identified as potentially occurring within the project boundary.

Preliminary field surveys were completed by EMM in January and March 2018. The purpose of these field surveys was to undertake preliminary mapping and classification of vegetation to PCT with a focus on the northern, central and southern areas; along with a high-level assessment of threatened species habitat within the project investigation area. In addition, a number of plots were completed in accordance with the BAM. The results of the preliminary field surveys have also been used to inform ongoing project design, landholder consultation and to facilitate preliminary consultation with DPE and OEH with regards to environmental constraints and likely biodiversity assessment requirements. Additional field surveys will be undertaken during the preparation of the BDAR and EIS and will be consistent with the SEARs issued for the project.

Five PCTs were recorded during the preliminary field surveys, which focused on areas within the northern, central and southern areas of the site (Figure 6.1). The PCTs were found to be in different condition states, with some occurring as woodlands with an exotic understorey, while others were derived native grassland utilised for native pasture. The majority of the native pasture within the site is highly modified with varying degrees of improvement including; seeding of pasture species, ploughing and the addition of fertiliser. One woodland PCT (996), occurred both as a naturally occurring form and as planted native windbreaks.

The PCTs recorded as part of the preliminary field surveys included:

- PCT 507 Black Sallee – Snow Gum grassy woodland of the New England Tableland Bioregion (planted windbreaks);
- PCT 510 Blakely's Red Gum – Yellow Box grassy woodland of the New England Tableland Bioregion (remnant vegetation and derived grasslands);
- PCT 997 New England Stringybarks – Peppermint open forest of the New England Tableland Bioregion (planted windbreaks);
- PCT 1174 – Silvertop Stringybark open forest of the New England Tableland Bioregion (remnant forest); and
- PCT 1200 – Snow Gum woodland of the New England Tableland Bioregion and NSW North Coast Bioregion (remnant woodland).

Both PCT 507 and PCT 1200 are likely to meet the scientific determination for Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion Endangered Ecological Community (EEC). Both communities do not represent high quality examples of the listed community, given that PCT 507 occurs as planted windbreaks and PCT 1200 occurs in discrete disturbed patches. Nevertheless this does not preclude them from meeting the EEC listing.

PCT 510 meets the scientific determination for the White Box Yellow Box Blakely's Red Gum Woodland EEC. This occurs in two forms; remnant trees with a modified groundcover of exotic and native pasture species, or as derived native grassland used for native pasture. Both occur in a modified state with reduced species diversity; however they still meet the listing for the EEC.

None of the areas mapped as PCT 510 meet the EPBC listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC owing to the low diversity of groundcover species.

To date, none of the vegetation types meet PCT 996 New England Peppermint Snow Gum grassy woodland on granitic substrates of the New England Tableland Bioregion.

One threatened fauna species, the Dusky Woodswallow (*Artamus cyanopterus*), was recorded in the site as part of the preliminary field surveys. The Dusky Woodswallow is listed as a vulnerable species under the BC Act.

The following 'species credit species' could occur within the project boundary:

- Bluegrass (*Dichanthium setosum*);
- Northern Blue Box (*Eucalyptus magnificata*);

- Narrow-leaved Black Peppermint (*Eucalyptus nicholii*);
- Glossy Black-Cockatoo (potential breeding habitat) (*Calyptorhynchus lathami*);
- Regent Honeyeater (*Anthochaera phrygia*); and
- Koala (breeding only) (*Phascolarctos cinereus*).

However, based on the preliminary assessment of habitat performed as part of the constraints analysis and field surveys, much of the site is unlikely to provide suitable habitat for these species given its predominantly cleared nature. The most likely species to occur is the Narrow-leaved Black Peppermint, which will be subject to targeted survey during the preparation of the BDAR and EIS.

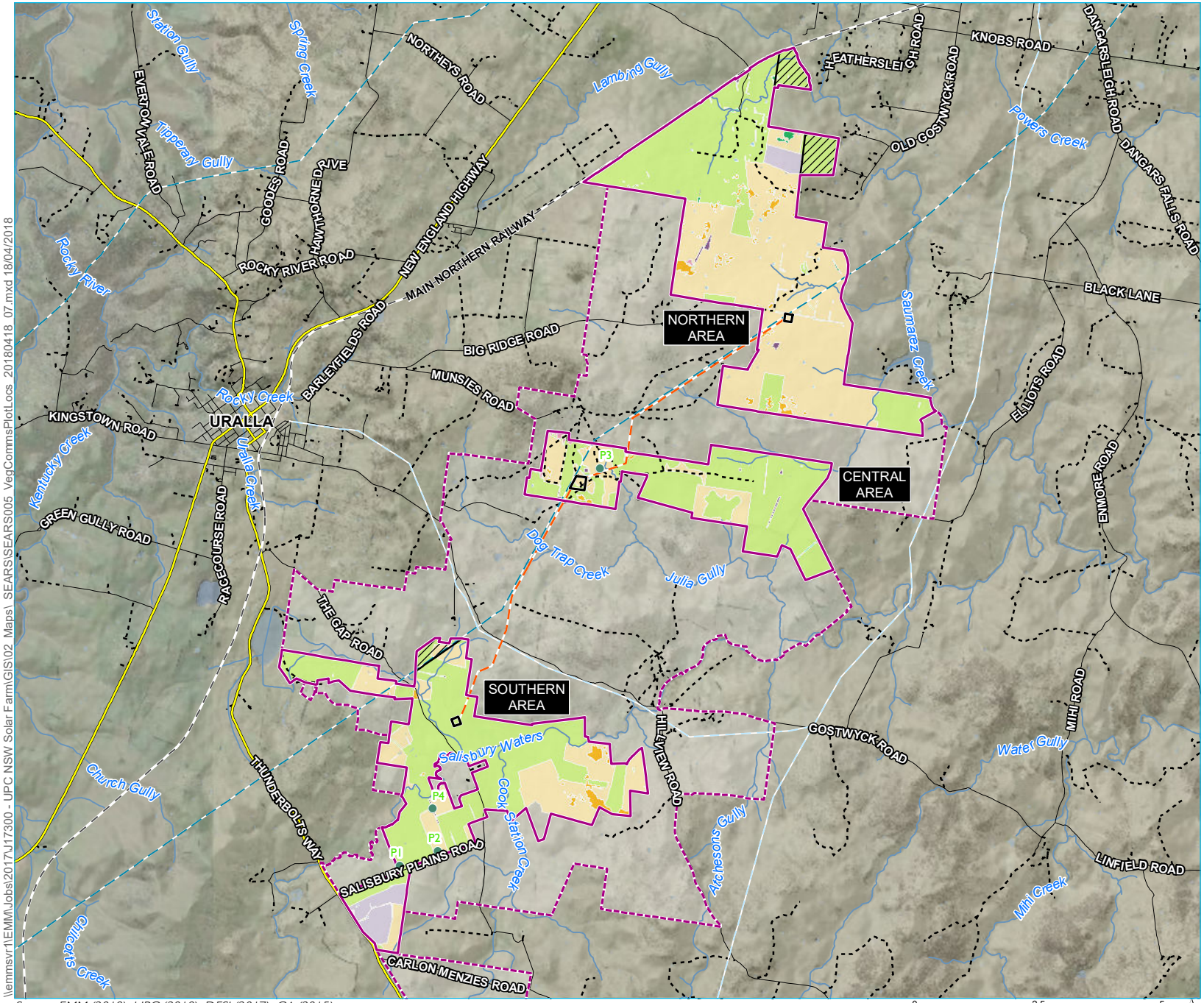
6.2.2 Assessment approach

To date, biodiversity assessments within the project investigation area have focussed on preliminary mapping and classification of vegetation to PCT, along with a high-level assessment of threatened species habitat. The EIS will include an assessment of the biodiversity values and the likely biodiversity impacts of the project, a detailed description of the proposed regime for minimising, managing and reporting on the biodiversity impacts of the project over time, and a strategy to offset any residual impacts of the project in accordance with the BC Act and the BAM.

Representatives from EMM and UPC have consulted with OEH's North East Branch to discuss the key outcomes of the preliminary field surveys and to confirm the scope of detailed field surveys in advance of receiving the biodiversity-related SEARs. In addition, clarification was sought on a number of matters including offsetting requirements for impacts on planted windbreaks. The project team will continue to engage with OEH throughout the preparation of the BDAR and EIS.

The EIS and BDAR will include constraints mapping to demonstrate the biodiversity values on land within the project boundary and will demonstrate how impacts to biodiversity have been avoided, mitigated and, if required, offset.

Substantial work has already been undertaken to avoid and minimise impacts to biodiversity, largely by restricting the site to cleared areas of lower quality within the project investigation area and avoiding impacts to identified threatened ecological communities (TECs).



KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary array connection
- Preliminary substation sites
- Plot location

Plant community type

- PCT 1174 Silvertop Stringybark - Open forest of the New England Tableland Bioregion
- PCT 1200 Snow Gum - Woodland of the New England Tableland Bioregion and NSW North Coast Bioregion
- PCT 507 Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion
- PCT 510 Blakely's Red Gum – Yellow Box grassy woodland of the New England Tableland Bioregion
- PCT 510 Blakely's Red Gum – Yellow Box grassy woodland of the New England Tableland Bioregion (Derived native grassland)
- PCT 997 New England stringybark - Peppermint open forest of the New England Tableland Bioregion
- Exotic - cropping
- Exotic - grassland
- Exotic - trees
- Scattered native trees
- Dam
- 66kV transmission line
- 330kV transmission line
- Rail line
- Main road
- Local road
- Vehicular track
- Watercourse / drainage line
- Waterbody

Vegetation communities identified within the site and surrounds

New England Solar Farm
Request for SEARs
Figure 6.1

EMM

Source: EMM (2018); UPC (2018); DFSI (2017); GA (2015)

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

0 2.5 5 km

GDA 1994 MGA Zone 56

N

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6.3 Aboriginal cultural heritage

6.3.1 Existing environment

i Overview

The predominant Aboriginal language group within the New England Tablelands IBRA bioregion and, more specifically, the Armidale and Uralla Shire LGAs is the Anaiwan (USC 2018b; OEH 2016). Aboriginal people used, and continue to use, this landscape as both a natural and cultural resource.

As noted within the *Northern Inland Regional Plan 2016-2019* (RDANI 2016a), one of the key social and cultural features of the NI region is a strong connection to land, with a large Aboriginal population of approximately 9%, which is significantly greater than the NSW and Commonwealth average of 2.5%.

Oral histories of the region show that local Aboriginal communities moved seasonally between the coastal plains and the New England Tablelands bioregion, with a range of sites, including carved trees, ceremonial bora grounds and art sites demonstrating the spiritual attachment of the traditional owners to the region's landscape (OEH 2016a).

The site is within the boundary of the Moombahlene Local Aboriginal Land Council (LALC), which falls within the Northern LALC of NSW.

A search of the NSW Native TitleVision website indicates that no determined or registered native title claim or Indigenous Land Use Agreement (ILUAs) exists over the site. The nearest registered native title claim starts approximately 13 km to the west (Gomeroi People, Tribunal No NC2011/006).

As part of the constraints analysis and preliminary project refinement work, the landscape context of the project investigation area has been reviewed to identify archaeologically sensitive landscape features. The landform pattern within and surrounding the project investigation area can generally be described as low rolling hills that are frequently dissected by drainage networks and their adjacent flood plains, terraces and foot slopes.

The most likely Aboriginal sites to occur within the project boundary would be stone artefact sites and grinding grooves, likely to be concentrated within close proximity of watercourses. Perennial watercourses, such as Salisbury Waters, are likely to have higher archaeological sensitivity. Stone artefact sites or stone quarries may occur on prominent crests or ridges where outcropping stone occurs, and Aboriginal scarred or carved trees may occur in areas of remnant native vegetation where mature trees exist.

ii Archaeological material within the project investigation area

A desktop review of the project investigation area and surrounds suggests that the area is likely to have been used by Aboriginal people, particularly given the location of Salisbury Waters, which flows through the southern area (Figure 6.2).

A search of the Aboriginal Heritage Information Management System (AHIMS) register has identified 36 Aboriginal sites within an approximate 25 km x 25 km area that includes the project investigation area in its centre. A number of Aboriginal site types have been recorded in the region, with the most common type stone artefact scatters (n=19). The remaining sites make up lower frequencies and include stone quarries, modified trees, grinding grooves, a rock shelter and a Bora Ring. These AHIMS sites are shown in Figure 6.2.

Two sites have been registered in the project investigation area, namely a scar tree (AHIMS #21-4-0046), in the south of the southern area and a ceremonial ring (AHIMS #21-4-002) south of the southern area (Figure 6.2). The recorded locations for these two sites were re-visited by appropriately qualified EMM archaeologists as part of the preliminary project refinement work performed in February 2018 in order to verify both their location and their status. Cultural sensitivities were observed during the inspection of the recorded location for the ceremonial ring (AHIMS #21-4-002). Neither AHIMS site was re-located during the fieldwork. It is likely that the ceremonial ring (AHIMS #21-4-002) has been destroyed by farming activity. The original coordinates for the scar tree (AHIMS #21-4-0046) were incorrectly recorded on the AHIMS site card. The site is located approximately 500 m south of Big Ridge Road on Lot 1 of DP 1015933, north-west of the central area and outside of the project investigation area. However, there is still potential for a scar tree at this location. Detailed field surveys with the RAPs will inspect suitable trees for cultural modifications.

As part of the preliminary project refinement work performed in February 2018, a number of sites possessing potential for the presence of Aboriginal cultural heritage objects and/or places were also inspected. This included two areas on elevated ground within the central and southern areas of the site and one area along Salisbury Waters (Figure 6.2). No artefacts/objects of Aboriginal cultural heritage interest were identified on the ground surface at these sites.

6.3.2 Assessment approach

Although artefacts themselves were not identified as part of the preliminary project refinement work, there is potential for the landscape within the project boundary to support a range of site types, including but not limited to stone artefact sites, grinding grooves and Aboriginal scarred or carved trees.

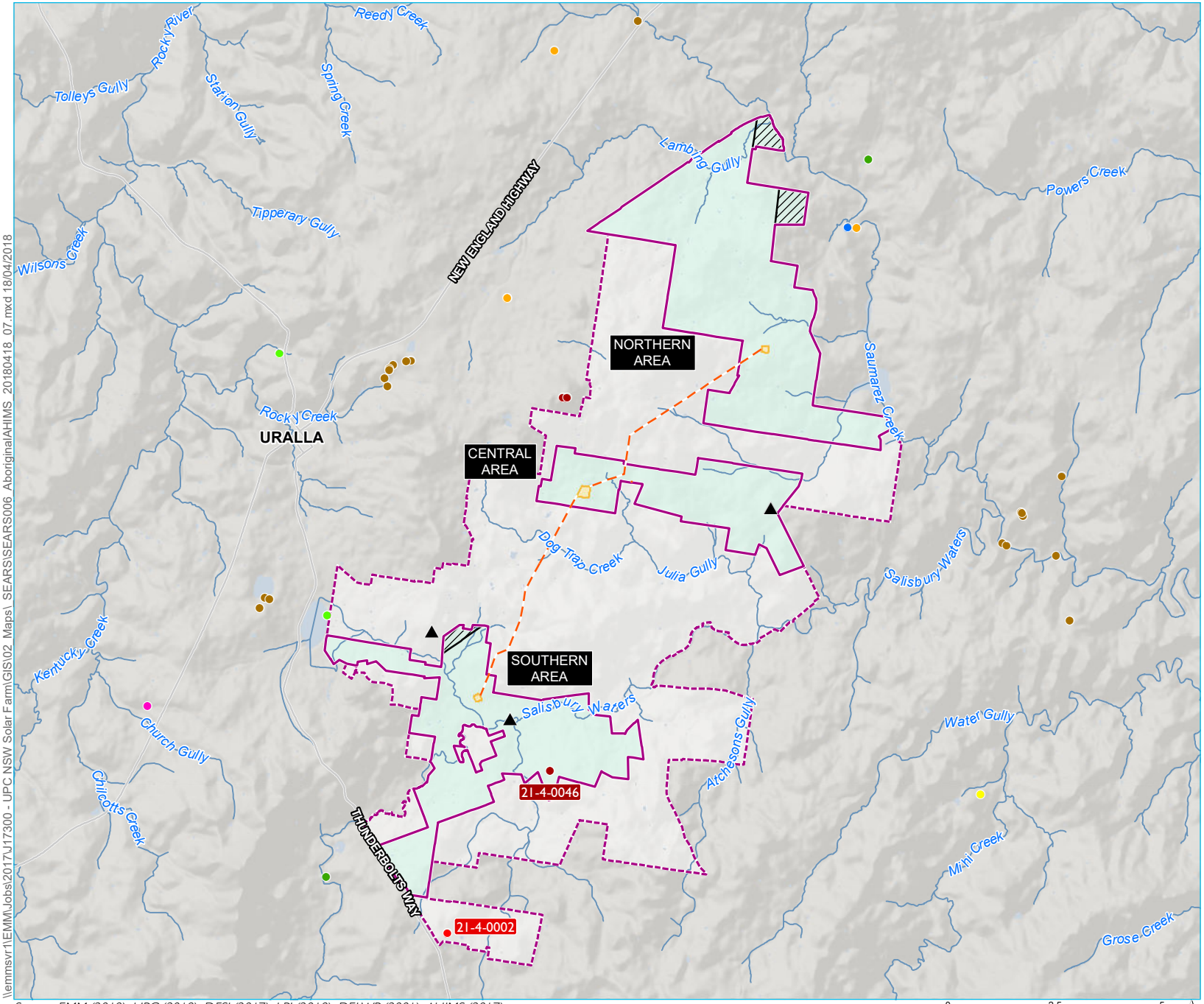
The ACHA will be guided by the following best practice documents, acknowledging that some of the requirements cannot be met because an Aboriginal heritage impact permit (AHIP) does not apply to SSD:

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010); and
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

The following will be undertaken as part of the ACHA:

- review of OEH databases (including those for historical sites) and any relevant literature;
- field survey of the site to identify places or items of Aboriginal cultural heritage significance;
- an assessment of Aboriginal cultural heritage items or places identified during the field survey;
- a cultural assessment to investigate whether there are any living cultural knowledge holders who may have cultural knowledge relevant to the assessment;
- consultation with Aboriginal stakeholders with guidance from the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010); and
- development of measures to avoid and mitigate potential impacts for Aboriginal cultural heritage, as required.

