

APPENDIX J

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

URBIS

AUGUST 2022

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MT FYANS WIND FARM

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

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17 AUGUST 2022
MD3252A
FINAL
PREPARED FOR WOOLNORTH RENEWABLES

URBIS

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

Director	Peter Haack
Associate Director	Alistair Towers
Senior Consultant	Ashley Poon
GIS Analysts	Danielle Cherubin / Nathaniel Jeffrey / Frida Kalantarian
Project Code	MD3252A
Report Number	Mt Fyans Wind Farm Landscape and Visual Impact Assessment

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1 Introduction

This report responds to the requirement to assess the landscape and visual impacts of the Mt Fyans Wind Farm proposed for development approximately 5 km north-east of Mortlake in the Western District of Victoria (refer to **Figure 1**).

Mount Fyans Wind Farm Pty Ltd proposes to develop a wind farm comprised of a maximum of 81 wind turbines with a power output of 300 – 480 MW. A 220 kV transmission line is proposed to transport electricity from an on-site substation to a grid connection substation next to the Mortlake Terminal Station.

1.1 STUDY OBJECTIVES

The objective of the assessment is to determine the landscape and visual impact of the proposed development with regard to relevant legislation and policy. The project methodology is derived from existing best practice in landscape and visual impact assessment with reference to:

- Local Policy Framework and zoning for Moyne Shire;
- Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria (March 2019);
- Best practice guidelines for implementation of wind energy projects in Australia (Auswind, 2006);
- Wind Farms and Landscape Values: National Assessment Framework (Australian Wind Energy Association and Australian Council of National Trusts, 2007); and
- The Planning and Environment Act 1987.

The landscape and visual amenity assessment has been undertaken in two stages:

- A preliminary assessment of landscape significance to inform the wind farm design process; and
- A detailed assessment as part of the planning and approvals process.

This report relates to the detailed assessment phase.

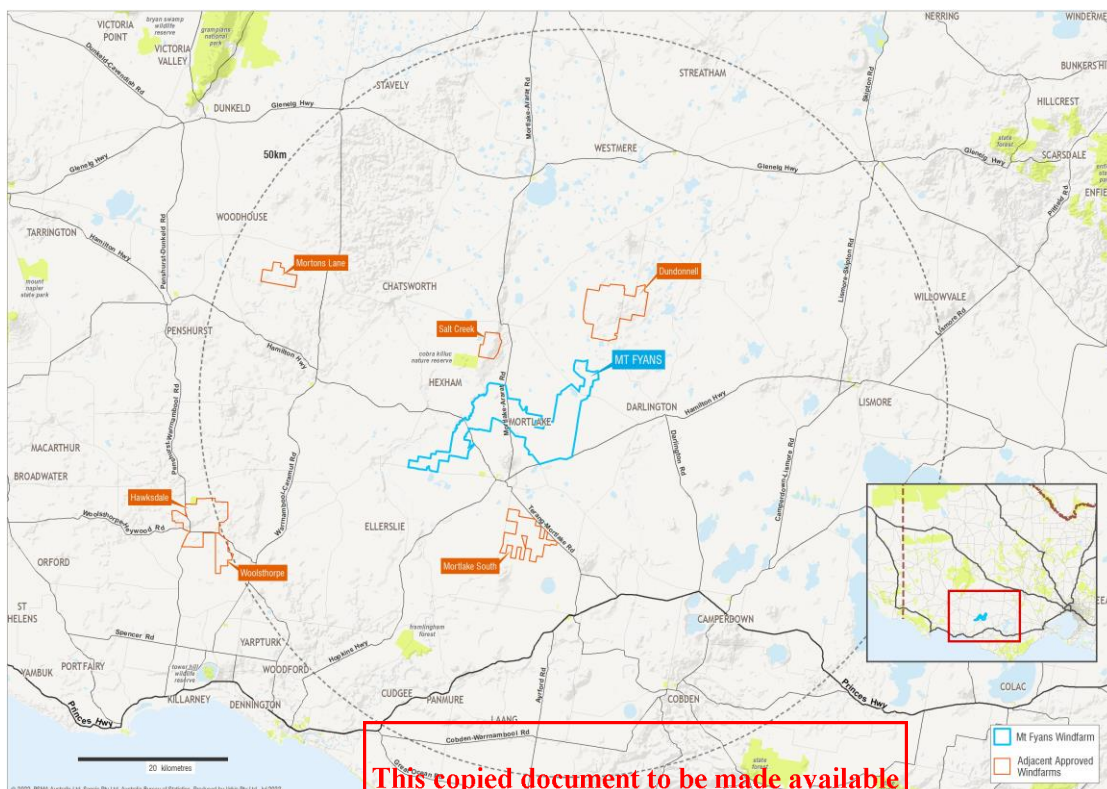


FIGURE 1 – STUDY AREA

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1.2 STUDY REQUIREMENTS

The requirements for the detailed assessment phase of the study include the following:

- Undertake a detailed desktop analysis to assess the landscape and its features and to define key viewing patterns;
- Define the catchment for potential visual and landscape impact for the proposal (e.g. including initial review of current literature on distance thresholds for visual intrusion of wind turbines);
- Review existing landscape studies, National and State policies and guidelines;
- Undertake a landscape analysis of the site and surrounds, (up to approximately 60 km radius of the site) through on-site assessment and survey as well as analysis using ESRI - ARC GIS software. Provide analysis of:
 - Landscape character types and areas;
 - Significant landforms and scenic features; and
 - Culturally significant landscape elements.
- Define landscape character types and cultural landscape significance;
- Undertake a Zone of Visual Impact (ZVI) based on the proposed layout;
- Identify dwellings nearby to the proposed wind farm site;
- Identify and categorise dwellings and sensitive viewing locations based on the presence of surrounding vegetation of varying densities;
- Review and assess at a regional level the potential cumulative impact;
- Define the 'pattern of viewing' of sensitive viewpoints to the wind farm site (e.g. roads / touring routes, townships, dwellings, parks and recreational areas / tourism locations etc.) within the viewshed;
- Preparation of photographic montages of the proposal to assist with the assessment of landscape and visual impacts; and
- Detailed assessment of a range of representative sensitive viewpoints of varying distances from the proposed development and aspect.

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1.3 STUDY METHOD

The method employed by Urbis has been undertaken in accordance with the consultant's brief and requirements of the assessment process. The approach has been based on an analysis of the setting and assessment of the anticipated impacts of the development of the project. The methodology is comprised of a number of components. These are:

- Quantitative Assessment
 - Visual prominence – How prominent is the proposed development within the landscape of the surrounding setting from particular viewpoints, based on distance and extent of project (horizontal and vertical field-of-view occupied)? This approach to assessment is highly conservative, as it does not take into consideration the effects of screening vegetation throughout the landscape as well as vegetation surrounding residential viewpoints (*refer to Section 1.4*).

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▪ Qualitative Assessment

- Taking into account the screening effects of existing vegetation and built-form (*refer to Section 5.4.2*).
- What is the scenic quality of the landscape setting? (*Refer to Section 1.6 and Section 4*).
- Sensitivity – How sensitive will viewers be to the proposed development? (*Refer to Section 1.5*). The approach utilised is conservative, assuming that viewers will respond negatively to wind turbines within the setting. Positive responses to wind turbines as indicated in perceptual studies are not considered (*refer to Section 2*).

While the assessment approach is primarily qualitative, underpinned by the professional experience of the Landscape Architect, quantitative analysis provides additional verification of visual prominence.

1.3.1 APPROACH TO ASSESSMENT

The method employed by Urbis is based on the Visual Management System (VMS) developed by the US Forestry Service whereby the visual impact of a proposed development is determined by evaluating the degree of visual fit of the development in the context of the visual sensitivity of surrounding land use areas from which a proposed development may be visible. The visual impact resulting from the combination of varying levels of visual prominence and visual sensitivity, or viewer sensitivity, is illustrated in **Table 1**.

Level of Visual Impact VL = Very Low, L = Low, M = Moderate, H = High		Viewer Sensitivity		
		H	M	L
Level of Visual Prominence	H	H	H	M
	M	H	M	L
	L	M	L	L
	VL	L	VL	VL
	NA	NA	NA	NA

TABLE 1 – VISUAL IMPACT MATRIX

The Potential Level of Visual Impact reported in **Section 5.7** also incorporates an assessment of the likely view possible from the viewpoint given the surrounding topography and the screening effect of surrounding buildings and vegetation.

Given the diversity of public responses to wind turbines, determination of visual fit, or prominence within a landscape setting is treated as being of a lower relevance to the determination of visual impact than the sensitivity or perception of a viewer.

Given the scale, form and appearance of the wind generators, they do not fit the normal definitions of an industrial form. Their form can best be likened to sculptural elements, often evoking very positive reactions from viewers. This is reflected in the response to studies of viewer perceptions (refer to **Appendix A**). However, conservatively, the approach we have taken is to assume a higher level of sensitivity than indicated within these studies.

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1.4 VISUAL PROMINENCE

Throughout the visual catchment (or Zone of Visual Influence [ZVI]) the degree of visual prominence will generally decrease as the distance from the development site to various viewing locations increases (refer to **Table 2**, **Table 3** and **Table 4** and **Appendix F**).

1.4.1 VISUAL PROMINENCE – RELATIONSHIP WITH VIEWSHEDS

The report defines a number of viewsheds based on distance from the development for the purposes of assessment. The methodology is based on the reduction of impact with an increase in distance between a given viewpoint and the development. The transition between the specified ranges is gradual and not immediate but defines parameters for the assessment process.

Degrees of Field of View Occupied	Potential Visual Prominence – Horizontal Field of View
Less than 5°	Insignificant – Low Visual Prominence The development may not be highly visible in the view unless it contrasts strongly with the background.
5° – 30°	Potentially Noticeable – Moderate Visual Prominence The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 30°	Potentially Dominant – High Visual Prominence The development will be highly noticeable.

TABLE 2 – HORIZONTAL LINE OF SIGHT – VISUAL IMPACT / VISUAL PROMINENCE

Degrees of Field of View Occupied	Potential Visual Prominence – Vertical Field of View
Less than 0.5°	Insignificant - Low Visual Prominence A small thin line in the landscape.
0.5° – 2.5°	Potentially Noticeable – Moderate Visual Prominence The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 2.5°	Potentially Dominant – High Visual Prominence The development will be highly noticeable, although the degree of visual intrusion will depend on the landscape setting and the width/spread of the object.

TABLE 3 – VERTICAL LINE OF SIGHT – VISUAL IMPACT / VISUAL PROMINENCE

Distance from Object	Potential Visual Prominence
8,000 metres (Regional viewshed)	Visibility Diminishing The visibility of the development will progressively diminish over distance with there being no visibility beyond 20 km.
4,000 – 8,000 metres (Sub-regional viewshed)	Potentially Noticeable The development will be noticeable, reducing with distance. The degree that it intrudes on the view will be dependent on topography and the vegetation of the landscape setting as well as atmospheric conditions.
Less than 4,000 metres – (Local)	Potentially Dominant

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viewshed)	The development is likely to be visually dominant where not screened by vegetation or buildings.
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TABLE 4 – VISUAL PROMINENCE IN RELATION TO DISTANCE AND VIEWSHED SETTINGS ¹

To determine the overall potential level of visual prominence, the values from the vertical and horizontal prominence calculations are combined (refer to **Table 5**).

The vertical angle value has a weighting applied that is double that of the horizontal angle value. This reflects that fact that the human eye is accustomed to a strong horizontal line within the visual landscape. Any strong vertical element is therefore more visually prominent or apparent in views and horizontal elements are more influenced by the screening effects of intervening vegetation between the viewer and the object subject to assessment.

Vertical Angle (Weighted Value x 2)

	H (6)	M (4)	L (2)	
Horizontal Angle	H (3)	H (9)	H (7)	M (5)
	M (2)	H (8)	M (6)	L (4)
	L (1)	H (7)	M (5)	L (3)

L = Low (Insignificant)
Total score = 3 - 4

M = Moderate (Potentially Noticeable)
Total score = 5 - 7

H = High (Potentially Dominant)
Total score = 8 - 9

Level of Visual Prominence

TABLE 5 – DETERMINATION OF VISUAL PROMINENCE

1.5 VISUAL SENSITIVITY

Visual sensitivity is a measure of how critically a change to the existing landscape will be viewed from various use areas. Different activities undertaken within the landscape setting have different sensitivity levels. For example, tourists who are using the surrounding landscape as a part of the holiday experience will generally view changes to the landscape more critically than agricultural workers in the same setting. Similarly, individuals may view changes to the visual setting of their residence more critically than changes to the visual setting of the broader setting in which they travel or work.

The visual sensitivity of the development depends on a range of viewer characteristics. The primary characteristics used in this study are:

- Land use / Visual use area.
- Distance of the development from viewers.

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¹ University of Newcastle (2002) *Visual Assessment of Windfarms Best Practice*. Scottish Natural Heritage Commissioned Report F01AA303A – Page 13.

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The visual sensitivity of land uses was assessed to assist in determining the visual impact of the development. As distance from the viewer to the proposed development increases, the level of sensitivity reduces.

1.5.1 VIEWER SENSITIVITY LEVELS

Typical levels of viewer sensitivity to the development specifically developed for the study area and its population based on the Visual Management System (VMS)² are outlined in **Table 6**.

A precautionary approach to the determination of visual sensitivity which assumes that viewers will be highly sensitive to visual change within the landscape setting has been applied to the assessment process. Perceptual responses to wind farms are discussed in **Section 2** and in full in **Appendix A**. The summarised perceptual studies indicate that it is likely that a majority of viewers will have a positive response to wind turbines within the landscape setting.

Visual Use Area	Visual Catchment			
	Local < 4km	Sub-Regional (Near) 4 - 5.9 km	Sub-Regional (Far) 6 - 7.9 km	Regional >8 km
National Park	H	H	M	M
Residential (Township)	H	H	M	L
Residential (Rural - Isolated)	H	H	M	L
Tourist Accommodation / Attractions	H	H	M	L
State Forest Recreation Areas / Look-outs	H	H	M	L
Highways / Tourist Roads	H	M	L	L
Recreation / Sporting Reserve	M	L	L	L
Agricultural Land	L	L	VL	VL
Local Roads / Streets	L	L	VL	VL

TABLE 6 – TYPICAL VISUAL (VIEWER) SENSITIVITY

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1.6 LANDSCAPE ASSESSMENT

1.6.1 LANDSCAPE VALUES

The identification of landscape values for the study area is driven by the project specific community perception studies and consultation and engagement with the local community. This is also supported by the outputs of the cultural heritage studies and seeks to identify the connection between the community and the landscape.

Benchmarking of landscape values is undertaken by reviewing project specific results with the results of previous regional, State and National community perception studies.

1.6.2 LANDSCAPE UNITS AND ABSORPTIVE CAPABILITY

Landscape units for the region are defined based on physical characteristics such as:

² Forest Service USDA, *National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System. Agricultural Handbook No. 462, April 1974.*

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- Topography.
- Vegetation.
- Drainage patterns.
- Geology.
- Land use patterns.

The definition of landscape absorptive quality is an assessment of how well a landscape setting is able to accommodate change or a development. The key factors considered in determining absorptive capability are topography and vegetation.

1.6.3 LANDSCAPE SCENIC QUALITY

The scenic quality of the setting was assessed to assist with the determination of potential landscape impacts. The scenic quality of landscapes generally increases with an increase in:

- Topographic variation.
- The presence geological features.
- The presence of permanent water bodies.
- Patterning of vegetation texture and density.

