

# Orana BESS Facility

Landscape and Visual Impact Assessment

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## Landscape and Visual Impact Assessment

**Prepared for**

NGH

**Issue**

For Submission

**Date**

10.03.2023

**Project Number**

2220

Revision	Date	Author	Checked	Comment
A	27.10.22	JR	SW   DM	For Review
B	01.03.23	JR	MED	For Review
C	10.03.23	JR	MED	For Submission



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# 1.0 Introduction

## 1.1 Background

Moir Landscape Architecture (MLA) have been commissioned by NGH to prepare a Landscape & Visual Impact Assessment (LVIA) for the proposed Battery Energy Storage System (BESS) Facility (hereafter referred to as 'the Project') to the northeast of Wellington. The Applicant 'Akaysha Energy Pty Ltd' proposes to develop the Project within the property at 6945 Goolma Road, Wuuluman - Lot 1 & 2 DP1226751 (the Site). The Project will include construction, operation and eventual decommissioning of a BESS and associated ancillary infrastructure. Wellington Transgrid Substation (WTS) is located adjacent to the north of the Site. **Figure 01** provides the Project context in relation to the town of Wellington.

The Project is primarily sited on Lot 2 DP1226751, with part of the access road located on Lot 2 DP1136578. Lot 2 DP1226751 covers an area of approximately 41 hectares, however the BESS will occupy an area of approximately 14.8 ha. The Project Site comprises of privately owned farmland. The access road and network connection infrastructure would be subject to an easement for the life of the project. The site is immediately adjacent to the existing WTS and the Wellington Solar Farm (WSF).

Land use within the Site is zoned as SP2 Electricity Supply. There are no residential dwellings identified within the Project Site. The Project Site is located within the Dubbo Local Government Area (LGA) and is subject to planning policies outlined under the Dubbo Local Environment Plan 2022 (LEP).

Fieldwork was undertaken during September 2022, using key viewpoints and locations with potential views towards the Project. This report details the results of fieldwork, documents the assessment of the existing landscape character and assesses the potential visual impacts associated with the Project.

The report also provides an overview of the mitigation measures that may assist in the reduction of potential visual impacts. This information is provided to aid understanding of the likely impacts and how they may be managed to ensure the character of the immediate area and surrounding visual landscape is not overly modified or diminished.

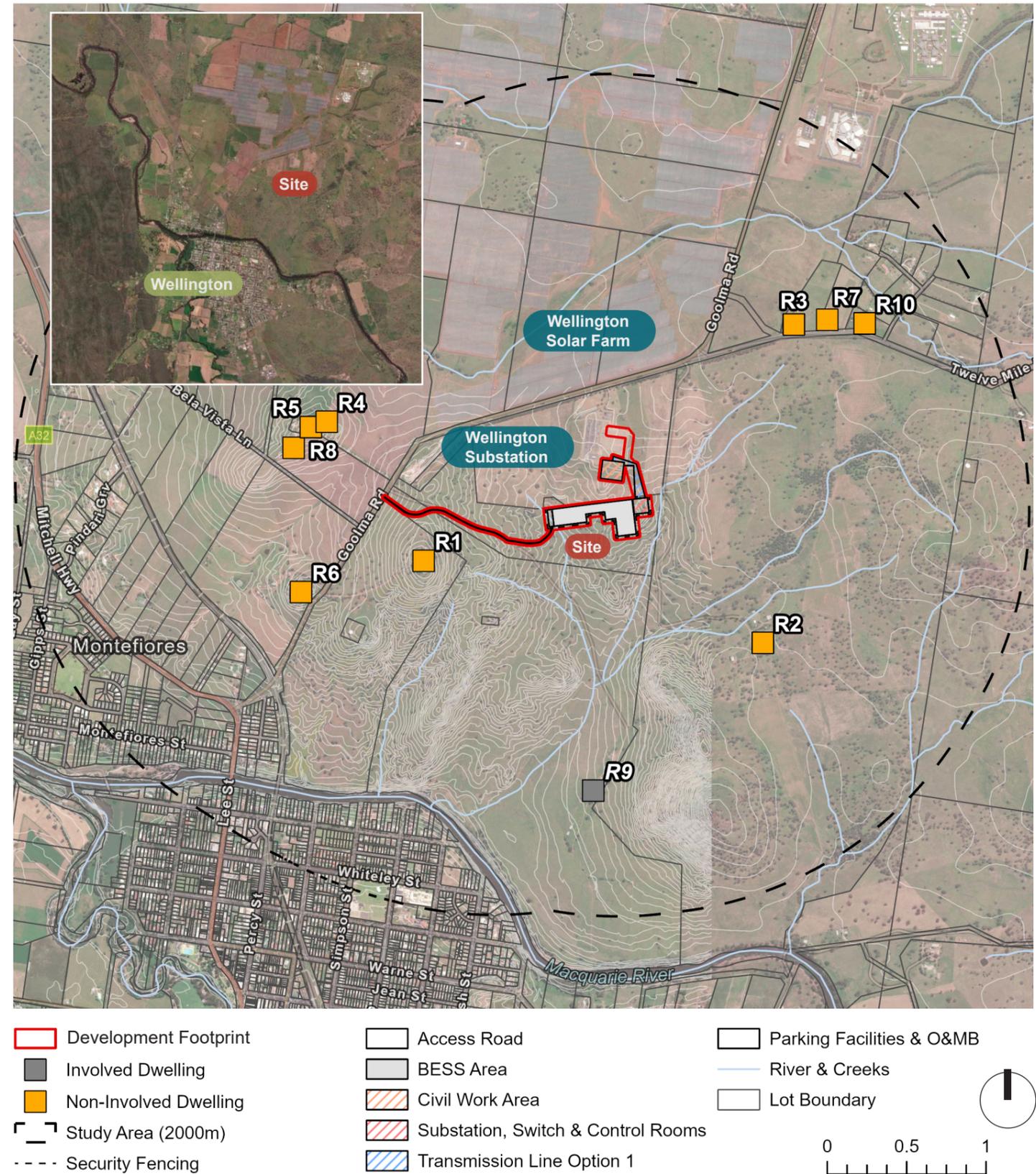


Figure 01 - Site Location Map (source: ESRI ArcGIS)

## 1.2 Report Structure

The following table provides an outline of the report structure and a summary the elements addressed in the LVIA. Detailed methodologies for each section of the assessment have been included in the relevant chapters of the report.

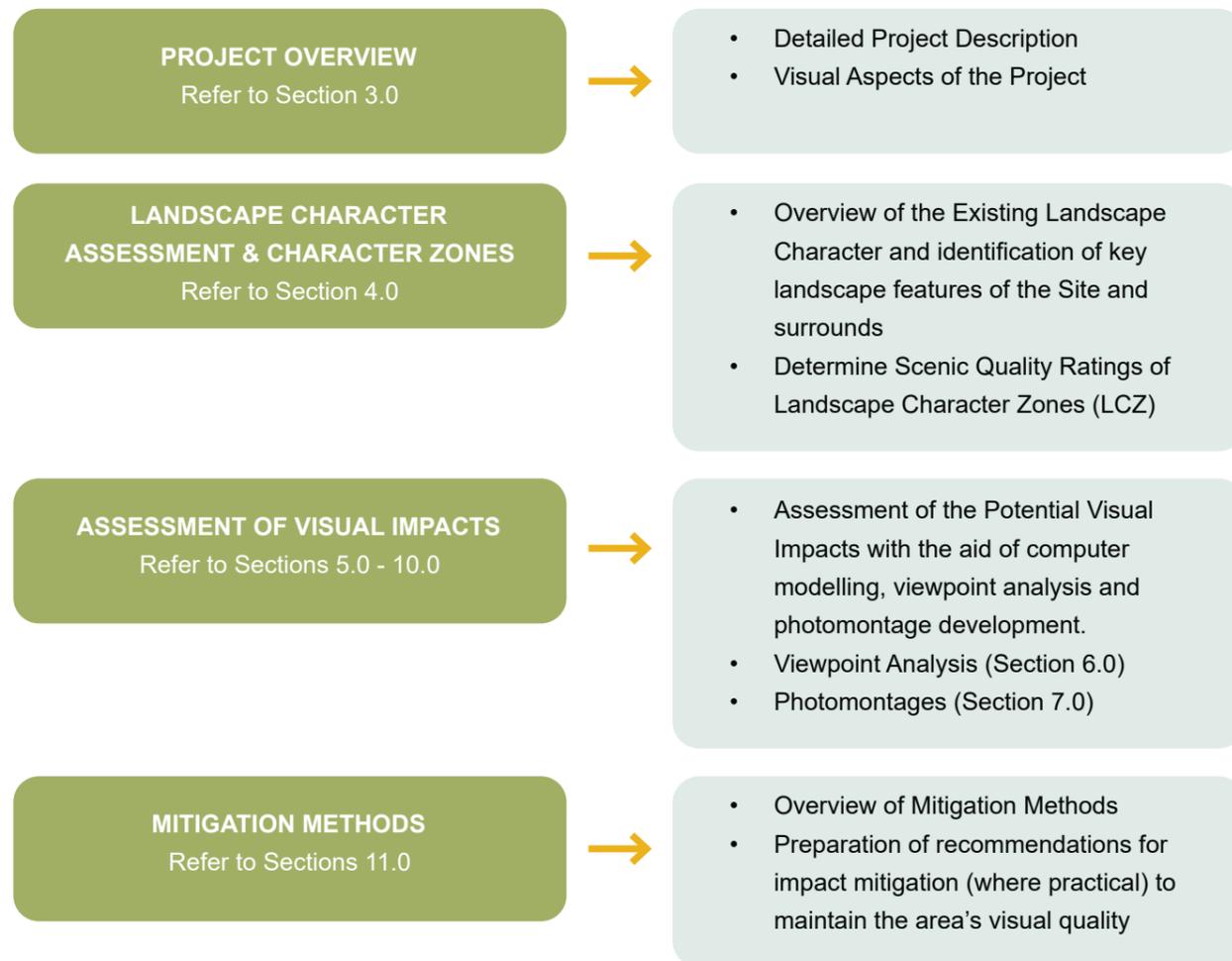
Visual Impact Assessment Report Structure	
<b>Section 2.0: Study Method</b>	Overview of Study Method utilised for the LVIA
<b>Section 3.0: Project Overview</b>	Project Description and overview of the Project and all components to be assessed within the LVIA
<b>Section 4.0: Existing Landscape Character</b>	Establish the existing Landscape and Visual Conditions prior to undertaking any visual assessment
<b>Section 5.0: Zone of Visual Influence</b>	Assessment to identify Potential Visual Impacts
<b>Section 6.0: Viewpoint Analysis</b>	Assessment of key viewpoints within the Visual Catchment
<b>Section 7.0: Photomontages</b>	Preparation Photomontages to illustrate the appearance of the Project
<b>Section 8.0: Visual Impact Assessment</b>	Overview of the Visual Impacts resulting from the project
<b>Section 9.0: Nightlighting</b>	Overview of potential Nightlighting Sources
<b>Section 10.0: Cumulative Visual Impact</b>	Overview of Cumulative Visual Impact of associated infrastructure
<b>Section 11.0: Mitigation Recommendations</b>	An outline of proposed mitigation and management options
<b>Section 12.0: Conclusion</b>	

Table 01 - Report Structure

# 2.0 Study Method

## 2.1 Overview of the Study Method

The following provides an overview of the Study Method utilised for undertaking the LVIA. This methodology is based on the relevant policies, frameworks and our experience in undertaking LVIA for large infrastructure projects. The LVIA was undertaken in the stages as noted below:



## 2.2 Landscape Character Assessment

Landscape Character refers to the distinct and recognisable pattern of elements that occur consistently in a particular landscape. The Landscape Character of an area is generally defined by the most dominant landscape element or unique combination of elements that occur within that landscape. It *'reflects how particular combinations of geology, landforms, soils, vegetation, land use and human settlements create a particular sense of place for different areas within the landscape'* (Landscape Institute, 2013). The Landscape Character of the Study Area has been assessed at a regional, local and site scale, with the Project 'Study Area' defined as two (2) kilometres from the Project boundary. This study will utilise existing topographic maps, site imagery and land use maps.

### 2.2.1 Landscape Character Zones and Scenic Quality

Once the Landscape Character has been assessed, Landscape Character Zones (LCZ) can be identified within the Study Area. Landscape Character Zones are defined as *'an area of landscape with similar properties or strongly defined spatial qualities distinct from areas immediately nearby'* (Transport of NSW, 2020).

The Scenic Quality 'Frame of Reference' has been formulated by MLA (refer to **Table 02**) utilising *'An Approach to Landscape Sensitivity Assessment'* (Natural England, 2019) to quantify the sensitivity of the LCZ. Each category of the 'Frame of Reference' has been quantified for each LCZ to determine a 'Scenic Quality' Rating of HIGH, MODERATE or LOW.

Each LCZ will be assigned a 'Scenic Quality' Rating where the Visual Sensitivity of a select location can be derived through the combination of 'Receptor Sensitivity' and 'Scenic Quality'.

SCENIC QUALITY RATING			
DESCRIPTION	LOW	MODERATE	HIGH
	←—————→		
<b>LANDFORMS</b>	<ul style="list-style-type: none"> <li>Flat Topography</li> <li>Absence of Landscape Features</li> <li>Open, broad extents of spaces</li> </ul>	<ul style="list-style-type: none"> <li>DivESRity in Topographical Range</li> <li>Unique Landscape Features</li> <li>Intimate spaces</li> </ul>	
<b>WATERFORM</b>	<ul style="list-style-type: none"> <li>Absence of Water</li> </ul>	<ul style="list-style-type: none"> <li>Presence of Water</li> <li>Visually prominent lakes, reservoirs, rivers streams and swamps.</li> </ul>	
<b>VEGETATION</b>	<ul style="list-style-type: none"> <li>Absence of vegetation</li> <li>Lack of divESRity</li> <li>Land cleared of endemic vegetation</li> <li>Low level of connection between vegetation and landscape / topography</li> </ul>	<ul style="list-style-type: none"> <li>Abundant vegetation</li> <li>High divESRity</li> <li>High retention of endemic vegetation</li> <li>High level of connectivity between natural landscape and landforms</li> </ul>	
<b>HUMAN INFLUENCE</b>	<ul style="list-style-type: none"> <li>High population</li> <li>High density in settlement</li> <li>High presence of infrastructure</li> <li>High levels of landscape modification</li> </ul>	<ul style="list-style-type: none"> <li>Low / dispersed population</li> <li>No settlement</li> <li>Absence of infrastructure</li> <li>Landscape in natural state</li> </ul>	
<b>ACTIVITY</b>	<ul style="list-style-type: none"> <li>High levels of traffic movement</li> <li>Presence of freight and passenger transport networks</li> <li>Presence of production or industry</li> </ul>	<ul style="list-style-type: none"> <li>Low traffic movement</li> <li>Absence of freight and passenger transport</li> <li>Absence of production or industry</li> </ul>	
<b>RARITY</b>	<ul style="list-style-type: none"> <li>Typical landscape within a local and regional context</li> </ul>	<ul style="list-style-type: none"> <li>Unique combination of landscape features in a local and regional context</li> </ul>	
<b>RELATIONSHIP WITH ADJOINING LANDSCAPES</b>	<ul style="list-style-type: none"> <li>Low visible connection with adjoining landscapes</li> <li>Low variability between adjoining landscapes</li> <li>Landscape features do not contribute to amenity from adjoining landscapes</li> </ul>	<ul style="list-style-type: none"> <li>High visibility with adjoining landscapes</li> <li>High variability and contrast with adjoining landscapes</li> <li>Landscape features contribute significantly to amenity of adjoining landscapes</li> </ul>	

Table 02 - Scenic Quality Rating (MLA)

2.2.2 Receptor Sensitivity Rating

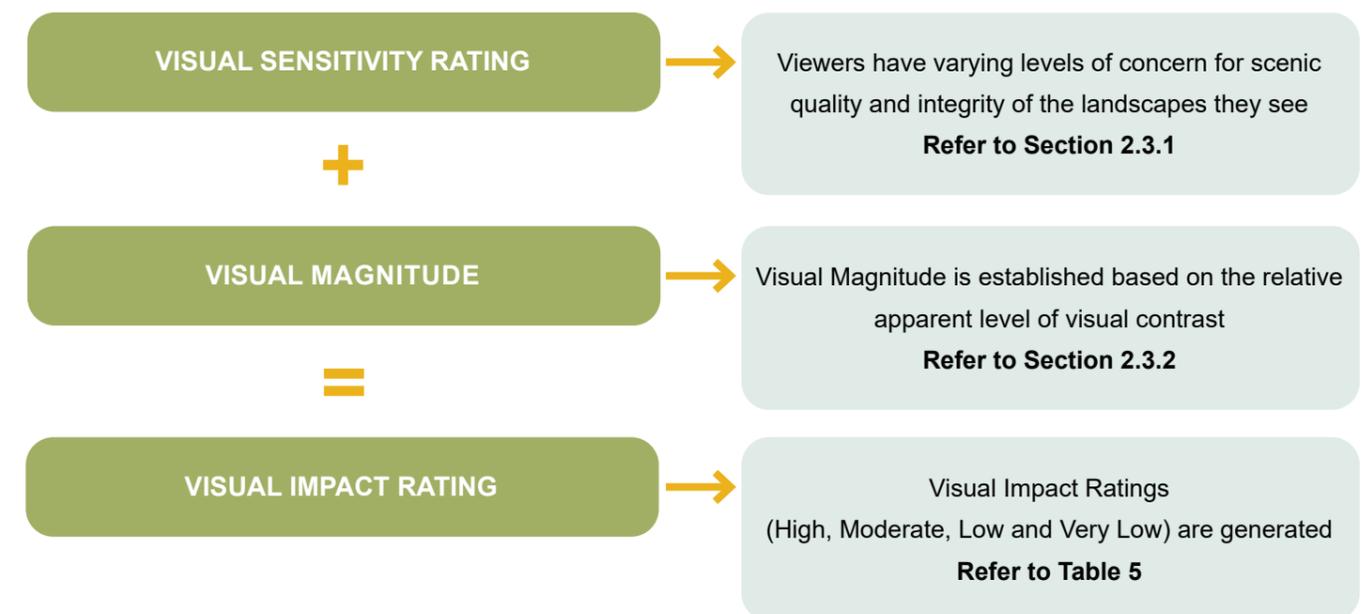
Receptor sensitivity relates to the relative importance of receptors (refer to Table 3) and the value that the community or visitors may place on landscapes viewed from public use areas, public travel ways and private receptors such as dwellings. The sensitivity of each viewpoint into one of four (4) sensitivity ratings (very low, low, moderate, high). The intent is to classify the viewer sensitivity on the LCZ in which the Project is being viewed and assessed based on the Landscape Character Assessment.

