Appendix 9

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

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Mallee Wind Farm

Landscape and Visual Impact Assessment

Acknowledgement of Country

Moir Landscape Architecture acknowledge the traditional custodians of the lands and waters of Australia, most notably the Awabakal Nation in which our office resides and the Barkindji, Latji Latji and Muthi Muthi and the Yitha Yitha Nation(s), the traditional owners of the lands on which this Project resides. We acknowledge their contribution to our community and their deep connection to the land. We pay our respects to Elders both past and present.

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Mallee Wind Farm

Landscape and Visual Impact Assessment

Prepared for
Umwelt (Australia) Pty Limited

Issue
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Glossary of Key Terms

Ancillary infrastructure - All permanent infrastructure necessary for the construction and operation of the wind farm with the exception of WTGs and battery storage, including but not limited to internal roads, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.

Associated dwelling - Dwellings not located on land within the Project Area or hosting infrastructure, however, the Proponent has a negotiated agreement in place with the landowner regarding Project impacts and are therefore associated with the Project.
For Mallee Wind Farm there are no associated dwellings.

Associated Landholder - The owner(s) of an associated dwelling. An associated landholder has reached a private agreement with Spark Renewables in relation to the Project and management of impacts. An associated landholder is distinct from a host landholder in that no Project infrastructure is proposed to be built on the associated landholder's property.
For Mallee Wind Farm there are no associated landholders.

Battery storage - Compound and technology for storing and discharging energy. Includes the battery energy storage system (BESS), as well as associated buildings, shipping containers and other infrastructure to contain the chosen technology and to connect the battery storage infrastructure with the WTGs, and substations via underground and/or overhead cables.

Bioregion - An ecologically and geographically defined area characterised by its combination of geological features, climate, flora, and fauna.

Cumulative Visual Impact - The combined effects of multiple projects on the visual catchment over time in which the Project is proposed.

Disturbance Footprint - This is the actual disturbance area required for the Project. The Disturbance Footprint is shown conceptually in Figure 3.1. The actual location and extent of the Disturbance Footprint will be determined prior to construction, subject to the micro-siting provisions outlined in this EIS.

Landscape and Visual Impact Assessment - A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenities.

Large-scale development - Works, infrastructure, and buildings that are State Significant Development (SSD).

Landscape character - A distinct, recognisable, and consistent pattern of elements in the landscape that makes one landscape different rather than better or worse.

Baseline Investigation - Work done to determine and describe the environmental conditions against which any future changes can be measured, predicted, and assessed.

Magnitude - A term that combines judgments about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible, and whether it is short or long-term in duration.

Non-associated dwelling - A dwelling on privately- owned land in respect of which the owner has not entered into a private agreement with Spark Renewables in relation to the Project's impacts.

Photomontage - A visualisation that superimposes an image of a proposed development upon a photograph or series of photographs.

Project Area - The Project Area encompasses all land within and including the Project Boundary.

Project Boundary - The outer boundary of the Project Area. The Project Boundary is the maximum spatial extent of potential land access defined by the boundaries of the host landholder properties (i.e. all agreed lots owned by host landholders).

Public Receptor - Publicly accessible locations which have the potential to be visually impacted by the Project. These generally include local roads.

Receptor - Individuals and/or defined groups of people which have the potential to be visually impacted by the Project.

Sensitivity - The capacity of a landscape or viewpoint to absorb the impacts of a proposed land use change and/or built form.

Temporary facilities - Temporary facilities used for the construction, repowering and/or decommissioning of the Project, including but not limited to the temporary workforce accommodation (TWA), site offices,

amenities, construction compounds and laydown areas (including stockpiling and materials storage areas), concrete or asphalt batching plants, minor ‘work front’ construction access tracks, environmental management and monitoring and signage.

View - The sight of a landscape or scene.

Viewpoint - A location or a receptor within the public or private domain with a potential view of the Project.

Viewshed - Observable area from a specific location or a vantage point typically related to a scenic landscape or natural features.

Visual impact - The impact on views from private and public places. It is determined by considering the visual magnitude and sensitivity.

Abbreviations

ADLS - Air Detection Lighting Systems

AGL - Above Ground Level

BESS – Battery Energy Storage Systems

DPHI - Department of Planning, Housing and Infrastructure (formerly known as Department of Planning and Environment)

EIS - Environmental Impact Statement

GIS – Geographical Information System

GGWF – Gol Gol Wind Farm

IBRA - Interim Biogeographic Regionalisation for Australia

LCU - Landscape Character Unit

LGA - Local Government Area

LVIA - Landscape and Visual Impact Assessment report

MCNP - Mallee Cliffs National Park

MDD - Murray Darling Depression Bioregion

MW - Megawatt

MWTT - Multiple Wind Turbine Tool

NSW - New South Wales

PVIA - Preliminary Visual Impact Assessment

SEARs - Secretary's Environmental Assessment Requirements

SSD - State Significant Development

SW REZ - South West REZ

WLR - Willandra Lakes Region

WTG - Wind Turbine Generator

VIZ - Visual Influence Zone

Executive Summary

Introduction
Moir Landscape Architecture (Moir LA) has been commissioned by Umwelt (Australia) Pty Limited on behalf of Spark Renewables (the Proponent) to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Mallee Wind Farm (the Project).

The Project Area is located in the South West Renewable Energy Zone and Murray region of New South Wales (NSW) approximately 16 kilometres (km) north east of Buronga, 114 km north west of Balranald and approximately 17 km north east of Mildura in Victoria. The Project includes the construction, operation and decommissioning of a wind farm up to 76 Wind Turbine Generators (WTGs), an estimated capacity of up to 402 megawatts (MW) and a maximum blade tip height of up to 280 metres (m).

In addition to the WTGs, this LVIA has assessed the proposed battery energy storage facility, permanent ancillary infrastructure, temporary facilities and off-site road works which form part of the proposed Project.

Study Method
Moir LA has utilised a quantitative study methodology with regards to the guidelines of the Wind Energy: Visual Assessment Bulletin (2016) (referred to hereafter as 'the Bulletin'). Relevant literature and guidelines relating to large scale energy projects and Moir LA's previous experience on large scale infrastructure projects have also been considered in the Study Method.

The LVIA includes a comprehensive assessment of the existing landscape character, scenic quality and visibility of the Project. Visual Influence Zones (VIZ) have been established from viewpoints and sensitive receptors and assessed against visual performance objectives outlined in the Bulletin.

Visual Impact on Landscape Character
Field work was undertaken by Moir LA to develop a visual baseline against which the Project has been assessed. The assessment determined the regional landscape character is typical of the Murray region with extensive flat landscapes utilised for grazing and irrigation or dryland cropping. The landscape was categorised into five (5) Landscape Character Units (LCUs). A quantitative frame of reference was applied to establish the Scenic Quality Rating of these LCUs which range from low to high.

The Scenic Quality Ratings are utilised in defining VIZ which are assessed against objectives outlined in the Bulletin.

The flat nature of the landscape will afford expansive, open views of the Project from most public locations. However, the existing landscape character within the Study Area is considered to be of low scenic quality due to it being modified and lacking any distinct landscape features. The assessment found the Project would change the character of the surrounding landscape, however, the landscape was not determined to be sensitive, rare or natural.

Preliminary Assessment Tools
In accordance with the Bulletin, Moir LA applied the Preliminary Assessment Tools to the Project to determine dwelling receptors that require detailed assessment. The assessment identified no non-associated dwellings within 8,000 m of the nearest WTG.

Public Viewpoint Assessment
The VIZ were determined for 25 key public viewpoint locations and where required the landscape scenic integrity was assessed in accordance with the relevant visual performance objectives.

The outcomes of this assessment found that of the 25 viewpoints:

- 23 were identified as VIZ3 (Low)
- Two (2) were identified as VIZ2 (Moderate)

Viewpoints identified as VIZ2 were taken in proximity to the Project. Eight (8) photomontages were prepared from nearby road corridors to demonstrate the potential visual impact from the WTGs. However, it was noted that Arumpo Road, Silver City Highway and Sturt Highway has a low viewer sensitivity level and there were no noted landscape features found to be impacted by the Project from these locations.

Dwelling Assessment
No non-associated dwellings were identified within 8,000 m of the nearest WTG. Additionally, assessment conducted for six (6) lots with dwelling entitlement, based on topography alone, suggested that the Majority of the Project will be visible on all identified lots. However, further desktop assessment indicated that the majority of the lots did not have an existing dwelling and were involved with other large-scale developments

Cumulative Assessment
A cumulative assessment was conducted using the Multiple Wind Turbine Tool (MWTT). The assessment of Gol Gol Wind Farm (GGWF) proposed adjacent to the Project was considered. The cumulative assessment also considered other large-scale developments including Gol Gol Solar Farm, Gol Gol BESS, Mallee Solar Farm, the Project Energy Connect and Euston Mineral Sands project.

The cumulative assessment concluded that although the flat, treeless landscape is ideal for energy generation, yet repeated large-scale developments could alter the region's landscape character, especially when viewed sequentially along major travel routes like Arumpo Road, Silver City Highway and Sturt Highway. Although the Project is unlikely to affect scenic or key landscape features, the cumulative visual impact could make these large-scale developments a defining element of the area's visual character.

Visual Impacts on Conservation Areas

The assessment of the existing landscape character and the viewpoint and photomontage assessments concluded there to be low visual impact on the Mallee Cliffs National Park (MCNP) and the World Heritage Listed Willandra Lakes Region (WLR). The MCNP is predominantly used for conservation and ecological research; public access to the park is restricted. The WLR has been identified as having negligible visual impact due to the considerable distance from the Project (in excess of 25 km).

Mitigation

The Preliminary Assessment Tools identified that there are no non-associated dwellings within the Study Area. Therefore no mitigation measures are required.

Shadow Flicker

A shadow flicker assessment was undertaken in line with the Bulletin. No non-associated dwellings were identified with potential shadow flicker hours. However, it was identified that portions of Arumpo Road are likely to experience shadow flicker on average between 30 - 100 hours per year.

Although there are no guidelines in the Bulletin relating to the acceptable level of shadow flicker on road users, shadow flicker has the potential to cause annoyance to road users. It is important to note that these impacts are based on theoretical modelling and is representative of a conservative amount of shadow flickering. Based on this assessment an acceptable level of impact has been demonstrated and therefore no mitigation measures are required.

Compliance with Performance Objectives

On evaluation, the Project is compliant with the performance objectives as per the Bulletin.

01

Introduction

1.0 Introduction

1.1 Introduction

Moir Landscape Architecture (Moir LA) has been commissioned by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Spark Renewables Pty Limited (Spark Renewables or the Proponent) to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Mallee Wind Farm (referred to hereafter as 'the Project').

The Project will include the installation, operation, maintenance and decommissioning of up to 76 wind turbine generators (WTGs), a single grid scale 100 megawatts (MW) / 200 megawatt hour (MWh) Battery Energy Storage System (BESS), ancillary infrastructure and temporary facilities associated with construction of the Project. The Project will have an installed generation capacity of up to 402 megawatts (MW). Further Project information is provided in **Section 3.4** of this report.

The purpose of this report is to provide a comprehensive assessment of visibility and potential visual impacts associated with the Project on the landscape character, landscape values, landscape amenity and any scenic vistas. The report details the results of the field work, documents the assessment of the landscape character and visual setting, and makes recommendations to assist in the mitigation of any potential impacts resulting from the Project.

This LVIA has been prepared in accordance with the requirements of the SEARs, and the *Wind Energy: Visual Impact Assessment Bulletin (2016)* referred to hereafter as 'the Bulletin'.This LVIA forms a part of the Environmental Impact Statement (EIS) to be submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI). This information will assist the community and DPHI to understand and assess the likely visual impacts.

1.2 Relevant Experience

The Bulletin states: *the proponent is expected to engage professionals from relevant natural resource management and design professions (for example environmental planners, geographers, landscape architects, architects, or other visual resource specialists), with demonstrated experience and capabilities in visual assessment to carry out a wind energy project visual assessment* (DPE, 2016).

Moir LA is a professional design practice and consultancy specialising in the areas of Landscape Architecture, Landscape Planning and Visual Impact Assessment. Our team has extensive experience in undertaking LVIAs for large scale infrastructure projects, in particular renewable energy projects. Our capabilities include digital terrain modelling, viewshed assessment, photo montage development, landscape character assessment and community consultation.

In the context of our experience and with guidance from the Bulletin we have developed methodologies to ensure a comprehensive and qualitative assessment of the Project. Relevant experience includes the assessment of following Wind Energy Projects:

- *Liverpool Range Wind Farm Modification* (Coolah, New South Wales)
- *Crudine Ridge Wind Farm* (New South Wales)
- *Bodangora Wind Farm* (Bodangora, New South Wales)
- *Uungula Wind Farm* (Wellington, New South Wales)
- *Hills of Gold Wind Farm* (Nundle, New South Wales)
- *Jeremiah Wind Farm* (Adjungbilly, New South Wales)
- *Valley of the Winds Wind Farm* (New South Wales)
- *Thunderbolt Wind Farm* (Kentucky, New South Wales)

02

Study Method

2.0 Study Method

2.1 Secretary's Environmental Assessment Requirements (SEARs)

The Project is classified as State Significant Development (SSD) and will be assessed and determined under the provisions of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

The NSW Planning Secretary's Environmental Assessment Requirements (SEARs) issued in February 2023 for the Project (SSD-53293710) state the EIS must address the following specific issues for the wind farm and associated infrastructure:

"Landscape and Visual – including a detailed assessment of the visual impacts of all components of the project (including turbines, transmission lines, substations, battery energy storage system, and any other ancillary infrastructure in accordance with the NSW Wind Energy: Visual Assessment Bulletin (DPE, 2016), including detailed consideration of potential visual impacts on local residences (including approved developments, lodged development applications and dwelling entitlements), scenic or significant vistas and road corridors in the public domain."

On 7 June 2023, a delegate of the Federal Minister for the Environment and Water (formerly Department of Agriculture, Water and the Environment) determined the Project was a controlled action under section 75 of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act controlling provisions for the proposed actions, that are relevant to this LVIA are i. World Heritage Properties (sections 12 and 12A), and ii. National Heritage Places (sections 15B and 15C).

2.2 Wind Energy: Visual Assessment Bulletin

The *Wind Energy: Visual Assessment Bulletin for State Significant Wind Energy Development* was adopted by the then Department of Planning and Environment in December 2016. The Bulletin has been developed to guide the appropriate location of wind energy development in NSW and to establish an assessment framework for the assessment of visual impacts associated with wind energy. Visual impacts are one of a range of issues considered in the assessment and determination of wind energy projects.

The objectives of the Bulletin are to:

- *Provide the community, industry and decision-makers with a framework for visual impact analysis and assessment that is focused on minimising and managing the most significant impacts;*
- *Facilitate improved wind turbine and ancillary infrastructure siting and design during the pre-lodgement phase of a project, and encourage early consideration of visual impacts to minimise conflicts and delays where possible, and provide for a better planning outcome;*
- *Provide the community and other stakeholders with greater clarity on the process along with an opportunity to integrate community landscape values into the assessment process; and*
- *Provide greater consistency in assessment by outlining appropriate assessment terminology and methodologies.*

The visual assessment process is broken into two main stages:

Stage 1: Preliminary Environmental Assessment and
Stage 2: EIS

This LVIA responds to the requirements of Stage 2 of the Bulletin. The Preliminary Visual Impact Assessment (PVIA) prepared for Stage 1 was undertaken by Moir LA in November 2022 and accompanied the Scoping Report lodged with DPHI for the Project. The findings of the PVIA have been considered in the preparation of this LVIA.

In addition, the EPBC Act controlling provisions relate to the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property situated approximately 25 km north west of the Project Area. The PVIA prepared for Stage 1 by Moir LA did not contemplate these provisions (as they were unavailable at the time) however indirect visual impacts have now been considered in the preparation of this LVIA, adopting the same methodologies applied to other relevant aspects in the LVIA. Biodiversity values and Aboriginal Cultural heritage matters are addressed separately within the EIS and more specifically by others within the Biodiversity Development Assessment Report (BDAR by Umwelt, 2024) and Aboriginal Cultural Heritage Assessment (ACHA by Austral Archeology, 2024).

2.3 Overview of the Study Method

In accordance with the Bulletin, the visual assessment includes:

- *Baseline study that includes analysis of the landscape character, scenic quality and visibility from viewpoints of different sensitivity levels;*
- *Establishment of visual influence zones from viewpoints using data collected in the baseline study;*
- *Assessment of the proposed layout against visual performance objectives; and*
- *Justification for the final proposed layout and identification of mitigation and management measures.*

Moir LA has formulated a quantitative study methodology with regards to the Bulletin and with consideration of previous experience on large scale infrastructure projects and relevant literature and guidelines relating to large-scale developments.

Extensive field work and photographic survey work for the study was undertaken in August 2022 and July 2023 from public viewpoints.

2.4 Report Structure

The flow chart on the following page provides a high level overview of the LVIA process utilised to undertake the assessment. **Table 01** provides an outline of the report structure, a brief overview of the objectives of the Bulletin and a summary of how these have been addressed in the LVIA.

Detailed methodologies for each part of the assessment have been included in the relevant chapters of the report.

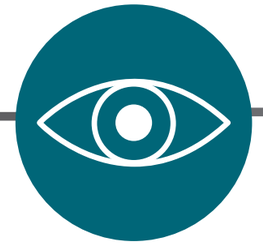
2.5 LVIA Process

Project Overview

Provide an overview of the aspects of the Project and the parameters against which the assessment is based.

Visual Baseline Study

Comprehensive assessment of the existing landscape character to determine the baseline against which the Project will require assessment against. Input from the community to determine landscape values is integral in this phase.

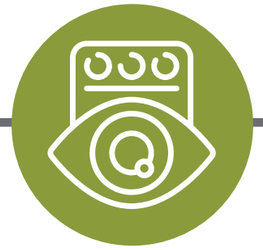


Define the Visual Catchment

Determine the visual catchment through the use of preliminary assessment tools and GIS mapping to determine the extent of visibility and identify areas upon which to undertake detailed assessment.

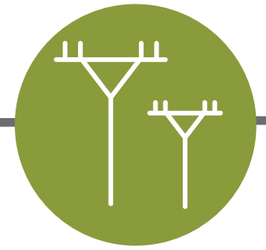
Key Viewpoint Analysis

Undertake assessments from key viewing locations identified within the 'visual catchment' to determine the impact of the Project. This includes an assessment from public and private viewing locations.



Visualisations

The use of visualisation tools (including photomontages and wireframe diagrams) to assist in the assessment of the Project.



Other Considerations

Assessment of other aspects which have the potential to contribute to the visual impact. This includes: an assessment of associated infrastructure, cumulative impact from surrounding Projects and night lighting

Summary and Recommendations

Summary of the findings of the report and preliminary recommendations for reducing the identified impacts.

Landscape and Visual Impact Assessment Report Structure:

PROJECT	**Section 3.0: Project Overview**	**Visual Bulletin Requirements Addressed:**
	• Detailed Project Description • Wind Turbine Design • Associated Infrastructure	• *The VIA is to include a full description of the proposed wind energy project design, the layout, structural elements and scenarios being considered.*
VISUAL BASELINE STUDY	**Section 4.0: Community Consultation**	**Visual Bulletin Requirements Addressed:**
	• Community Consultation Process • Community Landscape Values • Community Perception	• *The proponent is to further consult with the community to verify the community consultation findings from the scoping and design stage.*
	Section 5.0: Visual Baseline Study	**Visual Bulletin Requirements Addressed:**
	• Detailed assessment of Landscape Character and Key Features of the Region • Landscape Character Unit Classification • Application of Scenic Quality Class Ratings	• *A visual baseline study must be undertaken to establish the existing landscape and visual conditions. The baseline study is prepared and evaluated by the proponent prior to undertaking any visual analysis.* • *Describe, assess and map these factors in written and graphic forms supported by photographic representations of the area.* • *Identify Scenic Quality Classes.*
VISUAL CATCHMENT	**Section 6.0: Preliminary Assessment Tools**	**Visual Bulletin Requirements Addressed:**

	Define the Visual Catchment of the Project:
	• Preliminary Assessment Tools:
	  • Visual Magnitude
	  • Multiple Wind Turbine Effect
		• *Visual Magnitude Assessment: Mapping the residences, key viewpoints and proposed turbines at scale to establish the potential visual magnitude.*
		• *Map into six sectors of 60º any proposed turbines and any existing or approved turbines within each dwelling or key public viewpoint.*

	Section 7.0 - Zone of Visual Influence	**Visual Bulletin Requirements Addressed:**
	• Zone of Visual Influence (ZVI)	• *Establish the theoretical 'zone of visual influence' of the proposal (the area from which the proposal is theoretically visible or the 'visual catchment').*
KEY RECEPTOR ASSESSMENT	**Section 8.0: Public Viewpoint Analysis**	**Visual Bulletin Requirements Addressed:**
	Assessment of viewpoints from areas identified within the visual catchment. **Refer to Appendix B - Public Viewpoint Analysis**	• *All key public viewpoints and individual residences within the 'visual catchment' should be identified and assessed.* • *The visual performance objectives form the principle framework and guide for assessing the proposed wind energy project when applied to individual viewpoints.*
	Section 9.0: Dwelling Assessment Overview	**Visual Bulletin Requirements Addressed:**
	• Summary of impact on Residences.	• *All key public viewpoints and individual residences within the 'visual catchment' should be identified and assessed.*
VISUALISATIONS	**Section 10.0: Photomontage & Wireframe Diagrams**	**Visual Bulletin Requirements Addressed:**
	• Photomontage selection process • Photomontage development process **Refer to Appendix C - Photomontages**	• *Photomontages shall be prepared in accordance with the Scottish Natural Heritage Visual Representation of Wind Farms.* • *The visual assessment needs to include a concise description of the complete methodology used to create any photomontages presented in the visual assessment.*
	Section 11.0: Shadow Flicker & Blade Glint Assessment	**Visual Bulletin Requirements Addressed:**
	• Shadow Flicker Assessment • Blade Glint Assessment	• *An assessment of the number of hours of potential 'shadow flicker'.* • *Blade Glint.*
OTHER ASPECTS	**Section 12.0 Night Lighting**	**Visual Bulletin Requirements Addressed:**
	• Night Lighting Assessment	• *Consider whether any obstacle lighting required is likely to result in any significant increase in visual impacts.*
	Section 13.0 Cumulative Visual Impacts	**Visual Bulletin Requirements Addressed:**
	• Cumulative Visual Impacts	• *Address potential cumulative impacts of wind energy projects in the region (the wind energy project as well as existing and approved projects).*
	Section 14.0 Associated Infrastructure	**Visual Bulletin Requirements Addressed:**
	• Overview of impact resulting from Associated infrastructure	• *The assessment of visual impacts from all ancillary facilities and infrastructure will be required.*
	Section 15.0 Visual Impact on Landscape Character	**Visual Bulletin Requirements Addressed:**
	• Overview of LCUs with regards to Visual Performance Objectives • Summary of impact on Landscape Character	• *Assess the Project using visual performance objectives.*
SUMMARY AND RECOMMENDATIONS	**Section 16.0 Mitigation Methods**	**Visual Bulletin Requirements Addressed:**
	• Wind Farm Design	• *An outline of any mitigation and management options proposed, including consultation with affected property owners regarding the proposed mitigation works.*
	Section 17.0 Visual Performance Evaluation	**Visual Bulletin Requirements Addressed:**
	• Evaluation of Visual Performance Objectives	• *An assessment of the proposed wind energy project against each visual performance objective and demonstration of whether each objective is achieved and how the standard has been achieved.*
	Section 18.0 Conclusion	

Table 01 – Report Structure

2.6 Additional Literature

In addition to the Bulletin, the following literature has assisted in the formulation of the study methodology and where relevant has been referenced in the report:

- *Scottish Natural Heritage, Visual Representation of Wind Farms - Guidance (2017)*
- *Environment Protection and Heritage Council, Draft National Wind Farm Development Guidelines (2010)*
- *Landscape Institute and Institute of Environmental Management & Assessment, Guidelines for Landscape and Visual Impact Assessment Third edition (2013)*
- *Clean Energy Council, Best Practice Guidelines for Wind Energy Development (2018)*

2.7 Policy Considerations

2.7.1 Local Government Policies

The Project is an SSD and will be assessed as such by the NSW DPHI. The Project is located within the extents of the Wentworth Shire Local Government Area (LGA). Relevant local government policies outlined in the Wentworth Shire Local Environment Plan (LEP) of 2011 will be applicable for the Project.

2.7.2 NSW Roads and Maritime Services

The assessment of shadow flicker, blade glint and reflectivity is to consider impacts on road users. This has been included in **Section 11.0** of this LVIA.

2.7.3 Civil Aviation Safety Authority

The LVIA includes an assessment of potential visual impact associated with night lighting in accordance with the Civil Aviation Safety Authority (CASA). Refer to **Section 12.0** of this LVIA.

03

Project Overview

3.0 Project Overview

3.1 Regional Context

The Project is located within the Wentworth Shire LGA in the Murray region of NSW. It is situated approximately 16 kilometres (km) north east of Buronga and approximately 114 km north west of Balranald. The Project is located on land associated with expansive farming. Mildura in Victoria is located approximately 17 km south west of the Project. The Sturt Highway is a major transport road corridor located within close proximity to the Project (refer to **Figure 01**).

The Project is located on expansive operating pastoral and farming land. Arumpo Road passes through the Project. Arumpo Road is an important road connecting the surrounding towns to the World Heritage Listed Willandra Lakes Region (WLR), inclusive of both the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property) and the Mungo National Park. Mungo National Park lies approximately 50 km north east of the Project. The Project can be accessed directly from Arumpo Road.

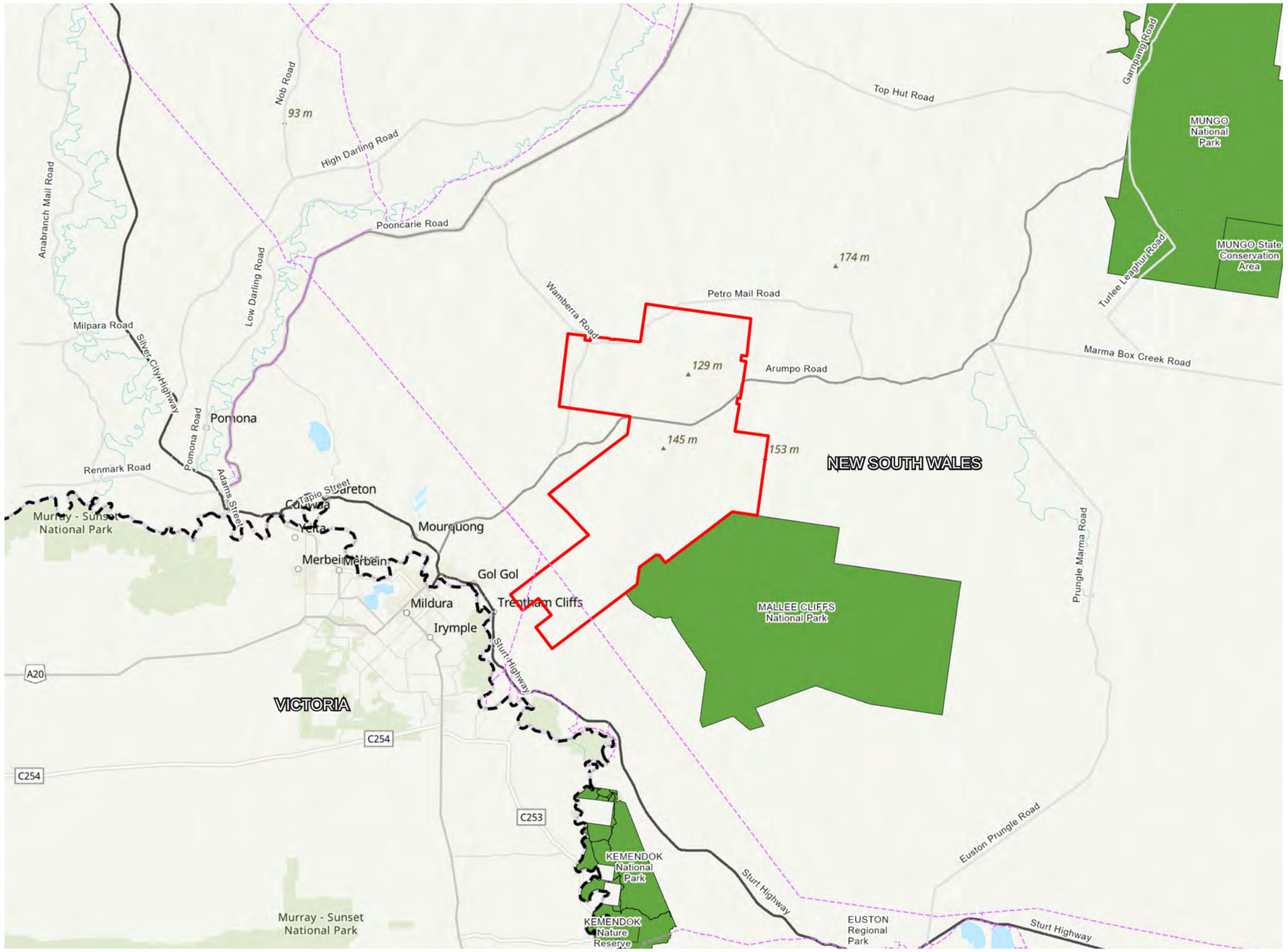
The Project is located within the South-West Renewable Energy Zone (SW REZ). The SW REZ was formally declared by the NSW Minister for Energy on 4 November 2022. The declared SW REZ has an intended transmission capacity of 2.5 GW (EnergyCo NSW, 2022). The Project is therefore strategically located in a broad area identified as suitable for renewable energy projects.

The South-West Region has been identified as having high solar and wind renewable energy resource potential. The Project will deliver energy into the new transmission line, approved and currently under construction under Project EnergyConnect (EnergyCo NSW, 2022) (SSI-9172452).

The region presents opportunities for the development of wind and solar farm sites. Currently a number of renewable energy projects are proposed and in various stages of the planning process. The nearest proposed large-scale developments include the Gol Gol Wind Farm (GGWF) and Gol Gol Solar Farm located west of the Project, Mallee Solar Farm located south west of the Project and the Euston Mineral Sands Project overlapping with the Project Area to the south. The potential cumulative impacts of these, and other proposed large-scale developments have been discussed in **Section 13.0** of this report.

Regional Context

Mallee Wind Farm



Project Boundary
State Border
Primary Road
Arterial Road
Sub Arterial Road
Existing Transmission Line
National Park, Reserves and State Conservation Area

STATE CONTEXT

Figure 01 – Regional Context
Source: ArcGIS, 2024

3.2 Study Area

The Study Area refers to the land associated with and surrounding the Project. For the purpose of this report, the Study Area is generally defined by an 8,000 metres (m) radius around the Project, however assessment of land outside of this radius has been undertaken as necessary, as the area is defined by a flat topographic character. **Figure 02** provides a birds eye view of the Study Area and illustrates the surrounding landscape character including the adjacent Mallee Cliffs National Park (MCNP), the Murray River, Buronga and Gol Gol to the south and Lake Gol Gol to the west of the Project.

Figure 02 – Birds Eye View of the Study Area
Source: Google Earth, 2024

3.3 The Project Area

The Project Area is located approximately 16 km northeast of Buronga, close to the NSW-Victorian state border and covers approximately 57,330.31 hectares. The Project Area is located on relatively flat land at an elevation of approximately 110 m with a good available wind resource. The Project Area is located primarily on land zoned RU1 Primary Production under the Wentworth LEP 2011. The Project Area is currently used for cropping and grazing, with patches of remnant native vegetation. The Project EnergyConnect transmission line corridor is located to the southwest of the Project Area. The Project Area is bordered by MCNP to the southeast. The Project Area is presented in **Figure 03**.

3.4 The Project

The Project will include the installation, operation, maintenance and decommissioning of up to 76 WTGs, a single grid scale 100 MW / 200 MWh BESS, ancillary infrastructure and temporary facilities associated with the construction of the Project. The Project will have an installed generation capacity of up to 402 MW.

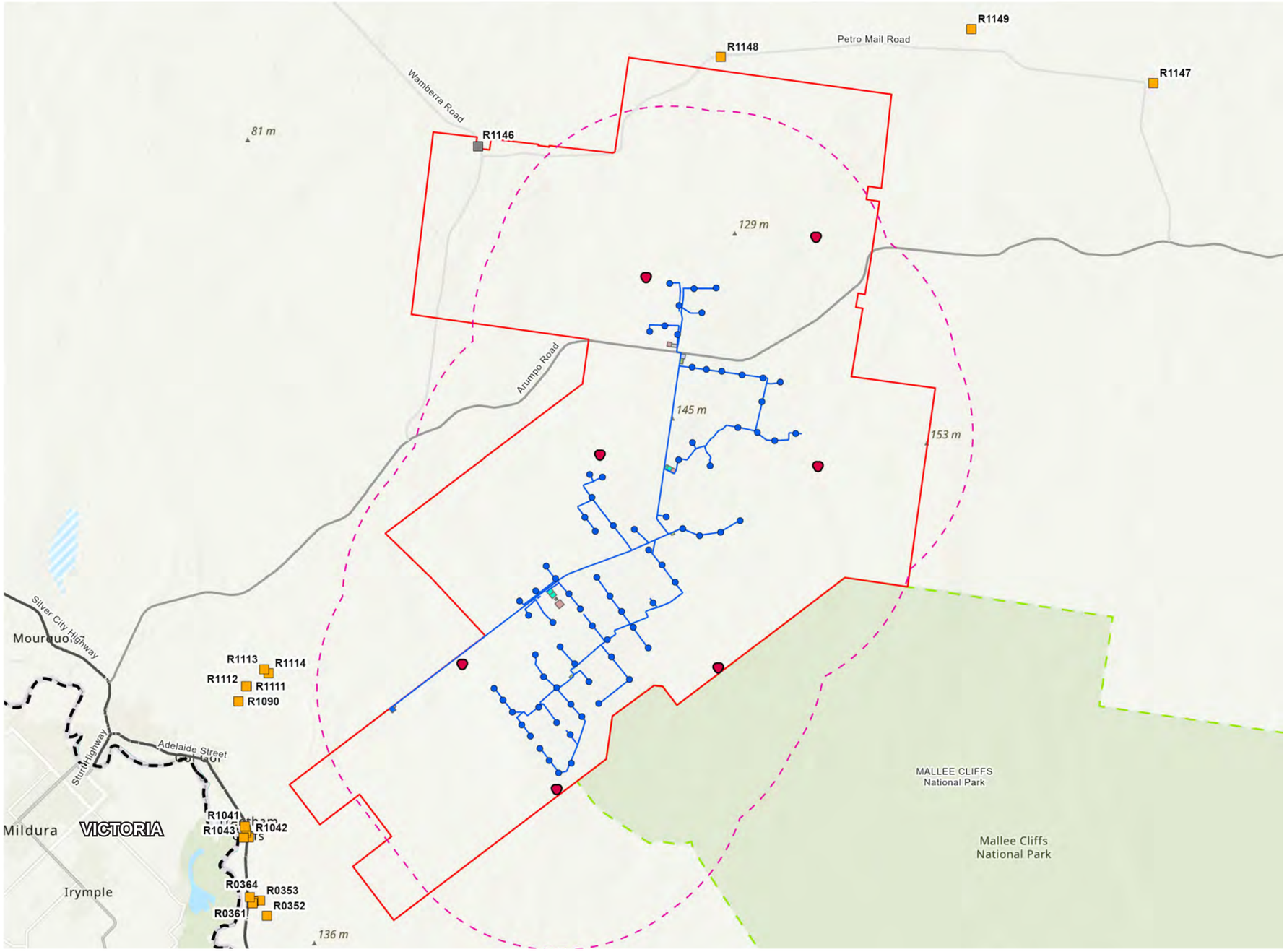
The precise location of individual turbines, the actual size of WTG and preferred WTG model will not be confirmed until the detailed design phase of the Project (prior to construction). However a detailed (but indicative) Project design (and WTG specification) has been established for the EIS and this LVIA, including all components of the Project. The indicative Project layout utilised for this LVIA is shown in **Figure 03**.

The key component of the Project include:

- Up to 76 (three (3) blade) WTGs, with a mximum blade-tip height of 280 m above ground.
- A single grid-scale 300 MW /1200 megawatt hour (MWh) BESS.
- Permanent ancillary infrastructure including internal access tracks, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Temporary facilities including temporary workforce accommodation (TWA) facility, site offices, amenities, construction compounds and laydown areas, concrete or asphalt batching plants, minor ‘work front’ construction access tracks, environmental management and monitoring and signage.
- Off-site road works, involving upgrades to the proposed local transport route and establishment of site access points to facilitate delivery of wind turbine components to the Project Area as required.

The Project

Mallee Wind Farm



- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- National Park, Reserves and State Conservation Area

ASSOCIATED INFRASTRUCTURE

- Proposed BESS
- Permanent Meteorological Masts
- Access Tracks
- Proposed Accommodation Camp
- Proposed Construction Compound
- Proposed Laydown Areas
- Proposed O&M Facility
- Proposed Collector Substation
- Proposed Switchyard

0 5 9 14 18 km

Figure 03 – The Project
Source: ArcGIS, 2024

3.5 Wind Turbine Design

The proposed WTGs are yet to be selected and therefore this report considers a maximum blade tip height of 280 m as a worst case scenario. The proposed WTGs include:

- A generating capacity of approximately 402MW;
- A 4-7 part tubular steel tower holding the nacelle;
- Three (3) blades mounted to a rotor hub on a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of 280 m Above Ground Level (AGL);
- A gearbox and generator assembly housed in a nacelle; and
- Adjacent hardstands for use as crane pads and assembly and laydown areas.

Table 02 provides an overview of dimensions of the turbine components that have been used for this assessment. To best represent a worst case scenario, the maximum hub height of 180 m has been used for modelling and visualisation purposes in this report. **Figure 04** illustrates the turbine parameters utilised for this report. **Image 01** shows the appearance of a typical wind turbine.

For the purposes of this LVIA the maximum dimensions of the proposed WTG have been assessed (i.e. 280 m tip height, 180 m hub height and 200 m blade diameter (incl. nacelle)). This approach has been taken to provide a precautionary assessment consistent with that of the EIS consistent with the EIS; and because the actual size of WTG will not be confirmed until the detailed design phase of the Project (prior to construction). Despite this precautionary assessment, it is noted that Project approval is being sought solely based on a maximum 85 m blade length as constrained by the outcomes of the Project's Route Options Analysis (RJA, 2024) and associated Traffic Impact Assessment (Access, 2024).

Wind Turbine Components		
Project Component	**Dimensions used in LVIA:**	**Quantity**
Uppermost Blade Tip	280 m AGL	up to 76
Tower (hub) height	180 m	
Blade length	100 m (including nacelle)	
Swept Area	31,415.93 m^2	

Table 02 – Wind Turbine Parameters for Visual Assessment

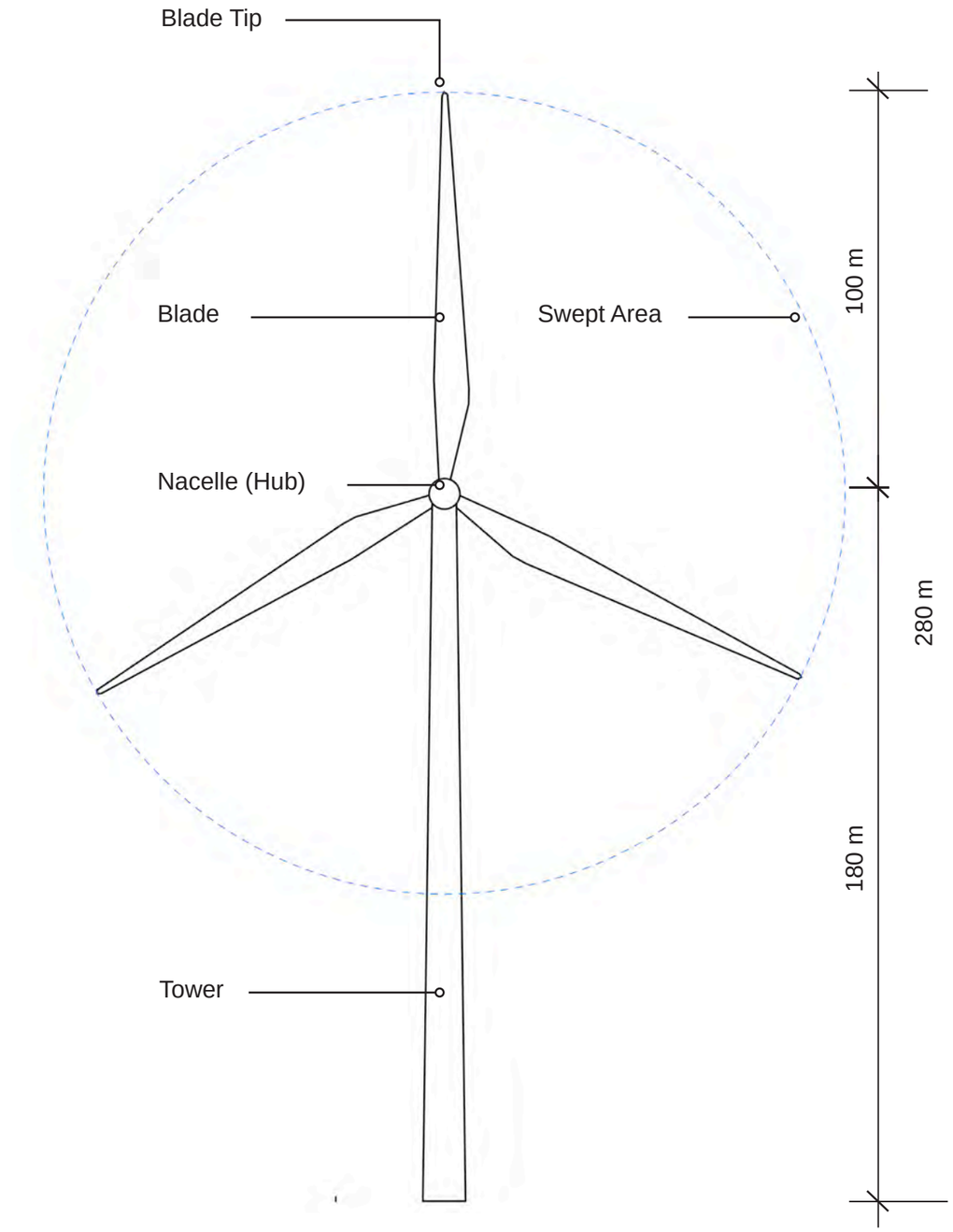


Figure 04 – Wind Turbine Parameters

3.6 Associated Infrastructure

In addition to the WTGs, the following provides an overview of the permanent associated infrastructure components proposed for the Project which have been considered in this visual impact assessment. An overview of the assessment of the potential visual impacts resulting from the associated infrastructure has been provided in **Section 14.0** of this report.

Associated Infrastructure	
Project Component	**Description**
On-site substations and switching stations	Up to two (2) collector substations/switching stations (**Image 02**) and one (1) main switchyard.
Overhead Transmission Lines	High voltage transmission lines (**Image 04**) approximately 18 km in length.
Underground cabling	Underground cabling within the disturbance area.
BESS Facilities	A single grid-scale 100 MW /200 MWh BESS
Operations & Maintenance (O&M) buildings	O&M buildings, storage, water tanks, and other necessary infrastructure placement (**Image 05**).
Meteorological masts	Up to seven (7) permanent meteorological masts.
Internal & External Roads	Upgrade to existing local road infrastructure and internal unsealed tracks.
Water Storage Tanks	At least one (1) dedicated non combustible 100,000 litre(l) water tank.
Hardstands	Located adjacent to each WTG for assembly, erection, maintenance and decommissioning purposes (**Image 03**).
Telecommunications facilities and utility services	The telecommunications facilities including (if required) masts will remain within the Project Area.

Table 03 – Associated Infrastructure

The following temporary elements will be required during construction of the Project:

- Construction compounds;
- Temporary Workforce Accommodation (TWA);
- Site offices;
- Laydown areas; and
- Concrete batching plants.

Image 01 – Typical Wind Turbine Design (Gullen Range Wind Farm)

Image 02 – Typical Substation (Source: Moir LA)

Image 03 – Crane Hardstand (Source: Moir LA)

Image 04 – 33kV Transmission Line (Source: Moir LA)

Image 05 – Operations and Maintenance Facility (Source: Moir LA)

04

Community Consultation

4.0 Community Consultation

4.1 Overview of Community Consultation Process

In accordance with the Bulletin: *community consultation at this early stage may be broad, but should include discussions about the proposed Development Footprint, likely corridors of development, or preliminary turbine layouts and must involve people from the visual catchment*.

The purpose of community consultation is to:

- Establish key landscape features
- Defined areas of scenic quality and
- Identify key public viewpoints valued by that community.

Understanding of the community perception towards the proposed development is an intrinsic component of the LVIA process. A CSIRO study published in 2012: *Exploring community acceptance of rural wind farms in Australia* provides a snapshot of community acceptance levels regarding Australian wind farms from a variety of stakeholder perspectives. It found levels of acceptance among the public are highly subjective and can differ depending on location, local context and place attachment.

4.2 Results of Community Consultation

In accordance with the Bulletin ongoing community consultation has been undertaken by the Proponent through one-on-one meetings, community drop-in sessions, newsletter distribution, and community surveys distributed to both associated and non-associated landholders and interest groups between August 2022 and October 2022. The survey was also placed on the Project website. As of August 2024, a total of 15 surveys had been completed.

4.3 Landscape Features and Values

Given the relatively flat terrain, residents of nearby communities held concerns relating to changes the Project may have to the broader visual landscape in the area. Other stakeholders commented that as the Project will be located some distance from Buronga and Gol Gol, they were relatively unconcerned about visual impacts. Comments included:

"Wouldn't worry me out there, but don't like seeing it on beautiful mountain ranges." – Community Group

"Not a lot of people go out that way, but it will make it look terrible" – Community member.

Responses were given to the question: "***Are there things Spark Renewables could do to reduce the visual impact of the wind farm or make it more visually appealing?***" One stakeholder suggested increasing the distance of the Project to Arumpo Road to reduce the visual impact of those travelling to Mungo National Park, wanting to maintain "*the remote feel of the place*". An additional stakeholder suggested the planting of trees as a visual screen. Others felt that no strategies could be put in place to reduce visual impacts of the Project.

4.4 Key Public Viewpoints

Responses given to the question: "***What are the best lookouts or public vantage points in the area?*** are listed below. For example, "***if you have a visitor, where do you take them to showcase your local area?***"

- *"The river in Gol Gol is amazing"*
- *"The river"*
- *"The river and Mungo National Park"*
- *"Mungo"*

Where possible, key viewpoints have been mapped in **Section 5.0** of this LVIA.

4.5 Overview of ongoing Community Consultation Sessions during EIS

The Applicant received responses as part of the ongoing Community Consultations. All community responses rated "*Lakes / Rivers*", *"Local Township"* and *"Natural/Undisturbed Landscape"* as having a high scenic value (see **Figure 05**). Few responses predominantly highlighted, "*Densely Vegetated Areas*", "*Farm Dams*", "*Cleared Areas*", "*Hills and Ridgelines*" and "*Grazing Land*" as having a moderate scenic value (see **Figure 05**).

Responses to the question, "***What are the best lookouts/ public viewing areas in the area? If you have a visitor, where do you take them to showcase your local area?***" identified the Murray River and Mungo National Park as key public locations.

Responses answered "***No***" to the question "***Are there any areas or landscape features close to, or within the proposed Project Area that are of significant value to yourself, your business, or your community?***". One (1) response identified their "*private dwelling*" as a response to the question regarding landscape features.

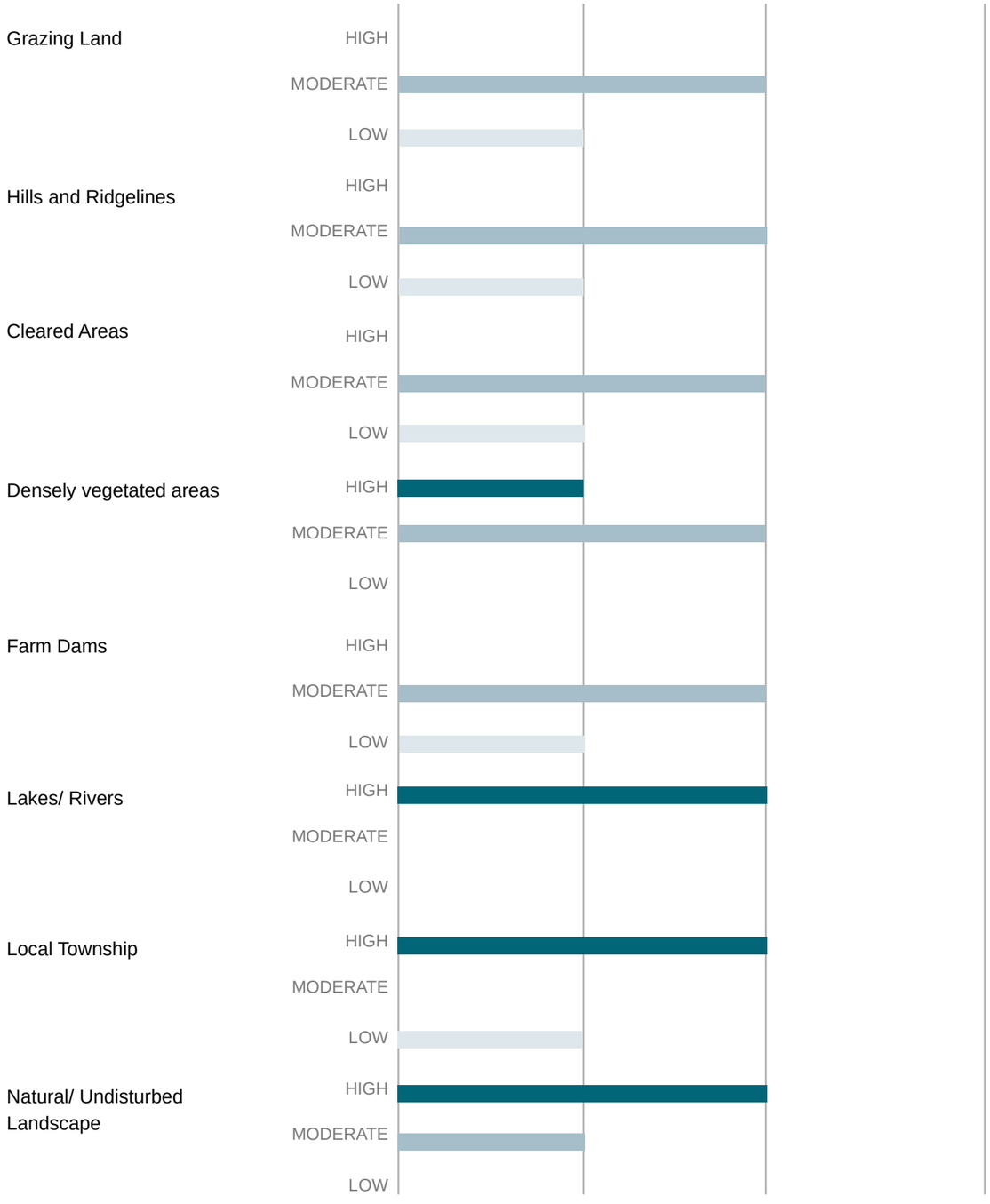


Figure 05 – Scenic Value of the landscapes

05

Visual Baseline Study

5.0 Visual Baseline Study

5.1 Visual Baseline Study

In accordance with the Bulletin, *A visual baseline study must be undertaken to establish the existing landscape and visual conditions. This forms the basis of determining the level of impacts of a proposed wind energy project.* The baseline study is prepared and evaluated by the Applicant prior to undertaking any visual analysis.

Moir LA has developed upon the baseline study undertaken in the PVIA to provide a detailed baseline study for the LVIA.

In accordance with the Bulletin, the baseline study should consider the following inputs in the 'visual catchment' for the Project:

- *Elements of the landscape important to the community, including public and private viewpoints;*
- *The sensitivity of the viewers who use those viewpoints, and the distances at which they may view the landscape and potential wind turbines and other ancillary facilities;*
- *The character of the landscape involved, its key features and the relative scenic quality of the area;*
- *The location of any existing operational or approved wind energy projects within both a regional and local context, including any nearby surrounding wind energy projects within eight kilometres which may have the potential to create direct or indirect visual impacts between the Project and any other operational, approved or proposed wind energy projects.*

The purpose of the Visual Baseline Study is to establish the existing landscape and visual conditions through descriptions, mapping and photographic representations. The study method for undertaking the Visual Baseline Study has been established in accordance with **Appendix A** of the Bulletin where relevant and in conjunction with previous experience on large scale wind energy projects.

Table 04 provides an overview of the methodology used to establish a quantitative approach to defining and assessing the landscape character.

Visual Baseline Study Inputs:	
Landscape Character Type	
• Describe the broad area of land in which the wind energy Project is located.	**Refer to Section 5.2**
Sensitive Land Use Designations	
• Map Layer identifying National and State Sensitive Land use Designations and LEP Zones.	**Refer to Section 5.3**
Key Landscape Features	
• Identify areas of visual interest or quality that stand out visually in the landscape.	**Refer to Section 5.4**
Landscape Character Unit Classification	
• Landscape is categorised into Landscape Character Units (LCU) and Scenic Quality Ratings are applied to each LCU.	**Refer to Section 5.5 & Section 5.6**
Viewpoint Inventory and Sensitivity Levels	
• Undertake a viewpoint inventory from public and private locations and establish the Visual Influence Zones for each.	**Refer to Section 8.0**
Visibility Distance Zones	
• Undertake visibility or view shed mapping when assessing what may be visible from a given viewpoint looking in all directions.	**Refer to Section 7.0**

Table 04 – Visual Baseline Study Inputs

5.2 Bioregion Context

The Project is situated in the Murray Darling Depression (MDD) Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA), located in the southwest corner of NSW (see **Figure 06**). This region is marked by dunefields, sandplains and numerous dry lakes and depressions. The land is predominantly flat, with occasional minor elevations. The area is mostly covered with deep siliceous and calcareous red to yellow sands, with gypseous and calcareous clays on lake beds. The vegetation is largely dominated by various species of Saltbush, including Old Man Saltbush, Cottonbush, Myall, and various grasses, which extensively cover the plains. Dominant species include Rosewood (Heterodendrum oleifolium), Belah (Casuarina cristata) along sandplains with diverse mixed communities predominately Mallee (Eucalyptus sp.) (DPE, 2021). **Image 06 - Image 08** illustrate typical landscape features within the Study Area.

