



Kalgoorlie Wind & Solar Farm

Landscape Visual Impact Assessment



We at Moir Studio acknowledge the traditional custodians of the lands and waters of Australia - most notably the Awabakal Nation in which our office resides and the Kaprum People of the Kaalamaya Nation, on whose traditional land this Project resides. As a practice, we recognise First Nations' ongoing contribution to Country and deep spiritual connection to Place. We pay our respects to Elders both past and present.

Kalgoorlie Wind & Solar Farm

Landscape Visual Impact Assessment

Prepared for
CDM Smith Australia

Project Number
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Glossary of Terms

The Project

The components that form the development, e.g. turbines, photovoltaic panels, associated infrastructure, transmissions lines etc.

Project Area

The boundaries of the involved land parcels where consent has been granted for the development.

Zone of Visual Influence

The area where the development could theoretically been seen based on a bare ground scenario.

Abbreviations

DTM

Digital Terrain Model

Ha

Hectare

LVIA

Landscape and Visual Impact Assessment

km

Kilometre

m

Metre

m²

Metre squared

PV

Photovoltaic

WTG

Wind Turbine Generator

ZVI

Zone of Visual Influence

1.0 Introduction

1.1 Background

Moir Studio have been engaged by CDM Smith Australia to undertake a Landscape Visual Impact Assessment (LVIA) for the proposed Kalgoorlie Wind & Solar Farm (referred to hereafter as the 'Project'). This report supports the Environmental Assessment in accordance with the Section 45C application to be assessed by the Western Australian Environmental Protection Authority (EPA).

This report aims to comprehensively assess the visibility and potential visual impacts of the Proposal relating to landscape character, values, amenities, and scenic vistas. The report details the results of the fieldwork, documents the assessment of the landscape character and visual setting, identifies potential impacts, and makes recommendations to assist in mitigating any potential impacts resulting from the Project.

1.2 Relevant Experience

Moir Studio, is a design practice specialising in Landscape Architecture, Landscape Planning, and LVIA's. Our team has extensive experience in conducting LVIA's for wind and solar energy projects. Using this expertise and relevant guidelines, we have developed methodologies for a comprehensive and qualitative assessment of the Project.

Our experience includes preparing LVIA's for the following Wind Energy Projects:

- Lakeland Wind Farm (QLD)
- Stony Creek Wind Farm (QLD)
- Wongalee Wind Farm (QLD)
- Bodangora Wind Farm (NSW)
- Capital II Wind Farm (NSW)
- Uungula Wind Farm (NSW)
- Hills of Gold Wind Farm (NSW)
- Cherry Tree Wind Farm (VIC)
- Murrin Murrin Wind and Solar Farm (WA)

1.3 Relevant Guidelines & Framework

The following provides an overview of the guidelines, relevant frameworks and considerations of authorities utilised to form the methodology for this LVIA.

1.3.1 Position Statement Renewable energy facilities - Western Australian Planning Commission

This document sets out the requirements of the Western Australian Planning Commission (WAPC) to ensure the consistent assessment and provision of renewable energy facilities across Western Australia. It further outlines that projects require a landscape and visual impact assessment that addresses:

- landscape significance and sensitivity to change, site earthworks, topography, extent of cut and fill, the extent and type of vegetation, clearing and rehabilitation areas, land use patterns, built form character, public amenity and community values
- likely impact on views including the visibility of the facility using view shed analysis and simulations of views from significant viewing locations including residential areas, major scenic drives and lookouts
- layout of the facility including the number, height, scale, spacing, colour, surface reflectivity and design of components, including any ancillary buildings, signage, access roads, and incidental facilities
- measures proposed to minimise unwanted, unacceptable or adverse visual impacts.

(Department of Planning, Lands and Heritage, 2023)

1.3.2 National Wind Energy Guidelines (Draft) (2010)

This policy provides a comprehensive framework for developing wind energy proposals including specifically points that addresses the impacts of wind farms on landscape values and visual considerations. The guideline provides technical methodologies for proponents to assess the impacts of wind farm proposals on landscape character and features, considering community values associated with landscapes. Key elements of the landscape assessment methodology include:

- Assessing the existing policy context of the development;
- Evaluating the impact of wind farm developments on landscape character and significance; and
- Considering visual impacts about viewsheds and views and identifying important views and viewpoints.

(Environment Protection and Heritage Council 2010)

1.3.3 State Planning Policy No. 2 'Environment and Natural Resources Policy'

This policy will be supported by more detailed planning guidelines that address specific natural resource issues requiring further information and direction. These supplementary documents may also serve as formal statements of planning policy and are intended to be applied alongside this overarching policy.

The objectives of the policy are to:

- *Integrate environment and natural resource management with broader land use planning and decision-making.*
- *Protect, conserve and enhance the natural environment.*
- *Promote and assist in the wise and sustainable use and management of natural resource*

(Western Australian Government 2023)

1.3.4 Visual Landscape Planning: A Manual for Evaluation, Assessment, Siting & Design (2007)

The manual is a valuable resource in providing detailed guidance on the preparation of LVIAs in Western Australia. The manual defines the visual landscape evaluation method which consists of five steps. This includes:

- *Step 1 - Define the scope and set the context;*
- *Step 2 - Describe the visual landscape character;*
- *Step 3 - Evaluate the way the visual landscape character is viewed, experienced and valued;*
- *Step 4 - Develop strategies for managing visual landscape character; and*
- *Step 5 - Implement strategies through the planning system.*

(Western Australian Planning Commission 2007)

As outlined in the Western Australia Visual Landscape Planning Manual (WAVLP) - the components of a wind farm that may impact on the surrounding landscape visually comprise of the following items:

- *wind farm Proposal area;*
- *layout of wind farm;*
- *turbine size (tower height and rotor size);*
- *turbine rotational speed;*

- *number of turbines;*
- *colour of turbines;*
- *reflectivity of rotating blades;*
- *access roads;*
- *ancillary features including associated buildings, signage, telecommunications infrastructure and transmission lines;*
- *extent of clearing required (eg vegetation removal);*
- *construction procedures; and*
- *rehabilitation measures.*

(Western Australian Planning Commission 2007)

1.3.5 Guidelines for Landscape Visual Impact Assessment (2013) and Guidance Note Landscape Visual Impact Assessment (2018)

The purpose for both these documents are to provide a practical framework for the practice of LVIA among registered landscape architects. The process for undertaking this LVIA is reflective of the best practice guidelines, including terminology, principles, and methodology.

1.3.6 City of Kalgoorlie-Boulder Local Planning Scheme 2 (2023)

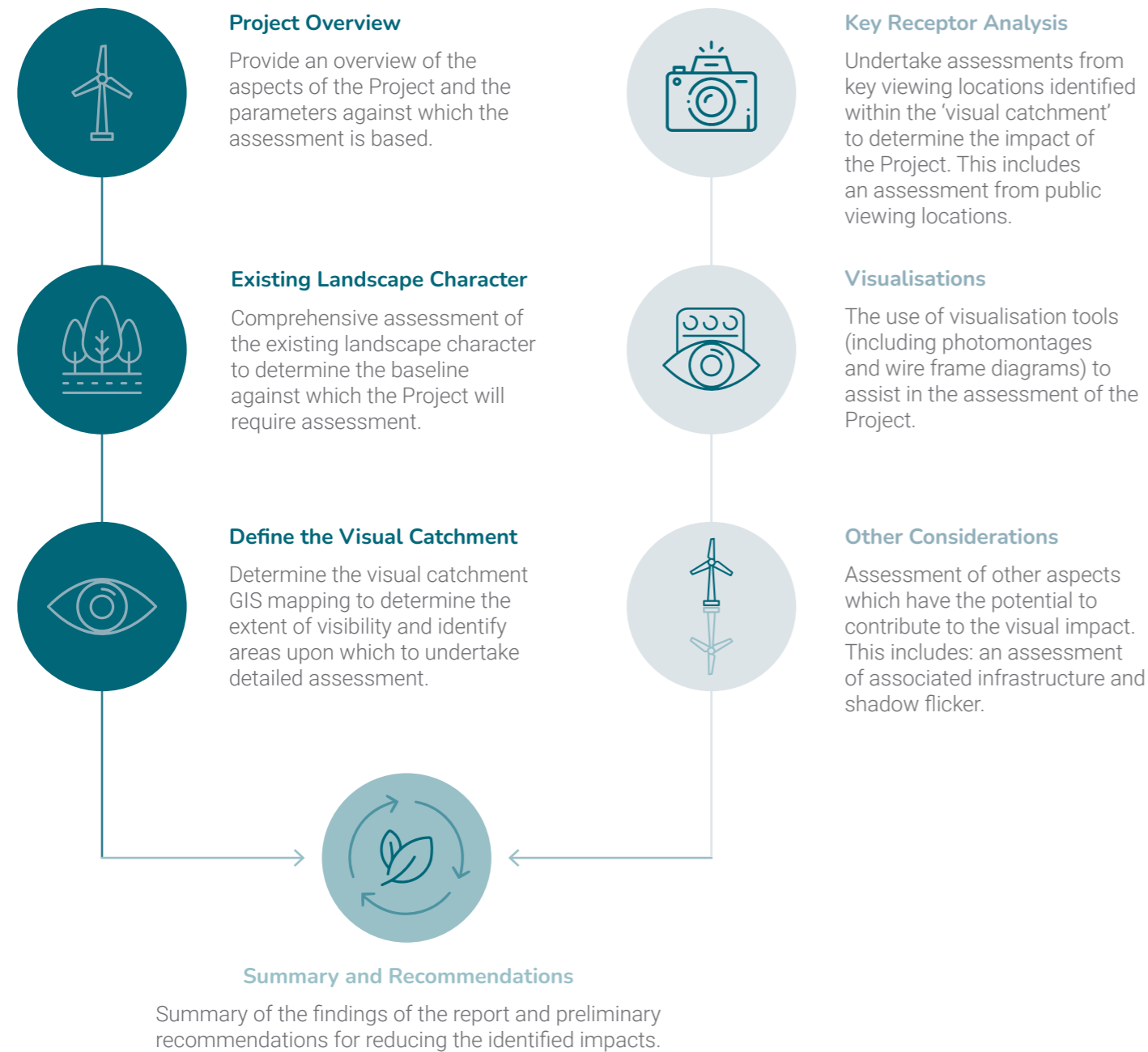
The aims of the Scheme are to ensure a sufficient supply of serviced land for housing, commercial, community, and recreational uses, while supporting infrastructure improvements. It promotes diverse accommodation choices, sustainable development, and protection of environmental and cultural values. The Scheme also encourages economic growth through flexible planning, maintains amenity and heritage, supports the resource sector, and provides for quality open space and recreation opportunities.

(Western Australian Government 2023)

2.0 Study Method

2.1 Overview of The Study Method

The fundamental steps in undertaking a LVIA are as follows:



2.2 Visual Assessment Methodology

The potential visual impact of the Proposal is assessed based on the relationship between visual sensitivity and visual magnitude.

This following methodology is used to assess the Project's visual impact to both the overall landscape (refer to **Section 5.6**) and representative viewpoints of key receptors (refer to **Section 6.0**).

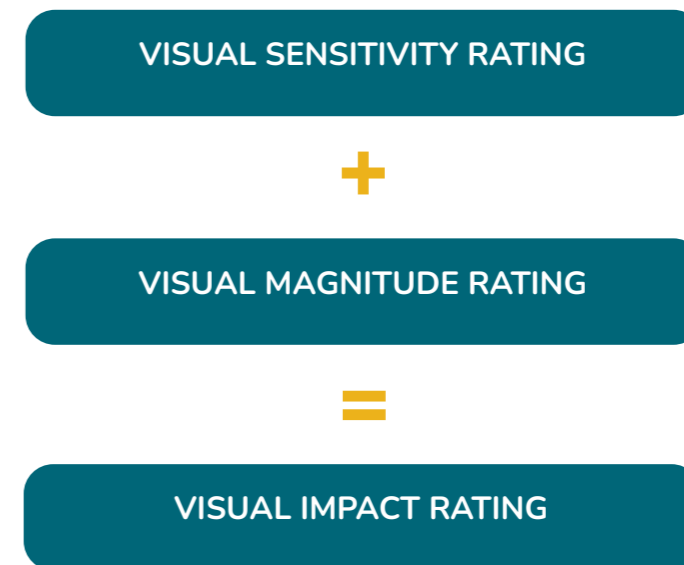


Figure 01 Landscape & Visual Impact Assessment Process

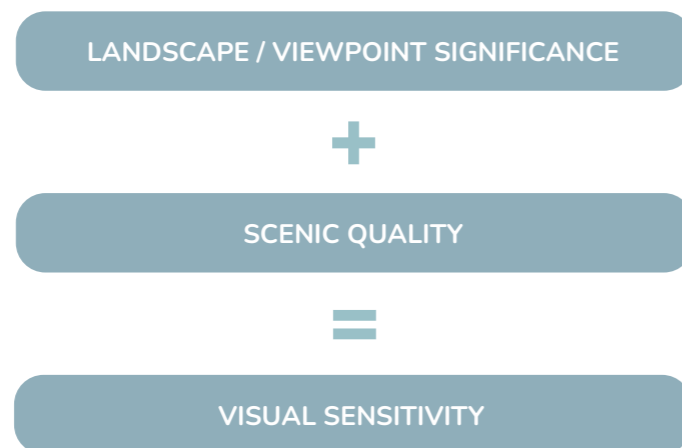
2.2.1 Visual Sensitivity

The visual sensitivity is determined by the area's visual absorption capacity - specifically 'the ability to visually absorb or sustain change as a result of new development without altering the overall character of the landscape, based on variables such as landform, vegetation pattern and height, and existing land use' (Western Australian Planning Commission 2007).

Both the landscape/viewpoint significance and the scenic quality are combined to give an overall visual sensitivity rating (Refer to **Table 01**).

Generally, the following principles apply:

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



Visual Sensitivity				
		LOW	MODERATE	HIGH
SIGNIFICANCE	LEVEL 1 National/State	MODERATE	MODERATE	HIGH
	LEVEL 2 Regional	LOW	MODERATE	MODERATE
	LEVEL 3 Local	LOW	LOW	MODERATE

Table 01 Visual Sensitivity Rating

LANDSCAPE/VIEWPOINT SIGNIFICANCE

The landscape significance of the viewing location and viewer experience is classified as:

- Level 1 (National/State Significance);
- Level 2 (Regional Significance); or
- Level 3 (Local Significance)

(Western Australian Planning Commission 2007)

An outline of the rating for landscape significance is provided in **Table 02**.

SCENIC QUALITY

The scenic quality is measured from a range of physical attributes as outlined in the Scenic Quality Frame of Reference (**Table 03**). The Scenic Quality 'frame of reference' has been formulated by MS utilising an approach to landscape sensitivity assessment by Natural England (Tudor & Natural England, 2019). It is noted that scenic quality is measured from a range of physical attributes and is rated in the context of all landscape types across the state, not just within the Study Area.

After considering these physical attributes, scenic quality ratings can be identified for each Landscape Character Unit (LCU) and categorised as **LOW, MODERATE**, or **HIGH** scenic quality (refer to **Section 5.5**).

An outline of the rating for the Scenic Quality Frame of Reference is provided in **Table 03**.

Viewpoint/Landscape Significance			Additional Considerations - significance increase with:
Level 1 National/State Significance	Level 2 Regional Significance	Level 3 Local Significance	
<ul style="list-style-type: none"> State highways and other main roads (sealed or unsealed) with high levels of vehicle usage; designated tourist routes, scenic drives; recreation, conservation, cultural or scenic sites, areas, viewpoints and lookouts of state or national significance, including their access routes; walking, cycle or bridle tracks of national or state significance; towns, settlements or residential areas; passenger rail lines; navigable waterways of national or state recreation importance; ocean sites of national or state recreation importance eg surf breaks; and views of national or state importance. 	<ul style="list-style-type: none"> main roads with moderate levels of vehicle usage (sealed or unsealed); recreation, conservation, cultural or scenic sites, areas, viewpoint, and lookouts of regional or high local significance (including their access routes); navigable waterways of regional recreation significance; walk, cycle or bridle paths of regional significance; and views of regional importance. 	<ul style="list-style-type: none"> all remaining roads with low levels of vehicle usage; locally significant roads or tracks; recreation and other use areas of local significance; navigable waterways of local recreational significance; walk, cycle or bridle paths of local significance; and views of local importance. 	<ul style="list-style-type: none"> importance of views, including type, features, rarity; volume of use of roads, trails and navigable waterways; degree of sensitivity of viewers; those who are more likely to be more sensitive include wilderness users, other recreational users, tourists, people who choose to live in an area because of its landscape character and views (eg assessed by noting how vocal observers are about specific travel routes or use areas, indicated in letters, protests etc); degree to which experiencing the landscape is integral to enjoyment of a travel route or site. Is it the focus of the use, as in recreational use, or just incidental, as is more likely with people using a route to work? and length of duration of a view; range could include glimpses from a high speed road, longer duration views obtained from roads used for sightseeing or from recreation sites and lookouts and very long and frequent views from the main living areas of homes.

Table 02 Level of Significance Classification
Source: Western Australian Planning Commission 2007

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

Table 03 Scenic Quality Frame of Reference

2.2.2 Visual Magnitude

Visual magnitude refers to the extent of change that receptors will experience. The objective ways of measuring and assessing the magnitude of change are determined by the combination of these factors identified below. These factors include:

- **size** and **scale** - including the extent of existing landscape elements that may be lost and the contribution of that element to the character of the landscape;
- the **extent** to which the development becomes a minor or major element in the landscape and its **dominance** in the visual catchment;
- the extent to which the development changes the key characteristics of the landscape, which are critical to its distinctive character;
- the geographic area of the landscape over which the effects will be experienced. This could vary from the immediate setting of the development to larger scales where the development may influence several landscape character units;
- the **duration** and **reversibility** of the effects on the landscape; and/or
- the level of **contrast** and **compatibility**

2.2.3 Overall Visual Impact

Visual Impact refers to the change in the landscape appearance due to the Proposal. Visual impact is the combined effect of visual sensitivity and magnitude (refer to **Table 04**).

Visual Impact				
		SENSITIVITY		
		LOW	MODERATE	HIGH
MAGNITUDE	HIGH	MODERATE	MODERATE	HIGH
	MODERATE	LOW	MODERATE	MODERATE
	LOW	LOW	LOW	MODERATE
	NEGLIGIBLE			

Table 04 Visual Impact Matrix

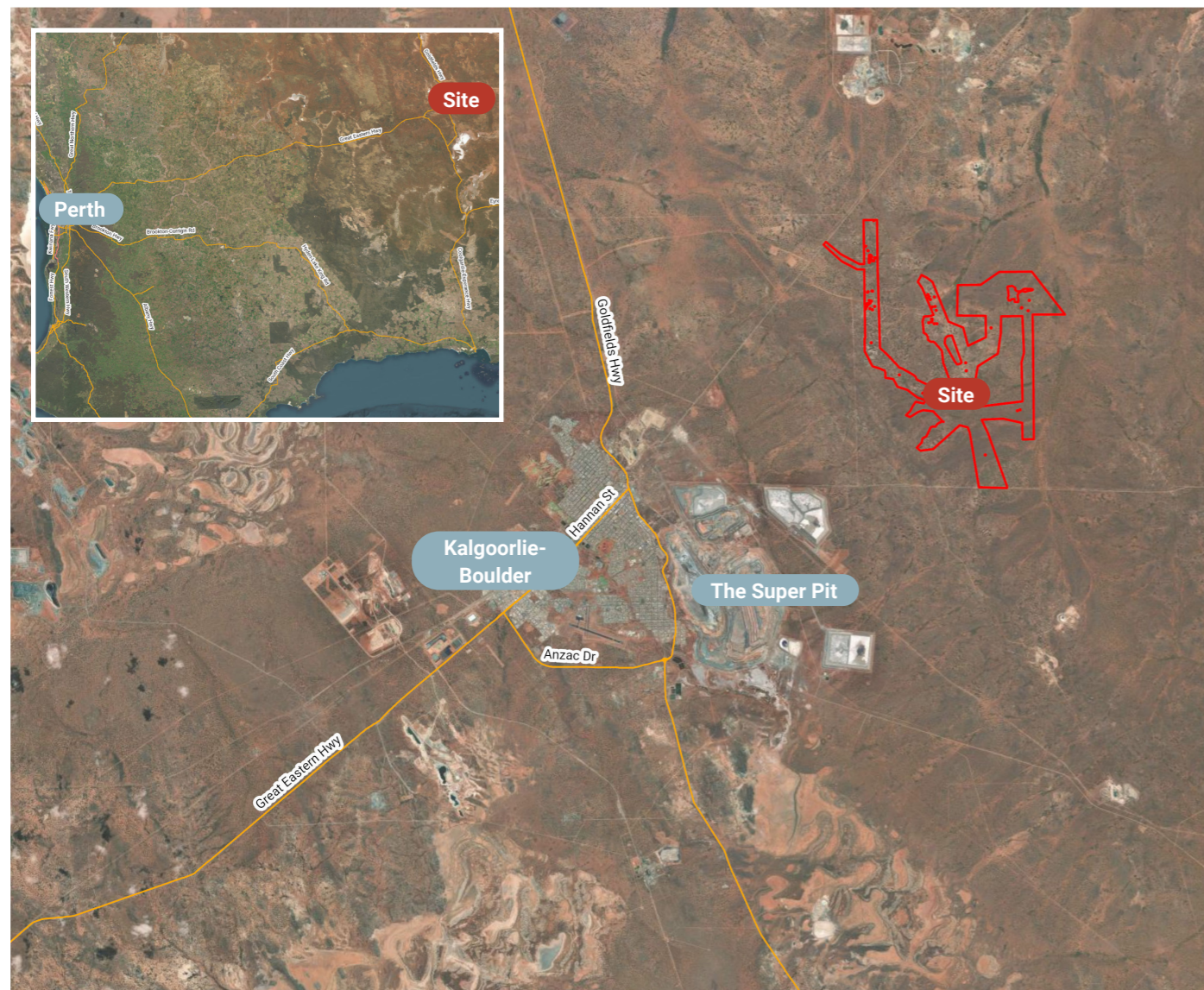
3.0 Project Overview

3.1 Regional Context

The Project is a proposed wind farm and solar farm located in the Goldfields-Esperance region of Western Australia. The Project is proposed approximately 12 km northeast of the town of Kalgoorlie-Boulder, as shown in **Figure 02**. The area is known for its mining and in particular the Fimiston Open Pit gold mine colloquially known as The Super Pit.