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1.7 POLICY CONSIDERATIONS

1.7.1 STATE GOVERNMENT

AMENDMENTS VC82 AND VC 91

Amendment VC82 prohibits a wind energy facility in the following circumstances and locations:

- Turbines within one kilometre of an existing dwelling except where the planning permit application includes evidence of written consent from the owner of the dwelling to the location of the turbine (VC91).
- Areas of high conservation and landscape values including National and State Parks described in a schedule to the National Parks Act 1975 and Ramsar wetlands as defined under section 17 of the Environment Protection and Biodiversity Act 1999.
- Locations that feature a high degree of amenity, environmental value, or significant tourist destinations including the Yarra Valley and Dandenong Ranges, Mornington Peninsula, Bellarine Peninsula, Macedon and McHarg Ranges, Bass Coast and the Great Ocean Road region.
- A wind energy facility is also a prohibited use in an Urban Growth Zone and within five kilometres of major regional cities and centres specified in the Regional Victoria Settlement Framework plan in the PPF, being:
 - Ararat, Bairnsdale, Ballarat, Bendigo, Benalla, Colac, Echuca, Geelong, Hamilton, Horsham, Mildura, Moe, Morwell, Portland, Shepparton, Swan Hill, Traralgon, Sale, Wangaratta, Warrnambool and Wodonga.

POLICY AND PLANNING GUIDELINES FOR DEVELOPMENT OF WIND ENERGY FACILITIES IN VICTORIA (2019)

The guidelines outline for authorities, proponents and the community the suitability of sites to accommodate wind energy facilities and the process and considerations for facility design and planning. The guidelines aim to provide:

- A framework for a consistent and balanced approach to the assessment of wind energy projects across the state;
- A set of consistent performance standards to inform the assessment and operation of a wind energy facility project;
- Guidance for conformity with permit application requirements;
- Guidance as to locations in the state that are not appropriate to locate wind energy facilities; and
- Provide a framework to ensure proposals for wind energy facilities are thoroughly assessed, including where necessary the need for an Environment Effects Statement (EES).

1.7.2 LOCAL GOVERNMENT

Although all of the parcels of land associated with the project are located within the Shire of Moyne and subject to the Moyne Planning Scheme, the project will be visible from the adjacent municipalities of Corangamite, to the east, and Ararat, to the north.

SHIRE OF MOYNE

The various parcels of land that comprise the wind farm site, which lie within the Shire of Moyne, and the majority of surrounding land in the regional setting apart from the township of Mortlake, are zoned Farming Zone under the local planning scheme (refer to **Figure 2**).

There are no overlays present in the project area or surrounding area for landscape significance (LSO), environmental significance (ESO), vegetation protection (VPO) or heritage HO which may indicate the presence of elements in the landscape which contribute to higher cultural or scenic values.

1.7.3 WIND FARMS AND LANDSCAPE VALUES NATIONAL ASSESSMENT FRAMEWORK (2007)

The recognition of the value placed by the local community on the natural and cultural landscape is the intended focus of the National Assessment Framework (NAF). The study was commissioned by the National Trust (Australia) and Auswind. Broad consultation was undertaken with State and Local Government as well as potentially affected communities with the recommended methodology developed in response to issues raised. The methodology applied in this study is consistent with the goals of the NAF.

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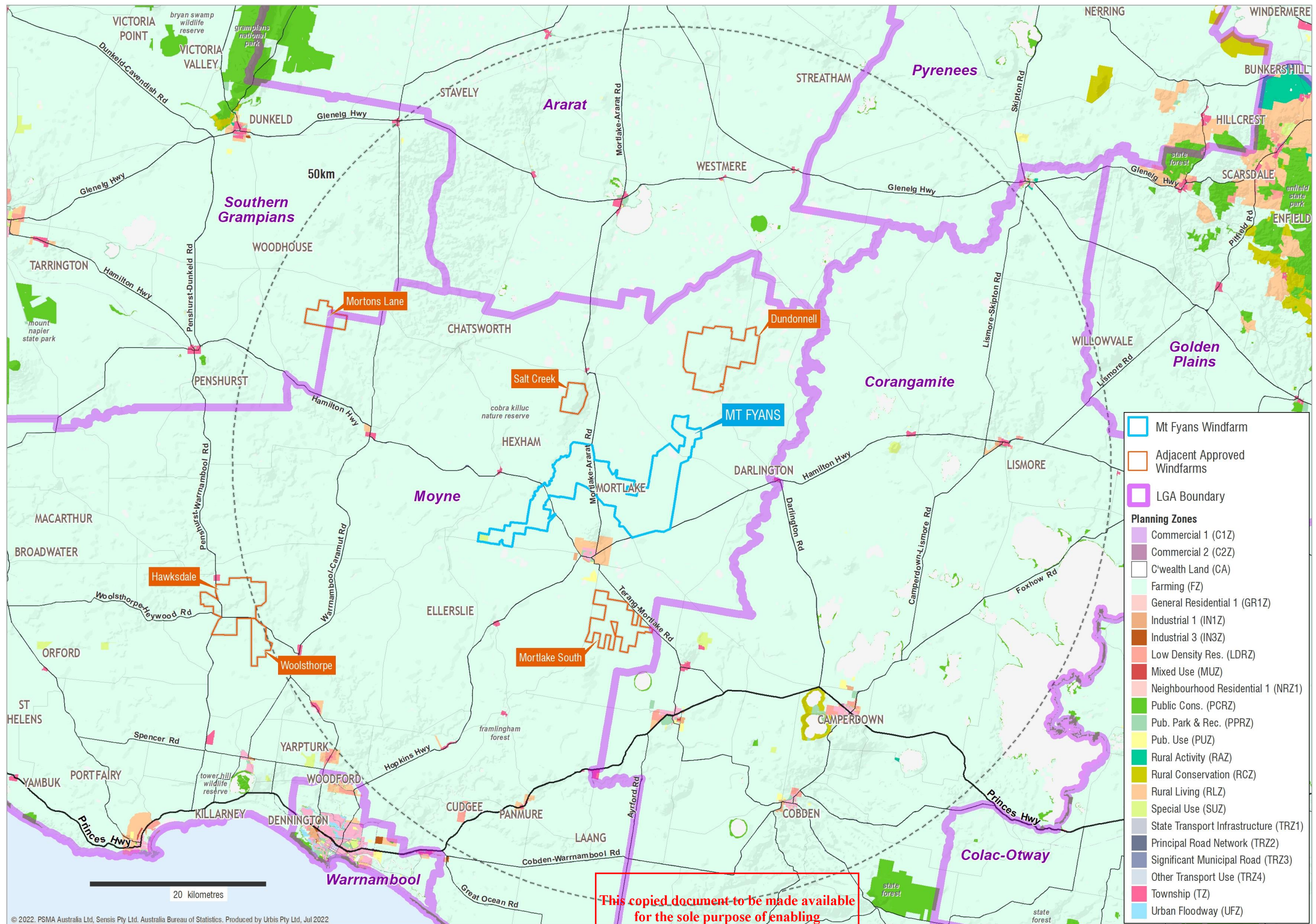


FIGURE 2 – LAND USE ZONING

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2 Community Values and Perception

2.1 COMMUNITY VALUES

An assessment of local community values is a requirement of Stage 1 of the “Wind Farms and Landscape Values, National Assessment Framework”³ (NAF). Related to community values is viewer perception of wind farms as this has a bearing on how a wind farm may impact on the landscape amenity of the local or regional setting.

While a wind farm will change the character of the landscape in which it is located, perceptual studies (outlined below) have shown that the change is not necessarily negative.

As previously mentioned, the approach to the assessment of community values draws on the findings of previous studies which indicate that not all change is necessarily perceived as negative. However, we have taken a cautionary approach to the assessment of landscape values and have assumed that local communities will be sensitive to change and will have a high degree of association or connectedness with their surrounding landscape setting.

2.2 COMMUNITY PERCEPTION STUDIES

Research has been undertaken by Urbis of similar wind farm projects locally and from around the world, particularly in relation to community perception studies. A number of the studies reviewed discuss issues other than purely aesthetics. However, these other issues all contribute to a viewer's perception and are important to consider.

A person's perception of visual impact on the landscape, as well as noise impact, will depend on how unpleasant the wind farm is perceived to be by the viewer. People hear and perceive things differently, which makes designing a wind farm which everyone will be happy with a difficult task.

In general, public support for wind power has been found to be very high, but when the development is going to be in their local area the acceptance of wind power decreases (Gipe, 1995).

People object to proposed local projects because of the anticipated noise and visual impact on the landscape. Studies have shown that the public support of wind power projects usually increases once the wind turbines are installed and operating (Collett 1995).

Generally, people who favour renewable energy are more likely to find the impacts of wind power acceptable and those who are neutral to the idea will accept wind turbines in the landscape if they know they are beneficial to the environment.

The consultation undertaken as part of the development of the NAF confirmed that visual sensitivity can vary widely based on community perceptions to a wind farm development. Because of the widely ranging reactions to the visual appearance of wind generators, it is not possible to categorise visual user groups into the normal types that would be applied for more typical developments of an industrial nature.

Australian and overseas perceptions studies have regularly found that between 60-70% of respondents find wind turbines an attractive element within the landscape, with up to 15% of respondents remaining undecided and approximately 20% disliking wind farms. Viewer perception is an important consideration, especially in proximity to recreation or tourist destinations or attractions.

A wind farm will change the landscape character of a locality, however to postulate that this will result in a significant reduction in landscape values and negatively impact the visual amenity of the setting is not supported by the reviewed perception studies.

³ *Wind Farms and Landscape Values National Assessment Framework. Australian Wind Energy Association and Australian Council of National Trusts, June 2007.*

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The study results outlined following, and summarised in **Appendix A**, indicate that many people find wind turbines attractive and that the majority of those surveyed enjoy the view to wind turbines. Therefore, for many people, the visual impact may be positive, not negative as may be assumed.

2.2.1 PERCEPTION ALTERATION AFTER CONSTRUCTION

There has been no research done on the visual impact of wind farms in Australia after construction, however overseas studies suggest greater acceptance levels by people who live in the vicinity of wind farms after their construction (Gipe, n.d.).

Anne Marie Simon Planning and Research in the previously cited study also found that all studies that looked at perceptions before and after construction, reported an increase in acceptance after the Wind Farm was completed.

It is also interesting to note that the study on Scotland and Ireland (cited above) also shows a 27% increase in acceptance following construction, although the greatest proportion of people who changed their mind were in the "Neutral or undecided" group, there was still a significant reduction from 17% to 4% in the group that opposed the wind farms.

This study supports the view that familiarity does not increase opposition to a wind farm, but rather increases acceptance and support for wind turbines in the landscape.

It should also be acknowledged that while the older research may target viewers in the general community, including visitors, tourists and residents, viewing the wind farm from local roads, tourist locations and from other publicly accessible locations, the later research is focused on those who live in the area, those that are the most familiar with the local landscape.

These recent studies show a discernible rise in the level of public acceptance over the older studies on community perceptions to wind farms in Australia and overseas. The earlier research continually shows a level of community support at around 60- 70% and a level of opposition between 5-30%, while the more recent research (Lal Lal Wind Farm) shows a level of community support in excess of 90% and a level of opposition of between 3-5%.

It is important to realise that this acceptance level is unique to wind farms. Similar research to the visual impact of a transmission line, a major road or other large infrastructure projects would show a greater degree of dislike for the changes these projects make on the landscape. The much greater acceptance of wind turbines in the landscape may well be a result of their clean lines and aerodynamic shape, or perhaps with their perceptual link with green energy. Irrespective of the reason, it is clear that wind turbines are generally accepted by the majority of viewers in all but the most sensitive of locations.

2.2.2 PERCEPTIONS OF CUMULATIVE IMPACT

Cumulative landscape and visual impacts occur where when either sequential or simultaneous views to wind farms are possible. Recent community perception studies provide valuable insight into the acceptability by the local community.

MORTLAKE SOUTH WIND FARM

Two community perception studies were undertaken in the Mortlake area as part of the approvals process for Acciona Energy's Mortlake South Wind Farm. The first study was undertaken by ERM in 2008, prior to the planning application being lodged. The second was undertaken by Quantum and Porter Novelli in 2010 after the application was lodged, and immediately prior to the Planning Panel hearing.

In both instances there was substantial favourable community sentiment, with the 2010 report showing a 78% favourable response amongst the Mortlake surrounding and Terang and Darlington communities.

In relation to the acceptance of additional wind farms in the local area, 87% expressed support for one wind farm in addition to the Mortlake South Wind Farm and 71% expressed support for three additional wind farms.

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3 Description of the Form of the Proposed Wind Farm

3.1 BROAD DESCRIPTION OF THE PROJECT

The development consists of a number of identical elements that define its visual character, are of a large scale and potentially have a significant impact.

The wind turbine layout that is the subject of this assessment has been prepared by the proponent to take account of wind yield, as well as consideration of various site constraints, including ecology and noise.

The wind farm was assessed on the basis of 81 wind turbines mounted on towers. Generated electricity between individual units will be routed through a small transformer at each tower, then via underground electrical cables to the main transformer yard. Gravel access roads will be constructed to each tower, whilst temporary crane hardstands will be installed around each tower to provide a solid foundation for crane operation.

A transformer compound will be constructed to allow for connection of the wind farm to the electricity grid via an overhead 220kV power line.

The existing land management or use activities can continue around the turbines and within the boundary of the entire wind farm.

3.1.1 COMPONENTS OF THE PROJECT

The development is comprised of the following components:

- Wind turbines.
- Meteorological masts with anemometer
- MV switchgear and transformer padmount. (Dependant on the ultimate turbine supplier).
- Access tracks.
- Access to roads.
- Substation.
- 220kV Powerline.

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3.1.2 SUMMARY OF TURBINE DETAILS

Refer to **Figure 3** - Components of a Wind Turbine and **Table 7** –Details of Proposed Wind Turbines.

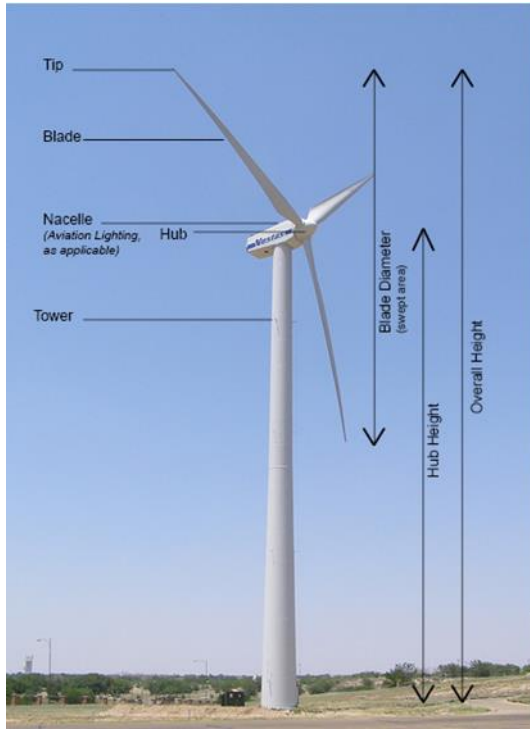


FIGURE 3 – COMPONENTS OF A WIND TURBINE

Model – The application is for 81 wind turbines with a maximum tip height of 200m. For the purposes of the landscape assessment, the following dimensions have been assumed.

Component	Number / Size
Number of Turbines	81 (max)
Hub Height (centre of rotor)	119 m (max)
Rotor Diameter	162 m
Tower – Tapered tubular steel	3.26 - 4.0 m dia.
Height to Blade Tip (maximum)	200 m

TABLE 7 – DETAILS OF PROPOSED WIND TURBINES

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3.1.3 LAYOUT

The assessment was based on the layout provided by Mount Fyans Wind Farm Pty Ltd (refer to **Figure 5**).

The site for the proposed development is an irregular, elongated shape covering approximately 10,800 hectares.

3.1.4 OTHER ELEMENTS

The site development will also contain smaller elements that combine together to provide an overall visual character. These are:

- **Internal roads** – Gravel access roads will be installed to provide access to each tower. Road length and the area of disturbance will be kept to a minimum and primarily serve as service access roads following construction. The access road width may be narrowed following construction to accommodate a standard vehicle width.
- **Hardstand** – an area of gravel (50 m x 50 m) will be prepared to provide a stable foundation for crane operation during erection.
- **Substation / Control Building** – Substations and control buildings will be constructed close to the edge of the site. Two will be required for the site - one for the HV switchyard (proponent) and another for the wind farm (proponent). The building will be constructed to appropriate building standards and will be designed to blend in with the local environment through choice of cladding material colouring.