In addition, the ceremonial ring (AHIMS #21-4-002) will be the subject of consultation with Aboriginal stakeholders and more detailed research to determine whether it is possible that the location of this site has been incorrectly recorded within the AHIMS database.



KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary array connection
- Preliminary substation sites
- Additional sites visited during preliminary field survey

AHIMS sites

- Bora Ring, ceremonial ring
- Grinding grooves
- Modified tree (carved or scarred)
- PAD
- Rock shelter with deposit
- Scarred tree
- Stone artefact site
- Stone quarry with artefacts
- Water hole with artefacts

- Main road
- Watercourse / drainage line
- Waterbody

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

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Source: EMM (2018); UPC (2018); DFSI (2017); LPI (2018); DELWP (2001); AHIMS (2017)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

AHIMS sites and preliminary field survey

New England Solar Farm
Request for SEARs
Figure 6.2

EMM

6.4 Historic heritage

6.4.1 Existing environment

i Overview

Historical records indicate that European exploration and settlement of the New England Tablelands bioregion, and more specifically, the Uralla Shire LGA, commenced in the early 19th Century (USC 2018a; OEH 2016a). In 1827, Allan Cunningham described the landscape as "...lightly-timbered, at times very open country..." with "...patches of plain, drought stricken but well grassed..." (USC 2018a).

Early European exploration in the region was generally carried out by pastoralists in search of land suitable for grazing. By the 1850s, Armidale had become the central administrative town of the region with a population of more than 500. By 1861, the population had grown to 4,200 making it the capital of the New England region (OEH 2016a).

ii Historic heritage items within the project investigation area

As part of the constraints analysis and preliminary project refinement work, background research of the project investigation area and surrounds has been undertaken. In addition, a preliminary field survey was undertaken, which focused on areas north and east of the southern area and south of the central area (Figure 6.3). These areas were selected because of the presence of two heritage items on the Uralla LEP.

Schedule 5 of the Uralla LEP lists a number of heritage items within the Uralla Shire LGA, including two items within the broader project investigation area, namely Gostwyck Memorial Chapel and Precinct (Uralla LEP listing I10) and Deeargee Woolshed (Uralla LEP listing I11) (refer Figure 6.33).

a. Gostwyck Memorial Chapel and Precinct

The property description for Gostwyck Memorial Chapel and Precinct within the Uralla LEP is listed as Lot 1 of DP 227322 and subsequently, the polygon provided in Figure 6.3 makes up the listing. Both the central and southern areas of the site overlap Lot 1 of DP 227322 (Figure 6.3).

Gostwyck Station encompasses a total area of approximately 2,626 ha, which includes the Gostwyck Memorial Chapel and Precinct, along with the Gostwyck homestead and cottages. The Gostwyck Memorial Chapel was built in 1921, in honour of Major Clive Dangar, who served in World War I, by his widow Ashley Clarendon Cox. It is constructed of bricks made on the historical Gostwyck Station; the brick-making area is now encompassed by the neighbouring Deeargee Station.

Gostwyck Memorial Chapel and Precinct is recognised as a place of local environmental heritage significance within the Uralla LEP. One of the objectives of the Uralla LEP is:

> to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views.

Potential views to the project infrastructure from Gostwyck Memorial Chapel and Precinct and, more generally, from Gostwyck Station will be investigated as part of the visual impact assessment; however, it is anticipated that the majority of views will be screened by existing vegetation and undulation within the landscape. Further, the distance to the southern and central areas of the site from Gostwyck Memorial Chapel and Precinct, along with the relatively low height of the project's infrastructure will limit the potential for any views from this location.

It is anticipated that the results of the viewshed analysis performed as part of the visual impact assessment will be used to inform the detailed design of the project infrastructure layout on Gostwyck Station. Where residual visual impacts are unavoidable, mitigation measures such as landscaping (ie vegetation screens) may be required.

b. Deeargee Woolshed

The property description for Deeargee Woolshed within the Uralla LEP is listed as Lot 3 of DP 1122757 and subsequently, the polygon provided in Figure 6.3 makes up the listing. Lot 3 of DP 1122757 is within the project investigation area; however, there is no overlap with the site (Figure 6.3).

Deeargee Station was originally part of Gostwyck Station. In 1969, Gostwyck was divided along Salisbury Waters; the historic woolshed on the east side became Deeargee and Gostwyck Station retained the homestead on the west bank of Salisbury Waters. Deeargee Woolshed was built in 1851, before it burnt down and was subsequently rebuilt by Alexander Mitchell in 1868. There are conflicting reports regarding the subsequent works on Deeargee Woolshed; but it is clear that further works continued into the early 1900s. The unique structure allows the maximum amount of light possible while being well ventilated. Along with Deeargee Woolshed, Deeargee Station held a homestead and four huts.

c. Conclusion

The preliminary field survey and documentary research undertaken as part of the project refinement work identified the most significant elements of the Gostwyck Station are those that are defined by the Gostwyck Memorial Chapel and Precinct (refer Figure 6.3), which is unlikely to be affected negatively by the project as both the undulating topography and remnant vegetation within the surrounding area would act as a visual screen, limiting views of project infrastructure from this location.

The remainder of Gostwyck Station has value as the surviving component of an early squatters run and residence, then as an early grant in the New England region. These values are demonstrated by the views, vistas and setting of Gostwyck Station, the established exotic and native plantings and, significantly, the continued use of the property as a pastoral enterprise. Similarly, Deeargee Station beyond the heritage listing (ie Lot 3 of DP 1122757) has heritage value, as it was part of the original Gostwyck Station holding. However, the heritage curtilage of Deeargee Station will not be physically affected by the project.

Archaeological sites and other areas of heritage value may be scattered across the site because of the early use of the New England region by squatters and the subsequent colonial alienation of the land for grants.

6.4.2 Assessment approach

The potential impact of project infrastructure within the project boundary on heritage values will require further detailed assessment. This will need to include further research and assessment of a range of values such as significant cultural landscapes, views and vistas across the pastures that may be impacted.

A heritage assessment and statement of heritage impact (SoHI) will be prepared for the project; with a focus on those areas that will be affected by the installation of project infrastructure. The heritage assessment and the SoHI will be guided by the following best practice documents:

- *Burra Charter* (Australia International Council on Monuments and Sites (ICOMOS) 2013);
- *Assessing Heritage Significance* (Heritage Office 2001);

- *Assessing Significance for Historical Archaeological sites and Relics* (Heritage Branch Department of Planning 2009);
- *Statement of Heritage Impact* (Heritage Office 2006);
- *Investigating Heritage Significance* (Heritage Office 2004); and
- any other guideline relevant to assessing significance and impacts.