RECEPTOR SENSITIVITY RATING	
<b>VERY LOW</b>	<ul style="list-style-type: none"> <li>Local sealed and unsealed roads</li> <li>Passenger rail lines with daily daylight services</li> <li>State highways, freeways and classified main roads</li> <li>Walking tracks and navigable waterways</li> </ul>
<b>LOW</b>	<ul style="list-style-type: none"> <li>Secondary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3 and C4)</li> <li>Tourist roads and scenic drives</li> <li>Walking tracks and navigable waterways</li> <li>Cemeteries, memorial parks</li> </ul>
<b>MODERATE</b>	<ul style="list-style-type: none"> <li>Primary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3 and C4)</li> <li>Tourist and visitor accommodation and places of worship (such as bed and breakfasts, motels, hotels)</li> <li>Tourist uses in tourist areas (zoned SP3)</li> <li>Publicly accessible green and open spaces including picnic areas, parks, public recreation areas</li> <li>Town centres and central business districts</li> </ul>
<b>HIGH</b>	<ul style="list-style-type: none"> <li>Dwellings in residential areas and rural villages (land zoned R1, R2, R3, R4 and RU5)</li> <li>Historic rural homesteads/residences on the national, state or local heritage list</li> </ul>

Table 03 - Receptor Sensitivity Rating (Adapted from Technical Supplement - LVIA Large-Scale Solar Energy Guidelines)

2.3 Visual Impact Assessment

The potential visual impact of the Project is then assessed based on the relationship between the visual sensitivity (refer to Section 2.3.1) and visual magnitude (refer to Section 2.3.2).



### 2.3.1 Visual Sensitivity

Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to change (as noted in **Sections 2.2.1** and 2.2.2). Visual Sensitivity, defined by the DPE 'refers to the quality of the existing view and how sensitive the view is to the proposed change. In some cases, visual sensitivity is also related to the direction of the view and where it can be viewed from (such as a resident's living room). The visual sensitivity is determined by identifying the sensitivity of each viewpoint and categorising the scenic quality of the area in view' (DPE, 2022b).

For example, a significant change that is not frequently seen may result in a low visual sensitivity although its impact on a landscape may be high. Generally the following principles apply:

- Visual sensitivity decreases as the viewing time decreases;
- Visual sensitivity decreases as the number of potential viewers decreases; and
- Visual sensitivity can also be related to viewer activity (e.g. a person viewing a Project Site whilst engaged in recreational activities will be more effected by change than someone passing a scene in a car travelling to a desired destination)

Visual Sensitivity ratings are defined as HIGH, MODERATE, LOW and VERY LOW based on the Scenic Quality and Receptor Sensitivity.

VISUAL SENSITIVITY RATING				
		SCENIC QUALITY LANDSCAPE CHARACTER ZONE		
		HIGH	MODERATE	LOW
RECEPTOR SENSITIVITY	HIGH	HIGH	HIGH	MODERATE
	MODERATE	HIGH	MODERATE	MODERATE
	LOW	MODERATE	LOW	LOW
	VERY LOW	LOW	VERY LOW	VERY LOW

Table 04 - Visual Sensitivity Rating Table (Adapted from Technical Supplement - LVIA Large-Scale Solar Energy Guidelines)

### 2.3.2 Visual Magnitude

Visual magnitude refers to the extent of change that will be experienced by receptors. Factors that are considered when assessing the magnitude of change include (AILA, 2018):

- the proportion of the view / landscape effected;
- extent of the area over which the change occurs;
- the size and scale of the change;
- the rate and duration of the change; and
- the level of contrast and compatibility.

### 2.3.3 Visual Impact

Visual Impact refers to the change in appearance of the landscape as a result of the Project. Visual Impact is the combined effect of visual sensitivity and visual magnitude. Various combinations of visual sensitivity and visual magnitude will result in HIGH, MODERATE, LOW or VERY LOW overall visual impacts (refer to **Table 05**).

### 2.3.4 Visual Impact Analysis

This process involves a qualitative assessment of the conclusions of visual impact ratings for each viewpoint. The analysis takes into consideration other relevant influencing factors not easily addressed through the process of quantitative analysis.

VISUAL IMPACT RATING					
		VISUAL MAGNITUDE			
		HIGH	MODERATE	LOW	VERY LOW
VISUAL SENSITIVITY	HIGH	HIGH	MODERATE	MODERATE	LOW
	MODERATE	MODERATE	MODERATE	LOW	LOW
	LOW	MODERATE	LOW	LOW	VERY LOW
	VERY LOW	LOW	LOW	VERY LOW	VERY LOW

Table 05 - Visual Impact Rating Table

## 2.4 Guidelines and Statutory Framework

An overview of the guidelines, relevant frameworks and considerations of authorities utilised to form the methodology for this LVIA is provided in the following section.

### 2.4.1 State Environmental Planning Policy (Transport & Infrastructure) 2021

State Environmental Planning Policy (Transport & Infrastructure) 2021 (ISEPP) aims to deliver sustainable and effective infrastructure across NSW.

Division 4 - Electricity Generation Works or Solar Energy Systems, section 2.36 (1)b states that any 'development for the purpose of electricity generating works may be carried out by any persons with consent on the following land: (1)b - *'any land in a prescribed non-residential zone'*.

The Site is zoned as SP2 Infrastructure (Electrical Supply) which is not a prescribed a residential zone.

### 2.4.2 Dubbo City Council

The project site is located within Dubbo Local Government Area (LGA). The Site is zoned as SP2 Infrastructure (Electricity Supply) under the Dubbo LEP 2022.

The objectives of SP2 Infrastructure (Electricity Supply) are as follows:

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The proposed development is intended to store and generate electricity which is allowable within this land zoning under the LEP.

### 2.4.3 Energy Strategy & Implementation Plan 2020-2025 Dubbo Regional Council

The Energy Strategy & Implementation Plan 2020-2025 (ESIP) adopted by Dubbo Regional Council in 2020 is designed to support Council in *'reducing energy consumption, increasing energy efficiency, increasing the use and adoption of renewable energy resources and sustainable transport while taking into account the needs and desires of a growing community'*. The Plan ensures for the implementation of renewable projects, and acknowledges battery energy storage systems as an efficient and sustainable cost saving pathway. The report outlines the value of 'energy storage' which ensures energy availability to deploy stored surplus energy when required.

The proposed battery energy storage facility aligns with the Council's vision for a sustainable energy saving model as highlighted within the ESIP 2020.

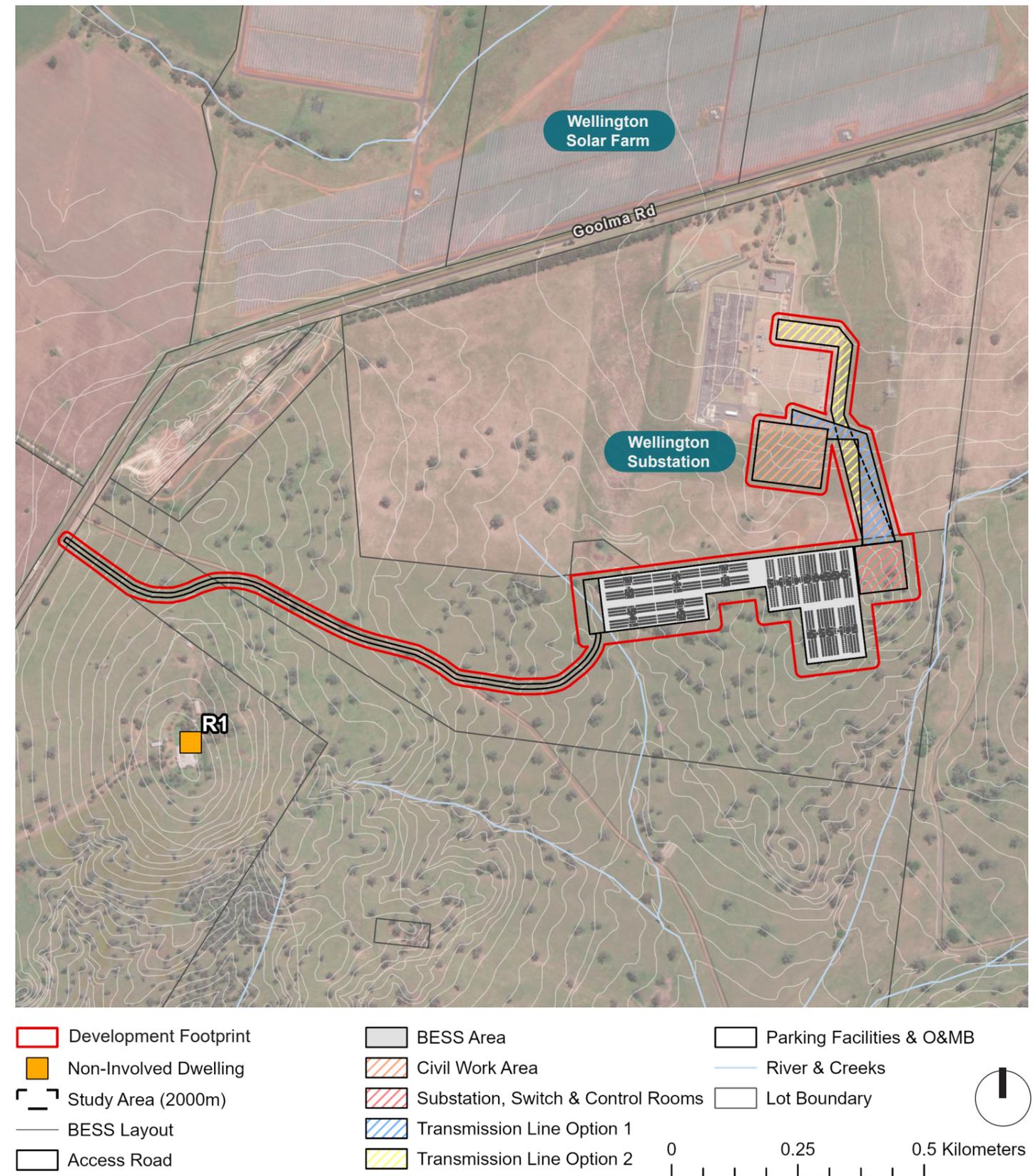
# 3.0 Project Overview

## 3.1 Project Overview

The Project includes the construction, operation and eventual decommissioning of a BESS that would be connected into the electricity grid at the Wellington Transgrid Substation to the north of the Project. During its operational life of approximately 40 years, it would provide electricity storage, assisting the grid's transition to renewable energy sources, as fossil fuel electricity generation is reduced.

Some fundamental elements of the Project include:

- 400MW Lithium-ion BESS (1.6m w x 2.5m d x 3.4m h) providing up to 4hours or 1600MWh of energy storage or 200MW BESS providing up to 8 hours or 1600MWh of energy storage.
- BESS DC segment; each container will be 1.6m wide, 2.5m deep and 3.4m high with up to 18 segments per row
- Rows of DC segments connect to a DC collection segment of similar dimensions to the segments that is joined to the start of the row
- Row of DC segments are connected to a single PCS with multiple inverter modules. The PCS will be 5.3m wide, 1.7m deep and 2.5m high
- Two PCS's are connected to each 7.3MVA medium voltage (MV) transformer with a double low-voltage windings stepping up to 33kV
- MV transformers are grouped via ring main units (RMU), from which 33kV cables connect to the 33kV switchroom. The main transformer structure will be circa 5m high and the isolators and oil tank extend this to 7-8m high
- A new transmission line that would run from the development footprint to the existing Wellington Substation. There are two transmission line options as shown in **Figure 02A & 02B**
  1. Option 1: a 330kV overhead line from the BESS to the southern portion of the Wellington Substation. This option includes two (2) 45m tall transmission poles with a 60m wide clear easement corridor.
  2. Option 2: a 330kV underground line from the BESS to the northern portion of the Wellington Substation. This option would include a 20m wide cable corridor.
- A switchyard and on-site substation (up to a height of 8m)
- National Energy Market compliant metering.
- Internal access track from Goolma Road.
- Security fencing around the perimeter of the BESS (up to a height of 1.8m) with Closed Circuit Television (CCTV).
- An Operations and Maintenance Building (O&MB) (up to a height of 4m).
- A water tank that would be able to supply water to an appropriate ring main and fire hydrants around the BESS.
- Specific areas of vegetation screen plantings.



During the construction phase, temporary facilities would include a laydown area with a secure compound, construction site offices, amenities and parking facilities for construction staff. After decommissioning, most above ground infrastructure would be removed and the site will be returned to the existing land capability, for continued agricultural or alternative appropriate uses. The layout of the Project can be seen in **Figure 02a & 2b**.

A new transmission line will be established between the Project and the existing Substation. This LVIA will assess the overhead transmission line (Option 1) throughout the report, with the underground transmission line (Option 2) assessed separately at the end of report within **Section 10**.

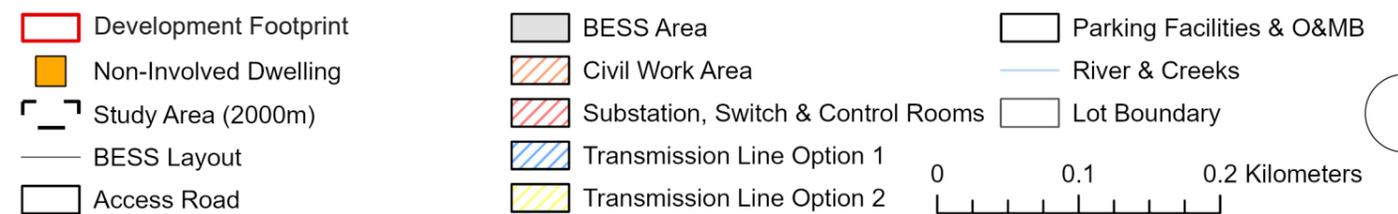
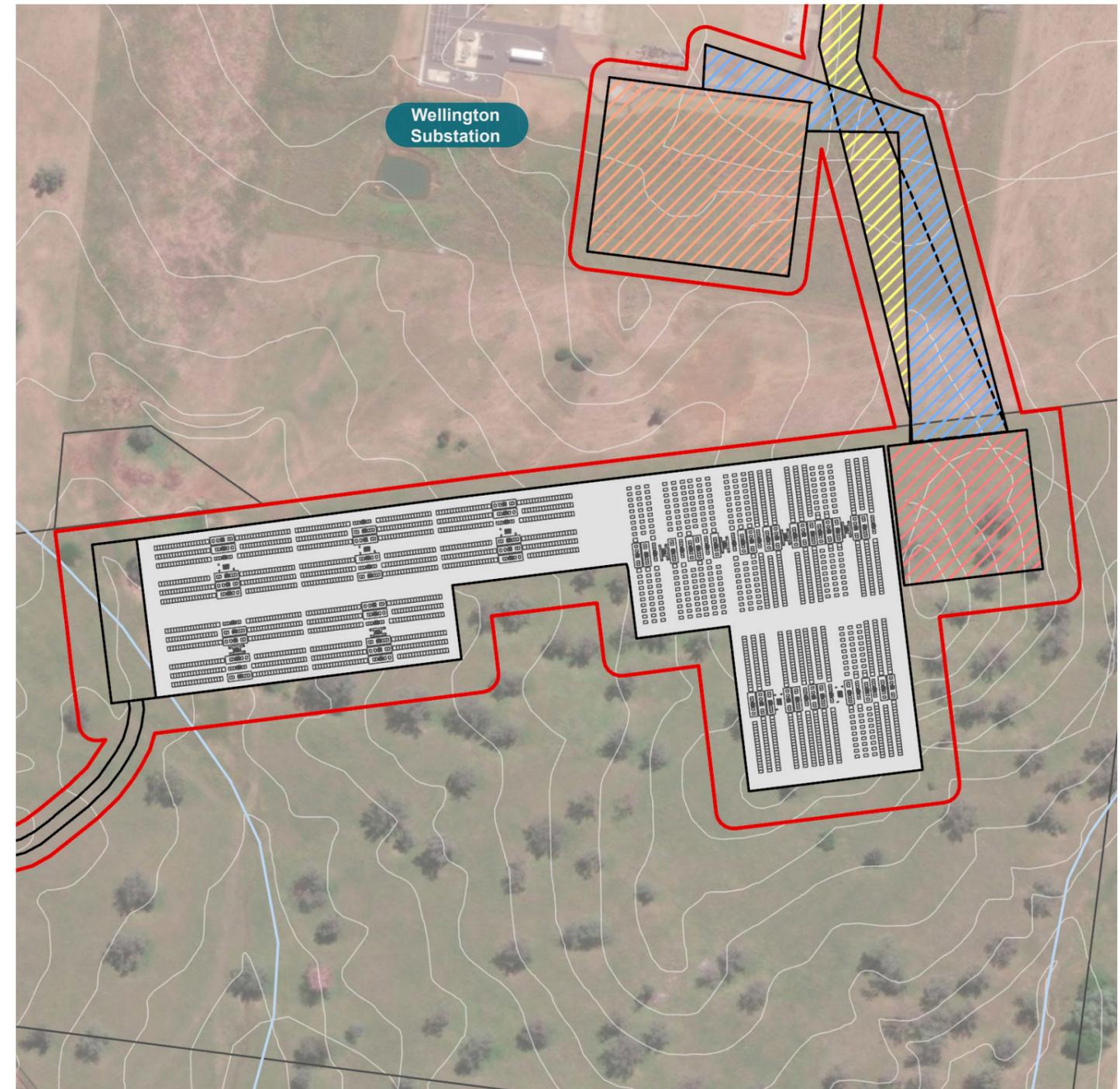


Figure 02B - BESS Layout (source: ESRI ArcGIS, 2022 data provided by NGH)

# 4.0 Existing Landscape Character

## 4.1 Site Description

The Site is located along Goolma Road in Wuuluman, approximately 2.0 kilometres (km) northeast of Wellington, NSW in the Dubbo City Council LGA. The Site is zoned SP2 Infrastructure (Electricity Supply) (refer to **Figure 3B**).