3.2 The Project

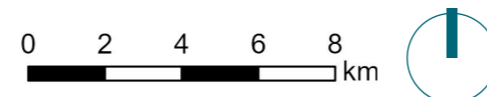
The Project Area is approximately 2,260 hectares (ha) and consists of 33 proposed Wind Turbine Generators (WTG) as well as a Photovoltaic (PV) Array component and associated infrastructure. The proposed indicative layout is outlined in **Figure 03**.

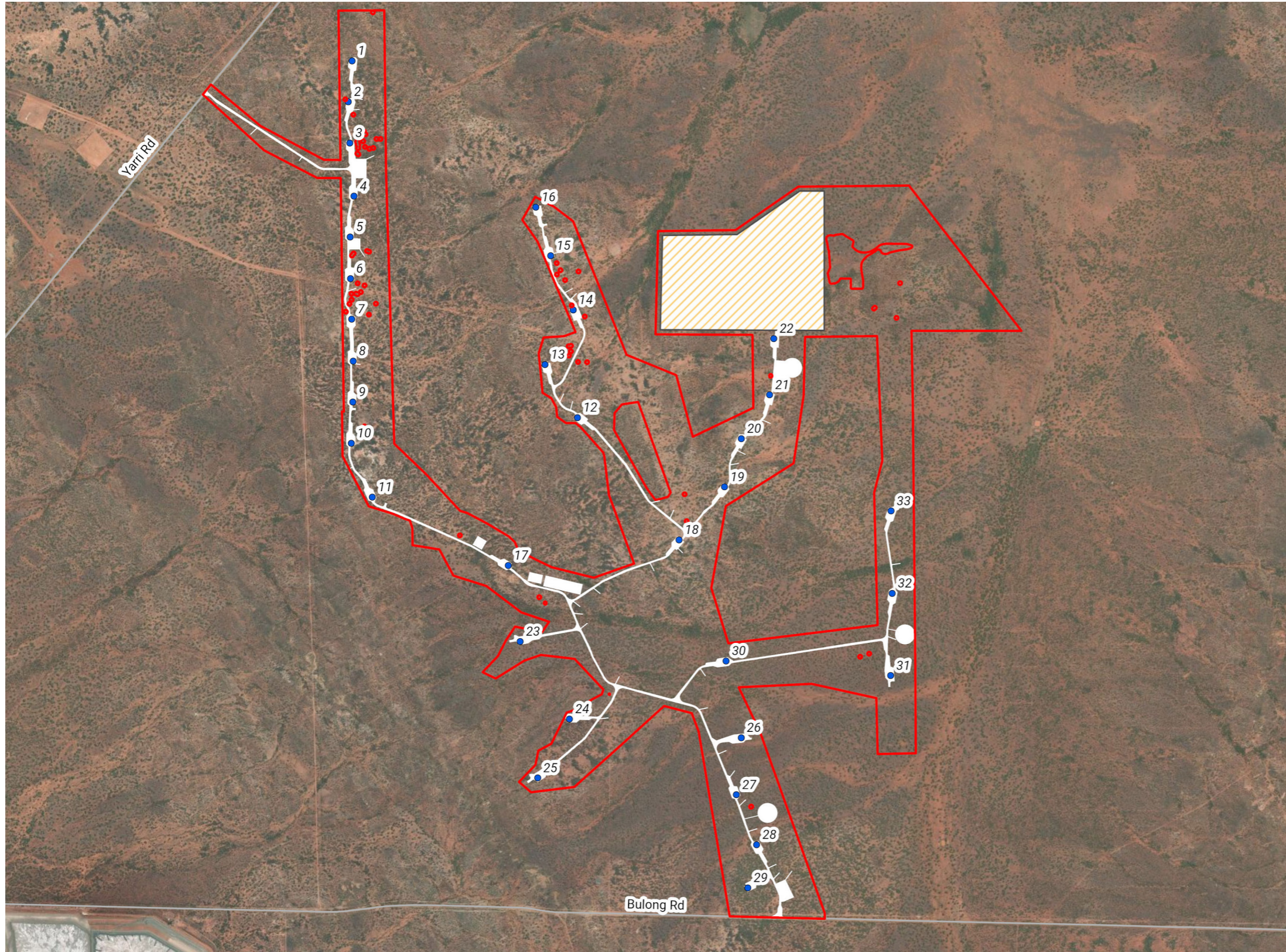


LEGEND

- Project Area
- State Highway - sealed

Figure 02 Regional Context





Project Layout

Refer to Section 3.2

LEGEND

- Project Area
- WTG_Layout_20250714
- Solar Farm
- Permanent Disturbance Footprint
- Minor Road - sealed

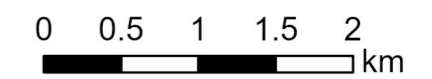


Figure 03 Project Layout
Basemap Source - ESRI, 2025

3.3 Project Components

The proposed WTG considers a maximum blade tip height of 241 m as a worst case scenario.

Table 05 provides an overview of dimensions of the WTG components that have been used for this assessment. To best represent a worst case scenario, the maximum hub height of 150m has been used for modelling and visualisation purposes in this report. **Figure 04** illustrates the WTG parameters utilised for this report.

The proposed PV Array details have not been provided at the time of this report. However, the height of a typical PV Array is approximately 3-5 m. For the purposes of the assessment, a worst-case scenario of 5m height has been used.

WTG Parameters		
Project Component	Dimensions used in this LVIA	Quantity
Maximum Blade Tip Height	241 m	33 WTG
Hub Height	150 m	
Blade Length	91 m	

Table 05 WTG Parameters

Solar Array Parameters	
Proposal Component	Dimensions used in LVIA:
Maximum Height	5 m (worst-case scenario)

Table 06 Solar Parameters for LVIA

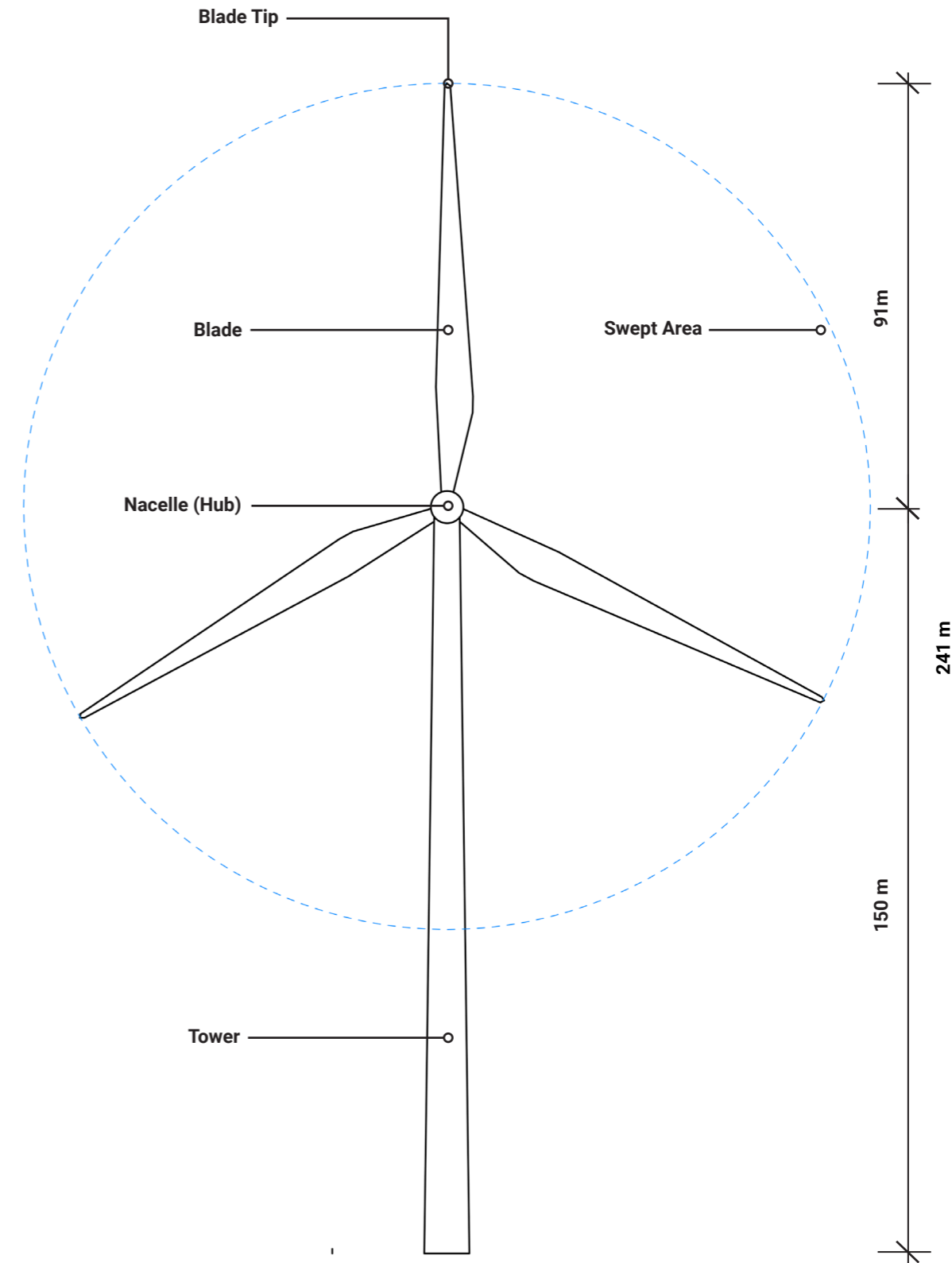


Figure 04 WTG Parameters For Assessment

4.0 Visual Catchment

4.1 Defining Visual Catchment

The visual catchment for the project is defined to establish the study area for the visual impact assessment. Calculations are based on the parameters of the human eye, with distances determined according to a typical line of sight from a person standing at ground level (refer to **Figure 05**).

The extent of the visual catchment is also influenced by the height of the wind turbines. The closer a turbine is to a viewer, the greater the portion of the viewer's field of view (FOV) it occupies—and the greater the potential visual impact. **Figure 06** illustrates viewshed calculations based on a 241 m tall turbine, while Table 02 presents the corresponding visual impacts associated with the level of FOV occupied.

Although turbines may still be visible beyond the viewshed they are generally perceived as minor elements in the landscape at such distances, resulting in a negligible visual impact. This concept is supported by **Image 01** to **Image 04**, which show how turbines appear at various distances. As demonstrated, turbines become increasingly visually dominant as the distance to the viewer decreases—an idea further demonstrated in **Figure 07**.

4.2 Visual Study Area

Based on the calculations shown in **Figure 06** and the associated visual impact thresholds in **Table 07**:

The Visual Study Area for this project is 13.81 km from the nearest Turbine.

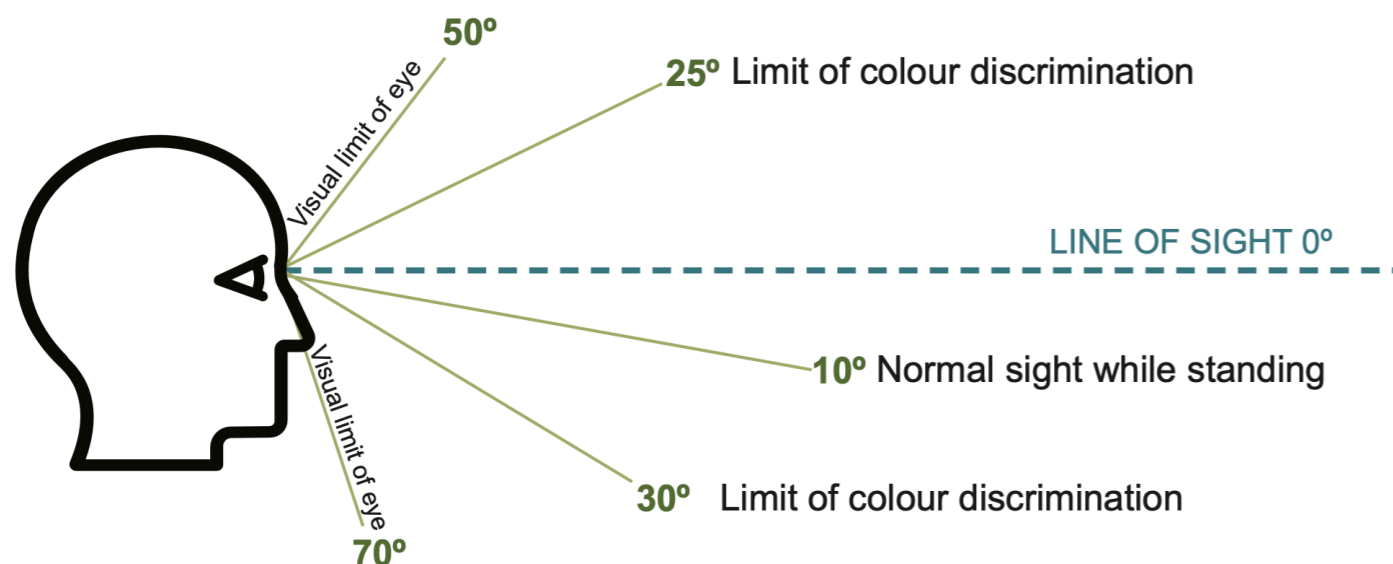


Figure 05 Human Eye Vertical Line of Sight
Source - Panero, J. and Zelnik, M. 1979

$a = 1^\circ \quad y = 13.81 \text{ km}^*$

$a = 2.5^\circ \quad y = 5.52 \text{ km}^*$

$a = 5^\circ \quad y = 2.76 \text{ km}^*$

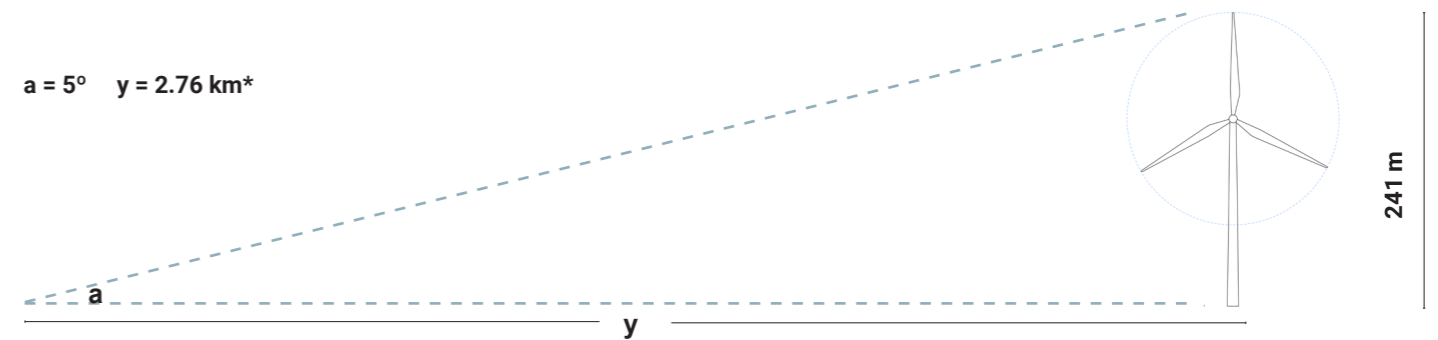


Figure 06 Viewshed calculations
Source - Panero, J. and Zelnik, M. 1979

Visual Impact	Viewshed Distances	
	Field of View (Degrees)	Distance
<p>Will be visually dominant in the landscape from most viewing locations</p> <p>Unless screened by topography or vegetation, wind turbines will dominate the landscape in which they are sited.</p>	> 5°	<2.76km
<p>Highly visible and will usually dominate the landscape</p> <p>The degree of visual intrusion will depend on the wind turbines placement within the landscape and factors such as foreground screening.</p>	2.5° - 5°	2.76 - 5.52 km
<p>Potentially noticeable and can dominate the landscape</p> <p>The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer.</p>	1° - 2.5°	5.52 - 13.81 km

Table 07 Viewshed Distances
Source - Environment Protection and Heritage Council, 2010



Image 01 Turbines located at 2 km
 Highly visible and are dominant in scale relative to elements such as fence posts and vegetation visible in the foreground.



Image 02 Turbines located at 4 km
 Likely to diminish in scale relative to other elements such as fence posts and intervening vegetation in the foreground.



Image 03 Turbines located at 6 km
 Likely to appear smaller in scale relative to vegetation and structures in the foreground.



Image 04 Turbines located beyond 6 km
 Likely to be visible and appear smaller in scale relative to vegetation and structures in the foreground and middleground.