Figure 06 – Bioregions of New South Wales
Source: NSW Department of Planning, Industry and Environment, 2012

Image 06 – Typical character of vegetation within the Disturbance Footprint: saltbush plains, cotton bush, myall and grasses (Source: MLA, 2022)

Image 07 – Typical character of the agricultural and rural residential uses along Sturt Highway, south of the Project Area. (Source: MLA, 2022)

Image 08 – Typical character of modified pastures in the area, with intermittent areas of dense vegetation. (Source: MLA, 2022)

5.3 Sensitive Land Use Designations

5.3.1 Land Zoning

The Project is located in the Wentworth Shire LGA. The Project has been assessed against the objectives of the Wentworth LEP 2011 (see **Figure 07**).

RU1 Primary Production

The Disturbance Footprint and majority of the surrounding land is zoned RU1 - Primary Production. Wentworth LEP states the following objectives of the RU1 zoning that are relevant to the visual impact assessment:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*

C1 National Parks and Nature Reserves

Land directly to the southeast of the Project Area has been zoned as C1 - National Parks and Nature Reserves forming the Mallee Cliffs National Park (MCNP).
Further afield additional C1 zoned land includes:

- Kemendok National Park
- Mungo National Park
- Willandra Lakes Region World Heritage Area

The Project's south eastern boundary is shared with MCNP. According to the MCNP Plan of Management 2018, Mallee Cliffs conserves a regionally significant sample of mallee dune and sandplain vegetation of the semi-arid MDD IBRA Bioregion, which have been greatly diminished in the wider landscape due to deforestation and degradation by grazing (NPWS, 2020).

The National Park's landscape, biological, cultural and educational values are as follows:

- *The park supports 11 native plant communities and over 293 native plant species, including two threatened plants listed under the Biodiversity Conservation Act 2016.*
- *Mallee Cliffs provides valuable habitat for a diverse range of animals, especially mallee-dwelling animals. Native animals recorded in the park include: 129 birds, 50 reptiles and 18 mammals.*
- *Twenty seven threatened animals listed under the Biodiversity Conservation Act have been recorded in the park. Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide Biodiversity Conservation Program (formerly known as the Threatened Species Priorities Action Statement).*
- *Mallee Cliffs lies in the centre of the identified stronghold for the endangered mallee fowl and park management effort has focused on the protection and conservation of this ground-dwelling species. The mallee fowl population in the park is of regional if not national significance as this species has become severely depleted in New South Wales as a result of land clearing and fox predation.*

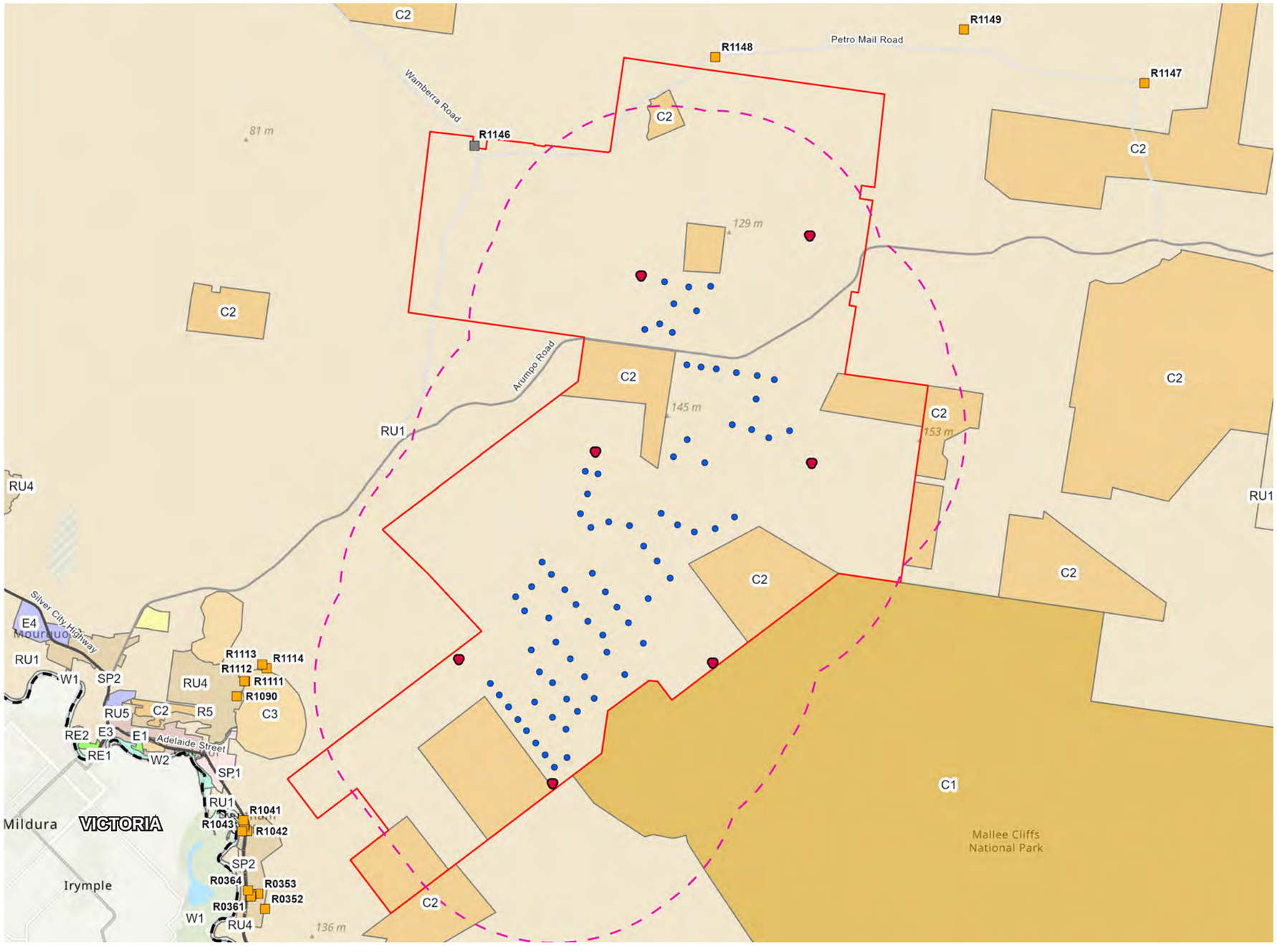
C2 Environmental Conservation

Scattered parcels of land throughout the Project Area is zoned C2 - Environmental Conservation, however the Development Footprint does not occur in land zoned C2. Wentworth LEP states the following objectives of the RU1 zoning that are relevant to the visual impact assessment:

- *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.*
- *To prevent development that could destroy, damage or otherwise have an adverse effect on those values.*

5.3.2 Land Use

The land within the Study Area is predominantly used for agricultural activities including native grazing pastures and dryland cropping (see **Figure 08**). The Sturt Highway lies to the south of the Project Area and connects multiple towns, while Arumpo Road, a low-use minor road, passes through the Project Area. MCNP is mostly untouched and classified as Nature Conservation, due to its high natural, cultural, and educational value.



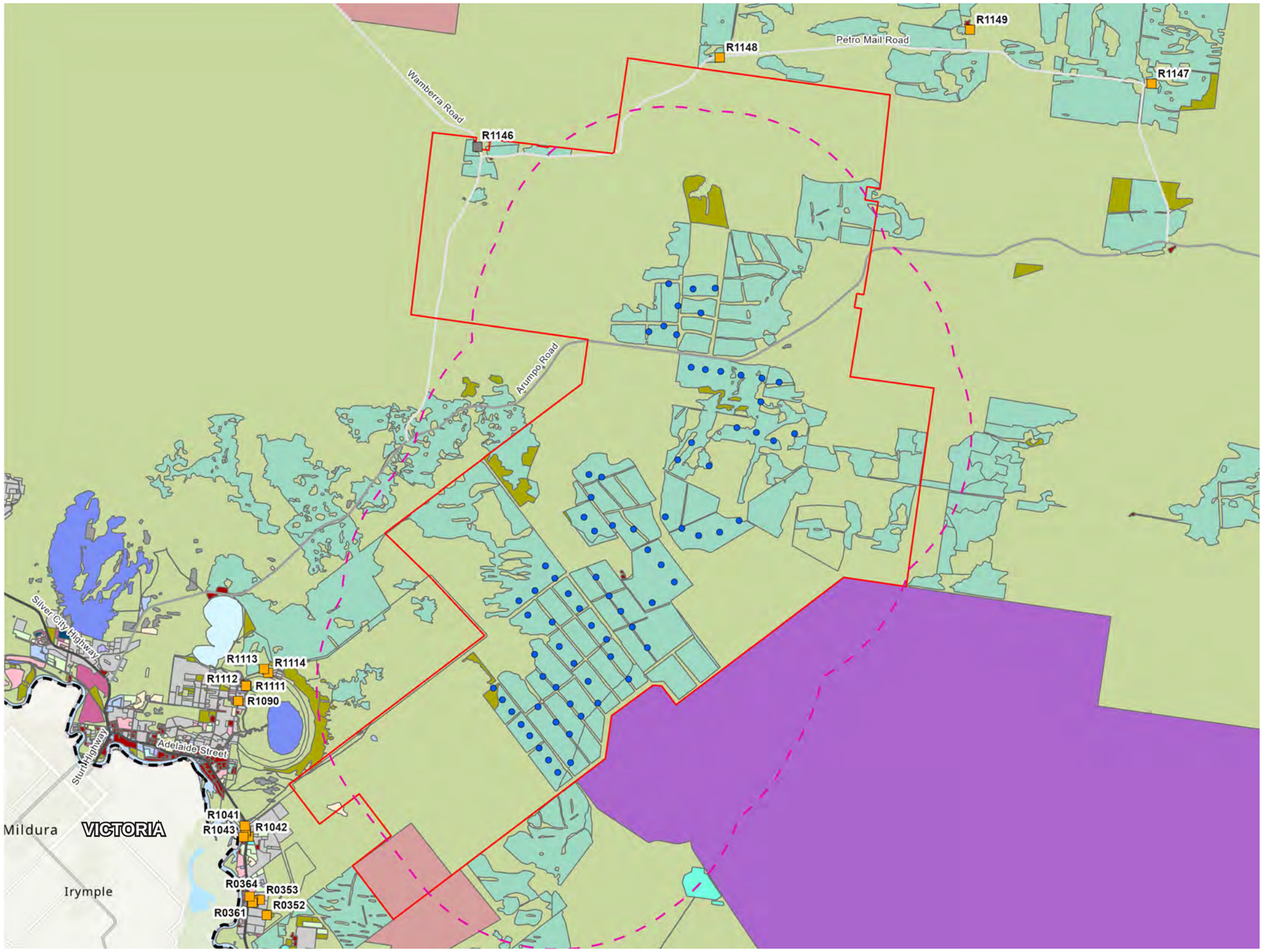
Land Zoning

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Permanent Meteorological Masts
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- C1 - National Parks and Nature Reserves
- C2 - Environmental Conservation; C2, Environmental Management
- C3 - Environmental Management
- E1 - Local Centre
- E3 - Productivity Support
- E4 - General Industrial
- R5 - Large Lot Residential
- RE1 - Public Recreation
- RE2 - Private Recreation
- RU1 - Primary Production
- RU4 - Primary Production Small Lots
- RU5 - Village
- SP1 - Special Activities
- SP2 - Infrastructure
- W1 - Natural Waterways
- W2 - Recreational Waterways

0 2 5 9 14 18 km

Figure 07 – Land Zoning
Source: NSW Department of Climate Change, Energy, the Environment and Water, 2019



Land Use

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road

Within Project Area

- 1.1.0 Nature conservation
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 5.3.0 Manufacturing and industrial
- 5.7.0 Transport and communication
- 5.8.0 Mining

Not Within Project Area

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 3.6.0 Land in transition
- 4.1.0 Irrigated plantation forestry
- 4.2.0 Grazing irrigated modified pastures
- 4.3.0 Irrigated cropping
- 4.4.0 Irrigated perennial horticulture
- 4.5.0 Irrigated seasonal horticulture
- 4.6.0 Irrigated land in transition
- 5.1.0 Intensive horticulture
- 5.2.0 Intensive animal production
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 5.9.0 Waste treatment and disposal
- 6.1.0 Lake
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.4.0 Channel/aqueduct
- 6.5.0 Marsh/wetland

0 5 9 14 18 km

Figure 08 – Land Use
Source: State Government of NSW and NSW Department of Planning, Housing and Infrastructure, 2024

5.4 Key Landscape Features & Key Viewing Locations

The Bulletin states: *proponents must identify key landscape features, dwelling locations and key public viewpoints* (see **Figure 09**). The following section provides an overview of the key features identified.

5.4.1 Geology and Landform

The region is made up of Tertiary and Quaternary sediments with shallow and small depressions (Environment NSW, 2011). These depressions form a number of dry lakes that are spread across the landscape. In some areas these depressions form large scale swamps. The landform is also characterised by isolated low rises formed by aeolian processes, i.e., through wind action (Environment NSW, 2011). The landform is generally flat with dry floodplains and isolated lunettes (National Parks and Wildlife Service (NPWS), 2003). There are 7 geological units within the Project Area. Dominant geological unit is Woorinen formation and a number of smaller geological units associated with floodplains and lakes of the Murray and Darling rivers. There are 4 landforms within the Project Area. Dominant landform is flat with elements of undulating dunes, slopes and ridgelines/crests.

5.4.2 Vegetation Character

Vegetation within the surrounding landscape is typical of the MDD IBRA Bioregion. Vegetation character evolves in accordance with the landforms within the landscape. Semi-arid conditions support dominant Mallee communities with derived grasslands, Belah (*Casuarina pauper*), Rosewood (*Heterodendrum oleifolium*) woodland communities, isolated Mulga (*Acacia aneura*) and Bluebush (*Maireana pyramidata*) shrublands (NSW & OEH, 2018). Variable Spear Grass (*Stipa variabilis*), Cane Grass (*Eragrostis australasica*), Lignum (*Muehlenbeckia cunninghamii*) with clumps of Black Box (*Eucalyptus largiflorens*) form part of the unique vegetation character of the surrounding area (NPWS, 2003) (**Image 11**). Lack of tall canopy species allows for an expansive landscape. Other areas to the north, east and west of the Project Area show predominantly low vegetation allowing easier grazing opportunities for sheep, thus rendering the area favourable for livestock grazing (**Image 10**).

5.4.3 Creeks, Dry Lakes and Swamps

Given the semi-arid conditions of the region, the lakes and creeklines remain dry through most of the year. The most significant hydrological features in close proximity of the Project Area include the Murray River, Gol Gol Creek, Lake Gol Gol and Gol Gol Swamp.

Image 09 – Typical character of the Project Area, modified pastures and cropping with scattered vegetation. (Source: MLA, 2022)

Image 10 – Typical character of modified pastures within Project Area. (Source: MLA, 2022)

Image 11 – Typical vegetation character along dry lake beds nearby the Project Area. (Source: MLA, 2022)

Lakes or depressions are generally shallow with clay floors and are defined by low-storey, scrubby vegetation such as saltbush and canegrass species, with lignum and nitre goosefoot also common (Environment NSW, 2011).

5.4.4 National Parks and Nature Reserves

MCNP (MCNP) is located to the immediate east of the Project. The MCNP exhibits characteristics of the MDD IBRA Bioregion's Murrumbidgee subregion. The MCNP is one of the examples of undisturbed patch of dense Belah, Mallee, Rosewood and Sugarwood communities with abundant grasses and Dillon Bush (NPWS, 2003; NPWS, 2020). The MCNP is extensively managed to protect the unique red sandplains and linear dunefields formed nearly 500,000 years ago. The MCNP is part of Country for the Barkandji People and an Indigenous Land Use Agreement (ILUA) with the Barkandji native title holders focused on managing the parks within the native title area (NSW & OEH, 2018). The MCNP serves as a habitat for native flora and fauna including 11 Native plant communities, 293 native plant species and 27 threatened fauna species such as the Mallee Fowl (NSW & OEH, 2018).

Mungo National Park located within the World Heritage Listed WLR is located approximately 50 km northeast of the Project. Arumpo Road is a primary connector route which provides access to the Mungo National Park. The WLR boundary is approximately 25 km from the Project, however the nearest publicly accessible recreation area (Mungo Lookout) within the WLR is approximately 57 km from the Project. This is considered further in **Section 8.4.4.**

5.4.5 Recreation Associations and Point of Interest

Recreational associations within the wider Study Area are limited. Bottle Bend Picnic Area, within the Gol Gol State Forest (**Image 14**), is the closest publicly accessible recreation spot (approximately 15 km south) which offers opportunities for short bushwalks and birdwatching. Dense Mallee, Belah and Rosewood communities dominate the region. Other areas of interest include the Trentham Cliffs Rest Area on Sturt Highway (**Image 12**). This area serves as an important resting spot for commuters travelling towards the towns of Buronga and Mildura. The MCNP is predominantly used for conservation and ecological research. Access to the park is limited to researchers and bird watching groups who visit the park a few times per year (NSW & OEH, 2018).

Image 12 – Typical character of Trentham Cliffs Rest Area (Source: MLA, 2022)

Image 13 – Treeless plains with saltbush and native grasses (Source: MLA, 2023)

Image 14 – Typical character of Gol Gol State Forest. (Source: MLA, 2022)

5.4.6 Access Roads

Sturt Highway is a main road connecting various towns and runs along the southern boundary of the Project, generally running east - west. Sturt Highway serves as an important transport corridor connecting the towns of Mildura, Buronga and Gol Gol to Euston, Balranald and Hay (**Image 12**).

Minor roads within Gol Gol and Buronga provide connections to Mildura in Victoria. Arumpo Road is a significant tourist route serving as a connection to the World Heritage listed Mungo National Park located approximately 50 km northeast from the Project. Arumpo Road passes directly through the Project Area and intersects the northern portion of the Project.

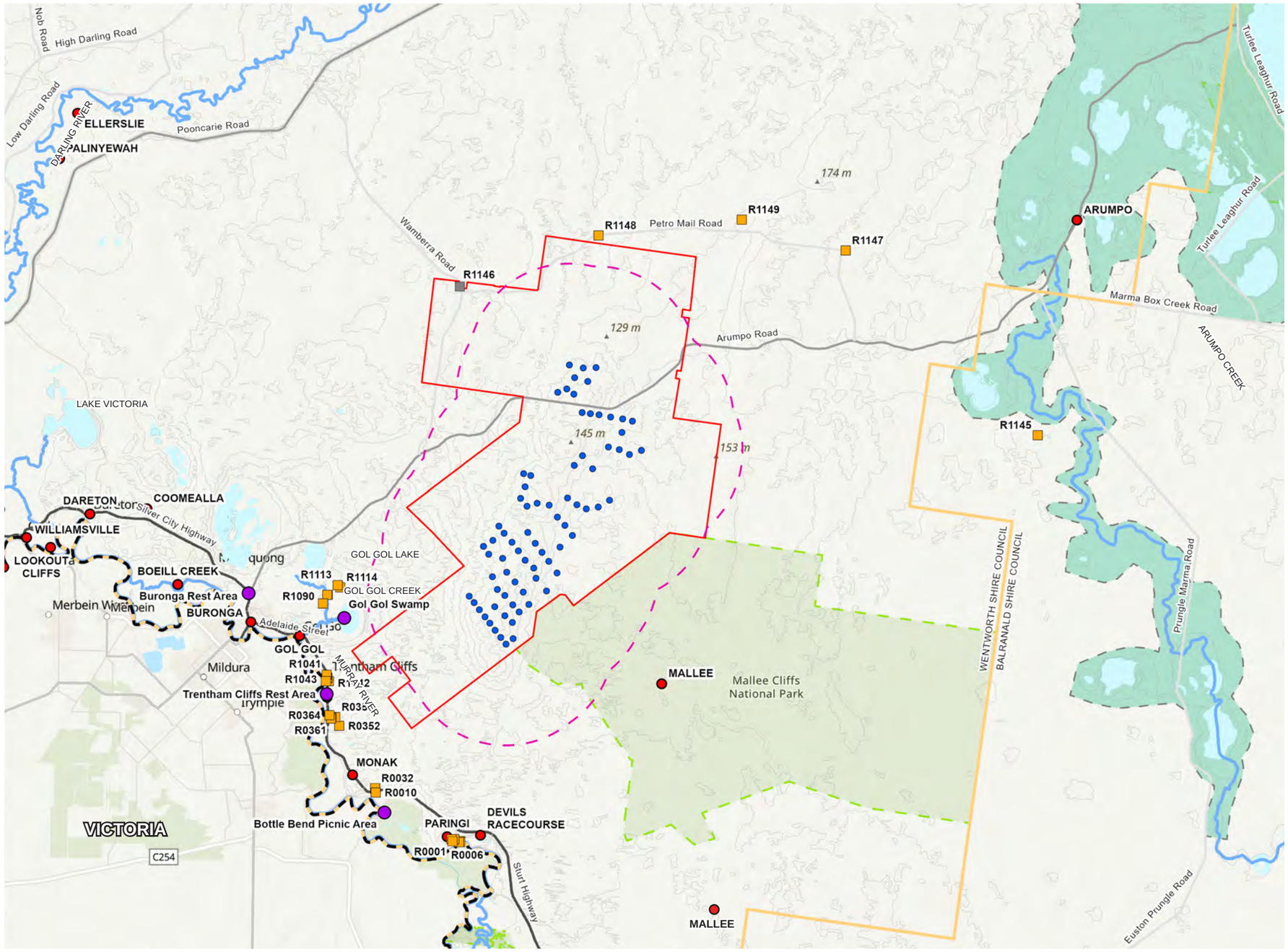
5.4.7 Nearby Towns

The nearest townships are Buronga (16 km southwest of the Project Area), Gol Gol (13 km southwest of the Project Area) (**Image 15**) and Mildura located approximately 17 km southwest of the Project Area.

Image 15 – Typical character of Gol Gol (Source: MLA, 2022)

Landscape Features and Key Viewpoints

Mallee Wind Farm



- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- LGA Boundary
- Primary Road
- Arterial Road
- Sub Arterial Road
- Points of Interest
- Localities
- Rivers and Creeks
- Lakes
- World Heritage Listed Willandra Lakes Region
- National Park, Reserves and State Conservation Area
- Contour

Figure 09 – Landscape Features and Key Viewpoints
Source: ArcGIS, 2024

0 4 7 14 21 28 km

5.5 Landscape Character Unit Classification

Due to the large scale and varying landscape character the Study Area has been categorised into five (5) Landscape Character Units (LCU) to assist in the assessment. The LCU's include:

- LCU01 - Grazing Native Vegetation
- LCU02 - Creek and River Systems
- LCU03 - Cropping Pastures
- LCU04 - Local Townships
- LCU05 - National Parks and Conservation Areas

LCUs are classified by slight variations in the landscapes geology, topography, land use and vegetation which create distinct character areas within the Study Area. The LCUs have been informed by land use patterns, vegetation coverage, topographical maps, site images and site inspection.

The general extent of the LCUs are shown on **Figure 10**. The Scenic Quality 'frame of reference' has been applied to each LCU (see **Table 05**).

5.6 Scenic Quality Class Rating

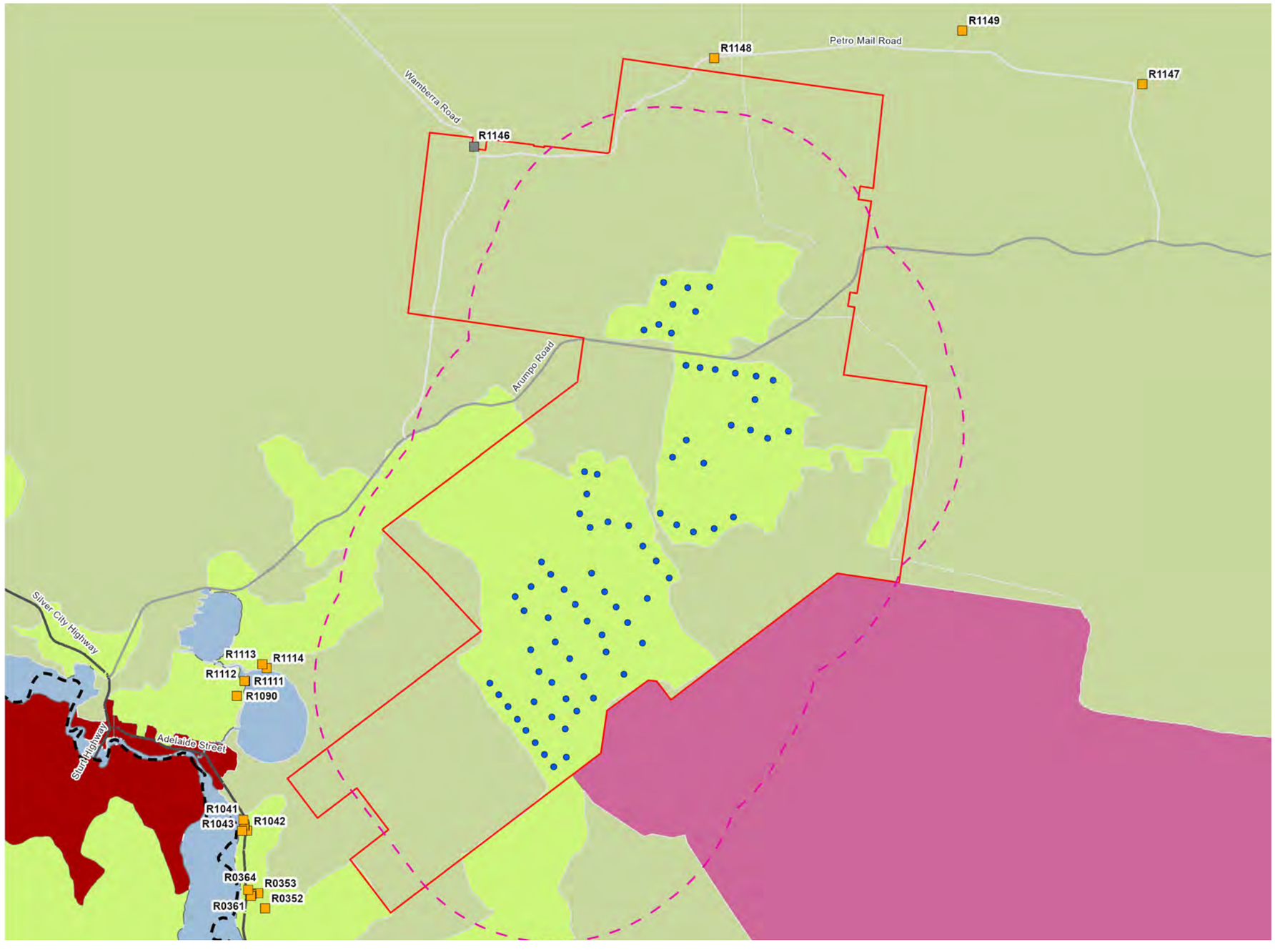
The Bulletin states: *the baseline study inputs, including key landscape features and sensitive land use designations, should lead to the identification of Scenic Quality Classes. Scenic quality refers to the relative scenic or aesthetic value of the landscape based on the relative presence or absence of key landscape features known to be associated with community perceptions of high, moderate or low scenic quality. It is both a subjective and complex process undertaken by experts in visual impact assessment, taking into account community values identified in early community consultation.*

In accordance with the Bulletin, a Scenic Quality 'frame of reference' has been formulated by Moir LA (see **Table 05**) utilising an approach to landscape sensitivity assessment - to inform spatial planning and land management, developed by Natural England.

Each category of the 'frame of reference' has been quantified for each LCU (summarised in **Table 06**) to determine a Scenic Quality Rating of low, moderate or high. The resulting Scenic Quality Rating is used to assist in defining the Visual Influence Zones (VIZ) in accordance with the Bulletin (refer to matrix in **Appendix A**).

SCENIC QUALITY RATING FRAME OF REFERENCE		
LOW	MODERATE	HIGH
LAND FORM		
• Flat topography • Absence of landscape features • Open, broad extents of spaces		• Diversity in topographical range • Unique landscape features • Intimate spaces
WATER FORMS		
• Absence of water		• Presence of water • Visually prominent lakes, reservoirs, rivers streams and swamps
VEGETATION		
• Absence of vegetation • Lack of diversity • Land cleared of endemic vegetation • Low level of connection between vegetation and landscape/ topography		• Abundant vegetation • High diversity • High retention of endemic vegetation. • High level of connectivity between natural landscape and landforms
HUMAN INFLUENCE		
• High population. • High density in settlement • High presence of Infrastructure • High levels of landscape modification		• Low / dispersed population • No settlement • Absence of infrastructure • Landscape in natural state
ACTIVITY		
• High levels of traffic movement • Presence of freight and passenger transport networks • Presence of production or industry		• Low traffic movement • Absence of freight and passenger transport • Absence of production or industry
RARITY		
• Typical landscape within a local and regional context		• Unique combination of landscape features in a local and regional context
RELATIONSHIP WITH ADJOINING LANDSCAPES		
• Low visible connection with adjoining landscapes • Low variability between adjoining landscapes • Landscape features do not contribute to amenity from adjoining landscapes		• High visibility with adjoining landscapes • High variability and contrast with adjoining landscapes • Landscape features contribute significantly to amenity of adjoining landscapes

Table 05 – Scenic Quality Rating Frame of Reference



Landscape Character Units

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- LCU01: Grazing Native Vegetation
- LCU02: Creek and River Systems
- LCU03: Cropping Pastures
- LCU04: Local Townships
- LCU05: National Parks and Conservation Areas

0 2 5 9 14 18 km

Figure 10 – Landscape Character Units
Source: ArcGIS, 2024

Image 16 – Typical characteristic of the area surrounding the Project. Generally modified paddocks with cleared vegetation to support grazing and other activities (Source: MLA, 2023).

Image 17 – View of the Murray River - a significant hydrological feature within the region. Urban development is visible along the river fringes. (Source: MLA, 2023).

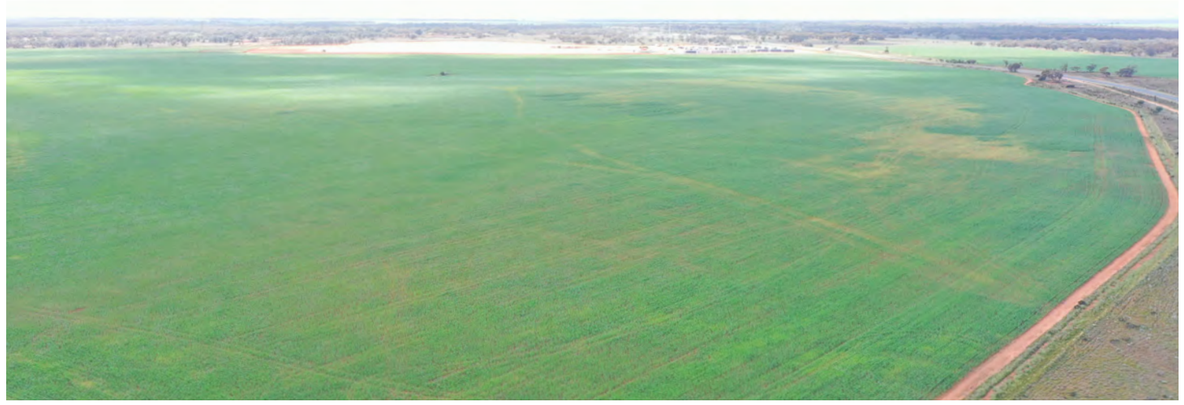


Image 18 – Typical character of vast modified pastoral lands modified for agriculture. Landscape is usually highly modified (Source: MLA, 2023).

LCU01: Grazing and Native Pastures

The LCU is defined by vast, open land parcels that are utilised for livestock grazing. The LCU portrays the most dominant character in the region. It comprises of open plains with scattered or no tree cover and vast extents of Chenopod Mallee and Shrubland. Common land uses include grazing, dryland cropping, modified and irrigated pastures (**Image 16**).

This LCU is the most prominent character in the area and includes little to no elevation changes.

LCU02: Creek and River systems

This LCU is defined by characteristic riverine vegetation along its extents. Gol Gol Swamp, Gol Gol Creek, Murray River and Gol Gol Lake are some significant features within the LCU. Human intervention is through urban development along the river fringes (**Image 17**). Tree density varies in different locations and native vegetation has been modified as a result of urban development.

Notable hydrological features within this LCU include, the Murray River, Gol Gol Creek, Lake Gol Gol, Gol Gol Swamp and associated floodplains.

LCU03: Cropping Pastures

The LCU is characterised by vast extents of land modified for dryland cropping and irrigated agriculture. Vegetation is patchy and serves only as wind breaks or screening. Expansive lots have been modified to support pastoral farming and irrigated agriculture (**Image 18**). This LCU is typically visible within and around the Project Area.

Image 19 – Typical character of Gol Gol Town (Source: MLA, 2023).

Image 20 – Low lying Shrubland are characteristic of this LCU (Source: MLA, 2023).

LCU04: Local Townships

The LCU is typically defined by dense urban development with significant human intervention. Buronga and Gol Gol are the closest townships to the Project and are important town centres within the Murray region (**Image 19**). Both towns are included within the wider Sunraysia region along the Murray River and are key producers of fruits and vegetables. The Project is also in proximity to Mildura, a major regional centre.

LCU04: National Parks and Conservation Areas

This LCU is defined by the densely vegetated woodlands that fall within the extents of the MCNP and Gol Gol State Forest, as well as other densely vegetated areas.

Land is subjected to minimal use and represents unique characteristics defined by the flat topography and dense Mallee, Rosewood and Belah woodlands (**Image 20**).

Recreational associations have been identified within the extents of the LCU, the closest being the Bottle Bend picnic area within Gol Gol State Forest.

Landscape Character Units

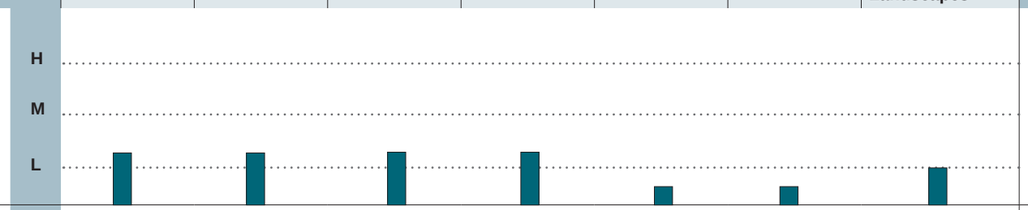
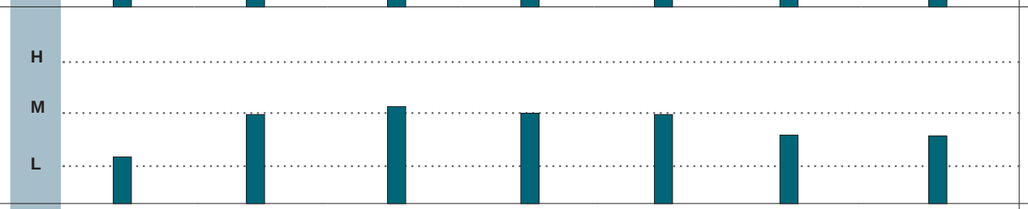
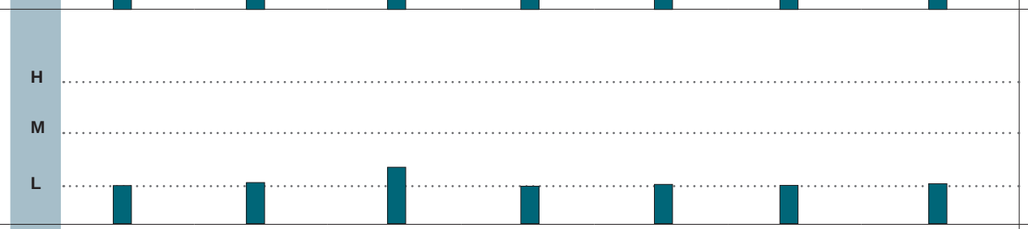
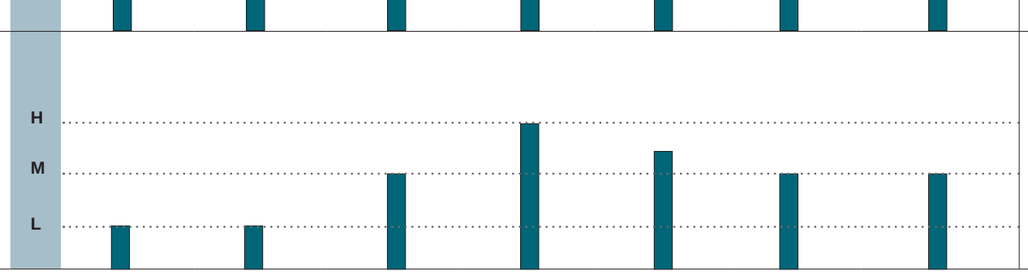
LCU:	Name:	Key Landscape Features:	Key locations:	Application of Scenic Quality Rating Frame of Reference:	Scenic Quality Rating:
				Landform / Waterforms / Vegetation / Human Influence / Activity / Rarity / Relationship with Adjoining Landscapes	
LCU01	**Grazing and Native Pastures**	Clear, flat expanses of land used for grazing or cropping. Most prominent character of the region with minor to no elevation change.	Within Project Area, along Sturt Highway, Silver City Highway and Arumpo Road.		**LOW**
LCU02	**Creek and River Systems**	Characteristic riverine vegetation along river channels, creeks and lakes. Features include Gol Gol Creek, Lake Gol Gol, associated floodplains and swamps.	Gol Gol Creek, Gol Gol Lake, Gol Gol Swamp, Murray River.		**MODERATE**
LCU03	**Cropping Pastures**	Expansive lots with modified land to support irrigated cropping and agriculture. Vegetation character is predominantly Mallee shrubland scattered throughout the landscape.	Within Project Area, along Sturt Highway and Arumpo Road.		**LOW**
LCU04	**Local Townships**	Dense urban development is characteristic of this LCU and includes the towns of Mildura, Buronga and Gol Gol.	Gol Gol, Buronga, Mildura.		**LOW**
LCU05	**National Parks and Conservation Areas**	Comprises of dense woodlands of dense Mallee, Rosewood, Bluebush and Belah woodlands that are spread across the extents of Riverina plains within the extents of the Mallee Cliffs National Parks, Gol Gol State Forest and other vegetated areas in close proximity.	Mallee Cliffs National Park, Gol Gol State Forest		**MODERATE**

Table 06 – Overview of Landscape Character Unit Scenic Quality Ratings

06

Preliminary Assessment Tools

6.0 Preliminary Assessment Tools

6.1 Overview of Preliminary Assessment Tools

To assist in defining the visual catchment, preliminary assessment tools have been developed in the Bulletin. In accordance with the Bulletin, the purpose of the preliminary assessment tools are: *to provide an early indication of where turbines require careful consideration because of potential visual impacts. The tools apply to both residences and key public viewpoints in the study area. The tools provide an early indication of where placement of turbines will require further assessment and justification, and where consultation with potentially affected landowners needs to be focused – including discussions for landholder agreements.*

The preliminary assessment tools involve analysis of two key visual parameters:

- Visual Magnitude (Refer to **Section 6.2**)
- Multiple Wind Turbine Tool (Refer to **Section 6.4**)

Once defined, the Bulletin states: *Further assessment and justification for placement of turbines located in these sensitive areas in the EIS will be required, along with a description of mitigation and management measures being employed to reduce impacts. This assessment may identify that factors such as topography, relative distance and existing vegetation may minimise or eliminate the impacts of the project.*

Dwellings and key public viewpoints identified through the application of the preliminary assessment tools have been assessed in detail in this LVIA.

6.2 Preliminary Assessment Tool 1: Visual Magnitude

The Visual Magnitude Threshold is based on the highest vertical extent of the tip of the WTG blade and distance from dwellings or key public viewpoints as shown in **Figure 11**.

In accordance with the Bulletin: *proposed turbines below the black line must be identified along with the residences or key public viewpoints as part of the request for SEARs.* The proposed WTGs are based on a worst case scenario with a tip height of 280 m. The ‘black line ‘intersects at a distance of 3,750 m and the ‘blue line’ intersects at 5,500 m (see **Figure 12**).

For the purpose of the Preliminary Assessment, the Visual Magnitude thresholds were based on a 2D assessment of the Project alone. Further assessment indicates factors such as topography, relative distance and existing vegetation may reduce or eliminate the impacts of the Project from dwellings.

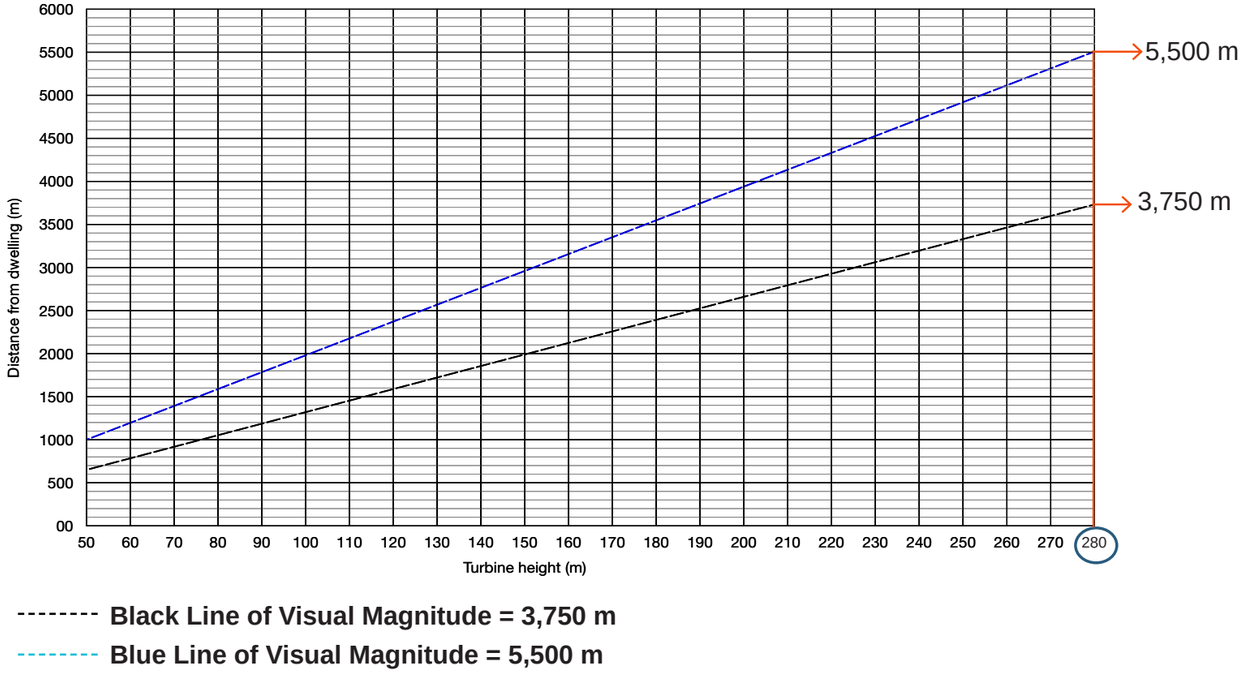
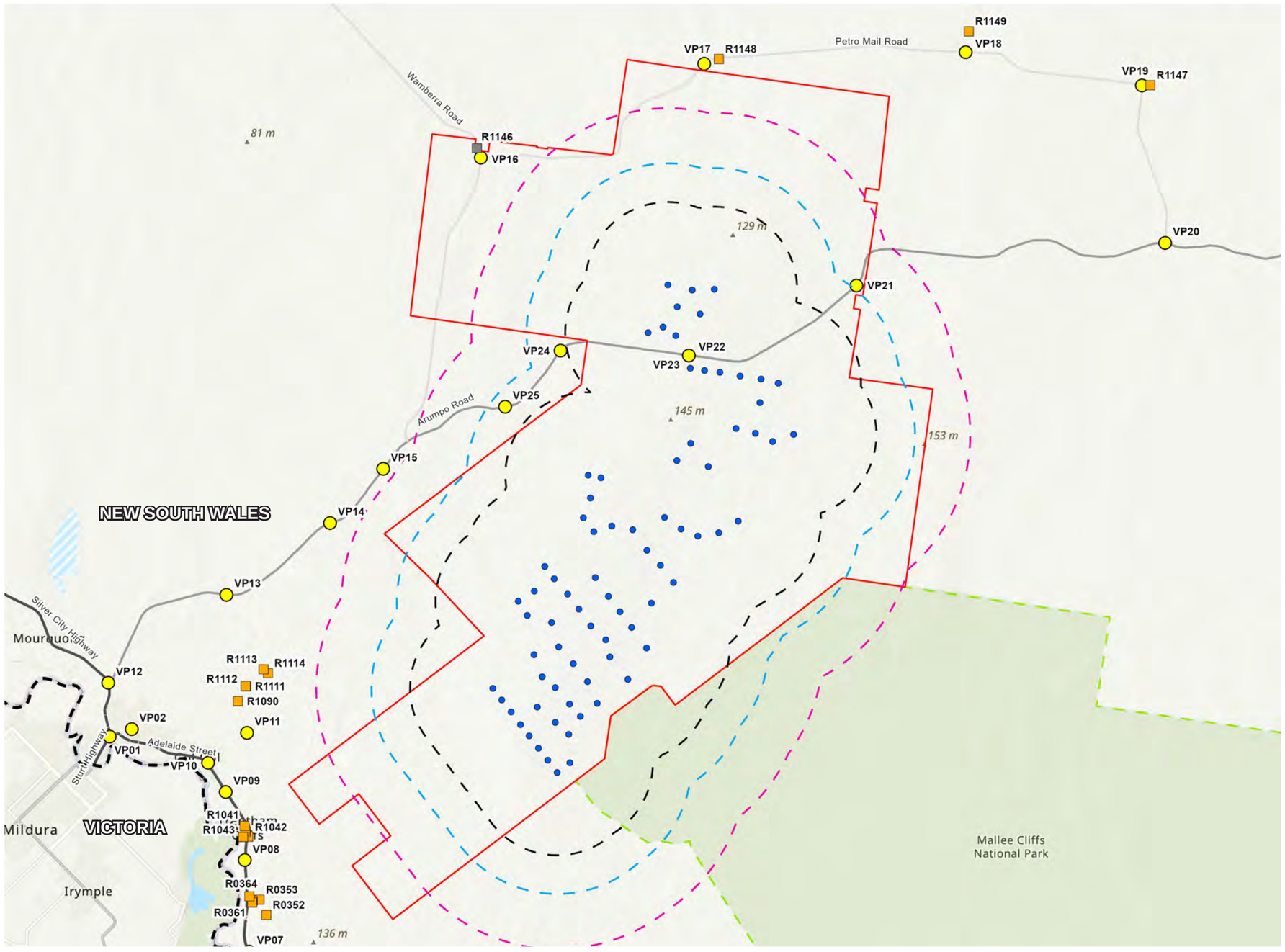


Figure 11 – Preliminary Assessment Tool 1: Visual Magnitude thresholds for Project Layout
Source: Visual Assessment Bulletin, 2016



Visual Magnitude

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- Public Viewpoint Locations
- 3750m From Nearest WTG (Black Line of Visual Magnitude)
- 5500m From Nearest WTG (Blue Line of Visual Magnitude)
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- National Park, Reserves and State Conservation Area
- Primary Road
- Arterial Road
- Sub Arterial Road

Note:

Preliminary Assessment Tool 1: Visual Magnitude is based on a 2D Assessment alone and does not take into account topography, vegetation or other screening factors which may reduce the potential for viewing WTGs.

Figure 12 – Preliminary Assessment Tool 1: Visual Magnitude
Source: ArcGIS, 2024

0 2 5 9 14 18 km

6.3 Results of Preliminary Assessment Tool 1: Visual Magnitude

Application of the Preliminary Assessment Tools is used to identify dwellings which require further assessment in accordance with the Bulletin. No non-associated dwellings have been identified with 8,000 m of the nearest WTG.

6.4 Preliminary Assessment Tool 2: Multiple Wind Turbine Tool

The Multiple Wind Turbine Tool (MWTT) provides a preliminary indication of potential cumulative impacts arising from the Project. To establish whether the degree to which dwellings or key public viewpoints may be impacted by multiple WTGs, the proponent must map into six sectors of 60° any proposed WTGs, and any existing or approved WTGs within eight (8) km of each dwelling or key public viewpoint. **Figure 13** below provides examples of where a dwelling or key public viewpoint may have views to WTGs in multiple 60° sectors.

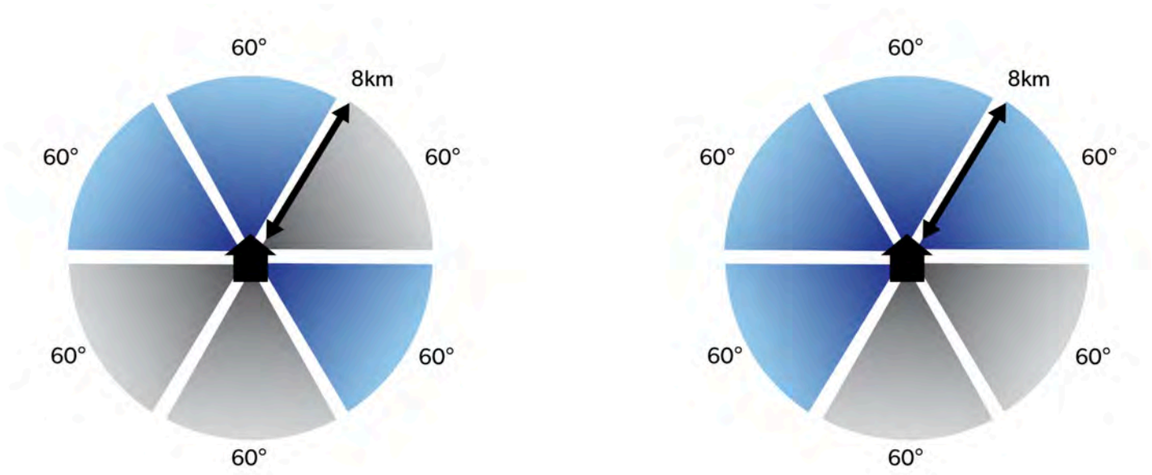


Figure 13 – Preliminary Assessment Tool 2: Multiple Wind Turbines
Source: Visual Assessment Bulletin

In accordance with the Bulletin where WTGs are visible within the horizontal views of the dwelling or key public viewpoints in three or more 60° sectors, the proponents have identified the turbines, relative dwelling and key public viewpoint, along with the relative distance and submited these to the DPHI as part of the request for SEARs. These turbines are a focus for assessment in the EIS.

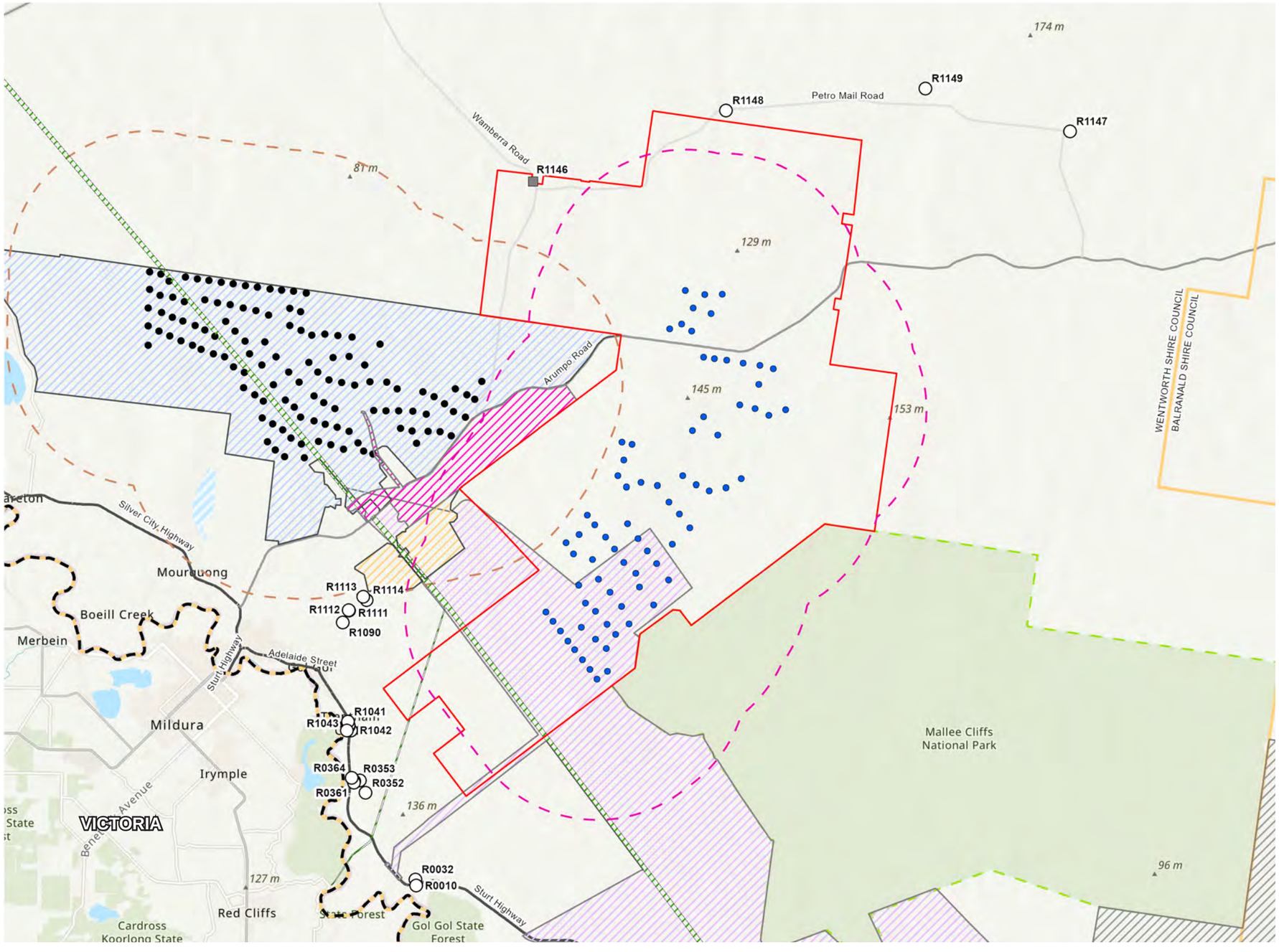
6.5 Results of Preliminary Assessment Tool 2: Multiple Wind Turbine Tool

The 2D MWTT (see **Figure 13**) assessment, taking into account turbines associated with the Gol Gol Wind Farm, did not identify any non-associated dwellings within 8,000 m.