The site consists of scattered vegetation to the south of Wellington Transgrid Substation (WTS). The Wellington Solar Farm (WSF) and infrastructure associated with the WTS including overhead transmission lines are existing visual character elements within the area. The Site is surrounded by rural properties, with the majority of adjoining land parcels zoned as RU1 Primary Production.

The Project Site measures a total area of 41 ha of which approximately 14.8 ha has been utilised for the Project. Observations made during the fieldwork confirm there are no residential building located within the Site. The Project Site is generally flat with cleared areas and some scattered vegetation. The topography of the Project Site gradually rises to form hills to the southwest and southeast of the Project Site with the Macquarie River running approximately 1.5 km south.

Goolma Road connects to the Mitchell Highway to the southwest, with the highway connecting Wellington and Dubbo. There are no public roads to the south of the site, with the Macquarie River forming a boundary between Wellington to the south and rural properties adjoining the Project in the south.

For the purposes of this report, references made to the 'Study Area' is defined by the area of land 2000m from the Project extent as shown in **Figure 03A**.

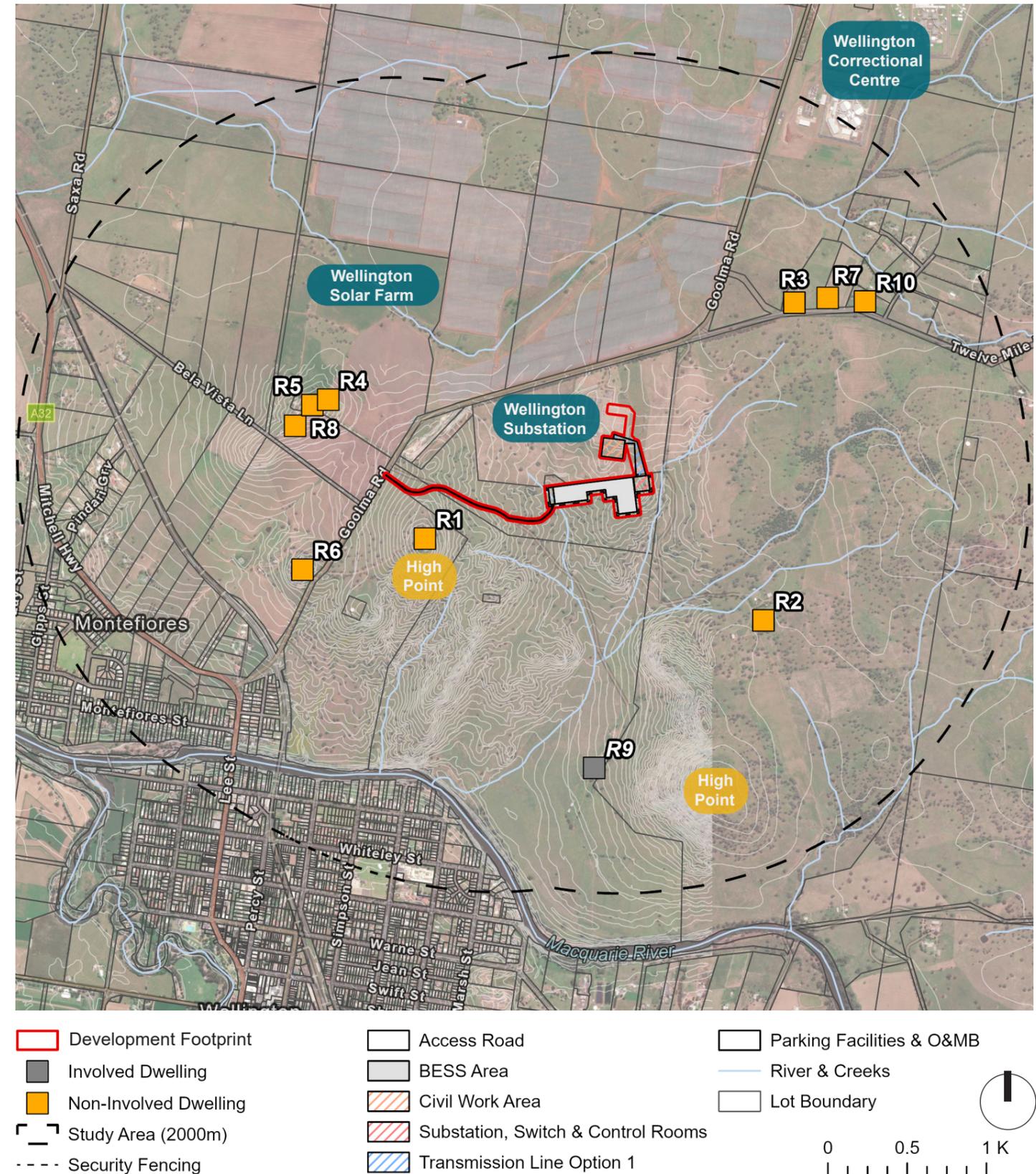
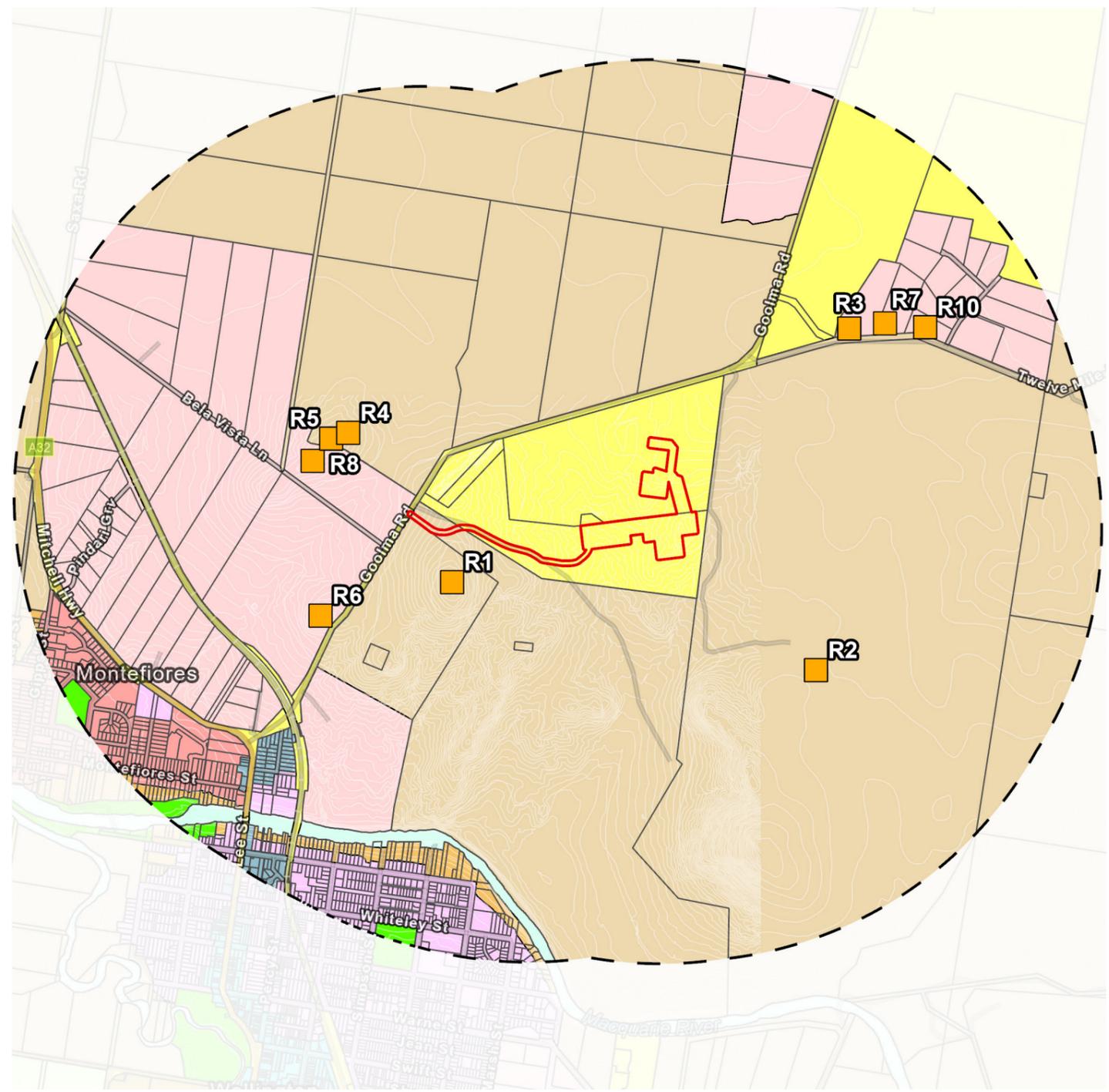


Figure 03A - Wider Site Context (source: ESRI ArcGIS, 2022)



Project Area	Study Area (2000m)	R1	RU1
Non-Involved Dwelling	Lot Boundary	R2	SP1
		R4	SP2
		R5	

0 0.5 1 K

Figure 03B - Land Zoning (source: ESRI ArcGIS, 2022, NSW LEP, 2022)

## 4.2 Existing Landscape Character

The Site is located within a parcel of land recognised as 6945 Goolma Road, Wuuluman. The surrounding character can be described as rural properties with large lots cleared to support farming activities and renewable energy systems. The existing WTS and WSF north of the Site forms an integral part of the existing visual character of the area (refer to **Image 01**).

### 4.2.1 Topography & Hydrological Character

The Site lies within the Macquarie-Bogan Catchment area which is part of the Murray Darling Basin. The Macquarie River spans 960km from Cardina in the northwest to Windamere Dam to the east of the Project Site. There are no creek channels identified within the Site, however there are two first order stream watercourses which connect to the Macquarie River.

Within the Development Footprint, the terrain is gently undulating, ranging between 320 AHD to 360 AHD. The land immediately surrounding the Development Footprint within the Study Area is of a typical undulating character. To the south, the terrain ranges from approx. 300 AHD to 366 AHD to the southwest and to approx. 422 AHD in the southeast.

### 4.2.2 Vegetation

The land surrounding the site has been cleared to support agricultural activities and infrastructure associated with energy production. The character within the Site can be defined as generally cleared with scattered vegetation. There are no known endangered or significant vegetation communities identified within the Site. The vegetation character within the surrounding area includes screen planting along fencelines and nearby residences along Goolma Road. Pockets of dense vegetation are visible along the undulations and lining the Macquarie River to the south towards Wellington.

### 4.2.3 Infrastructure & Facilities

The Project is located south of the WTS and WSF. This infrastructure forms an integral part of the existing visual character when traversing through the area (refer to **Image 03**). The transmission lines, solar panels and other elements associated with the substation are existing features in the wider visual landscape. Landscape screening has been implemented along the northern boundary of the substation to assist with the screening from surrounding land (refer to **Image 02**). Wellington Correctional Centre is located to the northeast of the Project along Goolma Road.



**Image 01** - Existing Transmission Infrastructure to the south of WTS and WSF



**Image 02** - Existing Screen Planting along Goolma Road

#### 4.2.4 Roads

Four roads were identified nearby the Project Site and include Goolma Road, Twelve Mile Road, Bela Vista Lane and Mitchell Highway. The proposed primary access point to the Site will be from Goolma Road. Twelve Mile Road and Bela Vista Lane are low use local roads servicing surrounding dwellings and rural properties. Dense screen vegetation forms part of the typical character along Goolma Road. Mitchell Highway is approximately 1.5 km southwest of the Site, a major road connecting the towns of Wellington and Dubbo.

#### 4.2.5 Towns

Wellington Town Centre is located approximately 4 km southwest of the Project. Other towns located in proximity include Geurie, Wongarbron and Dubbo. Several dwellings surround the Project which are typical rural residential dwellings with vegetation for visual amenity aligning property boundaries.



Image 03 - Views towards Wellington Solar Farm (Drone Image)

#### 4.3 Key Landscape Features

Infrastructure associated with energy production forms an existing part of the visual character of the area. Infrastructure including the solar panels and transmission lines dominant elements within the existing landscape. Gentle undulations in the area often provide expansive views of the surrounding landscape. Views towards the vegetated hills to the south towards Wellington are a key backdrop to the existing visual character (refer to **Image 04**).

Most receptors are located to the northeast, southwest and southeast including residences along Twelve Mile Road, Bela Vista Lane and Goolma Road. Select residences off Goolma Road are positioned on higher elevations and have views towards the Project (refer to **Section 06**). Views from residences along Twelve Mile Road are contained by either topography or vegetation corridors as shown in the Zone of Visual Influence (ZVI).



Image 04 - Typical Character of Surrounding Area (Drone Image)

### 4.4 Landscape Character Zones

As assessment of existing land use and landscape features suggests the Study Area consist of infrastructure associated with energy production, agricultural practices along with rural residential dwellings and the township of Wellington. A number of Landscape Character Zones (LCZs) exist within the Study Area as shown in **Figure 04**, totally six (6) key landscape typologies being identified.

**Table 06** below provides an overview of each LCZs and Scenic Quality Ratings that have been applied as outlined in **Section 2.0**. These ratings have been developed to form part of the assessment in determining the Visual Sensitivity as described in **Section 2.0**.