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- *Transmission lines* – a 220kV line with an approximate length of 19.0 km and a 500kV line with an approximate length of 400 m.
- *Meteorological Masts* – a total of three meteorological masts each with a height of 120m, with equipment including anemometer for monitoring weather conditions.



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FIGURE 4 – EXAMPLE METEOROLOGICAL TOWER - FORSCHUNGSZENTRUM.KARLSRUHE

(SOURCE: <https://commons.wikimedia.org/wiki/File:Forschungszentrum.Karlsruhe.-.Measurement.Tower.png>)

3.1.5 GENERAL SITE CLEARING / FOUNDATIONS

This component of the development will involve the clearing of a footprint of approximately 17 m x 17 m for each tower base. Excavation and earthworks for tower bases and road works will be minimal as the site is relatively flat.

The foundation of each tower will be constructed from concrete and steel. The foundation type appropriate for each tower site will be determined by geotechnical survey and designed to withstand extreme loads.

Some additional clearing may be required for the hardstand and substation / control building and an all – weather maintenance track will be developed between turbines.

All disturbed areas will be reinstated with grass after completion of the works.

3.1.6 CONNECTION TO THE ELECTRICITY GRID

The wind farm will be connected to the distribution network via an overhead connection line. The proposal is for a 220 kV line with an approximate length of 19.0 km and a 500 kV line with a length of approximately 400 m which are to be within a Transmission and Substation Development Envelope.

The location of the transmission lines and associated poles and towers used in this assessment report is indicative of the final location of this infrastructure.

3.1.7 SITE DEVELOPMENT STAGING

The construction of the project will occur over approximately 18 - 21 months.

3.1.8 LIGHTING

Turbine lighting is not proposed as part of the planning application. It is unlikely that lighting to prevent plane strike will be required. Mount Fyans Wind Farm Pty Ltd will undertake a risk assessment to determine the level of aviation safety risk and any mitigation measures required.

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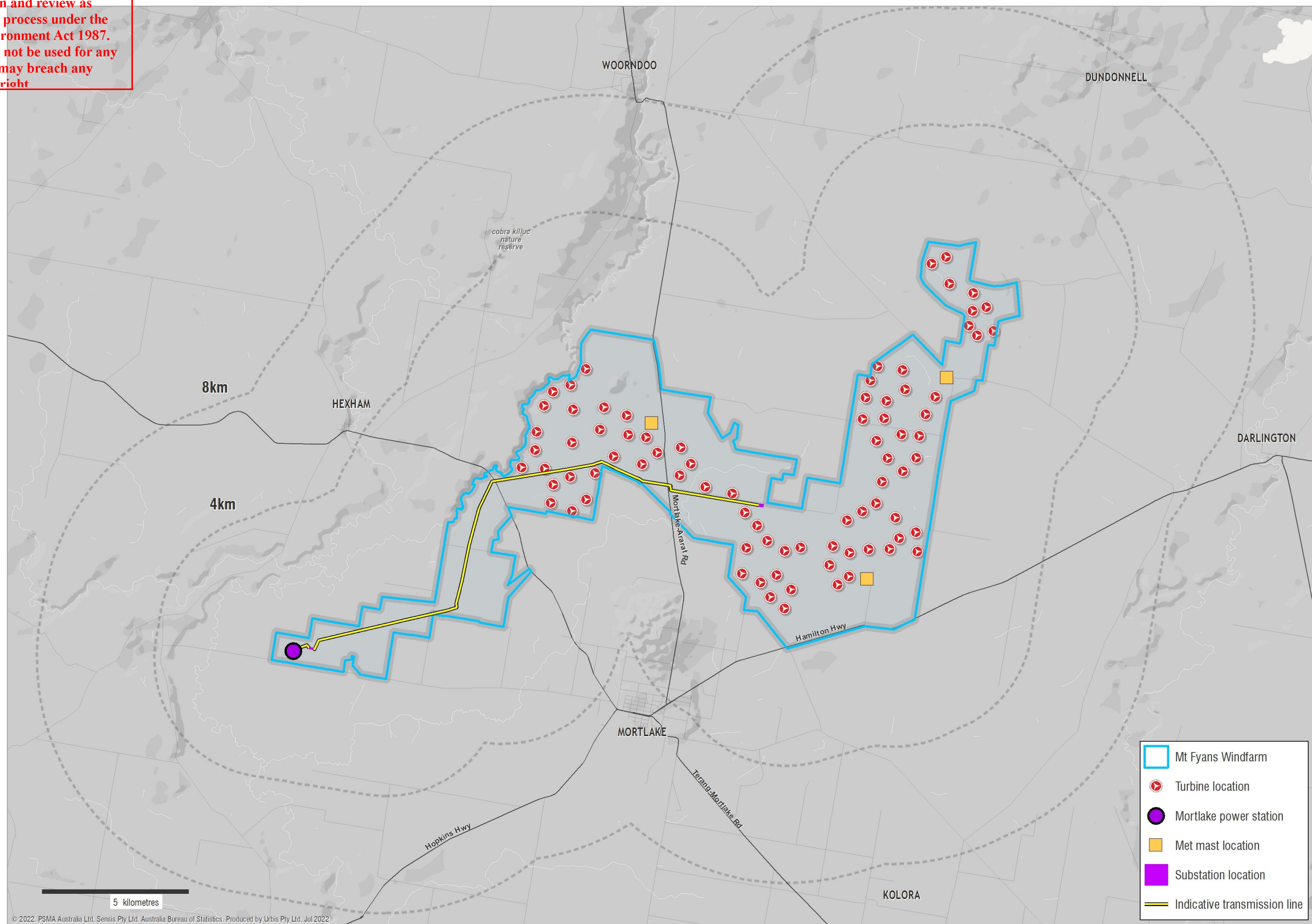


FIGURE 5 – LAYOUT OF MT FYANS WIND FARM

4 The Existing Landscape

This assessment of the landscape and visual issues has been undertaken for the following settings:

- **Regional** – More than 8 km from the project area up to approximately 60 km.
- **Sub-Regional** – Between 4 km and 8 km from the project area.
 - *Distant Sub-Regional* – Between 6 km and 8 km from the project area.
 - *Near Sub-Regional* – Between 4 km and 6 km from the project area.
- **Local** – Within 4 km of the project area.

4.1 SITE CONTEXT AND SUMMARY

The study area is located to the north of the town of Mortlake in the Western District of Victoria.

The landscape type of the region is typified by flat to very slightly undulating topography with native and exotic vegetation confined to narrow bands of rectilinear patterning along roadsides, property and paddock boundaries and around rural residences.

Built elements within the landscape of the setting include the major 500kV HV transmission lines of the State electricity grid, the Hamilton Highway, the local road network and farmhouses and associated buildings scattered throughout the area.

4.2 LAND USE

4.2.1 REGIONAL SETTING

The landscape of the regional setting is used primarily for agriculture, with the main activities being cropping and sheep grazing.

Minor settlements occur at Hexham and Darlington, Woorndoo, Caramut and Derrinallum.

The closest major towns, apart from Mortlake within the sub-regional setting, are Terang and Camperdown, 20 km and 25 km respectively to the south, and Lake Bolac 25 km to the north.

4.2.2 SUB-REGIONAL SETTING

The landscape surrounding the site is used primarily for agriculture, with the main activities being cropping and grazing.

Mortlake township is located approximately 4 km to the south of the project area.

4.2.3 LOCAL SETTING

The wind turbines are proposed to be located on land that is generally flat, ranging from approximately 150 m AHD to the west and the south of the project site up to 174 m AHD in the north.

The landscape of the site and local setting is used primarily for agriculture, with the main activities being cropping and grazing.

The Hamilton Highway is located immediately adjacent to the southern boundary of the project site.

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4.3 VEGETATION AND LANDSCAPE FORM AND CHARACTER

The landscape character type of the broader region in which the study area is located, is defined by Leonard and Hammond ⁴ as:

Western Plains - *The Western Plains are a generally flat landscape with topography rising from the coast gradually to the north. Nearer to the coast to the southeast of the regional study area, the landscape becomes more undulating as it rises to the Southern Uplands – Otways Ranges landscape sub-type.*

4.3.1 REGIONAL SETTING

Throughout the landscape of the regional setting the remnants of past volcanic activity can be found in the numerous volcanic cones and craters of the Western Volcanic Plains, such as Mt Elephant 24 km to the east, the low stony rises that form distinct, “fine-grained” landscapes and the abundant lakes throughout the study area, including Lake Bullen Merri, which are believed to have resulted from the collapse of underground caves formed through volcanic activity.

The abrupt formation of the Grampians Range is the most significant natural landscape element within the regional setting to the north-west, with Mt Abrupt signalling the southern extent of the range.

The patterning created by broad scale agriculture is the dominant human influence on the landscape in the region. The landscape is subjected to seasonal change, with the stages of agricultural production creating a cycling transition from the colour of raw soils resulting from tilling and cultivation, to the bright greens of emerging and growing crops, to the straw brown colour of mature crops awaiting harvesting.

Figure 16, Figure 17 and Figure 18 illustrate the landform broad landscape patterns and vegetation cover within the region.

4.3.2 SUB REGIONAL SETTING

The landscape is typified by flat to very slightly undulating topography with native and exotic vegetation confined to narrow bands of rectilinear patterning along roadsides, property and paddock boundaries and around rural residences.

Mt Shadwell, a volcanic cone and local visual feature in the otherwise flat landscape, is located 2 km south of the project area.

The northern part of the project site is comprised of a stony rises like landscape with the surface cover of trees removed and replaced with a pastoral landscape.

4.3.3 LOCAL SETTING

The northern part of the project site is comprised of a stony rises like landscape with the surface cover of trees removed and replaced with a pastoral landscape. The southern part of the site is generally flatter.

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⁴ Leonard and Hammond (1984). Landscape Character Types of Victoria. Forests Commission of Victoria.

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4.3.4 LANDSCAPE CHARACTER AREAS

Based on the assessment of landscape character types, scenic quality and landscape cultural significance, the local and sub-regional setting of the study area can be divided into the landscape units as shown in **Table 8** and **Figure 19**. (Refer also to **Figures Figure 6 - Figure 15**).

The landscape units and associated scenic quality are derived from sub units of the Central Western Hills regional landscape type as defined by Leonard and Hammond (1984).

The determination of local cultural significance has been rated as typically higher than scenic quality due to the assumption that a local community will have a high degree of connectedness with the landscape of their setting.

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TABLE 8 – LANDSCAPE UNITS AND SCENIC QUALITY

LANDSCAPE UNIT AREA	SCENIC QUALITY	LOCAL CULTURAL LANDSCAPE SIGNIFICANCE	CHARACTERISTICS/USE
<i>Western Plains Agricultural / Pastoral Areas</i>	Low	Moderate	<ul style="list-style-type: none"> extensive clearing and highly altered landscapes broad plain with minimal topographic variation
<i>Western Plains Volcanic Landforms</i>	Moderate to High	High	<ul style="list-style-type: none"> steep exposed slopes and peaks large rounded feature landforms that are dominant extensive clearing and highly altered landscapes contrasting with surrounding broad plain with minimal topographic variation
<i>Hopkins River Headwaters</i>	Low to Moderate	Moderate	<ul style="list-style-type: none"> moderate degree of topographic relief along numerous slightly incised watercourses some remnant vegetation along water courses
<i>Western District Lakes (Lake Corangamite)</i>	Moderate	Moderate to High	<ul style="list-style-type: none"> extensive clearing and highly altered landscapes presence of water of a permanent nature
<i>The Grampians</i>	High	High	<ul style="list-style-type: none"> steep exposed slopes over 30° with uneven peaks and serrated ridges deep gorges with nearly vertical walls and/or irregular configuration massive rock outcrops or exposed cliffs of irregular and outstanding form, and/or of high colour contrast with the surrounding landscape large feature landforms of unusual form that are highly dominant strongly defined patterns resulting from combinations of eucalypt forest and treeless areas specimen stands of vegetation which create unusual form, colour or texture in comparison to the surrounding landscape streams, lakes, reservoirs or swamps
<i>Stony Rises - Vegetated</i>	High	Moderate to High	<ul style="list-style-type: none"> moderate degree of topographic variation. highly dissected landform. exposed geology and rock formations strongly defined patterns resulting from combinations of eucalypt forest and treeless areas presence of dry-stone walling
<i>Stony Rises – Pastoral</i>	Low to Moderate	Moderate	<ul style="list-style-type: none"> moderate degree of topographic variation. moderately dissected landform presence of dry-stone walling

<i>Bolac Lakes</i>	Low to Moderate	Moderate to High	<ul style="list-style-type: none"> extensive clearing and highly altered landscapes presence of water of a permanent nature
<i>Rural Townships – Mortlake, Lake Bolac, and Caramut</i>	Moderate	Moderate to High	<ul style="list-style-type: none"> presence of mature, exotic vegetation presence of historic buildings and other built form
<i>Plantations</i>	Low to Moderate	Low	<ul style="list-style-type: none"> regular monospecies temporary/transitional landscape



FIGURE 6 – WESTERN PLAINS AGRICULTURAL / PASTORAL AREAS



FIGURE 7 – WESTERN PLAINS VOLCANIC LANDFORMS

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FIGURE 8 – HOPKINS RIVER HEADWATERS

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FIGURE 9 – WESTERN DISTRICT LAKES

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FIGURE 10 – THE GRAMPIANS



FIGURE 11 – STONY RISES - VEGETATED

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FIGURE 12 – STONY RISES – PASTORAL

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FIGURE 13 – BOLAC LAKES



FIGURE 14 – RURAL TOWNSHIPS



FIGURE 15 – PLANTATIONS

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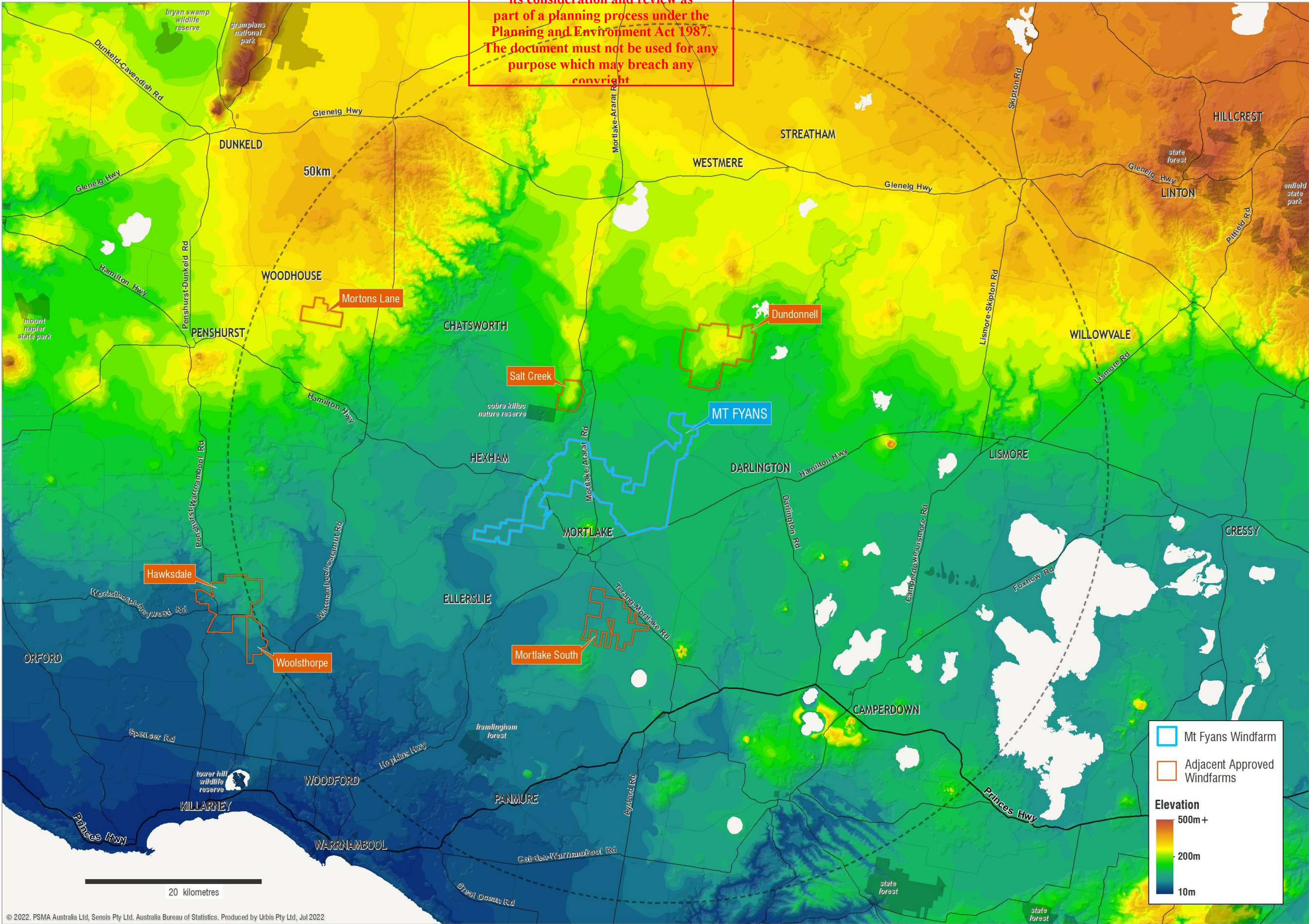