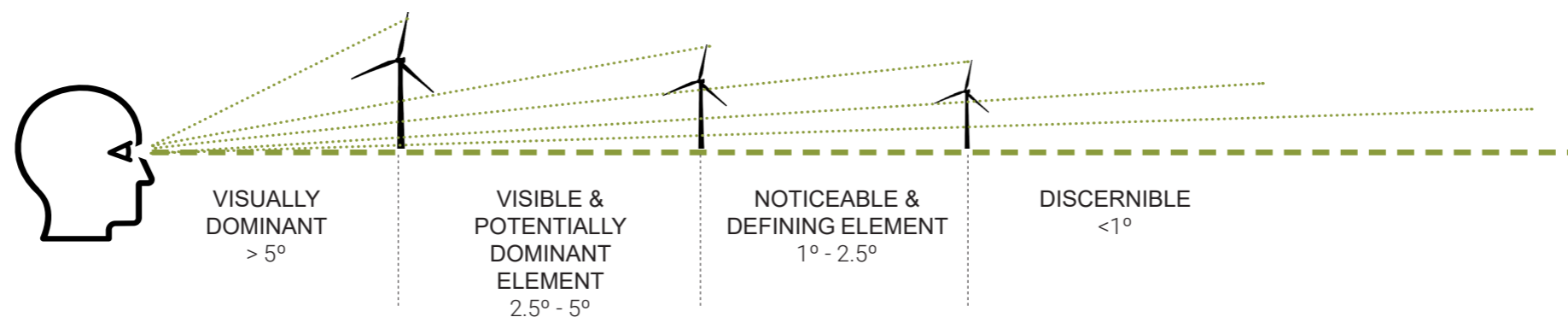
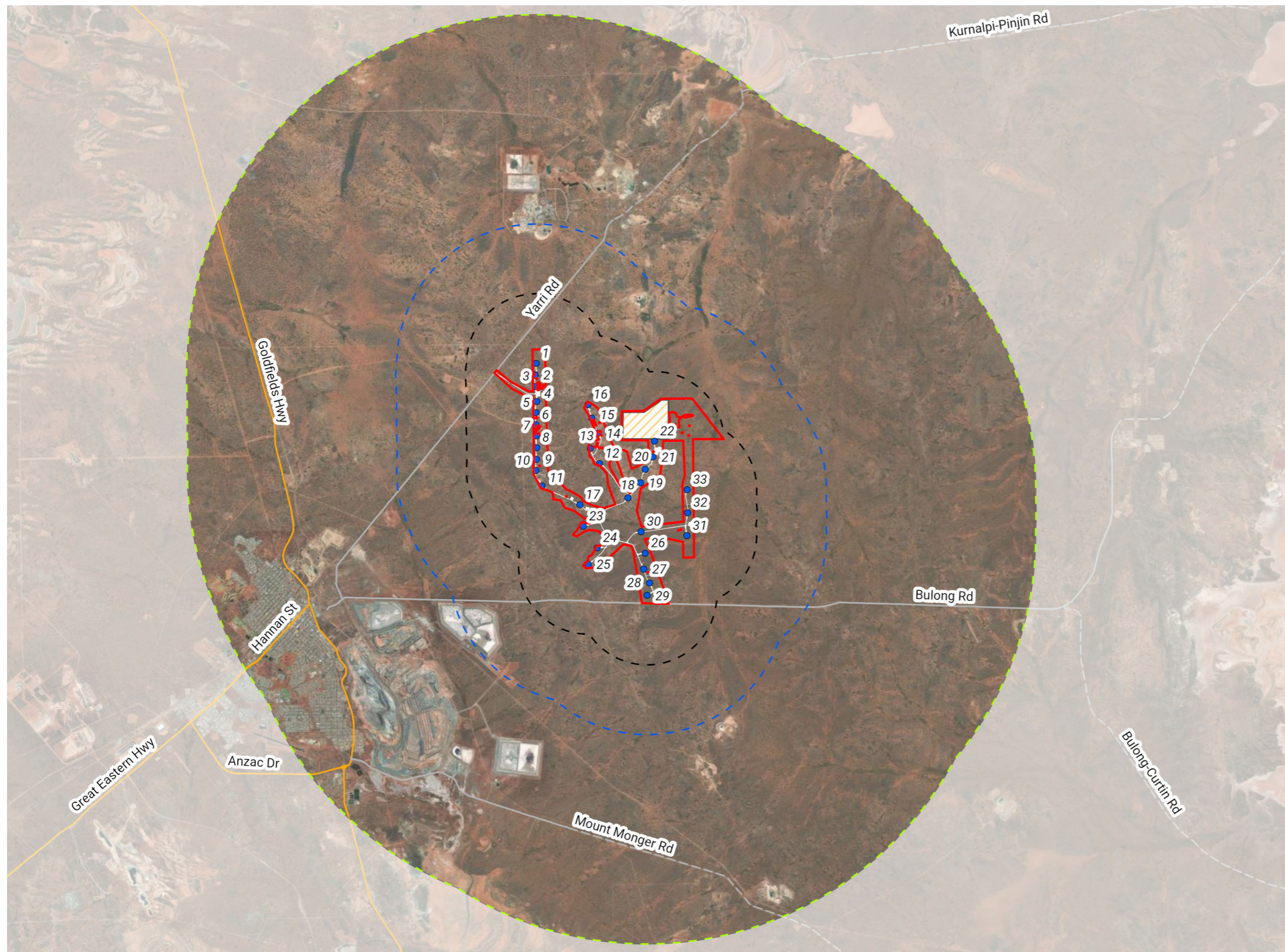


Figure 07 Visual dominance of turbines from varying distances



Viewshed Mapping

Refer to Section 4.1

LEGEND

- Project Area
- WTG_Layout_20250714
- Solar Farm
- Permanent Disturbance Footprint
- 13.81km from the nearest WTG
- 5.52km from the nearest WTG
- 2.76km from the nearest WTG
- State Highway - sealed
- Minor Road - sealed
- Minor Road - unsealed



Figure 08 Project Viewshed
 Basemap Source - ESRI, 2025

4.3 Zone of Visual Influence

Moir has conducted a Zone of Visual Influence (ZVI) analysis to determine the areas where the Project may theoretically be visible based on topography alone. **Figure 09** represents the ZVI for the WTGs based on a tip height of 241 m.

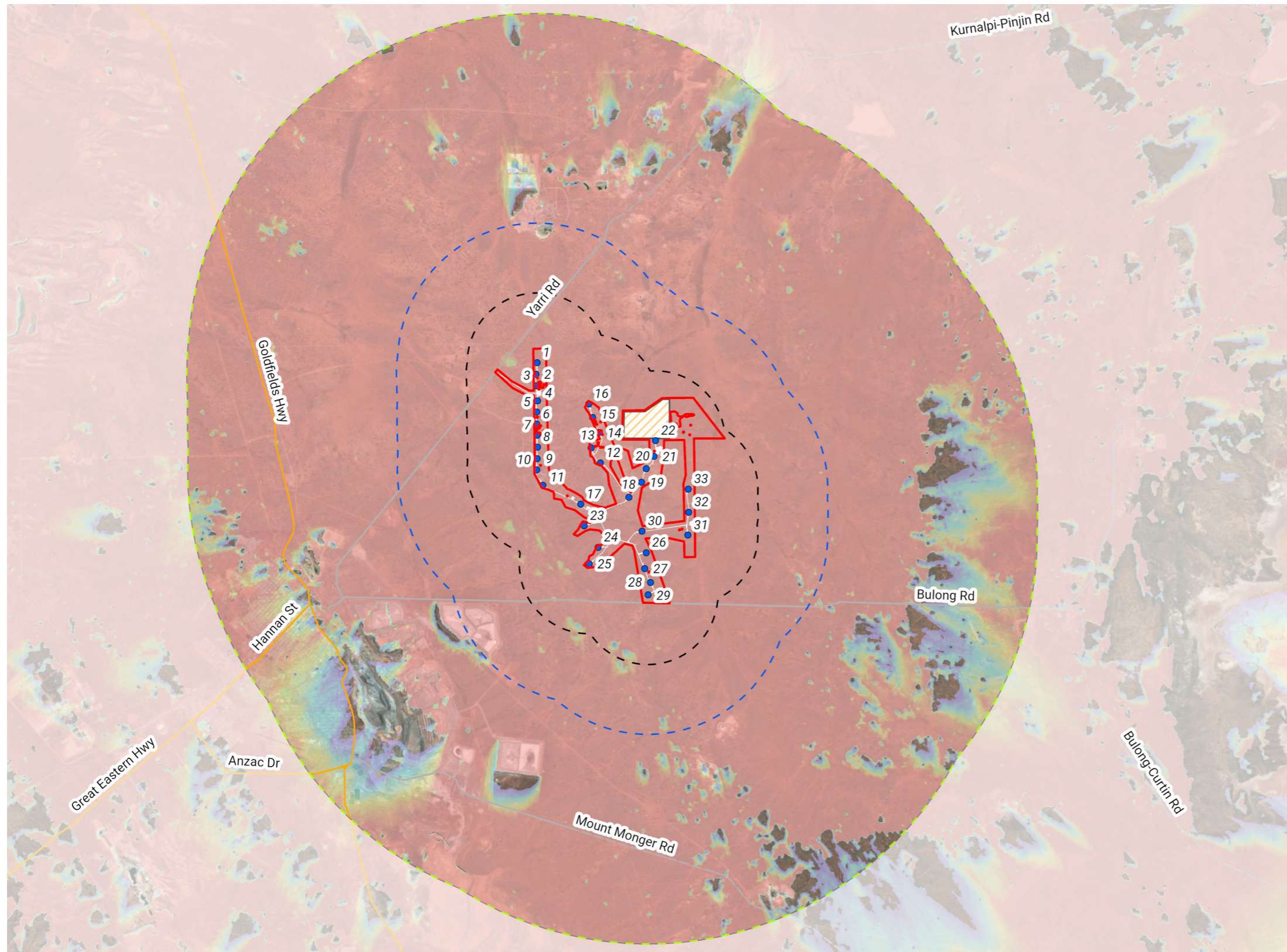
The ZVI represents the area where the Project can theoretically be viewed and is based on a Digital Terrain Model (DTM). It assumes a 'bare ground' scenario, meaning a landscape without any structures or vegetation.

Summary of ZVI Analysis

The following provides a summary of the viewshed map assessment:

- Most of the Project is theoretically visible from majority of the Study Area due to the flat topography.
- Modified topography/hills associated with the piling of waste rock from the mine sites will screen the majority of the Project from the town of Kalgoorlie - Boulder.

It is important to note that the ZVI does not account for vegetation or other potential screening elements and is intended as a preliminary assessment tool to identify areas for further detailed investigation, and rule out areas that have no potential visibility of the Project.



Zone of Visual Influence

Refer to Section 4.1

LEGEND

- Project Area
- WTG_Layout_20250714
- Solar Farm
- Permanent Disturbance Footprint
- 13.81km from the nearest WTG
- 5.52km from the nearest WTG
- 2.76km from the nearest WTG
- State Highway - sealed
- Minor Road - sealed
- Minor Road - unsealed

ZVI LEGEND

- Number of Potentially Visible Turbines
- 33 WTG's
 - 1 WTG

NOTE

The ZVI is a preliminary assessment tool used to represent a bare-ground scenario - i.e. 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 that the map is based solely on topographic information. Therefore this form of mapping represents a worst-case scenario.



Figure 09 Zone of Visual Influence
Basemap Source - ESRI, 2025

5.0 Existing Landscape Character Analysis

5.1 Existing Landscape Character Analysis

The purpose of the Landscape Character Analysis is to establish the existing landscape and visual conditions through descriptions, mapping and photographic representations. The Study Method for undertaking the Landscape Character Analysis has been established to meet the requirements as set out in the Western Australia Visual Landscape Planning Manual (WAVLP) where relevant and in conjunction with previous experience on large scale renewable energy and infrastructure Proposals.

Landscape Character Analysis Inputs:	
Regional Landscape Character	
Description of the regional area of land in which the Proposal is located including a description of the bioregion.	Refer to Section 5.2
Landscape Features and Key Viewing Locations	
Identify areas of visual interest or quality that stand out visually in the landscape. Establish key viewing locations from which assessment is to be undertaken.	Refer to Section 5.4
Landscape Character Unit Classification	
Landscape is categorised into Landscape Character Units (LCU) based on uniform patterns of vegetation, topography, water form and land use.	Refer to Section 5.5
Visual Impact Assessment on Landscape Character	
Use the LCU's as a framework to assess the Project's visual impact on the overall landscape character of the Study Area.	Refer to Section 5.6

Table 08 Landscape Character Analysis Inputs

5.2 Regional Landscape Character

The Project is located within Western Australia's Coolgardie and Murchison bioregions under the Interim Biogeographic Regionalisation of Australia (IBRA) (Refer to **Figure 10**).

The Coolgardie Bioregion encompasses 'granite rocky outcrops, low greenstone hills, laterite uplands and broad plains. Numerous salt lakes also occur through the bioregion. The Coolgardie bioregion covers the interzone between mulga and spinifex country, and eucalypt environments.'

'The Eastern Murchison comprises the northern parts of the craton's 'Southern Cross' and 'Eastern Goldfields' terrains and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. Broad plains of red-brown soils, breakaway complexes, and red sandplains are widespread. Vegetation is dominated by mulga woodlands.'

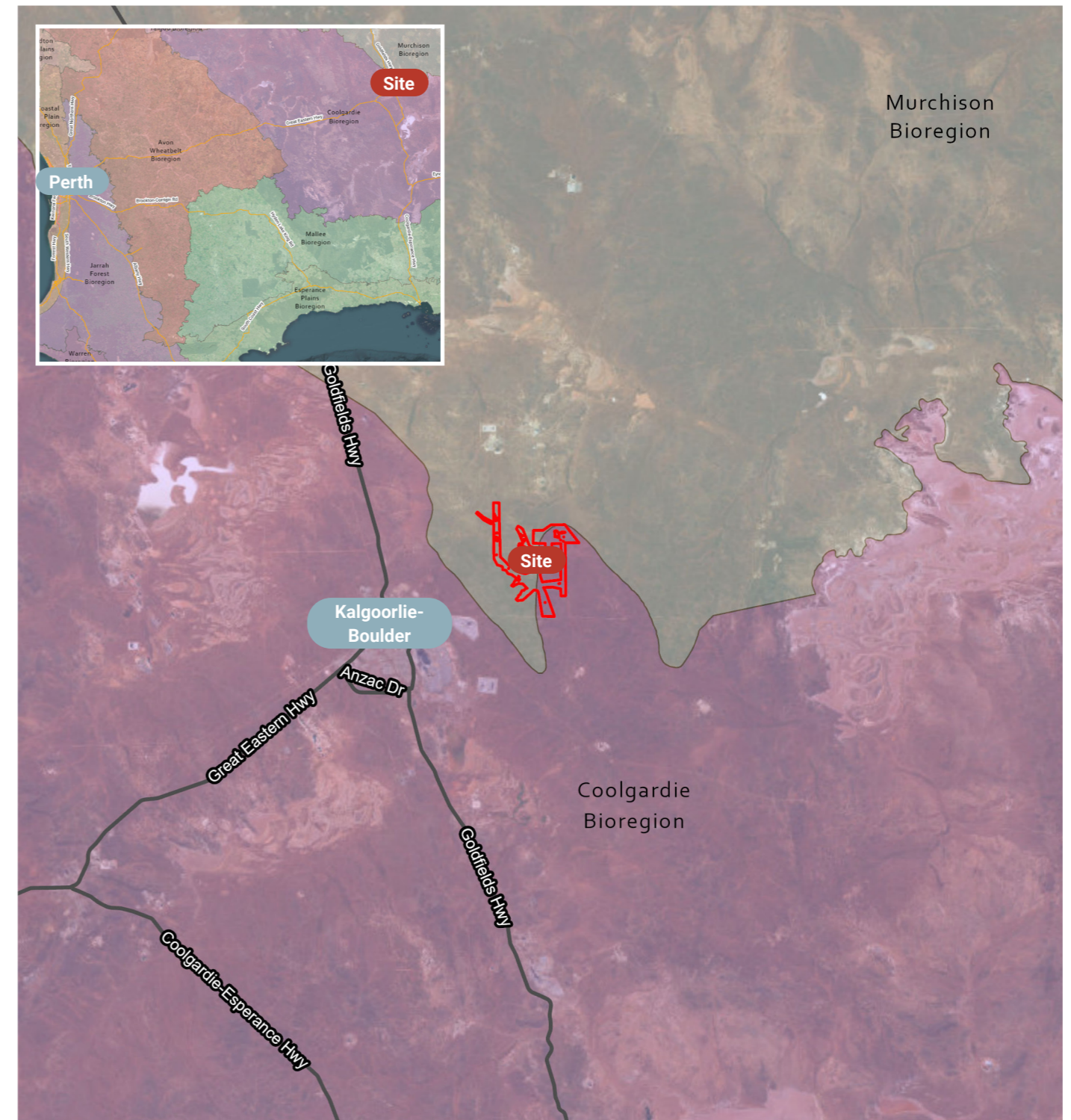
(Australian Government: National Land & Water Resources Audit 2008)

5.3 Landzoning

The Project Area is located within the Kalgoorlie Boulder Local Government Area (LGA) and is zoned under 'Rural' in the *Local Planning Scheme 2023*.

The objectives of the 'Rural' Zoning are as follows:

- To provide for the maintenance or enhancement of specific local rural character.
- To protect broadacre agricultural activities such as cropping and grazing, and intensive uses such as horticulture as primary uses, with other rural pursuits and rural industries as secondary uses in circumstances where they demonstrate compatibility with the primary use.
- To maintain and enhance the environmental qualities of the landscape, vegetation, soils and water bodies, to protect sensitive areas, especially the natural valley and water course systems from damage.
- To provide for the operation and development of existing, future, and potential rural land uses by limiting the introduction of sensitive land uses in the Rural zone.
- To provide for a range of non-rural land uses where they have demonstrated benefit and are compatible with surrounding rural land use.



LEGEND

- | | |
|---|---|
| Project Area | Coolgardie Bioregion |
| Highways | Murchison Bioregion |

0 3 6 9 12
km



Figure 10 Bioregions



Land Zoning

Refer to Section 5.3

LEGEND

- Project Area
- Study Area (13.81km from the n

LAND ZONING

- Civic and community
- Commercial
- District distributor road
- Drainage/waterway
- Environmental conservation res
- General industry
- Industrial development
- Light industry
- Local distributor road
- Local road
- Mixed use
- No zone
- Primary distributor road
- Private clubs, institutions and pl
- Public open space
- Public purposes
- Railways
- Residential
- Rural
- Service commercial
- Settlement
- Tourism
- Urban development

Figure 11 Land Zoning
 Basemap Source -Kalgoorlie Boulder Local Planning Scheme 2023



5.4 Key Landscape Features

5.4.1 Topography

The topography of the Project area is generally flat to gently undulating. Although no major mountain ranges exist, the landscape features low hills, broad plains, and occasional salt lakes. In addition to these natural features, large piles of waste rock from mining activities have formed prominent man-made hills adjacent to the Super Pit and other nearby mine sites.

5.4.2 Vegetation

Vegetation within the study area reflects the semi-arid to arid climate and primarily consists of mixed open woodlands of *Eucalyptus*, *Casurina*, and *Acacia*. Areas cleared of trees, particularly near Kanowna, consist of a mix of salt bush plains and spinifex country, with Ephemeral flora communities occurring throughout. Particular species of note include: *Eucalyptus oleosa*, *Casuarina cristata* and *Acacia aneura*.

5.4.3 Hydrology

Due to the semi-arid climate, water systems within the study area are seasonal, consisting of ephemeral creeks and dry salt lakes that flow intermittently during wet weather events.

5.4.4 Roads and Infrastructure

Yarri Road and Bulong Road, located adjacent to the Project, are low-use, sealed roads mainly providing access to nearby mining sites and homesteads. Yarri Road is also used to access the Kanowa ghost town and heritage trail, a tourist site of regional significance.

The Goldfields Highway traverses Kalgoorlie in a southeast–northwest direction and is located southwest of the project area. It forms part of a major regional corridor linking the Great Northern Highway at Meekatharra with the Coolgardie–Esperance Highway south of Kalgoorlie.

Adjacent to Kalgoorlie’s northeastern boundary lies the Super Pit, one of Australia’s largest open-cut gold mines and a significant feature of the town.

5.4.5 Recreation and Points of Interest

Several lookouts are located near the town of Kalgoorlie, southwest of the Project and include Mt Charlotte Reservoir and Lookout, Katunga Lookout, Superpit Lookout, and TKs Lookout. Sunset Lookout is located northeast of the ghost town of Kanowna, approximately 10 km north of the Project.



Image 05 Spinifex plains at Kanowna Heritage Trail



Image 06 Typical open woodland within Study Area



Image 07 Superpit Lookout

Karlkurla Bushland Park, located approximately 11 km west of the Project, just outside of Kalgoorlie, is a significant open space servicing Kalgoorlie. Facilities include picnic area, barbeques, trails, toilets, and Katunga Lookout. The sporting fields throughout the town of Kalgoorlie are also key recreation facilities.

Other tourist attractions include Kanowna Ghost Town (part of the Kanowna Heritage trail) and located approximately 6 km north of the Project.

5.4.6 Settlements

Kalgoorlie-Boulder is the nearest major settlement, located 10 km southwest of the Project. Its population is approximately 29,300 (Australian Bureau of Statistics 2021). The population is concentrated within the town, and minimal settlement is present elsewhere within the Project area.

Kanowna is a historic ghost town located approximately 6 km north of the Project. Once a thriving gold mining town, Kanowna now forms part of the Kanowna Heritage Trail and remains a point of historical and tourist interest.