Note, for the purposes of the assessment, the WTGs utilised for the assessment of GGWF was the layout available on NSW Planning Portal's Major Projects website (accessed on 28th May 2024).

Key Public Viewpoints:

No key public viewpoints were identified within the Study Area. As discussed in **Section 5.4.6**, Arumpo Road serves as an access to the World Heritage Listed WLR (inclusive of both the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property) and the Mungo National Park. However, site observations made during the fieldwork in August 2022 and July 2023 did not identify any key public viewpoints along this route. Similarly, no publicly accessible locations with recreational associations were identified within the adjacent MCNP.



Multiple Wind Turbine Tool

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings in excess of 8,000m
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- LGA Boundary
- National Park, Reserves and State Conservation Area
- Primary Road
- Arterial Road
- Sub Arterial Road
- Project Energy Connect 330kV Transmission Line (under construction) (approximate location)
- Proposed Turbines (Gol Gol Wind Farm)
- 8,000 m from nearest proposed WTG (Gol Gol Wind Farm)
- Project Boundary (Gol Gol Wind Farm)
- Development Footprint (Mallee Solar Farm)
- Project Boundary (Euston Wind Farm)
- Project Boundary (Euston Mineral Sands)
- Development Footprint (Gol Gol Solar Farm)

0 3 6 12 18 24 km

Figure 14 – Preliminary Assessment Tool 2: Multiple Wind Turbine Tool
Source: ArcGIS, 2024

07

Zone of Visual Influence

7.0 Zone of Visual Influence

7.1 Zone of Visual Influence

The Bulletin states: *'the use of Geographic Information Systems (GIS) to facilitate the application of the tools will streamline the evaluation phase of the evaluation phase of a project during the pre-lodgement stage. This can also assist in refining the number of turbines and viewpoints that will ultimately need more detailed assessment.'*

Two (2) Zone of Visual Influence (ZVI) diagrams have been prepared for the Project to illustrate the theoretical visibility of the proposed turbines.

Figure 15 depicts the areas of land from which the Project may be visible at a blade tip height of 280 m and provides an indicative number of visible WTGs.

Figure 16 depicts the areas of land from which the proposed turbines may be visible at a hub height of 180 m.

The ZVI Diagram represents the area over which a development can theoretically be seen, and is based on a Digital Terrain Model (DTM). 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 (The Landscape Institute and the institute of Environmental Management and Assessment, 2002).

The ZVI has been determined through the use of digital topographic information and 3D modelling software WindPro. The ZVI has been assessed to 8 km from the Project, consistent with the Study Area. It is also prudent to consider the ZVI beyond the Study Area boundary and visibility to 10 km was also assessed. Although it is possible for the development to be visible from further than 10 km away, it is generally accepted that beyond 10 km visibility is greatly diminished (Sullivan et.al., 2012, Bishop, 2002, Shang and Bishop, 1999).

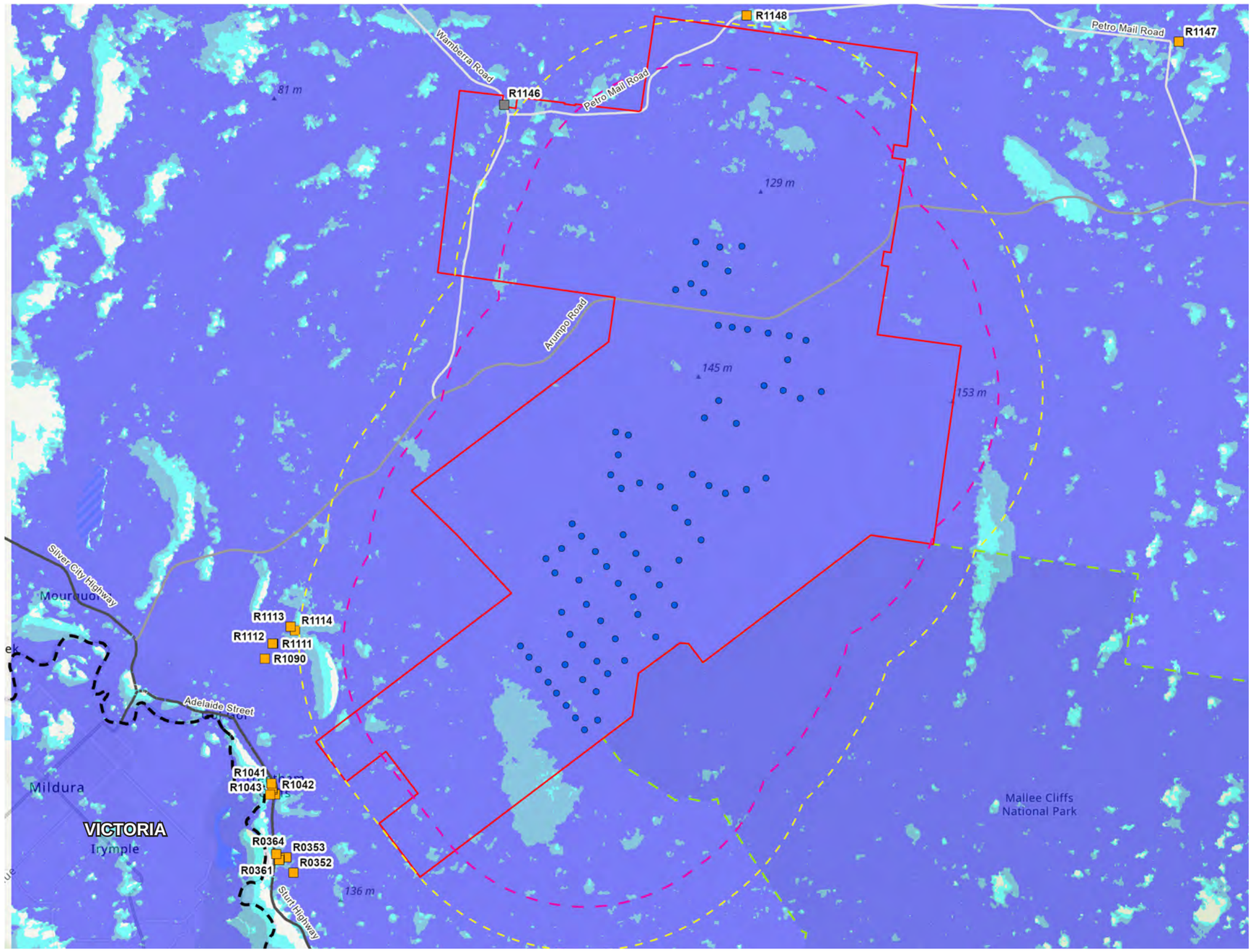
7.2 Summary of Zone of Visual Influence

The following provides a brief summary of the ZVI diagram prepared for Project:

- Due to the relatively flat topography, the majority of the WTGs associated with the Project are likely to be visible from the surrounding areas. The ZVI identifies these areas to have views to the majority of the WTGs due to the minor topographical differences between them and the Project. Certain areas to the southwest and west of the Project are characterised by shallow topographical changes by embankments along lakes and swamps.
- Due to proximity of the MCNP, there is potential visibility towards the majority of the Project (see **Figure 15** and **Figure 16**). No areas with public access have been identified within the National Park.

It is important to reiterate this is a preliminary ZVI based on a worst case scenario assessment with no vegetation or structures. The ZVI figures have been utilised to identify areas which require additional analysis.

Following the development of the ZVI, detailed site investigations (in the form of a viewpoint analysis inventory) have been undertaken to ground truth the findings (see **Section 8.0**).



Zone of Visual Influence Blade Tip Height: 280 m

Mallee Wind Farm

LEGEND

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- 10,000m From Nearest Proposed WTG
- State Border
- National Park, Reserves and State Conservation Area
- Primary Road
- Arterial Road
- Sub Arterial Road

ZONE OF VISUAL INFLUENCE LEGEND
NUMBER OF TURBINES VISIBLE
(Based on topography alone):

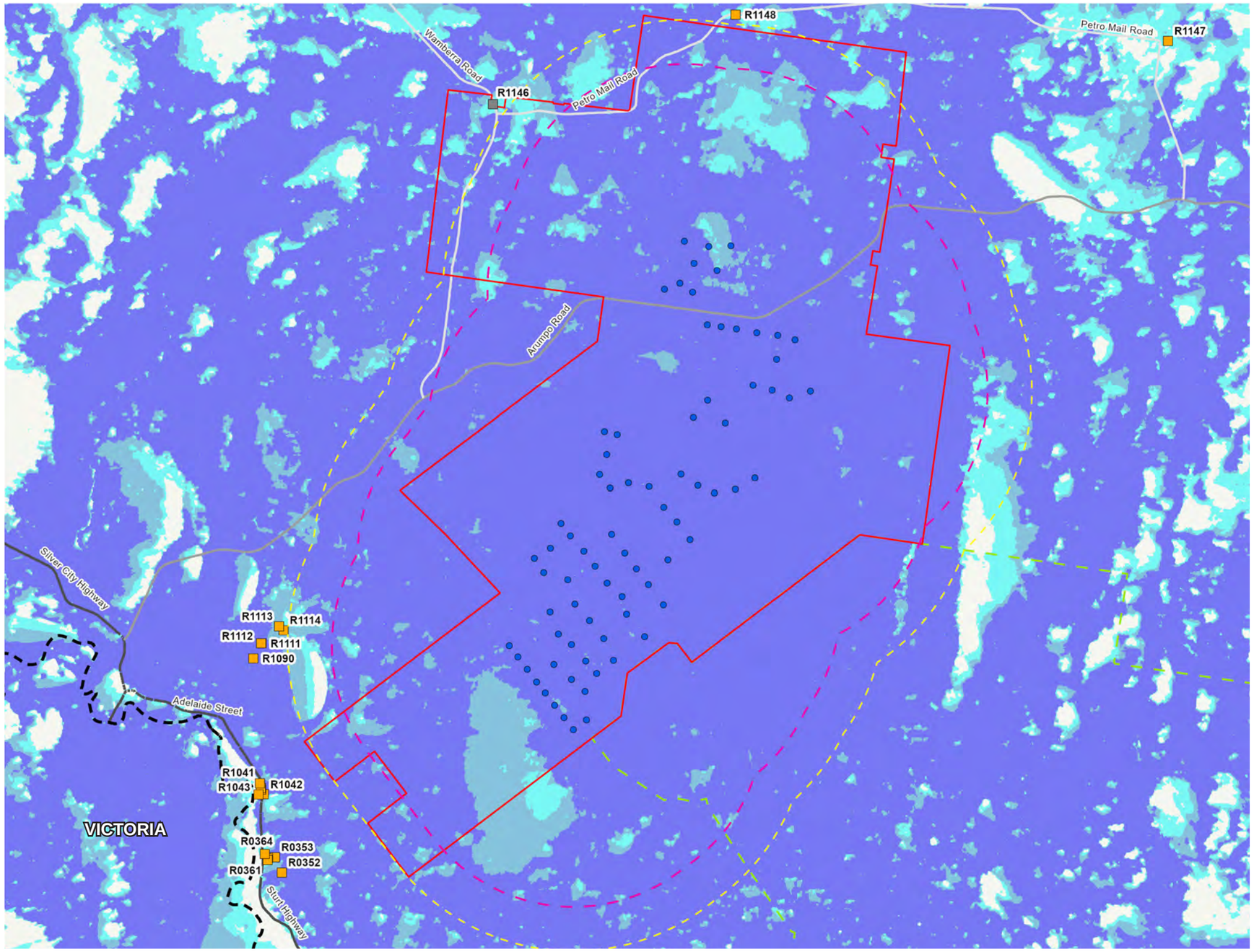
- 0 - 1 Turbines
- 1 - 24 Turbines
- 25 - 49 Turbines
- 50 - 76 Turbines

Note

The ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. a landscape without screening, structures or vegetation. 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.

0 2 5 9 14 18 km

Figure 15 – Zone of Visual Influence (Blade Tip Height = 280 m)
Source: ArcGIS, 2024



Zone of Visual Influence Hub Height: 180 m

Mallee Wind Farm

LEGEND

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- 10,000m From Nearest Proposed WTG
- State Border
- National Park, Reserves and State Conservation Area
- Primary Road
- Arterial Road
- Sub Arterial Road

ZONE OF VISUAL INFLUENCE LEGEND
NUMBER OF TURBINES VISIBLE
(Based on topography alone):

- 0 - 1 Turbines
- 1 - 24 Turbines
- 25 - 49 Turbines
- 50 - 76 Turbines

Note:

The ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. a landscape without screening, structures or vegetation. 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.

Figure 16 – Zone of Visual Influence (Hub Height = 180 m)
Source: ArcGIS, 2024

0 2 5 9 14 18 km

08

Public Viewpoint Analysis

8.0 Public Viewpoint Assessment

8.1 Overview of Public Viewpoint Analysis

In accordance with the Bulletin 'all key public viewpoints and individual residences within the 'visual catchment' should be identified and assessed'.

A total of 25 viewpoints were taken from public locations during the field work process in August 2022 and July 2023. Viewpoints have been carefully selected to be representative of the range of views within the Study Area. The selection of viewpoints is generally informed by the topographical maps, field work observations and other relevant influences such as access, dwellings, landscape character and the popularity of vantage points. Viewpoints are selected to illustrate a combination of the following;

- Viewpoints identified by the community in community consultation,
- Present landscape character types,
- Areas of potentially high landscape or scenic value,
- Range of distances,
- Varying aspects and elevations,
- Varying extent of wind farm visibility (full and partial visibility), and
- Sequential views along specific routes.

It is important to note that viewpoints for this LVIA study have been taken from accessible public land (typically roads, rest areas, campgrounds and lookouts) which were identified as having a potentially high visibility to the Project through the desktop review process.

Selected viewpoint assessment locations are shown on **Figure 17**.

8.2 Public Viewpoint Analysis Methodology

Once the viewpoints had been selected, panoramic photographs are taken in accordance with the standards outlined in the Scottish Natural Heritage *Visual Representation of Wind Farms Guidance Version 2.2*.

Photographs used for viewpoints are taken on a level tripod at a height of 150 cm (to represent eye level). Photographs were taken with a Canon EOS 5D Mark III Full Frame digital SLR through a 50mm fixed focal lens which closely represents the central field of vision of the human eye. Parameters for the photography are provided in **Table 07**.

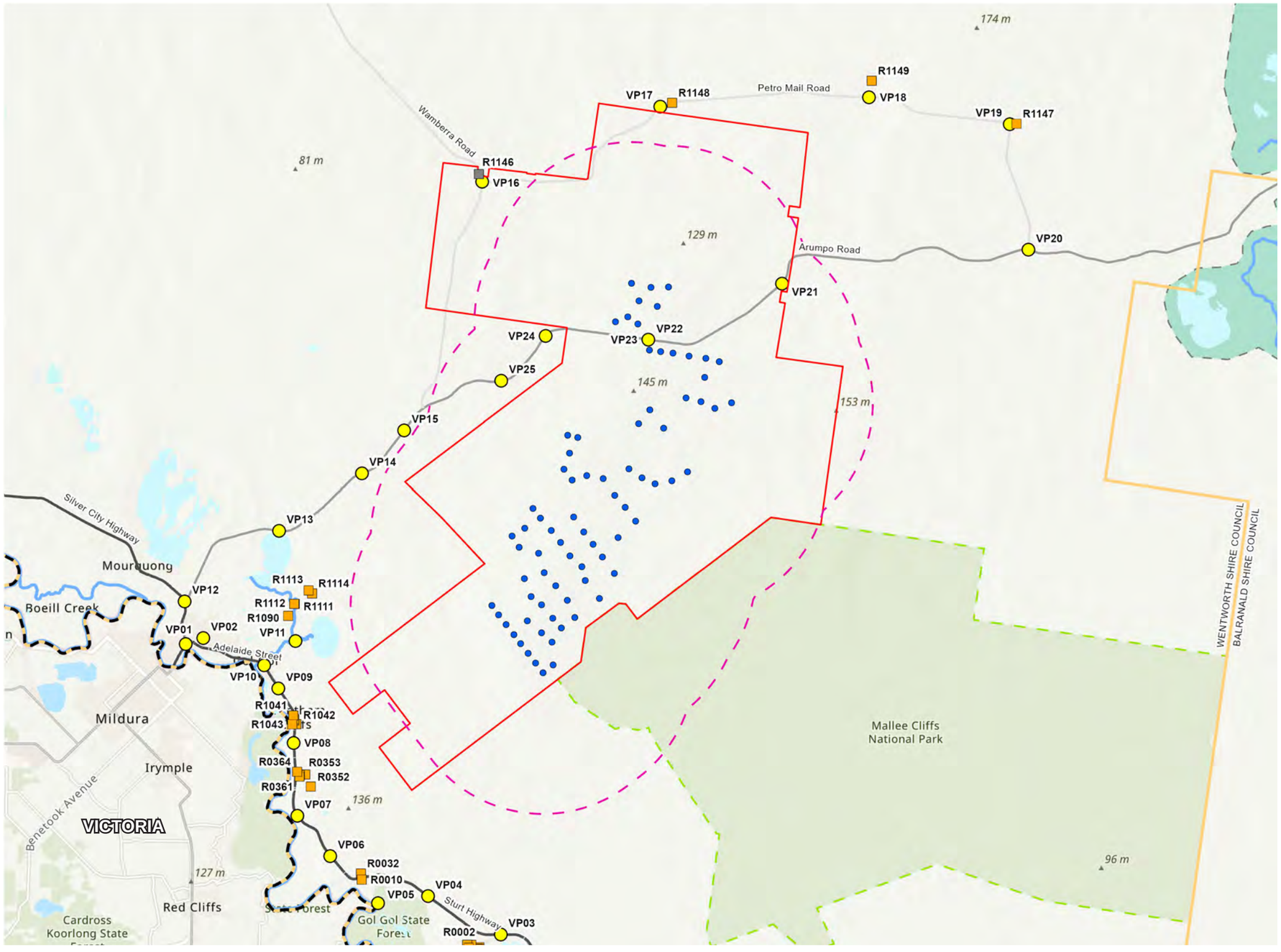
The visual impact of the viewpoint was assessed both on site and through a desktop assessment utilising the topographic and aerial information to ensure accuracy.

The locations of the viewpoints have been identified in **Figure 17** and the general viewing direction of each viewpoint is identified on the map on each viewpoint.

Viewpoint analysis prepared for the Project from public locations has been included as **Appendix B.**

Photography Specifications:	
Camera Make and Model:	**Canon EOS 5D Mark IV Full Frame Digital SLR**
Lens:	**EF50mm f/1.2L USM**
Focal Length:	**50mm f/0**
Aperture Setting:	**f/6.3 - 10**
Tripod Height:	**150cm**

Table 07 – Photography Specifications



Public Viewpoint Analysis Locations

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- Public Viewpoint Locations
- 8,000m From Nearest Proposed WTG (Study Are
- State Border
- LGA Boundary
- National Park, Reserves and State Conservation
- World Heritage Listed Willandra Lakes Region
- Primary Road
- Arterial Road
- Sub Arterial Road
- Rivers and Creeks
- Lakes

0 3 6 12 18 24 km

Figure 17 – Public Viewpoint Analysis Locations
Source: ArcGIS, 2024

8.3 Visual Influence Zone (VIZ)

Visual Influence Zones have been established from the Development Footprint from dwellings and key viewpoints. This establishes the relative landscape significance against which the potential impacts of WTGs may be assessed. The Visibility Distance Zone, Viewer Sensitivity Level and Scenic Quality Class of each viewpoint have been assessed which, when combined, result in an overall VIZ (see **Figure 18** below and refer to **Section 17.0**). An evaluation using the corresponding visual performance objectives (Table 2 of the Visual Assessment Bulletin) has been included for each viewpoint.

For each viewpoint, the potential visual impact was analysed through the use of a combination of the 3D terrain modelling, topographic maps and on site analysis.

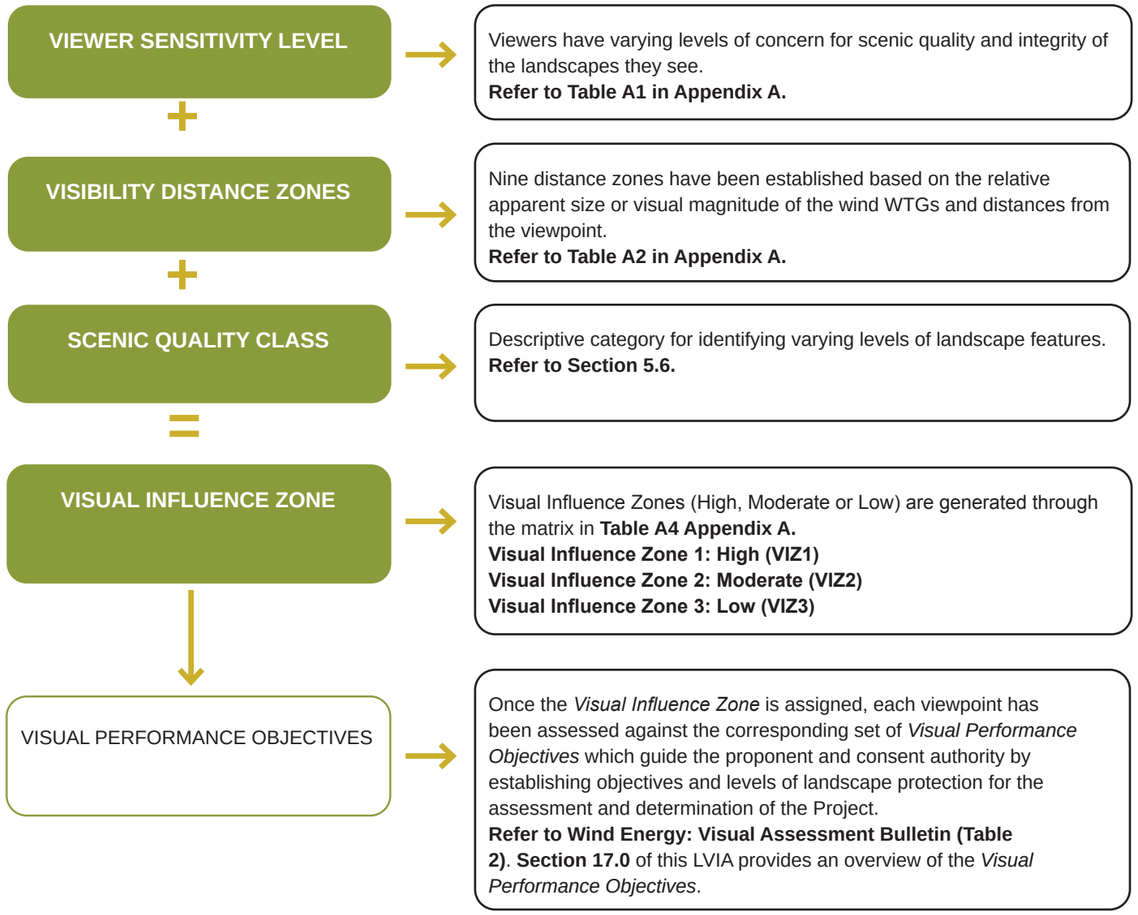


Figure 18 – Methodology for determining Visual Influence Zone (VIZ)

8.4 Summary of Public Viewpoint Analysis

The 25 public viewpoints assessed for the purpose of this LVIA were taken from varying distances and locations surrounding the Project.

Each viewpoint was assigned a VIZ based on their Viewer Sensitivity Level, Visibility Distance Zone and Scenic Quality Class combinations (refer to the methodology in **Section 17.0** and **Appendix A**). In accordance with the objectives of the Bulletin, each viewpoint was assessed against the objectives for the VIZ. **Table 08** provides a brief overview of the viewpoint analysis (refer to **Appendix B**).

Photomontages have been undertaken from eight (8) public viewpoints to illustrate the potential visual impacts (refer to Section 10.0).

The VIZ was identified for 25 key viewpoint locations and where required the landscape scenic integrity was assessed in accordance with the relevant visual performance objectives.

8.4.1 Visual Influence Zone 1 (VIZ1):

No public viewpoints were assessed as being VIZ1.

8.4.2 Visual Influence Zone 2 (VIZ2):

Two (2) public viewpoints (VP22 and VP23 were assessed as being VIZ2 (see **Table 08**).

8.4.3 Visual Influence Zone 3 (VIZ3):

23 public viewpoint locations were rated as VIZ3 in accordance with the methodology in the Bulletin (see **Table 08**). There are no performance objectives for VIZ3 rated viewpoints.

Photomontages have been prepared from eight (8) public viewpoints to demonstrate the potential of the Project to dominate the visual catchment from various locations (refer to **Appendix C**). It is noted that Arumpo Road has a low viewer sensitivity level and there were no noted landscape features impacted by the Project from these locations.

8.4.4 Willandra Lakes Region World Heritage Area

The Willandra Lakes Region is more than 25 km from the Project, in accordance with the Guideline, and as stated in **Section 7.1**, although it is possible for the development to be visible from further than 10 km away, it is generally accepted that beyond 10 km visibility is greatly diminished (Sullivan et.al., 2012, Bishop, 2002, Shang and Bishop, 1999).The furthest viewpoint assessed in this report with no vegetation to fragment views (VP20), is 18.62 km from the Project, and was assessed as having a Low Visual Impact Rating as the overall view affected was negligible. The nearest publicly accessible viewpoint within the WLR is approximately 57 km from the Project, more than three (3) times the distance of VP20, therefore, the visual impact to the Willandra Lakes Region can be considered to be negligible, given the distance from the Project.

VP Analysis ID	Location	Approx. distance to nearest WTG	Visual Sensitivity	LCU	Visual Influence Zone (VIZ)	Visual Magnitude	Visual Impact Rating	Photomontage Analysis ID
VP01	Buronga Wetlands, Buronga	17.49 km	MODERATE	LCU04	VIZ3	LOW	LOW	N/A
VP02	Melaleuca Street, Buronga	16.47 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP03	Sturt Highway, Paringi	15.02 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP04	Sturt Highway, Paringi	14.26 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP05	Billabong Road, Gol Gol State Forest	16.07 km	MODERATE	LCU05	VIZ3	LOW	LOW	N/A
VP06	Sturt Highway, Monak	15.91 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP07	Sturt Highway, Trentham Cliffs	16.13 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP08	Trentham Hills Rest Area, Sturt Highway, Trentham Cliffs	13.67 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP09	Sturt Highway, Mallee	12.95 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP10	Sturt Highway, Gol Gol	13.22 km	LOW	LCU04	VIZ3	LOW	LOW	PM04
VP11	Off Potters Drive, Gol Gol Creek, Mallee	11.30 km	LOW	LCU02	VIZ3	LOW	LOW	PM05
VP12	Rest Area along Silver City Highway, Mourquong	17.41 km	LOW	LCU01	VIZ3	LOW	LOW	PM06
VP13	Arumpo Road, Wentworth	12.80 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP14	Arumpo Road, Wentworth	9.24 km	LOW	LCU03	VIZ3	LOW	LOW	N/A
VP15	Arumpo Road, Wentworth	8.54 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP16	Corner Petro Mail Road and Wamberra Road, Arumpo	10.25 km	LOW	LCU01	VIZ3	LOW	LOW	PM01
VP17	Petro Mail Road, Arumpo	10.15 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP18	Petro Mail Road, Arumpo	15.69 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP19	Petro Mail Road, Arumpo	21.28 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP20	Corner Petro Mail Road and Arumpo Road, Arumpo Road	18.62 km	LOW	LCU01	VIZ3	LOW	LOW	PM02
VP21	Arumpo Road, Arumpo	5.68 km	LOW	LCU01	VIZ3	LOW	LOW	PM07
VP22	Arumpo Road, Arumpo	0.60 km	LOW	LCU03	VIZ2	MODERATE	MODERATE	N/A
VP23	Arumpo Road, Arumpo	0.60 km	LOW	LCU03	VIZ2	MODERATE	MODERATE	N/A
VP24	Arumpo Road, Wentworth	4.04 km	LOW	LCU01	VIZ3	LOW	LOW	N/A
VP25	Arumpo Road, Wentworth	4.87 km	LOW	LCU03	VIZ3	LOW	LOW	PM08

Table 08 – Overview of Viewpoint Analysis

09

Dwelling Assessments

9.0 Dwelling Assessments

9.1 Overview of Dwelling Assessment

9.1.1 Dwelling Assessment Requirements

Non-associated dwellings:

The Preliminary Assessment Tools (**Section 6.0**) defined the 'visual catchment' and identified no non-associated dwellings within the Study Area which require further assessment (see **Figure 19**).

9.2 Lots Adjacent to the Project

The SEARs issued for the Project states that the LVIA must include a "*detailed consideration of potential visual impacts on local residences (including approved developments, lodged development applications and dwelling entitlements)*".

9.2.1 Dwelling Entitlement (in excess of minimum lot size)

Umwelt undertook a dwelling entitlement analysis which identified two (2) lots within 5.5km of the nearest WTG in excess of the minimum lot size under subclause (3)(a) of the Wentworth LEP 2011. The two lots comprise:

- Lot 11 / DP1262716
- Lot 6906 / DP1004307

It is noted that any lots that are prohibited from dwelling entitlement based on zoning such as Conservation Zones were also excluded including Lot 2977/DP765176 which comprises MCNP.
An overview of the visual assessment for two (2) lots identified as potentially holding dwelling entitlements within 5,500 m of the nearest WTG has been included in this report (see **Figure 20**). An assessment based on topography alone suggests that the majority of the Project will be visible on all lots within the Study Area (see **Figure 20**).

9.2.2 Dwelling Entitlement (below minimum lot size)

The dwelling entitlement of six (6) lots within 5.5km but below the minimum lot size under the Wentworth LEP 2011 were investigated further by Wentworth Shire Council as outlined in **Table 09**. It is noted that any lots below the minimum lot size associated with host landholders or Crown landholdings were excluded.

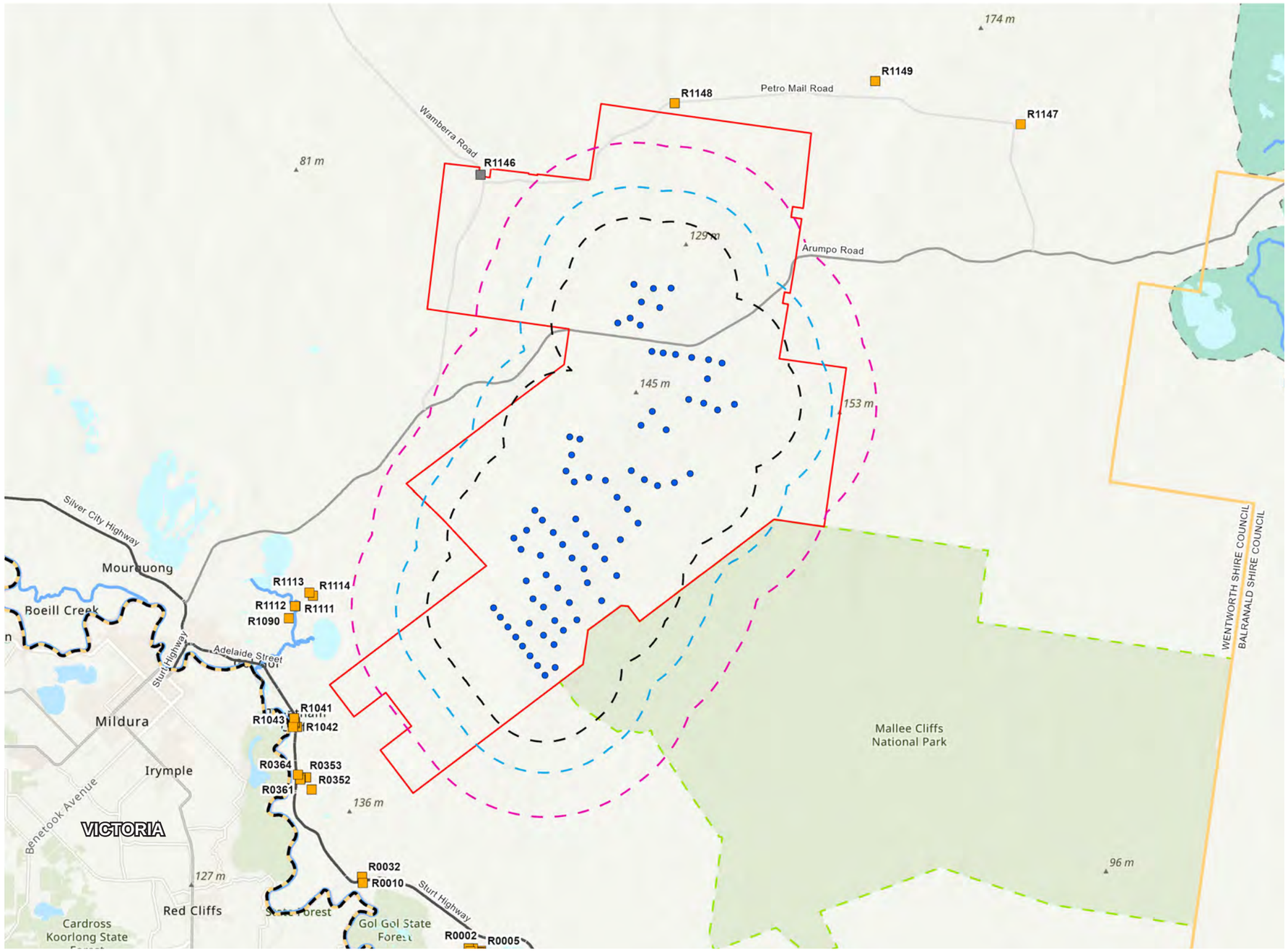
Additionally, the assessment identified that, most of the lots are associated with the adjacent Gol Gol Wind Farm or the Euston Mineral Sands Project (see **Table 09**).

MLA Reference	Lot / DP & Address	LGA	Assessment notes
MLA01	1036/DP765851	Wentworth Shire LGA	No dwelling entitlement if there is currently no existing dwelling on the land. An aerial assessment of the lot identified that there is no dwelling currently on the lot. The additional assessment identified that the lot is likely associated with the adjacent Gol Gol Wind Farm.
MLA02	3/DP1182353	Wentworth Shire LGA	Associated Landholder
MLA03	1/DP1233260	Wentworth Shire LGA	No dwelling entitlement. Part of the lot is likely associated with the adjacent Euston Mineral Sands.
MLA04	2/DP1233260	Wentworth Shire LGA	No dwelling entitlement. Most of the lot is likely associated with the adjacent Euston Mineral Sands.
MLA05	29/DP836099	Wentworth Shire LGA	No dwelling entitlement if there is currently no existing dwelling on the land. Most of the lot is likely associated with the adjacent Euston Mineral Sands.
MLA06	1/DP756951	Wentworth Shire LGA	No dwelling entitlement if there is currently no existing dwelling on the land.

Table 09 – Overview of Lots Adjacent to the Project
Source: Wentworth Shire Council,2024

Dwelling Locations

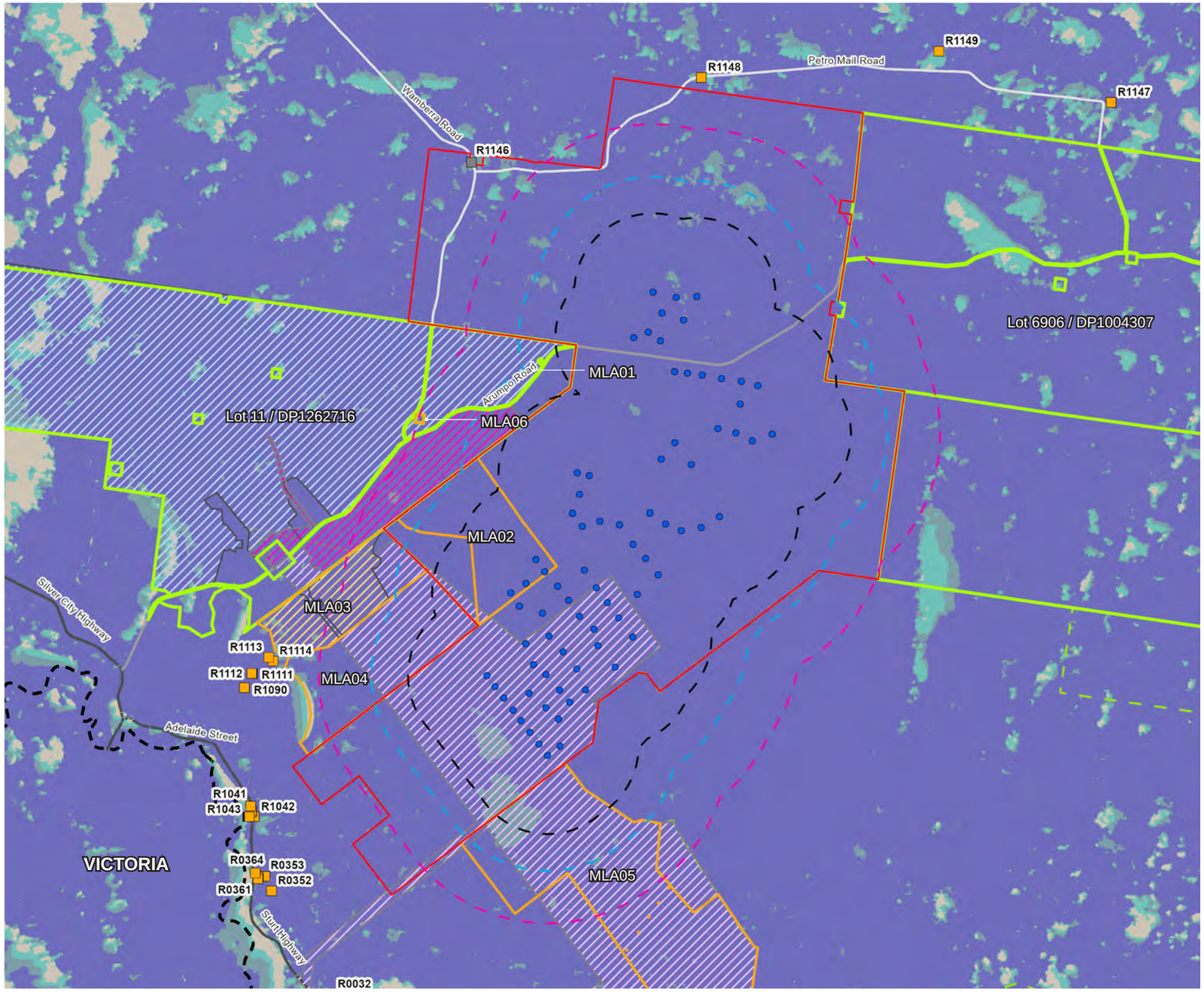
Mallee Wind Farm



- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 3750m From Nearest WTG (Black Line of Visual Magnitude)
- 5500m From Nearest WTG (Blue Line of Visual Magnitude)
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- LGA Boundary
- National Park, Reserves and State Conservation Area
- World Heritage Listed Willandra Lakes Region
- Primary Road
- Arterial Road
- Sub Arterial Road
- Rivers and Creeks
- Lakes

0 3 6 12 18 24 km

Figure 19 – Dwelling Locations
Source: ArcGIS, 2024



Lots with Entitlement

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- Lots with Dwelling Entitlement
- Dwelling Entitlement (below minimum lot size)
- 3750m From Nearest WTG (Black Line of Visual Magnitude)
- 5500m From Nearest WTG (Blue Line of Visual Magnitude)
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- National Park, Reserves and State Conservation Area
- Primary Road
- Arterial Road
- Sub Arterial Road
- Project Boundary (Gol Gol Wind Farm)
- Development Footprint (Gol Gol Solar Farm)
- Development Footprint (Mallee Solar Farm)
- Project Boundary (Euston Wind Farm)
- Project Boundary (Euston Mineral Sands)

ZONE OF VISUAL INFLUENCE LEGEND
NUMBER OF TURBINES VISIBLE
(Based on topography alone):

- 0 - 1 Turbines
- 1 - 24 Turbines
- 25 - 49 Turbines
- 50 - 76 Turbines

0 2 5 9 14 18 km

Figure 20 – Lots with Entitlement
Source: ArcGIS, 2024

10

Photomontages and Wireframe Diagrams

10.0 Photomontages and Wireframe Diagrams

10.1 Overview of Photomontages and Wireframe Diagrams

10.1.1 Photomontages

The Bulletin states: *'Photomontages shall be prepared in accordance with the Scottish Natural Heritage Visual Representation of Wind Farms, Version 2.1 December 2014 guidelines, noting they are generally consistent with the Land and Environment Court's Photomontage Policy. The visual assessment needs to include a concise description of the complete methodology used to create any photomontages presented in the visual assessment.'*

A photomontage combines a photograph of an existing view with a computer-rendered image of a proposed development. Photomontages are used to illustrate the likely view of a proposed development as it would be seen in a photograph (not as it would appear to the human eye in the field).

Although photomontages are based on a photograph of the existing landscape, it is important to stress that they are not a substitute to visiting a viewpoint in the field. They are only one tool to aid assessment. They provide a two-dimensional image that can be compared with an actual view of the landscape to provide information, such as the scale and potential appearance of a proposed development.

10.1.2 Wireframe Diagrams.

A wireframe is a computer generated image based on a digital terrain model, that indicate the 3D shape of the landscape in combination with additional elements. They are a valuable tool in the wind farm LVIA process as they allow the assessor to compare the position and scale of the turbines to the existing view of a landscape (Scottish Natural Heritage, 2017). Wireframe images can be seen as a worst case scenario as they do not take into account factors such as vegetation, building structures.

Photomontages and wireframes have been prepared for the Project and have been included as Appendix C.

10.2 Photomontage Limitations

Visualisations in themselves can never provide the full picture in terms of potential impacts; they only inform the assessment process by which judgements are made. Visualisations of wind farms have a number of limitations which stakeholders should be aware of when using them to form a judgement on a wind farm proposal.

10.3 Photomontage Selection Process

Indicative viewpoints have been selected for the preparation of photomontages from public locations to best illustrate the potential appearance of the Project from varying distances and locations with differing views in public locations (refer to **Figure 22**).

10.3.1 Public Photomontage Locations:

A total of eight (8) viewpoint locations selected for the preparation of visual photomontages are based on feedback received from the community and Moir LA's experience in assessing key public viewpoint locations (see **Table 10**). Exact photomontage locations were selected on site to represent a worst case scenario for the viewpoint locations. These include key public viewpoints such as major routes, rest areas, camp grounds and viewing platforms. Localised screening factors such as vegetation were avoided (where possible) to ensure maximum exposure to the Project. Additionally, two (2) wireframes were generated from potential areas of interests (see **Table 10**).

Public Photomontages And Wireframes		
Photomontage 01	Viewpoint VP16	Intersection of Wamberra Road/Petro Mail Road, Arumpo NSW
Photomontage 02	Viewpoint VP20	Intersection of Petro Mail Road/Arumpo Road, Arumpo NSW
Photomontage 03	Viewpoint VPB01	Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park (Willandra Lakes Region)
Photomontage 04	Viewpoint VP10	Intersection of Sturt Highway/Wilga Road, Gol Gol NSW
Photomontage 05	Viewpoint VP11	Gol Gol Swamp, Gol Gol NSW
Photomontage 06	Viewpoint VP12	Intersection of Silver City Highway/Arumpo Road, Arumpo NSW
Photomontage 07	Viewpoint VP21	Arumpo Road, Gol Gol NSW
Photomontage 08	Viewpoint VP25	Arumpo Road, Gol Gol NSW
Wireframe 01		Mungo Youth Project Site
Wireframe 02		Marma Cricket Pitch

Table 10 – Overview of Photomontage and Wireframe Locations

10.4 Photomontage Development Methodology

The process for generating the photomontages involves computer generation of a wireframe perspective view of the turbines, associated infrastructure and the topography from each viewpoint. As per the requirements of the Bulletin, photomontages have been prepared in accordance with the Scottish Natural Heritage Visual Representation of Wind Farms, Version 2.2 February 2017. The process for photomontage development is demonstrated in **Figure 21**.

The photomontages are based on a worst case scenario of a maximum turbine height dimension of 280 m with a hub height of 180 m and rotor diameter of 100 m.

Moir LA have prepared the photomontages using the most current available version of Wind Pro software using the following process:

Step 1: Develop 3D Model

Detailed 3D model of the Project is developed in Wind Pro. The WTGs and associated infrastructure (substations, transmission lines, wind masts etc.) are modelled and sited in the 3D model to scale.

Step 2: Align Photograph and Model

The digital panorama is imported into Wind Pro and EXIF properties of the file are inserted automatically defining all relevant visualisation information as e.g. type of camera lens used, field of view for panoramas, the position and direction. Topography, control points, obstacle objects, existing wind masts can be used as reference to calibrate the camera model precisely.

Step 3: Render Photomontage

The software calculates the position of the sun based on the time and date of photograph and renders the WTGs in accordance with the specific weather conditions and position of the sun. Once rendered, detailed removal of intervening elements (such as vegetation) is undertaken to provide an accurate representation of the Project.

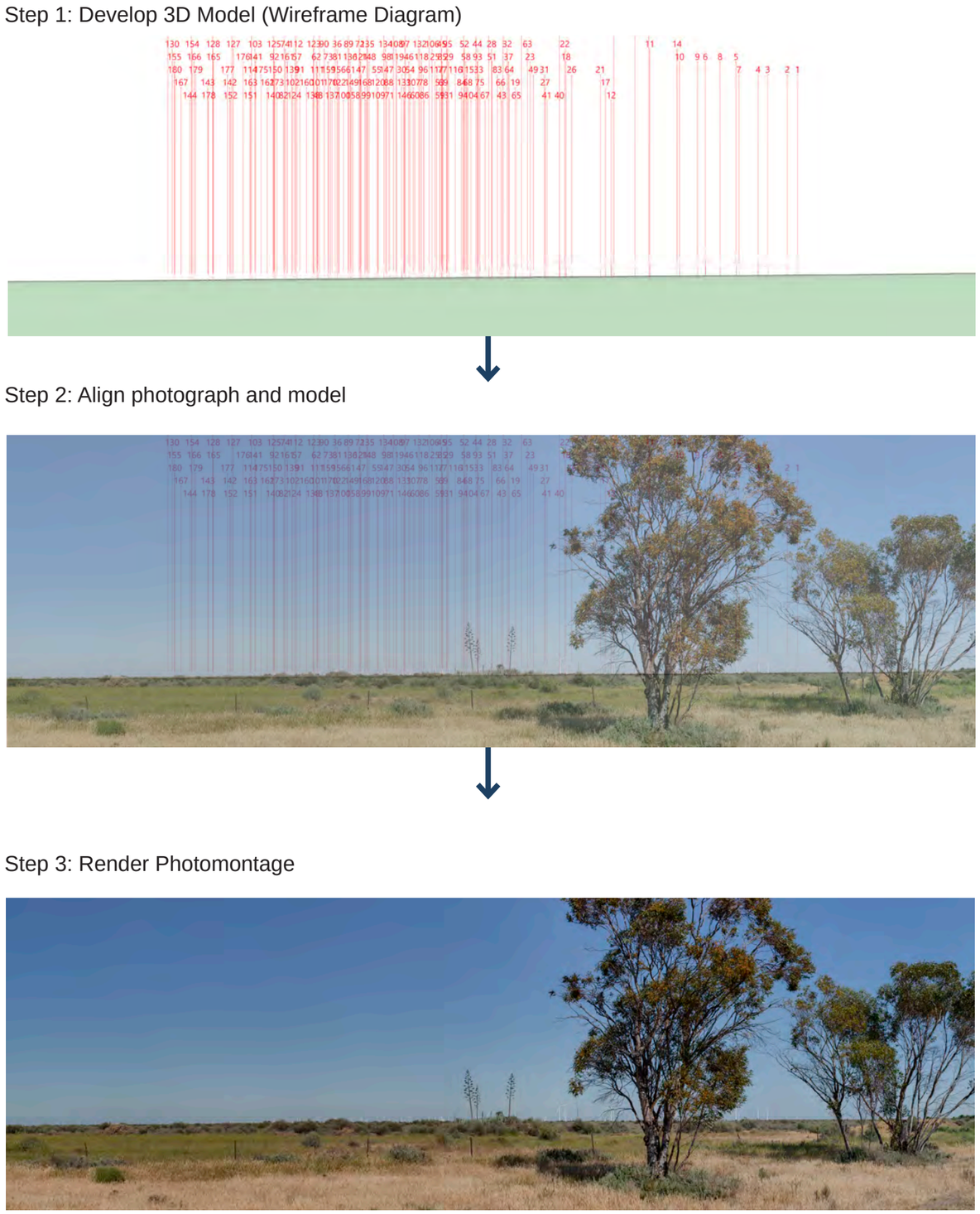
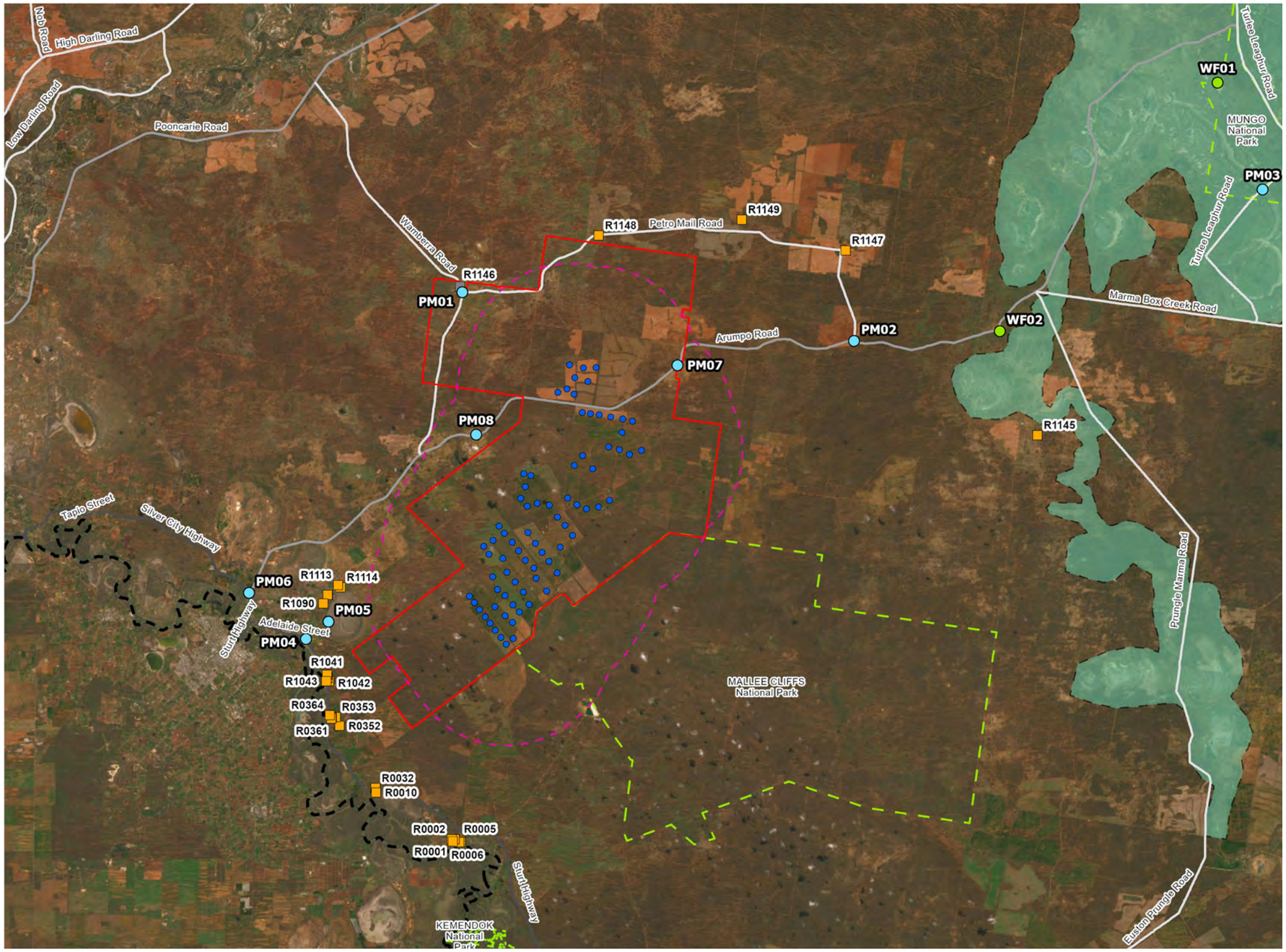


Figure 21 – Photomontage Development Process



Photomontage Locations

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- Photomontage Locations
- Wireframe Diagram Locations
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- World Heritage Listed Willandra Lakes Region
- National Park, Reserves and State Conservation Area

*Photomontages prepared for the Project have been included as **Appendix C**.*

Figure 22 – Photomontage Locations
Source: ArcGIS, 2024

0 4 9 17 26 34 km

11

Shadow Flicker & Blade Glint Assessment

11.0 Shadow Flicker and Blade Glint Assessment

11.1 Overview of Shadow Flicker

Shadow flicker is defined as the visual effect that occurs when rotating turbines cause moving shadows as the blades pass in front of the sun. The effect will occur under circumstances where the turbine is located such that at certain times of day the sun's rays pass through the swept area of the rotating blades, potentially affecting the viewpoint. The effect is diminished by the distance of the viewpoint from the turbine. Shadowing is also influenced by increased cloud cover, and is dependent on the angle of the sun's rays (Draft National Wind Farm Development Guidelines, 2010).