FIGURE 16 – ELEVATION OF TERRAIN

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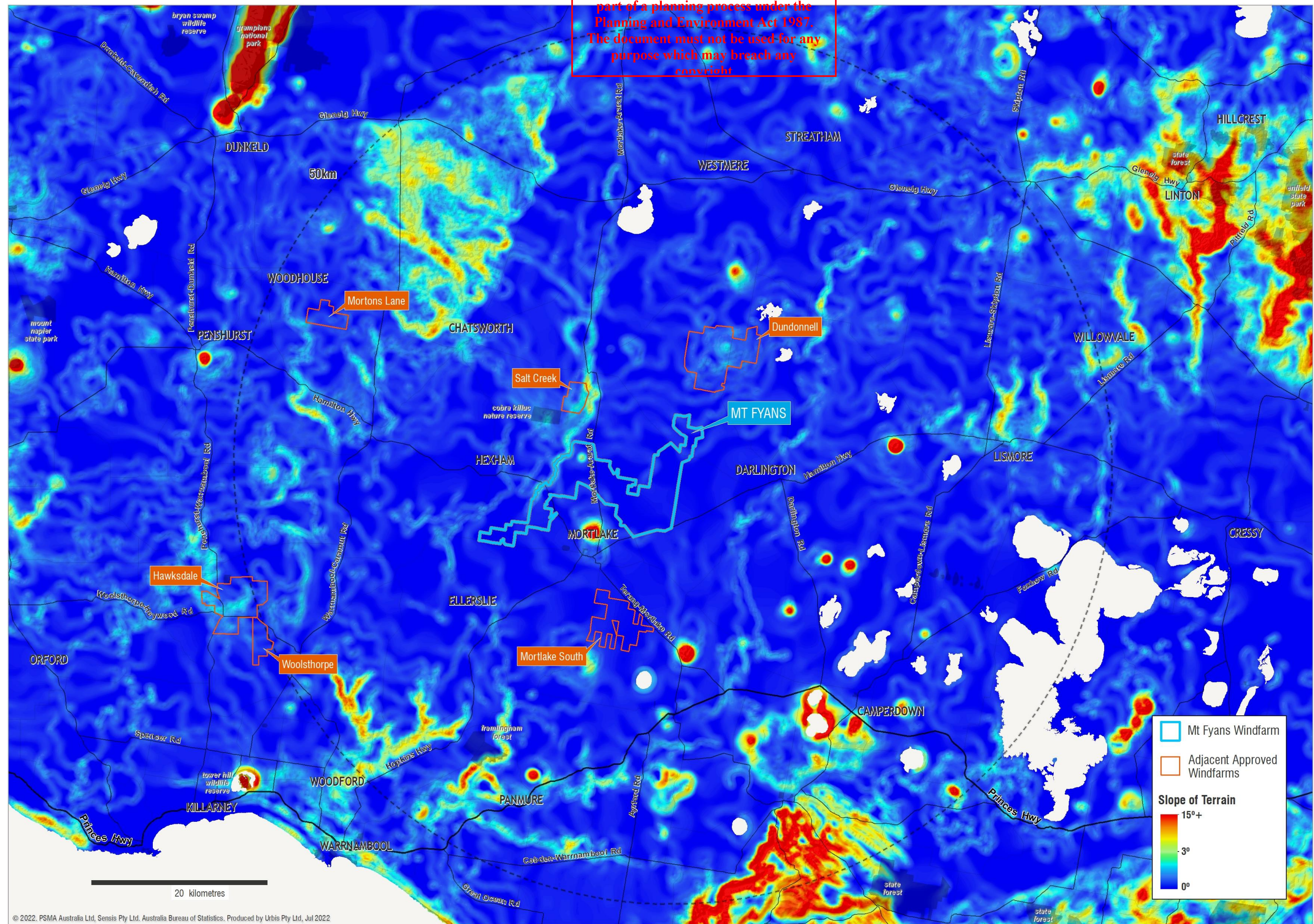


FIGURE 17 – SLOPE OF TERRAIN

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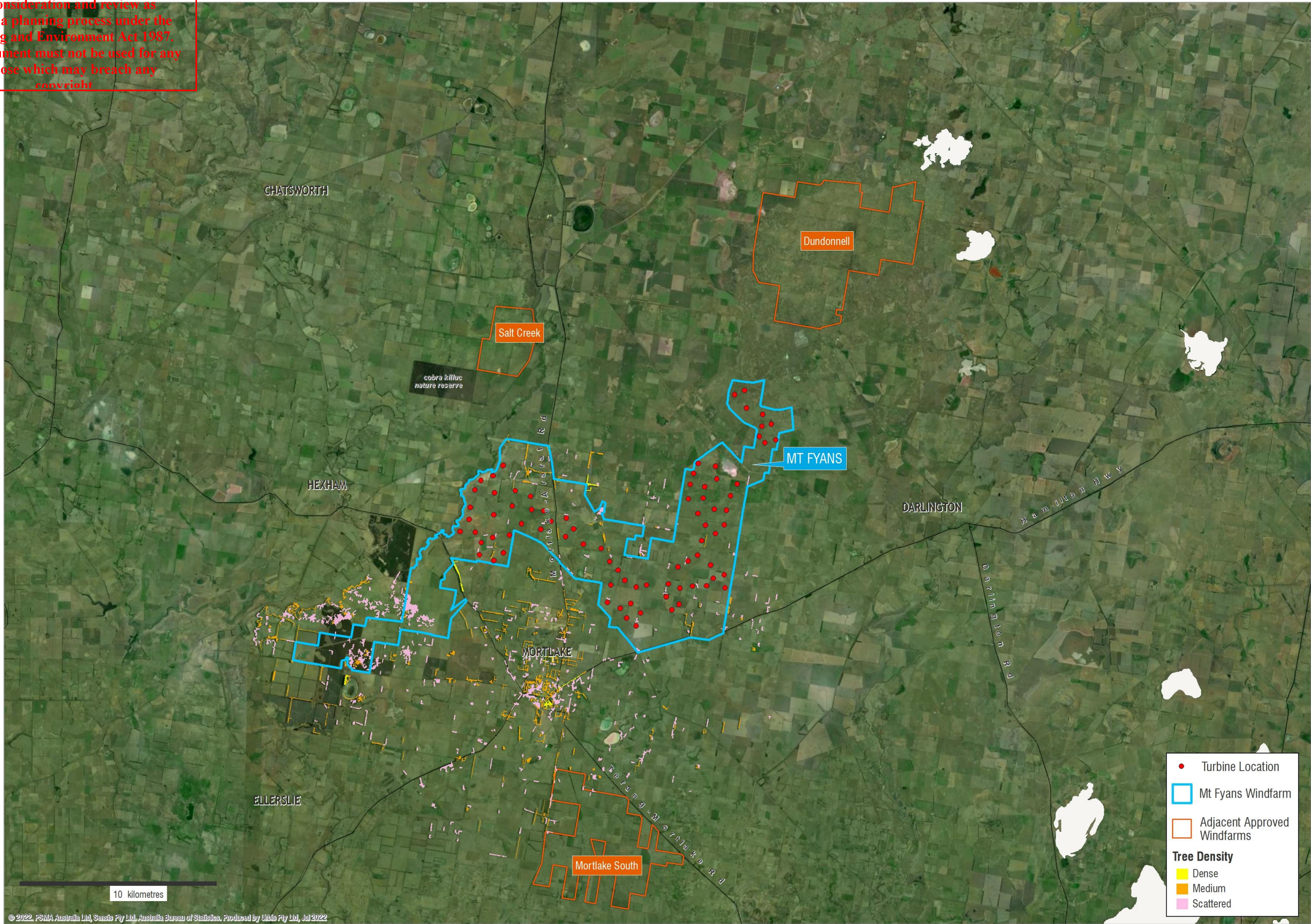


FIGURE 18 – VEGETATION PATTERNS

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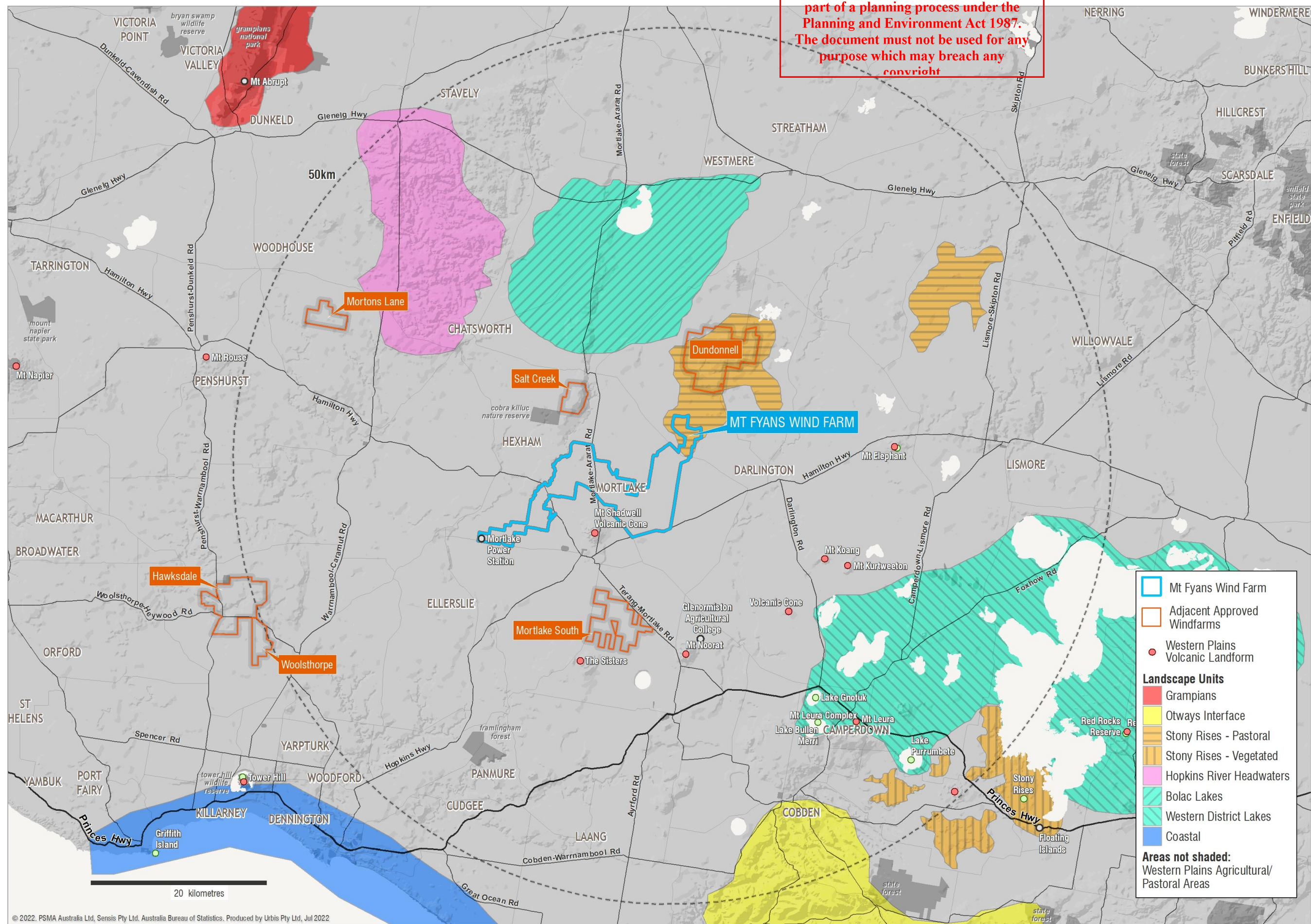


FIGURE 19 – LANDSCAPE CHARACTER AREAS AND FEATURES

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4.4 LANDSCAPE VALUES AND CULTURAL SIGNIFICANCE

4.4.1 PRE – EUROPEAN

Prior to European settlement of the area, the Wada wurrung tribe, who shared common language and social ties with the broader group collectively known as the Kulin, inhabited much of the region. Evidence of their inhabitation is known from recorded artefacts such as stone implements as well as historical records. However, much evidence of their occupation has been disturbed by subsequent European settlement activity. Locations that would have attracted activity in the study area include waterways and lake edges.

The landscape as experienced by the aboriginal inhabitants has been subject to significant change.

4.4.2 EUROPEAN SETTLEMENT

Mortlake was settled in 1853 following the tapping of a natural spring which provided a more reliable source of water than the stream at Hexham, the previously identified site for a major settlement in the area.

The availability of large volumes of water, combined with poor drainage, contributed to a Typhoid outbreak which claimed the lives of many people in the area.

Between 1852 and 1854, gold miners were attracted to alluvial deposits in the area, although little evidence of this activity in the landscape remains due to subsequent farming activities, and Mortlake became a centre for food production serving the surrounding areas and the goldfields.

Sheep graziers moved into the area and over the subsequent years, the taller vegetation was mostly cleared, and the species rich native grasslands were replaced by pasture grasses and crops. A bluestone mill was built in approximately 1856 to process grain grown in surrounding areas.

Today, the town is well known for its large number of private residences and public bluestone buildings, built from the local basalt of the western volcanic plain.

Over time, the larger properties in the area were progressively sold and subdivided. Exotic and native, non – indigenous species were planted as wind breaks around properties, defining the landscape pattern and character that exists today.

4.4.3 TOURISM

The study area is located on a volcanic plain and centrally between some of Victoria's most significant tourism areas, The Grampians to the north-west and the Great Ocean Road and Port Campbell National Park to the south.

The Hamilton Highway is a key road for transport and tourism to the Hamilton and the Western District and far Victorian west coast as well as Mt Gambier and the South Australian east coast. Typical traffic volumes are in the order of 1,000 vehicles per day. The road also provides an alternative route to the southern section of the Grampians National Park. The Hamilton Highway is also part of alternative tourist loop to the Princes Highway for travellers on the Great Ocean Road wishing to return to Melbourne.

Mortlake has a number of accommodation providers associated with travellers as well as visitors attracted to the historic buildings of the township and the volcanic landscape of the region. The broader region also promotes farm stay accommodation.

Given the number of wind farms proposed for the region, it is difficult to foresee that the development of a wind farm at Mt Fyans has the potential to become a tourist attraction in a similar way that some others that were developed earlier have, as some of the novelty has possibly worn off.

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4.4.4 PRINCIPLES FOR ASSESSING LANDSCAPE HERITAGE

The development of a model that acknowledges areas of cultural value within the assessment of landscape quality in areas where the landscape has been significantly altered by human influences was the focus of the National Assessment Framework.

- The main relevant principles for the assessment of cultural landscapes are:
- Definition/understanding of aesthetics as cultural significance (and recognition of the need to protect the 'un-aesthetic' also);
- Definition of boundaries, views and vistas;
- Definition of landscape values in terms of heritage significance;
- Recognition of interrelationships between aboriginal, historic and cultural values.