Image 08 TK's Lookout, overlooking salt lakes and the Superpit Mine



Image 09 Township of Kalgoorlie-Boulder



Image 10 Katunga Lookout, located within Karlkurla Bushland Park

Key Landscape Features

Refer to Section 5.4

LEGEND

- Project Area
- Study Area (13.81km from the n
- Highways
- Main Roads
- Roads
- Unsealed Roads
- Public open space
- Environmental conservation res
- Lookouts

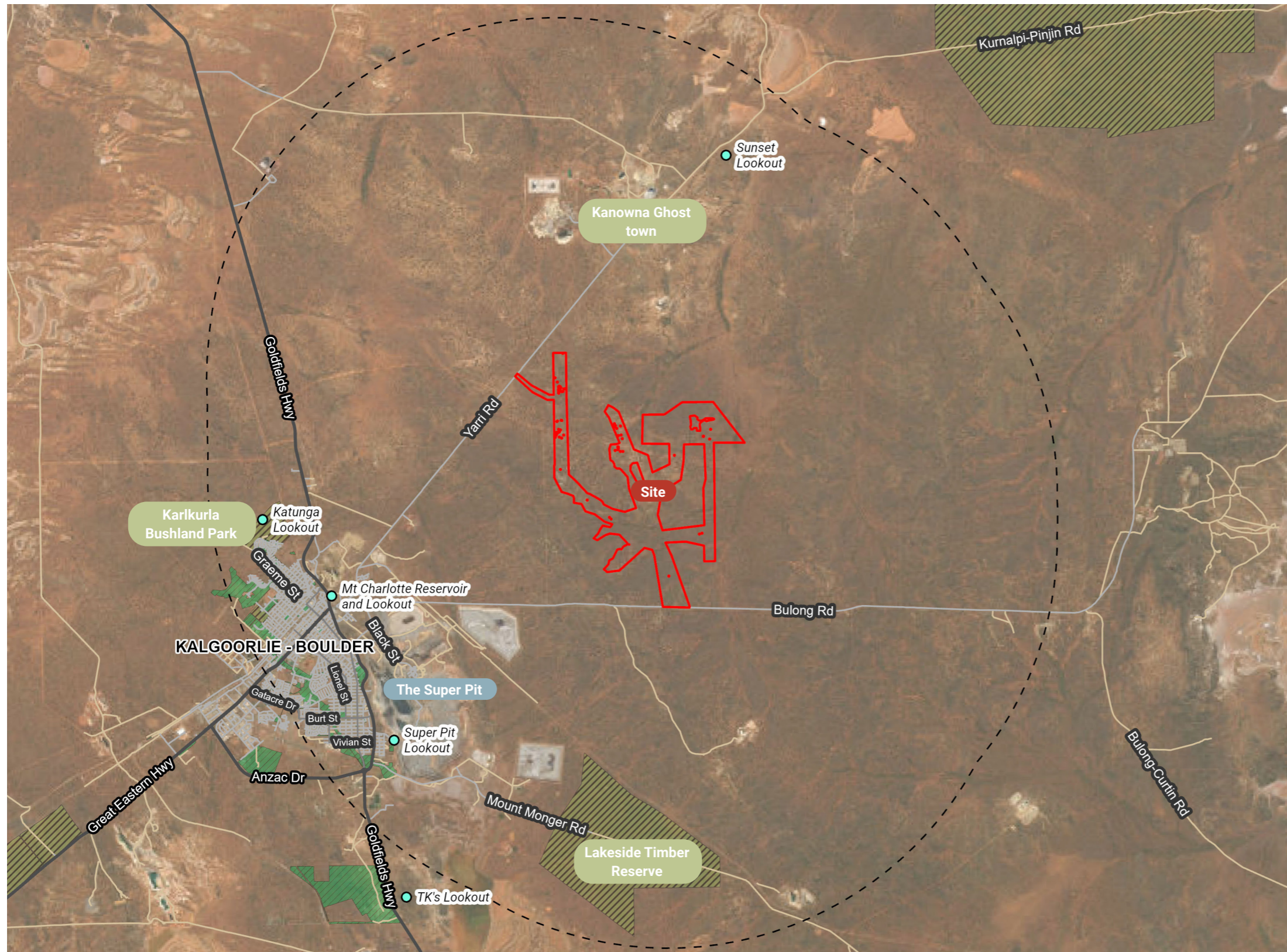


Figure 12 Key Landscape Features
 Basemap Source - ESRI, 2025

5.5 Landscape Character Units (LCU's)

Landscape Character Units refer to 'areas of homogenous patterns of visual, physical, environmental and cultural characteristics such as landform, vegetation, water form and land use, as well as individual features' (Draft National Wind Farm Development Guidelines, 2010).

The study area has been categorised into four (4) Landscape Character Units (LCU) to assist in the assessment. The LCUs are classified by slight variations in the landscape's geology, topography, land use and vegetation, which create distinct character areas within the Study Area. A combination of land use patterns, vegetation coverage, topographical maps, site images and site inspection findings has informed the development of the LCUs.

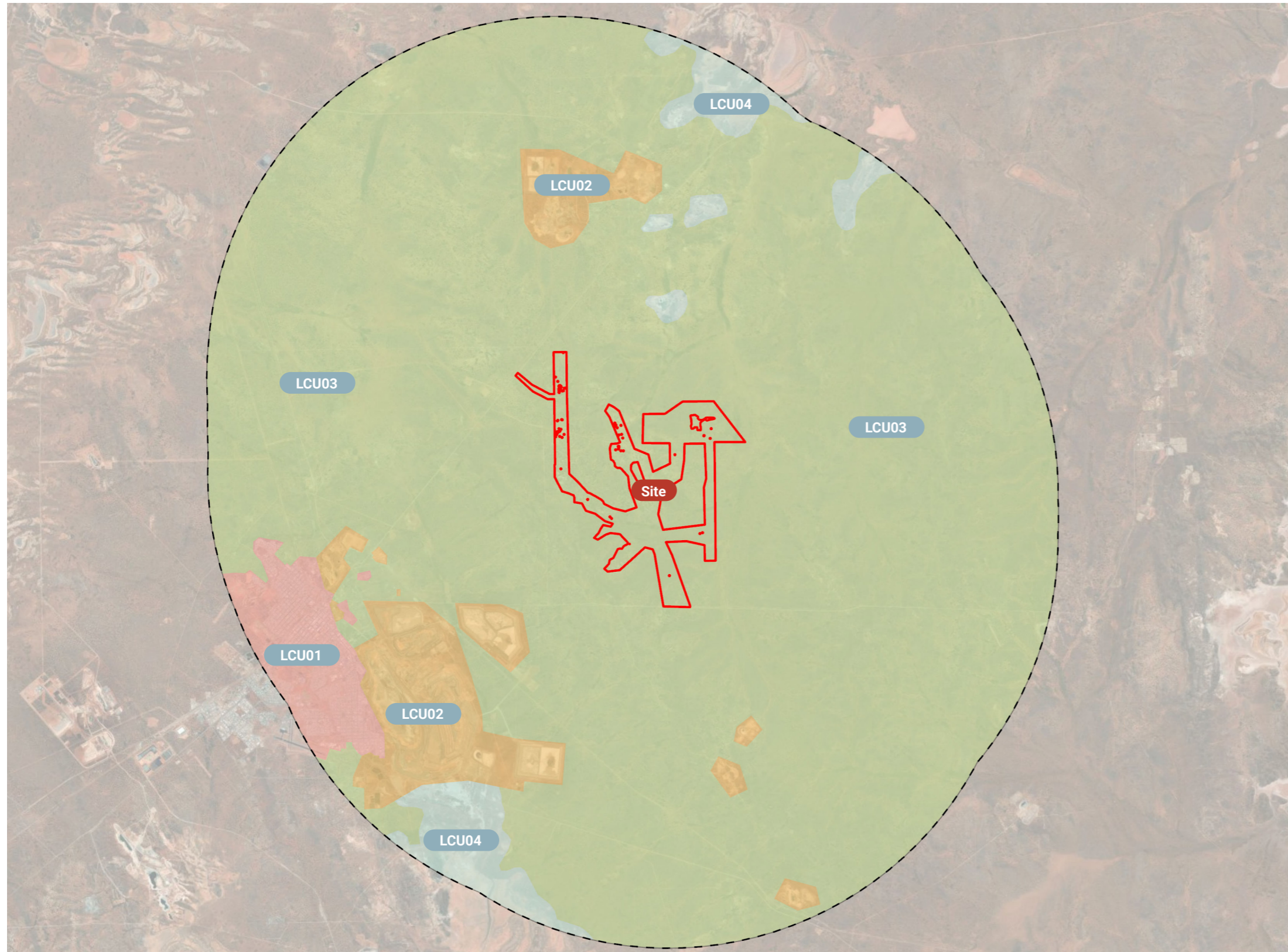
The general extent of the LCUs is shown in **Figure 13** on the following page, and a detailed description has been provided for each LCU.

The Scenic Quality 'Frame of Reference' has been applied to each LCU (refer to Table 04) to determine the level of visual significance. A Scenic Quality 'frame of reference' has been formulated by MS utilising an approach to landscape sensitivity assessment by Natural England (Tudor & Natural England, 2019).

Each category of the 'Frame of Reference' has been quantified for each Landscape Character Unit to determine a Low, Moderate or High Scenic Quality Rating.

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

Table 09 Scenic Quality Frame of Reference



Landscape Character Units

Refer to Section 5.5

LEGEND

- Project Area
- Study Area (13.81km from the nearest WTG)
- LCU01 - Town
- LCU02 - Mining and Infrastructure
- LCU03 - Arid Woodland and Shrubland
- LCU04 - Dry Salt Lakes

Figure 13 Landscape Character Units
Basemap Source - ESRI, 2025

5.5.1 LCU01 - Town

Located to the southwest of the Study Area, this Landscape Character Unit (LCU) encompasses the township of Kalgoorlie-Boulder and its immediate surroundings. It includes residential areas, commercial districts, built infrastructure, recreational parks, and local road networks within the town.



Image 11 Kalgoorlie-Boulder Township

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference							SCENIC QUALITY RATING
			Landform	Waterform	Vegetation	Human Influence	Activity	Rarity	Relationship with Adjoining Landscapes	
LCU01 - Town	Township of Kalgoorlie - Boulder	World's Tallest Bin Park, Hannan Street, St Albans Road, Boulder Road, Mount Charlotte Reservoir and Lookout	H							LOW
			M							
			L	■	■	■	■	■	■	

Table 10 LCU01 - Town

5.5.2 LCU02 - Mining and Infrastructure

This LCU comprises mining operations and associated infrastructure. This includes processing plant, tailings storage facility, water management systems, dams, and accommodation areas.



Image 12 Superpit Mine and tailings

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference							SCENIC QUALITY RATING
			Landform	Waterform	Vegetation	Human Influence	Activity	Rarity	Relationship with Adjoining Landscapes	
LCU02 -	Mines and associated infrastructures including Superpit, Mount Charlotte, Kanowna Red Hill and Golden Ridge Mine	Superpit Lookout, Nanny Goat Hill, TKs Lookout, Mt Charlotte Reservoir and Lookout	H							LOW
			M	■						
			L	■	■	■	■	■	■	

Table 11 LCU02 - Mining and Infrastructure

5.5.3 LCU03 - Arid Woodland and Shrubland

This LCU encompasses the expansive open woodlands and shrublands that comprise the majority of the Study Area, including the Project. The woodlands are typically composed of a mix of *Eucalyptus*, *Casuarina*, and *Acacia* species, while the clearings and open areas are predominantly characterised by saltbush and spinifex plant communities.



Image 13 Arid open woodland

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference							SCENIC QUALITY RATING
			Landform	Waterform	Vegetation	Human Influence	Activity	Rarity	Relationship with Adjoining Landscapes	
LCU03 - Arid Woodland and Shrubland	Open woodlands and shrublands	Sunset Lookout								MODERATE - LOW
		Yarri Road								
		Bulong Road								
			H							
			M							
			L							

Table 12 LCU03 - Arid Woodland and Shrubland

5.5.4 LCU04 - Dry Salt Lakes

This LCU comprises the dry salt lakes located in the far northern and southern extents of the Study Area. These lakes hold water intermittently, typically in response to seasonal or significant rainfall events



Image 14 Dry Salt Lakes

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference							SCENIC QUALITY RATING
			Landform	Waterform	Vegetation	Human Influence	Activity	Rarity	Relationship with Adjoining Landscapes	
LCU04 - Dry Salt Lakes	Dry Salt Lakes	TK's Lookout Yarri Road	H							MODERATE
			M							
			L							

Table 13 LCU04 - Dry Salt Lakes

5.6 Visual Impact Assessment on Landscape Character

Use the LCU's as a framework to assess the Project's visual impact on the overall landscape character of the Study Area.

Following the methodology outlined in **Section 2.2**, both the sensitivity and magnitude ratings in each LCU have been assessed, and combined to give an overall visual impact rating. This assessment contributes to the assessment of the Project's visual impact on the overall landscape character within the Study Area.

Visual Impact Assessment on Overall Landscape Character						
	Key Landscape Features and Viewpoints (within Study area)	Scenic Quality Rating	Landscape Significance Rating	Overall Visual Sensitivity	Overall Visual Magnitude	Visual Impact on Landscape Character
LCU01 Town	<ul style="list-style-type: none"> Township of Kalgoorlie - Boulder World's Tallest Bin Park Mount Charlotte Reservoir and Lookout 	LOW (Refer to Section 5.5.1)	Level 1 National/State Significance	LOW	LOW	LOW
	<p>Visual Sensitivity: LOW</p> <p>This LCU encompasses the township of Kalgoorlie-Boulder, including residential areas, commercial precincts, sports fields, parks, and lookouts of local to regional significance.</p> <p>The potential number of viewers is high, as most of the population resides within the township. The landscape is heavily modified due to sustained human activity, with built form defining the LCU. Mine infrastructure is a dominant visual feature to the northeast, in the direction of the Project (Refer to VP04). As a result, any views of the Project from this LCU are likely to be seen within a context already influenced by large-scale industrial development.</p> <p>Given the existing visual condition, the addition of the Project is not anticipated to significantly alter the character of the landscape or view. This LCU is assessed as having a high capacity to absorb or sustain further change visually.</p>			<p>Visual Magnitude: LOW</p> <p>Opportunities to view the Project from within this LCU are limited due to intervening built form associated with the township, which screens potential views (Refer to VP05). Additionally, the Project is located approximately 10 km away, where wind turbines would only be visible with a clear and unobstructed line of sight.</p> <p>As a result, potential visibility is largely restricted to elevated lookouts of local importance, such as the Mt Charlotte Reservoir and Lookout. As demonstrated in VP06, these elevated viewpoints offer expansive outlooks where the Project is visible; however, existing views are already characterised by prominent mining infrastructure. The introduction of wind turbines within this context is expected to result in minimal visual disturbance and is considered compatible with the existing character of the view.</p>		

Table 14 Visual Impact Assessment on Overall Landscape Character (LCUs)

Visual Impact Assessment on Overall Landscape Character						
	Key Landscape Features and Viewpoints (within Study area)	Scenic Quality Rating	Landscape Significance Rating	Overall Visual Sensitivity	Overall Visual Magnitude	Visual Impact on Landscape Character
LCU02 Mining and Infrastructure	<ul style="list-style-type: none"> • Superpit mine • Mount Charlotte mine • Kanowna Red Hill mine • Golden Ridge Mine 	LOW (Refer to Section 5.5.2)	Level 3 Local Significance	VERY LOW	LOW	LOW
	Visual Sensitivity: VERY LOW This LCU comprises land predominantly used for mining activities. The landscape character is heavily modified and typically features open-cut mining operations, associated infrastructure, and dams related to quarrying activities. Given the extent of existing modification, the introduction of the Project is not expected to significantly alter the character of the landscape or affect visual amenity. This LCU is therefore assessed as having a high capacity to visually absorb or accommodate further change.			Visual Magnitude: LOW While the Project would be screened from view across most of this LCU due to intervening topography and existing infrastructure, it may be partially visible from elevated ridgelines within the mine site. However, given the highly industrialised setting of this LCU, the introduction of wind turbines is considered compatible with the existing visual character. It is therefore expected to result in minimal visual disturbance.		
LCU03 Arid Woodland and Shrubland	<ul style="list-style-type: none"> • Open woodlands and shrublands • Sunset Lookout • Yarri Road • Bulong Road • Katunga Lookout • Kanowna Heritage Trail 	MODERATE - LOW (Refer to Section 5.5.3)	Level 2 Regional Significance / Level 3 Local Significance	MODERATE	LOW	LOW
	Visual Sensitivity: MODERATE This Landscape Character Unit (LCU) encompasses open woodlands and shrublands typical of an arid landscape. Key viewpoints include Yarri and Bulong Roads, Katunga Lookout within the Karlkurla Bushlands (a park of local significance), and the Kanowna Heritage Trail, which features the remains of Kanowna, Australia's largest ghost town and a site of regional tourism significance. While the LCU retains the appearance of relatively undisturbed arid vegetation, this landscape character is common across the region and does not hold high visual significance at a broader scale. Additionally, mining operations are scattered throughout the area, and the primary use of local roads is for access to mine sites and rural homesteads. Despite the area's remote setting and limited visible evidence of settlement, there is a history of the landscape accommodating infrastructure and development over time.			Visual Magnitude: LOW Although the Project is located within this LCU, views from nearby public roads such as Yarri and Bulong Roads are limited. These low-use roads primarily serve local mines and homesteads, and views from them are typically brief and partially screened by vegetation (See VP01 & VP02). While the Project may appear prominent at times due to the roads' close proximity, the short duration of views and natural screening reduce the overall visual impact. More sensitive viewpoints within this LCU, such as Katunga Lookout (VP08) and the Kanowna Heritage Trail (VP07), are located further from the Project. From these locations, turbines are distant, often screened, and visually recede into the broader landscape.		
LCU04 Dry Salt Lakes	<ul style="list-style-type: none"> • Dry Salt Lakes • TK's Lookout • Yarri Road 	MODERATE (Refer to Section 5.5.4)	Level 3 Local Significance	LOW	LOW	LOW
	Visual Sensitivity: LOW This LCU comprises dry salt lakes located in the far northern and southern extents of the Study Area, which hold water intermittently following seasonal or significant rainfall events. While these landscape features may hold local significance, they are low-use areas with no formal recreational facilities or designated lookouts. As the Project is not located within this LCU and public engagement with the landscape is minimal, the sensitivity of this LCU to visual change is assessed as low.			Visual Magnitude: LOW Due to the considerable distance from the Project and limited public access, any available views from this LCU will be distant and the Project is likely to recede into the background, making it difficult to discern. Intervening topography and vegetation are also expected to effectively screen most views.		

Table 14 Continued Visual Impact Assessment on Overall Landscape Character (LCUs)

6.0 Viewpoint Locations

6.1 Viewpoint Selection

The selection of public viewpoints has been informed by topographical maps, aerial maps, landscape character and the popularity and sensitivity of vantage points. Viewpoints are selected to illustrate the following:

- Areas of high scenic value, or community value
- Views from public areas such as camp grounds, rest stops, lookouts, parks, community halls etc.
- Views from public roads
- Areas that can represent views from the town of Kalgoorlie
- Range of distances from the Project
- Range of elevations in relation to the Project
- Range of extent of visibility of the Project

A total of 8 viewpoints (refer to **Figure 14**) were selected from publicly accessible locations to represent a range of views to evaluate the Project.

Viewpoints

Refer to Section 6.1

LEGEND

- Project Area
- Solar Farm
- WTG_Layout_20250714
- Permanent Disturbance Footprint
 - 13.81km from the nearest WTG
 - 5.52km from the nearest WTG
 - 2.76km from the nearest WTG
- Viewpoint Locations
- Highways
- Main Roads
- Roads
- 33 WTGs

ZVI LEGEND

- 1 WTG

NOTE

The ZVI is a preliminary assessment tool used to represent a bare-ground scenario - i.e. 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 that the map is based solely on topographic information. Therefore this form of mapping represents a worst-case scenario.