The Bulletin states: *The shadow flicker caused by certain sun angles in relation to the rotation of wind turbine blades on residences will be limited to 30 hours per year, and may require mitigation measures such as amended siting and design of turbines to minimise the amount of shadow flicker.*

11.2 Shadow Flicker Assessment Methodology

As there is no methodology for the assessment of shadow flicker in the Bulletin, Moir LA have referred to the Draft National Wind Farm Development Guidelines (2010) to define the parameters for the assessment (see **Table 11**). The parameters used for the Shadow Flicker Assessment are as follows:

Model Parameter	Setting Used:
Zone of Visual Influence of Shadows	265 x maximum blade chord
Minimum angle of sun	3 degrees
Shape of the sun	Disk
Time and duration of modelling	One full year
Orientation of the rotor	The rotor plane is always perpendicular to the line from the WTG to the sun
Time step	1 minute
Effects of topography	Included
Receptor Height	1.5 meters
Grid size	1 meter

Table 11 – Shadow Flicker Assessment Parameters

Modelling of the shadow flicker was conducted using specialist industry software (Wind Pro), assessing the largest turbine (based on a 280 m maximum tip height) proposed for the Project to represent the worst case impact scenario (see **Figure 23**).

It is important to note the shadow flicker modelling undertaken for the Project is based on topography alone and therefore the extent of impact may be decreased by a number of variables including:

- The aspect of the dwelling relative to the turbine(s) (window locations, living area locations etc);
- The extent of natural or screening vegetation between the turbine(s) and the receptor;
- The existence of other screening elements (buildings, structures etc) between the turbine(s) and the receptor;
- The time of year;
- The proportion of daylight hours in which the turbines operate; and
- The frequency of bright sunshine and cloudless skies (particularly at low elevations above the horizon).

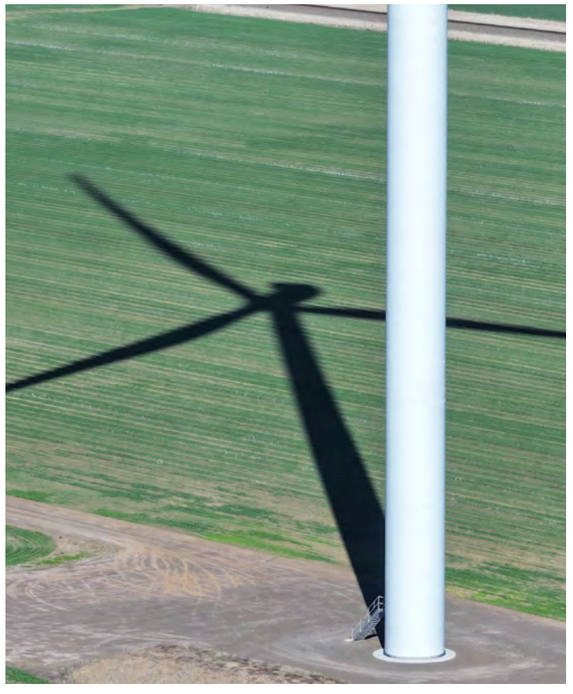


Image 21 – Example of shadow intensity from base of WTG

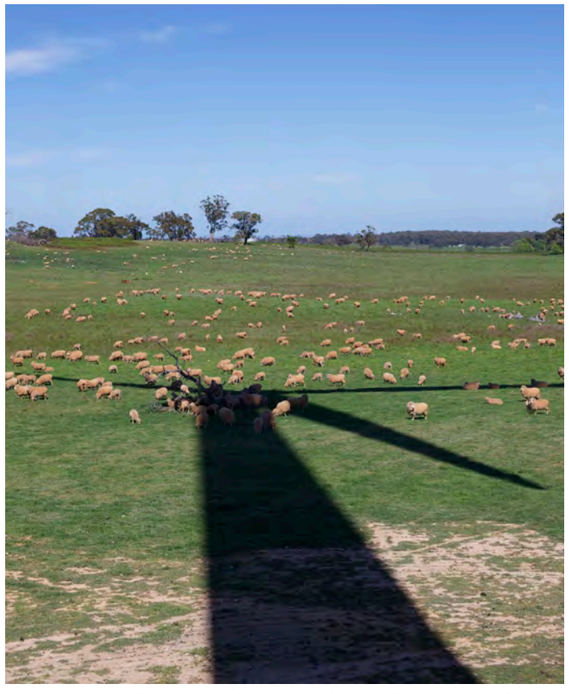
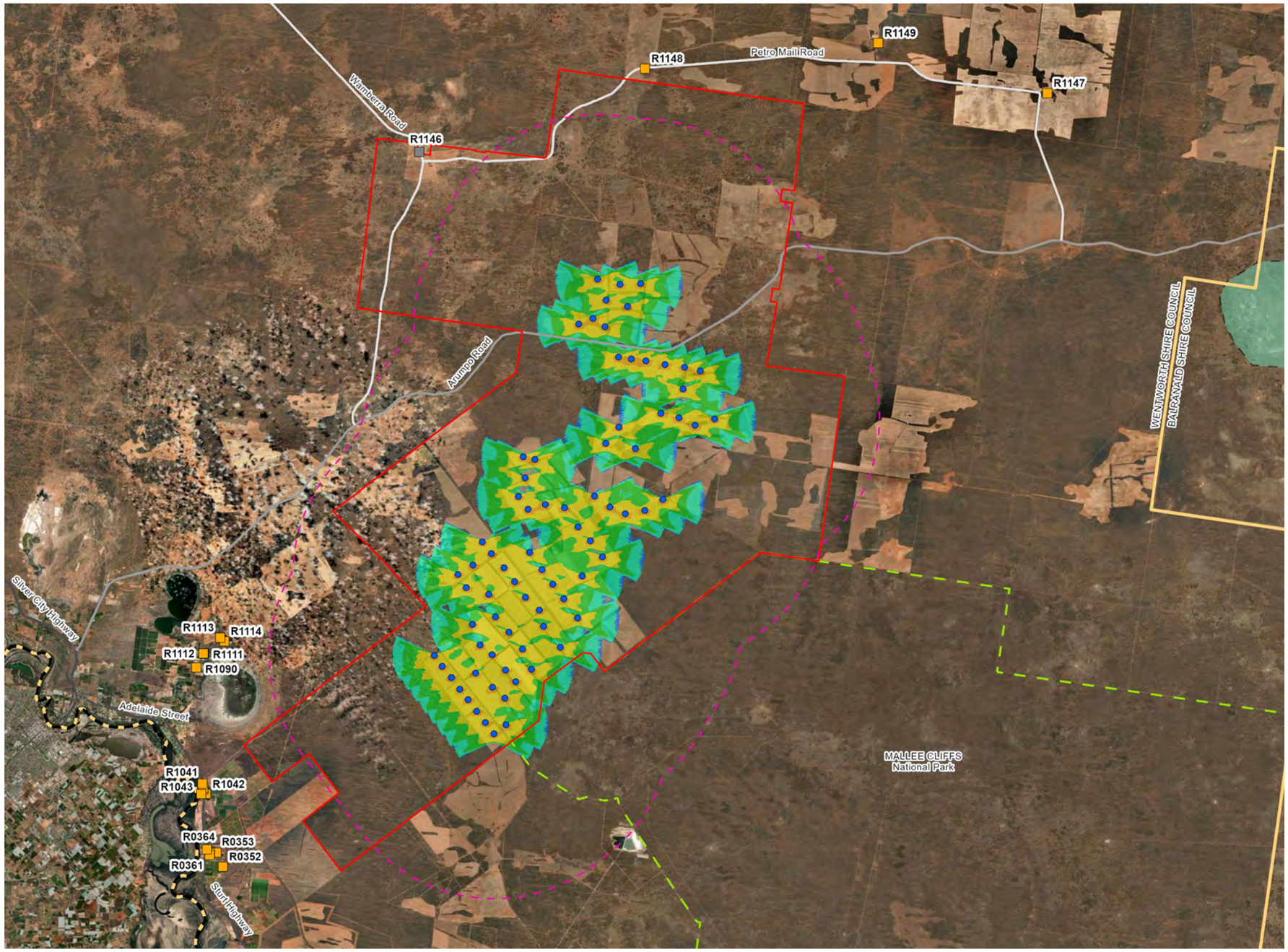


Image 22 – Example of shadow flicker from base of WTG



Shadow Flicker Assessment

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- LGA Boundary
- National Park, Reserves and State Conservation Area
- World Heritage Listed Willandra Lakes Region
- Primary Road
- Arterial Road
- Sub Arterial Road

Number of Hours of potential Shadow Flicker per year

- 0
- 0.1 - <10 Hours
- 10 - < 30 Hours
- 30 - < 100 Hours
- 100 - < 500 Hours
- 500 - < 1,000 Hours
- 1,000 - 2,000 Hours

0 3 5 10 15 20 km

Figure 23 – Shadow Flicker Assessment Diagram
Source: ArcGIS, 2024

11.3 Results of Shadow Flicker Assessment

The Bulletin states: "*the shadow flicker caused by certain sun angles in relation to the rotation of wind turbine blades on residences will be limited to 30 hours per year, and may require mitigation methods such as amend siting and design of turbines to minimise the amount of shadow flicker.*" (DPE, 2016).

No non-associated dwellings were found to have potential shadow flicker hours. However, parts of Arumpo Road are likely to experience potential shadow flicker from the WTGs (see **Figure 23**).

Although there are no guidelines in the Bulletin relating to the acceptable level of shadow flicker on road users, shadow flicker has the potential to cause annoyance to road users. The shadow flicker assessment identified approximately 11km of Arumpo Road to have the potential to experience shadow flicker from the Project.

Arumpo Road intersects the northern portion of the Project. The shadow flicker for Arumpo Road is projected to be experienced on average between 30 to 100 hr/per year. There is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker. Shadow flicker is little different for a vehicle in motion than the effect of shadows from trees on the side of the road or high passing vehicles, neither of which represent a significant risk in terms of road transport (EPHC, 2010).

The potential shadow flicker effects on road corridors surrounding the Project align with similar outcomes observed in other approved developments, highlighting the need for careful consideration of mitigation measures in line with established practices. Some mitigation measures that may be considered include warning signs, reduced speed limits and other controlled traffic measures being implemented along the affected portion of Arumpo Road.

11.4 Overview of Blade Glint

Blade Glint (also referred to as blade reflectivity) refers to the regular reflection from one or more rotating blades. This can be a temporary effect at any particular location, though the vast bulk of any glint occurs where the viewer is located above the altitude of the turbine hub.

The Bulletin recommends: *turbine blades be finished with a low reflectivity surface treatment to ensure any actual or perceived blade glint impact is minimised*.

All major wind turbine blade manufacturers currently finish their blades with a low reflectivity treatment. This prevents potentially a reflective glint from the surface of the blades and the possibility of a strobing reflection when the turbine blades are spinning. Therefore, the risk of blade glint from a new development is considered to be very low in accordance with the Draft - National Wind Farm Development Guidelines (EPHC, 2010).

The turbines selected for the Project will be finished with a low reflectivity surface treatment in accordance with the requirements of the Bulletin.

11.5 Results of Shadow Flicker Assessment on the MCNP

The western edge of the national park will experience potential flicker due to the proximity of the MCNP to the Project (see **Figure 23**) . However, because there is no public access in this area, there are no receptors that would experience potential shadow flicker.

12

Night Lighting Assessment

12.0 Night Lighting Assessment

12.1 Overview of Night Lighting

The following section of the report provides an assessment of the visual impacts of potential night lighting of the Project. Night lighting has the potential to result in the alteration of the night time landscape character of the region. Potential light sources include:

- Aviation Hazard Lighting (AHL) on MET masts only.
- Night lighting for safety and security on ancillary structures.

12.2 Aviation Hazard Lighting

The requirement of aviation hazard lighting (AHL) on WTGs for the Project is subject to the advice of the Civil Aviation Safety Authority (CASA). It is noted that the turbines proposed for the Project will possibly be up to 280 m in height and CASA generally recommends night lighting if an obstacle exceeds 160 m AGL.

The Aviation report prepared by Aviation Projects determined: the proposed WTGs would not require obstacle lighting to maintain an acceptable level of safety to aircraft. The report prepared by Aviation Projects does predict that CASA is likely to recommend aviation lighting to be fitted the MET masts only.

If determined to be required, potential CASA specifications for lighting could include:

- Two (2) flashing red medium intensity obstacle lights should be provided per MET mast where required.
- The light fixtures should be mounted sufficiently above the surface of the nacelle so that the lights are not obscured by the rotor hub, and are at a horizontal separation to ensure an unobstructed view of at least one of the lights by a pilot approaching from any direction.
- The interval between obstacle lighted turbines should not exceed 1.5 km. (CASA, 2023)

Representative images of aviation lighting (installed in August 2020) on WTGs at Biala Wind Farm have been included to best illustrate the potential visual appearance of aviation lighting. Photographs of the aviation lighting at varying distances and times have been included in this report.

Image 23 - Image 29 illustrate the appearance of night lighting on a dark rural landscape at intervals after sunset.

Image 23 – View towards Biala Wind Farm - 2.0 km from WTG at 6:20pm (30 minutes after sunset)

Image 24 – View towards Biala Wind Farm - 1.75 km from WTG at 6:35pm (45 minutes after sunset)

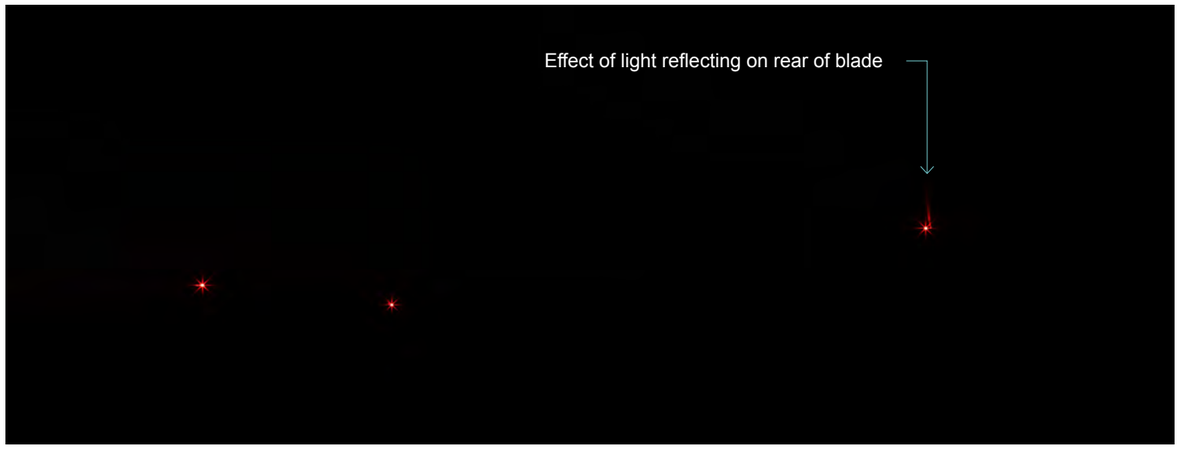


Image 25 – View towards Biala Wind Farm - 1.85 km from WTG at 6:50pm (60 minutes after sunset)

Image 26 – View towards Biala Wind Farm - 3.5 km from WTG

Image 27 – View at night towards Biala Wind Farm - 3.5 km from WTG

Image 28 – View at night towards Biala Wind Farm - 8.5 km from WTG

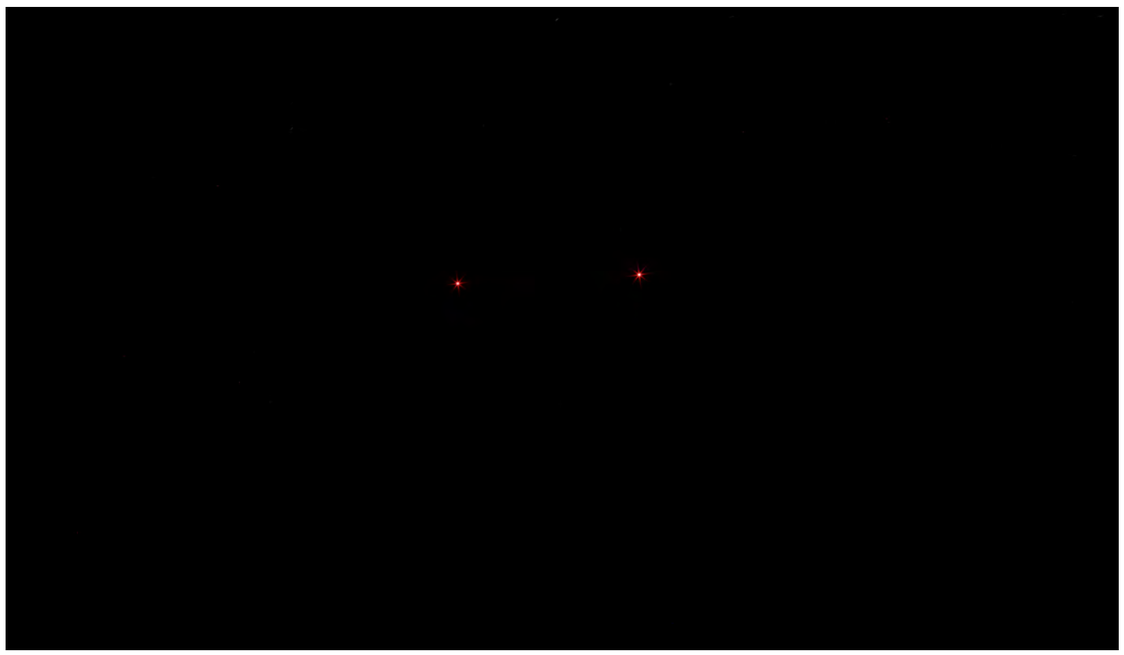


Image 29 – View at night towards Biala Wind Farm - 8.5 km from WTG

12.3 Overview of potential visual impacts from Night Lighting

Night lighting of turbines and associated infrastructure has the potential to extend the visual effect into the night time. Aviation hazard lighting has the potential to be visible from distances in excess of 20 km (Scottish Natural Heritage). However, the distance depends on a number of variables, including light intensity, topography, vegetation coverage and climatic conditions.

Due to the relatively isolated location of the Project, very little existing sources of lighting are present in the night time landscape of the Study Area. Some 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 night lighting is unlikely to be experienced from inside of a dwelling as internal lights reflect on windows and limit views to the exterior at night time.

The highest visual impact is likely to be people who experience the night landscape outdoors. Dark sky is a valued quality of the rural landscape, due to the lack of light pollution. However, as the Project is beyond 200 km of the Siding Spring Observatory, Dark Sky Planning regulations do not apply to this Project.

Aviation lighting has the potential to impact on receptors who view the landscape at night, in particular night-sky enthusiasts, photographers, star gazers, campers and some land owners with potential visibility of the turbines hub. The visual impact of potential aviation lighting could be reduced by employing mitigation methods outlined in **Section 16.0**. Considering the high elevation of the turbines and the implementation of shields, the source of visible light is likely to be reduced to ambient lighting as opposed to direct visibility of the light itself when viewed from a close proximity.

The Uungula Wind Farm (located to the east of Wellington in NSW) was approved in May 2021 with a recommendation to include low intensity aviation lighting (200 candela) which is considerably lower than the 2,000 candela required by international standards.

The use of lighting has the potential to impact the experience of the WLR and Mungo National Park, noting that the night sky was a key matter raised. However with mitigation measures in place, low or no impacts are anticipated due to the distance of the publicly accessible recreation areas within the WLR and Mungo National Park (57 km from the Project).

12.4 Recommendations to reduce the potential visual impacts from Night Lighting

The Bulletin states: *If such lighting is required, the CASA guidelines recommend that to minimise visual impacts "obstacle lights may be partially shielded, provided it does not compromise their operational effectiveness. Where obstacle lighting is provided, lights should operate at night, and at times of reduced visibility. All obstacle lights on a wind farm should be turned on simultaneously and off simultaneously.*

The lights should be fully shielded from the view of any dwelling within 2km. As part of the assessment of visual impacts of wind energy projects, the Department will consider whether any obstacle lighting required is likely to result in any significant increase in visual impacts.

To assist in the amelioration of the effect of Aviation Hazards Lighting on MET masts the Proponent could implement mitigation measures (to be considered at detailed design phase). These could include:

- If used, air navigation lighting should be spaced around the outer edges of the wind farm. Lights are not required on every tower. Where possible, careful consideration should be given to the selection of MET masts requiring lighting to avoid unnecessary impact upon residences.
- Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night.
- Use of the lowest candela intensity allowed by CASA.
- According to the CASA requirements, shielding may be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal (see **Figure 24**).
- No light should be emitted at or below 10° below horizontal.

Technology in both aviation and wind farm development is constantly evolving. One example of evolving technology is Air Detection Lighting System (ADLS). Although these haven't been utilised in NSW, an ADLS has been installed at the Lal Lal Wind Farm just east of Ballarat in Victoria (approximately 420 km from the Project). An ADLS is an effective measure to reduce visual impacts, save electricity and improve aviation safety. Aviation lighting is activated when an aircraft approaches within four to six km. As this technology such as ADLS become more cost effective and readily available, it may become a viable option for the Project.

Over time as wind farm development has occurred throughout NSW, there are precedents for the review of the requirement of aviation lightings on a number of wind farms post-construction. In the Upper Lachlan Shire, on November 1, 2010 Cullerin Wind Farm, owned by Origin Energy, switched off turbine aviation lighting after guidelines set out by CASA were withdrawn. Requirement of aviation lighting for Crookwell 2 Wind Farm was reviewed by CASA in 2019 and were allowed to be turned off (Crookwell Gazette, 2019).

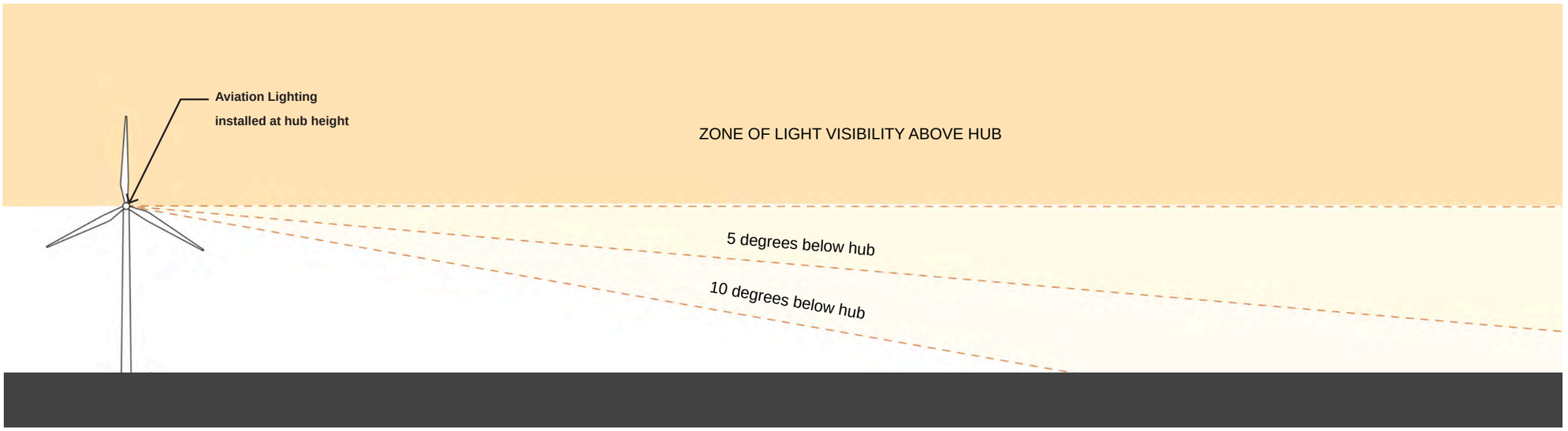


Figure 24 – Recommended Light Shielding to reduce lighting spread

12.5 Potential Impacts of Lighting Associated with Ancillary Infrastructure

Night lighting is likely to be required on ancillary infrastructure including meteorological masts, switching stations, collector substations, and facilities buildings.

Maintenance lighting will be installed at the substations and at the O&M building for night work including emergency operations. All maintenance lighting will be designed to reduce disturbance to neighbouring properties and will be used only when there are staff onsite or during emergencies.

Continuously operating security lighting would be installed on posts up to 3.5 m high adjacent to the security fencing and O&M buildings.

Up to seven (7) meteorological masts up to 170 m in height, and seven (7) temporary meteorological masts up to 200 m in height will include Aviation Hazard Lighting

It is unlikely the proposed night lighting associated with the ancillary infrastructure would create a noticeable impact on the existing night time landscape.

12.6 Recommendations to reduce the potential visual impacts from Ancillary Infrastructure

To assist in the amelioration of the effect of night lighting on ancillary structures the following may be applied if decided to be included by the Proponent:

- Security lighting throughout the wind farm, switching station and the substation should be minimised to decrease the contrast between the wind farm and the night time landscape of the area.
- Motion detectors should be used to activate night time security lighting when required.
- Lighting is to be designed to ensure it does not spill onto nearby roads or residences.

If design principles are incorporated into the night lighting for Ancillary Infrastructure, it is likely there will be no visual impacts resulting from night lighting 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
- Ensure lights are not directed at reflective surfaces
- Use non-reflective dark coloured surfaces to reduce reflection of lighting (**Figure 25**)
- Keep lights close to the ground and / or directed downwards (**Figure 26**)
- Use light shield fittings to avoid light spill (refer to **Figure 27**).

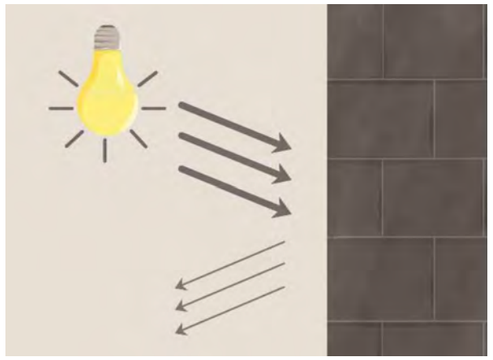


Figure 25 – Surface Reflectivity
Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife (2020)

In accordance with the recommendations of the LVIA, ancillary structures are to painted in a dark non-reflective paint to reduce any potential reflectivity from light and remain sympathetic to the surrounding landscape.

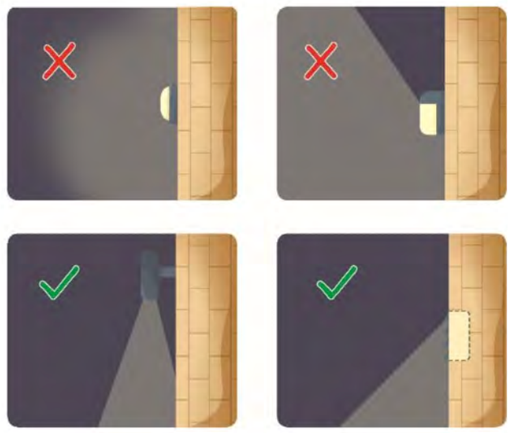


Figure 26 – Downward Lighting
Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife (2020)

Where possible, lighting is to be directed downwards and flood lighting should consider asymmetric beam distribution.

Where possible, lighting should be fully or partially shielded to prevent spill into surrounding areas.

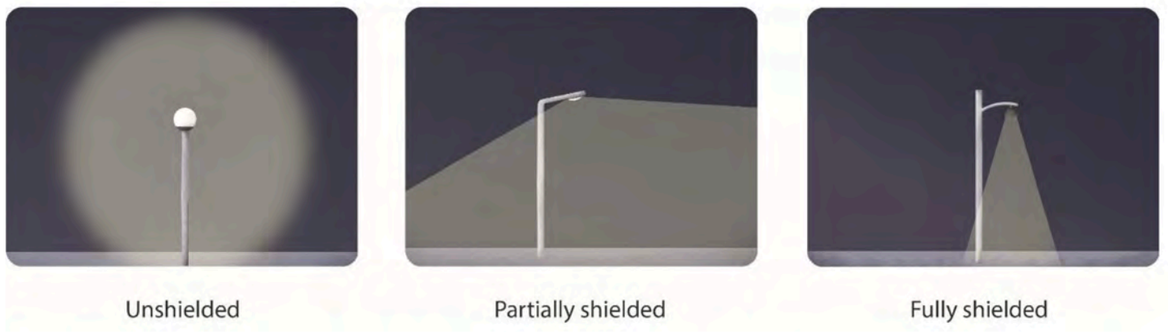


Figure 27 – Light Shielding
Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife (2020)

13

Cumulative Assessment

13.0 Cumulative Impact Assessment

13.1 Overview of Cumulative Visual Impacts

The NSW Cumulative Impact Assessment Guidelines for SSD Projects state that "*Cumulative impacts are a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative. They can be caused by the compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise.*" (DPHI, 2022a).

It is acknowledged that the existing landscape character will potentially be altered by nearby wind and solar farms which are expected to occur within renewable energy zones, and therefore, a cumulative impact assessment is required.

The Bulletin states - *The visual assessment must assess, in accordance with the SEARs, the overall and broader landscape impacts of the proposed wind energy project. It will also address potential cumulative impacts of wind energy projects in the region (the proposed wind energy project, as well as existing and approved projects).*

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 et al, 2008). Cumulative effects may also affect the way a landscape is experienced and can be positive or negative.

It is important the Project considers the potential cumulative effects on the immediate and broader regional context it forms part of.

A cumulative impact assessment has several dimensions:

- The impact of the wind farm, 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 development of wind energy. The impact of developments which are ancillary to or otherwise associated with the proposed wind farm eg. the development of transmission lines.
- The potential for future development of wind farms in the region.

The Bulletin requires that any assessment should consider the cumulative impacts of wind energy projects in the region. However, solar farms and transmission lines are not required to be addressed. On the other hand, the EIS cumulative impact guidelines state that cumulative impacts of all other major projects, including solar farms, need to be addressed.

The re-occurrence of wind farms, solar farms, and other infrastructure in a region can potentially alter the perception of the overall landscape character, regardless of whether they are viewed in a single viewshed or along a journey. Hence, a cumulative impact assessment will be provided to determine whether the effect of multiple developments would combine to become a dominant or defining visual element, thereby altering the perception of the general landscape character.

Table 12 provides a summary of the nearby developments.

Project Name	Project Size (Estimated)	Approx. distance from the Project	Current Status (as of June 2024)
Project EnergyConnect (NSW – Eastern Section)	Electricity transmission (SSI-9172452)	Adjacent to the south	Western Section and Second stage approved, Construction commenced
Euston Mineral Sands Project	Approximately 48,000 ha	Adjacent to the south. Part of the development intersects the Project.	SEARs issued: February 2023
Gol Gol Wind Farm	120 Proposed Turbines	Adjacent to the west	SEARs issued: June 2024
Gol Gol Solar Farm	Approximately 600 MW	Adjacent to the west	SEARs issued: June 2024
Gol Gol BESS	Up to 1,500 MW / 12 GWh	Adjacent to the west	SEARs issued: June 2024
Mallee Solar Farm	Approximately 600 MWac	Adjacent to the south west	SEARs issued: May 2024
Euston Wind Farm	96 Proposed Turbines	30 km south east	SEARs issued: October 2023
Koorakee Energy Park	Up to 167 Proposed turbines Solar Farm approximately 3,100 ha	47 km south east	SEARs issued: May 2024
Lake Victoria Wind Farm	Up to 203 Proposed Turbines	71 km west	SEARs issued: July 2024
Buronga Landfill Expansion	Expansion of existing landfill	15 km west	Approved

Table 12 – Summary of nearby proposed developments

13.2 Cumulative Impact Assessment of Nearby Renewable Energy Projects

The Bulletin states: "*The application of the cumulative tools to a distance of eight kilometres from a dwelling or public viewpoint is based on visibility research conducted by Sullivan et. al. (2012), Bishop (2002), Shang and Bishop (1999) and others. At eight kilometres, turbines and objects recede into the background in terms of visibility*" (DPE, 2016).

Figure 28 illustrates other proposed large-scale developments that are located in proximity of the Project. Therefore, the potential cumulative visual impact considers a total of four (4) proposed developments that are located within 8 km of the Project. These include the Gol Gol Wind Farm, Gol Gol Solar Farm, Mallee Solar Farm and the Euston Mineral Sands Project. The MWTT can help identify residences and public viewpoint locations that are likely to have cumulative impacts (refer to **Section 13.4**, **Section 13.5**, **Section 13.6** and **Table 12**).

As discussed in Section 6.5, no key public viewpoints were identified within the Study Area. Site observations made during the fieldwork in August 2022 and July 2023 did not identify any key public viewpoints along Arumpo Road. Similarly, no publicly accessible locations with recreational associations were identified within the adjacent MCNP.

The following provides a brief overview of the surrounding renewable energy projects (as per Major Projects, accessed June 2024):

Gol Gol Wind Farm

The nearest proposed wind farm to the Project is the Gol Gol Wind Farm. The proposed layout available on the Major Projects website indicates that GGWF is located directly west of the Project. The nearest GGWF turbine is located 8.99 km west of turbine 31 of the Project (see **Figure 28**). SEARs were issued for the GGWF project in June 2024. GGWF includes the operation and decommissioning of a wind farm of 120 turbines with a maximum height of approximately 280 m (to blade tip).There is potential to view GGWF and the Project simultaneously from the surrounding area.

Gol Gol Solar Farm

The proposed Gol Gol Solar Farm (GGSF) is currently proposed to be located directly adjacent to the west between GGWF and the Project (see **Figure 28**). SEARs were issued for the GGSF project in June 2024. Views towards GGSF and the Project are limited to Arumpo Road due to its proximity (see **Figure 28**). Arumpo Road is local low use road predominantly utilised as a tourist route providing access to the World Heritage Listed Mungo National Park.

Mallee Solar Farm

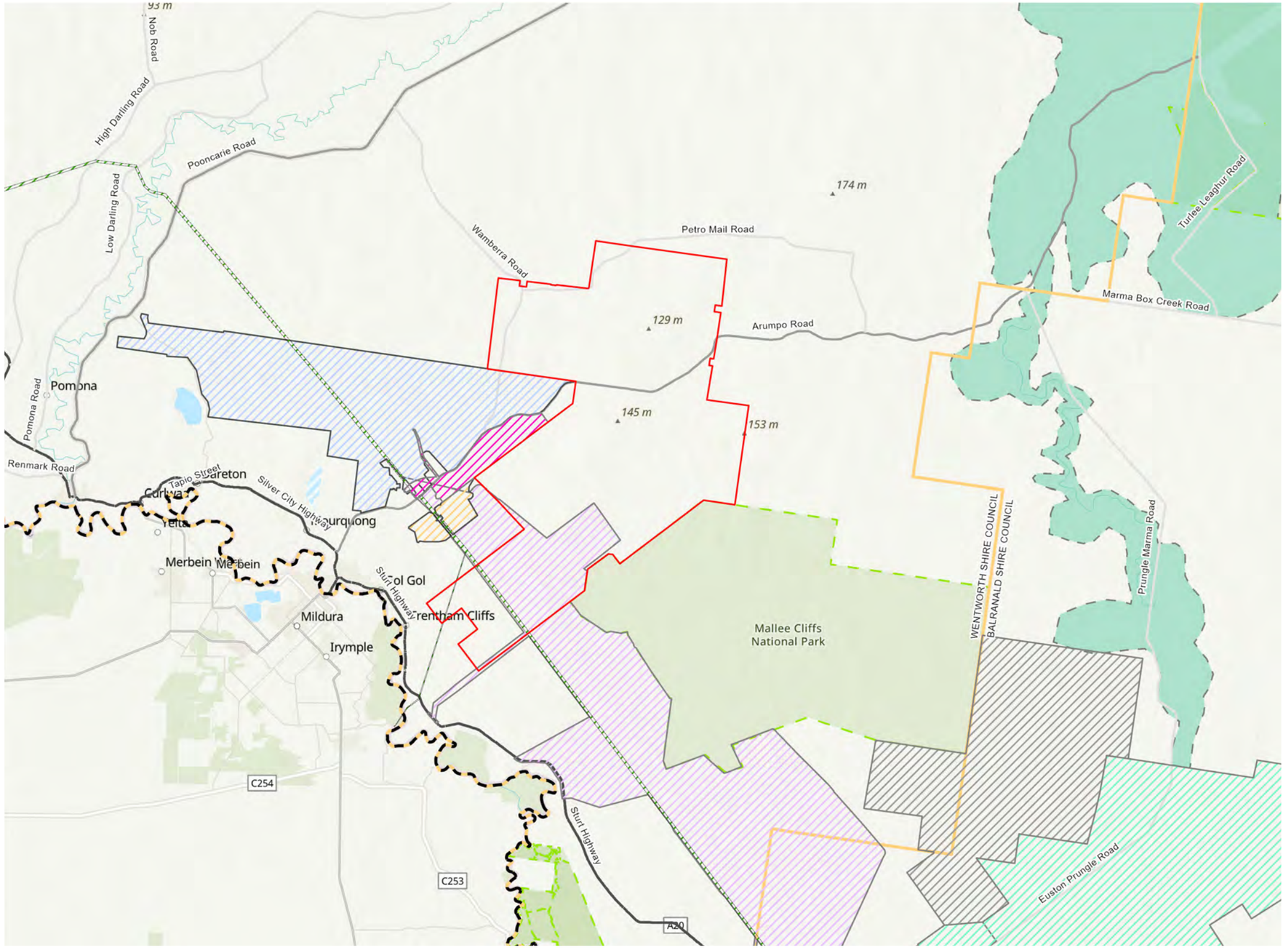
Mallee Solar Farm (MLSF) is located immediately southwest of the Project (see **Figure 28**). SEARs were issued for MLSF in May 2024.The residences located along Gol Gol Swamp may experience potential views of the MLSF and the Project (see **Figure 29**).

Euston Mineral Sands

Euston Mineral Sands (EMS) is spread across the southern portion of the Project (see **Figure 28**). SEARs were issued for EMS in February 2023. Due to its proximity, it is likely that EMS and the Project would be visible simultaneously.

Gol Gol BESS

The proposed Gol Gol BESS (GGB) is currently proposed to be located directly adjacent to the west of the Project. SEARs were issued for the GGB project in June 2024. GGB forms part of the Gol Gol Energy Hub and includes the GGWF and the GGSF. Views towards GGB and the Project are limited to Arumpo Road due to its proximity. Arumpo Road is local low use road predominantly utilised as a tourist route providing access to the World Heritage Listed Mungo National Park.

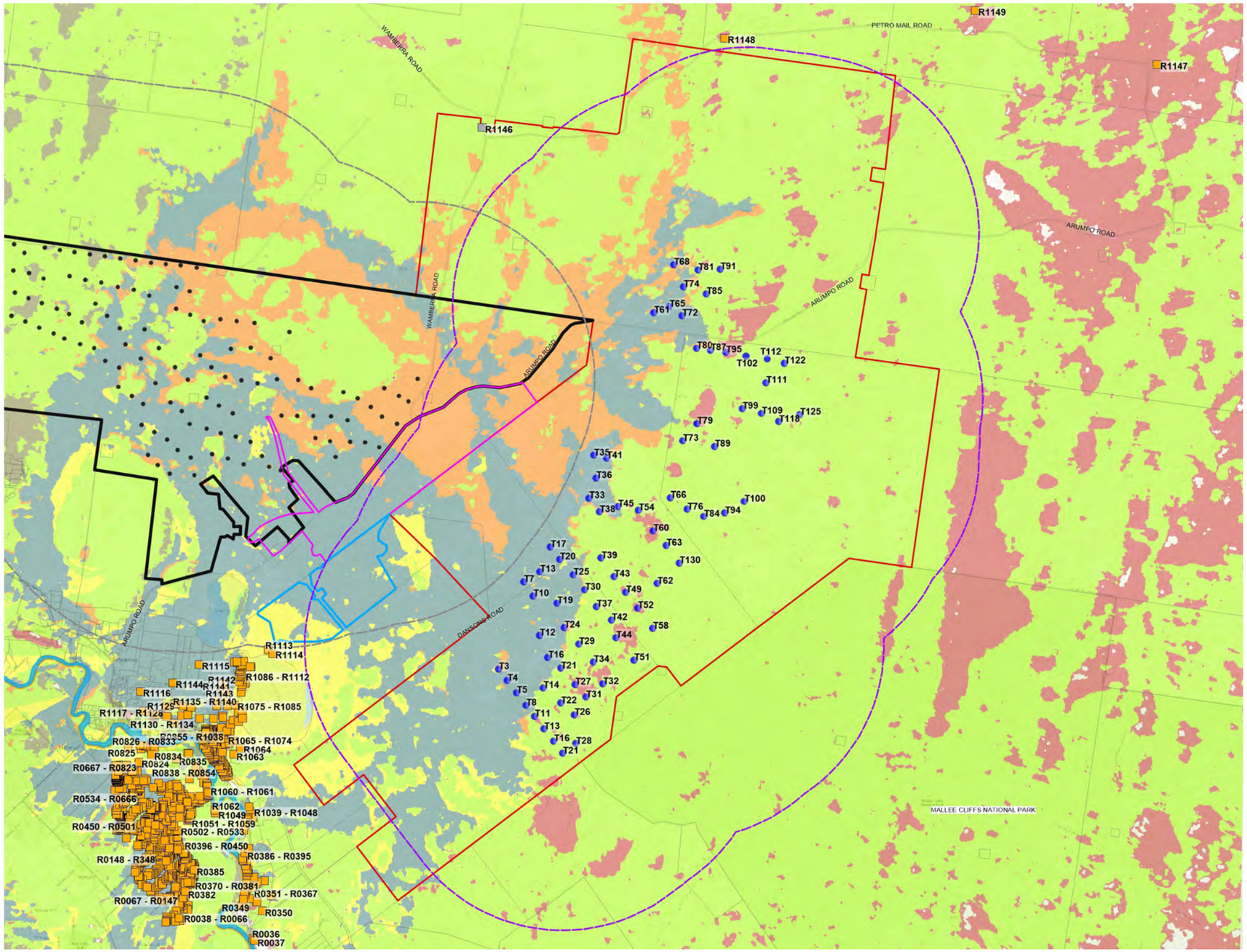


Nearby Renewable Energy Projects

Mallee Wind Farm

- Project Boundary
- State Border
- LGA Boundary
- National Park, Reserves and State Conservation Area
- World Heritage Listed Willandra Lakes Region
- Primary Road
- Arterial Road
- Sub Arterial Road
- Project Energy Connect 330kV Transmission Line (under construction) (approximate location)
- Project Boundary (Gol Gol Wind Farm)
- Development Footprint (Gol Gol Solar Farm)
- Development Footprint (Mallee Solar Farm)
- Project Boundary (Koorakee Energy Park)
- Project Boundary (Euston Wind Farm)
- Project Boundary (Euston Mineral Sands)

Figure 28 – SW REZ
Source: ArcGIS, 2024; NSW Planningportal/ Major Projects NSW



Cumulative Assessment

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- Proposed Turbines (Gol Gol Wind Farm)
- Project Boundary (Gol Gol Wind Farm)
- Development Footprint (Mallee Solar Farm)
- Development Footprint (Gol Gol Solar Farm)
- 8,000 m from nearest proposed WTG (Gol Gol Wind Farm)

ZONE OF VISUAL INFLUENCE LEGEND
CUMULATIVE VISUAL IMPACT
(Based on topography alone):

- No visibility
- Visibility to MWF
- Visibility to GGWF
- Visibility to MWF & GGWF
- Visibility to MWF & GGWF & GGSF
- Visibility to MWF & GGWF & MLSF
- Visibility to MWF & GGWF & GGSF & MLSF

0 5 9 14 18km

Figure 29 – Renewable energy projects within proximity of the Project
Source: ArcGIS, 2024; NSW Planningportal/ Major Projects NSW

13.3 Cumulative Impact Assessment of Nearby Wind Farm Project

Figure 29 represents the ZVI of the adjacent GGWF, GGSF, MLSF and the Project. The ZVI is based on topography alone and does not consider vegetation. Due to the flat terrain, views towards the majority of turbines are likely for most of the Study Area. It is likely that the Project and GGWF will be clearly visible while travelling southward along Arumpo Road and from surrounding dwelling receptors (see **Figure 29**).

The MWTT was applied to GGWF and the Project to assist in identifying the cumulative visual impacts in **Section 6.5** (refer to **Figure 14**).

As the nearest turbine associated with GGWF is located beyond the Study Area, no receptors were identified to have 60 degree sectors occupied by WTGs.

13.4 Cumulative Impact Assessment of Nearby Solar Farm Projects

Two (2) solar farm projects have been proposed adjacent to the Project (see **Figure 28**). These include the Gol Gol Solar Farm and the Mallee Solar Farm. The potential for cumulative impacts are likely along Arumpo Road due to the proximity of the solar farms to the Project. Arumpo Road is a publicly accessible road which runs northeast - southwest and intersects the Project. Arumpo Road is a local road that is utilised predominantly by residents and farm workers to access the surrounding farmlands. It is also well utilised to access the Mungo National Park from Buronga and Mildura in Victoria. It is noted that these are likely to be experienced for a short period of time when travelling along the road (see **Figure 29**).

13.5 Cumulative Impact Assessment of Transmission Lines

The Renewable Energy Zone (South West) Access Scheme Order 2024 (South West REZ Access Sceme) was formally declared by the Minister for Energy under section 24(1) of the Act on Friday 12 April 2024. A new electrical transmission line is under construction adjacent to the existing 220 kV electrical transmission line as part of 'Project EnergyConnect' that is being undertaken by ElectraNet and Transgrid.

Relevant to the Project, the existing transmission line runs in a generally northwest - southeast direction and is located on the southern side of the Project.

13.6 Cumulative Impact Assessment of Euston Mineral Sands Project

The Euston Mineral Sands Project (EMS) is a facility proposed to develop the high-value mineral sands which will be transported to a processing facility in Western Australia for further processing. The SEARs for the project were initially issued in February 2023. Following an amended scope submission (January 2024) by the applicant, a revised SEARs is expected to be issued.

EMS transects the southern portion of the Project Area (see **Figure 28**). Due to a relative horizontal scale of EMS in comparison to the Project, the views will likely be limited from the south.

13.7 Cumulative Visual Impact on the Broader Landscape Character

The NSW Government has identified five (5) REZs in regional areas of NSW. The Project is located within the South West REZ. The proposed land use associated with the Project is consistent with the NSW Government Policy for this area, however, visual impacts are to be reduced where possible. The existing landscape character of the region allows for optimum harvest of wind energy due to the large expanse of flat, treeless land parcels that are mostly uninhabited and cause minimal obstructions in the landscape.

The re-occurrence of wind farms within a region has the potential to alter the perception of the overall landscape character irrespective of being viewed in a single viewshed. As wind farm developments prevail it is important to determine whether the cumulative effect of wind farms and other major infrastructure within the region would combine to become the dominant visual element, altering the perception of the regions landscape character.

The ZVI prepared illustrates the extent of theoretical visibility of the Project combined with nearby large-scale developments (see **Figure 29**). The figure suggest that simultaneous views of GGWF and the Project are likely to occur along Arumpo Road.

Potential impact on views from the World Heritage Listed WLR (inclusive of both Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property) has been discussed in **Section 15.0**.

The potential cumulative visual impact must also be assessed in relation to the potential visual impact when viewed sequentially. If a number of large scale developments are viewed in succession as a traveler moves through the landscape (e.g. motorist travel routes such as Arumpo Road or Sturt Highway), this may result in a change in the overall perception of the broader landscape character. The viewer may only see one large-scale development at a time, but if each successive stretch of the road is dominated by views of large-scale developments, then that can be argued to be a cumulative visual impact (EPHC, 2010).

The existing landscape is associated with commercial agricultural activity and is a highly modified landscape with low scenic quality. When travelling along the Sturt Highway, the existing visual character is defined by flat, generally treeless, expansive lands used for grazing and cropping. As a result there is the potential for simultaneous distant views towards the Project whilst travelling along the Highway between Balranald and Buronga. Due to the lack of any significant landscape features, the wind farm has the potential to become a defining character element along this route. However, as the Project is set off from Sturt Highway by approximately 15 km to the nearest turbine, the visibility of the Project will be defined by weather factors and clear visibility. It is noted that no scenic or key landscape features will be impacted by the projects.

Due to the lack of defining landscape features along Arumpo Road, the proposed large-scale developments have the potential to become a defining character element. It is noted that no scenic or key landscape features will be impacted by the projects.

14

Associated Infrastructure

14.0 Associated Infrastructure

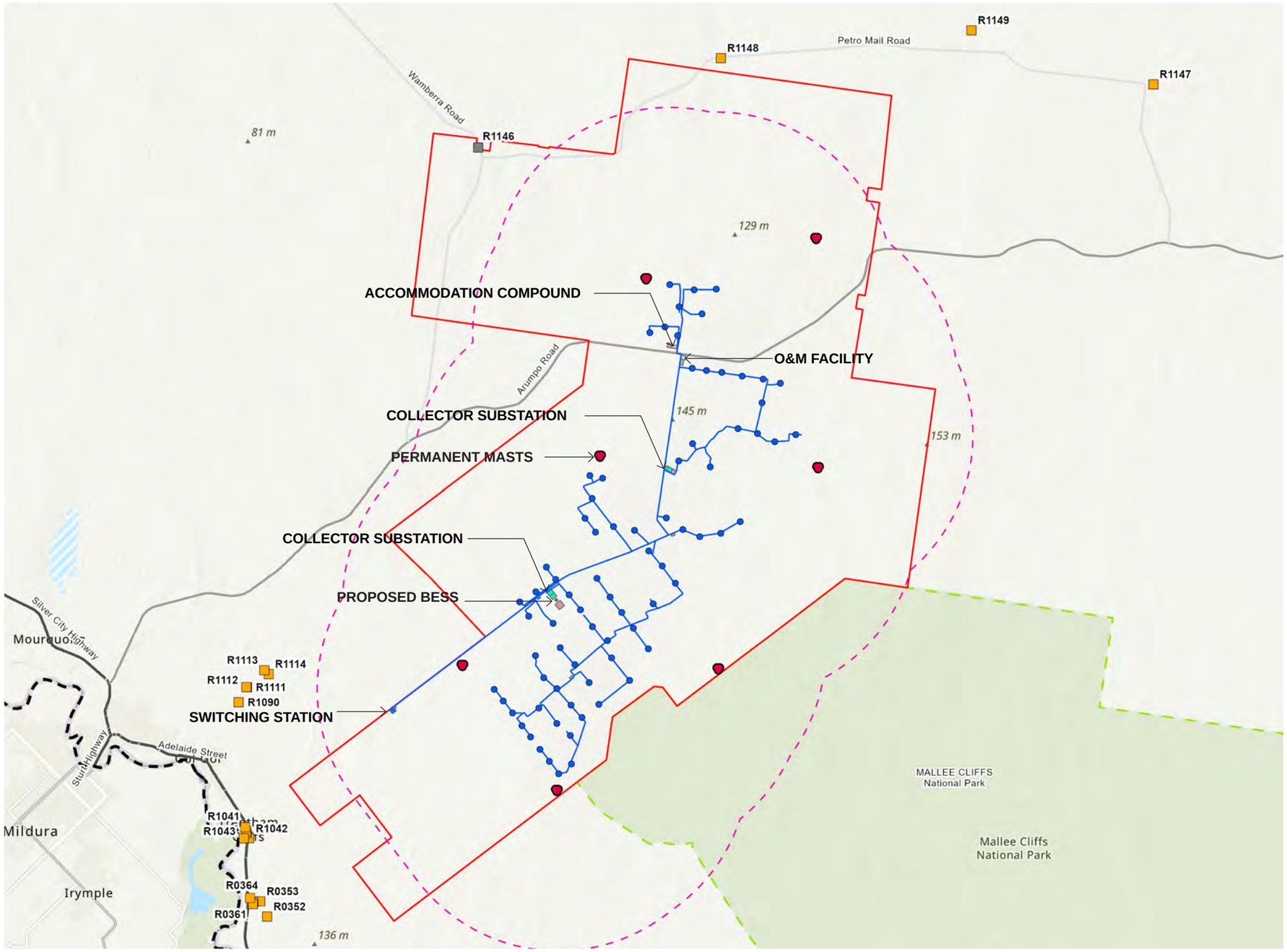
14.1 Overview of Associated Infrastructure

The Bulletin states: "*the assessment of visual impacts from all ancillary facilities and infrastructure will be required.*

In addition to the proposed WTGs, the associated infrastructure (as described in **Section 3.6**) is likely to contrast with the existing visual landscape. Due to the large scale and elevated siting of the proposed wind farm, access tracks, transmission lines and other ancillary structures have the potential to alter the existing visual landscape. An overview of the potential visual impact resulting from associated infrastructure and project components is provided in the following section of the report.

Associated Infrastructure	
Project Component	**Description**
On-site substations and switching stations	Up to 2 collector substations/switching stations and one (1) main switchyard.
Overhead Transmission Lines	High voltage transmission lines approximately 18 km in length.
Underground cabling	Underground cabling within the disturbance area.
BESS Facilities	A single grid-scale 100 MW /200 megawatt hour (MWh) BESS
Operations & Maintenance (0&M) buildings	O&M buildings, storage, water tanks, and other necessary infrastructure placement.
Meteorological monitoring masts	Up to seven (7) wind monitoring masts.
Internal & External Roads	Upgrade to existing local road infrastructure and internal unsealed tracks.
Water Storage Tanks	At least one (1) dedicated non-combustible 100,000 litre(l) water tank.
Hardstands	Located adjacent to each WTG for assembly, erection, maintenance and decommissioning purposes
Telecommunications facilities and utility services	The telecommunications facilities including (if required) masts will remain within the Project Area.