LANDSCAPE CHARACTER ZONES			
CODE	NAME	GENERAL CHARACTER	SCENIC QUALITY RATING
LCZ01	Gently Undulating Hills	Consists of gentle undulations with scattered woodland vegetation dotted throughout the area including Eucalyptus species spanning northeast of Wellington. It is typical of the landscape character of the local area outside the township of Wellington.	LOW
LCZ02	Waterways & Rivers	Densely vegetated river system forming part of the Macquarie River Catchment. It is visually prominent when entering the township of Wellington.	MODERATE
LCZ03	Grazing & Pastures	Relatively flat and cleared land being used for agricultural practices including grazing and cropping.	LOW
LCZ04	Township	The township of Wellington located to the southwest of the Project has distinctive urban infrastructure and development present. This area has a high level of human influence with the landscape being highly modified. This LCZ has a strong relationship to the Macquarie River (LCZ02).	LOW
LCZ05	Rural Residential	Area consist of rural residential dwellings that has an increased amount of vegetation within the individual property boundaries. The topography is similar to LCZ03, however, there is an increased human presence similar to this LCZ.	LOW
LCZ06	Energy Production Infrastructure & Institutional Development	High presence of energy production infrastructure in this area, specifically the Wellington Solar Farm - a distinctive landscape feature of the area due to the scale. The topography is relatively flat to gently undulating resulting in the solar panel being highly visible and expansive from receptors viewing from Goolma Road.	LOW

Table 06 - Landscape Character Zones



LCZ01 - Gently Undulating Land



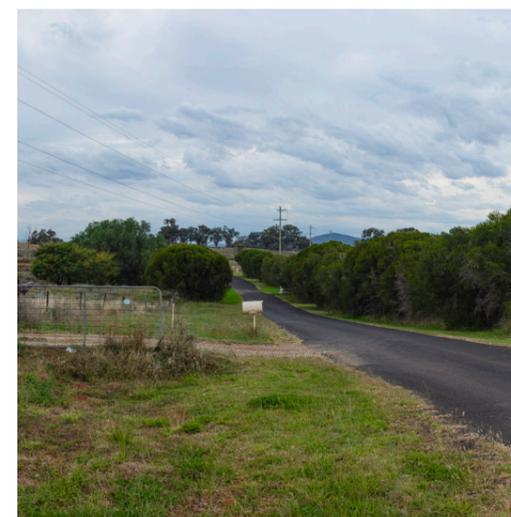
LCZ02 - Waterways & Rivers



LCZ03 - Grazing & Pastures



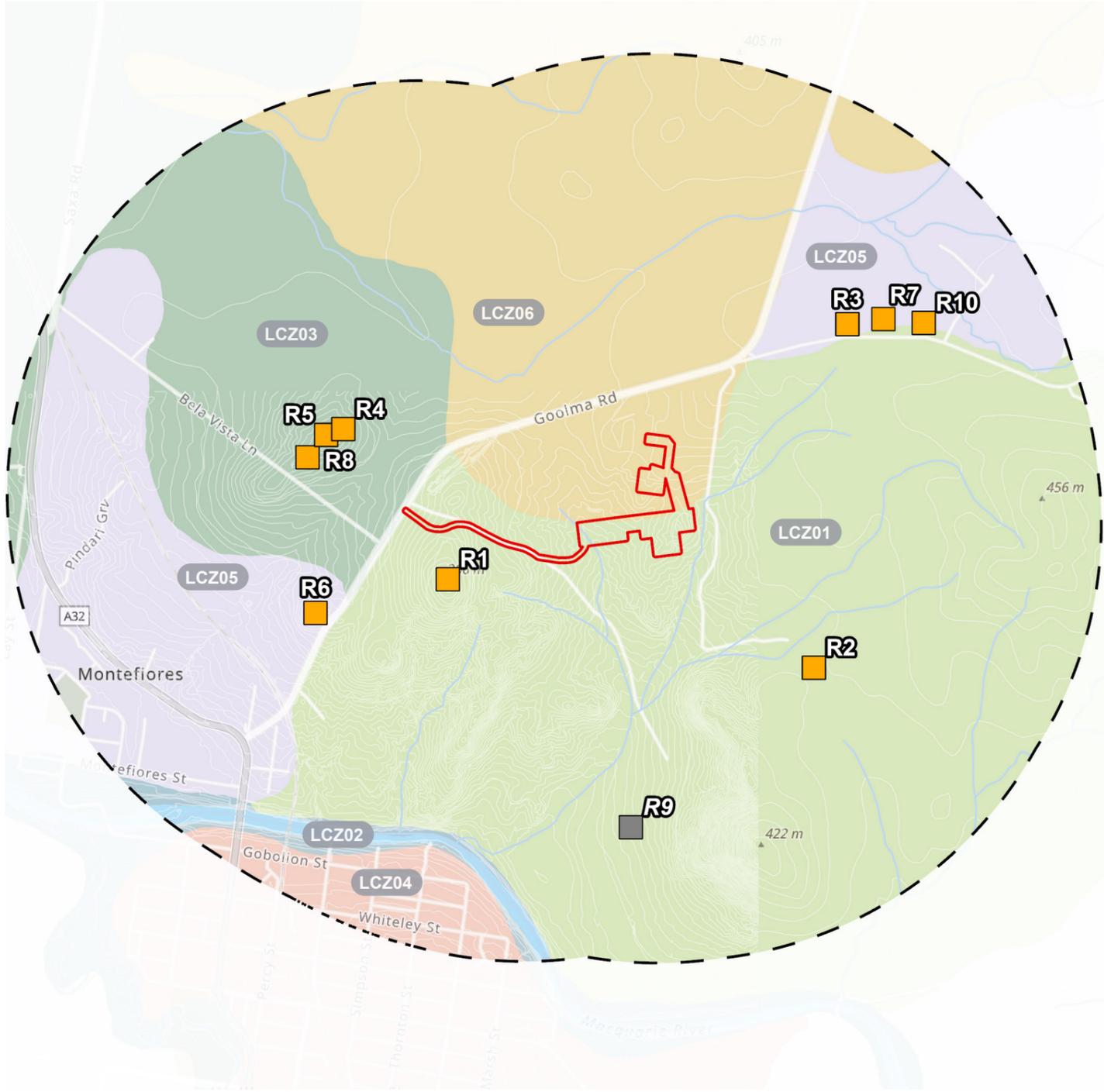
LCZ04 - Township



LCZ05 - Rural Residential



LCZ06 - Energy Production Infrastructure & Institutional Development



Project Area	River & Creeks	LCZ04 Township
Involved Dwelling	LCZ01 Gently Undulating Hills	LCZ05 Rural Residential
Non-Involved Dwelling	LCZ02 Waterways & Rivers	LCZ06 Energy Production
Study Area (2000m)	LCZ03 Grazing & Pastures	

Figure 04 - Landscape Character Zones

# 5.0 Zone of Visual Influence

## 5.1 Overview of Zone of Visual Influence

An initial visibility assessment was undertaken utilising Zone of Visual Influence (ZVI) mapping. This tool assists defining the theoretical areas from which the Project would have potential visibility and create the 'Visual Catchment'.

The ZVI represents the area over which a development can theoretically be seen, and is based on a Digital Terrain Model (DTM). The ZVI is a desktop tool intended to make the fieldwork more efficient by clearly excluding areas that are screened by topography. Fieldwork assessments are then undertaken predominantly within the areas with the potential for visual impacts.

The ZVI usually presents a bare ground scenario - ie. a landscape without screening, structures or vegetation, and is usually presented on a base map. It is also referred to as a zone of theoretical visibility (LIHEMA, 2002). As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.

## 5.2 Summary of Zone of Visual Influence

The ZVI was prepared based on the development footprint of the BESS at a height of 5 metres to represent the worst case scenario. The ZVI identified areas of land to the southwest, west and southeast of the Project from which topography will potentially screen views to the Project. The ZVI indicates the potential to view the Project to the immediate southwest, northwest and northeast of the Project. It is crucial to note that the ZVI is based solely on topographical information and represents a bare ground scenario - i.e. a landscape without screening, vegetation or structures. Generally the ZVI provides the following findings. Topography will screen views from seven (7) non-associated dwellings within 2000m Study Area of the Project. The ZVI has been used to identify areas of potentially high visibility which informed the viewpoint analysis (refer to **Section 6.0**) and identify dwellings requiring detailed assessments.

- Two (2) non-associated dwellings (R1 and R2) have been identified as having open views towards the Project based on topography alone.
- Views towards the Project may be available from areas of the township of Wellington to the south. However, it is likely that vegetation and structures will screen views towards the Project.
- Generally, views towards the Project will be available from the surrounding farmlands in close proximity to the BESS.

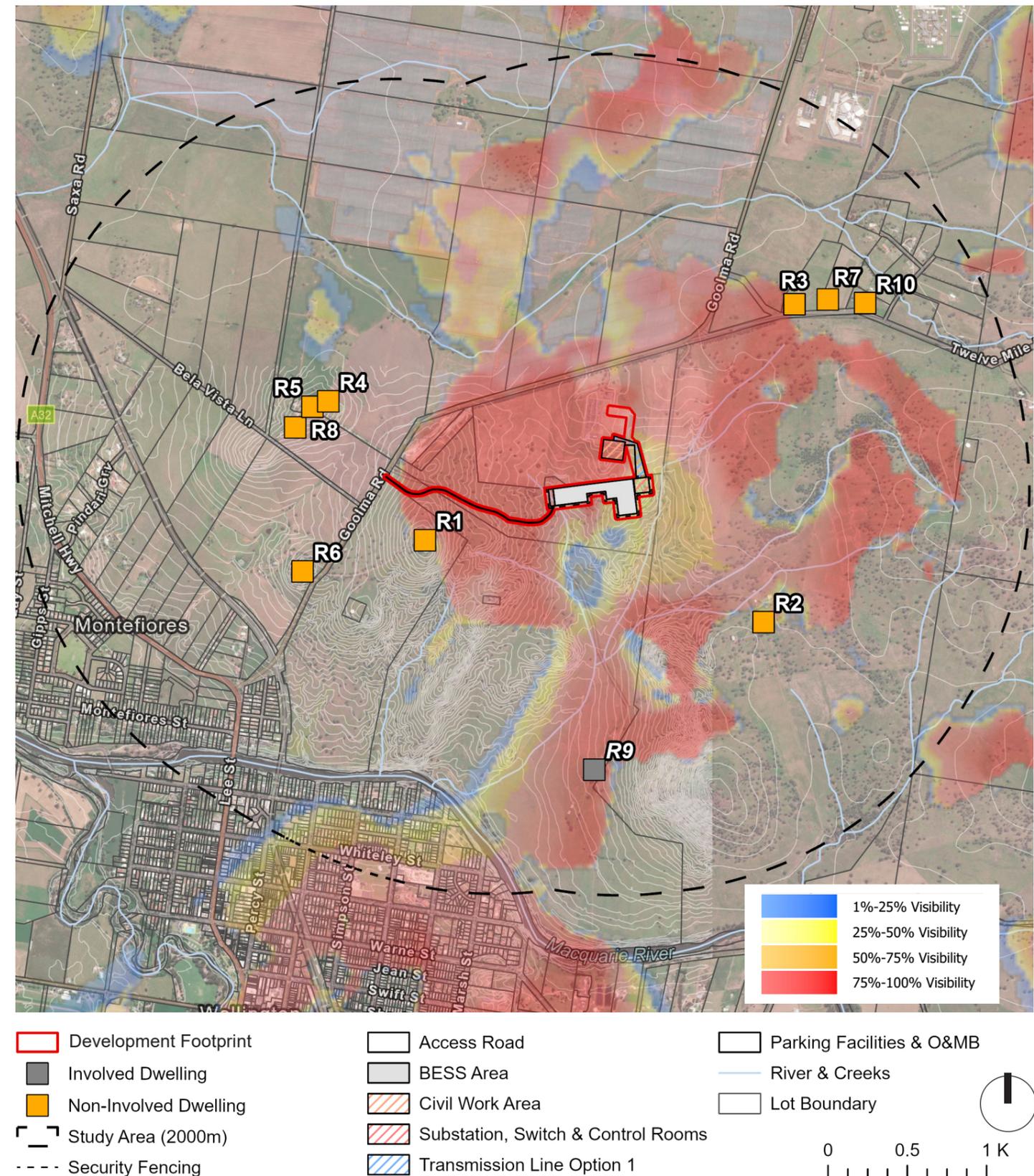


Figure 05 - Zone of Visual Influence (source: ESRI ArcGIS, 2022 & WindPro, 2022)

# 6.0 Viewpoint Analysis

## 6.1 Viewpoint Analysis Methodology

The viewpoint analysis considers the likely visual impacts of the Project on the existing landscape character and visual amenity by selecting prominent sites, otherwise referred to as viewpoints.

Once the viewpoints have been selected, panoramic photographs are taken on a level tripod at a height of 150cm (to represent eye level). Photographs are taken with a Canon EOS 5D Mark IV Full Frame digital SLR through a 50mm fixed focal lens which closely represents the central field of vision of the human eye.

The visual impact of the viewpoints are then assessed both on site and with the topographic and aerial information to ensure accuracy. For each viewpoint, the potential visual impacts are analysed through a combination of the 3D terrain modelling, topographic maps and on site analysis. Viewpoint photographs and analysis have been included in the following pages. The findings of the viewpoint analysis have been quantified and are summarised in **Table 07**.

## 6.2 Viewpoint Selection Process

The locations and general viewing direction of the viewpoints have been identified in **Figure 06**. The selection of viewpoints have been informed by topographical maps, fieldwork observations and other relevant influences such as access, landscape character and the popularity of vantage points. A total of 13 viewpoints have been selected to represent a range of views within the Study Area. Of these, 11 are from publicly accessible locations and two (2) from private non-associated dwellings, identified as R1 and R2.

Viewpoints are selected to illustrate a combination of the following:

- Areas of high landscape or scenic value
- Visual composition (eg. focused or panoramic views, simple or complex landscape pattern)
- Range of distances
- Varying aspects
- Various elevations
- Various extent of development visibility (full and partial visibility)
- Views from major routes

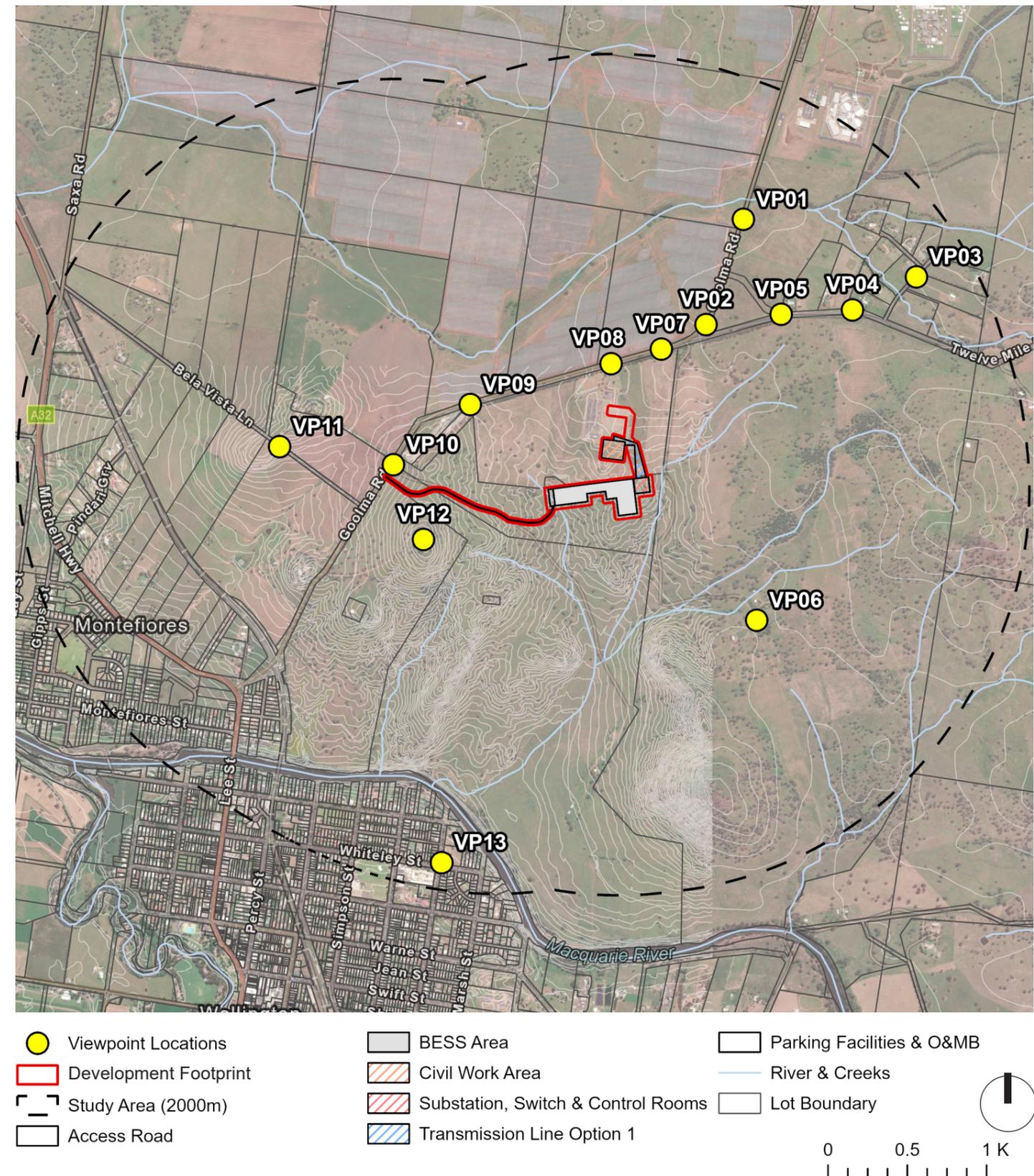


Figure 06 - Viewpoint Locations (source: ESRI ArcGIS, 2022)

### 6.3 Overview of Viewpoint Analysis

As discussed in the rationale for the viewpoint selection process, these viewpoints are representative of the worst case scenario. For each viewpoint, the potential visual impact are analysed through the use of a combination of topographic maps and on site analysis. The visual sensitivity and visual magnitude of each viewpoint have been assessed which, when combined, result in an overall visual impact for the viewpoint (refer to **Table 07**). Of the 13 viewpoints assessed as part of this LVIA

- Ten (10) viewpoints have been identified as having a visual impact rating of 'VERY LOW' and three (3) were rated as 'LOW'.
- It is noted that visual impacts associated with the Project are likely to be higher during the construction phases and ultimately achieve a 'LOW' or 'VERY LOW' visual impact level once the Project is constructed.

The mitigation measures outlined in **Section 11** of this report seeks to avoid, reduce and where possible remedy adverse visual magnitude arising from the Project. The viewpoints that were rated as a 'LOW' visual impact contained limited views to the Project, adequate screening or roadside vegetation which obscures majority of views.