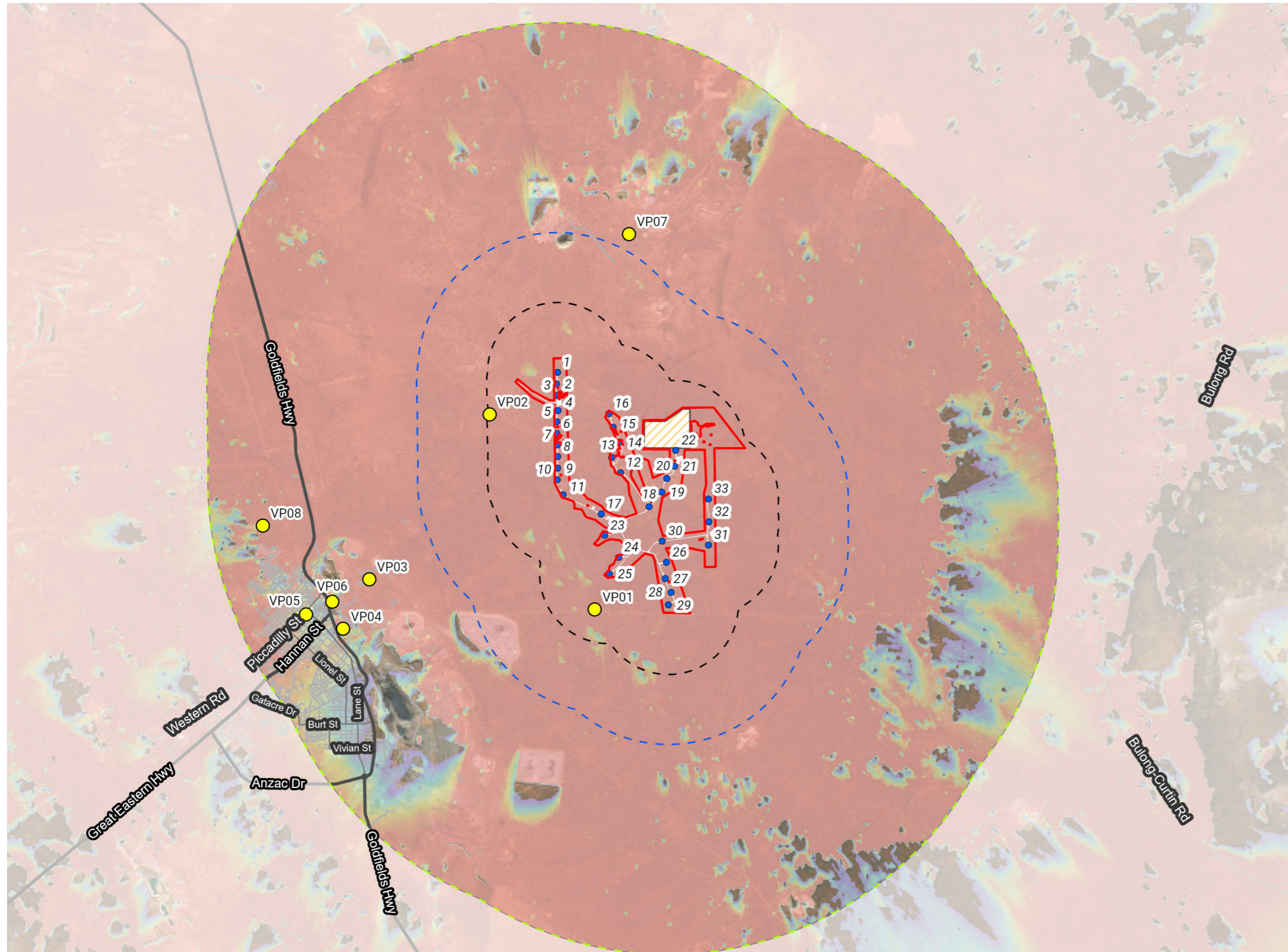
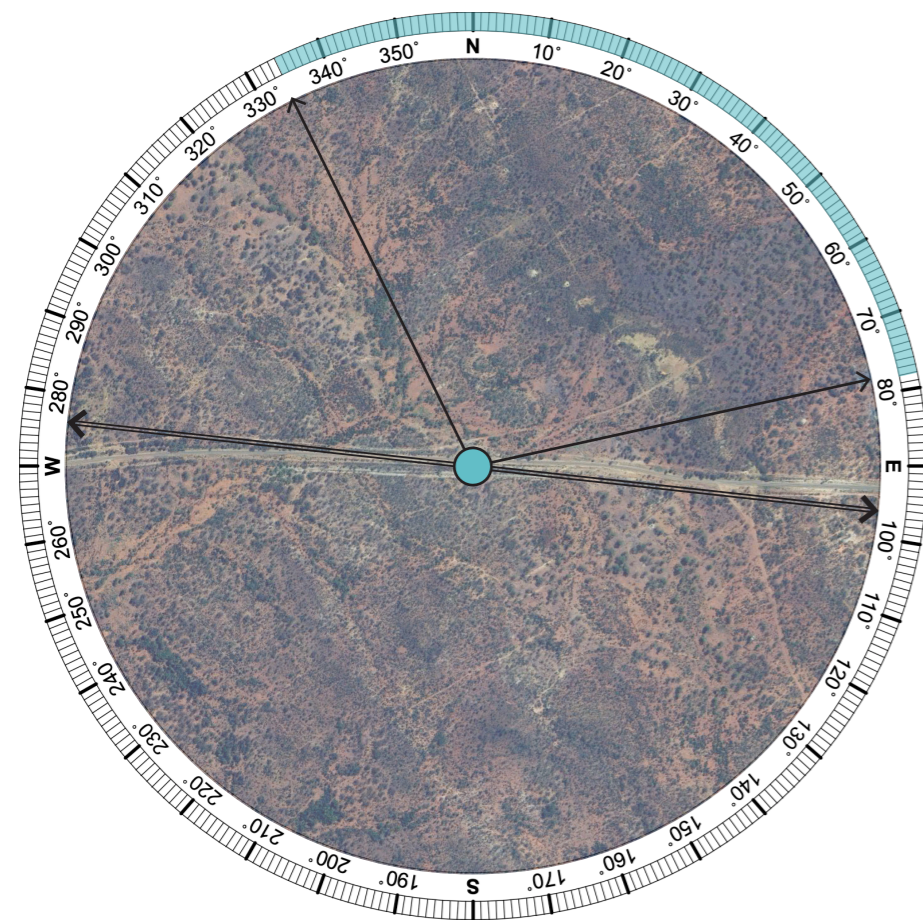


Figure 14 Preliminary Public Viewpoint Locations
 Basemap Source - ESRI, 2025

Viewpoint:
VP01 Bulong Road (PHOTOMONTAGE LOCATION)



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location: Bulong Road Elevation: 392m

Coordinates: 30°44'32.13"S Distance to Project: 1.54km
121°35'13.79"E

Viewing Direction: North

Visual Sensitivity: Low

Visual Magnitude: Low

Visual Impact: **Low**

→ Extent of Panorama
→ Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint is located just off Bulong Road. A low-use sealed road primarily used to access surrounding mine sites and cattle stations.

The surrounding landscape consists of scattered eucalyptus woodland and acacia shrubs typical of LCU03. The surrounding land has primarily been used for cattle grazing and mining, with transmission lines visible in the foreground.

The opening to the north is an unnamed road providing access to the Project.

The visual sensitivity of this viewpoint has been rated as **LOW**.

Potential Visual Impact:

The viewpoint is located approximately 1.54 km from the Project, where wind turbines have the potential to appear visually dominant due to their close proximity.

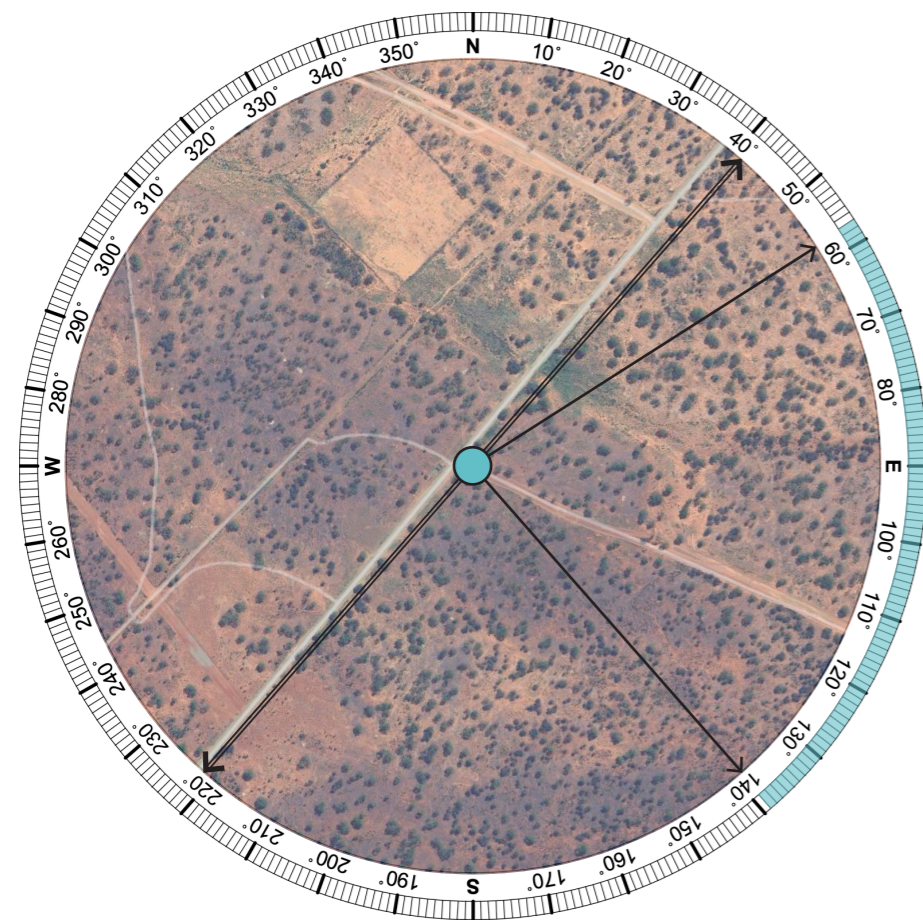
However, surrounding dense vegetation partially fragments or screens views of the Project, reducing its overall visual prominence.

Resulting in a **LOW** visual magnitude of change, leading to an overall **LOW** visual impact.

Viewpoint:
VP02 Yarri Road (PHOTOMONTAGE LOCATION)



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location: Yarri Road Elevation: 386m

Coordinates: 30°40'20.17"S Distance to Project: 2.67km
121°32'41.30"E

Viewing Direction: Southeast

Visual Sensitivity: Low

Visual Magnitude: Low

Visual Impact: **Low**

→ Extent of Panorama
→ Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint is located at the intersection of Yarri Road and an unsealed access road for the Project. While Yarri road has some minor tourist use, it is primarily used to access surrounding mine sites and cattle stations.

The surrounding landscape consists of scattered eucalyptus woodland and acacia shrubs typical of LCU03.

The opening to the east is an unnamed road providing access to the Project.

The visual sensitivity of this viewpoint has been rated as **LOW**.

Potential Visual Impact:

The viewpoint is located approximately 1.54 km from the Project, where wind turbines have the potential to appear visually dominant due to their close proximity.

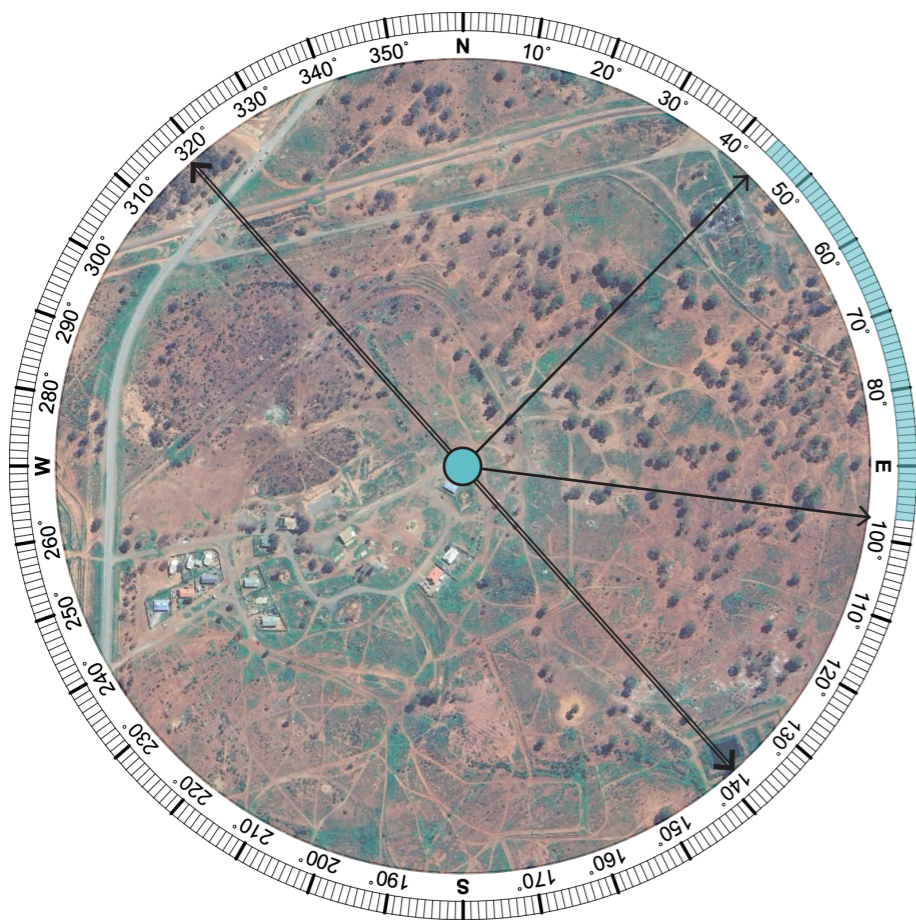
However, surrounding dense vegetation partially fragments or screens views of the Project, reducing its overall visual prominence.

Resulting in a **LOW** visual magnitude of change, leading to an overall **LOW** visual impact.

Viewpoint:
VP03 Nhalpa Drive (PHOTOMONTAGE LOCATION)



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location: Nhalpa Drive	Elevation: 384m
Coordinates: 30°43'49.56"S 121°29'39.40"E	Distance to Project: 8.33km
Viewing Direction: Northeast	

Visual Sensitivity:

Low

Visual Magnitude:

Low

Visual Impact:

Low

→ Extent of Panorama

→ Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint was taken along Nhalpa Drive, on the eastern side of Ningamia Community.

Scattered vegetation is visible in the middle-ground and background. Abandoned car wrecks and scattered litter waste is visible throughout the view.

The visual sensitivity of this viewpoint has been rated as **LOW**.

Potential Visual Impact:

The viewpoint is located approximately 8.33 km from the Project, where wind turbines have the potential to be visible to the viewer with a clear line of sight.

However, surrounding vegetation screens views in the direction of the Project, making any wind turbines hard to discern.

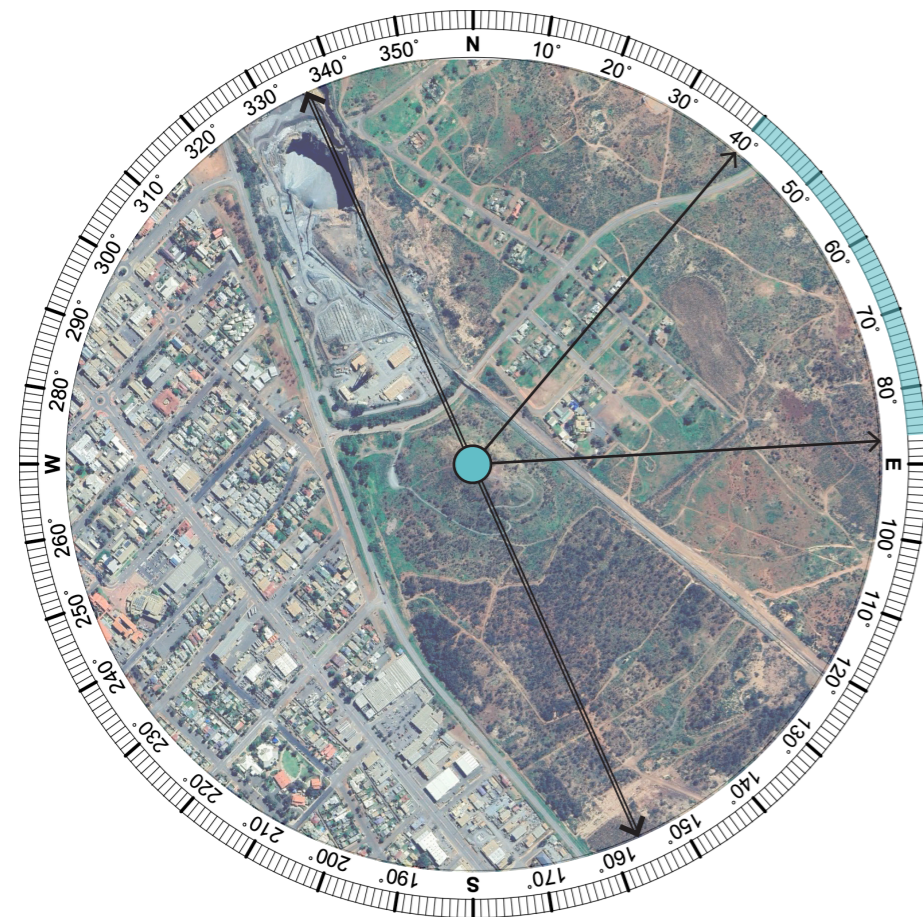
Therefore, the visual magnitude of change is **LOW**, resulting in a **LOW** visual impact.

Viewpoint:

VP04 Mt Gleddon, Williamstown Road (PHOTOMONTAGE LOCATION)



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location:	Elevation:
Nanny Goat Hill, Williamstown Road	402m
Coordinates:	Distance to Project:
30°44'52.82"S 121°28'59.58"E	10.15km

Viewing Direction:

Northeast

Visual Sensitivity:

Low

Visual Magnitude:

Low

Visual Impact:

Low

→ Extent of Panorama

→ Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint is located at Mt Gleddon also known as Nanny Goat Hill, a reclaimed indigenous heritage site and lookout situated to the west of Kalgoorlie-Boulder.

From this elevated location, expansive views extend northeast toward the Project. The Super Pit mining site is a prominent visual element in the background, with giant piles of mining waste creating hills that screen views to the far east and southeast.

Scattered vegetation and residential properties are visible in the middle ground, along with additional mining infrastructure to the north.

Although the viewpoint holds high to moderate sensitivity due to its function as a lookout and cultural heritage site, the surrounding landscape is already heavily modified. The dominance of existing mining infrastructure contributes to a high visual adaptability to further change.

Therefore, visual sensitivity of this viewpoint has been rated as **LOW-MODERATE**.

Potential Visual Impact:

The viewpoint is located approximately 10.15 km from the Project, where wind turbines may be visible to the viewer if given a clear line of sight.

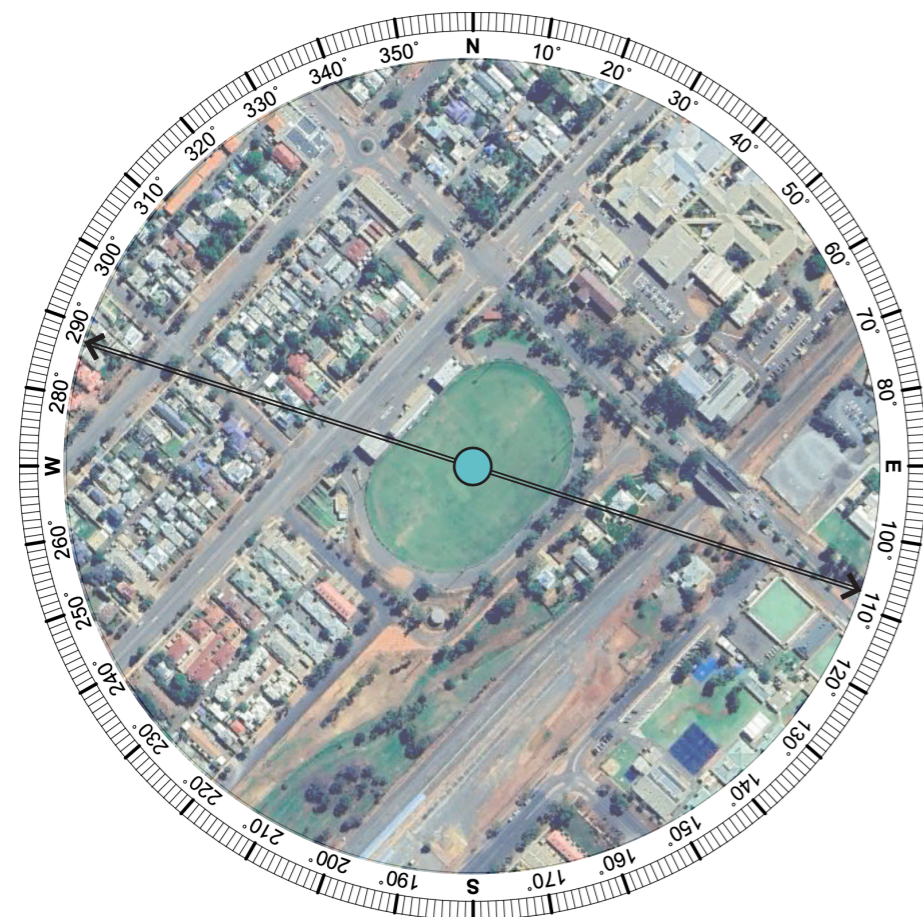
Although elements of the Project are visible from this location, the view is already dominated by existing mining infrastructure, resulting in a highly modified landscape. As such, the introduction of wind turbines is not expected to adversely impact the visual character of the view, which has already been significantly influenced by industrial development.

The visual magnitude of change is **LOW**, resulting in a **LOW** visual impact.

Viewpoint:
VP05 Sir Richard Moore Oval, Piccadilly WA



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location: Sir Richard Moore Oval, Piccadilly WA
Elevation: 385m

Coordinates: 30°44'33.67"S, 121°28'5.15"E
Distance to Project: 11.2km

Viewing Direction: Northeast

Visual Sensitivity: Low

Visual Magnitude: Negligible

Visual Impact: **Negligible**

→ Extent of Panorama
→ Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint was taken at Sir Richard Moore Oval, a sports field in Kalgoorlie-Boulder providing key recreational space used by the community.

Cleared playing fields immediately surround the viewpoint, with screening vegetation and built structures visible in the background.

The visual sensitivity of this viewpoint has been rated as **LOW-MODERATE**.

Potential Visual Impact:

The viewpoint is located approximately 11.2 km from the Project, where wind turbines have the potential to be visible to the viewer with a clear line of sight.