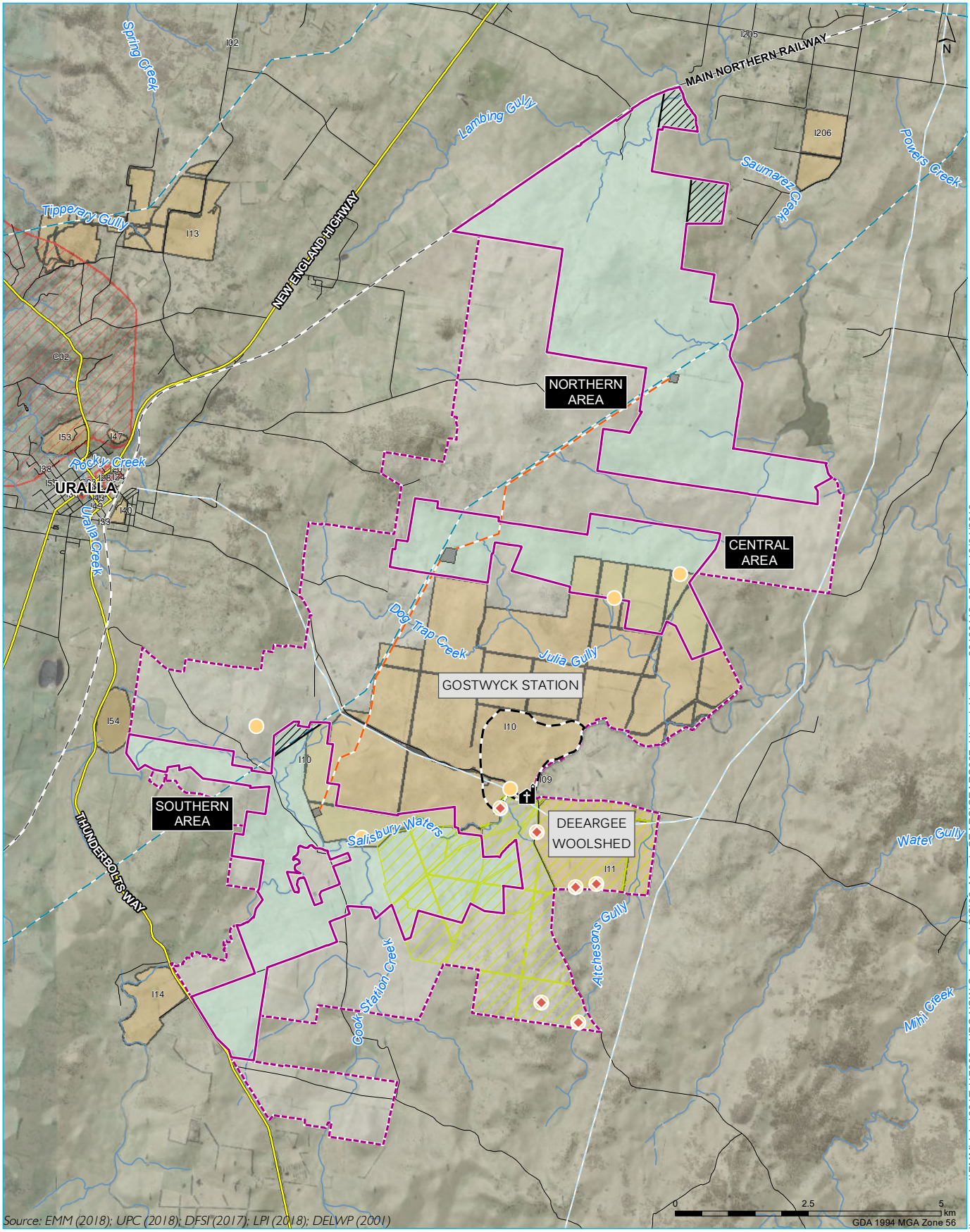
Based on the outcomes of the preliminary project refinement work, the assessment approach that will be undertaken as part of the heritage assessment and SoHI will include:

- detailed assessment of the project investigation area and field survey of the site to ensure that unrecorded sites are not inadvertently impacted;
- ongoing research using documentary sources to understand the history of the project investigation area with a focus on Gostwyck Station and Deeargee Station as these areas are considered representative of the original pastoral runs in New England region;
- assess the significance of the landscape with regard to topography, water sources such as springs, mature trees forming wind breaks, property boundaries and avenues, with particular attention on exotic plantings and species palette;
- engagement with Council, DPE and OEH Heritage Division, as required, to gain a better understanding of regulator expectations regarding potential impacts to known items of local heritage significance; and
- if possible, an interview with the landowners of Gostwyck Station, as this may provide information on early historical sites on the property.

The heritage assessment and SoHI prepared as part of the EIS will include:

- a summary of the existing environment and background research;
- a historical summary of the region and the site;
- a comparative analysis of like-sites to assist with the identification of significance, rarity, representativeness and archaeological potential;
- an analysis of the cultural landscape of the site;
- an assessment of cultural significance of the site;
- an assessment of heritage impacts associated with the project; and
- mitigation and management measures to avoid potential impacts to known items of heritage significance.

If relics, or potential relics, are identified during the assessment process that cannot be avoided by the project, archaeological test excavation may be necessary to establish the integrity and significance (or simply the existence) of the site. The information gathered from the archaeological test excavation would assist with decisions around the approval of the project. Archaeological test excavation may not be required and this step will be determined during the assessment process.



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KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary substation sites
- Preliminary array connection
- 66kV transmission line
- 330kV transmission line
- Preliminary array connection
- Rail line
- Main road
- Local road
- Watercourse / drainage line
- Potential heritage item
- Inspection area

Schedule 5 LEP (EP&A Act 1979)

- Item - General
- Conservation Area - General
- Chapel
- Gostwyck Memorial Chapel Precinct
- Deeargee Station

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Uralla LEP listings and preliminary field survey

New England Solar Farm
Request for SEARs
Figure 6.3

EMM

6.5 Land use

6.5.1 Existing environment

The project is within the Uralla Shire LGA, which covers an area of 3,215 km^2 in the inner north-east region of NSW. The Uralla Shire LGA is one of twelve LGAs in the New England North West region of NSW, which is one of Australia's most productive agricultural areas, with a significant share of the State's beef, cotton, sorghum and tomato production (NSW Government 2017). Cattle and sheep grazing for wool, breeding stock and meat dominate agricultural activities within the site and its immediate surrounds.

Within the New England Tableland bioregion, there are a number of subregions. The majority of the project investigation area is within the Armidale Plateau subregion. Soil types within this subregion are variable and include texture contrast soils on sedimentary rocks and granite, mellow and well drained on upper slopes, harsh and poorly drained on lower slopes, variable stony loams to deep black earths in valley floors on basalt and deep, dark loamy alluvium in swampy valleys (Morgan and Terrey 1992). A number of different soil landscapes are present within the project investigation area, including:

- Niangala Plateau and slopes;
- Moonbi – Walcha Granites; and
- Uralla Basalts and Sands.

Land and Soil Capability (LSC) mapping for NSW uses eight key soil and landscape limitations to assess the capability of land according to an eight class system. The LSC classification across the project investigation area is variable and includes a combination of LSC classes 3, 4, 5 and 6. LSC Class 3 land is recognised as having moderate limitations and is capable of sustaining high impact land uses (OEH 2013). Contrastingly, LSC Class 6 land is recognised as having very severe limitations and is incapable of sustaining many land use practices (OEH 2013).

As noted in Section 1.2.3, parts of the site are mapped as BSAL as defined by the Strategic Agricultural Land Map – New England North West regional mapping presented in the Mining SEPP (refer Figure 6.4). A total of 2.8 million ha of BSAL has been identified and mapped at a regional scale across NSW and includes land capable of sustaining high levels of productivity (NSW Government 2012).

The majority of the site has been modified by historical land use practices and past disturbances associated with land clearing, cropping and livestock grazing, and is currently used for livestock grazing. The land in between the three areas of the site will continue to be used as agricultural land. In addition, UPC is currently in discussions with a number of the landholders to enable sheep grazing to resume on portions of the development footprint following the completion of construction.

The site is zoned RU1 Primary Production under the Uralla LEP (refer Figure 1.4). Based on the current indicative design, no subdivision is proposed on the lots within the project boundary.

No mineral tenements within the project boundary were identified in a search of the DPE – Resources and Geoscience DiGS database. The closest mineral tenements are exploration licenses (ELs) issued under the NSW *Mining Act 1992*, including:

- EL6918 held by Kokong Holdings Pty Ltd, north of the township of Uralla, approximately 3 km north- west of the project investigation area at its closest point (Figure 6.4); and

- EL6483 held by Biacil Holdings Pty Ltd., west of the township of Uralla, approximately 2.4 km west of the project investigation area at its closest point (Figure 6.4).

Oxley Wild Rivers National Park is approximately 20 km east of the site at its closest point and covers approximately 1,452 km^2.

6.5.2 Assessment approach

The project will result in a change to the current land use within the site, being agriculture, to electricity generation. However, the majority of project landholders currently intend to continue with farming activities when the project proceeds, as the land area to be occupied by project infrastructure only accounts for a portion of their landholdings. Further, as noted in Section 6.5.1, UPC is currently in discussions with a number of the landholders to enable sheep grazing to resume on portions of the development footprint following the completion of construction (ie during the operations phase). At the end of the project's operational life, project infrastructure will be decommissioned and the development footprint can be returned to its pre-existing condition suitable for agricultural land use. Specific requirements on individual land parcels will be subject to consultation with the individual landholders.

As noted in Section 2.1.2, the project encourages sustainable primary industry production as it involves harnessing a natural resource, namely solar energy. It is acknowledged that the development of the project will reduce the utilisation of the site for agricultural production; however, this impact will be mitigated by a number of factors, including:

- Choice of PV module technology – the anticipated use of single axis tracking PV modules involves a typical row spacing of 5-8 m, which would result in a significant area of land within the project's development footprint that could still be utilised for sheep grazing during the operations phase of the project.

- Site selection – the three areas of the site have been strategically placed so that primary production can continue within the immediate surrounds and to reduce potential impacts on the use of neighbouring farm lands for primary production purposes.

- Drought-proofing – a number of the landholders involved in the project will benefit from the rental income stream and this will help hedge against price risks in the markets for their agricultural outputs (beef prices, wool prices, etc) - commonly referred to as 'drought-proofing'.

- Return to agricultural land – the site can be returned to agricultural land use at the completion of the project's operations phase.

As noted within Section 3.3, it is anticipated that the area within the project boundary on which project infrastructure will be installed will only require minimal site preparation and civil works such as grading/levelling and compaction.

At the completion of site establishment works, actual surface disturbance within the project boundary will be limited to the installation of the mounting frames to support the PV modules and the installation of the underground MV cable reticulation network. Therefore, the integrity of the LSC within the project boundary throughout the project's operations is expected to be retained. Further, appropriate land management practices will also be implemented within the project boundary during the construction and operational phases of the project.