A number of the elements listed above are components of an assessment process which is generally undertaken by planning authorities to protect areas of significant cultural, environmental or scenic quality, all values that are interrelated and contributors to landscape significance. If such values exist and are deemed worthy of protection, they would generally be protected by planning controls. No such controls apply to the project area or broader study area.

4.5 REGIONAL LANDSCAPE SIGNIFICANCE

A review of zoning overlays and the National Trust of Australia (Victoria) data base confirms that there are no areas of landscape significance in the project area or within a 15 km radius of the regional setting. Summaries from the citations for cultural and natural landscapes for the municipalities of Moyne, Corangamite and Southern Grampians are summarised below in **Table 9** and outlined in detail in **Appendix B**.

TABLE 9 – SUMMARY OF SITES OF LANDSCAPE SIGNIFICANCE

LOCATION	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
MOYNE SHIRE			
Tower Hill Extinct volcano 14 km East of Port Fairy	50 km	In terms of aesthetic significance, the scenic and visual qualities derive from the relationship of Tower Hill to the relatively flat and cleared coastal plain, the height and slope of the enlarged crater and the internal cones, the vegetation cover and the contract between landform and vegetation and the lake and its associated marginal wetlands. Tower Hill and Surrounds is of National significance for heritage landscape values.	International
Nirranda Coast Nirranda	58 km	The Nirranda Coast is of State significance for its aesthetic values: the area features some of the most scenic coastal cliffs in Victoria and is one of the	State

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LOCATION	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
		few places along the Victorian coast with wide open views across farmland adjacent to the coast but not separated from it by a major road.	
Griffith Island Rabbit/Goat/Griffith Island, Port Fairy	63 km	Griffith Island is an unusual landform as an isolated basalt outcrop, overlain with calcareous sand. It lies at the extremity of the Mount Rouse lava flow of 300,000 years ago. Griffith Island is significant as an example of a coastal landform which has a history of persistent human interference or use since the beginning of European settlement in Victoria.	Regional
CORANGAMITE SHIRE			
Mount Leura Complex Corangamite Volcanic Plains, Camperdown	30 km	The Mount Leura complex has landscape significance for the striking appearance of steep sided cones rising out of the flat surrounding plain, and the intricate pattern of smaller cones and craters within the outer maar rim. The Schedule to the Corangamite Shire's Significant Landscape Overlay SLO1 states that it is part of one of the State's most significant volcanic landscapes and features.	National
Port Campbell National Park Gellibrand	60+ km	This unusual and striking coastline with high visual, scientific and cultural importance possesses unique landforms of outstanding visual quality. The ecological community is largely intact and supports a collection of rare plants.	National
Mount Elephant Derrinallum	18 km	Mt Elephant is significant for its landscape cultural significance.	State
Lake Bullen Merri Camperdown	26 km	Lake Bullen Merri is significant for its aesthetic qualities at the National level. Lake Bullen Merri is a striking blue permanent lake in a deep hollow, with an attractive pastoral landscape on the ridge enclosing the lake.	National

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LOCATION	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
Hawks Nest Road And Environs, Stony Rises Hawks Nest Road, Pomborneit	47 km	Hawks Nest Road is significant for historic, scientific and aesthetic reasons at a State level and is an intricate and varied landscape with a scale of detail that is unusual in Victoria. Important geological features are seen alongside the road and roadside vegetation includes significant remnants of the open woodland that once covered much of the Western District.	State
Lake Gnotuk Camperdown	24 km	<p>Lake Gnotuk is significant for its aesthetic qualities at the State level.</p> <p>It is a maar, a broad volcanic crater, bordered by a high steep rim formed by deposition of scoria and ash ejected during the eruptions. A lake has formed within the crater.</p> <p>The combination of a wholly enclosed, often blue lake, which emerges as a surprise to the viewer who climbs the bordering ridge, and the steep grassy hill backdrop, provides a visually pleasing feature in the rather flat lava plain of the Western District.</p>	State
Port Campbell Headland & Port Port Campbell	62 km	<p>Port Campbell headland and port is highly significant for aesthetic reasons at a State level.</p> <p>Port Campbell headland's dramatic limestone cliffs and underlying sea caverns have been designated as a nationally significant coastal landscape.</p>	State
Lake Purrumbete Camperdown	36 km	<p>Lake Purrumbete is a maar, a broad, shallow volcanic crater formed by an explosive eruption. It is significant for aesthetic and historic reasons at the State level.</p> <p>The pastoral landscape around Lake Purrumbete was developed in association with an important historic property, Purrumbete Station. The classified Purrumbete Homestead is situated near the northern edge of the</p>	State

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LOCATION	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
		lake. There is very little other development and the pastoral setting of the lake and homestead remain virtually intact.	
SOUTHERN GRAMPPIANS SHIRE			
<i>The Grampians</i>	55 km	<p>The Grampians comprise a complex of sandstone ranges rising abruptly from the Western Plain. From a distance they are most spectacular with their series of precipitous peaks rising to 1,164m at Mt. William.</p> <p>The farming country surrounding the Grampians is enhanced by the spectacular backdrop of the mountain range.</p>	National

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4.6 LANDSCAPE SCENIC QUALITY OF THE STUDY AREA

The scenic quality of the landscape character types of the project area, as described by Leonard and Hammond, are outlined in **Table 10**.

DESCRIPTION	HIGH SCENIC QUALITY	MODERATE SCENIC QUALITY	LOW SCENIC QUALITY
LANDFORMS	<ul style="list-style-type: none"> Features as volcanic cones, volcanic craters, craggy peaks and sharply serrated ridges rising starkly from the plains. Isolated peaks or ranges with distinctive form and colour contrast that become focal points. Distinctive gorges with near vertical walls and/or unusual configuration and colour. Major rock outcroppings. 	<ul style="list-style-type: none"> Rounded hills, ridges and smaller volcanic cones which are not visually dominant but are surrounded by similar landforms. Moderately deep gorges with moderately sloped walls. Minor rock outcroppings. 	<ul style="list-style-type: none"> Large expanses of indistinctly dissected or unbroken landforms that provide little illusion of spatial definition or landmarks with which to orient.
VEGETATION	<ul style="list-style-type: none"> Strongly defined patterns resulting from eucalypt forest, scattered conifers, riparian vegetation, barren rock or 'stony-rises' and/or naturally appearing openings. Distinctive stands of vegetation which may create unusual forms, colours or textures in comparison to surrounding vegetation. 	<ul style="list-style-type: none"> Predominately open forest with some natural openings and/or riparian vegetation in patterns that offer some visual diversity. Vegetative stands that exhibit the range of size, form, colour, texture and spacing found commonly in the surrounding landscape. 	<ul style="list-style-type: none"> Extensive areas of similar vegetation, such as grassland, with very limited variation in colour and texture.
WATERFORMS	<ul style="list-style-type: none"> Lakes, rivers, streams, swamps and reservoirs of a permanent or almost permanent nature. 	<ul style="list-style-type: none"> Intermittent streams, lakes, rivers, swamps and reservoirs. 	<ul style="list-style-type: none"> Waterforms absent.*

TABLE 10 – WESTERN PLAINS SCENIC QUALITY CLASSIFICATION – FRAME OF REFERENCE
(SOURCE: LEONARD AND HAMMOND [1984])

*** Waterforms, where present in this mainly cleared agricultural character type, are of visual significance and therefore rate no lower than Moderate Scenic Quality.*

4.6.1 SOUTH WEST VICTORIA LANDSCAPE ASSESSMENT STUDY – DELWP (2013)

The South West Victoria Landscape Assessment Study assesses the landscape character of the regional as well as its significance and key views and vistas.

The Project falls within Landscape Unit 1 – Western Volcanic Plains, and sits in the regional context of (refer to **Figure 20**):

- Subunit 1.1 - Paddocks & Cones.

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- Subunit 1.3 – Volcanic Agricultural.
- Subunit 1.4 - Stony Rises & Lava Flows

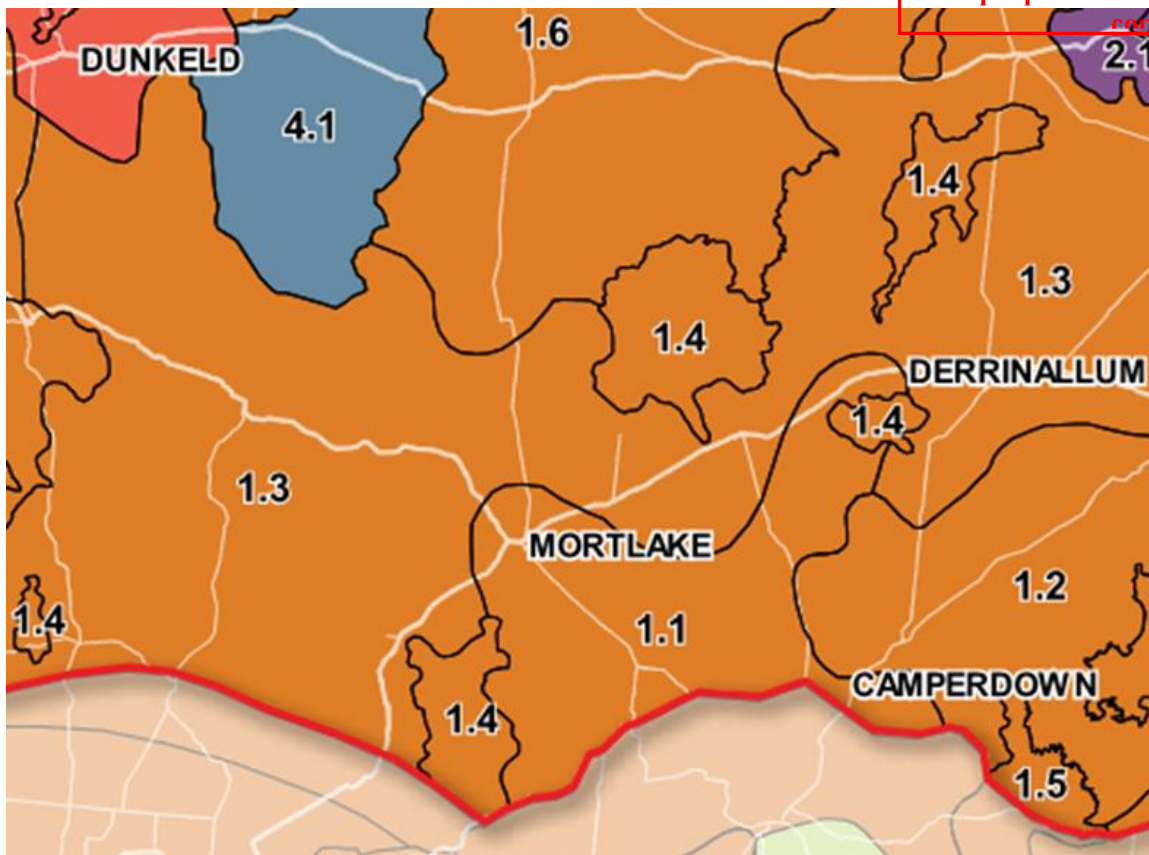


FIGURE 20 – LANDSCAPE SUBUNITS OF THE PROJECT AREA
(SOURCE: SOUTH WEST LANDSCAPE ASSESSMENT STUDY).

The Assessment Study identifies the following landscape types of significance within the regional setting of the project area:

- The Grampians (Gariwerd) & Surrounds – located 50 km to the north-west of the project area are rated of State significance or higher.
- Within Subunit 1.1 - Paddocks and Cones and Subunit 1.4 - Stony Rises & Lava Flows, Mt Shadwell, 1km to the southwest, is rated as being of State significance.

Identified major viewing corridors to Mt Shadwell of relevance to the project are:

- Hamilton Highway to the north and east of Mortlake, and west and south of the Project.
- Mortlake Ararat Road to the north of Mortlake and the west of the Project.
- Terang Mortlake Road to the south of Mortlake.

Other landscapes of significance are located distant from the Project, and include:

- Lake Keilambete, 15 km to the south, which is identified as a fine example of a volcanic marr.
- Other volcanic cones at Mt Noorat, 14 km to the south-east, Mt Elephant 20 km to the east and the Sisters 14 km to the south-west.

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4.6.2 PERCEPTIONS OF SCENIC QUALITY

A study by Lothian⁵ of perceptions of scenic quality and the influence of infrastructure found that in agricultural landscapes with the attributes of lower scenic quality, wind farms had the effect of increasing the level of scenic quality as perceived by the viewer, as they added an element of visual interest to the otherwise relatively featureless landscape setting. This finding should be considered when evaluating viewer sensitivity as it would have the effect of reducing the level of sensitivity.

In the following **Figure 21**, the ratings given by tested respondents to the quality rating they gave an agricultural setting without a wind farm was less than that with a wind farm present (Inland Scene 47 – the far right column on the graph).

Figure 2: Agricultural scenes—visual impact of wind farms on scenic quality

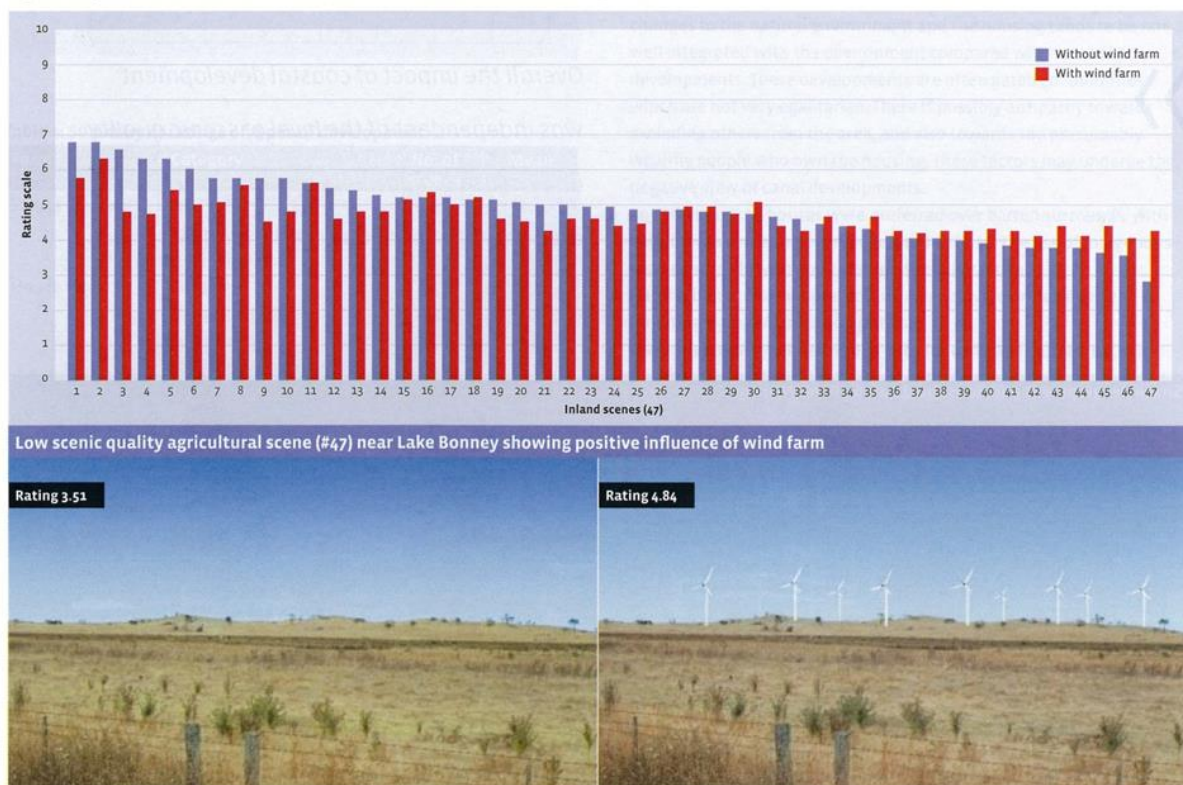


FIGURE 21 – SCENIC PREFERENCE – INFLUENCE OF WIND FARMS
(SOURCE: LOTHIAN – AUSTRALIAN PLANNER)

4.7 ABSORPTIVE CAPABILITY

The definition of landscape absorptive quality is closely related to that of visual modification levels. It is generally applied at a broader scale than visual modification and is an assessment of how well a landscape setting is able to accommodate change or a development.