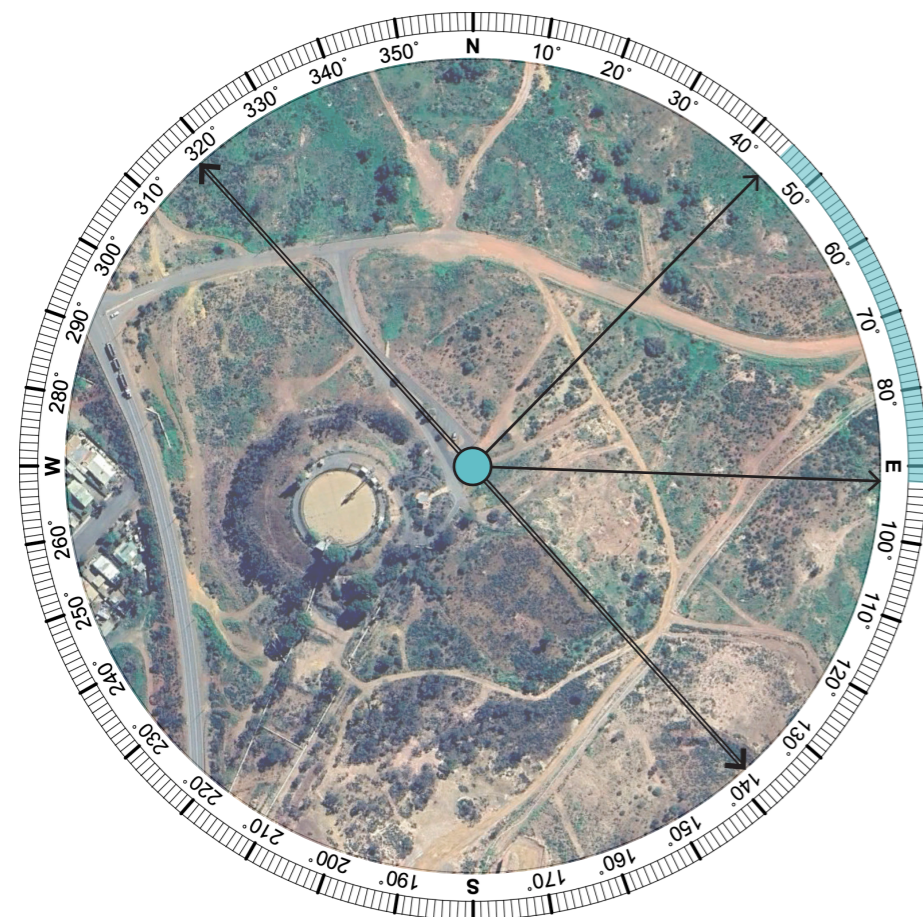
However, surrounding vegetation and built elements to the north screen any potential views of the Project.

Therefore, the visual magnitude of change is **NEGLIGIBLE**, resulting in a **NEGLIGIBLE** visual impact.

Viewpoint:
VP06 Mt Charlotte Reservoir and Lookout, Williamstown WA (PHOTOMONTAGE LOCATION)



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location:	Elevation:
Mt Charlotte Reservoir and Lookout, Williamstown WA	410m
Coordinates:	Distance to Project:
30°44'17.25"S 121°28'46.11"E	9.98km

Viewing Direction:

Northeast

Visual Sensitivity:

Low

Visual Magnitude:

Low

Visual Impact:

Low

- Extent of Panorama
- Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint was taken at Mount Charlotte Reservoir and Lookout, situated at the northeastern edge of Kalgoorlie-Boulder.

Expansive views to the northeast overlook spinefex and salt bush shrubland. Mining infrastructure is a prominent visual element in the background, with giant piles of rock waste forming hills that screen views to the north and southeast.

A telephone communication town is visible to the northeast, in the direction of the Project.

Although the viewpoint holds a moderate sensitivity due to its function as a lookout, the surrounding landscape is already heavily modified. The dominance of existing mining infrastructure contributes to a high visual adaptability to further change.

Therefore, visual sensitivity of this viewpoint has been rated as **LOW**.

Potential Visual Impact:

The viewpoint is located approximately 9.98 km from the Project, where wind turbines may be visible to the viewer given a clear line of sight.

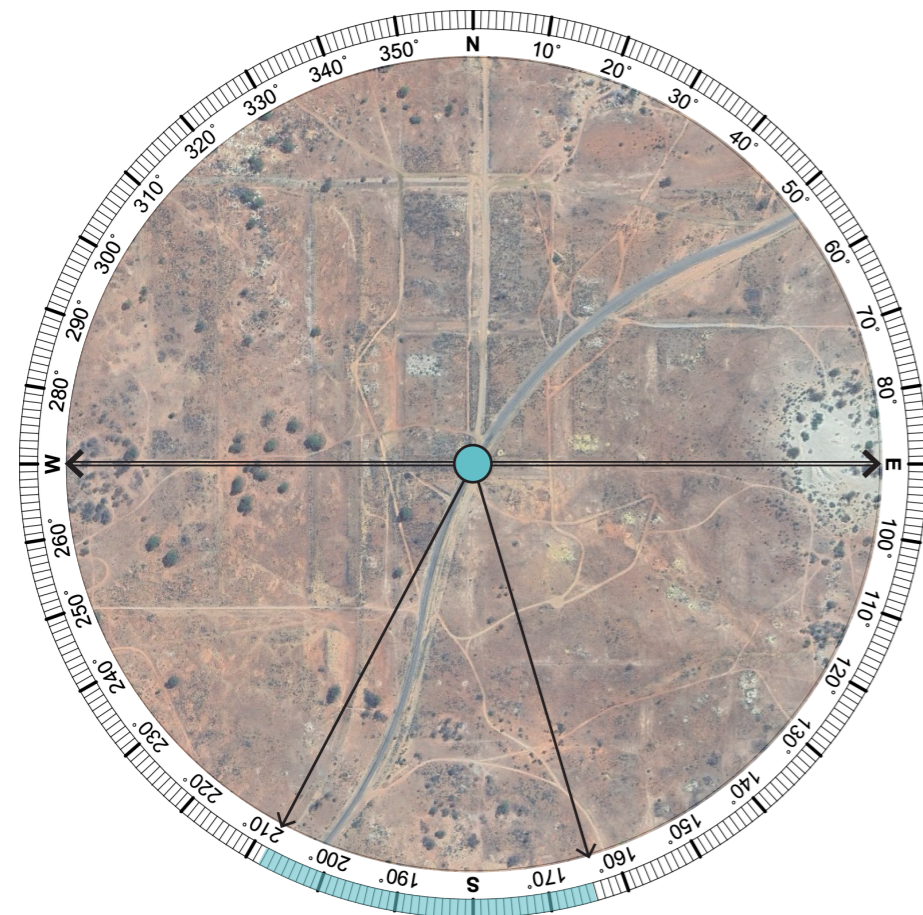
Although the Project will be visible from this location, the view is already dominated by existing mining infrastructure, resulting in a highly modified landscape. As such, the introduction of wind turbines is not expected to adversely impact the visual character of the view, which has already been significantly influenced by industrial development.

The visual magnitude of change is **LOW**, resulting in a **LOW** visual impact.

Viewpoint:
VP07 Kanowna Ghost Town, Kanowna WA



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location:	Elevation:
Kanowna Ghost Town, Kanowna WA	379m
Coordinates:	Distance to Project:
30°36'31.30"S 121°36'11.43"E	6.14km

Viewing Direction:

South

Visual Sensitivity:

Moderate

Visual Magnitude:

Low

Visual Impact:

Low

Existing Landscape Character Description:

This viewpoint is located at the entrance to Kanowna Ghost town and heritage trail, specifically at the intersection of Yarri Road and Isabella Street.

The land immediate surrounding the viewpoint had been cleared of trees, leaving low-lying saltbush and spinifex shrubland. Dense vegetation is visible in the background to the southwest. The topography is gently undulating, with a small rise visible in the background to the southeast.

The visual sensitivity of this viewpoint has been rated as **MODERATE**.

Potential Visual Impact:

The viewpoint is located approximately 6.14 km from the Project, where wind turbines may be visible to the viewer given a clear line of sight.

However, scattered vegetation in the background will likely fragment views of any wind turbines.

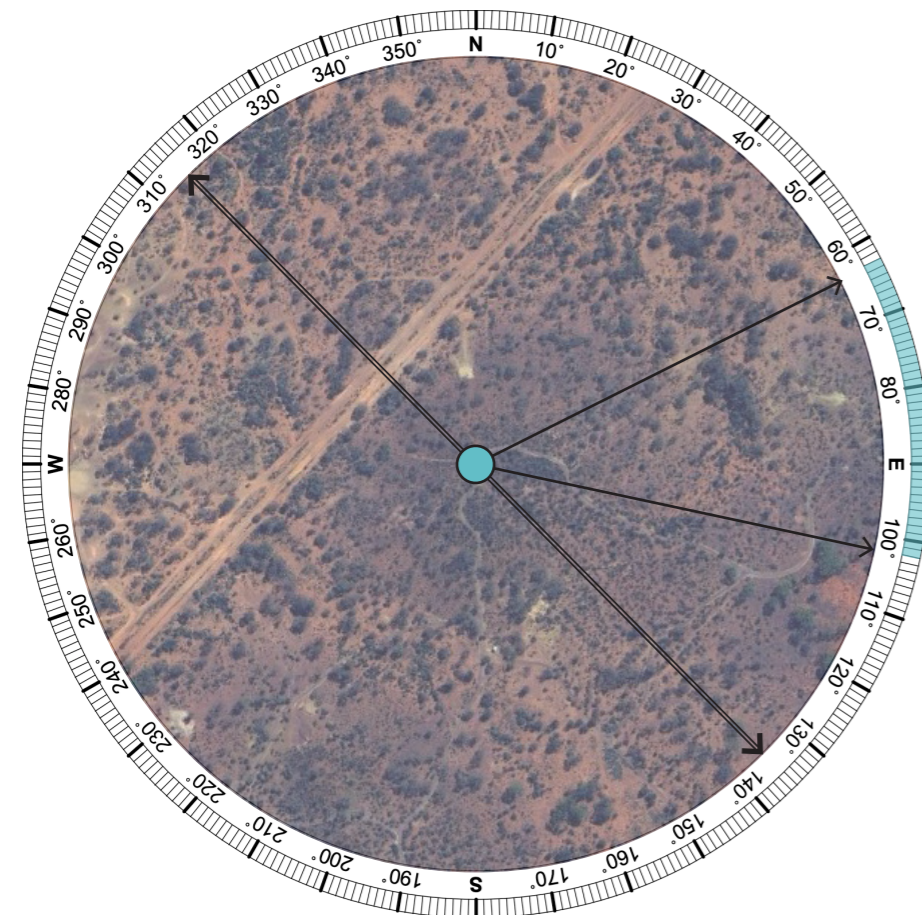
The visual magnitude of change is **LOW**, resulting in a **LOW** visual impact.

Aerial Source: Google Earth, 2024

Viewpoint:
VP08 Katunga Lookout, Karlkurla Bushland WA



Extent of Potential Visibility Approx. Location of Project



Viewpoint Summary:

Location:	Elevation:
Katunga Lookout, Karlkurla Bushland WA	410m
Coordinates:	Distance to Project:
30°42'38.85"S 121°27'2.53"E	11.75km

Viewing Direction:
Northeast

Visual Sensitivity:
Moderate

Visual Magnitude:
Negligible

Visual Impact:
Low

→ Extent of Panorama
 → Approximate Extent of Project

Aerial Source: Google Earth, 2024

Existing Landscape Character Description:

This viewpoint was taken at Katunga Lookout, located along the Karlkurla Bushland's walking track.

With the elevated outlook, the lookout offers expansive views over a mix of acacia shrublands, and eucalyptus open forests in the background. Casurina shrubs to the east partially screen some views.

Mining infrastructure is visible in the background of the view to the far southeast.

The visual sensitivity of this viewpoint has been rated as **Moderate**.

Potential Visual Impact:

The viewpoint is located approximately 11.75 km from the Project, where wind turbines may be visible to the viewer given a clear line of sight.

However, scattered vegetation to the east will likely fragment views of the wind turbines. Additionally, mining infrastructure is an existing feature in the background of the view.

Therefore visual magnitude of change is **Negligible**, resulting in a **NEGLIGIBLE** visual impact.

7.0 Photomontages

7.1 Overview of Photomontages

The NWFD define a photomontage as a composite image made by combining elements of real imagery with 3D digitalisation (Environment Protection and Heritage Council 2010).

A photomontage combines a photograph of an existing view with a computer-rendered image of a proposed development. It illustrates 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 photographs of the existing landscape, it is important to stress that they are not a substitute for visiting a viewpoint in the field. They are only one tool to aid visual assessments. 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.

7.1.1 Wireframes

A wireframe is a computed image generated based on a digital terrain model that indicates the 3D shape of the landscape in combination with additional elements. It is a valuable tool in the wind farm LVIA process as it allows the assessor to compare the turbines' position and scale to the existing landscape view (Scottish Natural Heritage 2017). Wireframe images are a worst-case scenario as they do not consider factors such as vegetation or building structures.

Wireframe diagrams are utilised in this LVIA to verify photomontage accuracy.

7.1.2 Limitations

Visualisations can never provide the complete picture of potential visual impacts as they only inform the assessment process by which judgements are made. Visualisations of wind farms and the Proposal have several limitations that should be considered when using them to form a decision on a Proposal.

As noted in the Visual Representation of Wind Farms Guidance (VRWFG) published by the Scottish Natural Heritage (SNH) - these include:

- A visualisation can never show precisely what the wind farm will look like in reality due to factors such as different lighting, weather and seasonal conditions, which vary through time and the resolution of the image;
- The images provided give a reasonable impression of the scale of the turbines and the distance to the turbines, but can never be 100% accurate;
- A static image cannot convey turbine movement, flicker, or the sun's reflection on the blades as they move. (Scottish Natural Heritage 2017)

7.2 Photomontage Selection

Six (6) viewpoints (VP01 - VP06) have been selected to prepare photomontages that best illustrate the potential appearance of the Proposal from varying distances and locations with differing views (refer to **Figure 16**). Exact photomontage locations were selected following detailed analysis to represent the views with the highest magnitude of change in combination with the varying distances mentioned above. Localised screening factors such as vegetation were avoided (where possible) to ensure maximum exposure to the Proposal.

Refer to **"Appendix A"** for detailed photomontage package and Project visualisations.

7.3 Photomontage Development Methodology

The process for generating the photomontages involves computer generation of a wire-frame perspective view of the Proposal and the topography from each viewpoint. **Figure 15** demonstrates the process of photomontage development.

The photomontages are based on Proposal parameters outlined in Section 3.3. Moir LA has prepared the photomontages using the most current available version of Wind Pro software using the following process:

STEP 1: Develop 3D Model

In Wind Pro, a detailed 3D Model of the Site is developed. The WTGs, PV Array, BESS 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 the EXIF properties of the file are inserted automatically, defining all relevant visualisation information, such as the type of camera lens used, the field of view for panoramas, and the position and direction. Topography, control points, obstacle objects, and existing wind masts can be used as references to calibrate the camera model very precisely.

STEP 3: Render Photomontage

The software calculates the sun's position based on the photograph's time and date and renders the wind turbines according to the specific weather conditions and the sun's position. Once rendered, detailed removal of intervening elements (such as vegetation) is undertaken to provide an accurate representation of the Proposal.

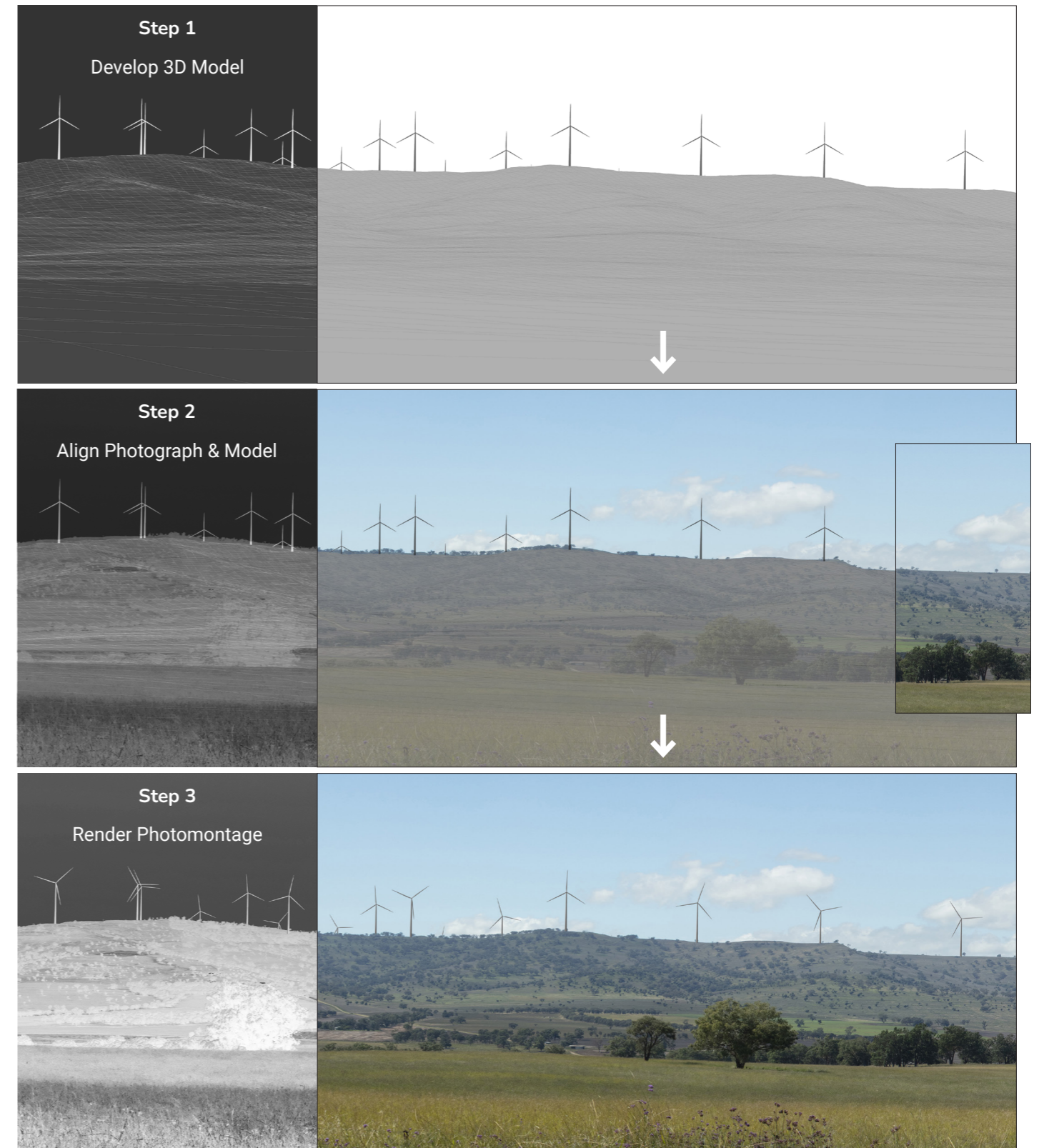


Figure 15 Photomontage Development

Photomontage Locations

Refer to Section 7.2

LEGEND

- Project Area
- WTG_Layout_20250714
- 13.81km from the nearest WTG
- 5.52km from the nearest WTG
- 2.76km from the nearest WTG
- Photomontage Locations
- Solar Farm
- Highways
- Main Roads
- Roads

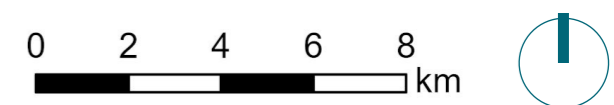
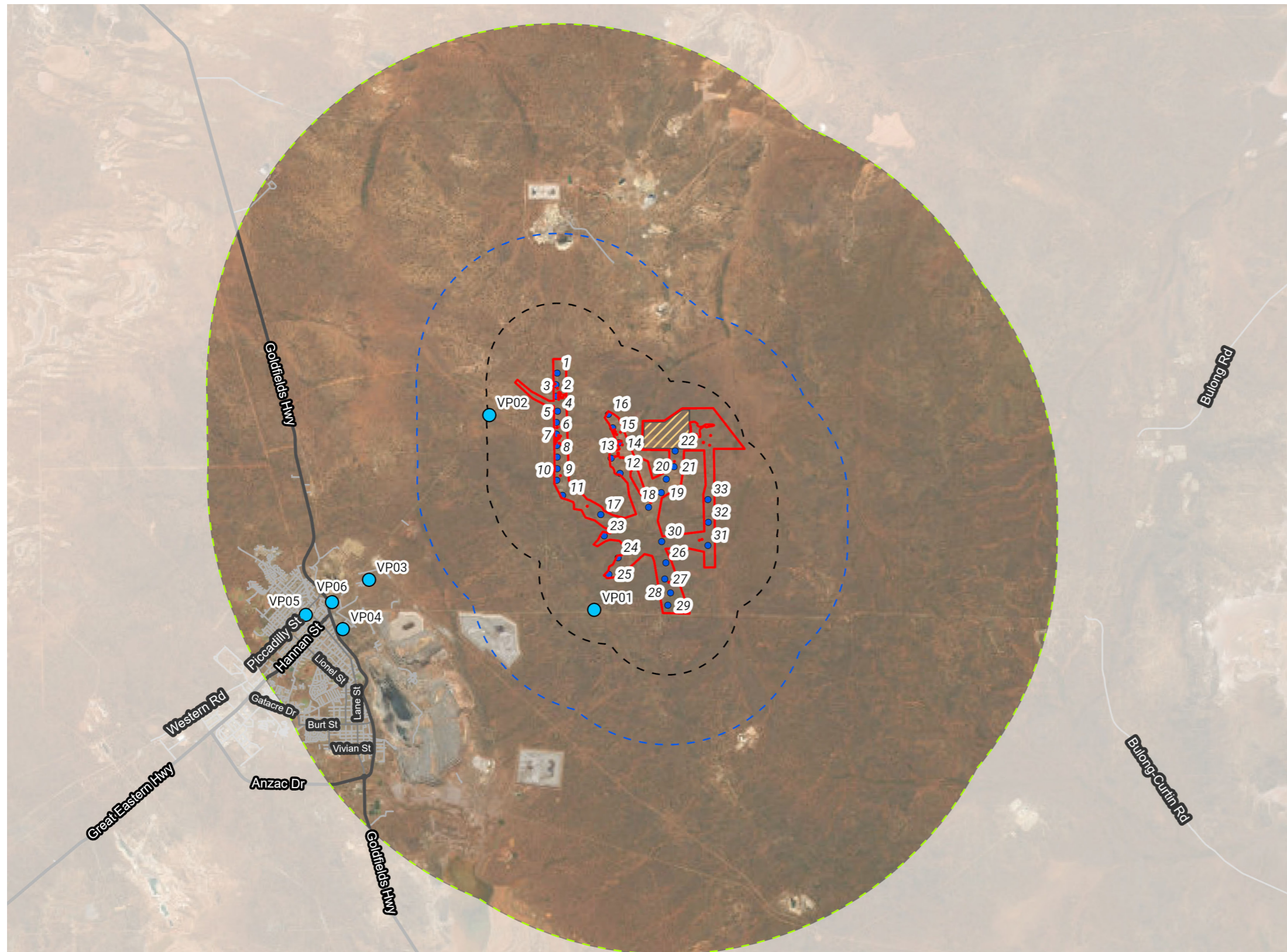


Figure 16 Photomontage Locations
 Basemap Source - ESRI, 2025

8.0 Associated Infrastructure

8.1 Overview of Associated Infrastructure

The proposal includes a Battery Energy Storage System (BESS) and associated infrastructure, including a connection to an existing overhead transmission line that intersects the southern boundary of the site. Additional elements include hardstands around the turbines, perimeter fencing, meteorological masts, communication towers, and a site operations and maintenance facility. These components are significantly smaller in scale compared to the turbines and are expected to have a negligible visual impact.