VIEWPOINT	LOCATION	SCENIC QUALITY RATING	RECEPTOR RATING	OVERALL VISUAL SENSITIVITY	VISUAL MAGNITUDE	POTENTIAL VISUAL IMPACT (WITHOUT MITIGATION)	RECOMMENDED MITIGATION	POTENTIAL VISUAL IMPACT (WITH MITIGATION)
VP01	Goolma Road, Wuuluman	LOW	VERY LOW	VERY LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP02	Goolma Road, Wuuluman	LOW	VERY LOW	VERY LOW	LOW	VERY LOW	Not Required	VERY LOW
VP03	Cadonia Drive, Wuuluman	LOW	LOW	LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP04	Twelve Mile Road, Wuuluman	LOW	LOW	LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP05	Twelve Mile Road, Wuuluman	LOW	LOW	LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP06	Off Goolma Road, Wuuluman	LOW	MODERATE	MODERATE	VERY LOW	VERY LOW	Not Required	VERY LOW
VP07	Goolma Road, Wuuluman	LOW	VERY LOW	VERY LOW	MODERATE	LOW	Refer to Section 11	VERY LOW
VP08	Goolma Road, Wuuluman	LOW	VERY LOW	VERY LOW	LOW	VERY LOW	Not Required	VERY LOW
VP09	Goolma Road, Wuuluman	LOW	VERY LOW	VERY LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP10	Goolma Road, Montefiores	LOW	VERY LOW	VERY LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP11	Bela Vista Lane, Montefiores	LOW	VERY LOW	LOW	VERY LOW	VERY LOW	Not Required	VERY LOW
VP12	Off Goolma Road, Montefiores	LOW	MODERATE	MODERATE	LOW	LOW	Refer to Section 11	VERY LOW
VP13	Pierce Street, Wellington	MODERATE	MODERATE	MODERATE	VERY LOW	LOW	Refer to Section 11	VERY LOW

\*Please note the Viewpoint Visual Impact Summary is based on the visibility assessment criteria outlined in Section 2.3 of this report.

**Table 07** - Viewpoint Visual Impact Summary

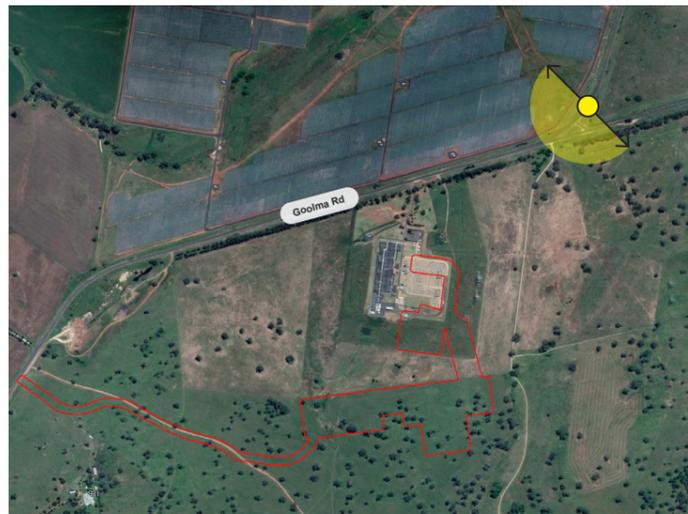
# VP01 Goolma Road, Wuuluman



VP01 Location

VIEWPOINT VP01		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken along Goolma Road towards Wellington. The project is located to the southwest. The terrain is characterised as gently undulating with the land being used to support agricultural and energy production activities. Views are open from this location with scattered vegetation visible within the adjoining paddocks to Goolma Road. Existing energy infrastructure, including solar panels, are key features within this viewpoint.  The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	Views towards the BESS will be unavailable due to distance to the Project and topography. However, views of the transmission line associated with the Project may be available from this location. However, as transmission lines are an existing element of the landscape there is unlikely to change or diminish the visual character from this location.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'3.40"S 148°58'15.66"E		
ELEVATION	359 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO SITE	1.45 km		
LAND USE	Low Use Road, Energy Production/Supply		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

# VP02 Goolma Road, Wuuluman



VIEWPOINT VP02		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken along Goolma Road towards Wellington. The project is located to the southwest. The terrain is characterised as gently undulating with the land being utilised for agricultural and energy production activities. Mount Arthur is visible in the distance to the west. Views are open yet contained by dense vegetation screening views towards the Project along Goolma Road. Existing energy infrastructure, including solar panels are key features within this viewpoint and are visible to the west of the view.  The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	It is likely that the Project will be partially visible from this location. From this location the extent of change to the landscape character and proportion of view effected by the Project is LOW due to the vegetation fragmenting views towards the Project.  The Project is consistent with the existing infrastructure present in the landscape. The proposed transmission towers overground will be partially visible, however, it will be difficult to distinguish due to the existing vegetation.  The visual magnitude is accessed as <b>LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'21.47"S 148°58'8.04"E		
ELEVATION	363 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO SITE	0.86 km		
LAND USE	Low Use Road, Energy Production/Supply		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

VP02 Location

# VP03 Cadonia Drive, Wuuluman

Approximate extent of Project Site



Cadonia Drive



VP03 Location

VIEWPOINT VP03		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Cadonia Drive, Wuuluman NSW 2820	This viewpoint was taken along Cadonia Drive, off Twelve Mile Road within a rural residential area. The Project is located to the southwest. The terrain is characterised as gently undulating with the land being used for rural residential dwellings. Views are open yet contained from this location by dense vegetation along lot boundaries. Existing rural residential dwellings are key features within this viewpoint.  The visual sensitivity of this viewpoint has been rated as <b>LOW</b> .	It is likely that the Project is not likely visible from this location. From this location the extent of change to the landscape character and proportion of view effected by the Project is <b>VERY LOW</b> due to the topographical condition and vegetation containing views towards the Project.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'13.24"S 148°58'50.92"E		
ELEVATION	383 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO SITE	1.77 km		
LAND USE	Low Use Road, Rural Residential		
VISUAL SENSITIVITY	<b>LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

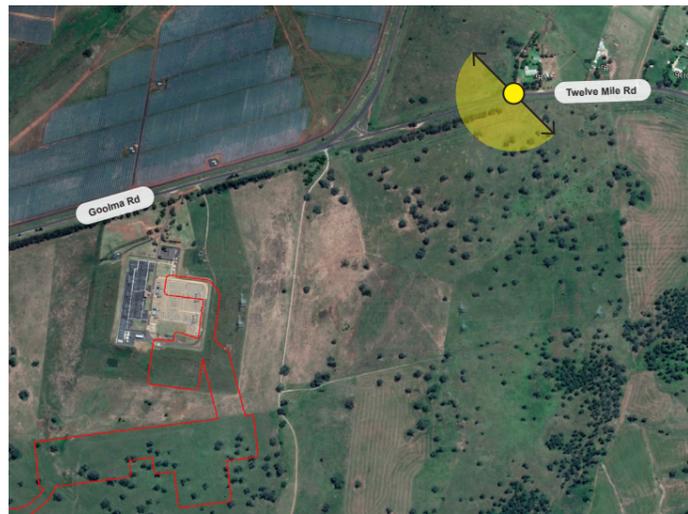
# VP04 Twelve Mile Road, Wuuluman



VIEWPOINT VP04		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Twelve Mile Road, Wuuluman NSW 2820	This viewpoint was taken along Twelve Mile Road near R7 and R10. The project is located to the southwest from this location. The terrain is characterised as gently undulating with the land being used for rural residential dwellings and agricultural activities. Views are open yet contained from this location by vegetation along road edge which screen views towards the Project. Existing rural residential dwellings and scattered vegetation are key features from this viewpoint.  The visual sensitivity of this viewpoint has been rated as <b>LOW</b> .	From this location the extent of change to the landscape character and proportion of view effected by the Project is <b>VERY LOW</b> due to the topographical condition and vegetation containing views towards the Project.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'18.94"S 148°58'37.90"E		
ELEVATION	375 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO SITE	1.40 km		
LAND USE	Low Use Road, Rural Residential		
VISUAL SENSITIVITY	<b>LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

VP04 Location

# VP05 Twelve Mile Road, Wuuluman



VP05 Location

VIEWPOINT VP05		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Twelve Mile Road, Wuuluman NSW 2820	This viewpoint was taken along Twelve Mile Road near dwelling R3. The Project is located to the southwest from this location. The terrain is characterised as gently undulating with the land being used for rural residential dwellings and agricultural activities. Views are open yet contained from this location by dense vegetation along road edge screening views towards the Project.  The visual sensitivity of this viewpoint has been rated as <b>LOW</b> .	From this location the extent of change to the landscape character and proportion of view effected by the Project is <b>VERY LOW</b> due to the topographical condition and vegetation containing views towards the Project.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'19.73"S 148°58'23.32"E		
ELEVATION	372 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO SITE	1.11 km		
LAND USE	Low Use Road, Rural Residential		
VISUAL SENSITIVITY	<b>LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

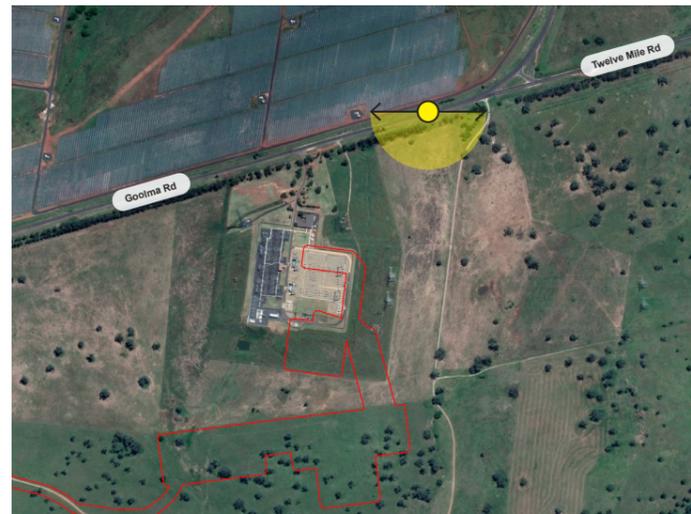
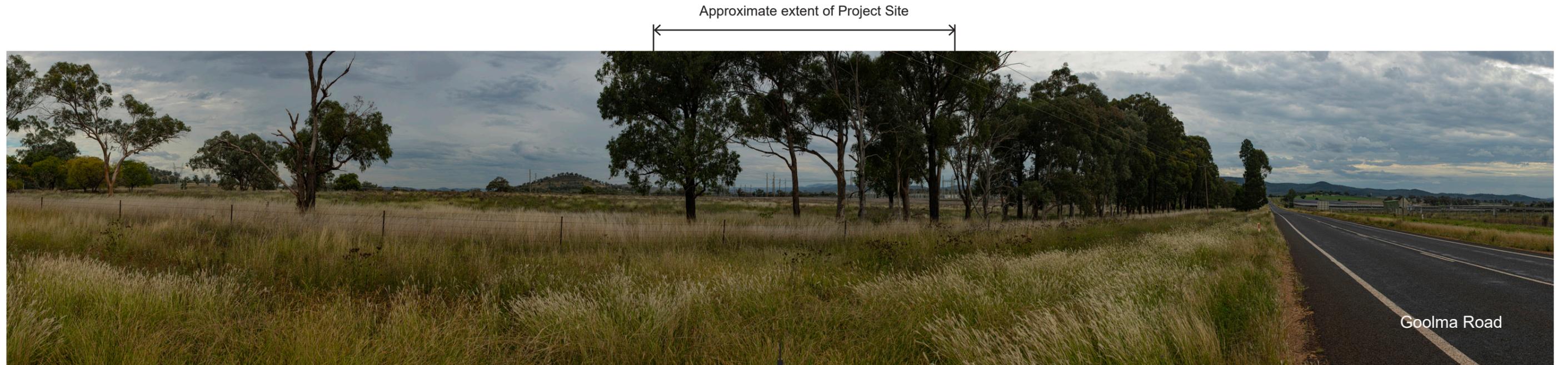
# VP06 Off Goolma Road, Wuuluman



VP06 Location

VIEWPOINT VP06		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken from private dwelling identified as R2, off Goolma Road. The Project is located to the northwest. The terrain is characterised as relatively flat with the land being used as a rural property and for agricultural activities. Views are contained from this location by dense vegetation surrounding the dwelling that screens views towards the Project.	From this location the extent of change to the landscape character and proportion of view effected by the Project is VERY LOW due to the vegetation containing views towards the Project.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°32'12.29"S 148°58'18.36"E		
ELEVATION	343 m	The visual sensitivity of this viewpoint has been rated as <b>MODERATE</b> due to land use and close proximity to dwelling.	
VIEWING DIRECTION	Northwest		
DISTANCE TO SITE	0.88 km		
LAND USE	Rural Property, Agricultural		
VISUAL SENSITIVITY	<b>MODERATE</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

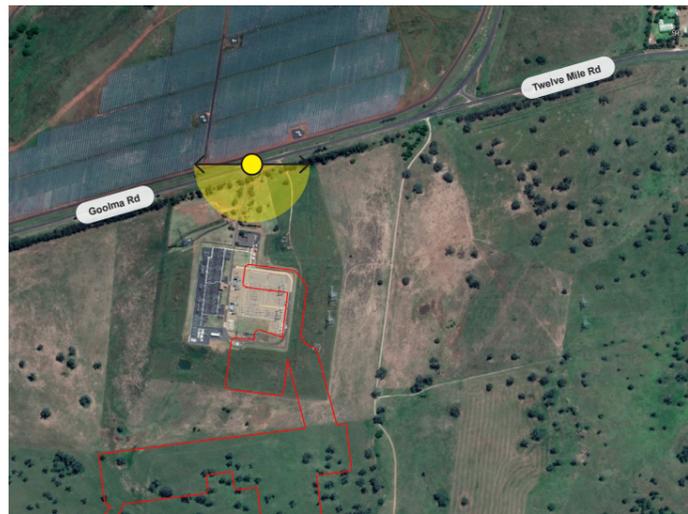
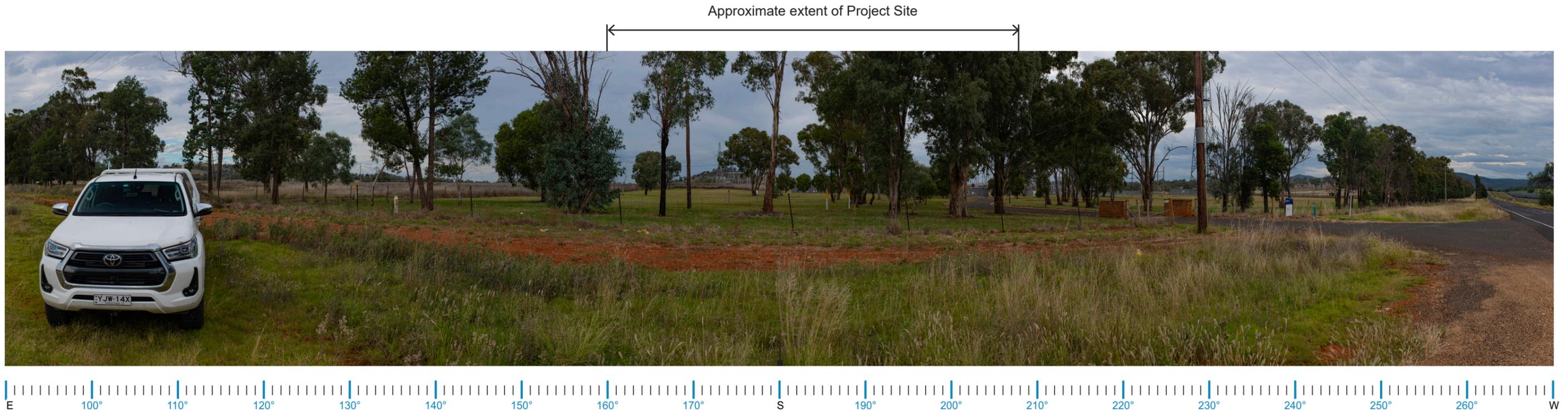
# VP07 Goolma Road, Wuuluman



VP07 Location

VIEWPOINT VP07		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken along Goolma Road towards Wellington. The Project is located to the south. The terrain is characterised as gently undulating with the land being used to support agricultural practices and energy production activities. Views are open from this location with vegetation filtering views towards the Project. Screen planting and existing energy infrastructure including solar panels characterise view from this location.	Due to the proposed scale and location of the Project in comparison to the existing energy production infrastructure, the extent of change to the landscape character by the Project is Low. The Project is consistent to the existing character of the area. The vegetation screening will assist in filtering views towards the Project from Goolma Road.
COORDINATES	32°31'25.72"S 148°57'58.91"E		
ELEVATION	355 m	The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	The proposed transmission tower will be partially visible, however, will be difficult to distinguish from the existing transmission towers associated with the substation and is therefore in keeping with the existing features of the landscape.  The visual magnitude is assessed as <b>MODERATE</b> resulting in an overall visual impact of <b>LOW</b> .
VIEWING DIRECTION	South		
DISTANCE TO SITE	0.67 km		
LAND USE	Low Use Road, Energy Production/Supply		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>MODERATE</b>		
VISUAL IMPACT	<b>LOW</b>		