The key factors considered in determining absorptive capability are topography and vegetation. In areas of flatter topography, overlooking is not possible and a low and thin band of vegetation is able to screen views to a development from a given viewpoint. In areas of undulating or elevated topography, overlooking can occur and vegetation needs to be higher and denser to achieve effective screening. Intervening undulating topography also has the potential to block views in certain landscapes.

⁵ Lothian, Dr Andrew, *Scenic Solutions, Visual Impact Assessment of some developments in South Australia, Australian Planner, Volume 45, Number 4, December 2008.*

The landscape settings of the project and its local, sub-regional and nearer regional surroundings (the primary areas subject to visual impact) have absorptive capabilities as described in **Section 4.7.1**.

4.7.1 LOCAL, SUB-REGIONAL AND REGIONAL SETTING

As previously described, apart from isolated volcanic cones, the landscape of the setting is generally flat with vegetation confined to a rectilinear pattern reflecting property boundaries and roads. Within this landscape, overlooking is not possible and even relatively low vegetation (up to eye-height) is effective at screening views.

Topography – High capability due to flat topography and no potential for overlooking, beyond a small area on the Mt Shadwell foothills.

Existing Vegetation – Generally low for cleared agricultural areas. Moderate to high capability where vegetation exists.

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5 Assessment of Visual Impact

5.1 VISUAL IMPACT – PRIMARY VIEWPOINTS

The critical issues to consider in the assessment of visual impact are:

- Number of and proximity of sensitive viewing locations.
- Degree to which the proposed wind farm will be visible. The method assumes that if the proposed development is not seen, then there is no resulting impact.

Analysis was undertaken to identify a range of typical representative sensitive viewpoints in the visual setting of the project based on a diversity of viewing aspect, e.g., north, south etc., with a typical sensitive viewpoint representative of other similar viewpoints within a particular setting assessed in detail. As the most significant tourism and transportation route in the region, a number of viewpoints have been assessed for the Hamilton Highway for each of the visual settings (local, sub-regional and regional).

The representative viewpoints, located within the local, sub-regional and regional settings chosen for detailed assessment based on their higher levels of viewer sensitivity (**Figure 22**) are:

- Selected indicative individual rural residences;
- Townships and settlements; and
- Transport / Tourist Routes - Hamilton Highway and Hopkins Highway.

5.2 VIEWSHED

The viewshed or Theoretical Zone of Visual Influence (TZVI) is the area from which views of a particular proposed development may be possible. The viewshed of the proposed wind turbines within the study area is shown in **Figure 22**.

A ZVI to aid the study process was calculated based on a 3D digital elevation model that included a 50 km radius of the site and a resolution of 10 metres. The colours refer to the number of visible turbines with a blade tip height of 200 m. The TZVI has been prepared for the blade tip height which is the maximum height visible. A viewer eye-height of 1.5 metres has been assumed.

During clear atmospheric conditions, the proposed wind turbines would be visible beyond 20 km but their visual impact would be insignificant. However, during typical atmospheric conditions the wind turbines would be visible up to a distance of approximately 20 km and this is considered to be the typical viewshed. The area generally up to 4 km, and in some locations with significant elevation up to 5 kms of a wind turbine, is most likely to be visually impacted.

The impacts of vegetative or building screening were not taken into account on the model and the results of the analysis, therefore, include many areas that may not have a view due to intervening screening vegetation or buildings, as demonstrated within the following analysis.

The absorptive capability of the landscape of the broader setting, as described in **Section 4.7**, indicates that the presence of vegetation within a generally flat landscape, even scattered vegetation, results in a reduction of visibility.

Therefore, the ZVI could be considered to be a worst-case scenario.

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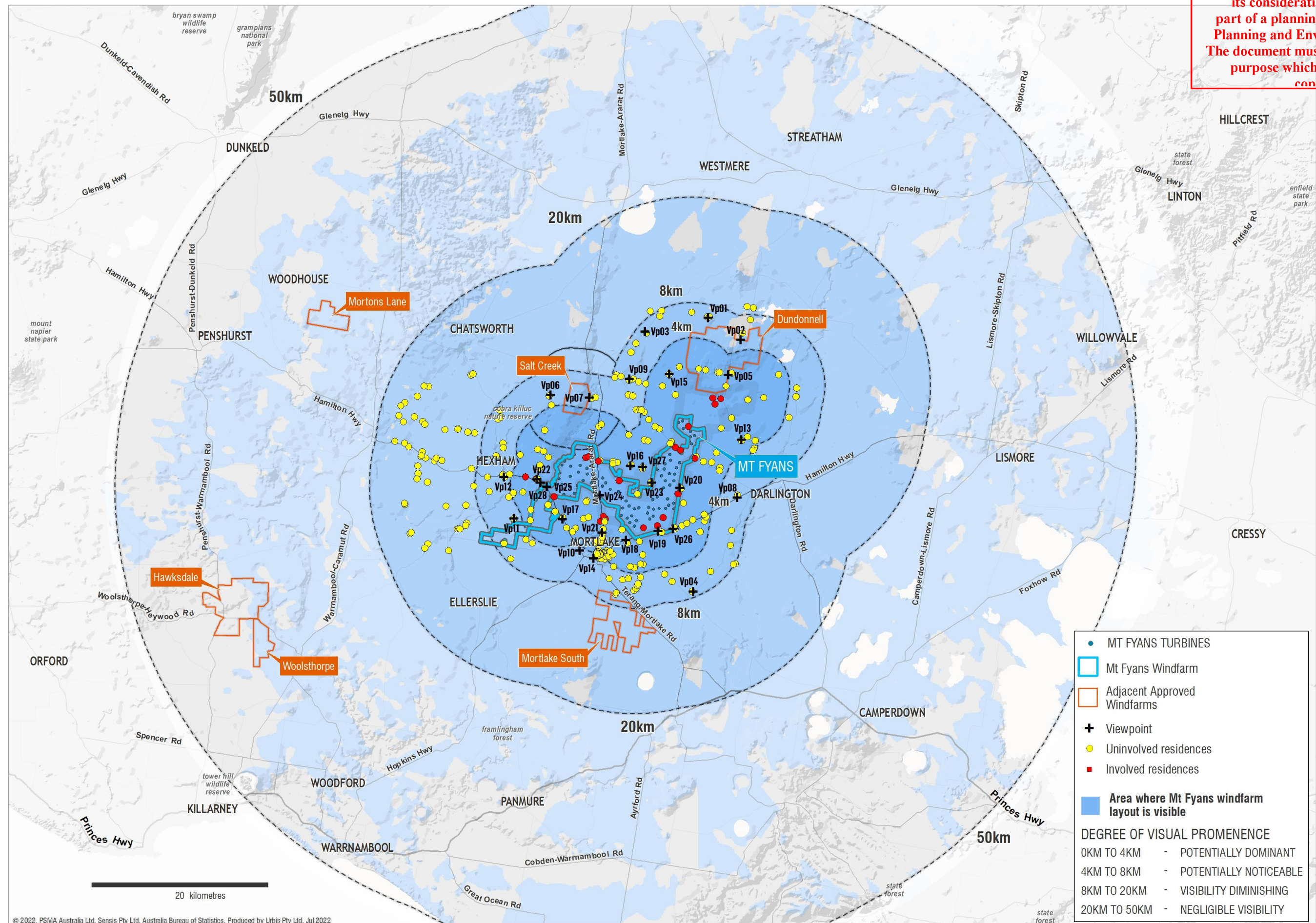


FIGURE 22 – ZVI ANALYSIS OF MT FYANS WIND FARM AND KEY SENSITIVE VIEWPOINTS – BLADE TIP HEIGHT OF 200 METRES

5.3 SUMMARY OF POTENTIALLY AFFECTED VIEWERS

5.3.1 QUANTIFICATION OF NUMBER OF RESIDENCES

The local (up to 4 km from the project area) and sub-regional settings, (up to 8km from the project area), are generally the visual catchment in which the level of visual impact is highest, beyond which it starts to gradually diminish for the most sensitive of land use types and user groups.

The following tables show data collected through the study process in order to attempt to quantify the potential impact of the wind farm on the surrounding area. Residences subject to wind farm agreements with Mount Fyans Wind Farm Pty Ltd have not been included. However, it should be noted that a number of the houses identified may have agreements in place with other wind farm proponents. The assessment relates to the area of land proposed for wind turbines. **Table 11** summaries the number of residences within an 8 km radius. **Table 12** summaries the number of residences in towns and settlements up to a 15 km radius as well as the number of vehicles per day using the Hamilton Highway.

Distance to Project (to turbines)	Number of Residences*
Within 4 kilometres	65
Between 4 and 8 km (excludes towns and settlements)	89

Source: – Locations of residences identified by desktop analysis.

TABLE 11 – NUMBERS OF ISOLATED RESIDENCES WITHIN THE LOCAL AND SUB-REGIONAL SETTING OF THE STUDY AREA

Towns and Major Roads	Number of Residences / Vehicles	Distance From Project Area	Direction
Mortlake	700 residences	4 km	S
Darlington	10 residences	10 km	E
Hexham	20 residences	6 km	W
Woorndo	15 residences	8 km	N - NW
Noorat	100 residences	15 km	S
Hamilton Highway	1,000 vehicles per day	Adjacent to site and within the local, sub-regional and regional settings	SW through to SE

TABLE 12 – TOWNSHIP RESIDENCES AND ROAD VEHICLES WITHIN THE SUB-REGIONAL AND REGIONAL SETTING OF THE PROJECT AREA (UP TO 15 KM RADIUS)

5.4 ASSESSMENT OF POTENTIAL IMPACT

5.4.1 INFLUENCES ON VISUAL IMPACT FROM RESIDENTIAL VIEWPOINTS

A number of factors will have a direct impact on the visibility of the project and the context in which it will be viewed. These are outlined following.

THE INFLUENCE OF HOMESTEAD VEGETATION ON VISUAL AMELIORATION

In order to provide protection from the influences of the environment, particularly sun and wind, Australian farm homestead gardens have traditionally developed a dense band of vegetation to surround an intimate and protected home yard. The effect of this in many instances has been to effectively contain the viewshed from the house and surrounding yard itself, screening views to the distance. The presence of foreground vegetation has a direct impact on the visibility of the proposed development and the context in which it will be viewed.

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Due to the general lack of accessibility to private yards, the site assessment process involved the undertaking of the analysis of views and the taking of photos from the most readily accessible public location immediately adjacent to a residences or residential areas, in most cases on the adjoining public road. Whilst the views from the publicly accessible areas to the proposed development may be uninterrupted, the views from the residences, in most cases, are screened or partially screened by surrounding vegetation.

THE INFLUENCE OF FARM WORK AREAS ON VISUAL MODIFICATION AND VIEWER DESENSITISATION

In many instances, the area immediately abutting and outside of the homestead garden is utilised as the works area for the operation of the farm. The presence of the “tools of the trade”, such as material storage areas, farm equipment, silos, sheds, etc., which can take up a considerable portion of the view shed around a house, can have a greater contributing influence on visual modification than other more distant elements.

5.4.2 RESIDENTIAL VIEWPOINT LANDSCAPE SETTING TYPOLOGIES

Throughout the visual catchment, the majority of residences sit within a landscape that is comprised of medium to tall vegetation, with varying levels of density depending on either the extent of clearing or extent of planting.

The height and density of vegetation has a direct relationship to the visual exposure of the residence to the proposed development.

The following three setting typologies have been developed to assist the understanding of the influence of vegetation on the screening of views from residences.

The assessment has considered the overall screening effect of vegetation as it relates to the direction of views towards the wind farm. For example, if the vegetation at the perimeter of the residence is sparse on the side away from the direction of views to the wind farm and dense on the side where there may be potential views, the effect of screening vegetation reflects the side with views. The same applies for the converse situation.

Typology 1 - Rural Residential – Open Tall Vegetation

Views to external areas are lightly to moderately filtered by scattered tall trees.

Influence on visibility and potential impact

Partial to open views of the proposed development will be possible between tall trees. The potential exists for visual impact (refer to **Figure 23**).

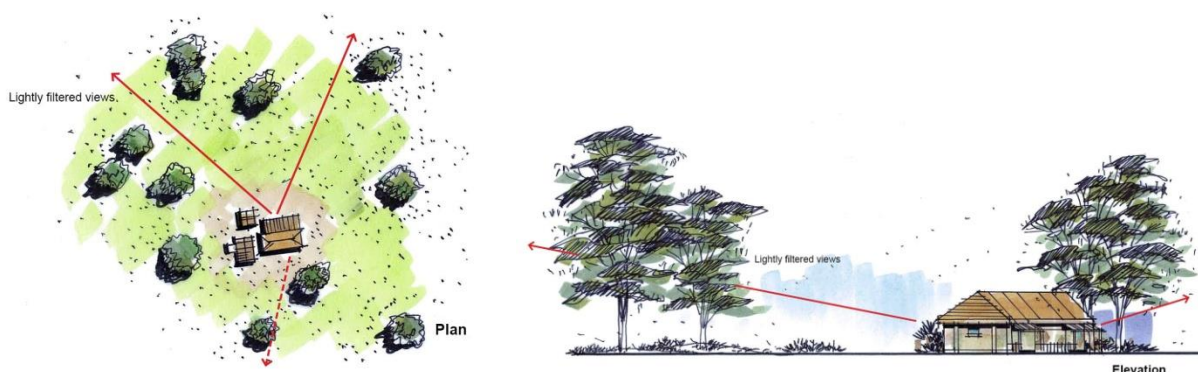


FIGURE 23 – TYPOLOGY 1 – TYPICAL PLAN AND SECTION

Typology 2 - Rural Residential – Semi Open Tall Vegetation

Views to external areas are partially to heavily screened by semi open, tall vegetation.

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Influence on visibility and potential impact

Partial to fully screened views of the proposed development will only be possible where limited breaks in vegetation occur. The potential for visual impact is significantly reduced (refer to **Figure 24**).

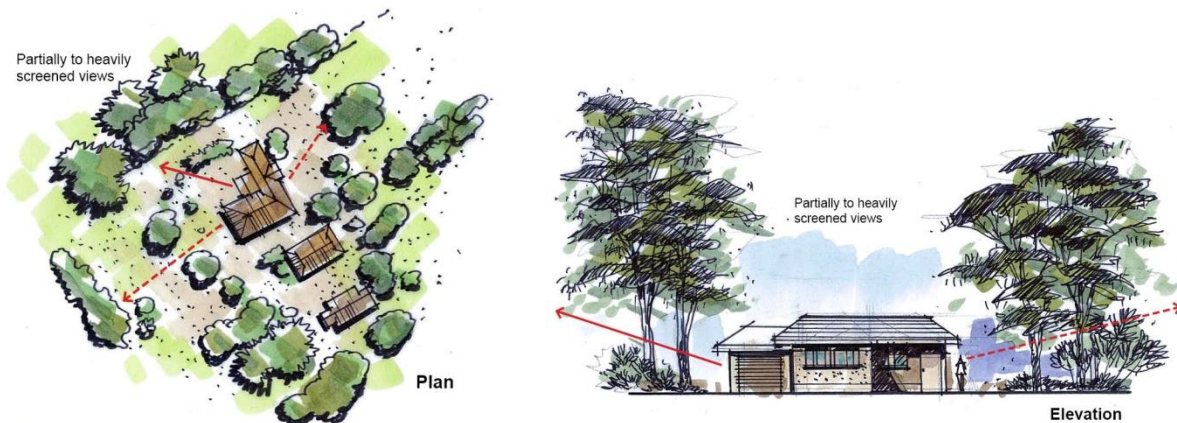


FIGURE 24 – TYPOLOGY 2 – TYPICAL PLAN AND SECTION

Typology 3 - Rural Residential – Dense Tall Vegetation

Views to external areas heavily to fully screened by dense, tall vegetation.

Influence on visibility and potential impact

Views of the proposed development will not be possible and therefore any impacts are highly unlikely (refer to **Figure 25**).