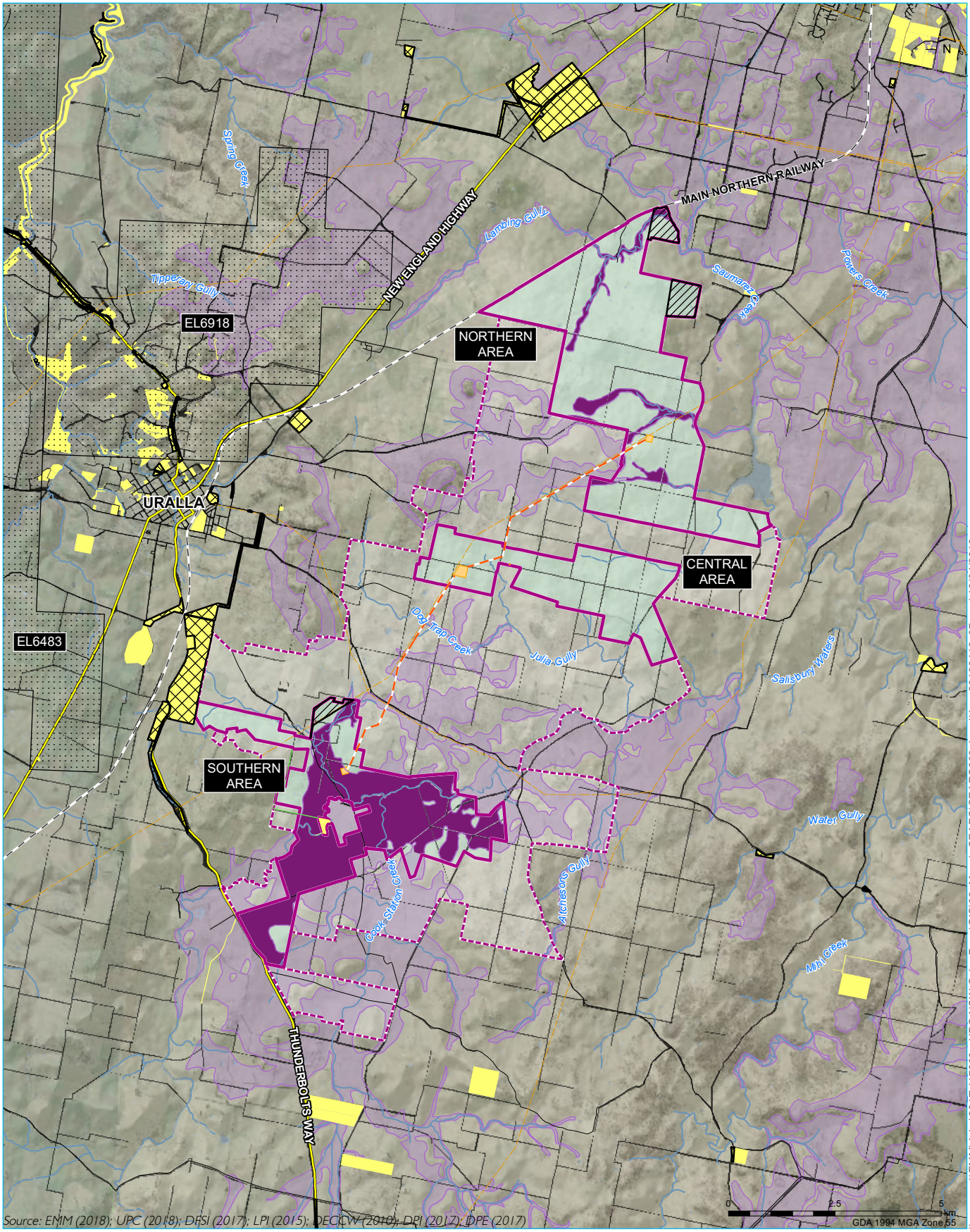
In order to establish the relevant LSC, a desktop baseline assessment will be undertaken as part of the EIS. In addition, an assessment of the potential impact of the project on agricultural land identified as BSAL will also be included in the EIS.

As outlined in Section 5.4, UPC has engaged with DPI during project scoping and preparation of this report, and will continue to engage with DPI as part of ongoing stakeholder engagement to clarify potential issues around the site and its potential impacts on agricultural land, which will inform the assessment and impact justification approach adopted as part of the EIS. As part of this early engagement, advanced advice on what will most likely be the main issues requiring consideration as part of the EIS has been provided, which included consideration of the project's impacts on agricultural productivity practices and existing land uses on adjacent land, as well as commitments to prepare an erosion and sediment control plan and site decommissioning plan.

A total of 13,992 ha of land within the Uralla Shire LGA has been mapped as BSAL, which represents approximately 4% of the total land area within the Uralla Shire LGA. Approximately 1,100 ha of BSAL is mapped within the project boundary, which is in the order of 8% of the total land area mapped as BSAL within the Uralla Shire LGA.

The site represents approximately 0.75% of the total land area within the Uralla Shire LGA. The utilisation of agricultural land by the project will only result in a temporary negligible reduction in the overall agricultural productivity of the Uralla Shire LGA and the New England North West region. Further, as noted in Section 6.5.1, land in between the three areas of the site will continue to be used as agricultural land.

The project's stakeholder engagement strategy (refer Section 5.2) encourages initiation and maintenance of open lines of communication with members of the local community for the duration of the project. Additionally, UPC will continue to engage with Council and DPI to identify potential impacts and develop appropriate mitigation measures to address local land use concerns. The project consultation log and EIS will incorporate any stakeholder engagement activities around land use and include discussions of the feedback received and actions taken to incorporate the feedback into the project design.



Source: EMM (2018); UPC (2018); DFSI (2017); LPI (2015); DECCW (2010); DPI (2017); DPE (2017)

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KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary substation sites
- Preliminary array connection
- Electricity transmission line
- Rail line
- Main road
- Local road
- Watercourse / drainage line
- Travelling stock reserve
- Exploration lease boundary
- Crown land
- Freehold easement
- Road corridor
- Strategic agricultural land - Biophysical
- Strategic agricultural land – Biophysical – within site boundary
- Waterbody

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Land use

New England Solar Farm
Request for SEARs
Figure 6.4

EMM

6.6 Water resources

6.6.1 Existing environment

The site falls within the New England Tablelands IBRA bioregion and encompasses parts of the MacIntyre, Clarence, Gwydir, Macleay, Namoi and Manning River catchments (OEH 2016a). The site is part of the Macleay catchment, which covers an area of 11,450 km^2 and includes extensive areas of the northern tablelands, a sparsely populated escarpment area and a coastal area ranging from foothills to coastal plains (NSW Government n.d.).

The Macleay River rises in the Northern Tablelands east of the project investigation area at the confluence of the Gara River, Salisbury Waters and Bakers Creek, and flows south-east through a coastal floodplain, where it meets the Pacific Ocean. The landform pattern within and surrounding the site can be described as low rolling hills that are frequently dissected by drainage networks and their adjacent flood plains, terraces and foot slopes. Perennial watercourses within the project investigation area include:

- Salisbury Waters and Cook Station Creek (6th and 5th order streams, respectively) that intersect the southern area of the site (Figure 6.5); and
- Dog Trap Creek and Julia Gully (both 4^{th} order streams) that traverse the project investigation area south of the central area of the site (Figure 1.26.5).

The site is outside of the Council flood planning area as mapped under the Uralla LEP. As part of the environmental constraints analysis process performed to date, the alignment of watercourses shown in Figure 6.5 has been sourced from NSW Land and Property Information databases. Based on a preliminary desktop analysis and as illustrated in Figure 6.5, part of the site has been identified as potentially flood prone land. In addition, there is potential for a number of riparian corridors to traverse the site.

Dangars Lagoon, an item of local heritage significance on the Uralla LEP, is adjacent to the western boundary of the southern area of the site (Figure 6.5). Water levels within the lagoon experience seasonal variability. Other surface water features within close proximity of the site include Racecourse Lagoon, approximately 1.6 km west of the southern area of the site, and a farm dam that captures water from Saumarez Creek, approximately 200 m north-east of the northern area of the site at its closest point (Figure 6.5).

The Water Sharing Plan for the Macleay Unregulated and Alluvial Water Sources 2016 applies to the site. This plan covers 33 surface water sources and one floodplain alluvial groundwater water source and covers an area of 11,450 km^2 (DPI Water 2016a). In addition, the Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016 also applies to the site. This plan covers an area of 76,000 km^2 of northern NSW (DPI Water 2016b).

The site is part of the New England Fold Belt Coast groundwater source, a fractured rock aquifer with groundwater contained within, and moving through, fractures in the rock (DPI Water 2016b). Water quality within this source is typically good. There are a number of licensed groundwater bores within the site.

6.6.2 Assessment approach

Potential impacts to water resources from the project are expected to include demand for water during the construction of the project, as well as for land management during operations. The project is not likely to impact groundwater during construction, operation and decommissioning due to the limited amount of subsurface disturbance activities required during the installation and decommissioning of project infrastructure.