Table 13 – Associated Infrastructure



Associated Infrastructure

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- National Park, Reserves and State Conservation Area
- Proposed BESS
- Permanent Meteorological Masts
- Access Tracks
- Proposed Accommodation Camp
- Proposed Construction Compound
- Proposed Laydown Areas
- Proposed O&M Facility
- Proposed Collector Substation
- Proposed Switchyard

Figure 30 – Associated Infrastructure
Source: ArcGIS, 2024

0 2 5 9 14 18 km

14.2 Transmission Lines

The Proponent has proposed underground reticulation to the connect the WTGs to collector substations and an overhead transmission line will connect the collector substations to the switchyard located in the southern extent of the Disturbance Footprint adjacent to Dansons Road. The Project is to be connected to the Project EnergyConnect transmission line via this switchyard (see **Figure 30**).

It is noted that Project EnergyConnect transmission line runs south west of the Project which proposes to construct a transmission line adjacent to the existing 220 kV line. These transmission towers are proposed to be up to 65 m in height. Project Energy Connect will be within the Project Area and connect to the on site switchyard.

It is acknowledged that the proposed transmission towers will be a visible element in the landscape from the surrounding area. However, the transmission towers will not contrast with the existing landscape character or features and the visual impacts of the proposed transmission towers are expected to be low.

Potential mitigation methods that may be applied during detailed design phase include:

- *Where possible underground cabling is to be used to connect wind turbines to the electricity grid.*
- *Utilise existing transmission lines where possible.*
- *The route for any proposed overhead transmission lines should be chosen to reduce visibility from surrounding areas.*
- *Plan route to minimise vegetation loss.*
- *Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised.*

Image 30 – Existing 220 kV transmission towers

14.4 Internal Access Tracks

Access tracks are proposed within the Project Area between the WTGs, associated infrastructure and connecting to existing arterial roads. Access to the Project is proposed via Arumpo Road close to WTG T80 and T72 associated with the Project.

Internal access tracks of minimum 6 m width will be constructed to provide access to the proposed WTG locations. This includes upgrades to some existing access tracks currently formed within the Project Area and the establishment of new access tracks. The access tracks are generally unsealed (refer **Figure 31**).

Generally, the internal roads have been sited to reduce potential vegetation loss and limit earth work requirements. Due to the existing agricultural land use within the Project Area, farm roads traversing the landscape form a significant part of the existing landscape character. The proposed access tracks are likely to be viewed as part of the existing character of the landscape. The Proponent could implement the following measures to mitigate residual visual impact beyond requirements from the construction of access tracks. These may include:

- Where possible utilise or upgrade existing roads, trails or tracks to provide access to the proposed WTG to reduce the need for new roads.
- Allow for the provision for downsizing roads or restoring roads to existing condition following construction where possible.
- Any new roads must minimise cut and fill and avoid the loss of vegetation.
- Utilise local materials where possible and practical.

14.3 On-site Substations, BESS and on-site Switching Stations

Up to two (2) collector substations are proposed throughout the Project Area. One (1) on-site switchyard and BESS facilities of up to 100 MW/ 200 MWh are proposed within the Project Area (see **Figure 30**). The substation and all ancillary buildings would be no taller than 4 m, excluding pole like structures such as gantries, bus bars and other transmission connection infrastructure.

The substation, BESS and switching station areas are located away from major transport corridor including Sturt Highway and Arumpo Road. There are no non-associated dwellings in close proximity to the substation, BESS and the switching station.

Due to the combination of distance and the low horizontal scale of the proposed substations, BESS and switching stations, views toward these elements are likely to be limited from public viewpoints in close proximity to these structures such as Arumpo Road. As a result, the visual impacts associated with these elements will be low.

Image 31 – Example of unsealed farm road typical of the landscape character in the area

14.5 Meteorological Monitoring Masts

Up to seven (7) permanent meteorological monitoring masts of up to 170 m in height are proposed to be located within the Project Area to record wind speed and other meteorological data. The meteorological masts will be fitted with various instruments such as anemometers, wind vanes, temperature gauges and other electrical equipment.

Due to the existing flat terrain, views towards the meteorological masts are likely to be available and have the potential to be a feature from public viewing locations surrounding the Project. However, it is noted that no key landscape features are likely to be impacted.

14.6 Operations and Maintenance (O&M) Facility

A permanent O&M building will be constructed to support the construction and operation of the wind farm. The O&M Facility is proposed to be located next the Arumpo Road. The O&M Facility will include storage, water tanks, and other necessary infrastructure placement.

Due to the proximity, the O&M Facility may be visible from the Arumpo Road. It is likely to appear in keeping with the farm infrastructure typical of the surrounding area. As a result, the visual impacts associated with these elements will be low.

14.7 Other Temporary Infrastructure

In addition, temporary infrastructure elements such as:

- Up to seven (7) temporary met masts up to a height of 200 m;
- Workers accommodation;
- Construction compounds;
- Laydown areas; and
- Concrete batching plants.

The visual impacts associated with these facilities will be temporary and will occur during the construction phase. No scenic views will be impacted by the construction activity.

The smaller scale of ancillary structures including the proposed O&M have the ability to be screened by existing vegetation or proposed screening vegetation. The Proponent could consider the following mitigation measures to reduce the potential impacts:

- *Siting to ensure minimal vegetation loss.*
- *Consideration should be given to controlling the type and colour of building materials used. Where possible a recessive colour palette is to be used which blends into the existing landscape.*
- *Avoidance of unnecessary lighting, signage on fences, logos etc.*
- *Any proposed buildings to be sympathetic to existing architectural elements in the landscape.*
- *Minimise cut and fill and loss of existing vegetation throughout the construction process.*
- *Boundary screen planting is an effective mitigation method which could be utilised to ameliorate potential visual impacts resulting from the construction of ancillary structures with a small vertical scale such as collector substations, switching stations and the operations facilities building.*

Image 32 – Example of mitigation screening to ancillary buildings

15

Overview of Impact on Landscape Character

15.0 Visual Impact on Landscape Character

15.1 Visual Impacts on Landscape Character

The Project is located within a predominantly rural landscape that has not been identified as significant or rare. The broad landscape character is dominated by established rural land which consists of modified vast plains with little topographical variation. Areas categorised under conservation such as the adjacent MCNP, provide a contast to this dominant landscape character. Generally, the Scenic Quality Classes of the LCUs within the Project Area have been rated from Moderate to Low (**refer to Section 5.0**).

The general landscape within the Study Area features areas modified for pastoral farming and irrigated agriculture and is characterised by cleared lands with areas of densely vegetated woodlands, minimal land use and flat topography.

The assessment has determined that the Project would become a feature within the visual landscape due to the addition of vertical turbines in a landscape offering unencumbered views across large expanses.

MCNP, valued for its ecological and environmental functions, are likely to remain intact, as the potential visual impact will be limited due to the restricted public access within the National Park. It is unlikely the Project would degrade the scenic value of this landscape feature.

Other important key features includes the World Heritage listed WLR World Heritage Area. Detailed assessments from key locations identified based on community feedback has been undertaken to illustrate potential visual impact from the Project (see **Section 15.2**).

The Project is proposed in the SW REZ and as result it is likely that the region will be developed for wind energy production due to largely uninhabited lands and conditions that favour wind energy harvest. As a result, it is inevitable that the placement of large scale WTGs in a rural landscape will alter the existing landscape character of the area.

15.2 Visual Impacts on World Heritage Listed Willandra Lakes Region

As noted in **Section 2.0** of this report, the Project was determined to be a controlled action under section 75 of the EPBC Act. The EPBC Act controlling provisions for the proposed action, that are relevant to this LVIA are i. World Heritage Properties (sections 12 and 12A) and ii. National Heritage Places (sections 15B and 15C); specifically the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property i.e. the WLR. The WLR is located approximately 25 km east of the nearest turbine (T127) (see **Figure 31**).

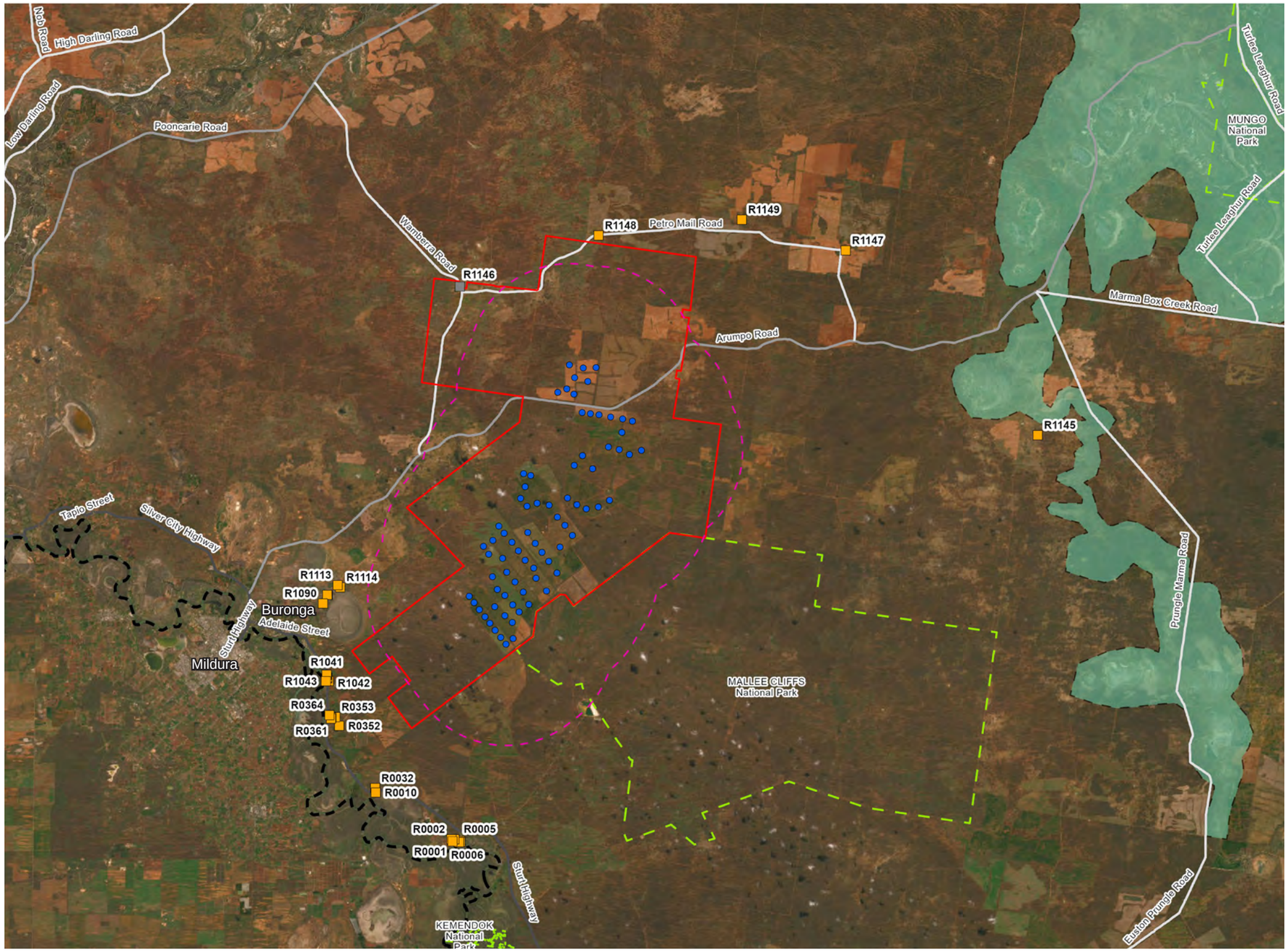
Biodiversity values and Aboriginal Cultural heritage matters associated with the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property are addressed within the EIS and separately by others within the BDAR (Umwelt, 2024) and ACHA (Austral Archeology, 2024). However, it is important that potential (indirect) visual impacts are considered to address the requirements of the Australian Government - Matters of National Environmental Significance - Significant impact guidelines 1.1 (MNES Guidelines) and ‘Supplementary SEARs’ received for the Project. While it is beyond the scope of this LVIA to assess the full set of ‘significant impact criteria’ defined in the MNES Guidelines; this visual assessment seeks to rate potential impacts such that any loss to World or National heritage values can be evaluated (by others).

Accordingly, a detailed assessment using photomontage and wireframe analysis has been undertaken to assess potential visual impacts of the Project on the World Heritage Listed WLR. As discussed in **Section 10.0** three (3) key public locations within the WLR were assessed using photomontages and wireframe analysis. These include:

- Chibnalwood Lunette - Turlee Leaghur Road within the extents of the Mungo National Park (PM03)
- Marma Cricket Pitch (WF02)
- Mungo Youth Project Area (WF01)

Due to the distance (greater than 25 km) of the Project from these locations (each within the WLR), it is unlikely that the Project will alter the existing visual landscape and the Project (even considering night lighting, if required) is unlikely to have any visual impact on this naturally and culturally important location. Photomontages and wireframe diagrams are included as **Appendix C**. Similarly, it is noted that visual impacts at R1145 (near the WRL as shown in Figure 31 below) are rated as ‘Low’.

Based on this assessment, no further mitigation measures are warranted to address impacts at this naturally and culturally important location.



World Heritage Listed Willandra Lakes Region

Mallee Wind Farm

- Project Boundary
- Proposed WTG Location
- Associated Dwellings
- Non-Associated Dwellings
- 8,000m From Nearest Proposed WTG (Study Area)
- State Border
- Primary Road
- Arterial Road
- Sub Arterial Road
- World Heritage Listed Willandra Lakes Region
- National Park, Reserves and State Conservation Area

Figure 31 – World Heritage Listed Willandra Lakes Region
Source: ArcGIS, 2024

0 4 9 17 26 34 km

15.3 Overview of the Visual Impact on LCUs

Table 14 provides an overview of the assessment of the potential visual impacts on the existing landscape character of the local area for each LCU as defined in **Section 5.6** of this report. An evaluation of the potential visual impacts has been undertaken using the visual performance objectives as outlined in the Bulletin.

Of the five (5) LCU's identified and assessed, the Project is likely to be visible from all character areas to varying degrees. Due to the flat topography surrounding the Project Area, dense woodlands typical of the region and distance to urban settlements, views of the Project are likely to be fragmented.

Landscape Character Unit	Name	Key Landscape Features	Key Viewpoints	Scenic Quality Rating	Overview of Impact on Landscape Character	Landscape Scenic Integrity	Potential Visual Impact Rating
LCU01	Grazing and Native Pastures	Clear, flat expanses of land used for grazing or cropping. Most prominent character of the region with minor to no elevation change.	Within Project Area, along Sturt Highway and Arumpo Road.	LOW	This LCU is characterised by land modified for grazing pastures with native vegetation with little to no topographical variations. The Project is located within this LCU and will likely be visible from public roads within this LCU including Arumpo Road. No key landscape features were identified in this LCU. Therefore, the Project is unlikely to alter the existing LCU character. The Project will not disrupt views of any key landscape features or viewpoints located within the LCU.	Views of the Project will be available from most locations within the LCU. Existing vegetation along roadsides will assist in fragmenting views. The LCU has a low scenic quality and does not offer any key visual features. The landscape has been extensively modified and used for grazing and cropping. No viewpoints were identified within this LCU.	LOW
LCU02	Creek and River Systems	Characteristic riverine vegetation along river channels, creeks and lakes. Features include Gol Gol Creek, Lake Gol Gol, associated floodplains and swamps.	Gol Gol Creek, Gol Gol Lake, Gol Gol Swamp, Murray River	MODERATE	The LCU has been defined by the gentle undulations associated with the Murray River, Gol Gol Creek and Gol Gol Lake. Human intervention occurs through urban development along river fringes. The density of vegetation varies across different locations, and native vegetation has been altered due to urban development. The key features that contribute to the overall landscape character of the LCU include the Murray River, Gol Gol Creek and Gol Gol Lake which are likely to remain unaltered.	Existing riparian vegetation and minor topographical undulations may fragment views from areas within the LCU. Due to the distance and intervening dense vegetation typical of the LCU, the Project will form a minor element in the overall visual landscape, and the scenic integrity is likely to remain intact.	LOW
LCU03	Cropping Pastures	Expansive lots with modified land to support pastoral farming and irrigated agriculture. Vegetation character is predominantly Mallee shrubland scattered throughout the landscape.	Within Project Area, along Sturt Highway and Arumpo Road.	LOW	The LCU consists of large areas of land modified for dryland cropping and irrigated agriculture, with sparse vegetation serving as windbreaks. No key features were identified within the LCU. The Project will not disrupt views of any key landscape features or viewpoints located within the LCU.	Views of the Project will be available from most locations within the LCU. Existing vegetation along lot fringes will assist in fragmenting views. The LCU has a low scenic quality and does not offer any key visual features. The landscape has been extensively modified and used for agriculture and cultivation. No viewpoints were identified within this LCU.	LOW
LCU04	Local Townships	Dense urban development is characteristic of this LCU and includes the towns of Buronga and Gol Gol.	Gol Gol, Buronga, Mildura.	LOW	The LCU is defined by dense urban developments, including the settlement of Buronga and Gol Gol. The land has been modified to produce fruits and vegetables as these towns are included within the wider Sunraysia region along the Murray River. No key landscape features were identified within the LCU. Due to the distance of the Project from these towns, the Project is unlikely to have an impact on the character of the LCU.	Existing vegetation and built structures will likely fragment views of the Project from locations within this LCU, including Buronga and Gol Gol. Due to its highly modified characteristics, the LCU's scenic quality is low. No key viewpoints were identified within the LCU.	LOW
LCU05	National Parks and Conservation Areas	Comprises of dense woodlands of dense mallee, rosewood, bluebush and belah woodlands that are spread across the extents of Riverina plains within the extents of the Mallee Cliffs National Parks and associated Nature Reserves and other vegetated areas in close proximity.	Mallee Cliffs National Park, Gol Gol State Forest	MODERATE	The LCU is defined by dense woodlands in the Mallee Cliffs National Park and Gol Gol State Forest, subjected to minimal land use and flat topography. Key features within the LCU include the Mallee Cliffs National Park and the Gol Gol State Forest. The Project is located adjacent to the Mallee Cliffs National Park. Following the reservation, public access is restricted within the Mallee Cliffs National Park and is limited to conducting ecological research. Despite the flat topography, the woodlands will likely help reduce the visibility of the Project. Views from recreational sites within Gol Gol State Forest will be fragmented by dense vegetation typical of the LCU and the distance to the Project.	Views from this LCU are often contained by the dense woodland typical of this LCU. The intervening vegetation will assist in mitigating views towards the Project. As such, the Project is likely to a minor impact on the scenic integrity of the LCU.	LOW

Table 14 – Overview of Impact on Landscape Character Units

16

Mitigation Measures

16.0 Mitigation Measures

16.1 Overview of Mitigation Measures

This section of the report provides recommendations which seek to achieve a better visual integration of the proposal and the existing visual character at both local and regional scales. The mitigation measures attempt to lessen the visual impact of the Project whilst enhancing the visual character of the surrounding environment.

Mitigation measures are best considered as two separate phases. These include:

- Primary measures that form part of the development of the wind farm design through an interactive process;
- Secondary measures designed to specifically address the remaining (residual) negative (adverse) effects of the final development proposals (The Landscape Institute et al 2008).

It is important to note that the mitigation methods proposed in this report are made notwithstanding issues raised by other consultants (eg. engineering, ecology, geology etc.). During the planning and design phase of a wind farm mitigation strategies should also be considered to lessen the visual impact of the proposal. This is by no means an exhaustive list, however the adoption of these recommendations will assist considerably in ensuring the proposal contributes positively to the visual quality and character of the area.

Mitigation methods considered for associated infrastructure has been included in **Section 14.0**.

16.2 Project Layout and Design

The design of the Project is a primary measure of mitigation. The general principles employed through the project design phase aim to significantly reduce the visual impact on surrounding landscape. The principles considered include siting, access, layout and other principles which directly impact the appearance of the Project. General guidelines for the design development of the Project have been outlined in the following section.

16.3 Wind Farm Layout and Size

The layout and size of the Project is a significant factor in the visual impact on the landscape. According to Stanton (1995) *the intrusiveness of a wind farm is not directly proportional to the number of turbines in an array, and instead, more a factor of design feature*. For example, large wind farms may appear less dominating than a smaller project when the large wind farm is subdivided into several visually comprehensible units.

It is suggested that fewer and more widely spaced turbines present a more pleasing appearance than tightly packed arrays (URBIS, 2009). The following principles should guide the design process of the wind farm:

- Controlling the location of different turbine types, densities and layout geometry to minimise the visual impacts.
- The lines of turbines should reflect the contours of the natural landscape as best as possible.
- Ensure the turbines are evenly spaced to give a regular pattern creating a better balance within the landscape.

It is important to note that as a result of community consultation during the development period, the Project has undergone many changes. The above design principles have been considered in the siting of the proposed turbines to provide a balanced appearance.

16.4 Wind Turbine Design and Colouring

Turbine design and colouring are an important factor. The WTGs will have a matte white finish and consist of three blades which is consistent with the current turbine models being considered.

The important factors to achieving a visual consistency through the landscape include:

- Uniformity in the colour, design, rotational speed, height and rotor diameter.
- The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye.
- Blades, nacelle and tower to appear as the same colour.
- Avoidance of unnecessary lighting, signage, logos etc.

16.5 Landscaping Principles

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.

16.6 Nightlighting

To assist in the amelioration of the effect of Aviation Hazards Lighting on MET masts the Proponent could implement mitigation measures (to be considered at detailed design phase). These could include:

- If used, air navigation lighting should be spaced around the outer edges of the wind farm. Lights are not required on every tower. Where possible, careful consideration should be given to the selection of MET masts requiring lighting to avoid unnecessary impact upon residences.
- Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night.
- Use of the lowest candela intensity allowed by CASA.
- According to the CASA requirements, shielding may be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal.
- No light should be emitted at or below 10° below horizontal.

17

Evaluation of Visual Performance Objectives

17.0 Visual Performance Objectives

17.1 Overview of Visual Performance Objectives

In accordance with the Bulletin:*"the visual assessment requires an evaluation of the proposed wind energy project and its various components, turbines and ancillary facilities against the visual performance objectives of the Project (refer to Table 2 of the Bulletin), using a combination of desktop and field evaluations. The visual performance objectives are used as a framework for evaluation that enables potential impacts and management options to be considered objectively, against the varying levels of landscape significance established by the baseline study. Application of the visual performance objectives will allow for a transparent and robust assessment process."*

The following tables provides a brief summary of the evaluation of each of the visual performance objectives and identifies the relevant sections of the LVIA where visual performance objectives are addressed.

Visual Magnitude - Visual Performance Objectives		
Visual Influence Zone 1 (High) Objectives:	**Visual Influence Zone 2 (Moderate) Objectives:**	**Visual Influence Zone 3 (Low) Objectives:**
Avoid turbines or provide detailed justification of turbines below the blue line (5,500 m for the Project)	**Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line (3,750 m for the Project). Consider screening between the blue line and the black line.**	**Consider screening below the black line (within 3,750 m).**
Summary of LVIA Evaluation		
Residences within 3,750 m (below the black line): • No non-associated dwellings were identified within 3,750 m of a proposed WTG. **Residences within 3,750 m - 5,500 m (between the blue and black line):** • No non-associated dwellings were identified between 3,750 m - 5,500 m of a proposed WTG. **Refer to Section 6.0: Preliminary Assessment Tools**		

Table 15 – Evaluation of Visual Performance Objectives - Visual Magnitude

Landscape Scenic Integrity

Visual Influence Zone 1 (High) Objectives:	Visual Influence Zone 2 (Moderate) Objectives:	Visual Influence Zone 3 (Low) Objectives:
Wind turbines should not cause more than a low level modification of the visual catchment. Turbines are seen as either very small and/ or faint, or as of a size and colour contrast (under clear, haze-free atmospheric conditions) that they would not compete with major elements of the existing visual catchment.	**Wind turbines should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment.**	**No Visual Performance objective applies.**

Summary of LVIA Evaluation

The landscape scenic integrity was assessed throughout various sections of the report. The following provides a summary of the findings:

Public Viewpoint Analysis:

- The Visual Influence Zone (VIZ) was identified for 25 key viewpoint locations within the Study Area and where required the landscape scenic integrity was assessed in accordance with the relevant visual performance objectives. Of the 25 viewpoint locations assessed, 23 locations were rated as being Visual Influence Zone 3 (VIZ3) and in accordance with the Bulletin, no visual performance objectives apply.
- Two (2) public viewpoints were assessed as being Visual Influence Zone 2 (VIZ2), the Project was assessed as being a visible element in the landscape from these public viewpoint locations. Photomontages have been prepared to demonstrate that the turbines have the potential to become a dominant feature in the existing visual catchment from two (2) locations. It is noted that these locations are on Arumpo Road, which is of a low visual sensitivity. No landscape features were identified at these locations.

Refer to Section 8.0 and Appendix B: Public Viewpoint Analysis

Landscape Character:

The potential for the Project to affect the scenic integrity of the existing landscape character was summarised for each Landscape Character Unit in **Section 15.0** of the LVIA. The existing character of the region is predominantly defined by vast tracts of open, flat modified land utilised for agricultural and grazing operations.

The Project has the ability to become a feature in the existing visual character of the Study Area since the turbines will be a visually prominent element in the flat, open landscape. However, it should be noted that once constructed, the Project will allow the continuation of the existing character of agricultural production and pastoral activities with the addition of a new productive land use, ie., energy production.

Refer to Section 15.0: Overview of Impact on Landscape Character.

Table 16 – Landscape Scenic Integrity - Evaluation of Visual Performance Objectives

Key Feature Disruption

Visual Influence Zone 1 (High) Objectives:	Visual Influence Zone 2 (Moderate) Objectives:	Visual Influence Zone 3 (Low) Objectives:
Avoid wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	**Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/ disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.**	**No Visual Performance objective applies.**

Summary of LVIA Evaluation

Key Landscape Features are identified in **Section 5.0**. The key features were identified through a combination of community consultation and landscape character assessment. The LVIA has assessed the key features of the area and it has been concluded that whilst the Project may impact views from some areas, key features identified through the landscape baseline study will remain the dominant features of the landscape. The potential impact on key landscape features was assessed throughout various sections of the report. The following provides a summary of the findings:

Public Viewpoint Analysis:

- The Visual Influence Zone (VIZ) was identified for 25 key viewpoint locations within the Study Area and where required the landscape scenic integrity was assessed in accordance with the relevant visual performance objectives. Of the 25 viewpoint locations assessed, 23 locations were rated as being Visual Influence Zone 3 (VIZ3) and in accordance with the Bulletin, no visual performance objectives apply.
- Two (2) public viewpoints were assessed as being Visual Influence Zone 2 (VIZ2), the Project was assessed as being a visible element in the landscape from these public viewpoint locations. Photomontages have been prepared to demonstrate that the turbines have the potential to become a dominant feature in the existing visual catchment from two (2) locations. It is noted that these locations are on Arumpo Road, which is of a low visual sensitivity. No landscape features were identified at these locations.

Refer to Section 8.0 and Appendix B: Public Viewpoint Analysis

Landscape Character:

The potential for the Project to affect key landscape features of the existing landscape character was summarised for each Landscape Character Unit. The LVIA concluded that the Project has the potential to become a feature of the landscape due to the existing flat terrain.

Refer to Section 15.0: Overview of Impact on Landscape Character.

Table 17 – Key Feature Disruption - Evaluation of Visual Performance Objectives

Multiple Wind Turbine Effects

Objectives (Applies to all Visual Influence Zones)

- Avoid views to the proposed, existing and approved turbines within eight km from Level 1 and Level 2 viewpoints, exceeding the following thresholds, or provide detailed justification:
- Level 1: (High Sensitivity) - Wind Turbines visible within the effective horizontal views of two or more 60º sectors.
- Level 2: (Moderate Sensitivity) - Wind Turbines visible within the effective horizontal views in three or more 60º sectors.

Summary of LVIA Evaluation

All viewers identified using the Multiple Wind Turbine Effect Tool (based on 2D plan assessment) are Level 3 Sensitivity (State Highways, freeways and classified main roads). In accordance with the Bulletin no further assessment of viewers (Level 3 Sensitivity) is required.

The approach to the MWTT identifies those residences which are non-involved with the Project and those that are non-involved with the Project but associated with another surrounding wind farm. The sectors occupied by turbines which form part of the associated project have been removed from the overall MWTT totals.

Based on a 2D Assessment (and with consideration to the Project and GGWF):

- No non-associated dwellings were identified within 8,000 m to have the potential to view WTGs within any 60º Sectors.

Refer to Section 6.0: Preliminary Assessment Tools

Table 18 – Multiple Wind Turbine Effects - Evaluation of Visual Performance Objectives

Shadow Flicker and Blade Glint - Visual Performance Objectives

Objectives (Applies to all Visual Influence Zones)

- Minimise shadow flicker to not more than 30 hours per year and utilise available mitigation options to minimise shadow flicker.
- Finish turbine blades with a low reflectivity surface treatment to ensure that blade glint is minimised.

Summary of LVIA Evaluation

A Shadow Flicker Assessment was undertaken.

The Report concluded that no non-associated dwellings will be subject to shadow flicker exceeding 30 hours per year.

Refer to Section 11.0:Shadow Flicker Assessment

Table 19 – Shadow Flicker & Blade Glint - Evaluation of Visual Performance Objectives

Aviation Hazard Lighting
Objectives (Applies to all Visual Influence Zones) **Objective Applies to all Visual Influence Zones** • Aviation Hazard Lighting (AHL) must meet the requirements of Australian Standard AS 4282 - 1997 and any prescribed or notified CASA requirement. Shield all AHL within 2 km of any residences. Avoid strobe lighting.
Summary of LVIA Evaluation
The visual effect from night lighting (if used) has the potential to have a visual impact on receptors including motorists and residents in the area. Mitigation methods have been outlined in **Section 16.0**. Shielding will be installed on all turbines with aviation lighting to reduce impact for residences within 2 km. There are no non-associated dwellings within 2 km of a proposed turbine. **Refer to Section 12.0: Night Lighting Assessment.**

Table 20 – Aviation Hazard Lighting - Evaluation of Visual Performance Objectives

18.0 Conclusion

The NSW Government has identified five (5) REZs in regional areas of NSW and the Project is located within the South West Renewable Energy Zones (SW REZ). The Project contrasts with the existing landscape character of the region, which is typically rural, grazing land which is highly modified and lacks key landscape and scenic features. It is inevitable that the placement of large scale WTGs in a rural landscape will dramatically alter the existing landscape character of the area.

With all visual impact assessments the objective is not to determine whether the Project is visible or not visible, but to determine how the Project will impact on the existing visual amenity, landscape character and scenic quality. It has been identified that although the Project will be a prominent feature in the landscape, views to key scenic or landscape features will remain unaltered because the predominant character of the region is defined by highly modified lands of low scenic quality. Landscape features with a moderate or a high scenic quality will remain intact. Once operational, the Project will allow the continuation of existing agricultural activity and add another land use, i.e., wind energy production.

Although this LVIA quantifies the visual impact of the turbines and ancillary infrastructure, the overall visual impact of the Project will vary greatly depending on the individual viewer's sensitivity to and acceptance of change. The sensitivity towards change varies greatly depending on the user's connection with the landscape. For example, visitors to the area may perceive the wind farm as an interesting feature of the landscape, which is otherwise defined by flat, large expanses that lack key features. This may contrast with a resident who passes the wind farm daily who may have a more critical perception of the visual presence of the wind farm.

The visual impact of the turbines are reduced as the distance of the vantage point from the Project is increased. This has been established through the preparation of photomontages from locations at varying distances. Although the area is characterised by large, flat tracts of land with cleared vegetation, it is understood that the visibility decreases as one moves further away from the turbines.

The LVIA concludes that there are no non-associated dwellings within 8,000 m of the Project. The greatest visual effect is most likely to be felt by travelers along Arumpo Road that transects the Project Area. The LVIA considered various locations along Arumpo Road to analyse visual impact along the route to verify the potential visual impact. Roadside vegetation along Arumpo Road will likely fragment views towards the Project. No key public viewpoints were identified along Arumpo Road.

The adjacent MCNP was identified as a key feature within 8,000 m of the Project. However, the MCNP does not offer recreational amenities as access is limited to ecological research. Although the Project will be a dominant feature in the views from the MCNP, the existing character which is defined by large tracts of flat lands with dense mallee woodland will continue to co-exist with the Project.

Another point of interest identified in the area is the World Heritage Listed WLR (inclusive of both the Willandra Lakes World Heritage Area and Willandra Lakes National Heritage Property) located in excess of 25 km northeast of the Project. The assessment identified that the Project (even considering night lighting, if required) it is unlikely to alter the existing visual landscape at this location and is unlikely to have any visual impacts due to the distance to the Project. Based on this assessment, no further mitigation methods are warranted to address impacts at this naturally and culturally important location.

It was also identified that the Project will impact the overall and broader landscape character within the Study Area. Although the Project will be visually prominent in the landscape, the landscape has been determined to be of low scenic quality and devoid of significant landscape features. The modification and clearing of the plains for agricultural use combined with the flat topography the landscape is in essence a blank canvas where any contrasting addition, particularly one of the scale of a wind farm, is likely to become a defining character element. This however will not diminish the existing landscape character.

The potential cumulative visual impact assessment of proposed renewable energy projects in the area concluded that it is likely that the re-occurrence of large-scale developments within this region has the potential to alter the perception of the overall landscape character irrespective of being viewed in a single viewshed. Since the Project is located in SW REZ, it is likely that the region will be developed for wind energy production due to largely uninhabited lands and conditions that favour energy production. The Project is located in an area of low scenic quality that offers no key features in the landscape. It should also be noted that the development of wind farms will allow the continuation of the existing primary production activities, as well as provide opportunity for energy production.

WTGs can be considered a temporary installation in the landscape due to their modular construction and relatively low impact during the construction phase. When implemented with appropriate environmental management, the development of wind farms can be undertaken with low impact on the surrounding environment whilst providing positive local, regional and national benefits.

On evaluation, it is the opinion of Moir LA that with mitigation measures implemented, the Project is compliant with the performance objectives of the Bulletin.

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A

Visual Influence Zone Study Method

VIEWER SENSITIVITY LEVEL

Level 1 Sensitivity: High	• Residential areas and rural villages • Recreation, cultural or scenic sites and viewpoints of National or State significance. • Any buildings, historic rural homesteads/residences on the State or local Government Heritage List
Level 2 Sensitivity: Moderate	• Rural dwelling • Tourist and visitor accommodation (definition in Standard Instrument Local Environmental Plan) • Recreation, cultural or scenic sites and viewpoints of regional significance
Level 3 Sensitivity: Low	• Interstate and state passenger rail lines with daily daylight services • State highways, freeways and classified main roads, classified tourist roads • Land management roads with occasional recreation traffic • Walking tracks of moderate local significance or infrequent recreation usage • Other low use and low concern viewpoints and travel routes • Navigable waterways

VISIBILITY DISTANCE ZONES

0 – 500 m	Near Foreground (**NF**)	Zone of Greatest Visual Influence
500 m – 1 km	Mid Foreground (**MF**)	
1 – 2 km	Far Foreground (**FF**)	
2 – 4 km	Near Middleground (**NM**)	
4 – 8 km	Far Middleground (**FM**)	
8 – 12 km	Near Background (**NB**)	
12 – 20 km	Mid Background (**MB**)	
20 – 32+ km	Far Background (**FB**)	Zone of Least Visual Influence

SCENIC QUALITY CLASS

LOW MODERATE HIGH

Landform
Waterbodies
Vegetation
Human Influence
Activity
Rarity
Relationship with adjoining landscapes

VISUAL INFLUENCE ZONE MATRIX

VIEWER SENSITIVITY LEVEL - VISIBILITY DISTANCE ZONE		**SCENIC QUALITY CLASS** HIGH	MODERATE	LOW
LEVEL 1 HIGH SENSITIVITY VIEWPOINTS				
Near Foreground (**NF**)	0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground (**MF**)	500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground (**FF**)	1 – 2 km	VIZ1	VIZ1	VIZ1
Near Middleground (**NM**)	2 – 4 km	VIZ1	VIZ2	VIZ2
Far Middleground (**FM**)	4 – 8 km	VIZ2	VIZ2	VIZ2
Near Background (**NB**)	8 – 12 km	VIZ2	VIZ2	VIZ2
Mid Background (**MB**)	12 – 20 km	VIZ2	VIZ2	VIZ3
Far Background (**FB**)	20 – 32+ km	VIZ2	VIZ2	VIZ3
LEVEL 2 MODERATE SENSITIVITY VIEWPOINTS				
Near Foreground (**NF**)	0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground (**MF**)	500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground (**FF**)	1 – 2 km	VIZ1	VIZ1	VIZ2
Near Middleground (**NM**)	2 – 4 km	VIZ2	VIZ2	VIZ2
Far Middleground (**FM**)	4 – 8 km	VIZ2	VIZ2	VIZ3
Near Background (**NB**)	8 – 12 km	VIZ2	VIZ3	VIZ3
Mid Background (**MB**)	12 – 20 km	VIZ2	VIZ3	VIZ3
Far Background (**FB**)	20 – 32+ km	VIZ3	VIZ3	VIZ3
LEVEL 3 LOW SENSITIVITY VIEWPOINTS				
Near Foreground (**NF**)	0 – 500 m	VIZ1	VIZ1	VIZ2
Mid Foreground (**MF**)	500 m – 1 km	VIZ2	VIZ2	VIZ2
Far Foreground (**FF**)	1 – 2 km	VIZ2	VIZ2	VIZ3
Near Middleground (**NM**)	2 – 4 km	VIZ2	VIZ3	VIZ3
Far Middleground (**FM**)	4 – 8 km	VIZ2	VIZ3	VIZ3
Near Background (**NB**)	8 – 12 km	VIZ3	VIZ3	VIZ3
Mid Background (**MB**)	12 – 20 km	VIZ3	VIZ3	VIZ3
Far Background (**FB**)	20 – 32+ km	VIZ3	VIZ3	VIZ3
Areas not visible		VIZ3	VIZ3	VIZ3

B

Public Viewpoint Analysis

VP01 Buronga Wetlands, Buronga

Approximate extent of potentially visible turbines

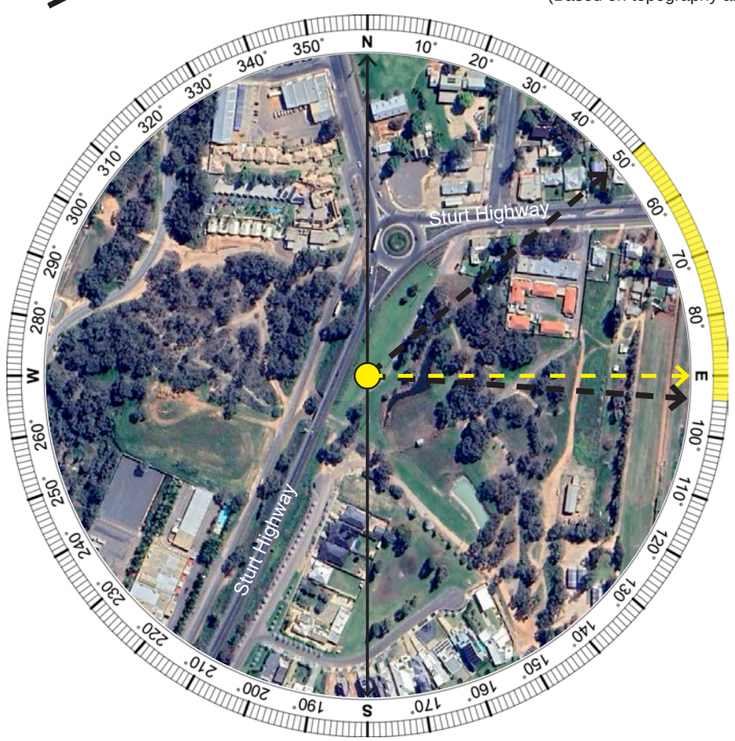
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP01

Viewpoint Summary:	
Location:	Elevation:
Buronga Wetlands, Buronga	44 m
Coordinates:	Viewing Direction:
34°10'19.80"S 142°10'50.32"E	East
Distance to nearest WTG:	Visibility Distance Zone:
17.49 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Recreation	**Moderate**
LCU:	Scenic Quality Rating:
LCU04 - Local Townships	**Low**
Visual Influence Zone: VIZ3	

Existing Landscape Character Description:

This viewpoint was taken off the Sturt Highway at the Buronga Wetlands. The terrain is relatively flat with the surrounding land being used as a recreation area within the town of Buronga. Views are contained in this location by dense vegetation surrounding the wetlands to the east towards the Project.

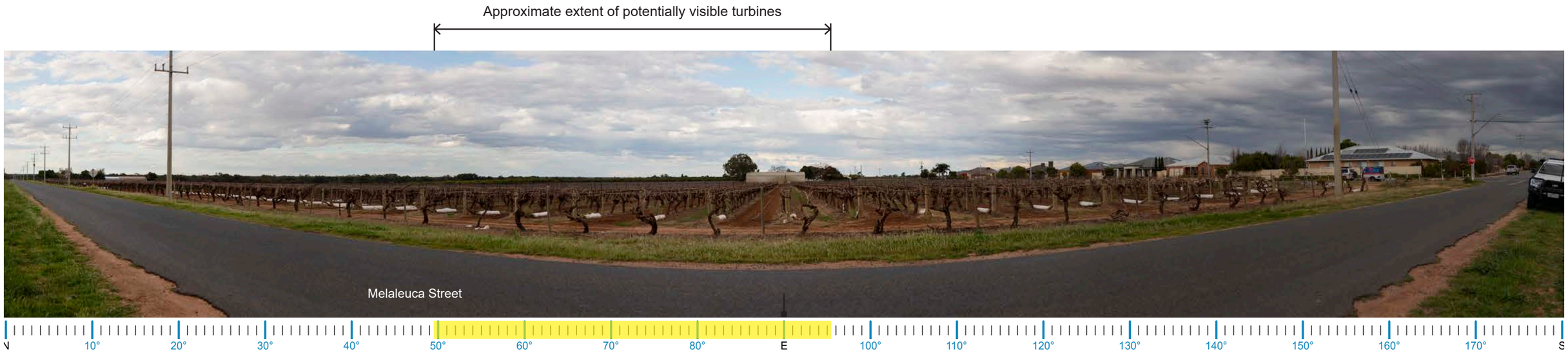
Potential Visual Impact:

From this view, intervening vegetation will filter the majority of the Project. Due to the viewer's distance from the Project, the WTGs will likely be indiscernible, and they are unlikely to alter the view's key landscape features, including Burgona Wetlands.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP02 Melaleuca Street, Buronga



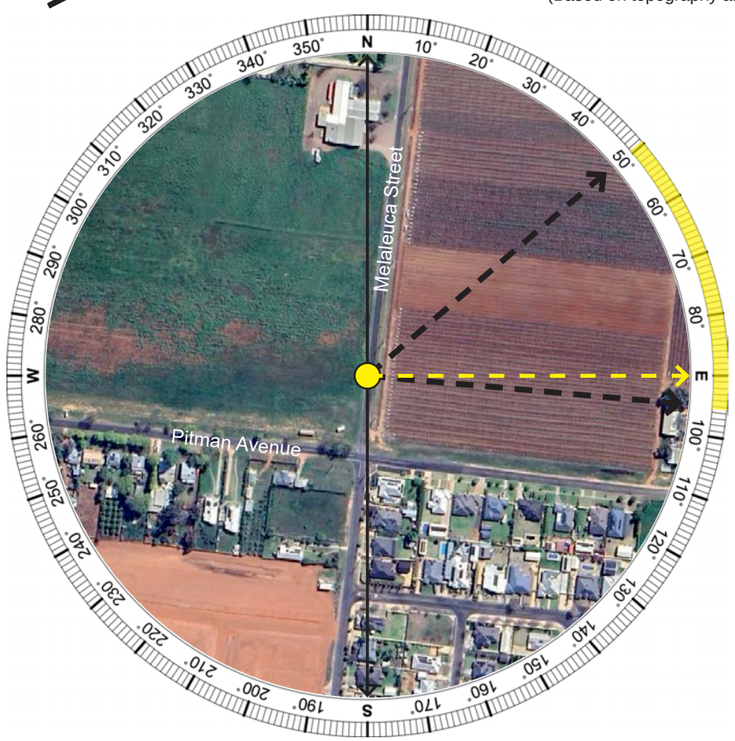
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP02

Viewpoint Summary:	
Location:	Elevation:
Melaleuca Street, Buronga	53 m
Coordinates:	Viewing Direction:
34°10'8.25"S 142°11'29.26"E	East
Distance to nearest WTG:	Visibility Distance Zone:
16.47 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**
Visual Influence Zone: VIZ3	

Existing Landscape Character Description:

This viewpoint was taken along Melaleuca Street within the township of Buronga. The terrain is relatively flat with the surrounding lands being used for agricultural activities in proximity to residential dwellings. Views are open and expansive from this location and minimal vegetation screening to the east. Power infrastructure is visible running along Melaleuca Street.

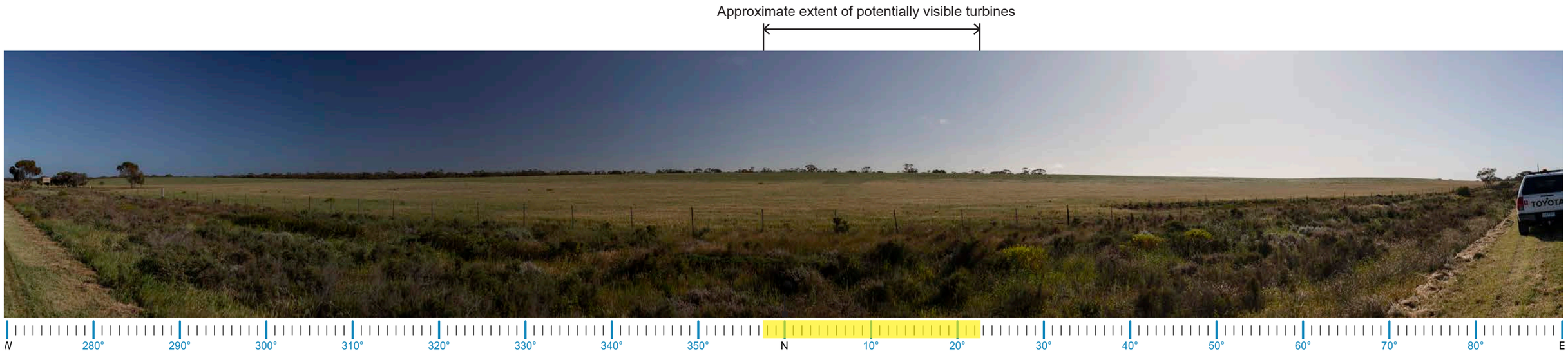
Potential Visual Impact:

Due to minimal intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is negligible.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP03 Sturt Highway, Paringi



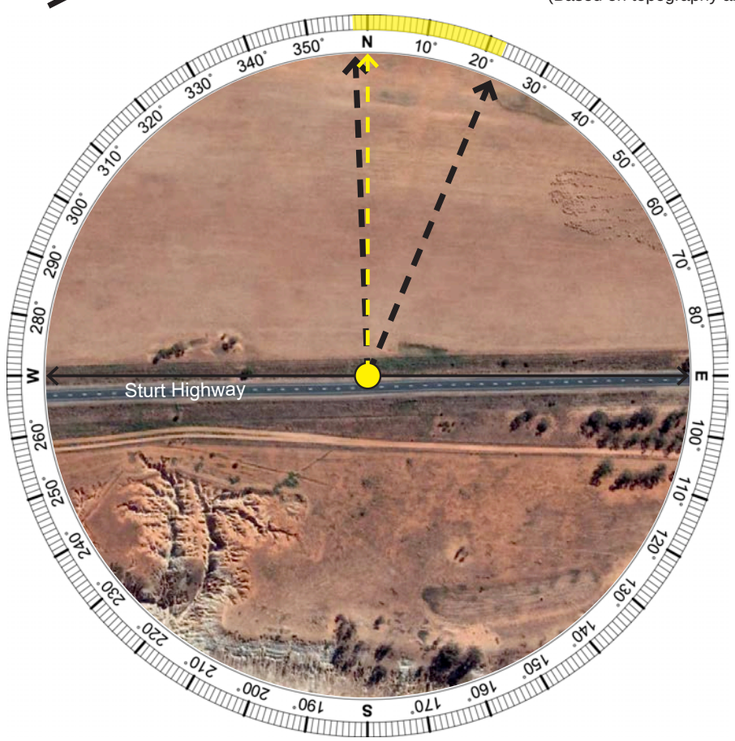
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP03

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Paringi	64 m
Coordinates:	Viewing Direction:
34°19'6.62"S 142°22'37.13"E	North
Distance to nearest WTG:	Visibility Distance Zone:
15.02 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along the Sturt Highway towards Paringi. The terrain is relatively flat to gently undulating with the land being used to support agricultural activities and grazing. Views towards the Project are open yet contained by the topographic condition and the scattered vegetation along the undulation.

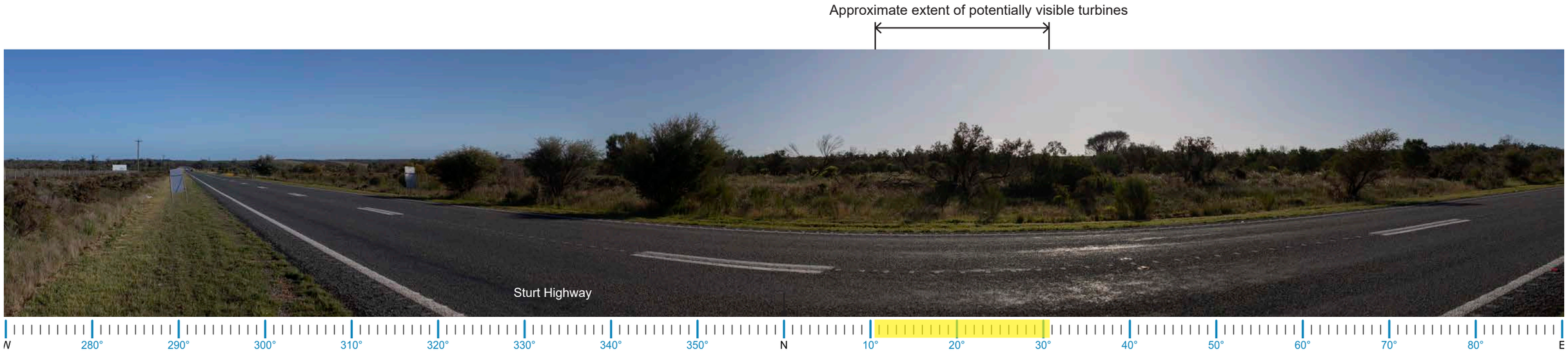
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is negligible.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP04 Sturt Highway, Paringi



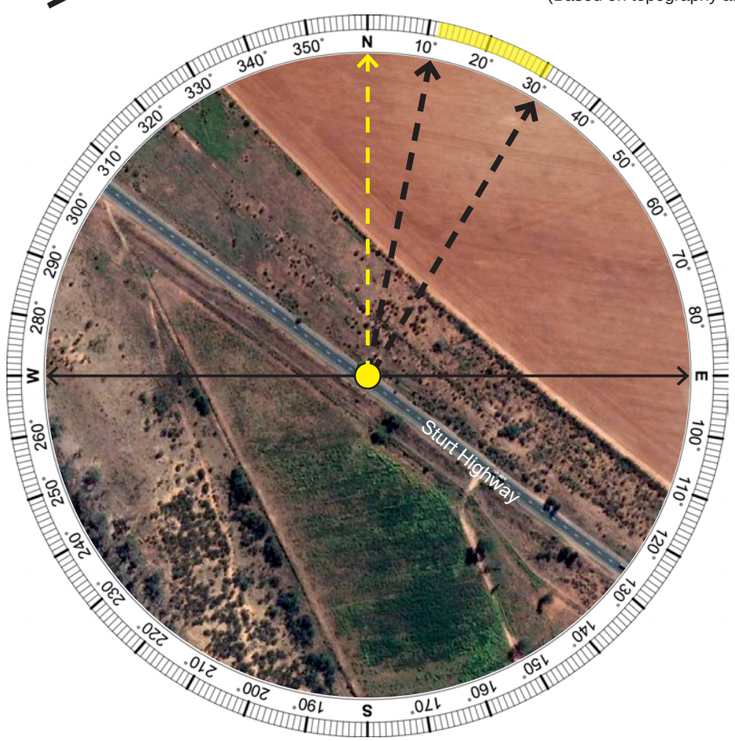
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP04

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Paringi	51 m
Coordinates:	Viewing Direction:
34°17'58.05"S 142°19'53.96"E	North
Distance to nearest WTG:	Visibility Distance Zone:
14.26 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Sturt Highway towards Paringi. The terrain is gently undulating with the surrounding land being used for agricultural activities. Views are open yet contained towards the Project by dense vegetation within the road corridor.

Potential Visual Impact:

From this view, undulating topography and intervening vegetation will filter the majority of the Project. Due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP05 Billabong Road, Gol Gol State Forest

Approximate extent of potentially visible turbines

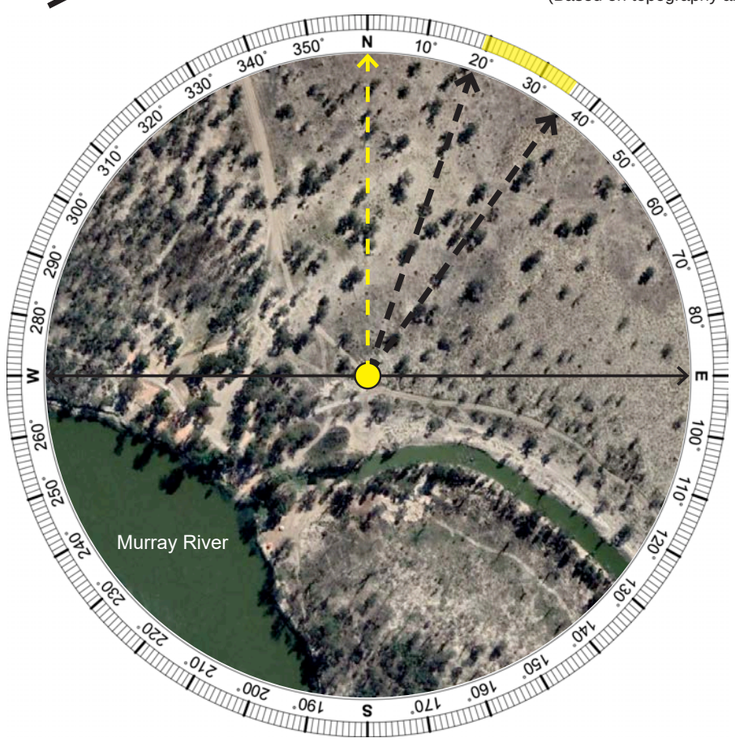
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP05

Viewpoint Summary:	
Location:	Elevation:
Billabong Road, Gol Gol State Forest	41 m
Coordinates:	Viewing Direction:
34°18'11.93"S 142°18'3.47"E	North
Distance to nearest WTG:	Visibility Distance Zone:
16.07 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Recreation	**Moderate**
LCU:	Scenic Quality Rating:
LCU05 - National Parks and Conservation Areas	**Moderate**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken on Billabong Road within Gol Gol State Forest. The terrain is relatively flat in this location, sloping down towards the Murray River to the east. Views are contained by scattered vegetation within the State Forest.