FIGURE 25 – TYPOLOGY 3 – TYPICAL PLAN AND SECTION

5.4.3 OVERVIEW ASSESSMENT OF VIEWS FROM RESIDENCES

A desktop assessment was undertaken based on aerial photography and Google “Streetview” imagery, followed by field surveys, of the potential degree of visibility and the potential visual impact on views from residences surrounding the project, considering the following factors:

- Proximity to the project;
 - Local setting (0-4 km from Project boundary).

- Sub-regional setting (4-8 km from project boundary).
- Degree of vegetation present around the residence (**Figure 26**):
 - Highly screened.
 - Partially screened.
 - Minimal screening.

Based on the proximity of the viewpoint and the degree of potential visual exposure to the project, an assessment was undertaken based on the methodology as outlined in **Section 1** which assumes that:

- viewer sensitivity reduces over distance; and
- a reduction in the visual modification level occurs with an increasing density of vegetation screening present.

The effects of vegetation on screening of views have not been assessed for residences at Mortlake due to the existing modified landscape character of the township setting, including screening from built form and fencing.

The overview findings are presented in **Table 13**.

VISUAL SETTING	RESIDENCES – HIGHLY SCREENED	POTENTIAL VISUAL IMPACT	RESIDENCES – PARTIALLY SCREENED	POTENTIAL VISUAL IMPACT	RESIDENCES – MINIMAL SCREENING	POTENTIAL VISUAL IMPACT
Local (0-4 km)	28	Moderate	31	Moderate to High	6	High
Sub-Regional (4-8 km)	35	Low	47	Moderate	7	Moderate to High

Note: Location and number of houses in the sub-regional and regional settings to be verified

Note: Level of potential impact does not factor in perceptual responses of viewers – i.e., it is a worst case scenario

Note: Based on distance from proposed turbines.

TABLE 13 – VISUAL IMPACT FOR RESIDENCES

5.5 PROTECTION OF VIEWS TOWARDS MT SHADWELL

Mt Shadwell is a significant feature in the region, being one of a number of volcanic cones of the Western Plains. It is visible from a number of locations along major roads such as the Hamilton and Hopkins Highways.

Figure 27 shows locations along the Hamilton and Hopkins Highways from which views of Mt Shadwell may be possible as well as the locations of proposed wind turbines. It is apparent from the analysis that vegetation plays a significant role in the containment of views from the Hamilton Highway both east and west of Mortlake, with vegetation often screening views out to Mt Shadwell as well as the surrounding area. The proposed arrangement of the wind turbines does not interrupt views to Mt Shadwell.

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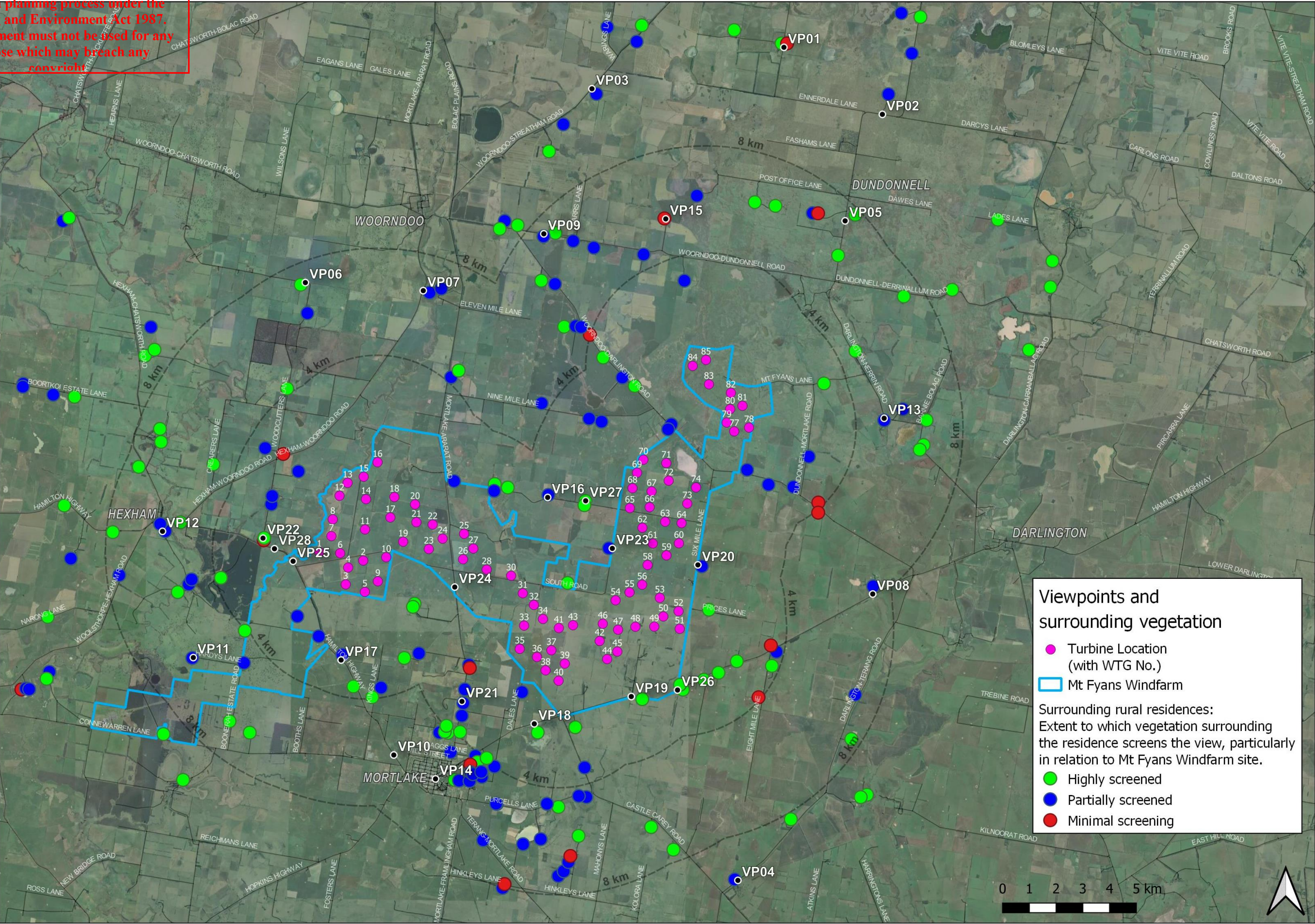


FIGURE 26 – RESIDENTIAL VIEWPOINTS AND EFFECTS OF SURROUNDING VEGETATION

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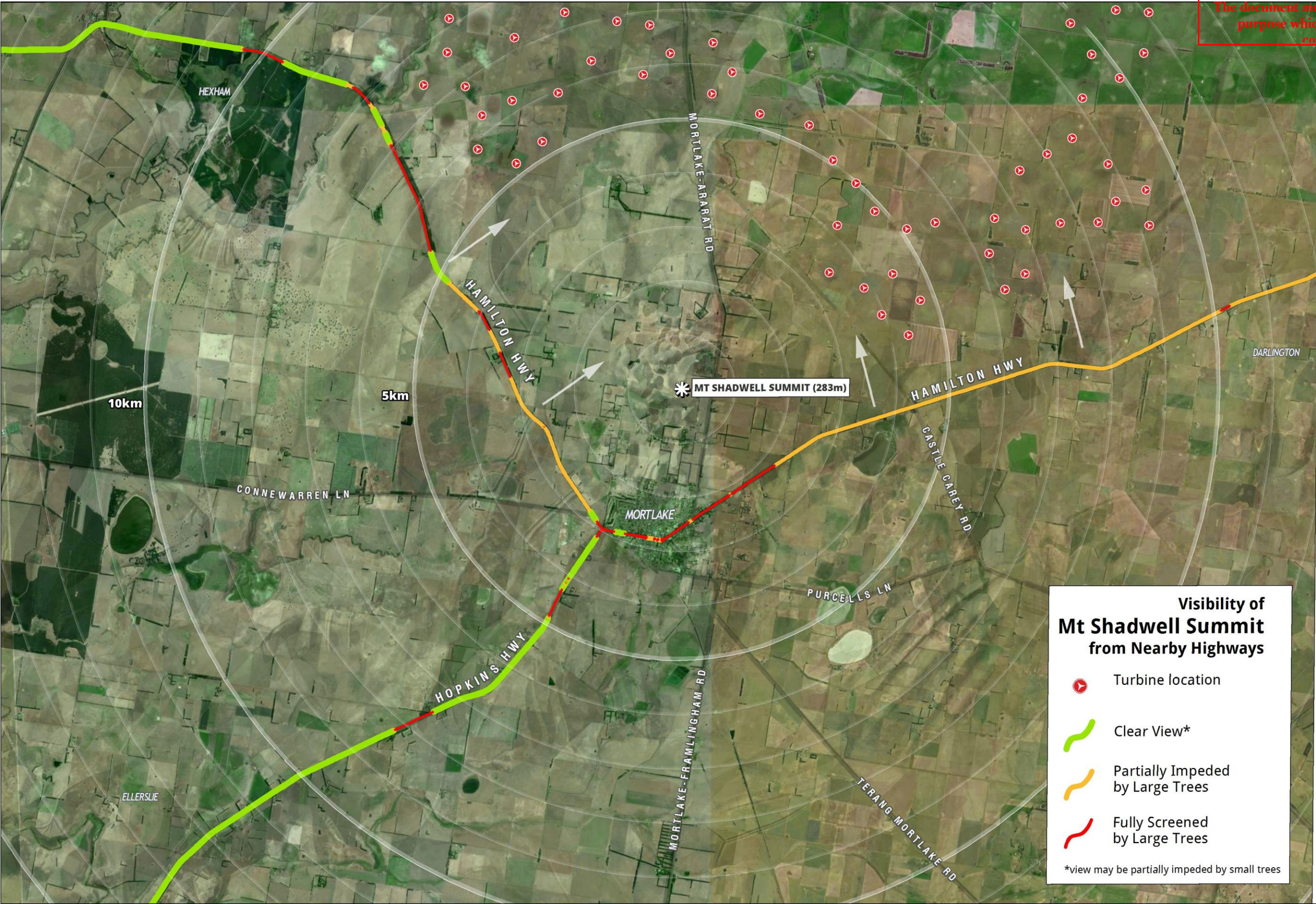


FIGURE 27 – EXISTING VISIBILITY OF MT SHADWELL FROM MAJOR ROADS

5.6 DETAILED VIEWPOINT ASSESSMENT

The following detailed assessment of viewpoints focusses on viewpoints of a high or moderate level of sensitivity. Low sensitivity settings of viewpoints have not been considered.

The assessment utilises a combination of both qualitative and qualitative approaches.

The quantitative assessment process has focussed on the Potential Visual Impact that may result on views for the most sensitive visual settings / land uses, applying the visibility method as described in **Appendix A**. (Refer to **Figure 26** for representative sensitive viewpoint locations). The quantification of visual prominence of the vertical angle is based on the height of the tallest element of the proposed development (the blade tip).

Perceptual responses of viewers to visual change are based on proximity to the proposed development and potential visibility. Viewer perception has not been adjusted to account for general community acceptance of wind farms that may be between 60% and 70%. In all cases it is assumed that the viewer has a low level of acceptance. The assessment therefore presents a conservative or “worst case” scenario.

The presented site photos have been taken at the closest publicly accessible location adjacent to the sensitive viewpoints, the local road network. The following assessment has been prepared based on the likely view possible from the sensitive viewpoint and, therefore, takes into account the effects of screening of views to the proposed development by surrounding vegetation and farm buildings. Only representative locations with a high level of visual sensitivity have been assessed.

For viewpoints where much of the proposed project is likely to be screened, photo-simulations have been enhanced with a blue outline to illustrate proposed turbines that are above existing topography but screened behind existing vegetation and buildings.

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**VIEWPOINT 01 -
RESIDENCE 86.**

Viewing Situation	Ennerdale Road near Residence 86.
Coordinates Easting / Northing	671,589m 5,810,980m
Viewing Distance (m)	12,213m from closest turbine (WTG_85)
Visual Setting	Regional
Landscape Character	<p>The residence is located in an open, slightly undulating pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation line paddock boundaries and roads. Scattered Eucalypts are located to the northeast corner of the residence, but there is no immediately adjacent vegetation around the remainder of the residence (Figure 28). Views from the residence south towards the project are not immediately screened by vegetation. However, dense windrows of vegetation located approximately 500 m from the residences would provide significant screening. Blades may be visible above the vegetation where the lower parts of the turbines are screened (Figure 29).</p> <p>From the local roads, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Minimal Screening</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Low
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 39 deg - Potentially Dominant (H)

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Vertical angle - 0.94 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Low.

Given the distance from the project, the relatively minimal topographic variation and the presence of vegetation around the residence and along roadsides which provide screening, views to the project will be limited, potentially only to blade tips and, in these instances, there will be a low to no apparent impact. Where views are possible through breaks in vegetation, the low sensitivity combined with a low to moderate actual level of visual prominence will result in a low potential visual impact.



FIGURE 28 – RESIDENCE 1 ON ENNERDALE ROAD – CHARACTER OF SETTING

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FIGURE 29 – RESIDENCE 1 ON ENNERDALE ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 02 -
RESIDENCE 185 AT
DUNERIN PROPERTY.

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Viewing Situation	Darcys Lane.
Coordinates Easting / Northing	675,270m 5,808,474m
Viewing Distance (m)	12,048m from closest turbine (WTG_85)
Visual Setting	Regional

Landscape Character

The residence is located within a pastoral landscape with regular stony rises providing topographic relief. The residence is surrounded by scattered, mixed native and exotic trees (**Figure 30**). There is limited vegetation along roadsides or paddocks. To the south of the residence in the direction of the project, the vegetation along Darcys Lane is sparse and generally of limited height. Vegetation immediately adjacent to the residence would provide partial screening of views. Views from the residence south towards the project would be also be partially screened by the intervening topography of the stony rises. Blades may be visible above the stony rises where the lower parts of the turbines are screened (**Figure 31**). From the nearby local roads, the project will be visible between scattered vegetation and blades may be visible above the stony rises where the lower parts of the turbines are screened.

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Landscape Unit / Scenic Quality	Foreground: Stony Rises - Pastoral
Residential Viewpoint Landscape Setting Typology Land Use	Partially Screened Residential (Rural - Isolated)
Visual Sensitivity	Low
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence	Horizontal angle - 33 deg - Potentially Dominant (H)

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(assumes no vegetation or buildings)

Vertical angle - 0.95 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

Low.

The vegetation around the residence would provide a degree of visual screening. Given the distance from the project, the stony rises would partially screen views to the project, potentially allowing views to blade tips. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in vegetation around the residence and between stony rises, the low sensitivity combined with an actual low to moderate level of visual prominence will result in a low potential visual impact.



FIGURE 30 – RESIDENCE ON “DUNERIN” PROPERTY ON DARCY’S LANE – CHARACTER OF SETTING

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FIGURE 31 – RESIDENCE ON “DUNERIN” PROPERTY ON DARCYS LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 03 - RESIDENCE 192

Viewing Situation Woorndoo - Streatham Road.

**Coordinates
Easting / Northing** 664,412m 5,809,431m

Viewing Distance (m) 10,752m from closest turbine (WTG_85)

Visual Setting Regional

Landscape Character The residence is located in a relatively flat, open, pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation line paddock boundaries and roads. Scattered vegetation, predominately native indigenous, exists around the edges of a number of nearby ephemeral lakes.
The residence is located within a dense surrounding planting of primarily native trees which provides for screening of views to the project (**Figure 32**)
From the nearby local roads, the project may be visible between breaks in intervening roadside and paddock boundary vegetation (**Figure 33**). Blades may be visible above vegetation where the lower parts of the turbines are screened

Landscape Unit / Scenic Quality Foreground: Bolac Lakes

**Residential Viewpoint
Landscape Setting
Typology
Land Use** Partially Screened
Residential (Rural - Isolated)

Visual Sensitivity Low

Number of Viewers Low

Duration of View Static

Potential Visual Prominence
(assumes no vegetation or buildings)
Horizontal angle - 58 deg - Potentially Dominant (H)
Vertical angle - 1.07 deg - Potentially Noticeable (M)
Overall Potential Visual Prominence - High Visual Prominence

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

Low.
Given the distance from the project, the relatively minimal topographic variation and the presence of vegetation around residences and along roadsides which provide screening, views to the project will be limited, potentially only to blade tips and, in these instances, there will be a low to no apparent impact. Where views are possible through breaks in vegetation around residences, the low sensitivity combined with an actual moderate level of visual prominence will result in a low potential visual impact.