Water demands will be relatively small, as the construction and operation of a solar PV electricity generation facility are non-water intensive and tanked water is typically brought in where needed. If surface water or groundwater extraction is required to meet the project's demand for water, an assessment of impacts for these water sources will be included in the EIS.

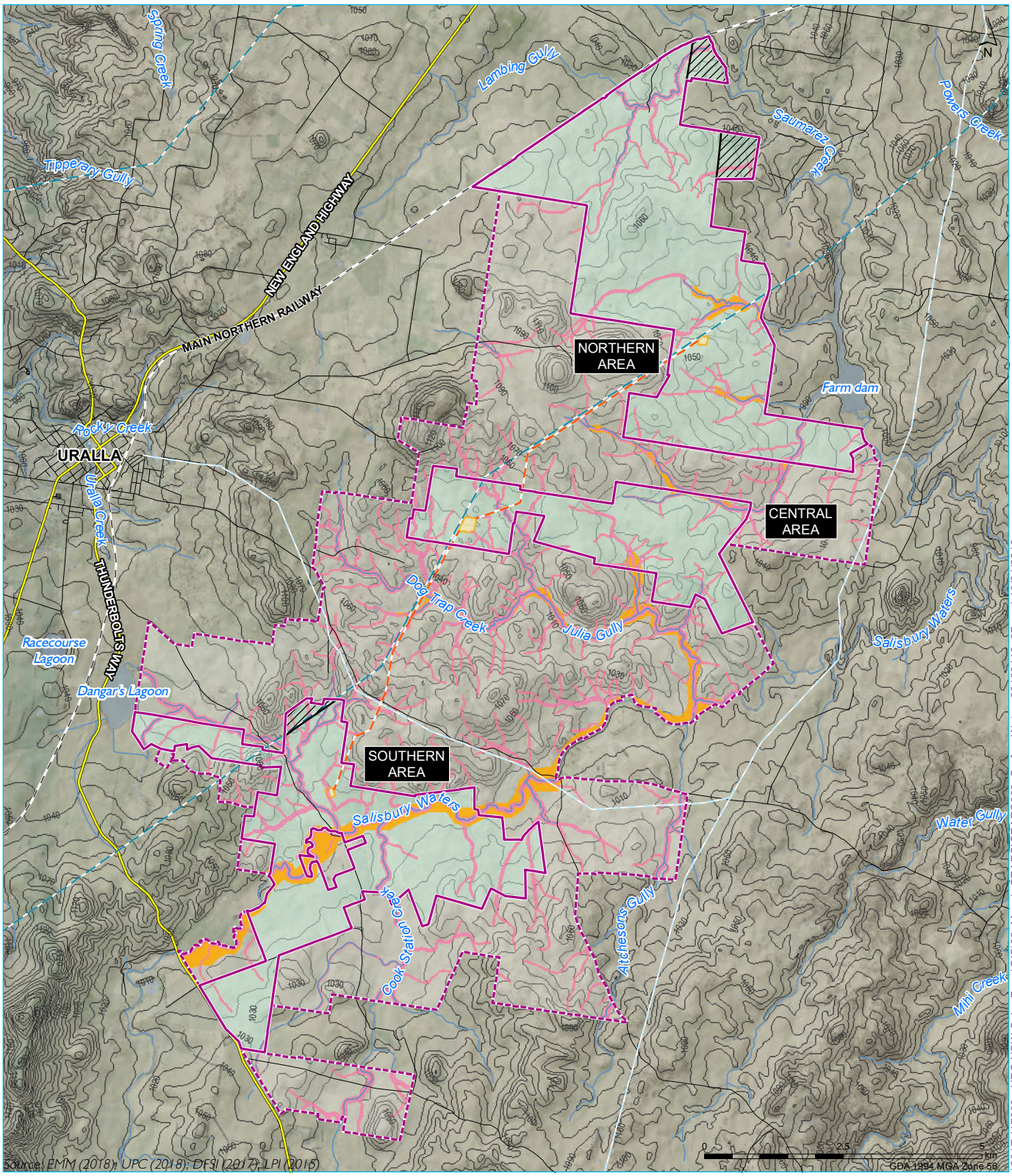
The surface water assessment will include a review of the existing surface water environment, an assessment of the surface water impacts and a description of any proposed mitigation and management measures. Engagement with key stakeholders including Water NSW, DPI, CLAWD and Council will also be undertaken as part of the water assessment, as required. Key surface water issues to be explored will include:

- flood risk management and flood modelling to establish reliable flood extents and potential flooding characteristics, including level, depth and velocity;
- water management during construction and operation;
- impacts to receiving waters;
- water licensing; and
- addressing the *Guidelines for Controlled Activities on Waterfront Land* (DPI Water 2012).

Should the presence of flood prone land within the site be confirmed during the detailed design process, a flood management strategy may be required for the project which would include:

- a recommendation that the project avoid development within riparian corridors and potentially flood prone land; and
- flood modelling to characterise the extent of a 1% Annual Exceedance Probability (AEP) flood event within the site and identify potential flood hazards.

During the detailed design process, where possible, the project will avoid riparian corridors. In areas where avoidance is undesirable, actions will be undertaken to reduce potential impacts on riparian corridors within the site. In addition, roads and services that require watercourse crossings will be designed and constructed in accordance with the methods recommended in the riparian corridor guidelines (DPI Water 2012). These guidelines are to provide best practice design and construction methods.



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Notes:

1. The alignment of watercourses has been sourced from LPI databases. Verification of the watercourse alignments via LiDAR survey or site measurements is recommended for watercourses that are in close proximity to the development footprint.
2. The extent of potentially flood prone land has been interpreted from low resolution aerial imagery and is potentially unreliable. Flood modelling would be required to establish reliable flood extents and characteristics such as level, depth and velocity.

KEY

- Project investigation area
- Project boundary*
- Areas to exclude project infrastructure
- Preliminary array connection
- Preliminary substation sites
- Potentially flood prone land
- Riparian corridor
- 66kV transmission line
- 330kV transmission line
- Rail line
- Main road
- Local road
- Contour (10 m)
- Watercourse / drainage line
- Waterbody

*Project infrastructure will occupy approximately 55% of the area within the project boundary.

Surface water features

New England Solar Farm
Request for SEARs
Figure 6.5

EMM

6.7 Traffic

6.7.1 Existing environment

The site has suitable access to the regional road network; including the New England Highway and Thunderbolts Way (refer Figure 1.2).

The New England Highway, which passes through the township of Uralla approximately 6 km west of the site, is classified as a State road and forms a major part of the Sydney-Brisbane national highway route. It connects a number of the State's largest regional settlements, including Tamworth and Armidale, and is a significant freight corridor. The New England Highway will be the major transport route for haulage during the construction phase of the project.

Thunderbolts Way is a regional road that extends over 290 km, connecting the townships of Inverell and Gloucester. Thunderbolts Way passes through a number of regional townships including Uralla to the west, Bundarra to the north-west and Walcha to the south-east of the project investigation area. Close to the project investigation area, Thunderbolts Way is a sealed single carriageway. Thunderbolts Way may be used by light vehicles during the construction and operational phases of the project.

A number of local roads traverse the site and surrounds; including Gostwyck Road, Salisbury Plains Road, The Gap Road, Carlon Menzies Road, Munsies Road, Saumarez War Service Road, Hillview Road, Big Ridge Road and Elliots Road (refer Figure 1.2).

The project will require the construction of a number of new internal roads from the surrounding local road network to enable access to the three areas of the site during both construction and operations. Indicative access points to the site from the local road network are provided in Figure 1.2.

Based on the preliminary project design, there will be in the order of eight vehicle access points to provide access for light and heavy vehicles throughout the operational life of the project (Figure 1.2), which may include, but may not be limited to:

- an access point from Big Ridge Road and Saumarez War Service Road to service the northern area;
- an access point from Munsies Road and Elliots Road to service the central area; and
- access points from The Gap Road, Gostwyck Road, Hillview Road and Salisbury Plains Road to service the southern area.

The exact locations of these access routes and the internal road network will be determined during the detailed design stage of the project and preparation of the EIS.

The Main Northern Railway is adjacent to the northern area (Figure 1.2). Armidale Airport is approximately 5.4 km north of the site.

6.7.2 Assessment approach

A traffic impact assessment (TIA) will be prepared to assess the likely project impacts to road capacity, traffic safety and site access including consideration of the Austroads intersection design standards and the likely maximum size of trucks accessing the site during construction. The TIA will include consideration of potential impacts on the New England Highway and Thunderbolts Way, as well as the local road network, which traverses the site and surrounds. The TIA will also consider potential impacts on the Main Northern Railway and railway crossings within close proximity of the site.

Project-related traffic impacts will be the subject of ongoing consultation with Council, TfNSW, RMS and surrounding landholders.

Traffic will predominantly be generated during the construction phase of the project, which is anticipated to take up to 24 months. The traffic movements will be generated via site establishment and delivery of project infrastructure, transportation of workers to and from site, as well as removal of waste. The typical vehicles used to deliver project infrastructure would be no larger than B-Double semi trailers, except for major pieces of equipment such as the transformers to be installed in the substations.