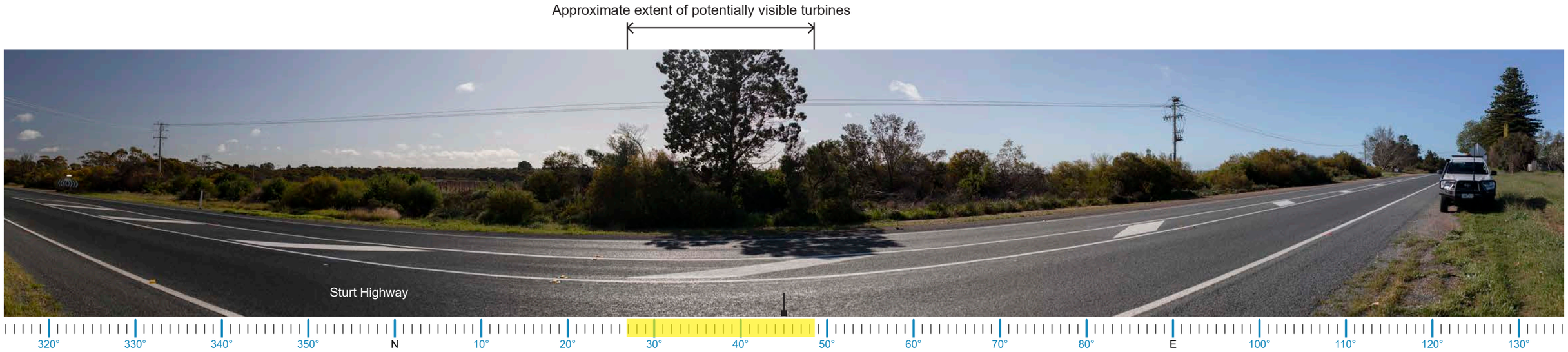
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the northeast. Due to the viewer's distance from the Project, the WTGs will likely be indiscernible, and they are unlikely to alter the view's key landscape features, including the Murray River.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP06 Sturt Highway, Monak



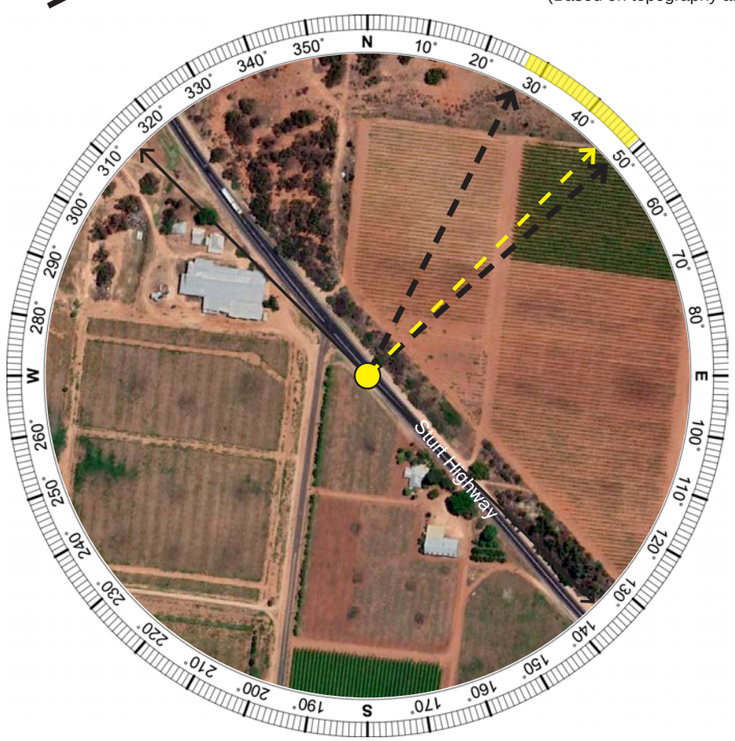
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP06

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Monak	75 m
Coordinates:	Viewing Direction:
34°16'46.35"S 142°16'16.31"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
15.91 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along the Sturt Highway towards Trentham Cliffs. The terrain is characterised as relatively flat with the surrounding land being used to support agricultural activities. Views are contained from this location by dense vegetation within the road corridor. Existing power infrastructure is visible along the edge of the Sturt Highway.

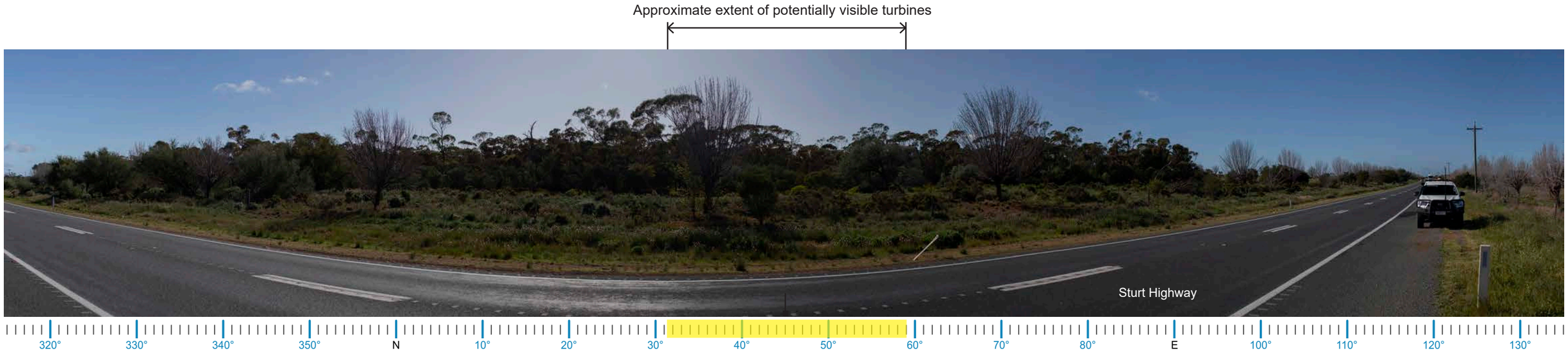
Potential Visual Impact:

From this view, intervening vegetation will filter the majority of the Project. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP07 Sturt Highway, Trentham Cliffs



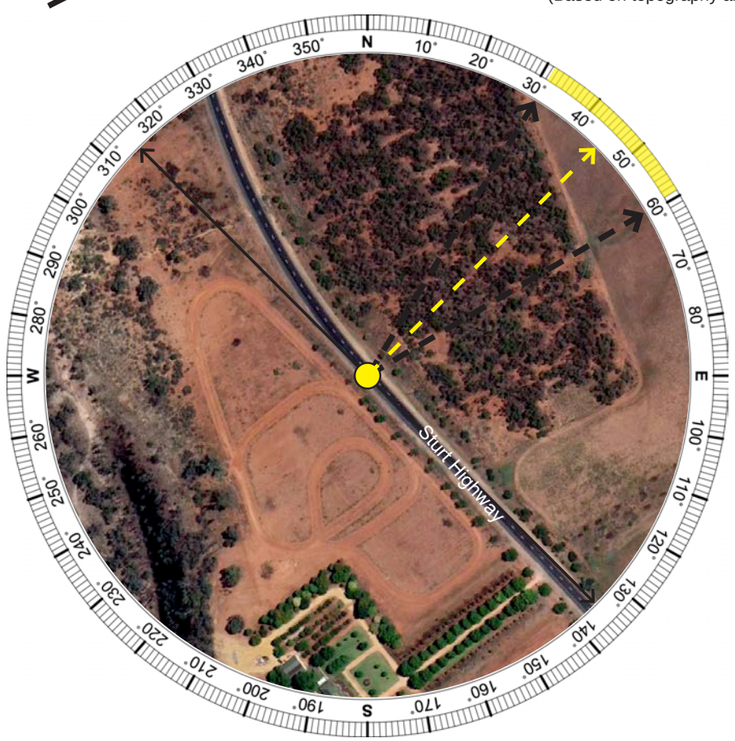
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP07

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Trentham Cliffs	49 m
Coordinates:	Viewing Direction:
34°15'33.20"S 142°15'2.06"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
16.13 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along the Sturt Highway towards Trentham Cliffs. The terrain is gently undulating with the land being used for agricultural activities and grazing. Views are contained by dense vegetation within the road corridor to the northeast.

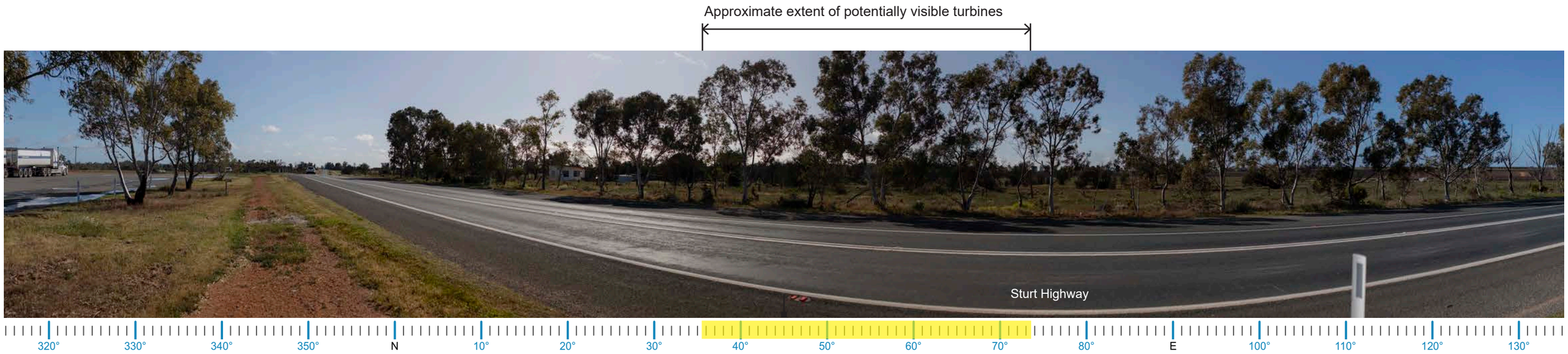
Potential Visual Impact:

From this view, undulating topography and intervening vegetation will filter the majority of the Project. Due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP08 Trentham Hills Rest Area, Sturt Highway, Trentham Cliffs



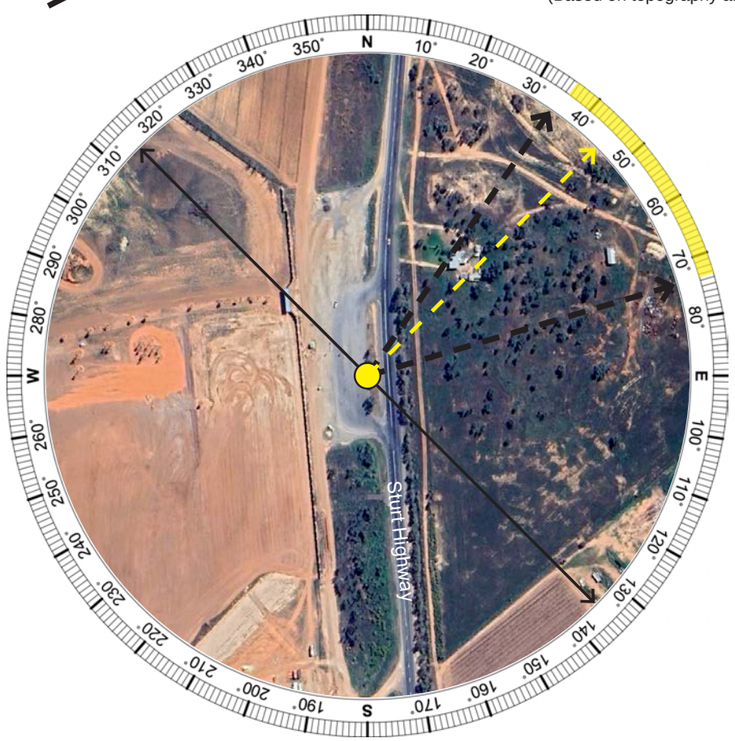
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP08

Viewpoint Summary:	
Location:	Elevation:
Trentham Hills Rest Area, Sturt Highway	57 m
Coordinates:	Viewing Direction:
34°13'18.97"S 142°14'51.77"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
13.67 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Rest Area	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken at the Trentham Hills Rest Area along the Sturt Highway. The terrain is relatively flat with the surrounding land being used for agricultural activities and grazing outside the rest area. Views towards the northeast are contained by screen planting within the road corridor.

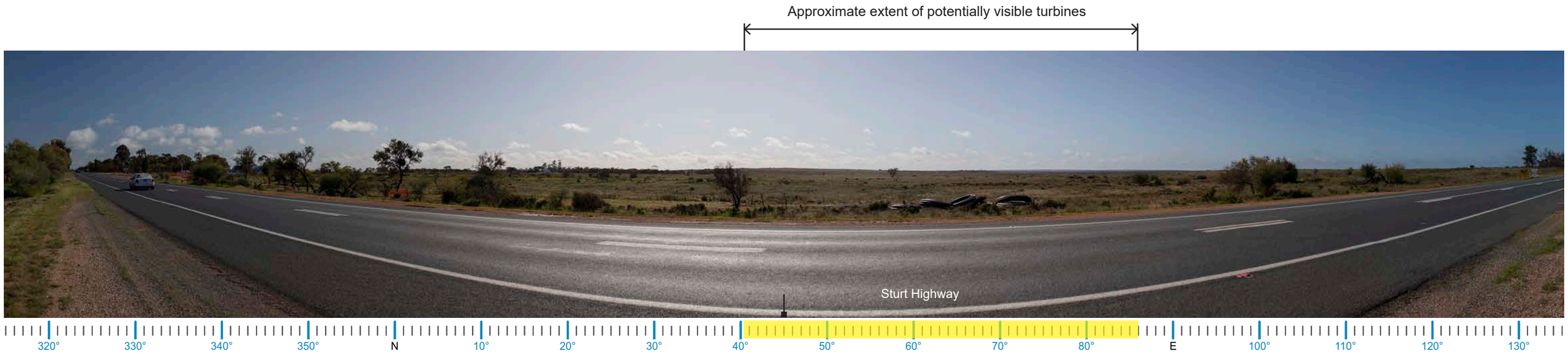
Potential Visual Impact:

From this view, intervening vegetation will filter the majority of the Project. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP09 Sturt Highway, Mallee



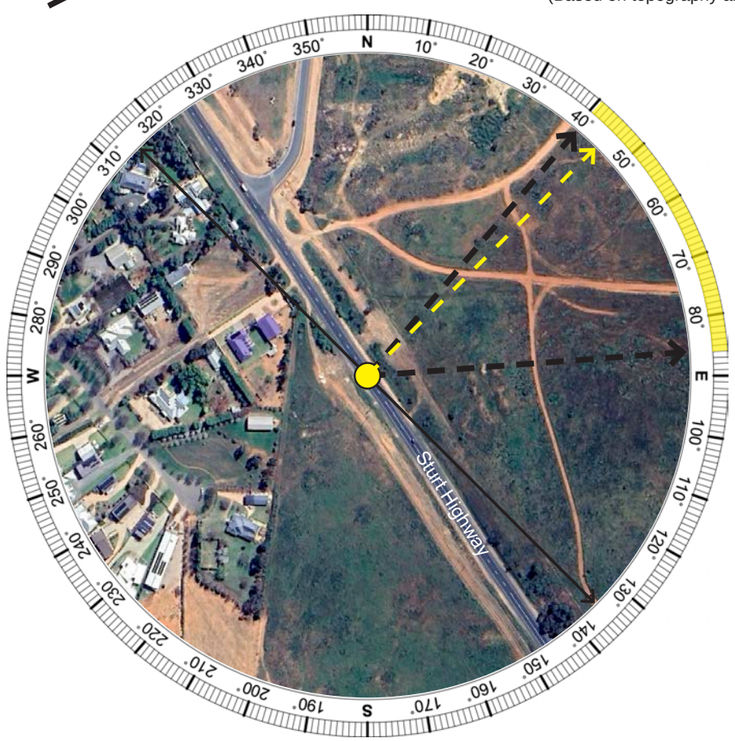
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP09

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Mallee	48 m
Coordinates:	Viewing Direction:
34°11'39.35"S 142°14'17.12"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
12.95 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Sturt Highway towards Gol Gol. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is charactered as native grasslands with scattered trees dotted throughout adjoining paddocks. Views are open and expansive from this location.

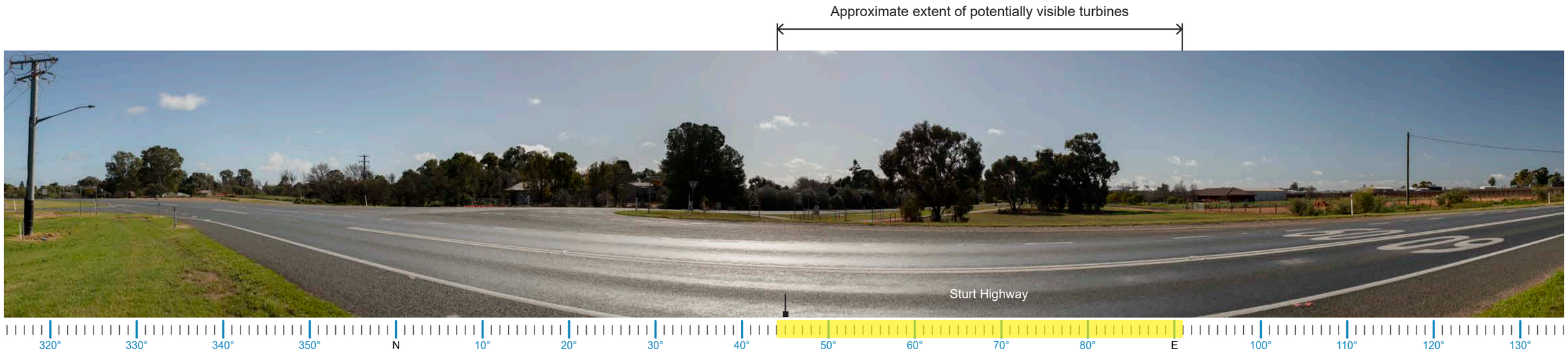
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is negligible.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP10 Sturt Highway, Gol Gol



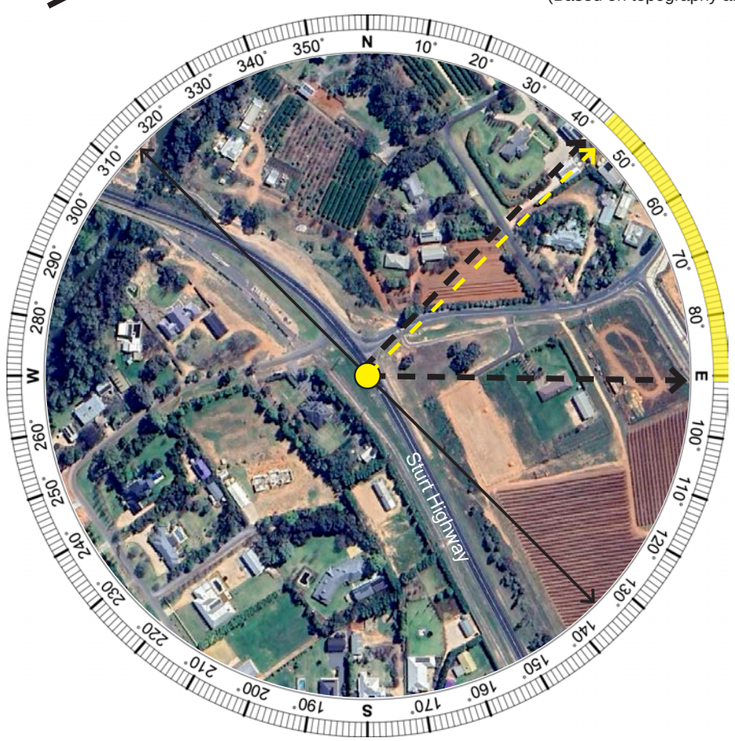
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP10

Viewpoint Summary:	
Location:	Elevation:
Sturt Highway, Gol Gol	44 m
Coordinates:	Viewing Direction:
34°10'56.77"S 142°13'44.83"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
13.22 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU04 - Local Townships	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along the Sturt Highway outside the township of Gol Gol. The terrain is relatively flat with the surrounding land being used for residential dwellings. Views are open yet filtered toward the Project by scattered vegetation surrounding select dwellings in this location.

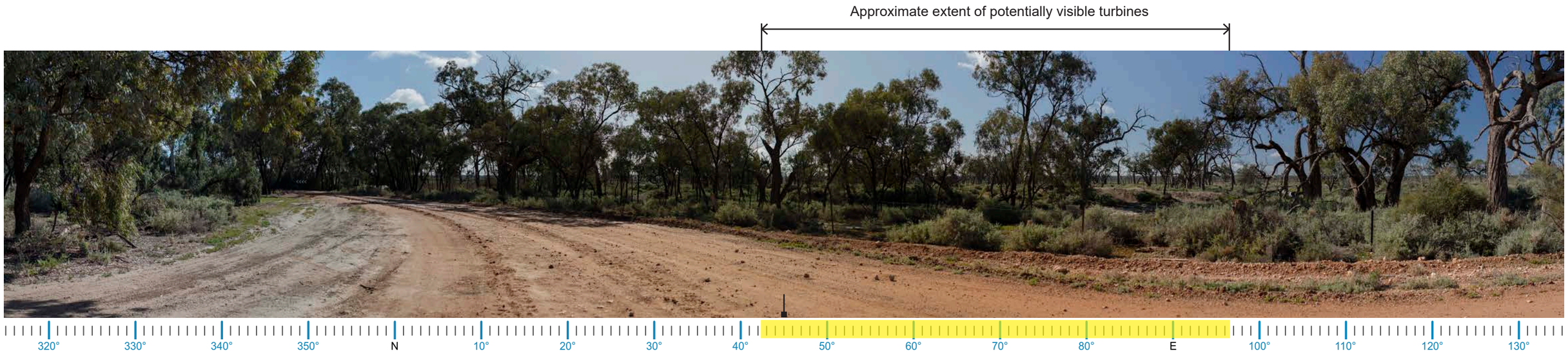
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the northeast. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP11 Off Potters Drive, Gol Gol Creek, Mallee



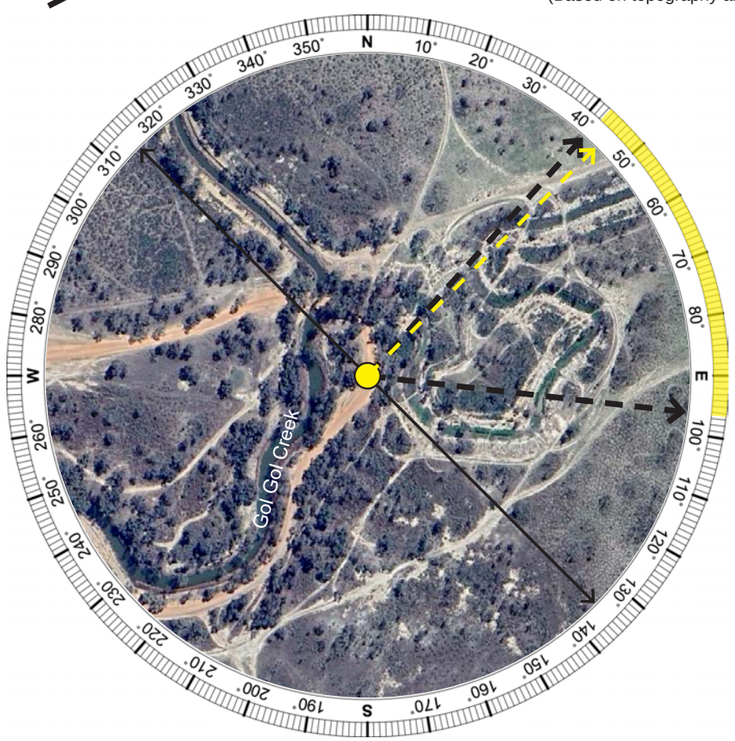
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP11

Viewpoint Summary:	
Location:	Elevation:
Off Potters Drive, Gol Gol Creek, Mallee	40 m
Coordinates:	Viewing Direction:
34°10'11.88"S 142°14'53.23"E	Northeast
Distance to nearest WTG:	Visibility Distance Zone:
11.30 km	**Near Background (NB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road	**Low**
LCU:	Scenic Quality Rating:
LCU02 - Creek and River Systems	**Moderate**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken off Potters Driver near Gol Gol Creek. The terrain is relatively flat with the vegetation character being associated with Gol Gol Creek with dense vegetation aligning the creekline that contain views towards the Project.

Potential Visual Impact:

From this view, intervening vegetation will filter the majority of the Project. Due to the viewer's distance from the Project, the WTGs will likely be indiscernible, and they are unlikely to alter the view's key landscape features, including Lake Gol Gol.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP12 Rest Area along Silver City Highway, Mourquong

Approximate extent of potentially visible turbines

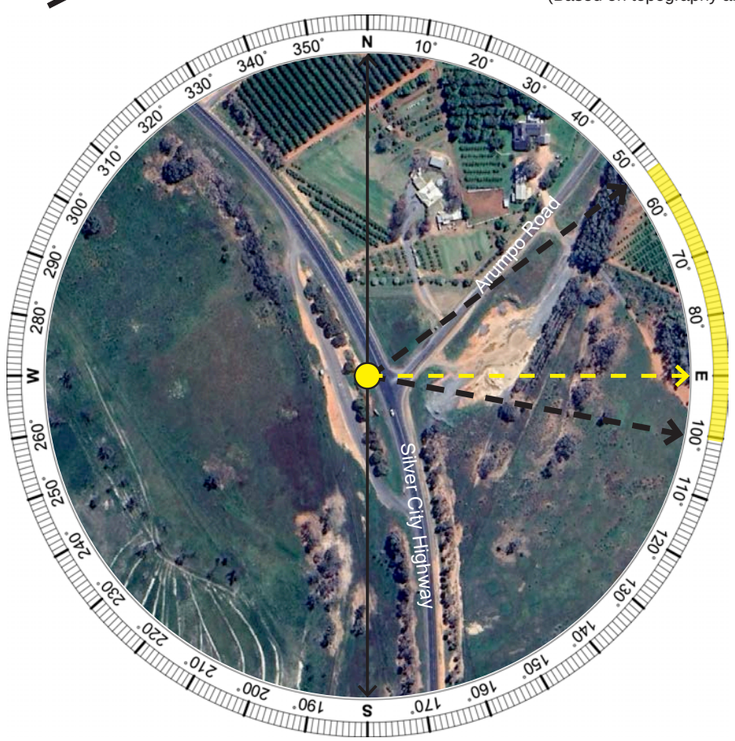
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP12

Viewpoint Summary:	
Location:	Elevation:
Rest Area, Silver City Highway, Mourquong	43 m
Coordinates:	Viewing Direction:
34° 9'0.43"S 142°10'46.56"E	East
Distance to nearest WTG:	Visibility Distance Zone:
17.41 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Rest Area	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken at the Rest Area along the Silver City Highway outside Buronga. The terrain is relatively flat with the surrounding land being used for agricultural activities. Views are contained towards the Project by dense vegetation with the road corridors.

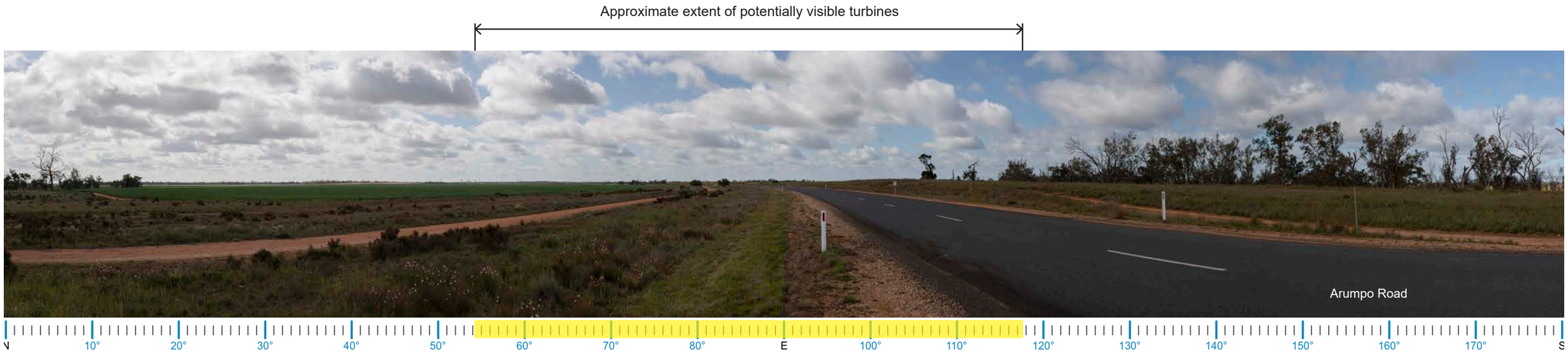
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the northeast. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP13 Arumpo Road, Wentworth



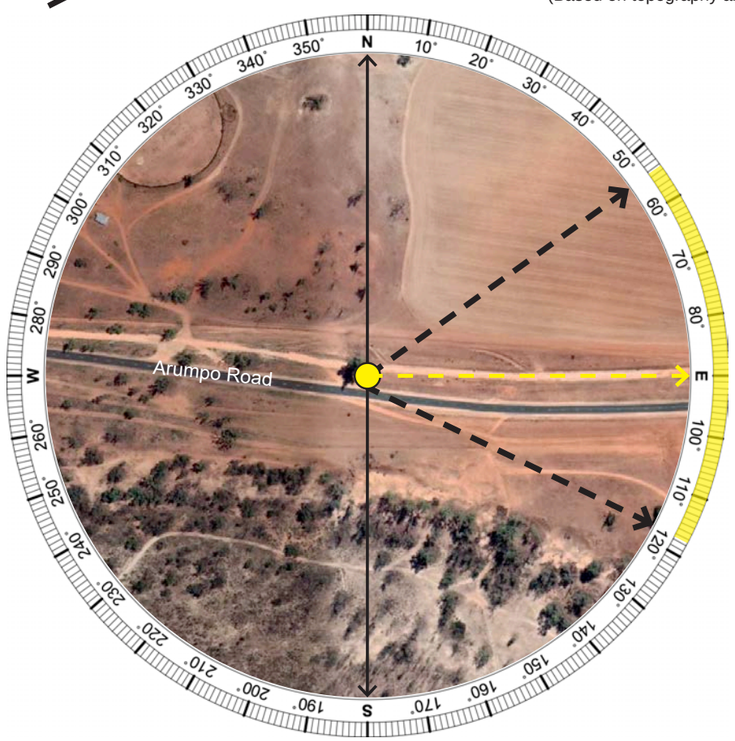
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP13

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Wentworth	41 m
Coordinates:	Viewing Direction:
34° 6’49.16”S 142°14’14.21”E	East
Distance to nearest WTG:	Visibility Distance Zone:
12.80 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road, near Lake Gol Gol. The terrain is relatively flat with the surrounding land being used for agricultural activities and grazing outside the extent of Lake Gol Gol. Views are open and expansive with select views filtered by scattered vegetation to the southeast.

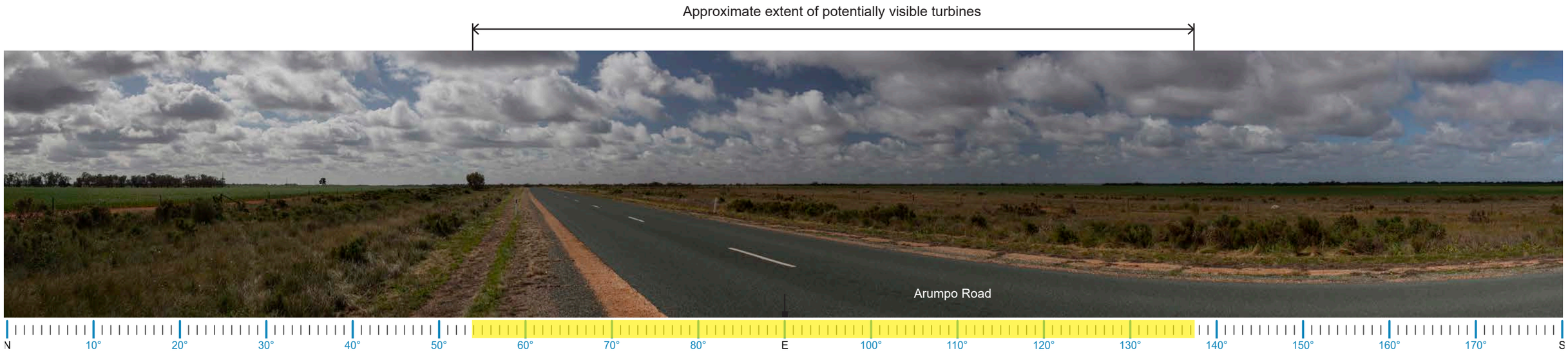
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is negligible.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP14 Arumpo Road, Wentworth



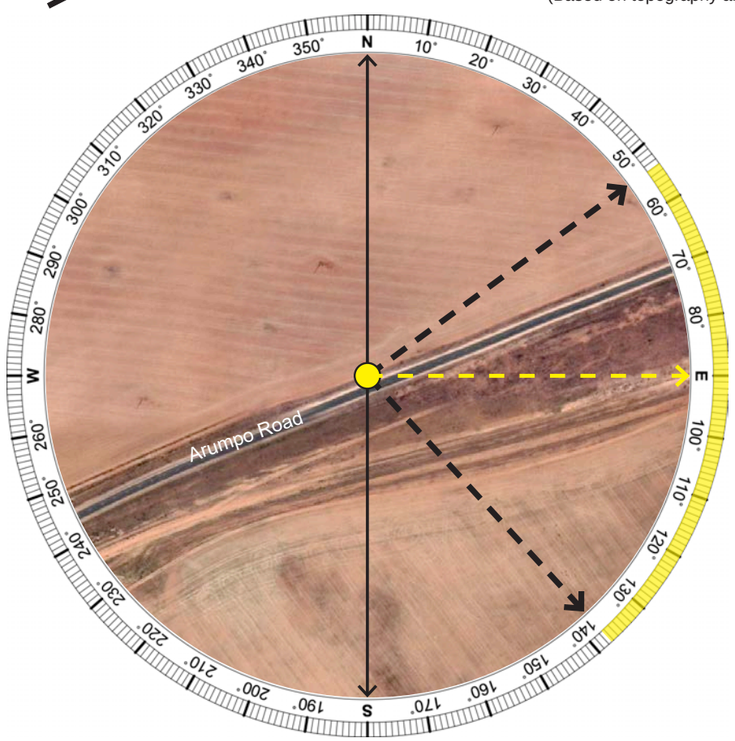
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP14

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Wentworth	67 m
Coordinates:	Viewing Direction:
34° 5'2.03"S 142°17'15.67"E	East
Distance to nearest WTG:	Visibility Distance Zone:
9.24 km	**Near Background (NB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road towards Mungo National Park. The terrain is flat being used for agricultural activities and grazing. Vegetation is characterised as native grasslands with minimal tree coverage. Views from this location are open and expansive towards the Project.

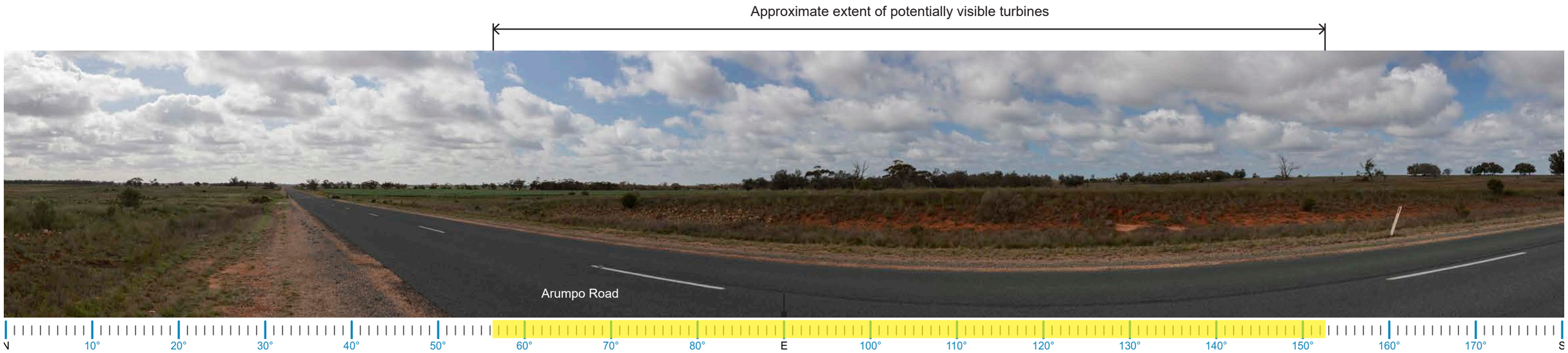
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is minimal.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP15 Arumpo Road, Wentworth



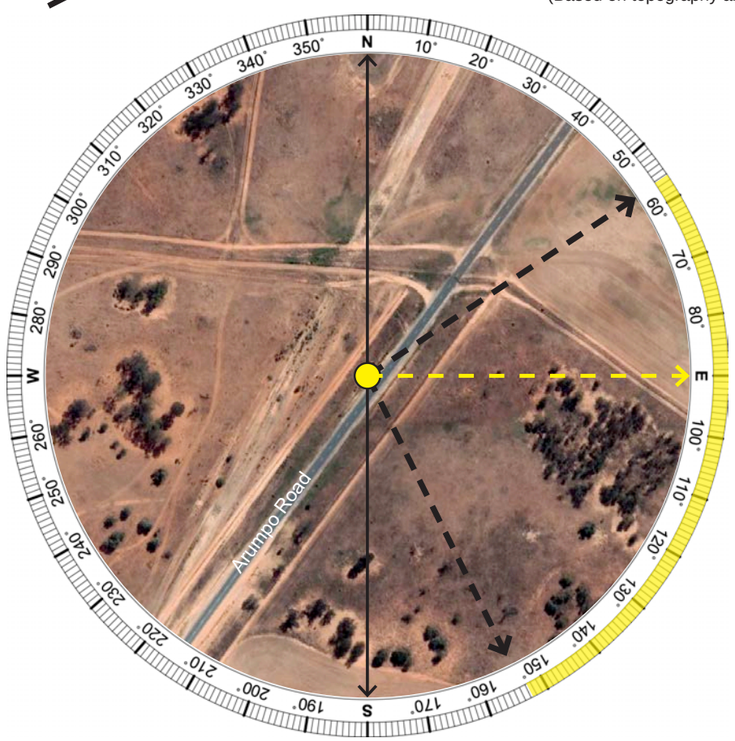
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP15

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Wentworth	67 m
Coordinates:	Viewing Direction:
34° 3’41.99”S 142°18’47.78”E	East
Distance to nearest WTG:	Visibility Distance Zone:
8.54 km	**Near Background (NB)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road towards Mungo National Park. The terrain is relatively flat with the surrounding land being used for agricultural activities and grazing. Views are open and expansive with scattered vegetation dotted throughout the adjoining paddocks to the east.

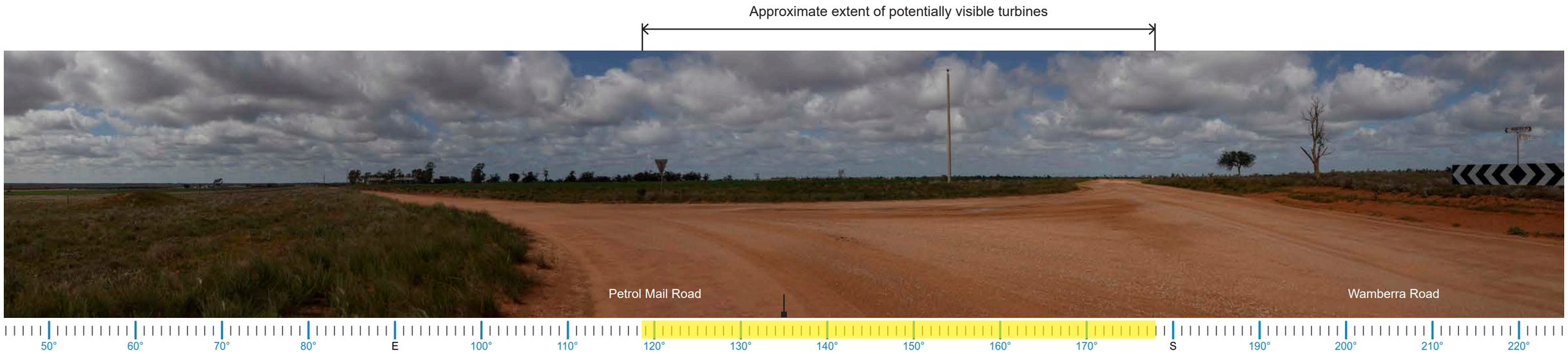
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape, and a low vertical proportion of the view will be affected. Vegetation to the east may filter views to select turbines.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP16 Corner Petro Mail Road and Wamberra Road, Arumpo



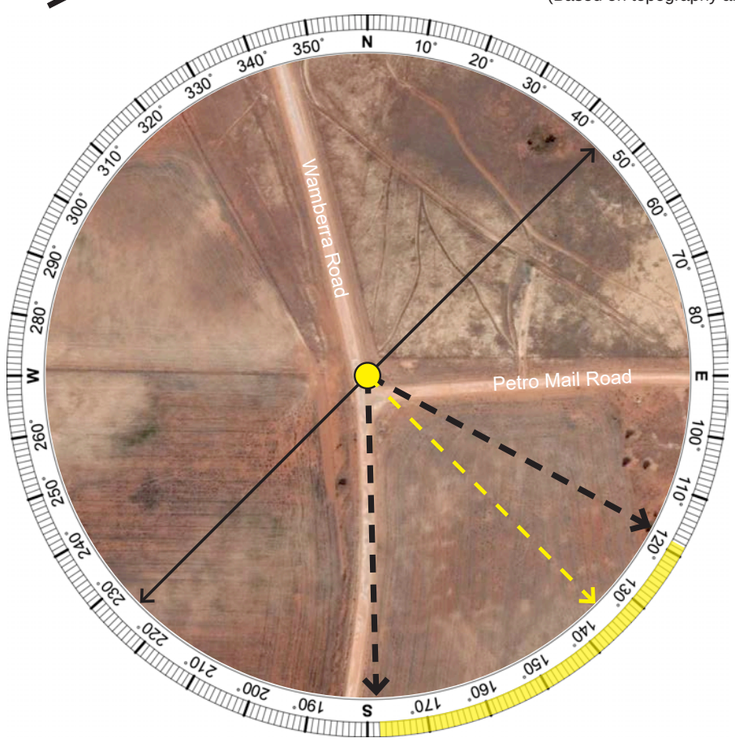
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP16

Viewpoint Summary:	
Location:	Elevation:
Corner Petro Mail Road and Wamberra Road, Arumpo	65 m
Coordinates:	Viewing Direction:
33°56'2.72"S 142°21'33.10"E	Southeast
Distance to nearest WTG:	Visibility Distance Zone:
10.25 km	**Near Background (NB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken on the corner of Petro Mail Road and Wamberra Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with scattered vegetation visible around dwelling to the east. Views from this location are classified as open and expansive.

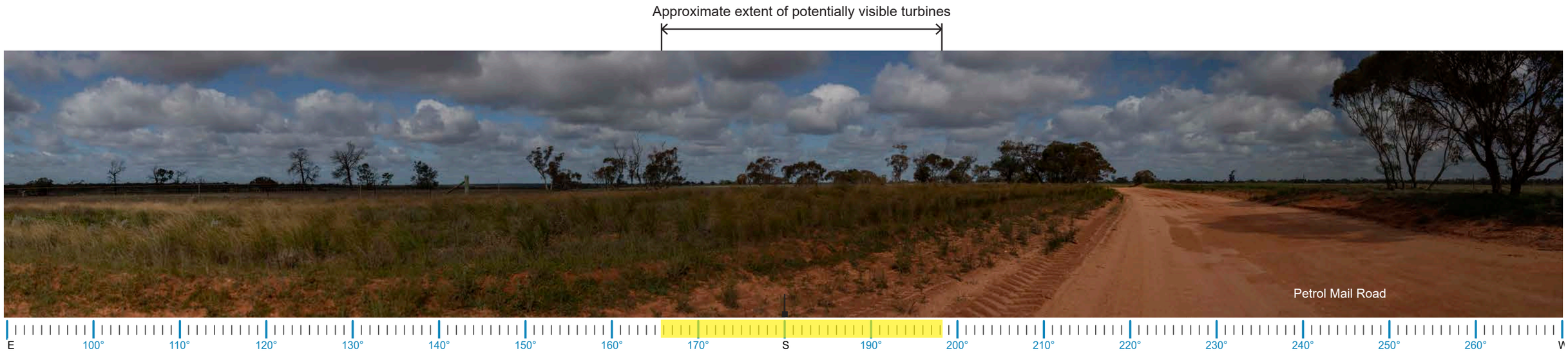
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is minimal.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP17 Petro Mail Road, Arumpo



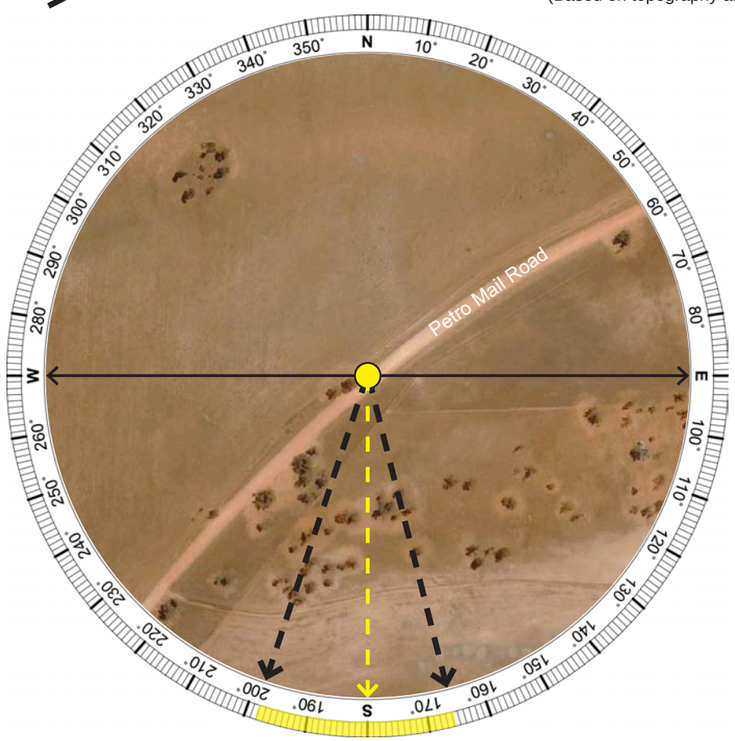
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP17

Viewpoint Summary:	
Location:	Elevation:
Petro Mail Road, Arumpo	81 m
Coordinates:	Viewing Direction:
33°53'39.98"S 142°28'4.39"E	South
Distance to nearest WTG:	Visibility Distance Zone:
10.15 km	**Near Background (NB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Petro Mail Road off Wamberra Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with scattered vegetation dotted throughout adjoining paddocks to the road corridor. Views are open and expansive with the vegetation filtering select views to the south towards the Project.

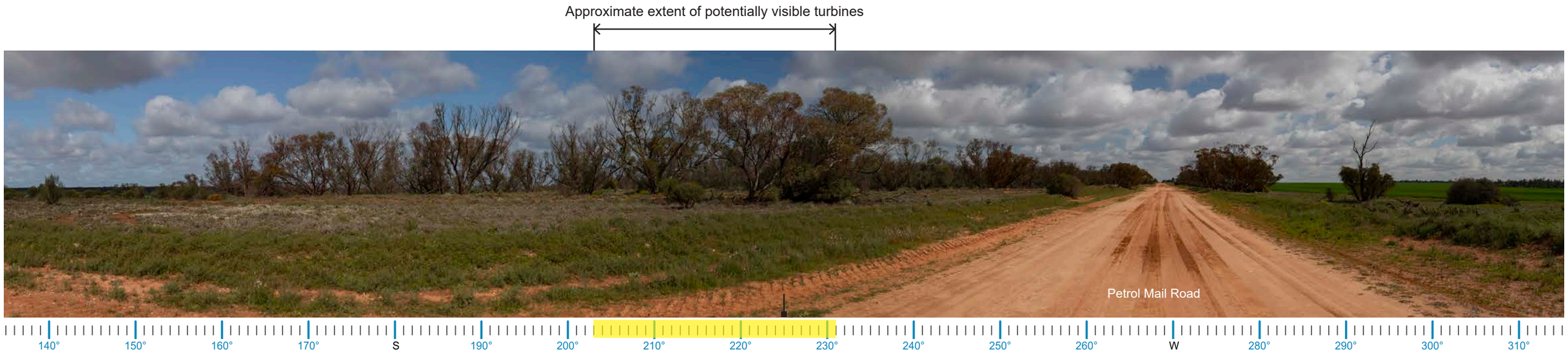
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the south. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP18 Petro Mail Road, Arumpo



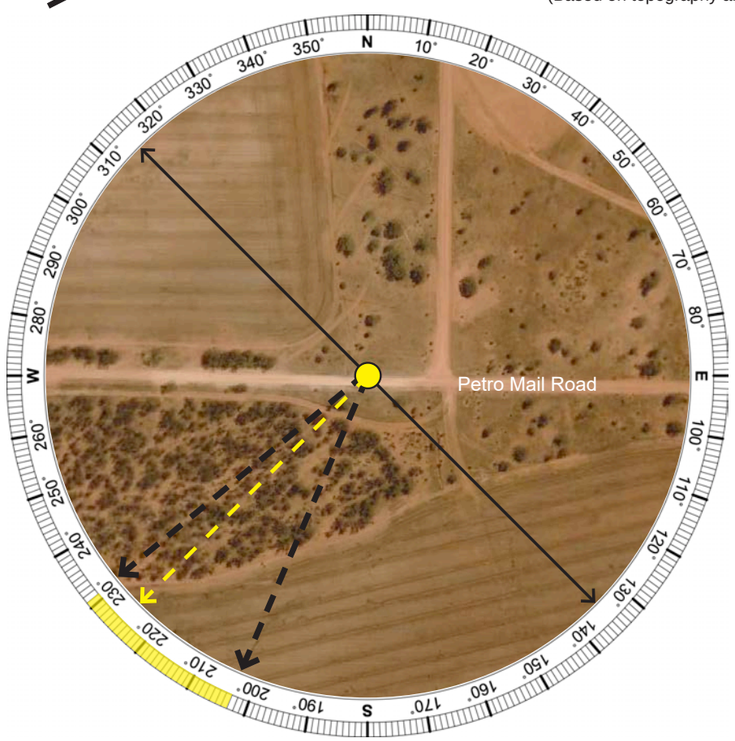
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP18

Viewpoint Summary:	
Location:	Elevation:
Petro Mail Road, Arumpo	101 m
Coordinates:	Viewing Direction:
33°53'17.30"S 142°35'44.54"E	Southwest
Distance to nearest WTG:	Visibility Distance Zone:
15.69 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Petro Mail Road off Wamberra Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with dense vegetation dotted within the road corridor and dotted throughout adjoining paddocks. Views are open and expansive with the vegetation screening views to the south towards the Project.