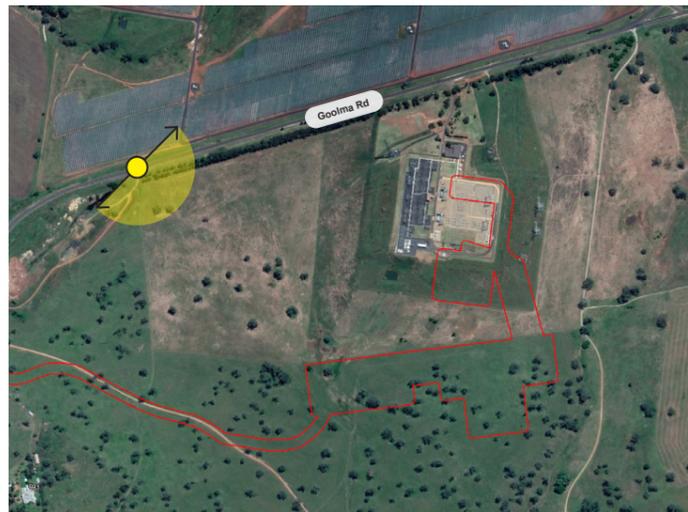
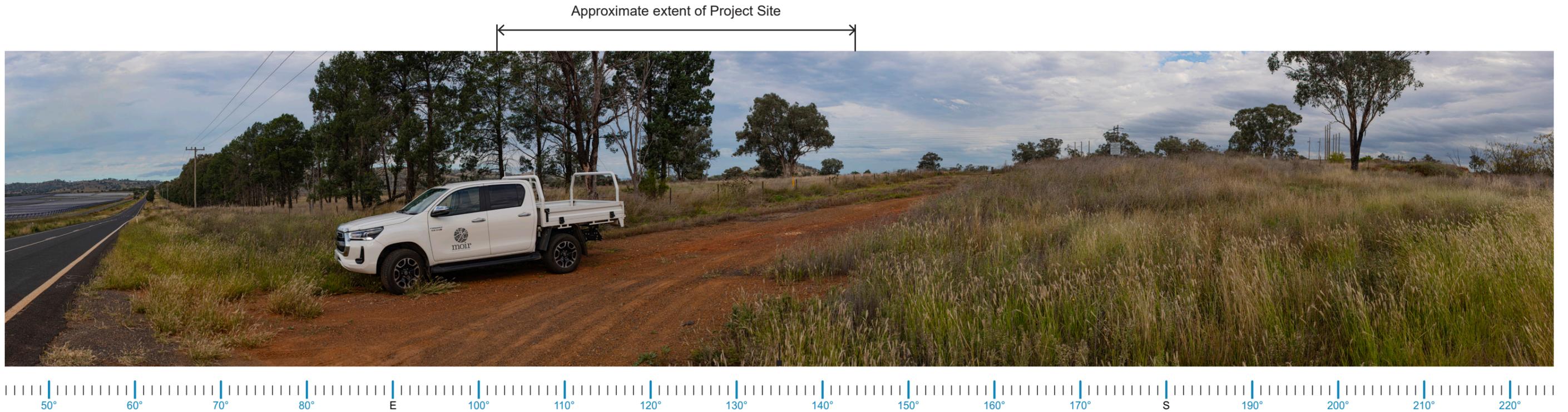
# VP08 Goolma Road, Wuuluman



VIEWPOINT VP08		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken along Goolma Road directly north of the Project. The project is located to the south. The terrain is characterised as gently undulating with the land being used for energy production activities. Views are generally contained from this location by existing vegetation which filters views towards the Project. Screen planting and existing energy infrastructure including the existing substation and transmission lines are key features within this location.  The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	Due to the proposed scale and location of the Project in comparison to the existing energy infrastructure - the extent of change to the landscape character is Low. The Project is to be located behind the existing substation, resulting in the screening of the BESS. The vegetation screening will assist in filtering views towards the Project from Goolma Road. The Project is in keeping with the existing infrastructure present in the landscape. The proposed transmission towers will be partially visible however will be difficult to distinguish from the existing transmission infrastructure associated with the substation.  The visual magnitude is accessed as <b>LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'28.16"S 148°57'48.62"E		
ELEVATION	348 m		
VIEWING DIRECTION	South		
DISTANCE TO SITE	0.62 km		
LAND USE	Low Use Road, Energy Production/Supply		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

VP08 Location

# VP09 Goolma Road, Wuuluman



VP09 Location

VIEWPOINT VP09		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Wuuluman NSW 2820	This viewpoint was taken along Goolma Road towards the Wellington Correctional Centre. The project is located to the southeast. The terrain is characterised as undulating with the land being used for energy production. Views are open yet contained from this location by vegetation lining Goolma Road screening the existing substation and transmission lines. Screening vegetation and existing energy infrastructure including solar panels to the west are key features within this viewpoint.  The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	Due to the scale and location of the Project in relation to the terrain in this location, the extent of change to the landscape character by the Project is <b>VERY LOW</b> . The existing buffer planting is likely to assist in filtering views towards the Project from Goolma Road. The proposed transmission towers will be partially visible, however, will be difficult to distinguish from the existing transmission infrastructure associated with the substation.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'35.20"S 148°57'19.86"E		
ELEVATION	342 m		
VIEWING DIRECTION	Southeast		
DISTANCE TO SITE	0.61 km		
LAND USE	Low Use Road, Energy Production/Supply		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

# VP10 Goolma Road, Montefiores

Approximate extent of Project Site



VIEWPOINT VP10		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Montefiores NSW 2820	This viewpoint was taken along Goolma Road. The project is located to the east. The terrain is characterised as undulating with the land being used to support agricultural activities. Views are contained from this location by the topographical conditions. Scattered vegetation are dotted throughout the adjoining paddocks to Goolma Road. Existing energy infrastructure is visible to the northeast towards the Wellington Solar Farm.  The visual sensitivity of this viewpoint has been rated as <b>VERY LOW</b> .	It is likely that the Project will not be visible from this location. The access road to the BESS will be visible from this location. The extent of change to the landscape character and proportion of view effected by the Project is VERY LOW due to the topographic condition.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'45.53"S 148°57'4.25"E		
ELEVATION	348 m		
VIEWING DIRECTION	East		
DISTANCE TO SITE	0.84 km		
LAND USE	Low Use Road, Agricultural		
VISUAL SENSITIVITY	<b>VERY LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

VP10 Location

# VP11 Bela Vista Lane, Montefiores



VP11 Location

VIEWPOINT VP11		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Bela Vista Lane, Montefiores NSW 2820	This viewpoint was taken along Bela Vista Lane off Goolma Road near R8. The Project is located to the east. The terrain is characterised as undulating with the land being used to support agricultural activities. Views are open from this location due to the topographical conditions. Scattered vegetation is dotted throughout the adjoining paddocks. Existing transmission towers are visible to the northeast because of the scale.  The visual sensitivity of this viewpoint has been rated as <b>LOW</b> .	The Project will not be visible from this location. The extent of change to the landscape character and proportion of view effected by the Project is <b>VERY LOW</b> .  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>VERY LOW</b> .
COORDINATES	32°31'42.43"S 148°56'41.03"E		
ELEVATION	346 m		
VIEWING DIRECTION	East		
DISTANCE TO SITE	1.45 km		
LAND USE	Low Use Road, Agricultural		
VISUAL SENSITIVITY	<b>LOW</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>VERY LOW</b>		

# VP12 Off Goolma Road, Montefiores



VP12 Location

VIEWPOINT VP12		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Goolma Road, Montefiores NSW 2820	This viewpoint was taken at a private dwelling off Goolma Road identified as R1. The project is located northeast from this location. The terrain is characterised as relatively flat surrounding dwelling, sloping down towards the Project site. The land is being used as a rural property and for agricultural activities. Views are contained from this location by dwelling infrastructure and vegetation surrounding the dwelling screening views towards the Project.	The dwelling is located at a high point of the topography looking down onto the Project. Existing energy infrastructure is visible in the distance. It is likely that the Project will be partially visible outside the curtilage of the dwelling. From this location the extent of change to the landscape character and proportion of view effected by the Project is low due to the vegetation and associated buildings screening views of the Project from within the curtilage of the dwelling (as shown in PM02). The proposed transmission towers will be difficult to distinguish with the existing transmission infrastructure within the area. The visual magnitude is assessed as <b>LOW</b> resulting in an overall visual impact of <b>LOW</b> .
COORDINATES	32°31'58.40"S 148°57'10.34"E		
ELEVATION	371 m	The visual sensitivity of this viewpoint has been rated as <b>MODERATE</b> .	
VIEWING DIRECTION	Northeast		
DISTANCE TO SITE	0.69 km		
LAND USE	Rural Property, Agricultural		
VISUAL SENSITIVITY	<b>MODERATE</b>		
VISUAL MAGNITUDE	<b>LOW</b>		
VISUAL IMPACT	<b>LOW</b>		

# VP13 Pierce Street, Wellington

Approximate extent of Project Site



VP13 Location

VIEWPOINT VP13		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
SUMMARY OF VIEWPOINT			
LOCATION	Pierce Street, Wellington NSW 2820	This viewpoint was taken along Pierce Street, within the town of Wellington. The Project is located to the northeast. The terrain is characterised as relatively flat with the land being used for residential dwellings. Views towards the Project are contained from this location by vegetation lining Macquarie River.  The visual sensitivity of this viewpoint has been rated as <b>MODERATE</b> .	From this location the extent of change to the landscape character and proportion of view effected by the Project is VERY LOW due to the distance to the Project and local screening factors.  The visual magnitude is accessed as <b>VERY LOW</b> resulting in an overall visual impact of <b>LOW</b> .
COORDINATES	32°32'53.93"S 148°57'13.99"E		
ELEVATION	302 m		
VIEWING DIRECTION	Northeast		
DISTANCE TO SITE	1.98 km		
LAND USE	Low Use Road, Township		
VISUAL SENSITIVITY	<b>MODERATE</b>		
VISUAL MAGNITUDE	<b>VERY LOW</b>		
VISUAL IMPACT	<b>LOW</b>		

# 7.0 Photomontages

## 7.1 Photomontage Development

A photomontage is a visualisation based on the superimposition of an image of the Project onto a photograph for the purpose of creating a realistic representation of proposed or potential changes to a view. (Horner and MacLennan, 2006). Photomontages have been utilised in this LVIA to assist in the impact assessment of the Project.

### 7.1.1 Photomontage Development Process

Photomontages are representations of the Project superimposed onto a photograph of the Project Site. The process for generating these images involves computer generation of a wire frame perspective view of the Project. This process includes:

- Capturing viewpoint with Canon EOS 5D Mark IV digital SLR through a 50mm fixed focal lens
- Build wireframe model of the Project
- Match wireframe model to viewpoint using rendering software
- Render model into viewpoint to a realistic level

The photo simulations based on photography from typical sensitive viewpoints that are included within the following analysis section. It is noted that a 50mm fixed focal lens closely represents the central field of vision of the human eye.

### 7.1.2 Photomontage Selection Process

Two (2) photomontages of the Project within the existing context were selected as key views and represent general visibility of the Site representative of surrounding dwellings. Photomontages have been prepared for public viewpoint VP07 (**PM01**) and private viewpoint VP12 (**PM02**) (refer to **Figure 7**). A wireframe from a non-associated dwelling, identified as R2, has also been included in this section to provide confirmation on the screening of the Project from within the curtilage of the dwelling. When undertaking a LVIA, viewpoints selected for the preparation of photomontages are generally those viewpoints determined to have the greatest potential for visibility of the Project and the highest visual impact to comparison to other viewpoints analysed. Due to existing roadside vegetation and very low visibility of the Project, the highest visual impact will be experienced along small sections of Goolma Road where vegetation has been cleared, or from receptors at a higher elevation in close proximity of the Project. A combination of topography and intervening vegetation will make the Project indiscernible from other locations and will have a VERY LOW visual impact.

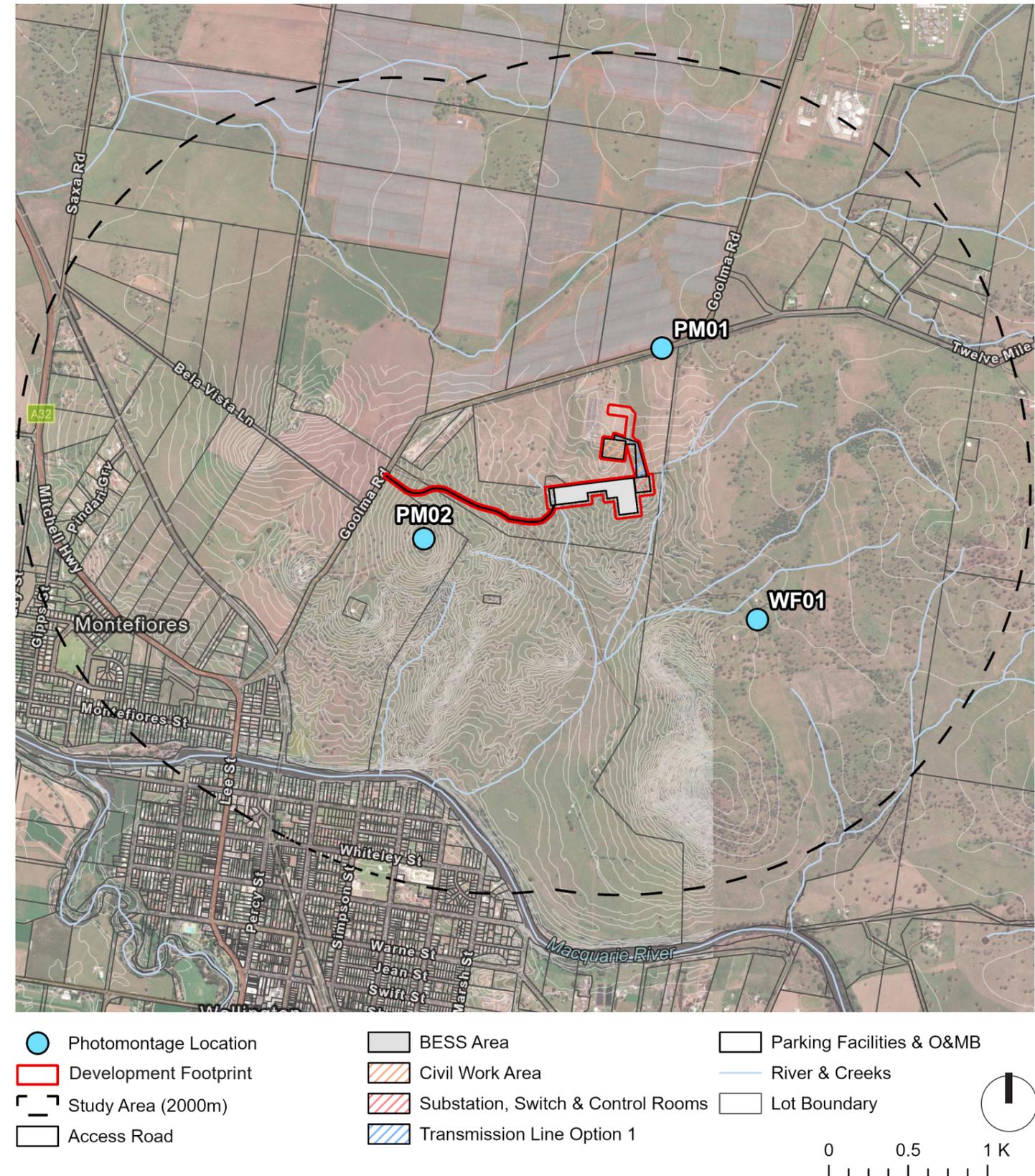
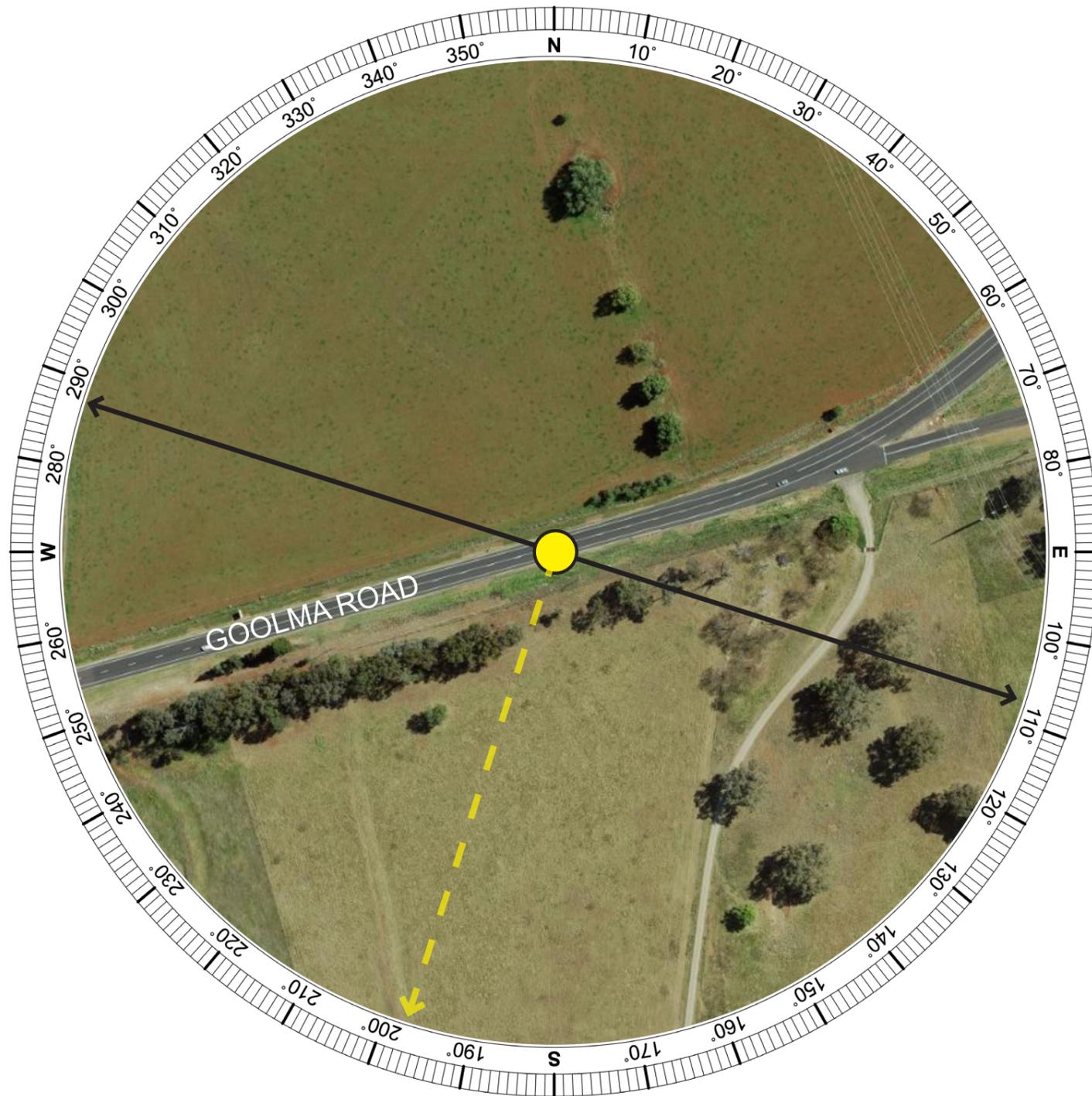