9.0 Assessment of Solar Farm

9.1 Overview of Solar Farm

The proposed PV Array details have not been provided at the time of this report. However, the height of a typical PV Array is approximately 3-5 m. For the purposes of the assessment, a worst-case scenario of 5m height has been used.

9.2 Potential Visual Impact from Solar Farm

Due to the Project's remote siting, visibility of the Solar Farm infrastructure is considered unlikely. The closest public viewpoints are along the travel corridors of Yarri Road and Bulong Road.

As demonstrated in the viewpoint analysis for VP01 and VP02 (refer to Section 6.0), views toward the Solar Farm are expected to be screened by existing vegetation.

Therefore, the potential visual impacts of the Solar Farm on surrounding road corridors and the overall landscape character are assessed as negligible.

10.0 Night Lighting

10.1 Overview of Night Lighting

The following section of the report assesses the visual impacts of the Proposal's potential night lighting. Night lighting has the potential to alter the nighttime landscape of the region. Potential light sources include:

- Aviation Hazard Lighting (AHL) on nacelle of wind turbines.
- Night lighting for safety and security on ancillary structures.

10.2 Aviation Hazard Lighting

The requirement of aviation hazard lighting (AHL) on wind turbines for the Proposal is subject to the advice of the Civil Aviation Safety Authority (CASA). CASA generally recommends nightlighting if an obstacle exceeds 160 metres above ground level, which the Proposal does exceed.

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

- Two flashing red medium-intensity obstacle lights should be provided per turbine where required.
- The light fixtures should be mounted sufficiently above the surface of the nacelle so that the rotor hub does not obscure the lights and is at a horizontal separation to ensure an unobstructed view of at least one of the lights by a pilot approaching from any direction.
- Sufficient individual wind turbines should be lit to indicate the extent of the group of turbines.
- The interval between obstacle-lighted turbines should not exceed 900m, and the most prominent (highest for the terrain) turbine(s) should be lit. (*Civil Aviation Safety Authority 2022; Australian Government & Civil Aviation Safety Authority 2019*)

Representative images of aviation lighting (installed in August 2020) on turbines at Biala Wind Farm (BWF) NSW, have been included to best illustrate the potential visual appearance of aviation lighting.

This report includes photographs of aviation lighting at varying distances and times. **Image 15** - **Image 17** illustrate the appearance of night lighting on a dark rural landscape at intervals after sunset.

It is to be noted that the Aviation Impact Assessment for this Proposal has been prepared by others - refer to supporting environmental reports for detailed aviation impact results.



Image 15 View towards BWF - 2.0 km from turbine (30 minutes after sunset)



Image 16 View towards BWF - 1.75 km from turbine (45 minutes after sunset)

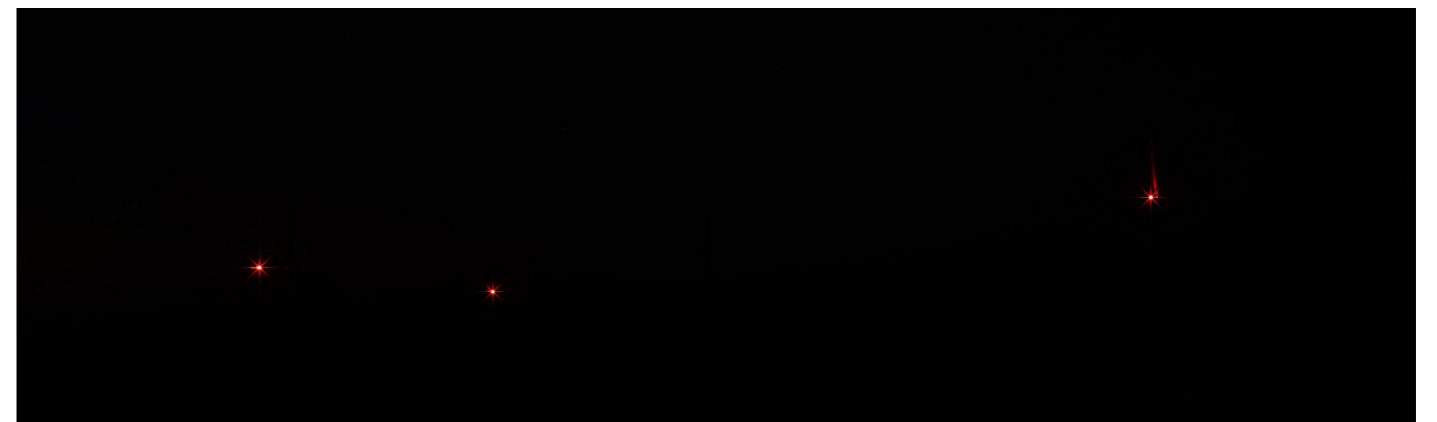


Image 17 View towards BWF - 1.85 km from turbine (60 minutes after sunset)

Turbines with Obstacle Light

Turbines with Obstacle Light



Image 18 View towards BWF - 3.5 km from WTG

Turbines with Obstacle Light

Turbines with Obstacle Light



Image 20 View towards BWF - 8.5 km from WTG



Image 19 View at night towards BWF - 3.5 km from WTG

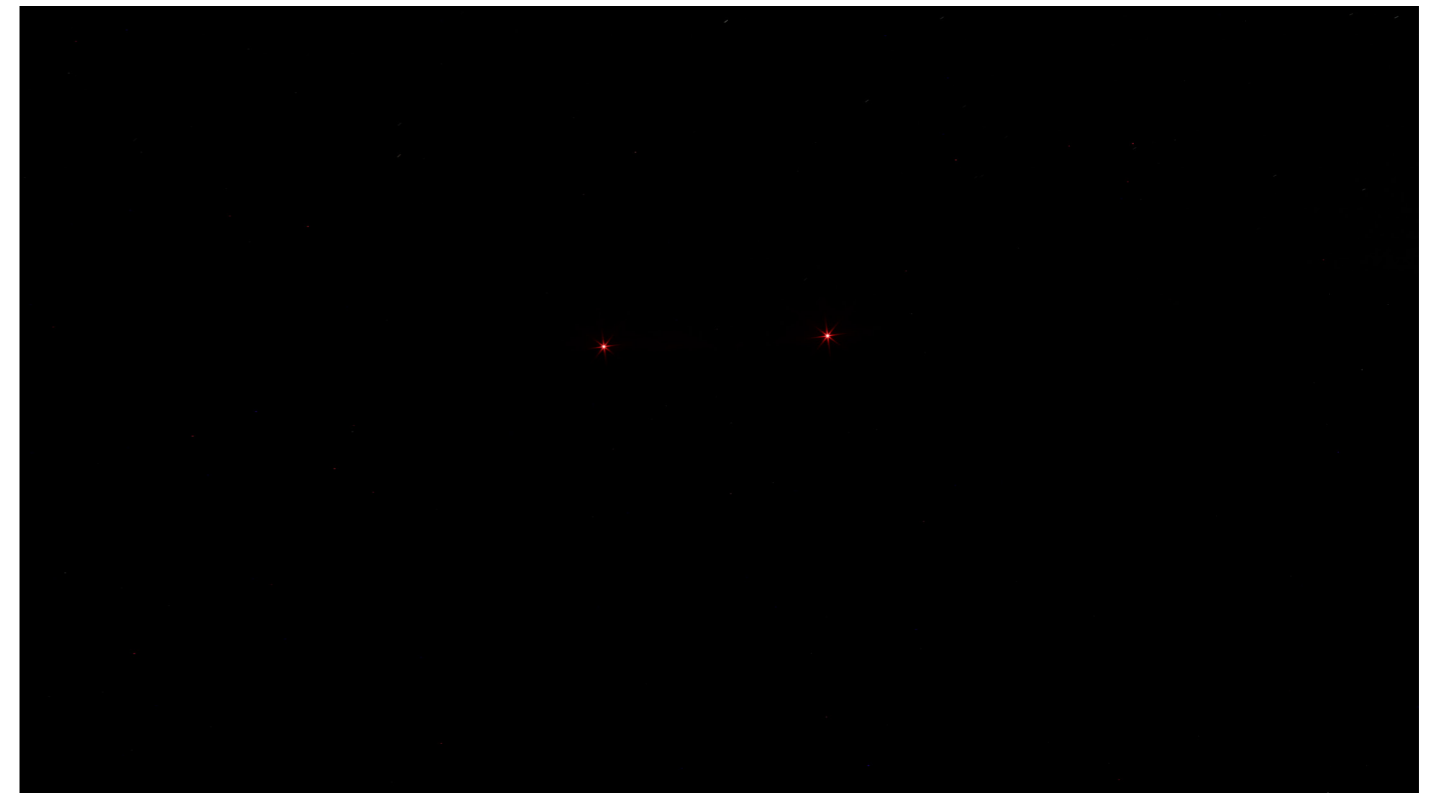


Image 21 View at night towards BWF - 8.5 km from WTG

10.3 Nightlighting Impacts

Night lighting of turbines and associated infrastructure has the potential to extend the visual effect into the night. Aviation hazard lighting on WTGs can be visible from distances in excess of 20 kilometres (*Scottish Natural Heritage 2017*). However, the distance depends on a number of variables, including light intensity, topography, vegetation coverage, and climatic conditions.

Due to the Proposal's isolated location, minimal existing lighting sources are present in the night-time landscape of the Study Area outside the extent of mining activities and infrastructure. Some existing lighting is associated with motor vehicles and machinery dispersed along roads and service roads within the Study Area. Isolated receptors within the Study Area experience a night sky with minimal light sources. Currently, the town of Kalgoorlie-Boulder and the adjacent Superpit mine is a significant light source in the region as the mine operates 24/7.

The most visual impact will likely be on people who experience the outdoor night landscape. Aviation lighting can impact receptors that view the landscape at night, particularly night sky enthusiasts, photographers, stargazers, campers, and some landowners with potential visibility of the turbine hub.

The visual impact of potential aviation lighting could be reduced by employing mitigation methods outlined in **Section 10.4**. Considering the high elevation of the turbines and the implementation of shields; the visible light will likely be reduced to ambient lighting instead of direct visibility of the light when viewed from proximity.

10.4 Mitigation Recommendations

To assist in the amelioration of the effect of Aviation Hazards Lighting on wind turbines the following should be applied:

- 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 turbines 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 (Refer to Figure 17); and
- No light should be emitted at or below 10° below horizontal. (*Australian Government & Civil Aviation Safety Authority 2019*)

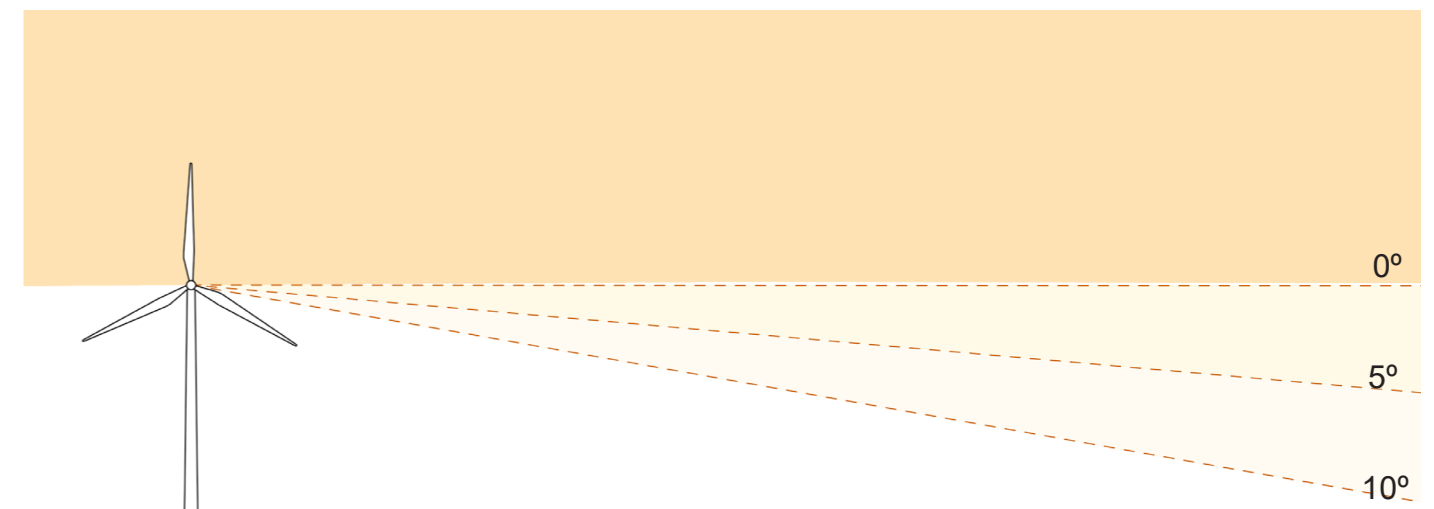


Figure 17 Recommended Light Shielding to reduce Lighting Spread

11.0 Recommendations and Summary

11.1 Conclusion

The purpose of this LVIA is to provide a quantitative assessment of the visual impacts resulting from the Proposal and recommendations for reducing potential visual impacts to an acceptable level.

The general character of the Study Area can be categorised as expansive arid woodlands and shrublands utilised primarily for grazing with extensive mining operations scattered throughout the local region. The town of Kalgoorlie-Boulder is the main settlement in the area and features a heavily industrialised character, marked by prominent man-made hills associated with the Super Pit mine site.

The landscape was categorised into four (4) Landscape Character Units (LCUs), identified as -

- Town
- Mining and Infrastructure
- Arid Woodland and Shrubland
- Dry Salt Lakes

The LCU's were used as a framework to assess the Project's visual impact on the overall landscape character of the Study Area. For each LCU, the landscape's sensitivity to change and magnitude of the Proposals impact was assessed.

A combination of factors, including the Project's remote location, the presence of mining infrastructure creating an industrialised landscape near key viewpoints, and the visual screening provided by existing woodlands – Means that the Project will have an overall LOW impact on the surrounding landscape character.

Eight (8) public viewpoints locations were selected and assessed as part of the LVIA. These included the following significant viewing locations:

- The town of Kalgoorlie-Boulder and various lookouts and recreations facilities along the towns north and northeastern edge (including Mt Charlotte and Katunga Lookout)
- The Kanowna Heritage Trail, exploring Kanowna Ghost Town, a tourist site of regional importance.

The assessment concluded that the Project's visual impact from these locations is expected to be minimal, as existing mining infrastructure already features prominently in most views from the Kalgoorlie-Boulder township. As such, the introduction of the Project is not expected to significantly alter the character of the landscape or affect visual amenity.

Furthermore, due to the Project's isolated location, any potential visibility from these viewpoints will occupy only a small portion of the field of view, often receding into the distant background or being

screened by intervening elements such as vegetation.

While Yarri Road and Bulong Road may offer closer-range views of the Project, these are expected to be fleeting due to the transient nature of travel along road corridors and the presence of existing vegetation, which helps to fragment and obscure views.

Overall, of the eight public viewpoint locations assessed as part of the LVIA, all were determined to experience a NEGLIGIBLE to LOW level of visual modification.

As the Proposal results in a low visual modification overall, no additional mitigation measures are required to reduce the visual impact to an acceptable level. However, good design principles employed through the detailed design and construction phases can significantly reduce the visual effects of the Proposal, including associated infrastructure. These considerations include:

- Existing vegetation generally present around the Proposal Boundary is to be retained and protected to maintain the existing level of screening;
- Consider the height and scale of the associated infrastructure to ensure the components do not contrast with the surrounding landscape and integrate with the existing electrical and mining infrastructure. The colours of the components, including the WTGs, will need to be considered in the detailed design phase to ensure minimal contrast, help blend into the surrounding landscape to the extent practicable, and remove the opportunity for a glint; and
- Where possible, the extent of overhead transmission infrastructure should be minimised, and underground transmission lines should be utilised to remove visual concerns.

After conducting the LCA and VIA for the Proposal, it is concluded that, due to its siting and relationship to adjoining LCUs, it could be undertaken whilst maintaining the key landscape character features of the area.