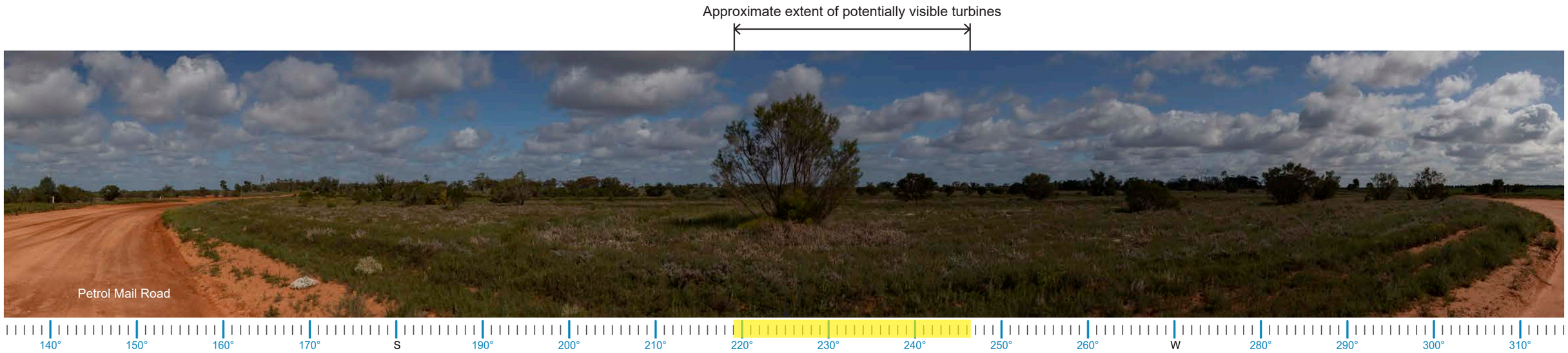
Potential Visual Impact:

From this view, intervening vegetation will filter the majority of the Project. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer's distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP19 Petro Mail Road, Arumpo



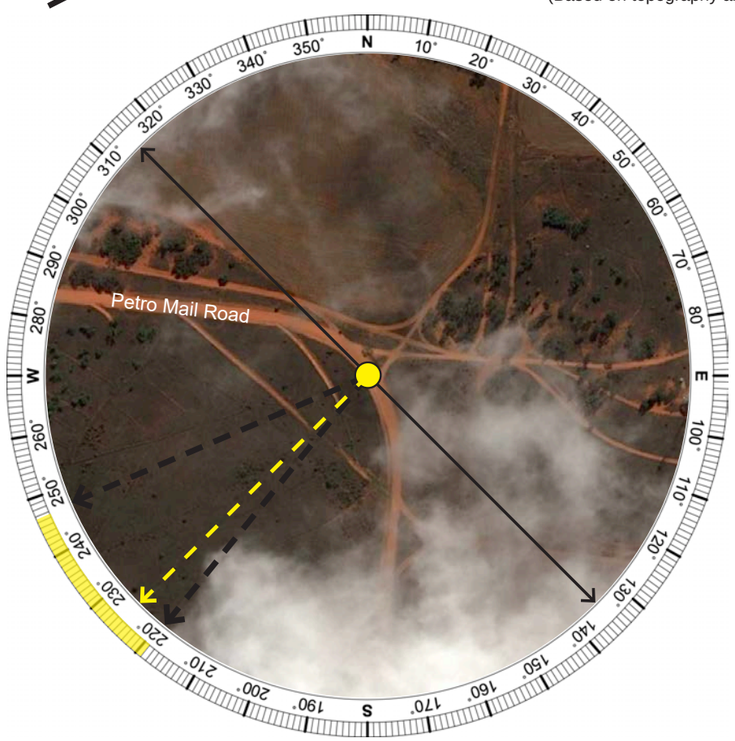
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP19

Viewpoint Summary:	
Location:	Elevation:
Petro Mail Road, Arumpo	93 m
Coordinates:	Viewing Direction:
33°54’2.44”S 142°40’56.00”E	Southwest
Distance to nearest WTG:	Visibility Distance Zone:
21.28 km	**Far Background (FB)**
Land Use:	Viewer Sensitivity Level:
Low Use Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Petro Mail Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with scattered vegetation dotted throughout outside the road corridor. Views are open and expansive with the vegetation containing select views to the southwest towards the Project.

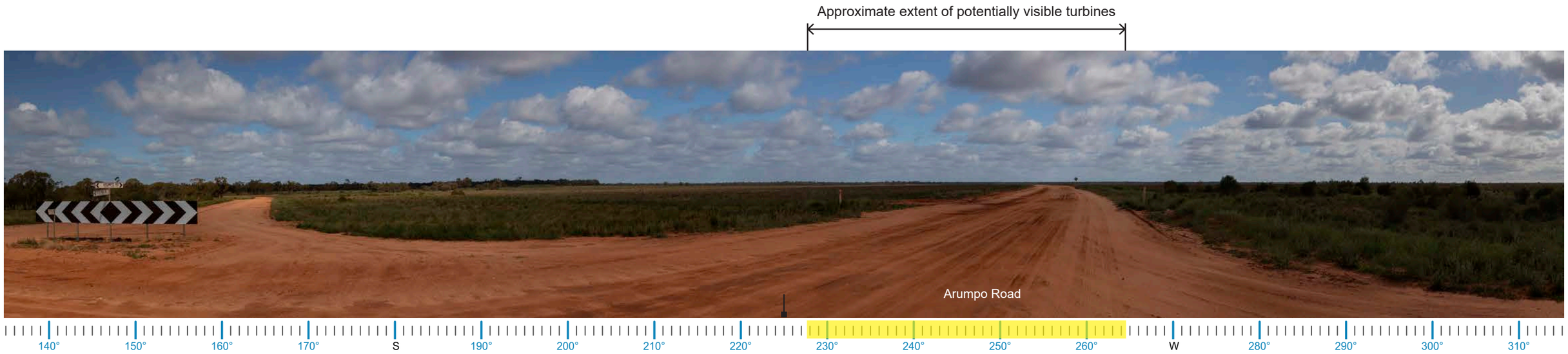
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the southwest. Due to the flat terrain, the WTGs will be a new element in the landscape; however, due to the viewer’s distance from the Project, the WTGs will likely be indiscernible and unlikely to alter the view from this location.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP20 Corner Petro Mail Road and Arumpo Road, Arumpo Road



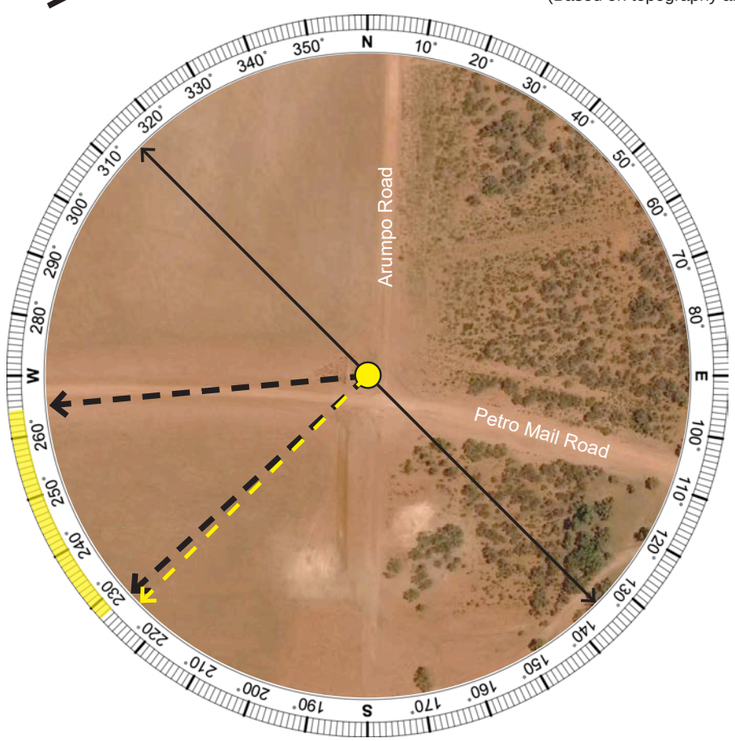
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP20

Viewpoint Summary:	
Location:	Elevation:
Corner Petro Mail Road and Arumpo Road	76 m
Coordinates:	Viewing Direction:
33°57'53.51"S 142°41'41.71"E	Southwest
Distance to nearest WTG:	Visibility Distance Zone:
18.62 km	**Mid Background (MB)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken on the corner of Petro Mail Road and Arumpo Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with scattered vegetation dotted throughout outside the road corridor to the east. Views are open and expansive towards the Project.

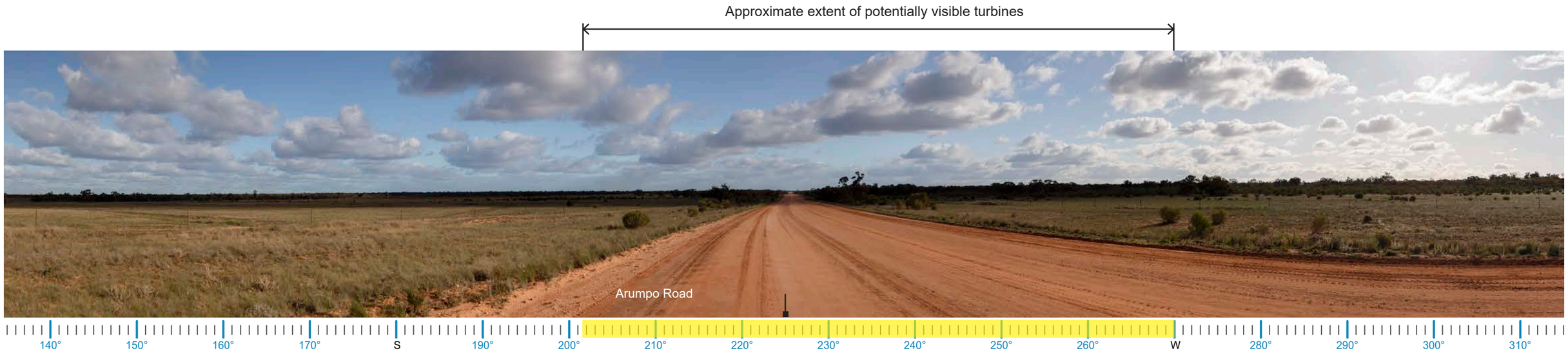
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape; however, due to the distance from the viewer, the vertical proportion of the view affected is negligible.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP21 Arumpo Road, Arumpo



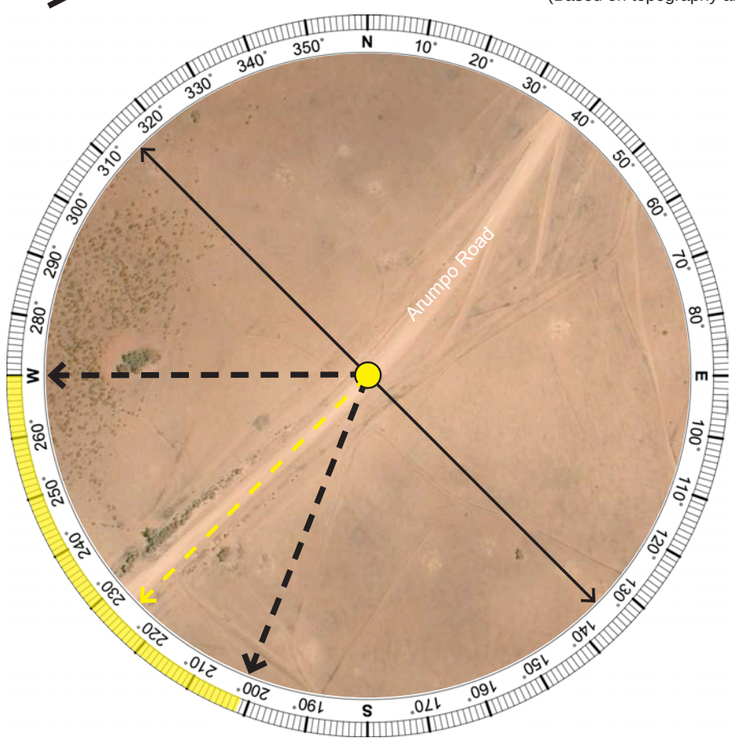
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP21

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Arumpo	73 m
Coordinates:	Viewing Direction:
33°59'2.63"S 142°32'38.49"E	Southwest
Distance to nearest WTG:	Visibility Distance Zone:
5.68 km	**Far Middleground (FM)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road towards Buronga. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with scattered vegetation dotted throughout outside the road corridor to the west. Views are open towards the Project.

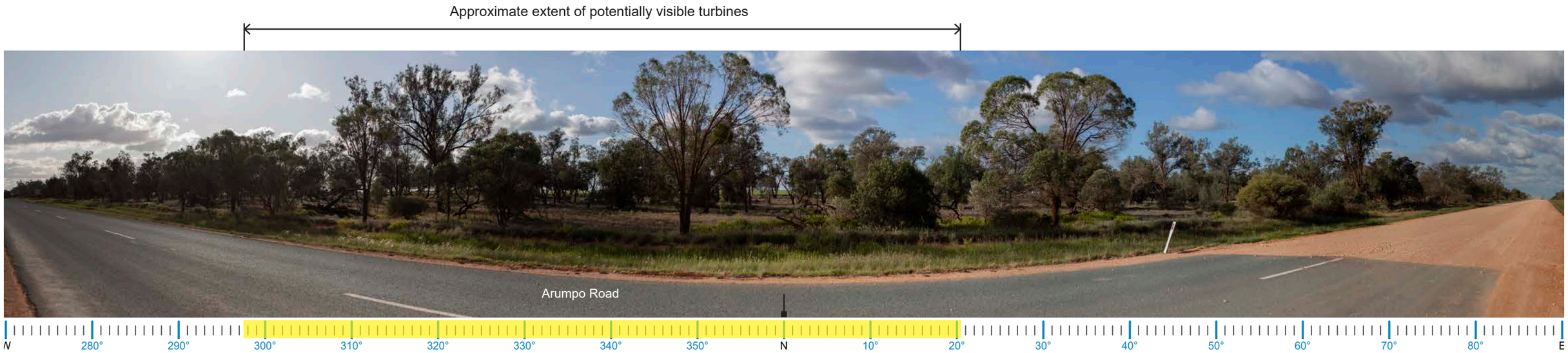
Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape, and a low vertical proportion of the view will be affected.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP22 Arumpo Road, Arumpo



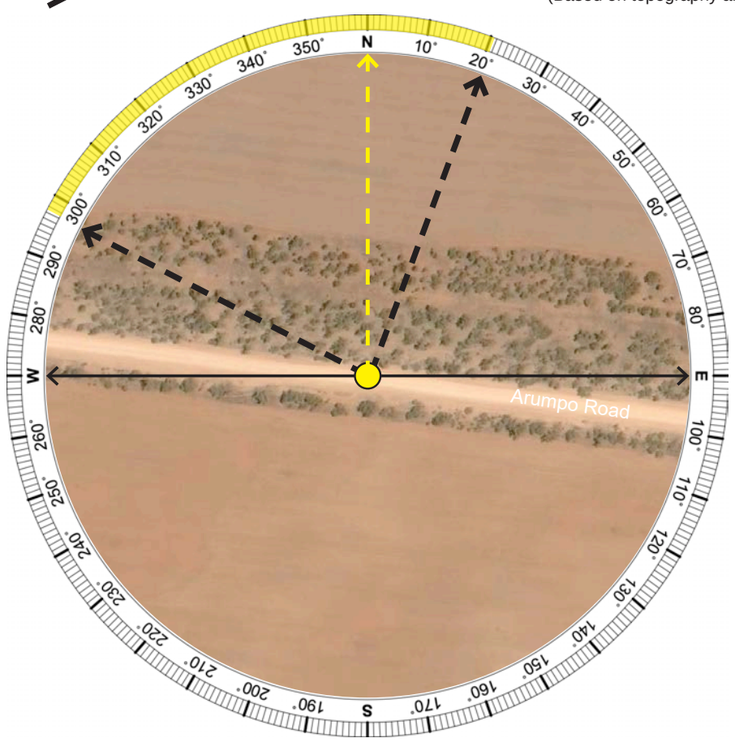
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP22

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Arumpo	122 m
Coordinates:	Viewing Direction:
34° 0’49.07”S 142°27’44.89”E	North
Distance to nearest WTG:	Visibility Distance Zone:
0.60 km	**Mid Foreground (MF)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ2

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with dense vegetation aligning the road edge. Views are open yet filtered by vegetation towards the Project.

Potential Visual Impact:

Due to the flat terrain and proximity to the Project, there will be clear views towards the Project. The WTGs will be a new element in the landscape, and a moderate vertical proportion of the view will be affected, altering the view from this location.

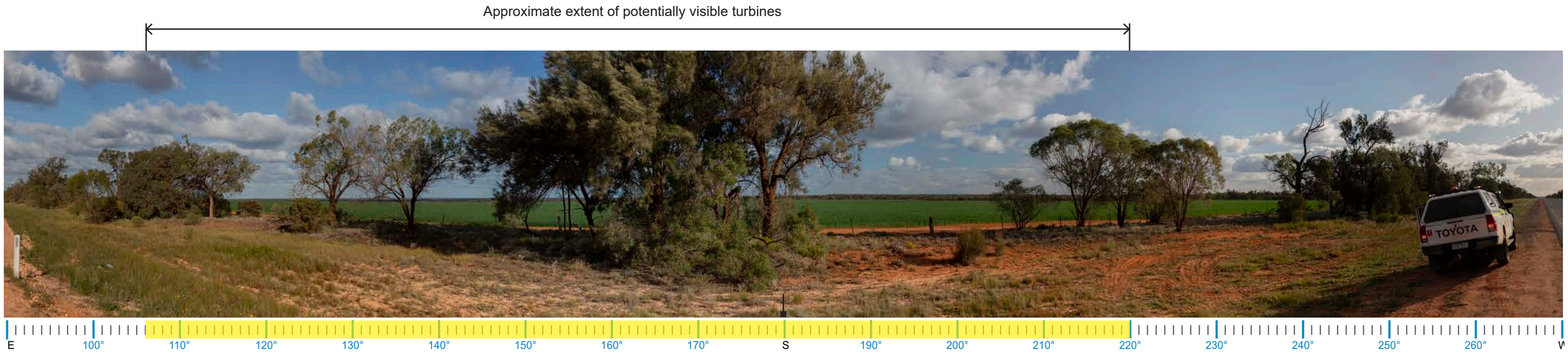
Visual Performance Objectives:

Visual Magnitude: The viewpoint is located within the ‘black line’ (3,750 m).

Landscape Scenic Integrity: The Project is likely to result in the modification of the visual catchment from this location. Turbines are likely to be a major element in the landscape.

Key Feature Disruption: The key features at this location include views across land utilised for agriculture. Whilst this feature is likely to remain in tact, it is likely that the Project will also become a key feature of the view from this location.

VP23 Arumpo Road, Arumpo



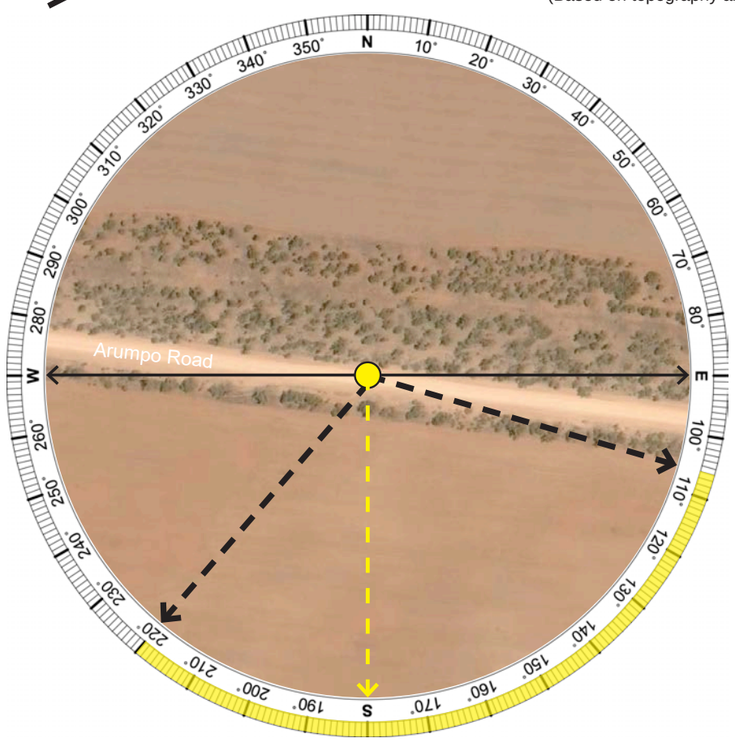
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP23

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Arumpo	122 m
Coordinates:	Viewing Direction:
34° 0’49.07”S 142°27’44.89”E	South
Distance to nearest WTG:	Visibility Distance Zone:
0.60 km	**Near Foreground (NF)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ2

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road. The terrain is relatively flat with the surrounding land being used for agricultural activities and grazing. Views are open yet filtered by scattered vegetation within the road corridor.

Potential Visual Impact:

Due to the flat terrain and proximity to the Project, there will be clear views towards the Project. The WTGs will be a new element in the landscape, and a moderate vertical proportion of the view will be affected, altering the view from this location.

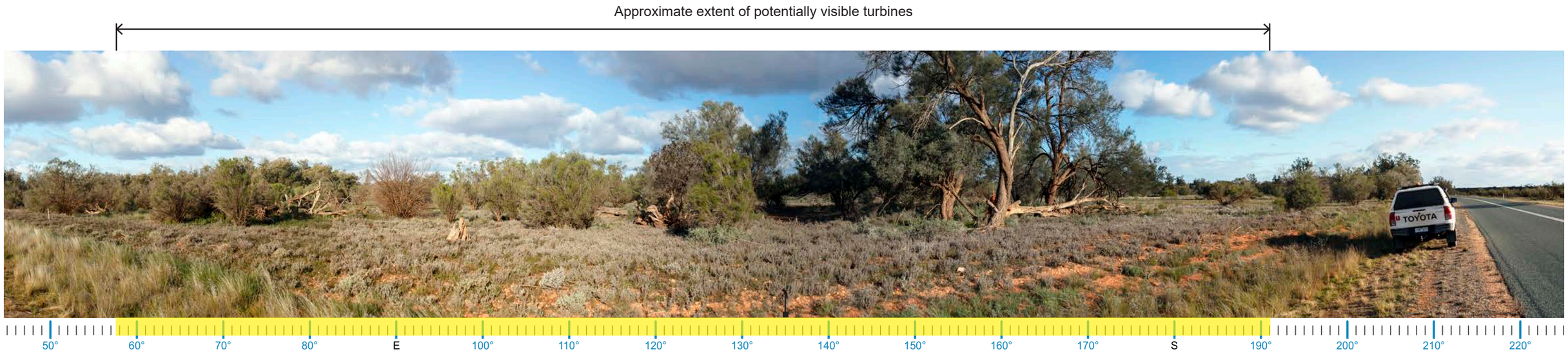
Visual Performance Objectives:

Visual Magnitude: The viewpoint is located within the ‘black line’ (3,750 m).

Landscape Scenic Integrity: The Project is likely to result in the modification of the visual catchment from this location. Turbines are likely to be a major element in the landscape.

Key Feature Disruption: The key features at this location include views across land utilised for agriculture. Whilst this feature is likely to remain in tact, it is likely that the Project will also become a key feature of the view from this location.

VP24 Arumpo Road, Wentworth



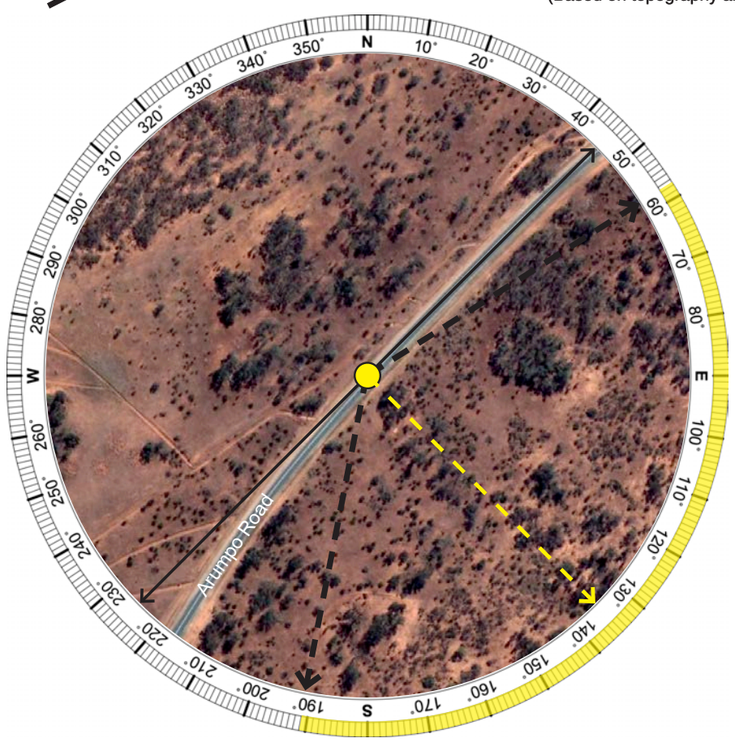
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines (Based on topography alone)



VIEWPOINT VP24

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Wentworth	68 m
Coordinates:	Viewing Direction:
34° 0’44.98”S 142°23’58.13”E	Southeast
Distance to nearest WTG:	Visibility Distance Zone:
4.04 km	**Far Middleground (FM)**
Land Use:	Viewer Sensitivity Level:
Major Road	**Low**
LCU:	Scenic Quality Rating:
LCU01 - Grazing Native Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road. The terrain is relatively flat with the surrounding land being used for grazing. Vegetation is characterised as native grasslands with open views that are contained by dense vegetation visible throughout the adjoining paddocks to the southeast.

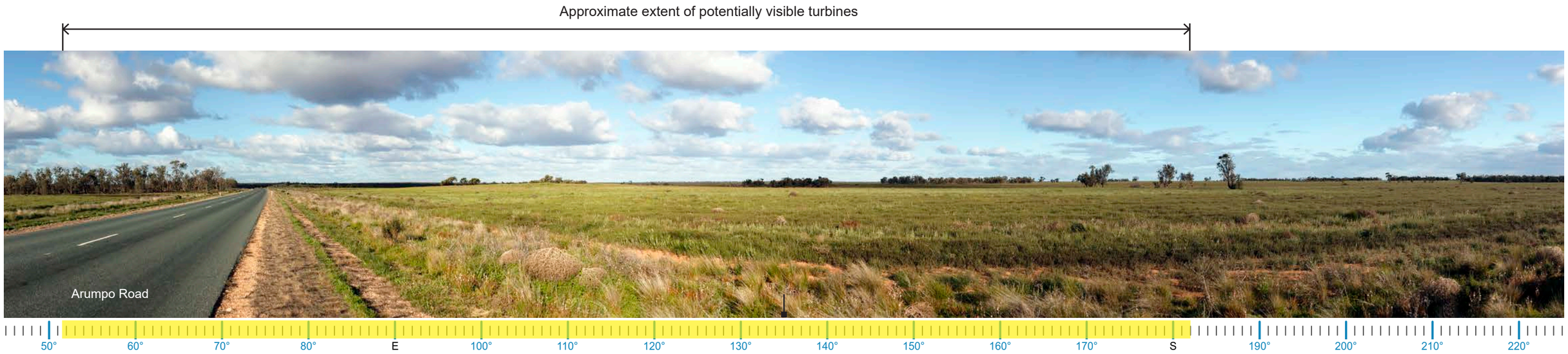
Potential Visual Impact:

From this view, intervening vegetation will filter select views of the Project to the south. Due to the flat terrain, the WTGs will be a new element in the landscape, and a low vertical proportion of the view will be affected.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

VP25 Arumpo Road, Wentworth



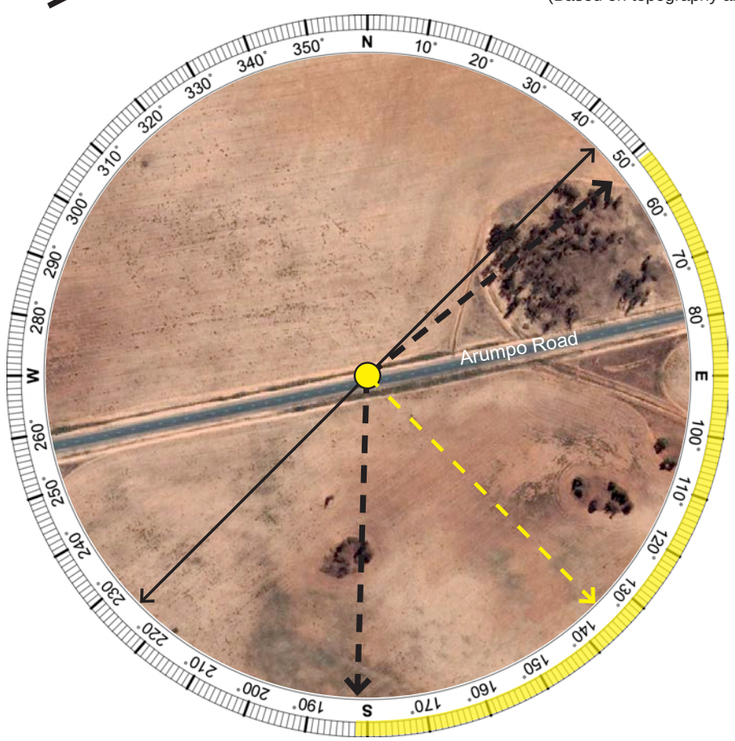
LEGEND

Viewing direction and centre of panorama

Extent of panorama

Direction of potentially visible turbines

Extent of visible turbines
(Based on topography alone)



VIEWPOINT VP25

Viewpoint Summary:	
Location:	Elevation:
Arumpo Road, Wentworth	72 m
Coordinates:	Viewing Direction:
34° 2’8.24”S 142°22’21.62”E	Southeast
Distance to nearest WTG:	Visibility Distance Zone:
4.87 km	**Far Middleground (FM)**
Land Use:	Viewer Sensitivity Level:
Major Road, Agricultural	**Low**
LCU:	Scenic Quality Rating:
LCU03 - Cropping Pastures	**Low**

Visual Influence Zone: VIZ3

Existing Landscape Character Description:

This viewpoint was taken along Arumpo Road towards Mungo National Park. The terrain is flat with the surrounding land being used for agricultural activities and grazing. Views are open and expansive with scattered vegetation dotted throughout the adjoining paddocks.

Potential Visual Impact:

Due to a lack of intervening elements and flat terrain, there will be open views towards the Project. The WTGs will be a new element in the landscape, and a low vertical proportion of the view will be affected.

Visual Performance Objectives:

No visual performance objectives apply to this viewpoint due to VIZ3.

C

Photomontages

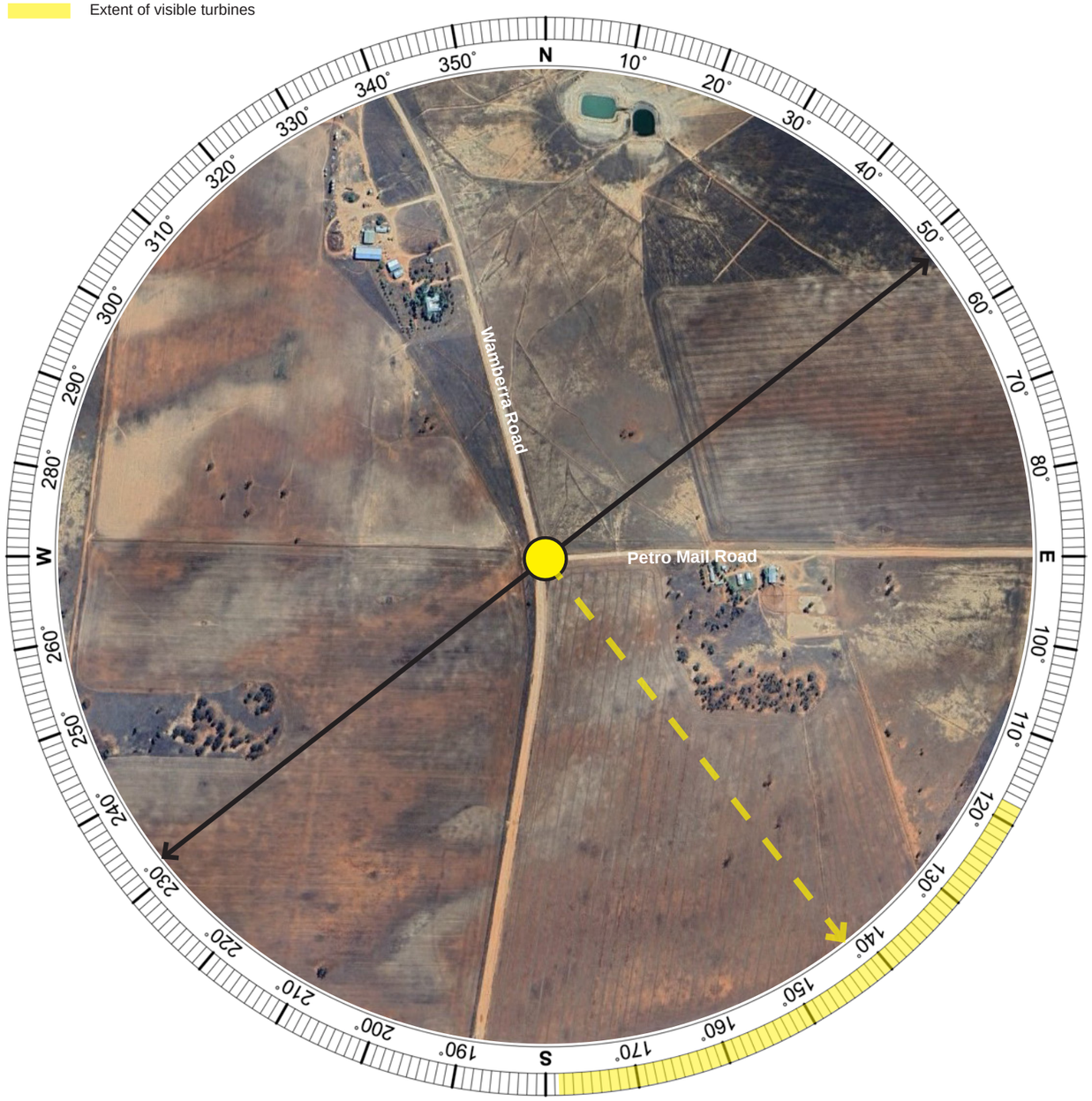
PM01

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 01

Location:

Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW

Photograph Date and Time:

23th August 2022 1:18 PM

Coordinates:

33°56’2.72”S 142°21’33.10”E

Distance to Project:

10.2 km

Viewing Direction:

South east

Elevation:

65 m

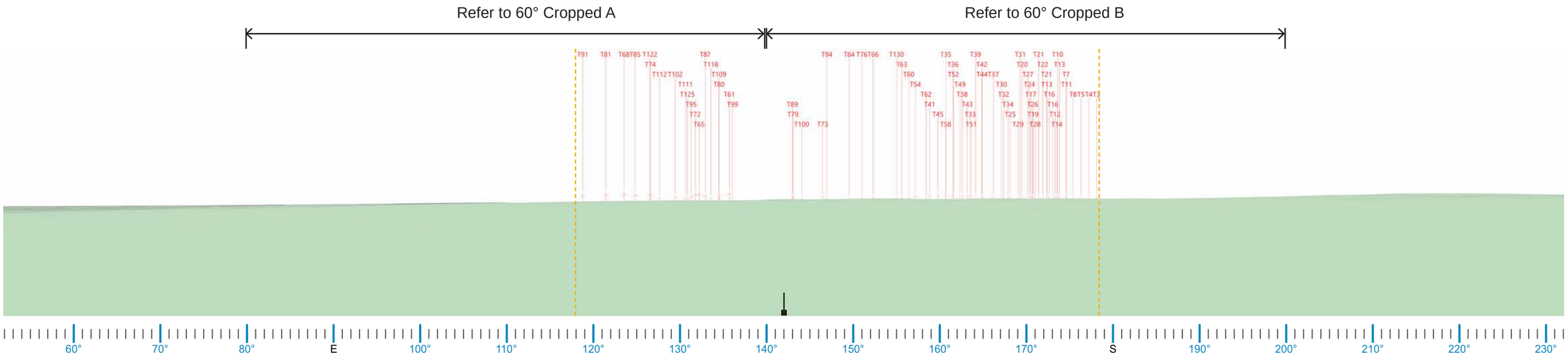
Aerial Image Source: Google Earth 2023

PM01 Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW

Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM01 Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW



Wireframe Diagram

Extent of visible turbines

Proposed View | 180° Photomontage

PM01 Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW

Proposed View | 60° Cropped A

PM01 Intersection of Wamberra Road/Petro Mail Road, Arumpo, NSW

Proposed View | 60° Cropped B

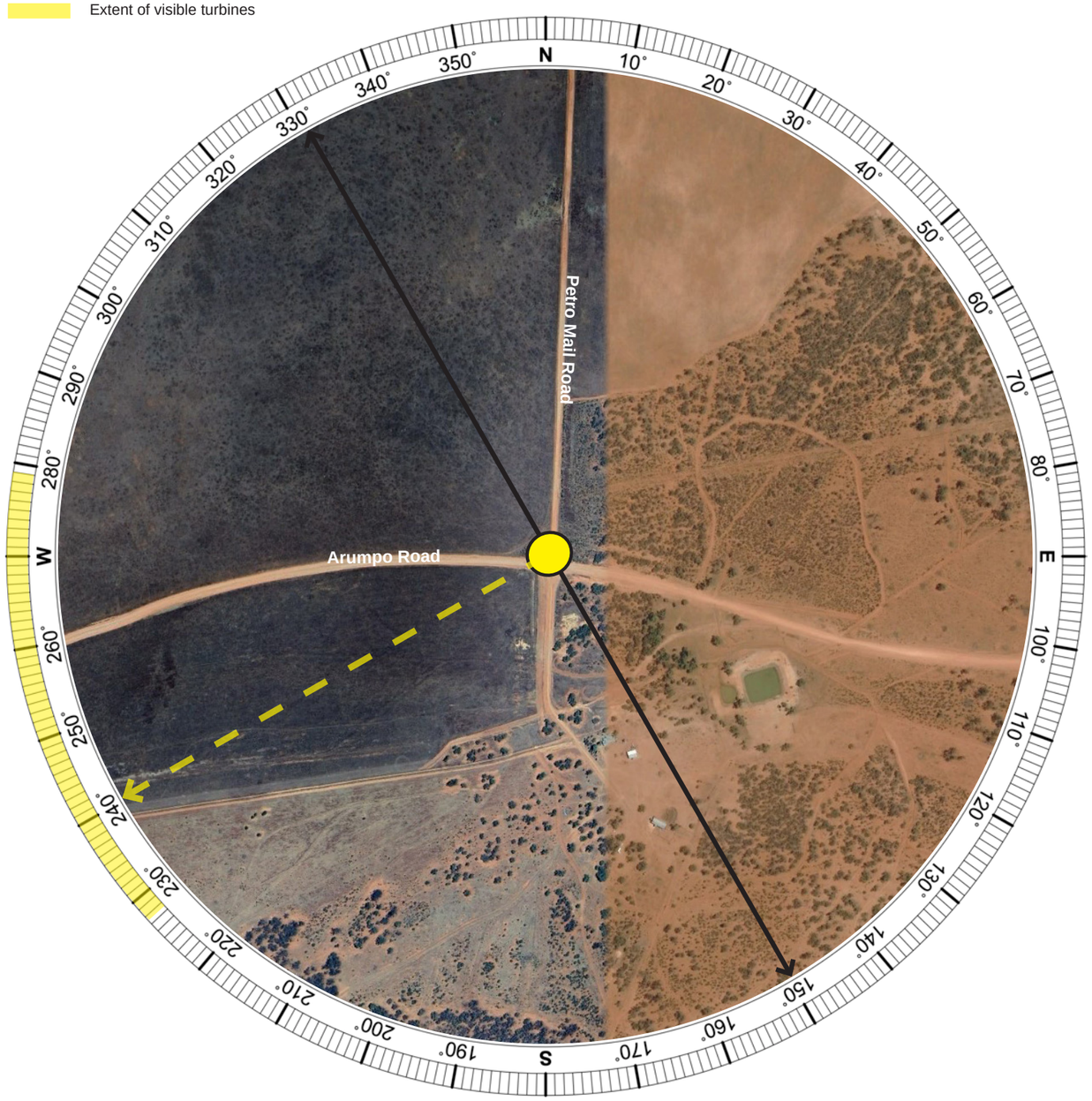
PM02

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 02

Location:

Intersection of Petro Mail Road/Arumpo Road, Arumpo, NSW

Photograph Date and Time:

23th August 2022 2:09 PM

Coordinates:

33°57’53.51”S 142°41’41.71”E

Distance to Project:

18.6 km

Viewing Direction:

South west

Elevation:

76 m

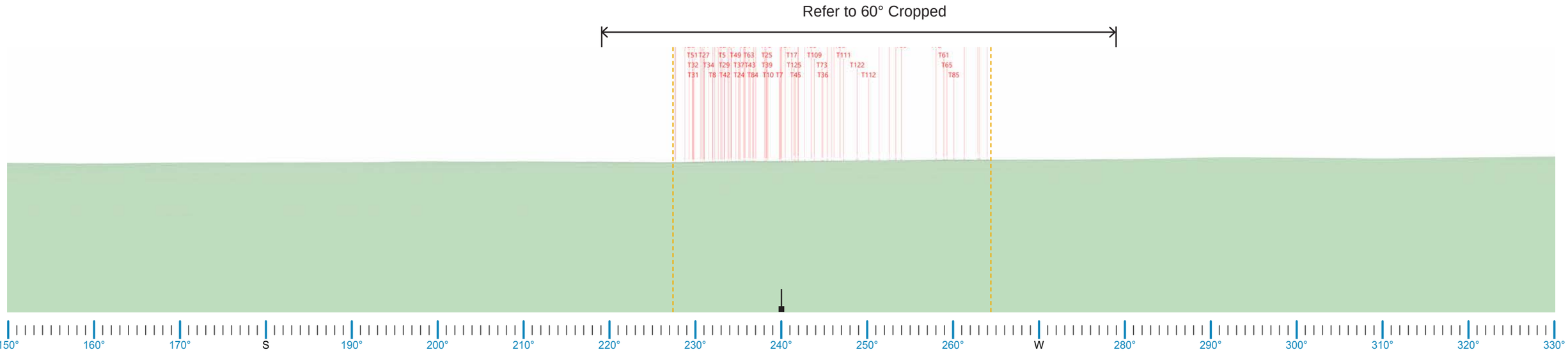
Aerial Image Source: Google Earth 2019

PM02 Intersection of Petro Mail Road/Arumpo Road, Arumpo, NSW

Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM02 Intersection of Petro Mail Road/Arumpo Road, Arumpo, NSW



Wireframe Diagram

Extent of visible turbines

Proposed View | 180° Photomontage

PM02 Intersection of Petro Mail Road/Arumpo Road, Arumpo, NSW

Proposed View | 60° Cropped

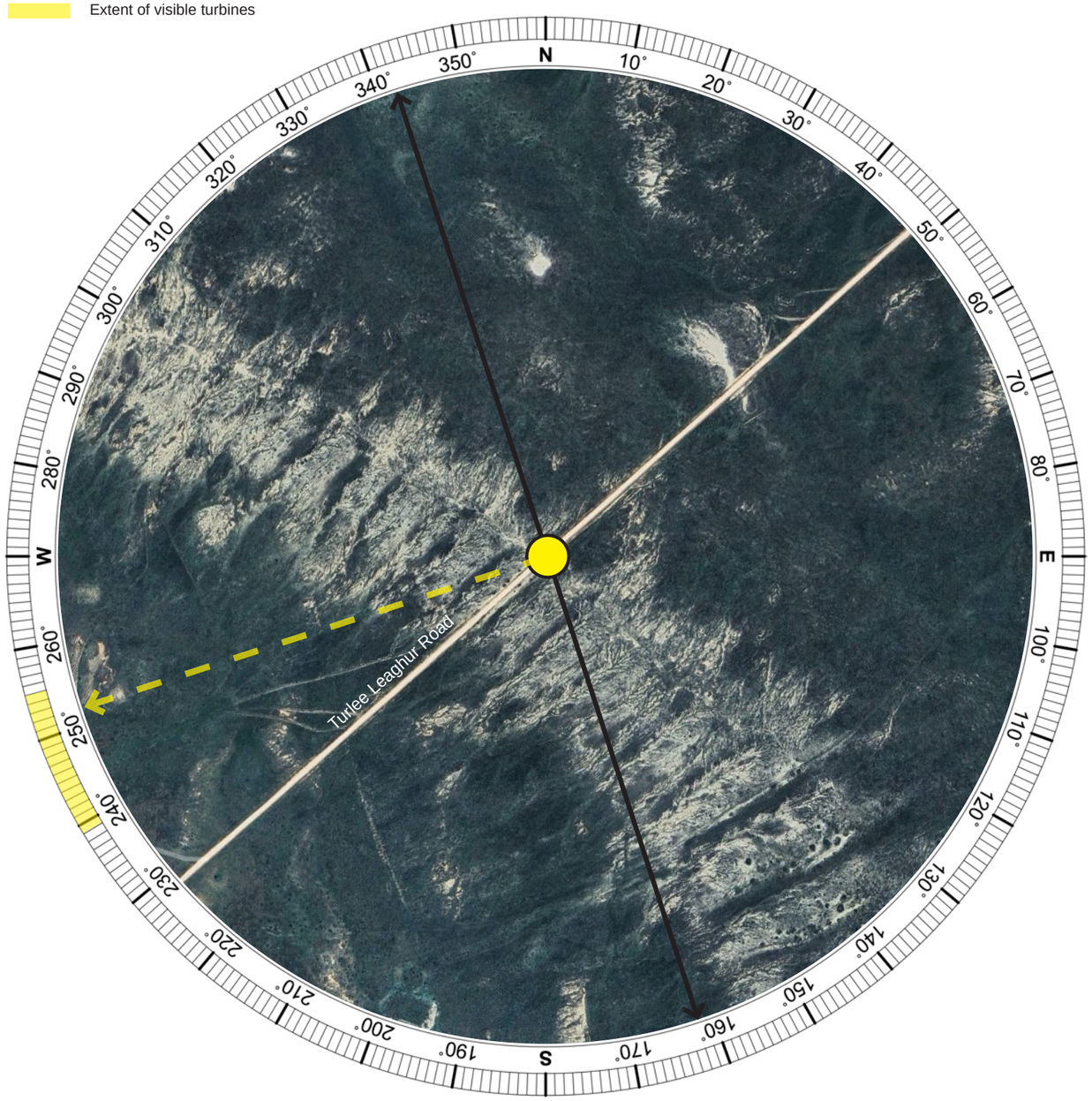
PM03

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 03

Location:

Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park

Photograph Date and Time:

27th July 2023 11:15 AM

Coordinates:

33°51’6.24”S 143° 2’30.03”E

Distance to Project:

53.0 km

Viewing Direction:

West

Elevation:

79 m

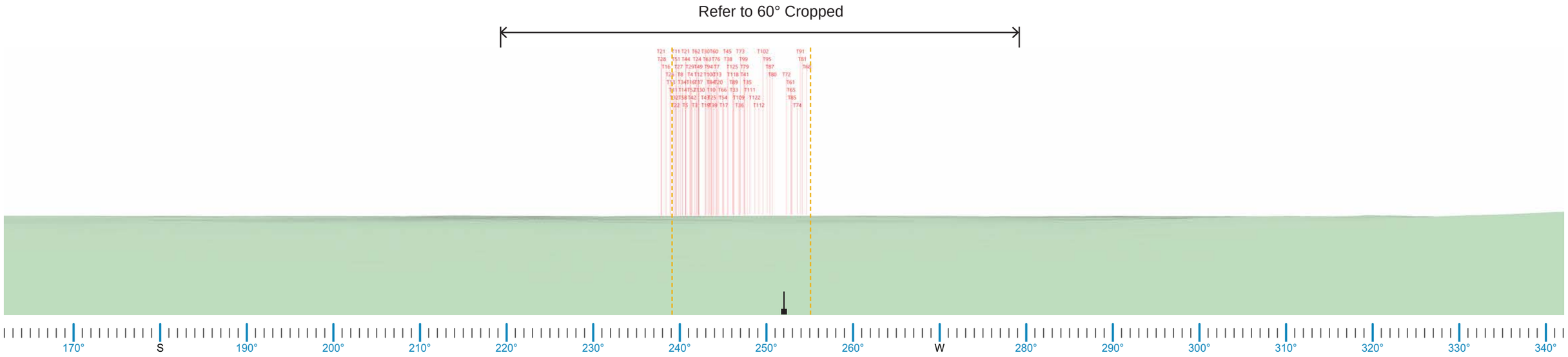
Aerial Image Source: Google Earth 2022

PM03 Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park

Existing View | 180° Baseline Panorama

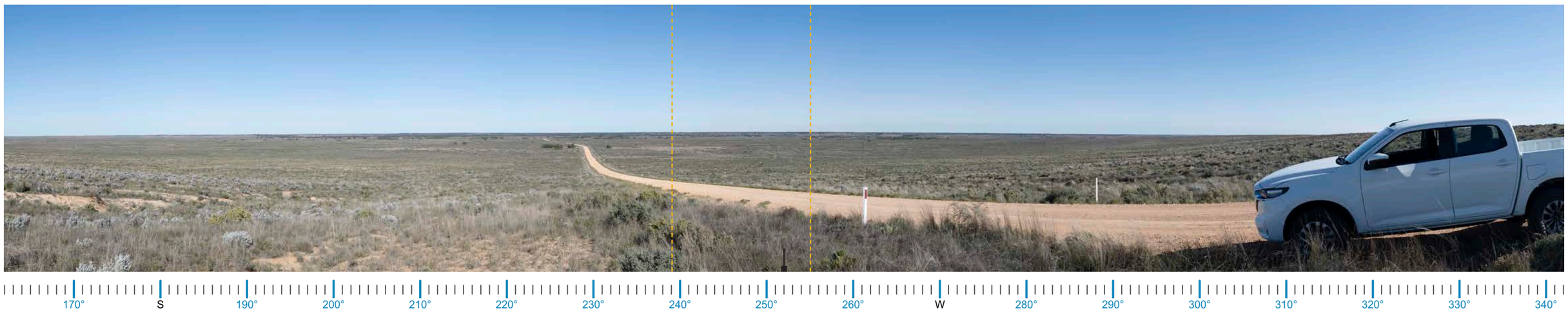
Proposed View | 180° Photomontage

PM03 Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park



Wireframe Diagram

Extent of visible turbines



Proposed View | 180° Photomontage

PM03 Chibnalwood Lunette - Turlee Leaghur Road, Mungo National Park

Proposed View | 60° Cropped

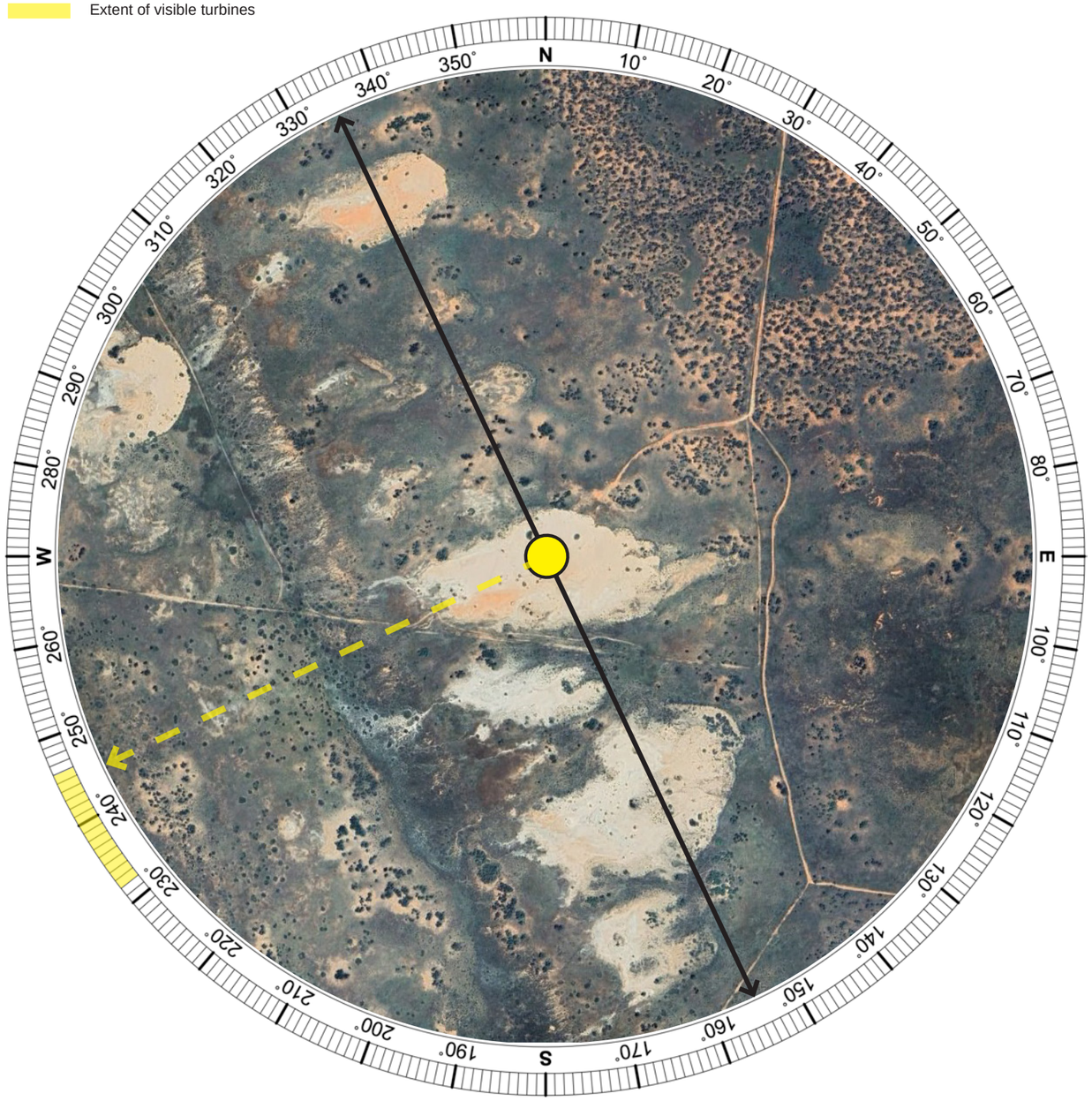
WF01

LEGEND

Viewing direction and centre of wireframe

Extent of wireframe

Extent of visible turbines



Wireframe 01

Location:

Mungo Youth Project Site

Coordinates:

33°46’33.98”S 143° 0’5.53”E

Distance to Project:

53.5 m

Viewing Direction:

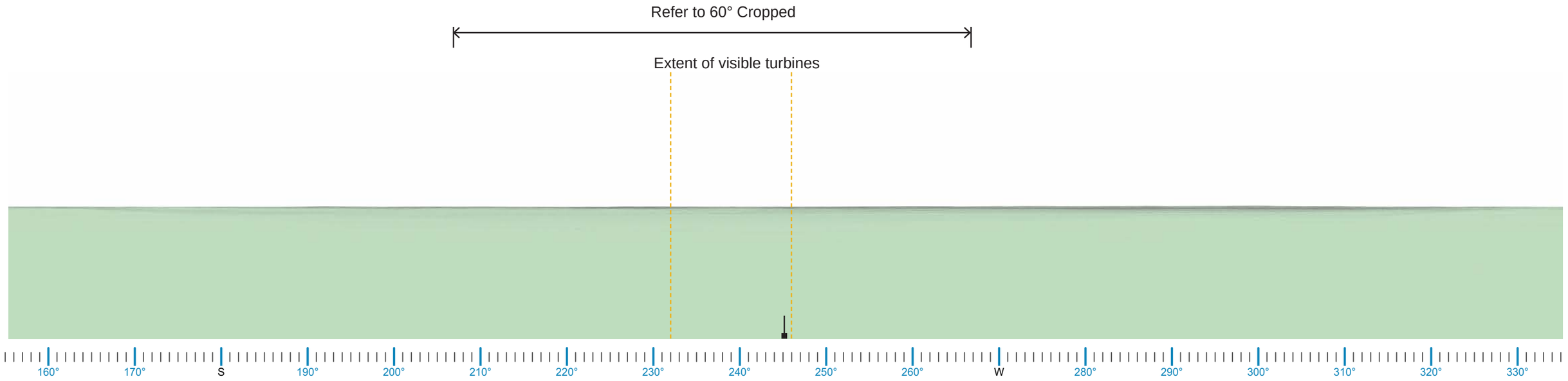
West

Elevation:

93 m

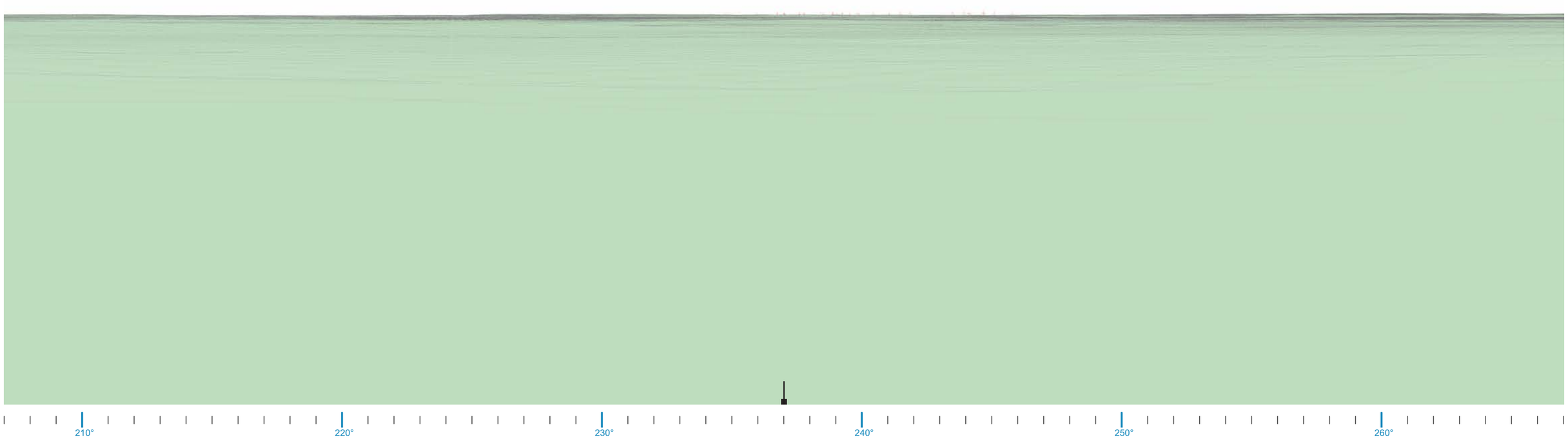
Aerial Image Source: Google Earth 2022

WF01 Mungo Youth Project Site



Wireframe Diagram

WF01 Mungo Youth Project Site



Proposed View | 60° Cropped

WF02

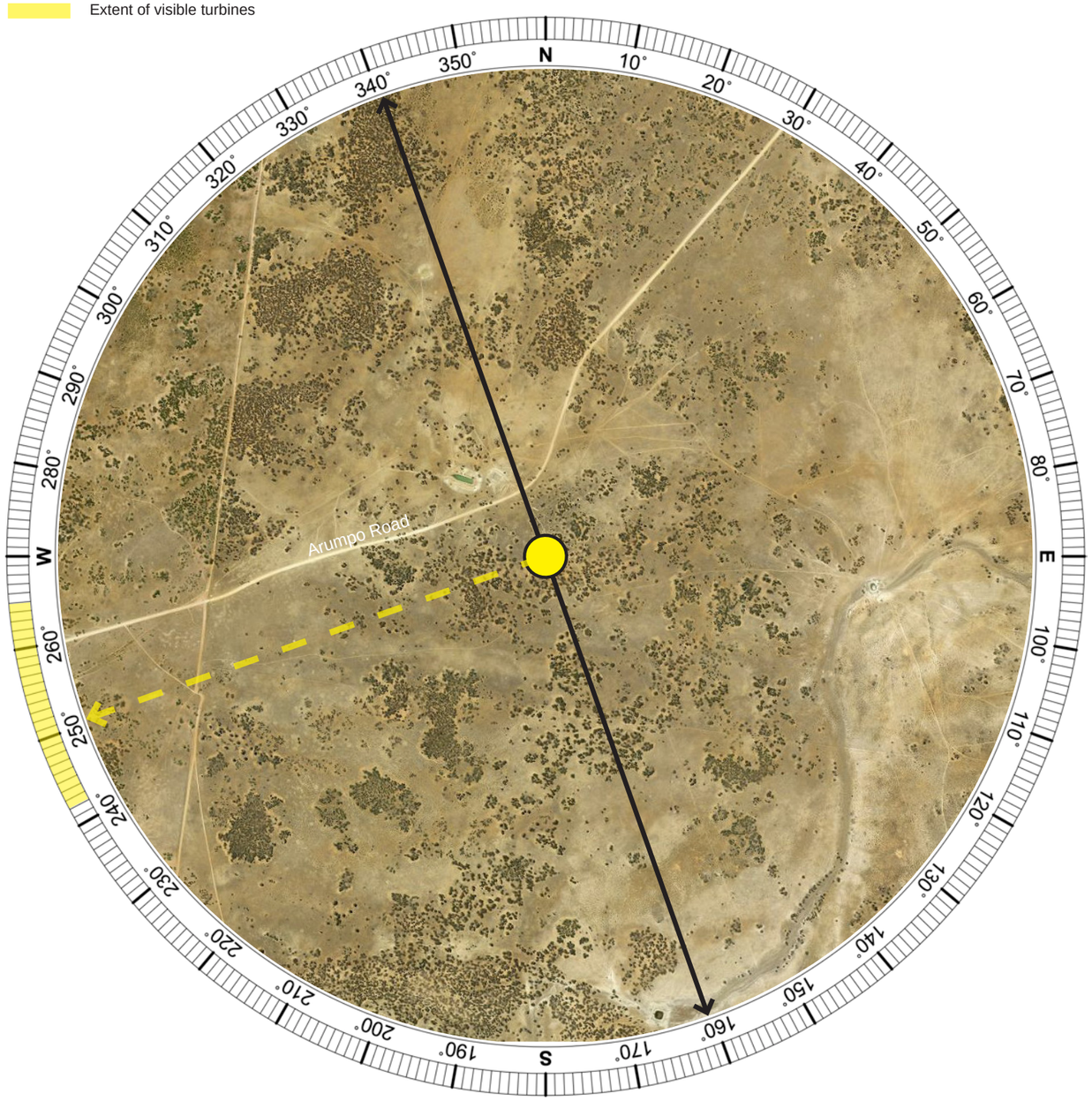
Mallee Wind Farm

LEGEND

Viewing direction and centre of wireframe

Extent of wireframe

Extent of visible turbines



Aerial Image Source: Google Earth 2014

Wireframe 02

Location:

Marma Cricket Pitch

Coordinates:

33°57’21.87”S 142°49’9.10”E

Distance to Project:

23.64 km

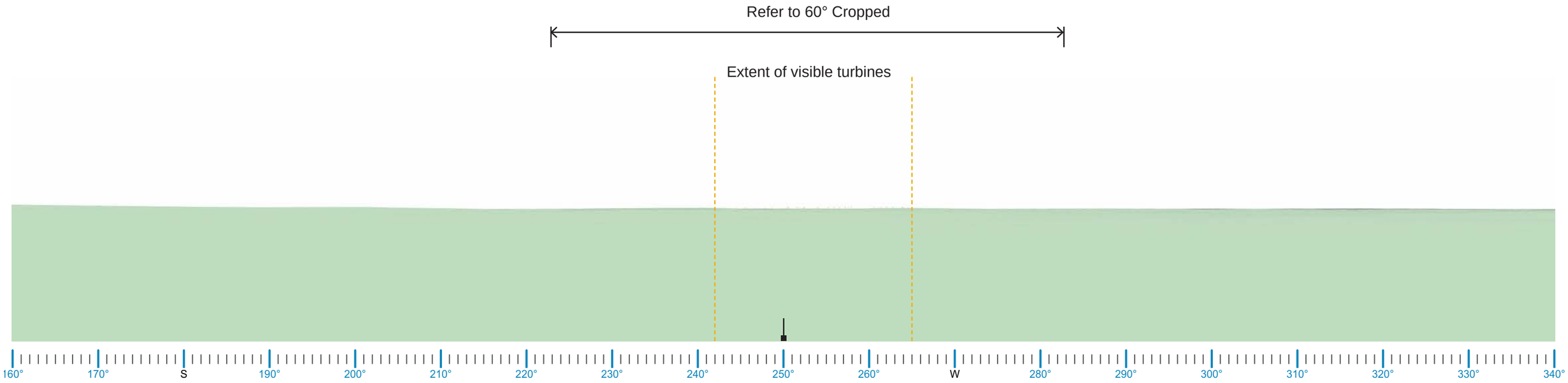
Viewing Direction:

West

Elevation:

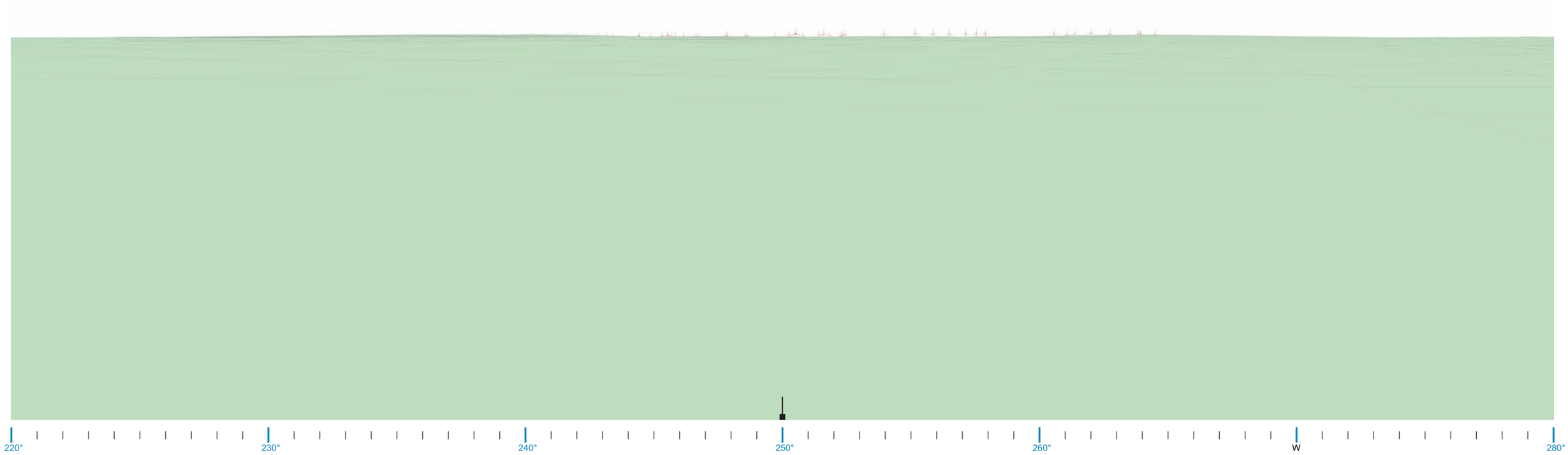
80 m

WF02 Marma Cricket Pitch



Wireframe Diagram

WF02 Marma Cricket Pitch



Proposed View | 60° Cropped

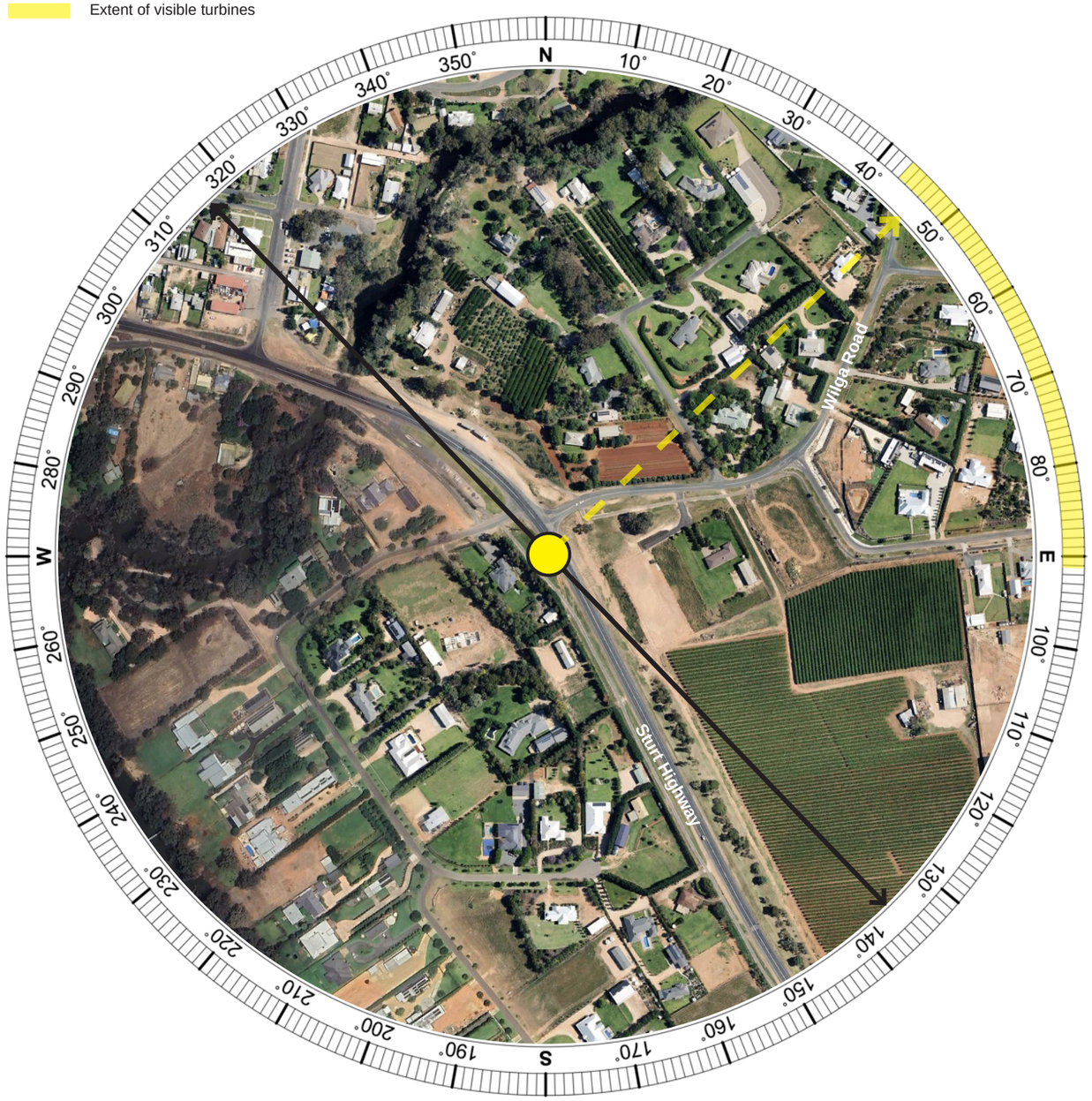
PM04

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 04

Location:

Intersection of Sturt Highway and Wilga Road, Gol Gol, NSW

Photograph Date and Time:

23th August 2022 11:33 AM

Coordinates:

34°10’56.76”S 142°13’44.83”E

Distance to Project:

13.3 km

Viewing Direction:

North east

Elevation:

44 m

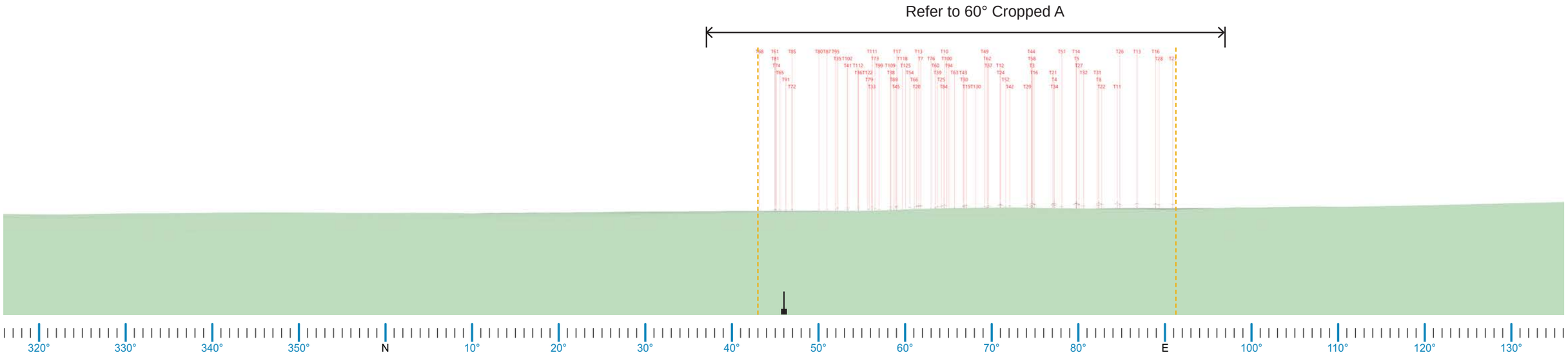
Aerial Image Source: Google Earth 2024

PM04 Intersection of Sturt Highway and Wilga Road, Gol Gol, NSW

Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM04 Intersection of Sturt Highway and Wilga Road, Gol Gol, NSW



Wireframe Diagram

Proposed View | 180° Photomontage

PM04 Intersection of Sturt Highway and Wilga Road, Gol Gol, NSW

Proposed View | 60° Cropped A

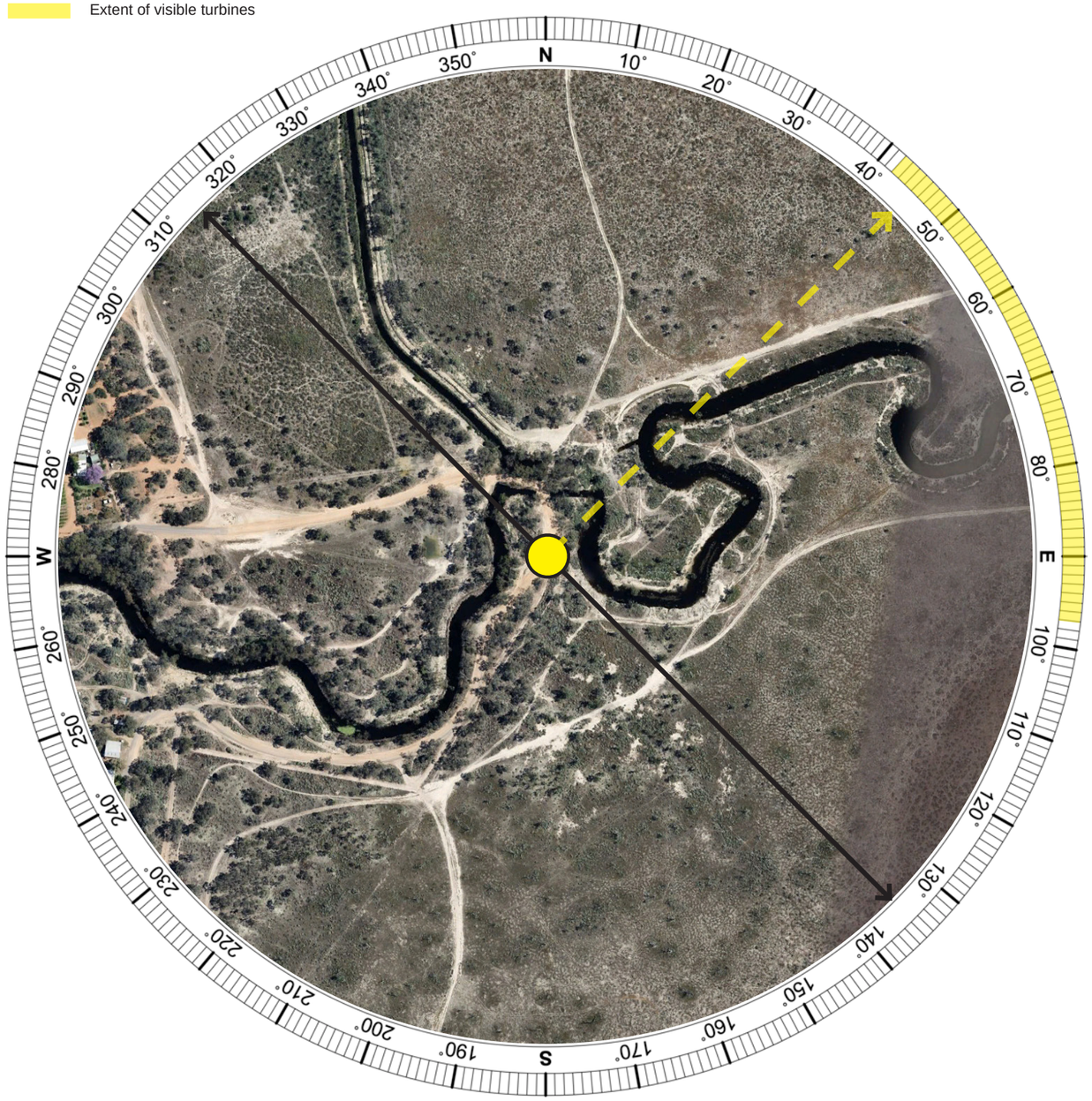
PM05

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 05

Location:

Gol Gol Swamp, Gol Gol NSW

Photograph Date and Time:

23th August 2022 11:44 AM

Coordinates:

34°10’11.88”S 142°14’53.23”E

Distance to Project:

11.3 km

Viewing Direction:

North east

Elevation:

40 m

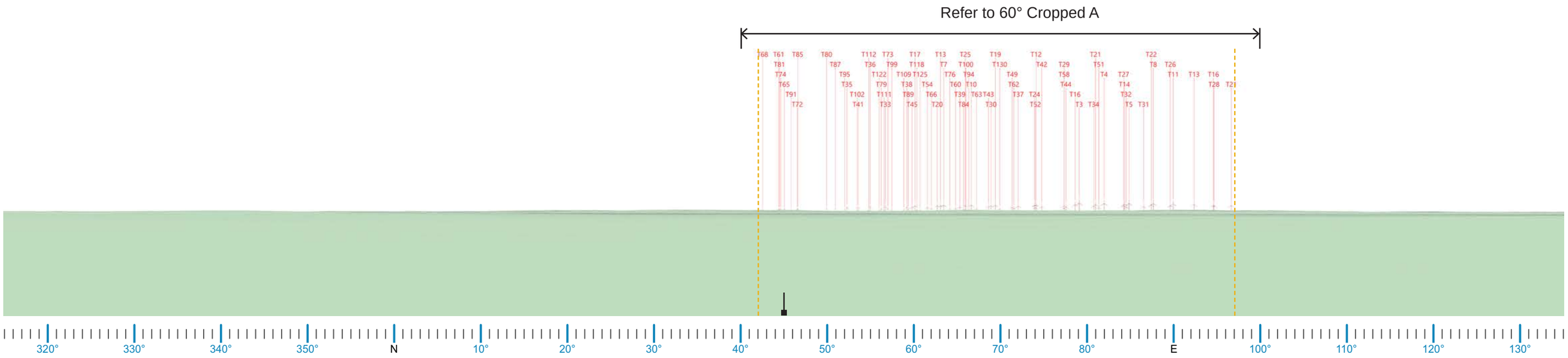
Aerial Image Source: Google Earth 2024

PM05 Gol Gol Swamp, Gol Gol NSW

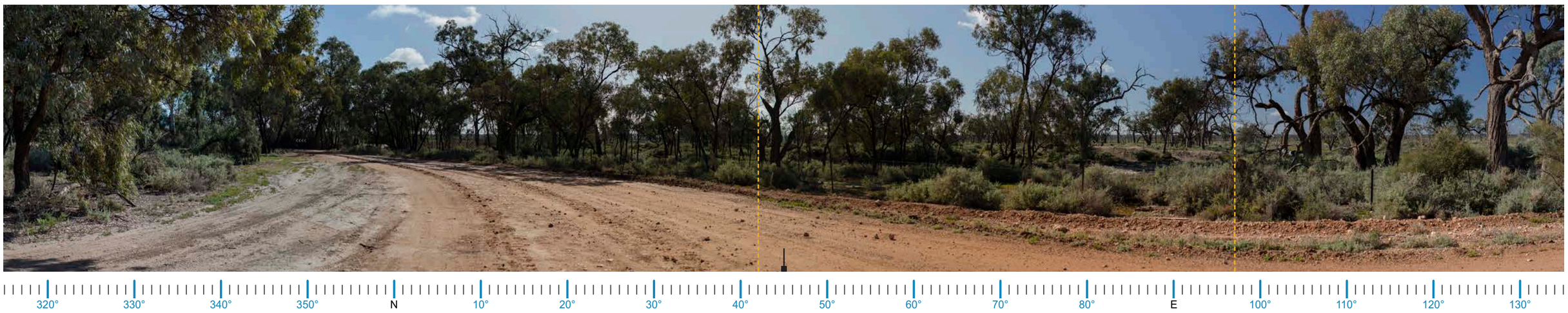
Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM05 Gol Gol Swamp, Gol Gol NSW



Wireframe Diagram



Proposed View | 180° Photomontage

PM05 Gol Gol Swamp, Gol Gol NSW

Proposed View | 60° Cropped A

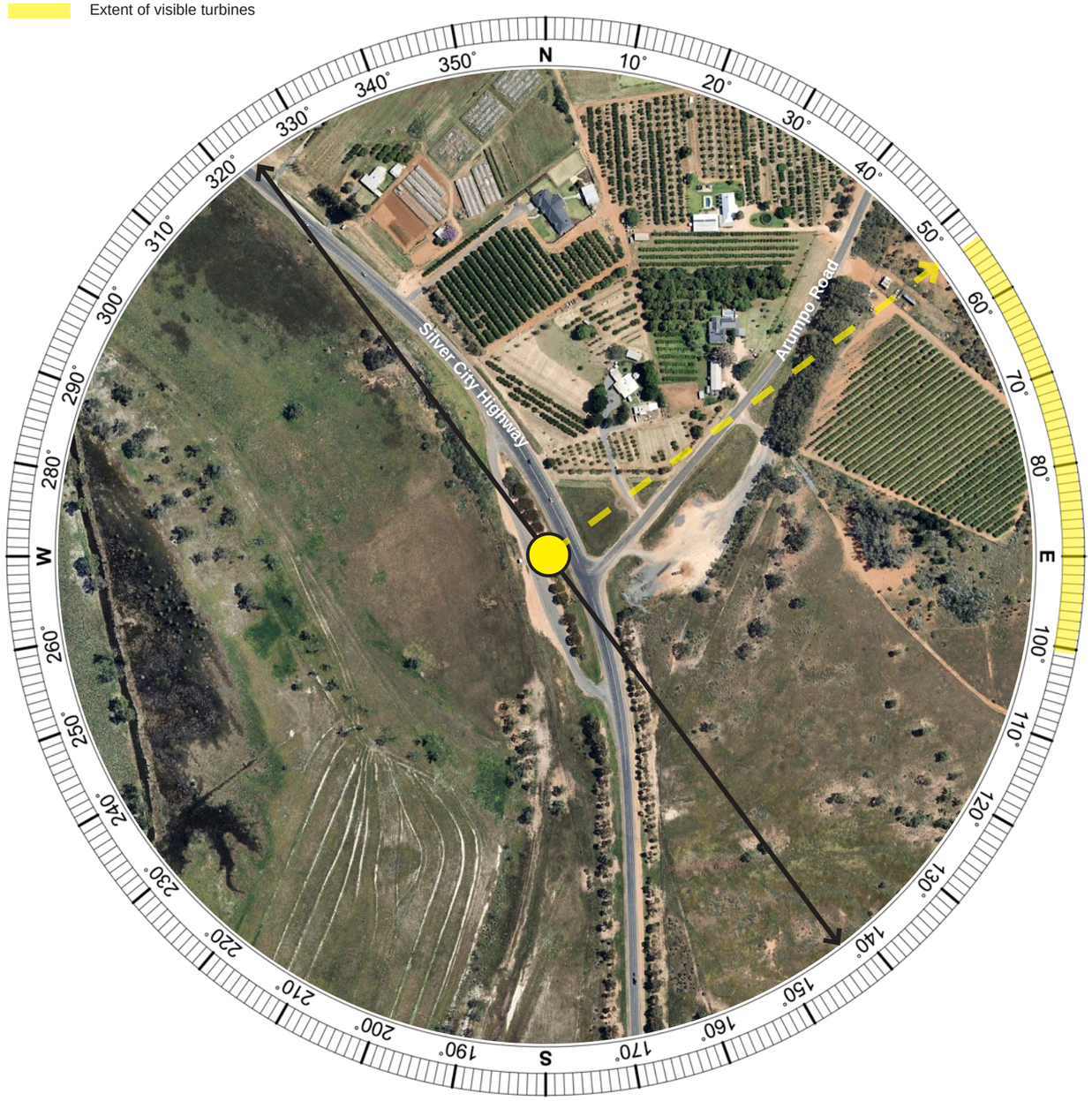
PM06

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 06

Location:

Intersection of Silver City Highway and Arumpo Road, Gol Gol, NSW

Photograph Date and Time:

23th August 2022 12:19 PM

Coordinates:

34° 9’0.43”S 142°10’46.56”E

Distance to Project:

17.4 km

Viewing Direction:

North east

Elevation:

43 m

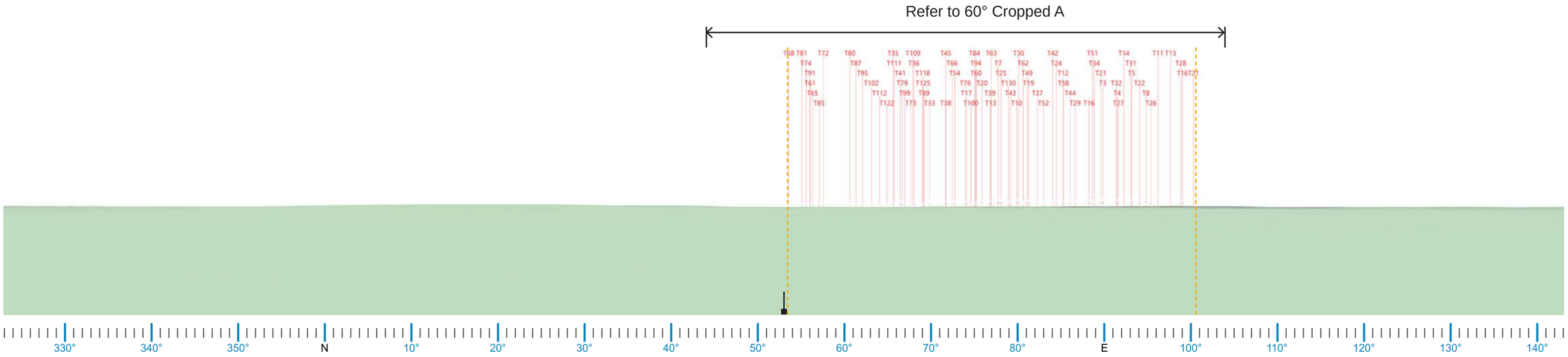
Aerial Image Source: Google Earth 2024

PM06 Intersection of Silver City Highway and Arumpo Road, Gol Gol, NSW

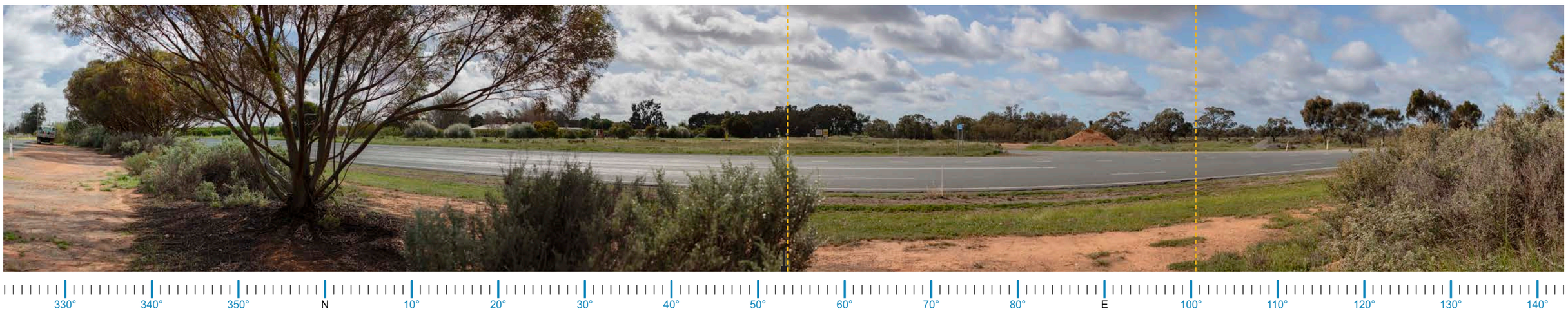
Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM06 Intersection of Silver City Highway and Arumpo Road, Gol Gol, NSW



Wireframe Diagram



Proposed View | 180° Photomontage

PM06 Intersection of Silver City Highway and Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped A

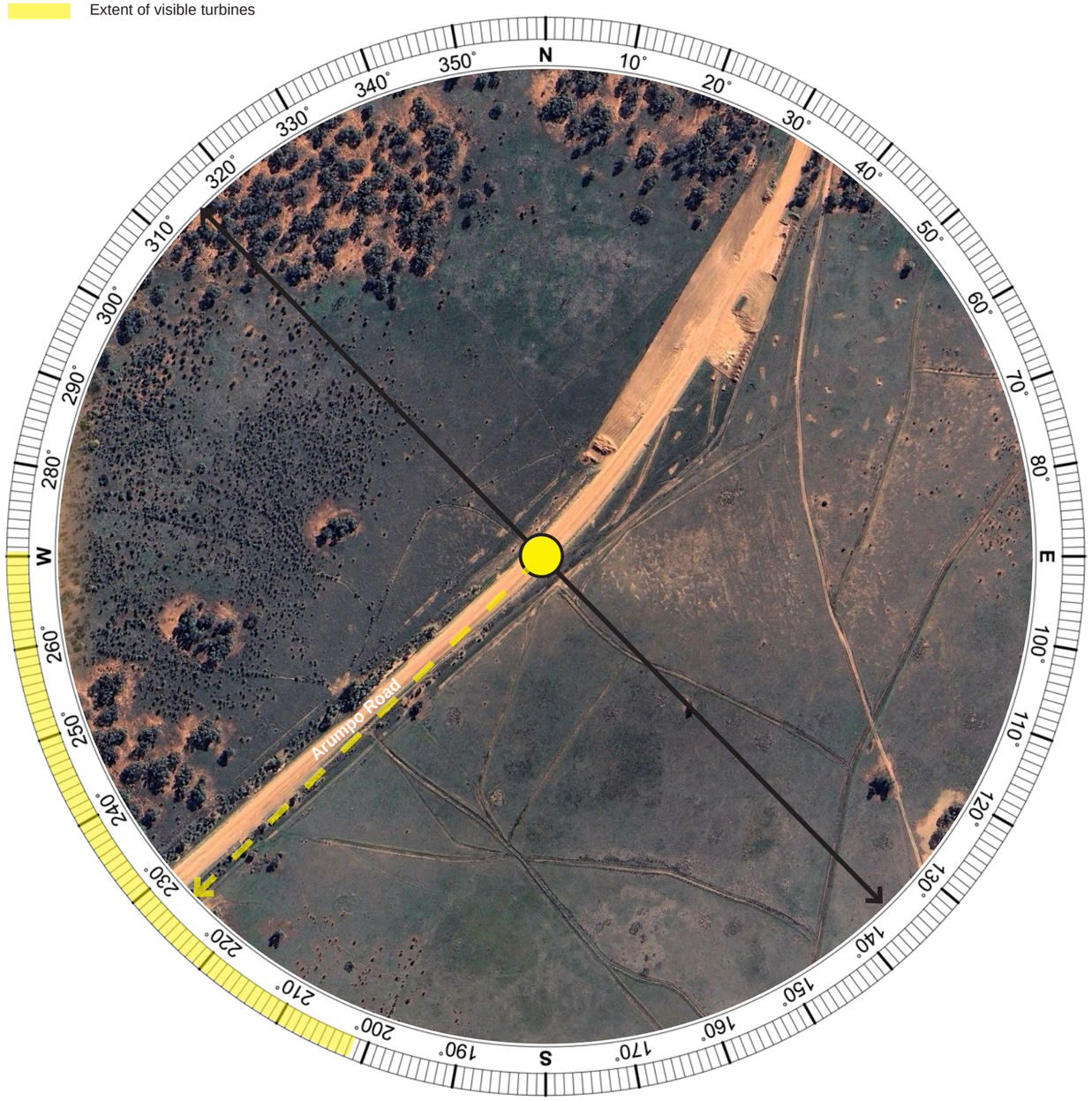
PM07

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 07

Location:

Arumpo Road, Gol Gol, NSW

Photograph Date and Time:

23th August 2022 4:00 PM

Coordinates:

33°59’02.63”S 142°32’38.49”E

Distance to Project:

5.7 km

Viewing Direction:

South west

Elevation:

73 m

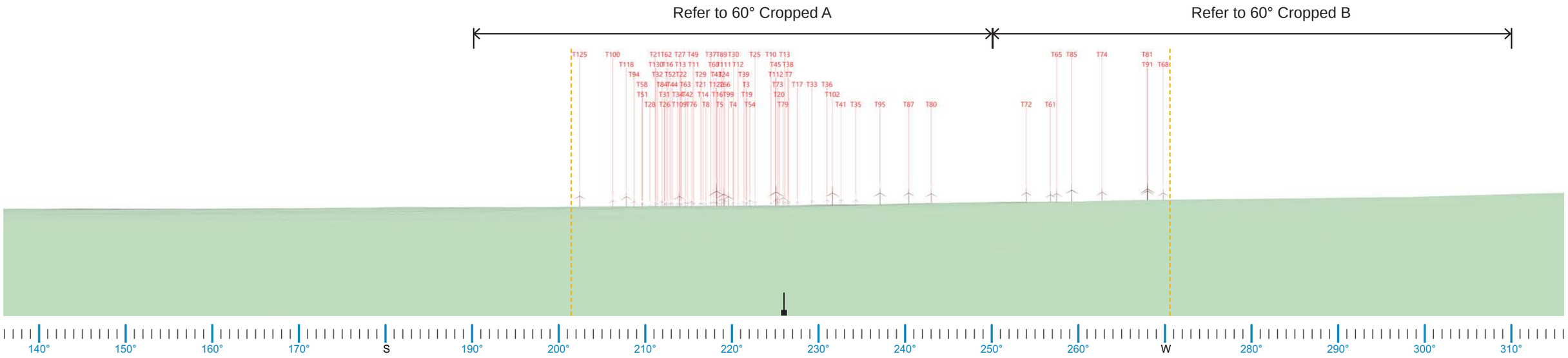
Aerial Image Source: Google Earth 2024

PM07 Arumpo Road, Gol Gol, NSW

Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

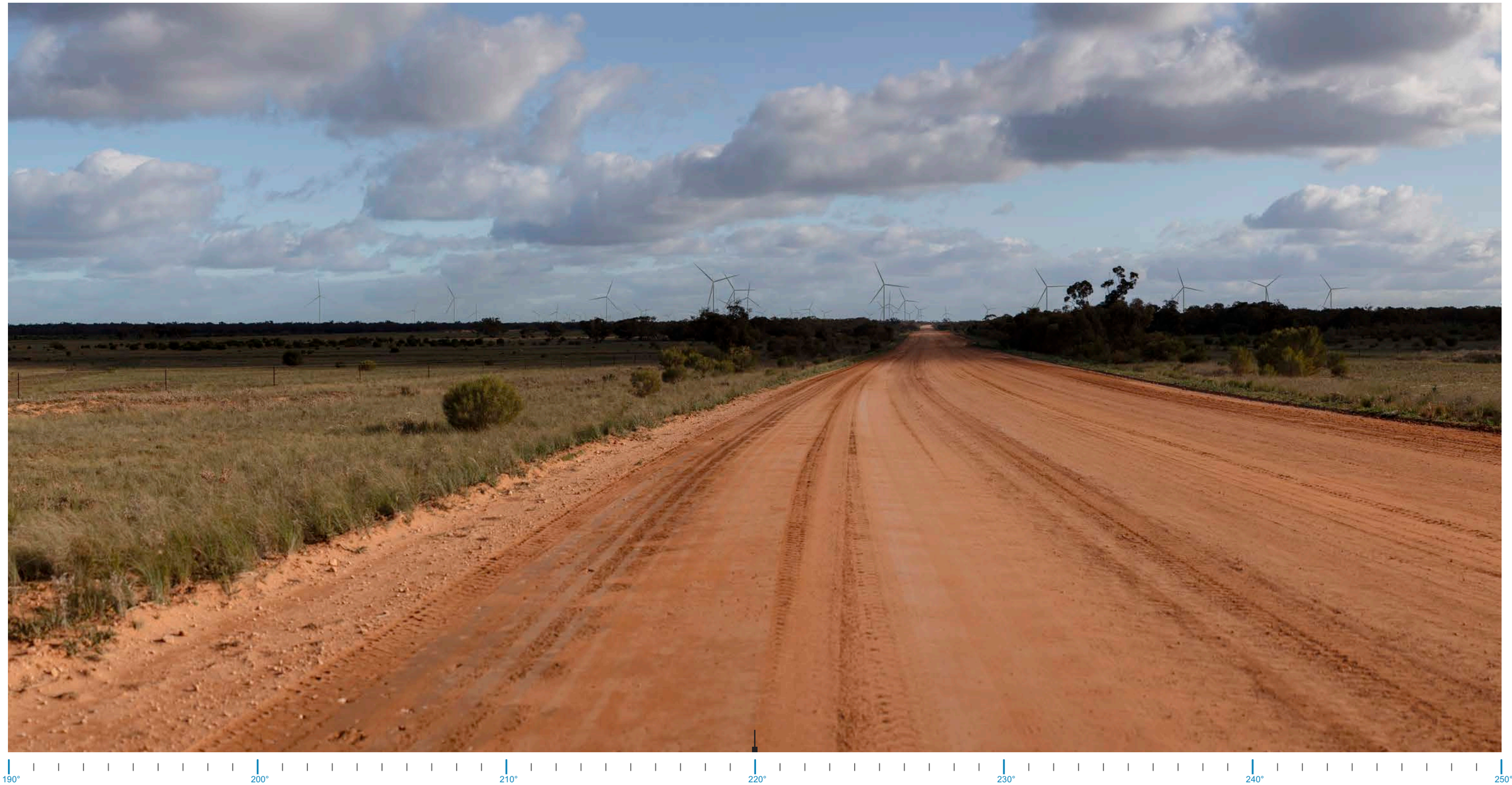
PM07 Arumpo Road, Gol Gol, NSW



Wireframe Diagram

Proposed View | 180° Photomontage

PM07 Arumpo Road, Gol Gol, NSW



Proposed View | 60° Cropped A

PM07 Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped B

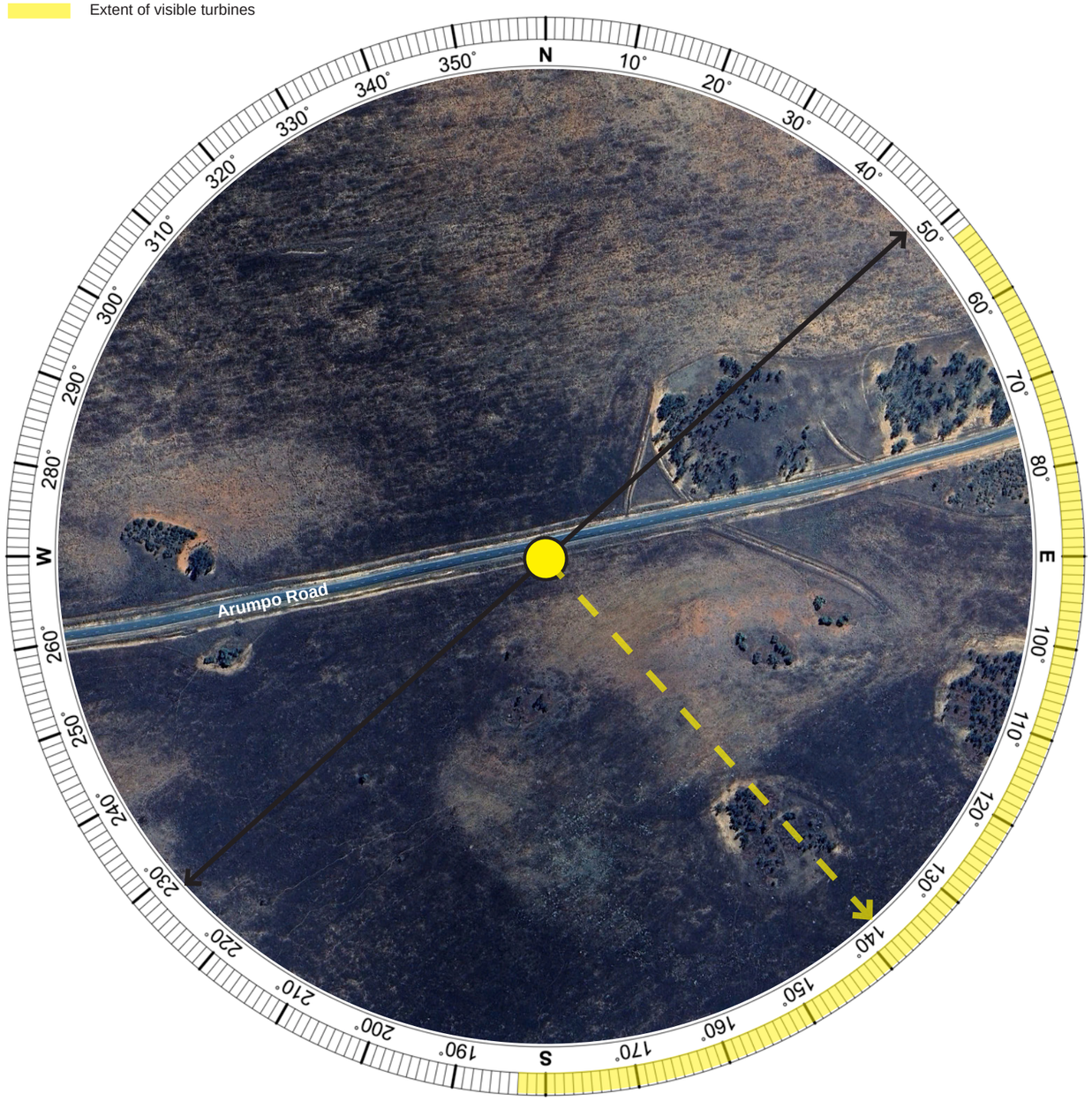
PM08

LEGEND

Viewing direction and centre of photomontage

Extent of photomontage

Extent of visible turbines



Photomontage 08

Location:

Arumpo Road, Gol Gol, NSW

Photograph Date and Time:

23th August 2022 5:25 PM

Coordinates:

34° 2’8.25”S 142°22’21.62”E

Distance to Project:

4.9 km

Viewing Direction:

South east

Elevation:

72 m

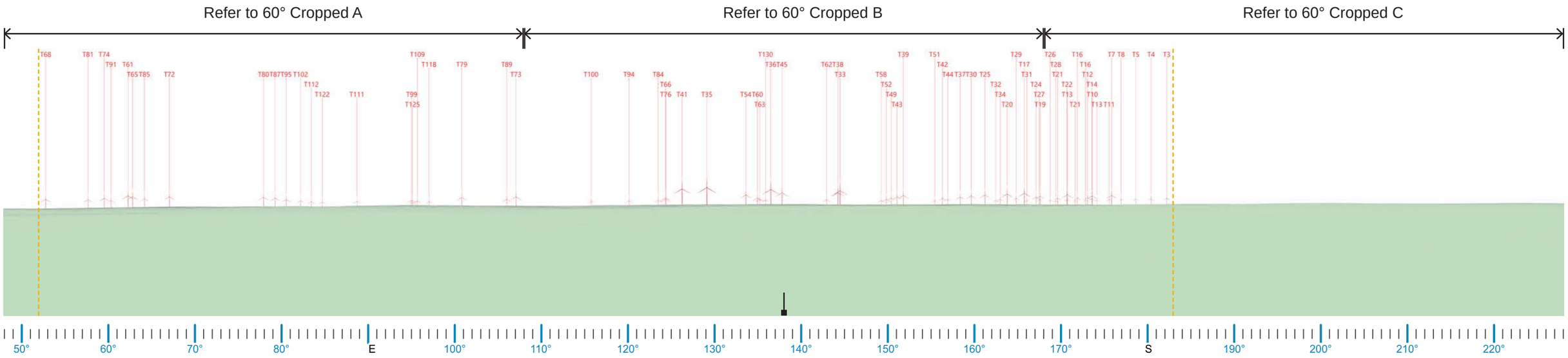
Aerial Image Source: Google Earth 2024

PM08 Arumpo Road, Gol Gol, NSW

Existing View | 180° Baseline Panorama

Proposed View | 180° Photomontage

PM08 Arumpo Road, Gol Gol, NSW

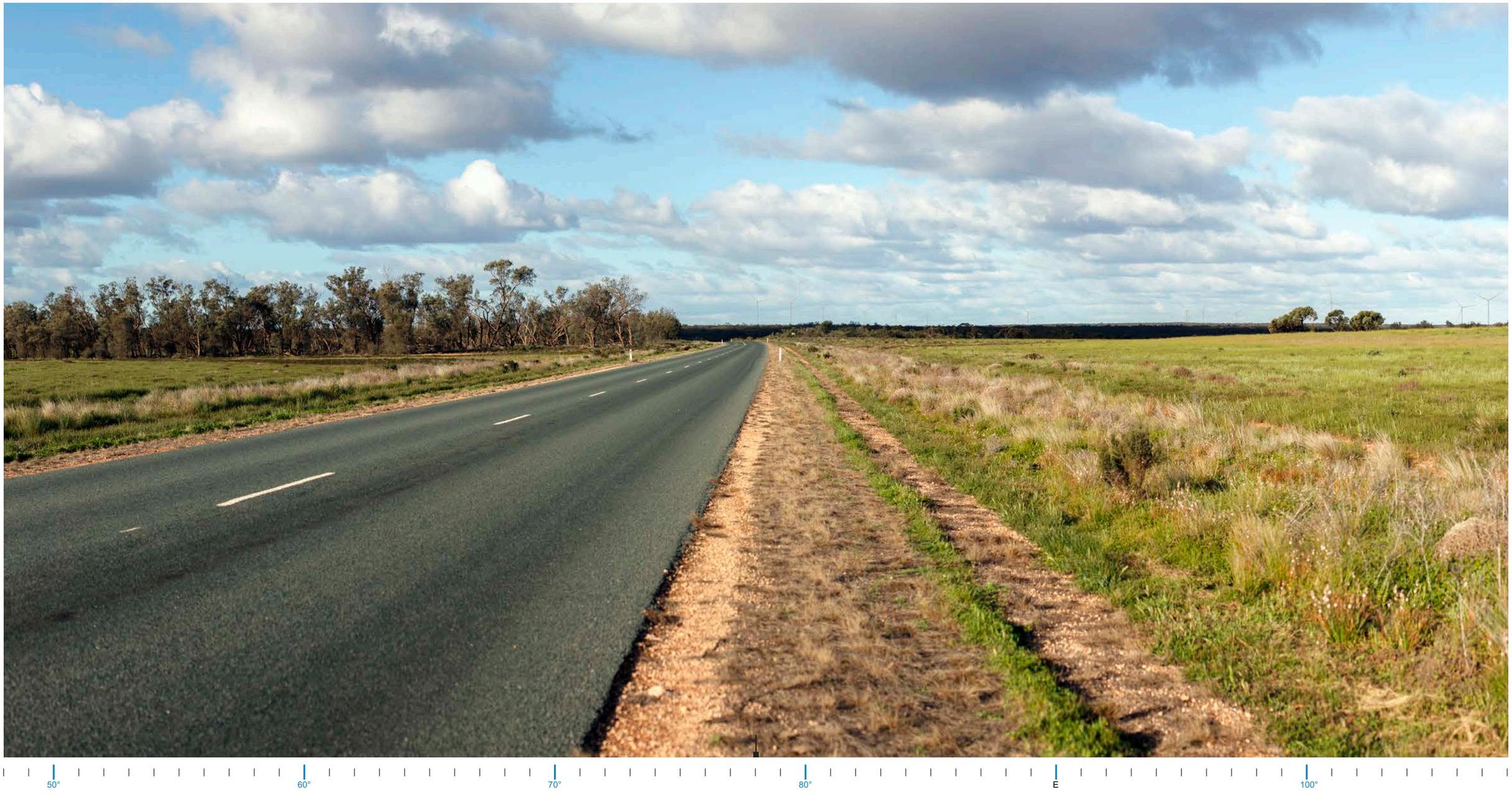


Wireframe Diagram

Extent of visible turbines

Proposed View | 180° Photomontage

PM08 Arumpo Road, Gol Gol, NSW



Proposed View | 60° Cropped A

PM08 Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped B

PM08 Arumpo Road, Gol Gol, NSW

Proposed View | 60° Cropped C