Figure 07 - Photomontage Locations (source: ESRI ArcGIS, 2022)

# PM01 Photomontage 01 - VP07 (Public Viewpoint)



Aerial Image Source: Sixmaps 2022

## PM01 Photomontage 01 - VP07

**Location:**

Goolma Rd, Wuuluman

**Photograph Date and Time:**

19th April 2022 4.00pm

**Coordinates:**

32°31'25.72"S 148°57'58.91"E

**Distance to Development Footprint:**

0.70km

**Viewing Direction:**

South

**Elevation:**

355m

**Representative Dwelling/s:**

n/a

# PM01 Photomontage 01 - VP07 (Public Viewpoint)



180° Existing View



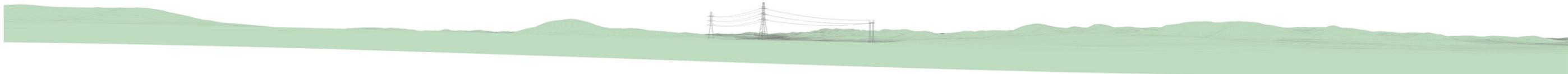
180° Proposed View

Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

Refer to 60 Degree Cropped Photomontage 01



180° Proposed View



Wireframe Diagram

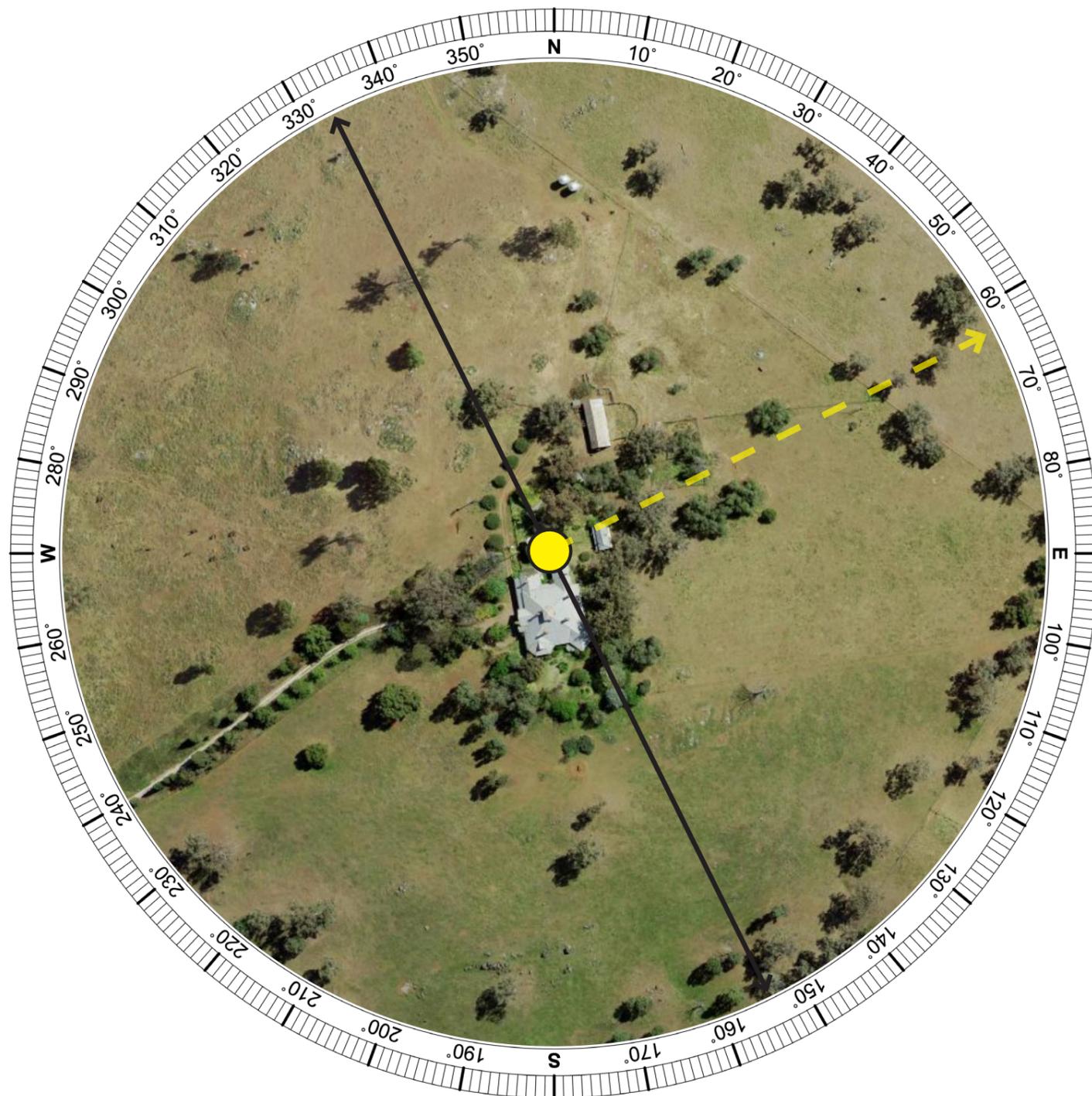
Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

60° Cropped Proposed View



Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

# PM02 Photomontage 02 - VP12 (Private Viewpoint)



Aerial Image Source: Sixmaps 2022

## PM02 Photomontage 02 - VP12

**Location:**

Off Goolma Rd, Montefiores.

**Photograph Date and Time:**

20th September 2022 1.35pm

**Coordinates:**

32°31'58.40"S 148°57'10.34"E

**Distance to Development Footprint:**

0.70km

**Viewing Direction:**

Northeast

**Elevation:**

367m

**Representative Dwelling/s:**

R1

# PM02 Photomontage 02 - VP12 (Private Viewpoint)



180° Existing View



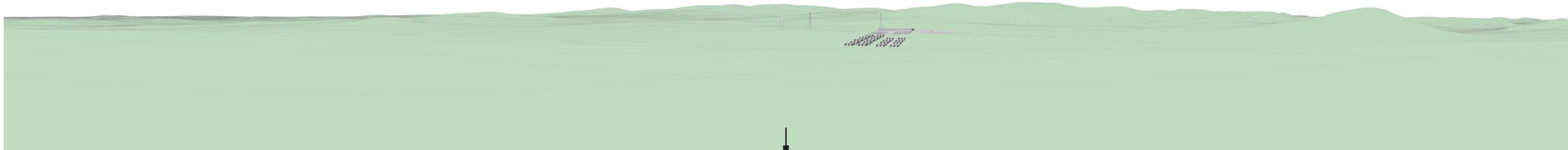
180° Proposed View

Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

Refer to 60 Degree Cropped Photomontage 02



180° Proposed View



Wireframe Diagram

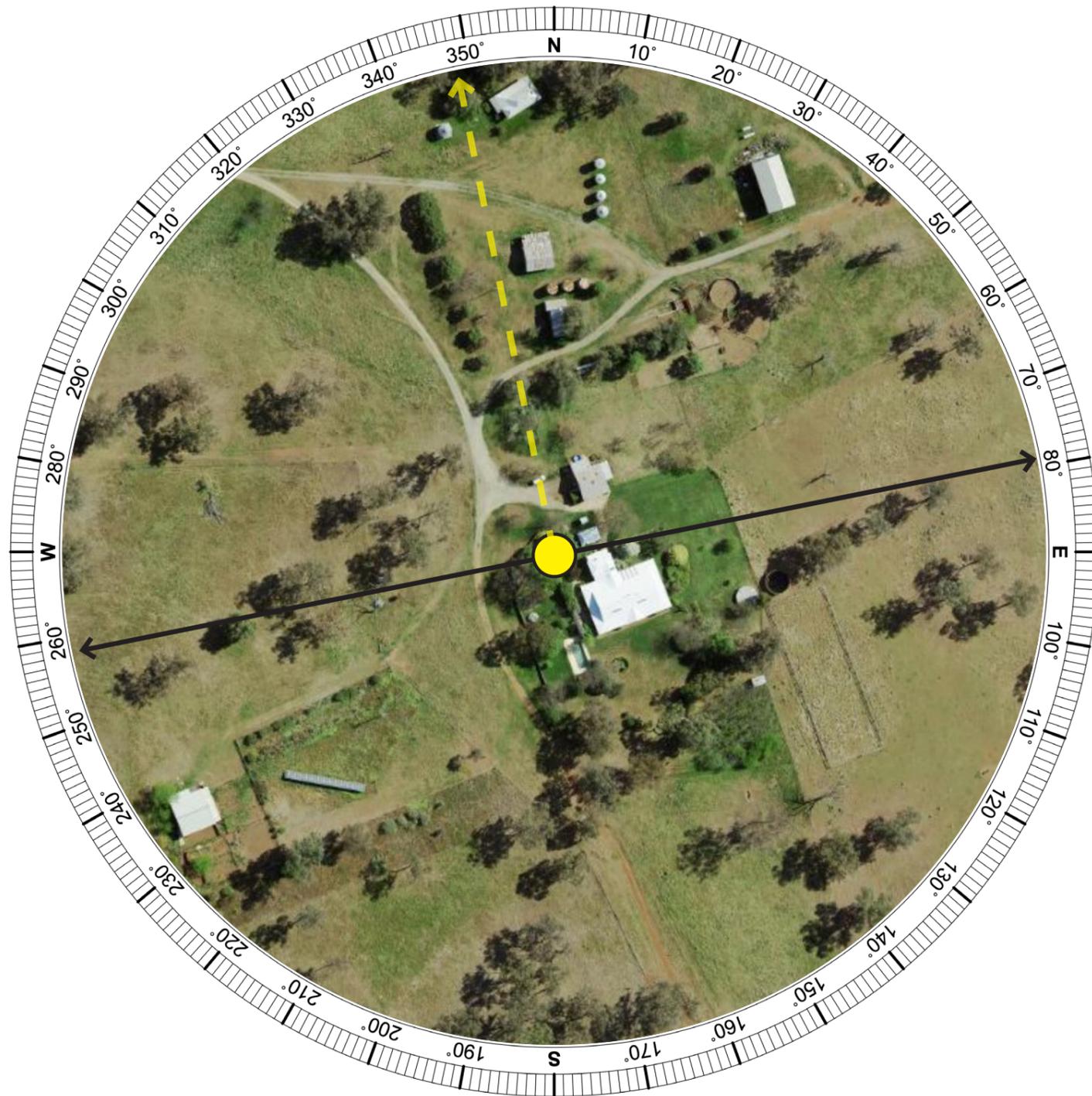
Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

60° Cropped Proposed View



Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

# WF01 Wireframe 01 - VP06 (Private Viewpoint)



Aerial Image Source: Sixmaps 2022

## WF01 Wireframe 01 - VP06

**Location:**

Goolma Rd, Wuuluman

**Photograph Date and Time:**

20th September 2022 1.10pm

**Coordinates:**

32°32'12.29"S 148°58'18.36"E

**Distance to Development Footprint:**

0.85km

**Viewing Direction:**

North

**Elevation:**

341m

**Representative Dwelling/s:**

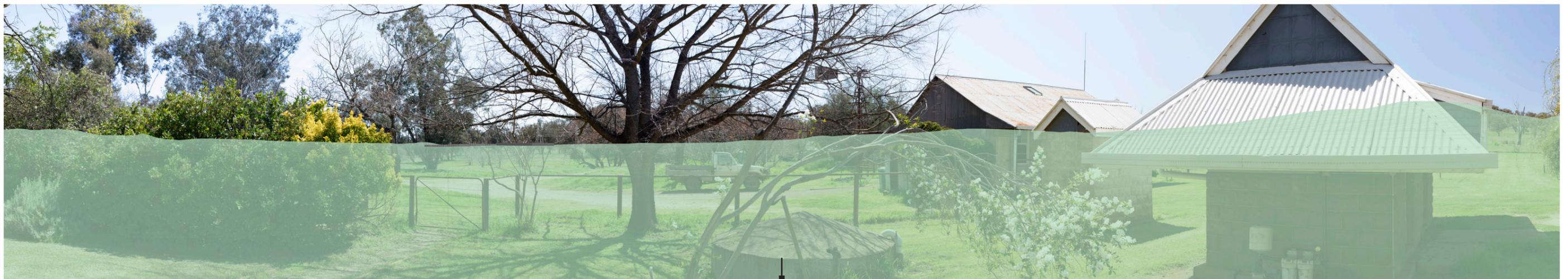
R2

# WF01 Wireframe 01 - VP06 (Private Viewpoint)

Refer to 60 Degree Cropped Wireframe 01



## 180° Proposed View



## Wireframe Diagram

Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

60° Cropped Proposed View



Photomontage representing a massing model of the Project with shapefiles provided by NGH. Refer to EIS Report for all component finishes and details.

# 8.0 Visual Impact Assessment

## 8.1 Overview of Visual Impacts

In addition to the photographic viewpoint assessment, the following section provides an overview of the potential visibility from areas surrounding the Project and how the requirements of various regulatory frameworks are being met. This is by no means an exhaustive description of the visibility from every locality, it is intended to provide an overall assessment of the potential visual impact on areas potentially effected by the Project.

## 8.2 Overview of Visual Impacts on Public Land

The Project will result in a an overall low to very low modification to the existing visual landscape character, as the Project is consistent with the existing infrastructure present within the landscape. There are limited opportunities to view the Project from publicly accessible land outside Goolma Road.

VP13 was selected as a representative viewpoint from the township of Wellington, where the visual magnitude is VERY LOW as the vegetation along the Macquarie River screens views of the Project.

The highest level of visual impact will be experienced when viewing along Goolma Road (refer to **Section 6**). However, the duration of change is minimal as most individuals viewing from these locations along Goolma Road will be in vehicular transport making the Project difficult to distinguish within the existing landscape. This also includes the associated infrastructure and overhead transmission line proposed.

Generally, the Project is not visible from publicly accessible land due to topographic conditions and existing vegetation. Views may be available in areas where there is a break in vegetation, as shown in PM01, however, the visible infrastructure is in keeping with the existing character of the landscape.

## 8.3 Visual Impact Rating Methodology for Residences

MLA has developed a framework for defining and rating the level of visual effect from each dwelling.

The framework in **Table 08** has been prepared with reference to the 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA, 2013), Residential Visual Amenity Assessment (RVAA) and MLA's extensive professional experience in undertaking LVIA's.