Accommodation for construction workers will be sourced from nearby townships, such as, Armidale, Uralla, Walcha and Tamworth, or through workers camps to be established on-site, or via a combination of these two approaches. UPC has commenced discussions with potential contractors on the optimal approach and will investigate this further as part of the preparation of the EIS. The use of workers camps on-site may significantly reduce vehicle movements during construction.

During operation, traffic is predicted to be limited to employee light vehicle movements for in the order of up to 15 employees, plus a small number of daily vehicle movements associated with ongoing maintenance and associated activities.

The TIA will be undertaken in accordance with the relevant guideline, *Guide to Traffic Generating Developments* (RTA 2002) and will include:

- existing traffic levels on transport routes and intersections likely to be used by the project;
- predicted traffic generation during construction;
- potential impacts to road and intersection capacity during construction;
- management of any level crossings on the Main North railway line during construction; and
- potential road and rail safety issues.

As traffic generation during operations will be minimal, a detailed assessment of operational traffic impacts is not considered to be required.

6.8 Air quality

6.8.1 Existing environment

The site is in a rural setting approximately 6 km east of the township of Uralla within the Uralla Shire LGA. The Uralla Shire LGA is sparsely populated with a population density of approximately 1.9 persons/km^2, which is significantly lower than the NSW average (9.6 km^2) (ABS 2017a).

Land use within the site and surrounds is primarily agricultural, which is likely to influence local and regional air quality. Existing sources of air pollution within a local setting are limited and consist primarily of dust and vehicle and machinery exhaust emissions associated with agricultural production and freight transport along the New England Highway and the Main Northern Railway.

The closest non-project related residences are less than 100 m from the site, which includes two residences within close proximity to the southern area and one residence within close proximity to the northern area (Figure 1.2).

In addition, a further 40 non-project related residences are within approximately 1 km of the project boundary, the majority of which are in a cluster of residences north-east of the northern area. Two portions of the northern area and a portion of the southern area will deliberately be excluded from the development footprint due to their proximity to residences (refer Figure 1.2). Further, UPC is currently in consultation with a number of landholders along The Gap Road and have commenced discussions around potential exclusion zones and/or landscaping and screening requirements around the perimeters of their properties. Consultation with these landholders is ongoing and the locations of exclusion zones, landscaping and screening will be refined in response to feedback from the landholders, project design considerations and environmental assessment outcomes as the project progresses.

6.8.2 Assessment approach

As noted in Section 3.3, the area within the project boundary on which project infrastructure will be installed requires minimal site preparation and civil works (ie grading/levelling and compaction).

The project is not anticipated to generate significant air quality impacts during construction or operations. Project-related traffic on unsealed roads within the project boundary may contribute to localised dust generation primarily during the construction phase of the project. Mitigation measures will be implemented to address these impacts. These measures will be discussed with Council and surrounding landholders as part of ongoing stakeholder engagement. The implementation of these mitigation measures will ensure that the project will not generate significant air quality impacts during construction, operation or decommissioning.

A detailed air quality assessment is not considered to be required as part of the EIS as potential impacts will be temporary in nature and will not extend beyond the construction phase of the project.

6.9 Noise and vibration

6.9.1 Existing environment

Land use in the site and surrounds is predominantly agricultural. Given the project's rural setting, background noise at nearby sensitive receptors is likely to be low and characterised by plant and equipment associated with agricultural production activities and vehicle movements along the local and regional road and rail network.

The construction of the project has potential to create noise and vibration impacts for surrounding landholders within and adjacent to the site. Noise generated by the project will include construction noise, and noise generated by increased traffic along the local road network.

As noted in Section 6.7.1, based on the preliminary project design, there will be in the order of eight vehicle access points to provide access for light and heavy vehicles throughout the operational life of the project (Figure 1.2). The exact locations of these access routes and the internal road network will be determined during the detailed design stage of the project and preparation of the EIS.

Solar farms are generally quiet during the operations phase with negligible noise impacts to be expected except from time to time for major maintenance activities or replacement of significant infrastructure.

6.9.2 Assessment approach

The noise and vibration impact assessment will include consideration of noise generated during both the construction and operation of the project and will be prepared in accordance with the following relevant documents:

- NSW *Noise Policy for Industry* (NPI) (EPA 2017);
- NSW *Road Noise Policy* (RNP) (DECCW 2011);
- NSW *Interim Construction Noise Guideline* (ICNG) (DECC 2009); and
- *Assessing Vibration: A Technical Guideline* (DECC 2006).

The results of the operational noise assessment will be used to inform the detailed design and infrastructure layout.

A traffic noise assessment will also be included in the EIS to assess noise impacts associated with project-related vehicle movements along the local road network during the construction phase of the project. As noted in Section 6.7.2, traffic movements during operations are expected to be minimal.

6.10 Visual

6.10.1 Existing environment

Due to the undulation in the landscape, elevation across the site is variable at approximately 986-1,149 MASL.

A preliminary desktop analysis indicates that project infrastructure may be visible from nearby agricultural land, rural residences adjacent to the northern and southern areas of the site, as well as by passing motorists travelling along the local and regional road network. Due to the distance of the site from the townships of Uralla and Armidale, the majority of motorists using the local road network are anticipated to be local residents. Tourist movements along Gostwyck Road are also expected.

As noted in Section 6.8, the closest non-project related residences are less than 100 m from the site, which includes two residences within close proximity to the southern area and one residence within close proximity to the northern area (Figure 1.2). In addition, a further 40 non-project related residences are within approximately 1 km of the project boundary, the majority of which are in a cluster of residences north-east of the northern area (Figure 1.2). Two portions of the northern area and a portion of the southern area will deliberately be excluded from the development footprint due to their proximity to residences (refer Figure 1.2). Further, UPC is currently in consultation with a number of landholders along The Gap Road and have commenced discussions around potential exclusion zones and/or landscaping and screening requirements around the perimeters of their properties. Consultation with these landholders is ongoing and the locations of exclusion zones, landscaping and screening will be refined in response to feedback from the landholders, project design considerations and environmental assessment outcomes as the project progresses.

Armidale Airport is approximately 5.4 km north of the site. Given its location (ie not runway aligned) and distance from the airport, it is unlikely that CASA will consider the project to present a potential hazard to aircraft operations travelling to and from Armidale Airport.

Schedule 5 of the Uralla LEP lists a number of heritage items within the Uralla Shire LGA, including two items within the project investigation area, namely Gostwyck Memorial Chapel and Precinct (Uralla LEP listing I10) and Deeargee Woolshed (Uralla LEP listing I11) (refer Figure 6.3). As noted in Section 6.4, one of the objectives of the Uralla LEP is:

> to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views.

6.10.2 Assessment approach

In the early stages of construction, the project will result in additional plant and equipment and construction activities that may be visible from nearby agricultural land, residences and motorists using the local and regional road network. The level of impact will depend on the duration of exposure; however, it is unlikely to result in significant impacts on visual amenity from the majority of viewpoints.

PV modules are designed to absorb sunlight. Modern PV modules also incorporate dual glass frameless design, which further eliminates any potential for reflection. Consequently, glare and glint is not anticipated to be a significant visual impact associated with the project.

The visual impact assessment will include an assessment of the likely visual impacts of the project (including any glare, reflectivity and night lighting) on surrounding residences, scenic or significant vistas, air traffic and road corridors in the public domain. A comprehensive viewshed analysis utilising light detection and ranging (LiDAR) data and results from site inspections and stakeholder engagement will be performed to identify locations within a local setting that may experience views of project infrastructure. Where relevant, the visual impact assessment and EIS will include mitigation measures to help reduce the project's impacts on visual amenity.

Potential views to the project infrastructure from Gostwyck Memorial Chapel and Precinct and, more generally, from Gostwyck Station will be investigated as part of the visual impact assessment (Figure 6.3); however, it is anticipated that the majority of views will be screened by existing vegetation and undulation within the landscape.

6.11 Hazards and risks

6.11.1 Existing environment

Electricity transmission line infrastructure traverses the site and surrounds, including TransGrid's 330 kV transmission line, which passes through the site, and Essential Energy's 66 kV transmission line, which runs east-west close to the northern boundary of the southern area (refer Figure 1.2).

As noted in Section 3.2, three new substations will be required (ie one at each of the three arrays) to increase the voltage from the MV reticulation network, as well as a Central Substation to increase the voltage to 330 kV, for injection into the grid via TransGrid's 330 kV line. Three 132 kV overhead transmission lines will transport electricity from the internal solar array substations to the Central Substation.

UPC is currently assessing the optimal location for a BESS. Based on current considerations, the BESS is most likely to be installed within the northern or central areas. The BESS will be housed in a secure compound. Key considerations include the type of technology (eg lithium ion) and the size of the BESS in terms of the MW of power that can be discharged and the hours of storage provided. Should any additional land be required for the BESS, this will be described within the EIS.