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Appendix A

Photomontages





Kalgoorlie Wind Farm

Photomontage

Kalgoorlie Wind Farm

Photomontage

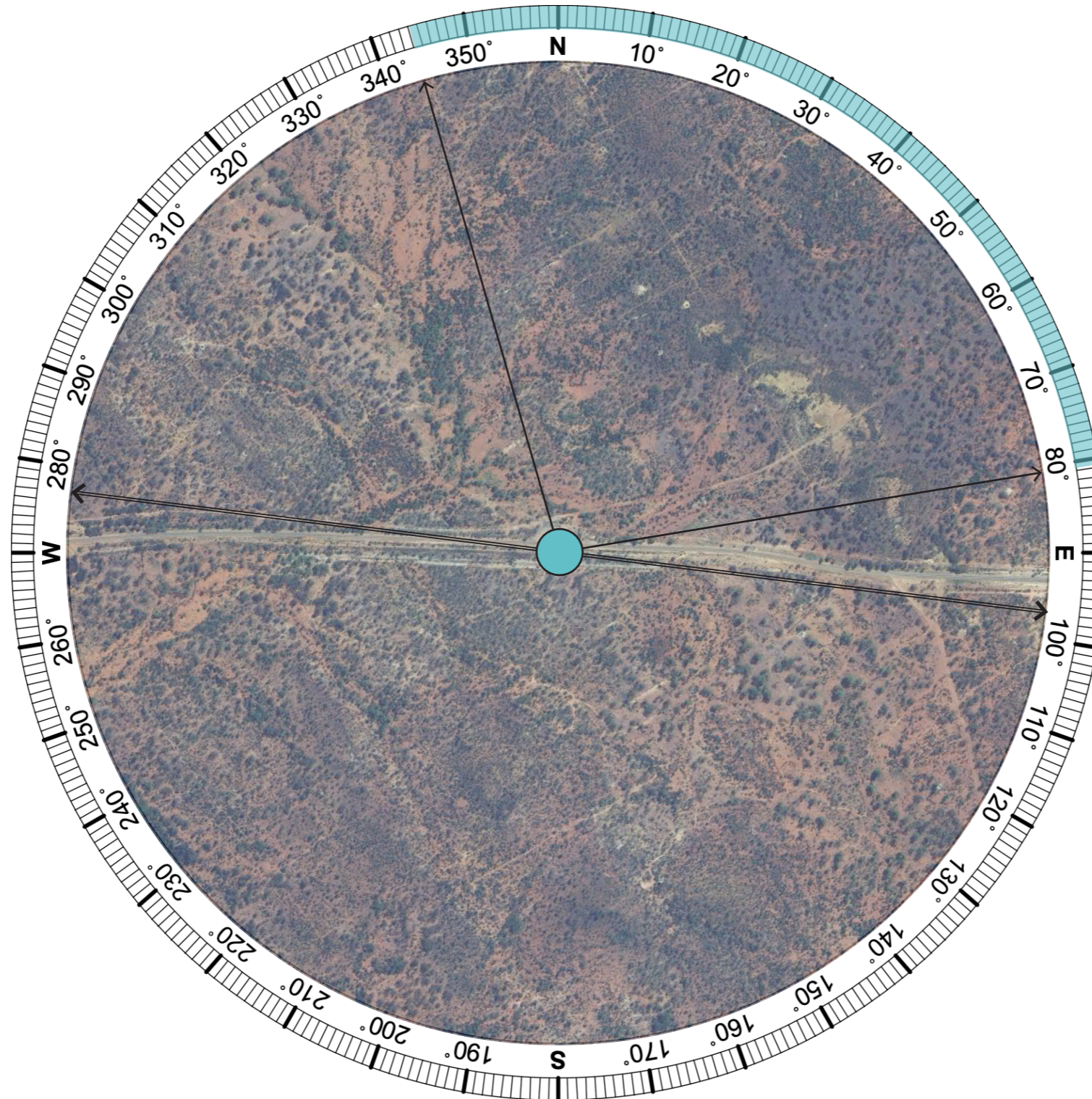
Prepared for
CDM Smith Australia

Project Number
2750

Revision	Date	Author	Checked	Comment
A	28/07/25	HW	TC	For Review

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ACN: 097 558 908
ABN: 48 097 558 908

Photomontage:
VPA05



Summary:

Location:

Bulong Road

Coordinates: Distance to Project:

30°44'32.13"S 1.54km
121°35'13.79"E

Viewing Direction: Elevation:

North 392m

Turbine Tip Height Turbine Hub Height

241m 150m

Viewpoint Date & Time:

14th July 2025 9:11am




WTG Layout used:

20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:

25th July 2025

LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Project

Photomontage:
VPA05 Bulong Road

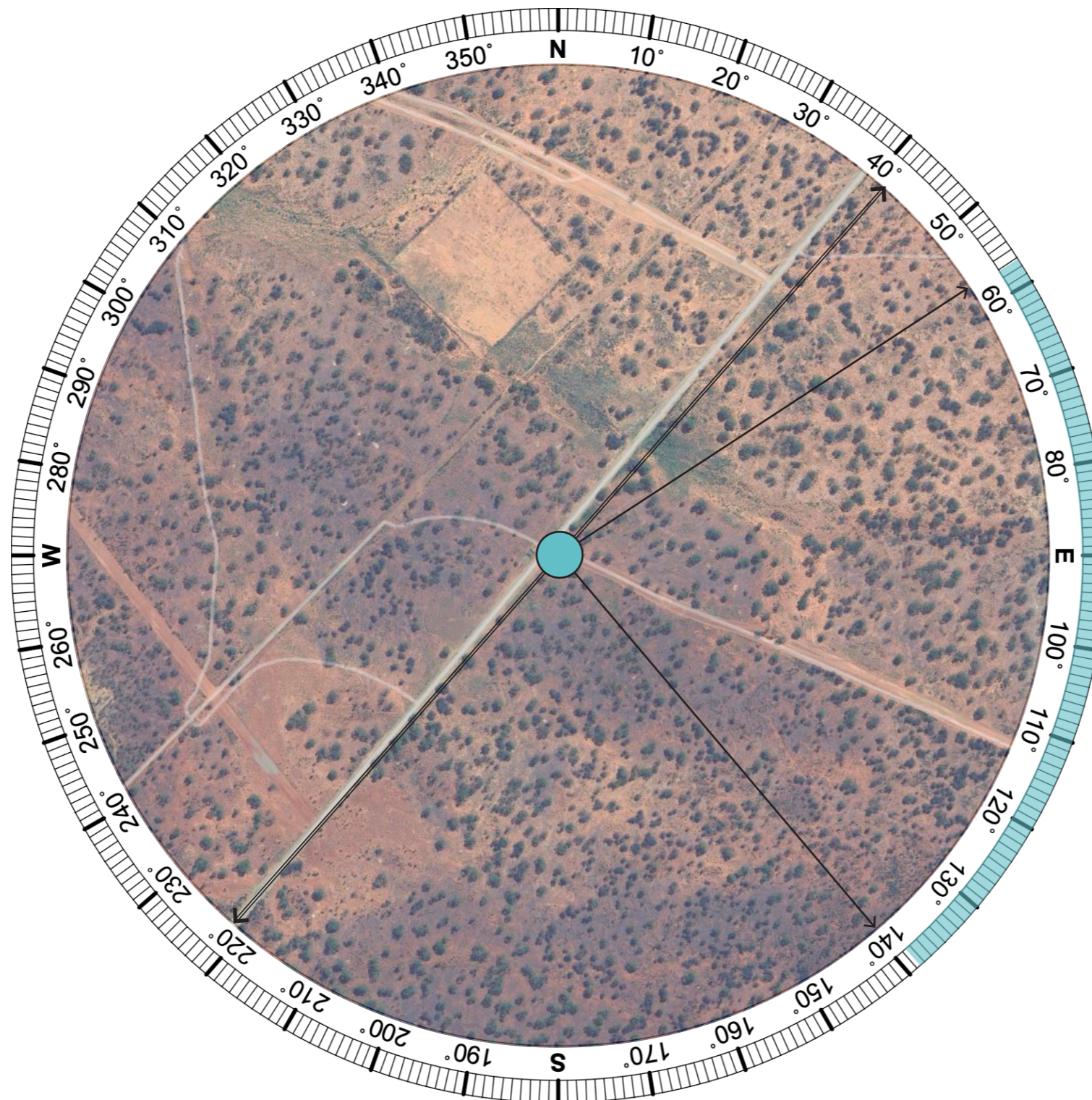


180° Existing View



180° Proposed View

Photomontage:
VPA11



Summary:

Location:

Yarri Road

Coordinates: Distance to Project:

30°40'20.17"S 2.67km
121°32'41.30"E

Viewing Direction: Elevation:

Southeast 386m

Turbine Tip Height Turbine Hub Height

241m 150m

Viewpoint Date & Time:

14th July 2025 9:11am




WTG Layout used:

20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:

25th July 2025

LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Project

Photomontage:
VPA11 Yarri Road

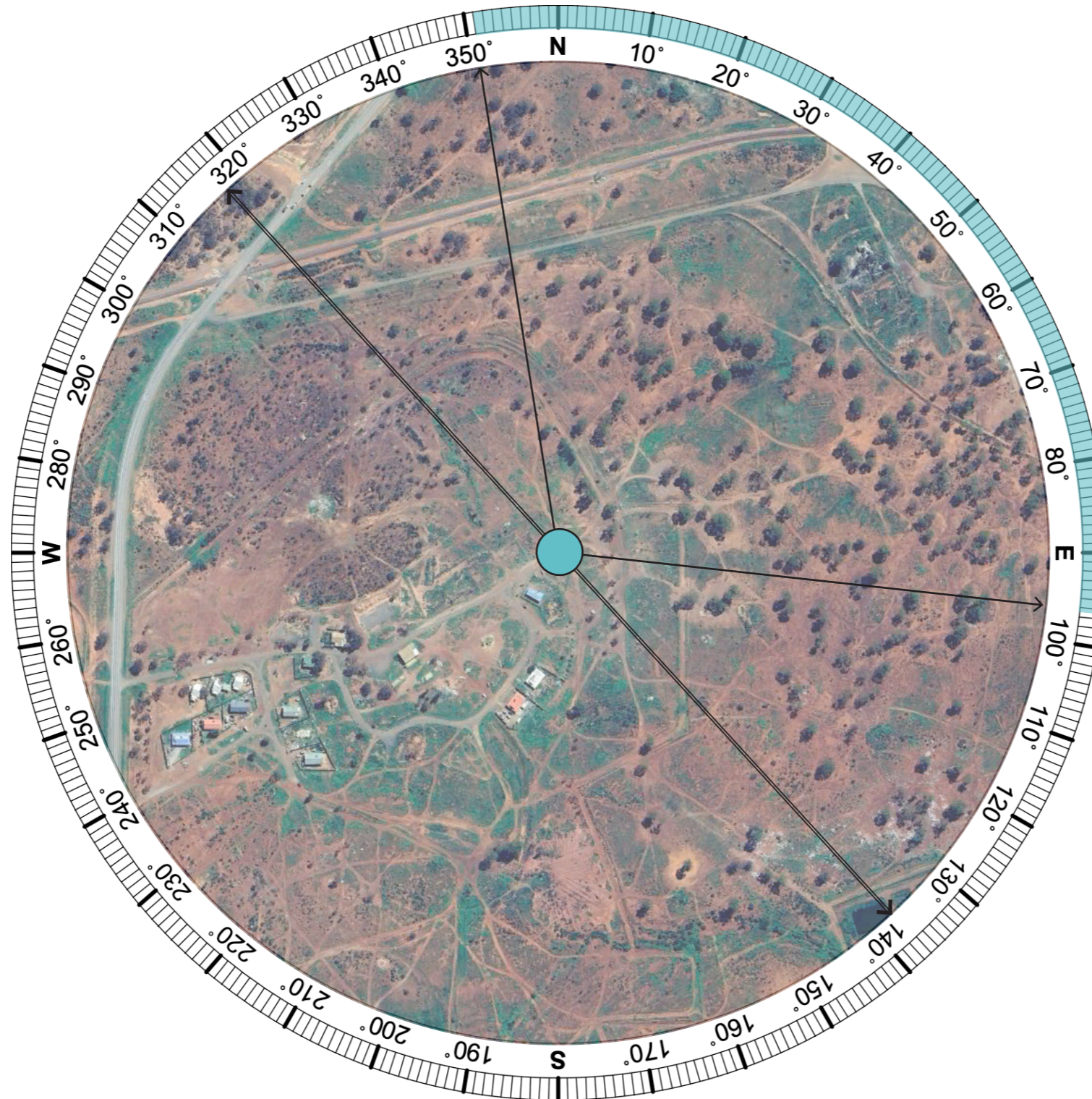


180° Existing View



180° Proposed View

Photomontage:
VPA12



Summary:

Location:

Nhalpa Drive

Coordinates: Distance to Project:

30°43'49.56"S 8.33km
121°29'39.40"E

Viewing Direction: Elevation:

Northeast 384m

Turbine Tip Height Turbine Hub Height

241m 150m

Viewpoint Date & Time:

14th July 2025 9:11am




WTG Layout used:

20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:

25th July 2025

LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Project

Photomontage:
VPA12 Nhalpa Drive

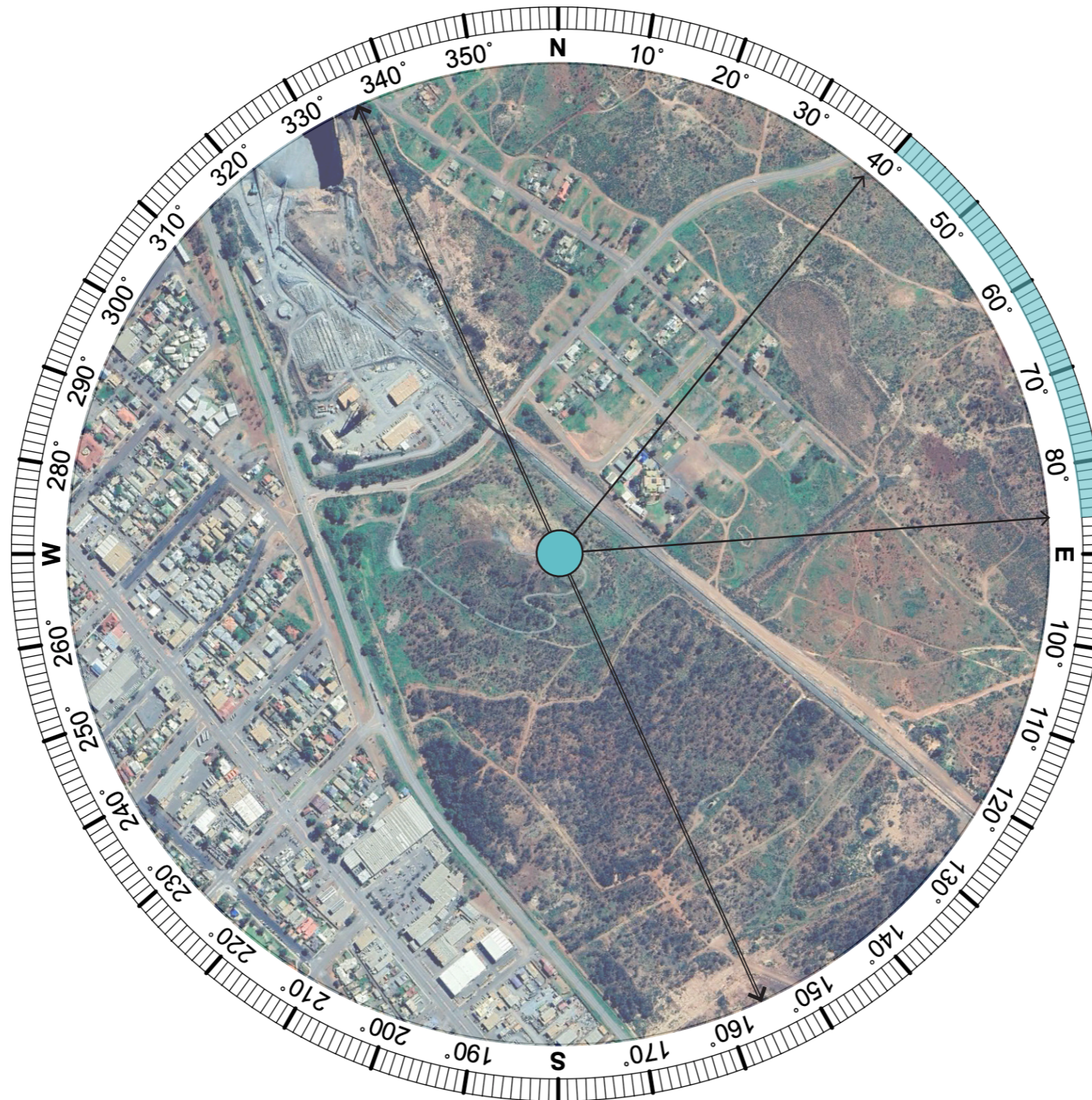


180° Existing View



180° Proposed View

Photomontage:
VPA17



Summary:

Location:

Williamstown Road

Coordinates: Distance to Project:

30°44'52.82"S 10.15km
121°28'59.58"E

Viewing Direction: Elevation:

Northeast 402m

Turbine Tip Height Turbine Hub Height

241m 150m

Viewpoint Date & Time:

14th July 2025 9:11am




WTG Layout used:

20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:

25th July 2025

LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Project

Photomontage:
VPA17 Williamstown Road

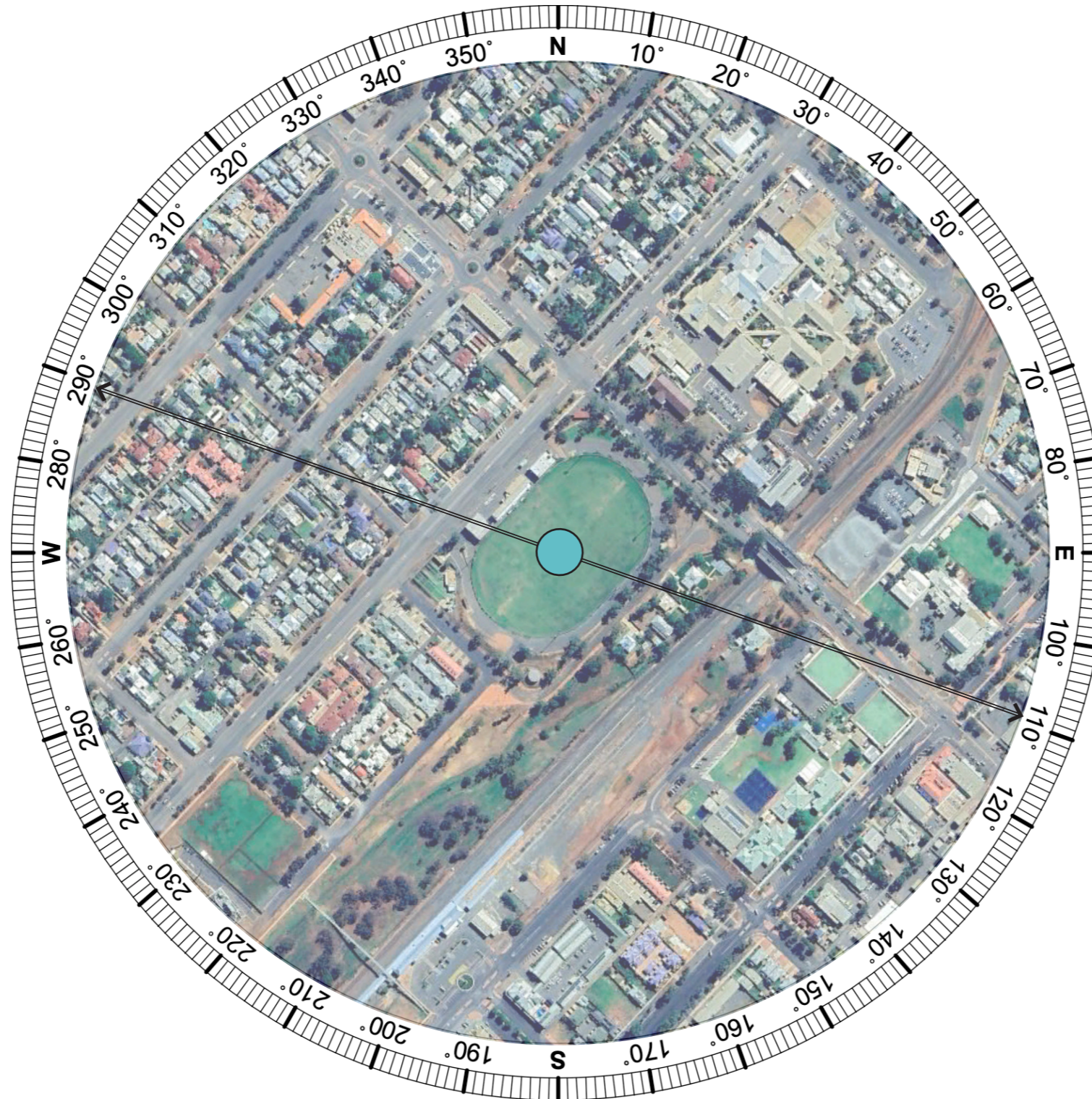


180° Existing View



180° Proposed View

Photomontage:
VPA20



Summary:

Location:

Piccadilly Road

Coordinates:	Distance to Project:
30°44'33.67"S	11.2km
121°28'5.15"E	

Viewing Direction:	Elevation:
Northeast	385m

Turbine Tip Height	Turbine Hub Height
241m	150m

Viewpoint Date & Time:
14th July 2025 9:11am

WTG Layout used:
20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:
25th July 2025

LEGEND

- Extent of Potential Visibility
- Extent of Panorama
- Approximate Extent of Project

Aerial Image Source: ESRI, 2025

Photomontage:
VPA20 Piccadilly Road



180° Existing View



180° Proposed View - No Visibility

Photomontage:
VPA23



Summary:

Location:

Collire Road

Coordinates: Distance to Project:

30°44'17.25"S 9.98km
121°28'46.11"E

Viewing Direction: Elevation:

Northeast 410m

Turbine Tip Height Turbine Hub Height

241m 150m

Viewpoint Date & Time:

14th July 2025 9:11am




WTG Layout used:

20250610 - 24-088 - Layout For Discussion_ptz.shp

Photomontage Preparation Date:

25th July 2025

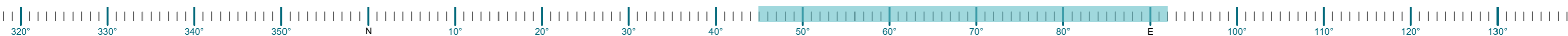
LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Project

Photomontage:
VPA23 Collier Place



180° Existing View



180° Proposed View