GLVIA is well established as providing 'best practice guidance' when undertaking LVIA's and RVAA is a stage beyond the LVIA - focusing exclusively on private views and private visual amenity. Considerations outlined in the RVAA provides a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects include:

- *Distance of property from the proposed development having regard to its size / scale and location relative to the property (e.g. on higher or lower ground);*
- *Type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be effected, having regard to seasonal and diurnal variations;*
- *Direction of view / aspect of property effected, having regard to both the main / primary and peripheral / secondary views from the property;*
- *Extent to which development / landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;*
- *Scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;*
- *Degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;*
- *Duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc. and*
- *Mitigation opportunities – consider implications of both embedded and potential further mitigation.*

(Source: RVAA, 2019)



DWELLING ASSESSMENT TABLE (non-associated dwellings within two (2) kilometres of the Project)																	
I.D	STREET NAME & COORDINATES	ELEVATION	DISTANCE TO PROJECT	VISUAL ASSESSMENT (based on an aerial analysis and zone of influence (ZVI) study)	Dwelling Visual Impact Rating								VISUAL IMPACT RATING (without mitigation)	MITIGATION MEASURES (refer to Section 11)	VISUAL IMPACT RATING (with mitigation)		
					Distance	Views	Direction	Visibility	Scale	Contrast	Duration	Mitigation					
R1	Goolma Road 32°31'58.54"S 148°57'10.66"E	371 m	0.69 km	Based on topography alone, the Project will be partially visible (between 1% - 25%) as shown in the ZVI study. This dwelling is located at a high point within the Study Area. As shown in VP12, views of the BESS are screened by vegetation and associated outhouse buildings. Associated infrastructure will be partially visible, however will be difficult to distinguish from the existing infrastructure.	H										LOW	Refer to Section 11	VERY LOW
M																	
L																	
N																	
R2	Goolma Road 32°32'12.60"S 148°58'19.74"E	344 m	0.88 km	Based on topography alone, the Project will be partially visible (between 1% - 25%) as shown in the ZVI study. This dwelling is located to the southeast. As shown in VP06, views of the Project are screened by vegetation, where the Project, due to the scale is likely to not be visible from within the curtilage of the dwelling.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	
R3	Twelve Mile Road 32°31'17.98"S 148°58'26.06"E	373 m	1.04 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP05 for a nearby public receptor, where the Project will not be visible from this location due to the heavy vegetation screening adjoining nearby pastures.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	
R4	Goolma Road 32°31'34.66"S 148°56'50.92"E	351 m	1.25 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP11 for a nearby public receptor, where the Project will not be visible from this location due terrain containing views.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	
R5	Goolma Road 32°31'35.57"S 148°56'47.70"E	355 m	1.33 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP11 for a nearby public receptor, where the Project will not be visible from this location due terrain containing views.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	
R6	Goolma Road 32°32'3.89"S 148°56'45.68"E	340 m	1.36 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP10 for a nearby public receptor, where the Project will not be visible from this location due terrain containing views.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	
R7	Twelve Mile Road 32°31'17.15"S 148°58'32.85"E	373 m	1.22 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP04 for a nearby public receptor, where the Project will not be visible from this location due to the terrain and heavy vegetation screening adjoining nearby pastures.	H										VERY LOW	N/A	N/A
M																	
L																	
N																	

Table 09 - Dwelling Assessment

DWELLING ASSESSMENT TABLE (non-associated dwellings within two (2) kilometres of the Project)															
I.D	STREET NAME & COORDINATES	ELEVATION	DISTANCE TO PROJECT	VISUAL ASSESSMENT (based on an aerial analysis and zone of influence (ZVI) study)	Dwelling Visual Impact Rating								VISUAL IMPACT RATING (without mitigation)	MITIGATION MEASURES (refer to Section 11)	VISUAL IMPACT RATING (with mitigation)
					Distance	Views	Direction	Visibility	Scale	Contrast	Duration	Mitigation			
R8	Bela Vista Lane 32°31'39.14"S 148°56'44.18"E	351 m	1.38 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP11 for a nearby public receptor, where the Project will not be visible from this location due terrain containing views.	H								VERY LOW	N/A	N/A
					M										
					L										
					N	●	●	●	●	●	●	●			
R10	Cadonia Drive 32°31'17.78"S 148°58'40.47"E	374 m	1.38 km	Based on topography alone, the Project will not be visible due the terrain as shown in the ZVI study. Refer to VP04 for a nearby public receptor, where the Project will not be visible from this location due to the terrain and heavy vegetation screening adjoining nearby pastures.	H							VERY LOW	N/A	N/A	
					M										
					L										
					N	●	●	●	●	●	●				●

Table 09 - Dwelling Assessment (cont.)

## 8.5 Summary of Landscape Character Assessment

Landscape Character Assessment					
LCZ:	Name:	Scenic Quality Rating:	Sensitivity:	Magnitude:	Landscape Character Impact:
LCZ01	Gently Undulating Hills	Low	<b>Low</b> The terrain within this LCZ consists of gentle undulations, with scattered vegetation. This LCZ has been partially modified with key features associated with LCZ06 visible when viewing towards the north.	<b>Low</b> The extent of change within this LCZ from the Project is considered as minor due to its compatibility with infrastructure associated with energy production adjoining this LCZ. High points of the terrain within this LCZ have not been effected visually.	<b>Low</b>
LCZ02	Waterways & Rivers	Moderate	<b>Moderate</b> LCZ consists of the Macquarie River and other minor creek connections. Dense vegetation along the river is present with adjoining land modified for agricultural practices and the township of Wellington.	<b>Very Low</b> The LCZ will remain unaltered as the landscape elements that contribute to its quality remain unchanged. It is unlikely that the Project will disturb key landscape features.	<b>Very Low</b>
LCZ03	Grazing & Pastures	Low	<b>Low</b> Land has been cleared to support pastoral activities and grazing. The LCZ has the capability to absorb the change that may occur due to the Project.	<b>Very Low</b> The LCZ will remain unaltered as the landscape elements that contribute to its quality remain unchanged. It is unlikely that the Project will disturb key landscape features.	<b>Very Low</b>
LCZ04	Township	Low	<b>Low</b> Wellington is the closest town located southwest of the Project. The surrounding landscape has been heavily modified evidenced through widespread clearance of vegetation for transport corridors, dwellings and electrical infrastructure.	<b>Very Low</b> The LCZ will remain unaltered as the landscape elements that contribute to its quality remain unchanged. It is unlikely that the Project will disturb key landscape features.	<b>Very Low</b>
LCZ05	Rural Residential	Low	<b>Moderate</b> LCZ is defined by rural residential dwellings within agricultural land or adjoining the township of Wellington.	<b>Very Low</b> The LCZ will remain unaltered as the landscape elements that contribute to its quality remain unchanged. It is unlikely that the Project will disturb key landscape features.	<b>Very Low</b>
LCZ06	Energy Production Infrastructure & Institutional Development	Low	<b>Low</b> LCZ is defined by large-scale energy production infrastructure and large-scale institutional developments. Wellington Solar Farm due to the scale of the development is a key visual feature of the landscape to the north of Wellington Transgrid Substation.	<b>Low</b> The extent of change within this LCZ from the Project is considered as low due to its compatibility with infrastructure associated with energy production.	<b>Low</b>

Table 09 - Landscape Character Assessment

# 9.0 Nightlighting

## 9.1 Overview of Potential Night Lighting Sources

Due to the relatively isolated location of the Project, very little existing sources of lighting are present at night within the Study Area. Existing lighting associated with homesteads and motor vehicles is dispersed around the Study Area. Isolated receptors within the Study Area experience a dark night sky with minimal light sources. The impact of nightlighting is unlikely to be experienced from inside a dwelling as internal lights reflect on windows and limit views to the exterior.

The requirements for nightlighting on ancillary infrastructure is generally limited to security lighting to the substation and within the operations and maintenance facility. The light sources are limited to low-level lighting for security, night time maintenance and emergency purposes. There will be no permanently illuminated lighting installed. The proposed ancillary infrastructure has been carefully sited to minimise visibility from existing residences and publicly accessible viewpoints. It is unlikely the proposed night lighting associated with the ancillary infrastructure would create a noticeable impact on the existing night time landscape.

## 9.2 Design Principles

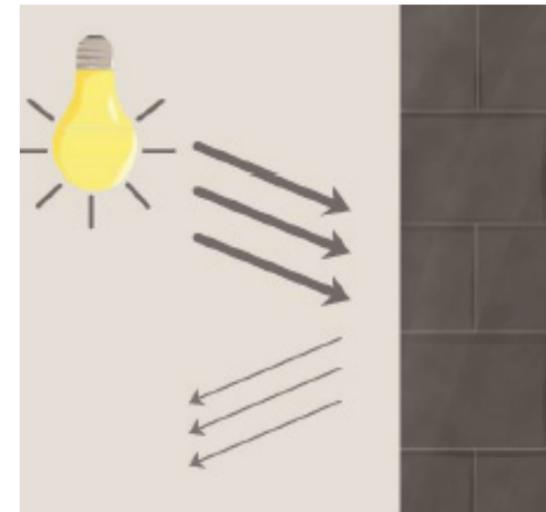
The following recommendations have been developed with consideration of the principles outlined in relevant best practice guidelines for lighting design. The Dark Sky Planning Guidelines have been developed by the Department of Planning and Environment (2016) provide guidelines for lighting practices that support the maintenance of a dark sky and improve lighting practice. The guidelines are related to projects within 200 kilometres of the Siding Spring Observatory, however they provide relevant guidance to reduce potential light pollution can be applied to lighting design for the ancillary infrastructure for the Project. The Australian Government Department of the Environment and Energy, National Light Pollution Guidelines for Wildlife (2020) may also be considered. It is likely there will be limited or no visual impacts resulting from nightlighting of ancillary structures.

### 1. Control the Level of Lighting

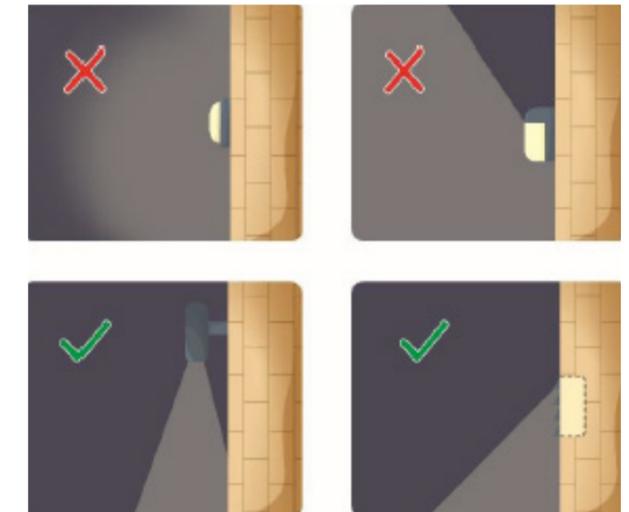
- Only use lighting for areas that require lighting ie. paths, building entry points
- Reduce the duration of lighting
- Switch off lighting when not required
- Consider the use of sensors to activate lighting and timers to switch off lighting

### 2. Lighting Design

- Use the lowest intensity required for the job
- Use energy efficient bulbs and warm colours
- Direct light downwards to eliminate
- Ensure lights are not directed at reflective surfaces
- Use non-reflective dark coloured surfaces to reduce reflection of lighting (**Figure 07**)
- Keep lights close to the ground and / or directed downwards (**Figure 08**)
- Use light shield fittings to avoid light spill (**Figure 9**)



**Figure 07** - Surface Reflectivity  
(source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)



**Figure 08** - Downward Lighting  
(source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)



**Figure 09** - Light Shielding  
(source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)

# 10.0 Cumulative Visual Impacts

## 10.1 Assessment of Cumulative Visual Impact

Cumulative landscape and visual effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future (Landscape Institute, 2008). Cumulative effects may also effect the way a landscape is experienced and can be positive or negative. Where they comprise benefits, they may be considered to form part of the mitigation measures.

A cumulative impact assessment has several dimensions:

- The impact of the proposed development when added to the combined impacts of all other existing developments and environmental characteristics of the area
- The impact of this development in the context of the potential for other infrastructure developments in the local, regional and national context
- The impact of developments which are ancillary to or otherwise associated with the Project eg. the development of substations and associated infrastructure

The potential cumulative visual impact must also be assessed in relation to the potential visual impact when viewed sequentially. If the Project is *'viewed in succession as a traveller moves through the landscape (eg. motorist travel routes or walking tracks) this may result in a change in the overall perception of the landscape character. The viewer may only see one development at a time, but if each successive stretch of the road is dominated by views of a development, then that can be argued to be a cumulative visual impact'* (EPHC, 2010). The Project is set back from major travel routes which prevents any opportunities to view both the developments in succession along major travel routes.

## 10.2 Assessment of Associated Infrastructure

In addition to the BESS, the associated infrastructure (as described in **Section 3.0**) has the potential to contrast with the existing visual landscape. Due to the small scale and the siting of the Project to the south of WTS - access roads, transmission lines and other ancillary structures including the onsite substation, switchroom and control room are unlikely to alter the visual landscape as this infrastructure is already present within the immediate area. An overview of the potential visual impact resulting from the associated infrastructure and Project components are provided below.

### 10.2.1 Substation, Switch Room & Control Room

The substation, switch & control rooms including the insulators and gantries will not alter the visual character of the landscape due to their scale and siting to the south of WTS.

### 10.2.2 Transmission Line (Option 1 - Overhead)

Option 1 consists of a new overhead transmission line connecting the Project to the existing Wellington Transgrid Substation. The new 330 kV transmission line would include one or potentially two transmission poles up to a height of 45 m (worst case scenario). As discussed in **Section 8.0**, the Project is screened by a combination of intervening topography or existing vegetation. It is noted that overall visual impact is minimal overall as it will be difficult for receptors viewing the Project to distinguish the proposed transmission line with the existing infrastructure and transmission lines associated with the Wellington Transgrid Substation, which forms part of visual character of the landscape.

### 10.2.3 Transmission Line (Option 2 - Underground)

Option 2 consists of an underground cable connecting the Project to the existing Wellington Transgrid Substation. This option is subject to detailed design and discussions with Transgrid. Option 2 would have an overall visual impact of the Project of NIL.

### 10.2.4 Access Road, Parking & O&M Building

The proposed site access point is to be located to the southwest of the Project along Goolma Road. The access road will not alter the visual landscape of the area and has been sited to avoid the removal of addition vegetation between the access point and the Project. Similar to the onsite Substation, the O&M Building and associated parking is of similar scale, and will not alter the visual character of the immediate landscape surrounding the Project.

# 11.0 Mitigation Recommendations

## 11.1 Recommended Mitigation Methods

As discussed in **Section 8.0**, the opportunities to view the Project are very low and as a result there are limited areas or receptors that are likely to experience unacceptable or direct visual impacts located within proximity of the Project. The following section outlines recommendations to further reduce any potential visibility of the Project.

### 11.1.1 Design Considerations

Good design principles employed through the Project design phase can significantly reduce the visual impact. These include the siting principles, access, layout and other aspects of the design which directly influence the appearance of the proposed development. The following outlines the design considerations that have been applied to the site:

- Retain existing vegetation aligning Goolma Road associated with the WTS, as it reduces the overall visual impact from receptors viewing from the north. Existing vegetation present around the Site to be retained and protected to maintain the existing level of screening.
- Consideration should be given to the colours of the associated buildings to ensure minimal contrast and to help blend into the surrounding landscape to the extent practicable (see **Image 05**)



**Image 05** - Example of a building colour palette sympathetic to the surroundings

### 11.1.2 Landscape Principles

To ensure that the screen planting integrates into the existing landscape character, the bands should be planted with fast growing small trees and bushes, and low lying vegetation to ensure a naturalistic effect. Plant species are to be selected in keeping with existing plant communities generally present at the site. Additional screen planting in the form of scattered groups could be considered along sections of Goolma Road lacking existing vegetation to further reduce impact of the Project.

The existing character of the landscape allows for a variety of methods of landscaping and visual screening which will remain in keeping with the landscape character. General guidelines to adhere to when planning for landscaping and visual screening include:

- Planting is recommended post construction in consultation with the landowner.
- Planting should remain in keeping with existing landscape character.
- Species selection is to be typical of the area.
- Planting layout should avoid screening views of the broader landscape.
- Avoid the clearing of existing vegetation. Where appropriate reinstate any lost vegetation.
- Allow natural vegetation to regrow over any areas of disturbance.

Locally native plant species are preferred, as they help to preserve the landscape character and scenic quality of the area as well as building habitat for local fauna. Native species are also well-suited to local conditions (ie. soil, climate, etc.) and will build on the existing vegetation assemblages in the area.

# 12.0 Conclusion

## 12.1 Conclusion

With all visual impact assessments the objective is not to determine whether the Project is visible or not visible, it is to determine how the Project will impact on existing visual amenity, landscape character and scenic quality. The intent of the LVIA report is to determine if there is a potential for a negative impact on these factors, and investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

There are limited opportunities to view the Project from publicly accessible land and roads. Overall, three (3) public viewpoints were identified as a 'Low' visual modification to the existing landscape character. Mitigation strategies outlined in **Section 11** will assist in reducing the visual impact experienced at certain locations. The remaining public receptors were identified as having a very low visual impact.

### Summary of Findings:

- Infrastructure associated with energy production forms part of the visual character of the landscape in where the Project is proposed. The overall visual magnitude of the Project is very low, with the Project being comparable with the scale of infrastructure present within the immediate area of the Project, thus not impacting on the scenic quality of the area.
- The Project will not visually alter the the existing landscape character due to the scale and siting to the south of the existing Wellington Trangrid Substation.
- Views toward a small portion of the associated infrastructure may be available from the curtilage from select receptors, however, it will be difficult to differentiate between the proposed and existing transmission infrastructure.
- One (1) non-associated dwelling, labelled as R1 was identified as having a low visual modification from the Project.
- As shown in the wireframe provided for non-associated dwelling R2, the Project and associated infrastructure will be screened by vegetation.

When implemented with the mitigation recommendations, the Project could be undertaken whilst maintaining the character of the area, having a very low visual impact on the surrounding landscape character.