The exact location of transmission infrastructure and BESS will be determined as a result of ongoing engineering and environmental considerations, discussions with TransGrid, the needs of potential offtakers of energy and the selection of the final transmission line easements in cooperation with project landholders.

A small portion of the southern area (approximately 10 ha) is mapped as bushfire prone land. In addition, land in between the three areas of the site is also mapped as bushfire prone land.

6.11.2 Assessment approach

The EIS will include a preliminary risk screening in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP 2011a), and if the preliminary risk screening indicates the development is "potentially hazardous", a preliminary hazard analysis (PHA) will be prepared in accordance *with Hazard Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (DoP 2011b) and *Multi-Level Risk Assessment* (DoP 2011c).

The EIS will also include an assessment of all potential hazards and risks including but not limited to bushfires, spontaneous ignition, electromagnetic fields or the proposed grid connection infrastructure (including the proposed internal solar array and central substations) against relevant guidelines.

6.12 Socio-economics

6.12.1 Existing environment

The population of the Uralla Shire LGA in 2011 was 6,034 compared to 6,048 in 2016 which reflects an increase of 14 people residing within the area (ABS 2017b; ABS 2011a). Similarly, the township of Uralla has also experienced growth over this period with an increase of 322 people residing in the area between 2011 (2,421) and 2016 (2,743) (ABS 2017c; ABS 2011b). The population of the Uralla Shire LGA is predicted to increase by approximately 19% by 2031 (RDANI 2016a).

The majority of businesses within the Uralla Shire LGA are associated with agriculture, forestry and fishing, which contribute to more than $100 million or 25% of the Uralla Shire LGA's gross regional product (RDANI 2016b). The importance of agriculture to the Uralla Shire LGA's economy is further reflected by the area's employment statistics, which indicate that approximately 400 employees or 30% of employment within the Uralla Shire LGA is supported by agriculture, forestry and fishing (RDANI 2016b).

In September 2017, the unemployment rate within the Uralla Shire LGA was 4.1%, which was less than the NSW (4.9%) and Australian (5.7%) unemployment rates, respectively (DoE 2017). Based on the total employment estimate within the Uralla Shire LGA and RDANI's assessment of the labour force, it is estimated that there are approximately 80 people looking for full-time work and 60 people looking for part-time work within the Uralla Shire LGA (RDANI 2016b).

As recognised by RDANI (2016b), there is considerable scope for mitigating the risks associated with a heavy dependence on agriculture by diversifying the regional economy. One of the identified investment opportunities within the Uralla Shire LGA is renewable energy (RDANI 2016b).

6.12.2 Assessment approach

The project will result in employment opportunities within the Uralla Shire LGA, which would be a benefit in terms of both contributions to an expanded workforce within the Uralla Shire LGA, as well as diversification of skills for the local population. The project will also contribute to the ongoing diversification of the local and regional economy, providing a stable income base to boost resilience.

The EIS will include consideration of the socio-economic impacts and benefits of the project, including an assessment of the likely impacts on the local community and a consideration of the construction workforce accommodation including assessment of cumulative impacts. As noted in Section 6.7, accomodation for construction workers will be sourced from nearby townships, such as, Armidale, Uralla, Walcha and Tamworth, or through workers camps to be established on-site, or via a combination of these two approaches. UPC will investigate this further as part of the preparation of the EIS.

6.13 Cumulative impacts

Given the scale of the project and the duration of the construction period, there is potential for cumulative impacts including traffic generation on the local road network, as well as socio-economic impacts in the locality, should the project's construction coincide with other major projects and developments in the Uralla Shire LGA and, more generally, within the New England region.

Based on a review of DPE's Major Projects Register in February 2018, there are currently no major projects proposed within the Uralla Shire LGA. However, there are a number of major projects in surrounding LGAs, including the Metz Solar Farm in the Armidale LGA and the Woolbrook Wind Farm in the Tamworth and Walcha LGAs.

Infinergy Pacific Limited (Infinergy) proposes to develop the Metz Solar Farm (SSD 16_7931), a 100 MV PV solar farm, at Metz, approximately 18 km east of Armidale (Figure 1.1). The project was approved by the Minister for Planning on 18 July 2017.

Newtricity propose to develop the Woolbrook Wind Farm (SSD 13_6162), a wind farm comprising of up to 30 wind turbines, on a site approximately 38 km north-east of Tamworth and approximately 40 km south-west of the site(Figure 1.1). Director General's environmental assessment requirements (DGRs) for the project were released in January 2014. Subsequently, due to the time elapsed since their release; further consultation with DPE would be required prior to the preparation of the EIS for the project.

As part of ongoing engagement with Council and DPE, UPC will seek regular updates on major projects and developments within the Uralla Shire LGA and, more generally, within the New England region.

7 Conclusion

UPC proposes to develop the New England Solar Farm; a significant grid-connected solar farm along with associated infrastructure, near the township of Uralla, which lies approximately 6 km east of the township of Uralla in the Uralla Shire LGA. The project is likely to be developed across three separate arrays of PV modules, incorporating connecting infrastructure between each of the three arrays and a Central Substation, and connection to the existing electricity network.

As part of the scoping stage of the project, UPC has developed a stakeholder engagement strategy for the project, which encourages initiation and maintaining open lines of communication with a wide range of stakeholders. UPC is committed to engaging with DPE, Council, regulators, industry stakeholders, Aboriginal stakeholders, landowners and the local community. The stakeholder engagement strategy will be maintained as a dynamic document that responds to issues identified during the consultation process. In addition, the EIS will include discussions of the feedback received and actions taken to incorporate the feedback into the project design.

The design and location of project infrastructure within the site will be limited to the development footprint, which will be refined on the basis of further detailed grid connection studies, stakeholder engagement, environmental assessment and constraints identification, engineering assessment and financing considerations throughout the project design phase and preparation of the EIS.

Abbreviations

ACHA	Aboriginal cultural heritage assessment
AEMO	Australian Energy Market Operator
AEP	annual exceedance probability
AHIP	Aboriginal heritage impact permit
BAM	biodiversity assessment method
BC Act	NSW *Biodiversity Conservation Act 2016*
BESS	battery and energy storage system
BoM	Bureau of Meteorology
BSAL	biophysical strategic agricultural land
CASA	Civil Aviation Safety Authority
CEEC	critically endangered ecological community
CL Act	NSW *Crown Land Act 1989*
CLAWD	Department of Industry - Crown Lands and Water Division
Council	Uralla Shire Council
CSEP	community stakeholder engagement plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DA	development application
DGRs	Director-general's environmental assessment requirements
DoE	Commonwealth Department of Employment
DoEE	Commonwealth Department of Environment and Energy
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
DRG	NSW Department of Planning and Environment – Division of Resources and Geoscience
DRE	NSW Department Planning and Environment – Division of Resources and Energy
EIA	environmental impact assessment
EIS	environmental impact statement
EMM	EMM Consulting Pty Limited

EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPA	NSW Environment Protection Authority
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPL	environment protection licence
Forestry NSW	Forestry Corporation of NSW
FTE	full-time equivalent
GHG	greenhouse gas
GHI	global horizontal irradiance
GWh	gigawatt hours
ha	hectares
HV	high voltage
IBRA	Interim Biogeographic Regionalisation for Australia
ILUA	Indigenous Land Use Agreement
IPP	independent power producer
kW	kilowatt
LALC	Local Aboriginal Land Council
LGA	local government area
LiDAR	light detection and ranging
LPI	NSW Land and Property Information
LRET	large-scale renewable energy target
MASL	metres above sea level
MNES	matters of national environmental significance
Mtpa	million tonnes per annum
MV	medium voltage
MW	megawatt
MWh	megawatt hours
NPW Act	NSW *National Parks and Wildlife Act 1974*
NSP	network service provider

OEH	NSW Office of Environment and Heritage
OM	operations and maintenance
PCT	plant community type
PMST	Protected Matters Search Tool
POEO Act	NSW *Protection of the Environment Operations Act 1997*
PV	photovoltaic
RAP	registered Aboriginal party
RDANI	Regional Development Australia Northern Inland
REA	Renewable Energy Advocate
REAP	Renewable Energy Action Plan
RET	renewable energy target
REZ	renewable energy zone
RF Act	NSW *Rural Fires Act 1997*
RFS	NSW Rural Fire Service
RMS	NSW Roads and Maritime Services
SEARs	Secretary's environmental assessment requirements
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State significant development
TEC	threatened ecological community
TfNSW	Transport for NSW
UNE	University of New England
UPC	UPC Renewables Australia Pty Ltd
Uralla LEP	Uralla Local Environmental Plan 2012
WM Act	NSW *Water Management Act 2000*

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SYDNEY
Ground floor, Suite 01, 20 Chandos Street
St Leonards, New South Wales, 2065
T 02 9493 9500 F 02 9493 9599

NEWCASTLE
Level 1, Suite 6, 146 Hunter Street
Newcastle, New South Wales, 2300
T 02 4907 4800 F 02 4907 4899

BRISBANE
Level 4, Suite 01, 87 Wickham Terrace
Spring Hill, Queensland, 4000
T 07 3839 1800 F 07 3839 1866