FIGURE 32 – RESIDENCE ON WOORDOO – STREATHAM ROAD – CHARACTER OF SETTING

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FIGURE 33 – RESIDENCE ON WOORND – STREATHAM ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 04 - RESIDENCE 74.

Viewing Situation	Darlington - Terang Road.
Coordinates Easting / Northing	669,868m 5,779,845m
Viewing Distance (m)	9,517m from closest turbine (WTG_44)
Visual Setting	Regional
Landscape Character	<p>The residence is located in an open, slightly undulating pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation line nearby paddock boundaries and roads. Scattered native and exotic trees are located around the residence and a continuous band of trees is located to the west and southwest, approximately 100 m distant (Figure 34).</p> <p>Views north from the residence to the project would be mostly screened. Views may be possible through scattered vegetation to the most easterly part of the project. Blades may be visible above more distant the vegetation where the lower parts of the turbines are screened (Figure 34).</p> <p>From the local roads, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Low
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 55 deg - Potentially Dominant (H)</p> <p>Vertical angle - 1.2 deg - Potentially Noticeable (M)</p>

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Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing vegetation and built-form)

Low.

Given the distance from the project, the relatively minimal topographic variation and the presence of vegetation around the residence and along roadsides which provide screening, views to the project will be limited, potentially only to blade tips and, in these instances, there will be a low to no apparent impact. Where views are possible through breaks in vegetation, the low sensitivity combined with an actual moderate level of visual prominence will result in a low potential visual impact.



FIGURE 34 – RESIDENCE 74 ON DARLINGTON – TERANG ROAD – CHARACTER OF SETTING AND VIEW TOWARDS PROJECT

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**VIEWPOINT 05 -
RESIDENCE 5.**

Viewing Situation	Darlington - Nerrin Road.
Coordinates Easting / Northing	673,877m 5,804,494m
Viewing Distance (m)	7,786m from closest turbine (WTG_85)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located within a pastoral landscape with regular low, stony rises providing some topographic relief. The residence is surrounded by dense, mixed native and exotic trees (Figure 35).</p> <p>There is limited vegetation along roadsides or paddocks. To the south of the residence in the direction of the project, the vegetation along Darlington – Nerrin Road is sparse and generally of limited height. Vegetation immediately adjacent to the residence would provide blocking of views (Figure 36).</p> <p>From the nearby local roads, the project will be visible between scattered vegetation and blades may be visible above the stony rises where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Stony Rises - Pastoral
Residential Viewpoint Landscape Setting Typology Land Use	<p>Highly Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 40 deg - Potentially Dominant (H)</p> <p>Vertical angle - 1.47 deg - Potentially Noticeable (M)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

Non apparent to Very Low.
The vegetation around the residence would block views to the project. The moderate sensitivity combined with no apparent views will result in no potential visual impact.



FIGURE 35 – RESIDENCE 5 ON DARLINGTON – NERRIN ROAD – CHARACTER OF SETTING

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FIGURE 36 – RESIDENCE 5 ON DARLINGTON – ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 06 - RESIDENCE 83.

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Viewing Situation	Woodcutters Lane.
Coordinates Easting / Northing	653,698m 5,802,187m
Viewing Distance (m)	7,230m from closest turbine (WTG_16)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located in an open, slightly undulating pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation line nearby paddock boundaries and roads. Scattered, but generally linear plantings of native and exotic trees are located to around the residence to the north and east, with a continuous band of trees being located to the south and west (Figure 37).</p> <p>Views from the residence to the project would be screened (Figure 38).</p> <p>From the local roads, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Highly Screened Residential (Rural - Isolated)
Visual Sensitivity	Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 76 deg - Potentially Dominant (H)</p> <p>Vertical angle - 1.58 deg - Potentially Noticeable (M)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

Non Apparent to Very Low.
The vegetation around the residence would block views to the project. The moderate sensitivity combined with no apparent views will result in no visual impact.



FIGURE 37 – RESIDENCE 83 ON WOODCUTTERS LANE – CHARACTER OF SETTING

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FIGURE 38 – RESIDENCE 83 ON WOODCUTTERS LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 07 - RESIDENCE 68.

Viewing Situation	Hexham - Woorndoo Road.
Coordinates Easting / Northing	658,106m 5,801,885m
Viewing Distance (m)	6,630m from closest turbine (WTG_16)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located within a pastoral landscape defined by rectilinear windbreaks lining roads and paddock boundaries. Scattered vegetation lines the course of the meandering waterway to the east.</p> <p>The residence is surrounded by scattered, mixed native and exotic trees (Figure 39).</p> <p>Vegetation immediately adjacent to the residence would provide partial screening of views. Views from the residence south towards the project would also be partially to fully screened by the intervening rising topography and windbreaks of vegetation in the distance. Blades may be visible above the rising topography and vegetation where the lower parts of the turbines are screened (Figure 40).</p> <p>From the nearby local roads, the project will be visible between scattered vegetation and blades may be visible above the rising topography and windbreaks where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 100 deg - Potentially Dominant (H)

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Vertical angle - 1.73 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Moderate.

The vegetation around the residence would provide a degree of visual screening. Given the distance from the project, rising topography and windbreaks would partially to fully screen views to the project. Views to blade tips may be possible. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in, and over vegetation, the moderate sensitivity combined with an actual moderate level of visual prominence will result in a moderate potential visual impact.



FIGURE 39 – RESIDENCE 68 ON HEXHAM – WOORDOO ROAD – CHARACTER OF SETTING

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FIGURE 40 – RESIDENCE 68 ON HEXHAM – WOORDOO ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 08 -
RESIDENCE 46.

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Viewing Situation	Hamilton Highway adjacent to Residence 46.
Coordinates Easting / Northing	674,909m 5,790,547m
Viewing Distance (m)	7,335m from closest turbine (WTG_52)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located within a pastoral landscape defined by occasional rectilinear windbreaks along roads and paddock boundaries.</p> <p>The residence is located to the south of the Hamilton Highway surrounded by scattered, mixed native and exotic trees (Figure 41). A tall, dense wind break is located to the north of the residence, along the northern road reserve of the Hamilton Highway.</p> <p>Vegetation immediately adjacent to the residence would provide partial screening of views. Views from the residence west towards the project would also be partially to fully screened by windbreaks of vegetation in the distance. Blades may be visible above the vegetation where the lower parts of the turbines are screened (Figure 42).</p> <p>From the Hamilton Highway, the project will be visible between scattered vegetation. A number of turbines would be visible entirely and for others, blades may be visible above the rising windbreaks, where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence	Horizontal angle - 71 deg - Potentially Dominant (H)

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(assumes no vegetation or buildings)

Vertical angle - 1.56 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

Moderate.

The vegetation around the residence would provide a degree of visual screening. Windbreaks would partially to fully screen views to the project. Views to blade tips may be possible. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in, and over vegetation, the moderate sensitivity combined with an actual moderate level of visual prominence will result in a moderate potential visual impact.



FIGURE 41 – RESIDENCE 46 ON HAMILTON HIGHWAY – CHARACTER OF SETTING

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FIGURE 42 – RESIDENCE 46 ON HAMILTON HIGHWAY – VIEW TOWARDS PROJECT

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VIEWPOINT 09 - RESIDENCE 198

Viewing Situation	Woorndoo - Dundonnell Road.
Coordinates Easting / Northing	662,613m 5,804,009m
Viewing Distance (m)	7,387m from closest turbine (WTG_84)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located in an open, slightly undulating pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation occasionally line nearby paddock boundaries and roads. Scattered native and exotic trees are located around the residence and an almost continuous band of trees is located to the south and east, approximately 50 m to 100 m distant (Figure 43).</p> <p>Views to the south and east from the residence to the project would be mostly screened. Views to the project to the east may be possible to the project through breaks in vegetation. Where views are possible through breaks in vegetation, blades may be visible above more distant the vegetation where the lower parts of the turbines are screened (Figure 44).</p> <p>From the local roads, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 92 deg - Potentially Dominant (H)

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Vertical angle - 1.55 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

Moderate.

The vegetation around the residence would provide significant visual screening. Distant windbreaks would provide additional partial to full screening of views to the project where views may be possible from the residence out between breaks in vegetation. Views to blade tips may be possible above more distant vegetation. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in, and over vegetation, the moderate sensitivity combined with an actual moderate level of visual prominence will result in a moderate potential visual impact.



FIGURE 43 – RESIDENCE ON WOORNDOO – DUNDONNELL ROAD – CHARACTER OF SETTING

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FIGURE 44 – RESIDENCE ON WOORNDOO – DUNDONNELL ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 10 - HAMILTON HIGHWAY.

Viewing Situation	View from Hamilton Highway to Mt Shadwell.
Coordinates Easting / Northing	657,004m 5,784,531m
Viewing Distance (m)	6,156m from closest turbine (WTG_35)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>This location on the Hamilton Highway is located approximately 700 m west of the edge of the township of Mortlake within a pastoral landscape defined by occasional rectilinear windbreaks along roads and paddock boundaries.</p> <p>The highway in this area is typically devoid of adjacent tree planting. Unobstructed oblique views are possible from the highway, east to Mt Shadwell (Figure 45).</p> <p>From the Hamilton Highway, a large proportion of the central area of the project will be screened by the topographic form of Mt Shadwell. Turbines not obscured by Mt Shadwell will be partially screened by intervening vegetation and areas of rising topography. A number of turbines would be visible entirely and for others, blades may be visible above the rising windbreaks, where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Minimal Screening Highways / Tourist Roads
Visual Sensitivity	Low
Number of Viewers	High
Duration of View	Dynamic
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 88 deg - Potentially Dominant (H)

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Vertical angle - 1.86 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

Low.

Although there is limited vegetation immediately adjacent to the roadway, rising topography and windbreaks in the middle ground, in conjunction with the form of Mt Shadwell and its flanks, would partially to fully screen views to the project. Views to blade tips may be possible. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in, and over vegetation, the low sensitivity combined with an actual moderate level of visual prominence will result in a low potential visual impact.



FIGURE 45 – VIEW NORTHEAST FROM HAMILTON HIGHWAY TO MT SHADWELL AND VIEW TOWARDS PROJECT

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VIEWPOINT 11 - RESIDENCE 141.

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Viewing Situation	Hardys Lane.
Coordinates Easting / Northing	649,509m 5,788,172m
Viewing Distance (m)	6,184m from closest turbine (WTG_01)
Visual Setting	Sub-Regional (Far)
Landscape Character	<p>The residence is located in an open, generally flat pastoral landscape with sparsely scattered indigenous trees. Rectilinear wind breaks line nearby paddock boundaries and roads (Figure 46).</p> <p>A dense linear windbreak of native vegetation is located approximately 80 m to the northeast of the residence. Views north and northeast from the residence to the project would be mostly screened. Views east to the project may be possible through scattered vegetation to blades visible above more distant the vegetation where the lower parts of the turbines are screened (Figure 47).</p> <p>From the local roads, the project may be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Partially Screened Residential (Rural - Isolated)
Visual Sensitivity	Moderate to Moderate
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 52 deg - Potentially Dominant (H)</p> <p>Vertical angle - 1.85 deg - Potentially Noticeable (M)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

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Low to Moderate.

The vegetation to the northeast of the residence would provide significant visual screening to much of the project. Intervening scattered trees and distant windbreaks would provide additional partial to full screening of views to the project where views may be possible from the residence out between breaks in vegetation. Views to blade tips may be possible above more distant vegetation. In these instances, there will be a low to no apparent impact. The viewpoint has only a single turbine within a high viewer sensitivity distance with the turbines beyond within a moderate to low viewer sensitivity distance, therefore where views are possible through breaks in, and over vegetation, the moderate to high sensitivity combined with an actual low level of visual prominence will result in a low to moderate potential visual impact.



FIGURE 46 – RESIDENCE 141 ON HARDYS LANE – CHARACTER OF SETTING

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FIGURE 47 – RESIDENCE 141 ON HARDYS LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 12 - RESIDENCE 119.

Viewing Situation	Boonerah Road.
Coordinates Easting / Northing	648,357m 5,792,890m
Viewing Distance (m)	5,813m from closest turbine (WTG_01)
Visual Setting	Sub-Regional (Near)
Landscape Character	<p>The residence is located within a pastoral landscape defined by rectilinear windbreaks lining roads and paddock boundaries. Scattered vegetation lines the course of the meandering waterway to the east.</p> <p>The residence is bounded by a dense windbreak to the west and scattered trees to the north, east and south (<i>Figure 48</i>).</p> <p>Vegetation immediately adjacent to the residence would provide partial screening of views towards the project. Views would also be partially to fully screened by the intervening vegetation in the distance, such as a plantation on the Hamilton Highway. Blades may be visible above the vegetation where the lower parts of the turbines are screened (<i>Figure 49</i>).</p> <p>From the nearby local roads, the project would be visible between scattered vegetation and blades may be visible above the rising topography and windbreaks where the lower parts of the turbines are screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	Moderate to High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 39 deg - Potentially Dominant (H)

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Vertical angle - 1.97 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Moderate to High.

The vegetation to the east of the residence would provide significant visual screening to much of the project. Intervening scattered trees and distant windbreaks and plantations would provide additional partial to full screening of views to the project where views may be possible from the residence out between breaks in vegetation. Views to blade tips may be possible above more distant vegetation. In these instances, there will be a low to no apparent impact. The viewpoint has only a single turbine within a high viewer sensitivity distance with the turbines beyond within a moderate to low viewer sensitivity distance, therefore where views are possible through breaks in, and over vegetation, the moderate to high sensitivity combined with an actual moderate level of visual prominence will result in a moderate to high potential visual impact.

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FIGURE 48 – RESIDENCE 120 ON BOONERAH ROAD – CHARACTER OF SETTING

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FIGURE 49 – RESIDENCE 120 ON BOONERAH ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 13 - RESIDENCE 179

Viewing Situation	Darlington - Nerrin Road.
Coordinates Easting / Northing	675,336m 5,797,115m
Viewing Distance (m)	5,633m from closest turbine (WTG_78)
Visual Setting	Sub-Regional (Near)
Landscape Character	<p>The residence is located in an open, slightly undulating pastoral landscape. Dense rectilinear windbreaks of native and exotic vegetation occasionally line nearby paddock boundaries and roads. Scattered but relatively dense native and exotic trees are located around the residence and almost continuous bands of trees are located to the north and west, approximately 40 m and 100 m distant respectively (<i>Figure 50</i>).</p> <p>Views from the residence to the project would be screened (<i>Figure 51</i>).</p> <p>From the local roads, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 59 deg - Potentially Dominant (H)</p> <p>Vertical angle - 2.03 deg - Potentially Noticeable (M)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

Low.
The vegetation around the residence would provide significant visual screening. The high sensitivity combined with a very low to non-apparent level of visual prominence will result in a low potential visual impact.



FIGURE 50 – RESIDENCE ON DARLINGTON – NERRIN ROAD – CHARACTER OF SETTING

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FIGURE 51 – RESIDENCE ON DARLINGTON – NERRIN ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 14 -
MORTLAKE - TOWN
INTERSECTION -
ROUNDBOUT ON
HAMILTON HIGHWAY.

Viewing Situation	Hamilton Highway, Mortlake.
Coordinates Easting / Northing	658,564m 5,783,637m
Viewing Distance (m)	5,779m from closest turbine (WTG_38)
Visual Setting	Sub-Regional (Near)
Landscape Character	Rural town urban setting with generally older, single storey buildings and relatively dense tree cover of exotic evergreen, deciduous and native trees. Prominent views to Mt Shadwell are possible along Officer Street (Figure 52). Views from the main street (Hamilton Highway) to the project are fully screened by topography, buildings and canopy vegetation (Figure 53).
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Not Applicable Residential (Township)
Visual Sensitivity	High
Number of Viewers	Moderate
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 86 deg - Potentially Dominant (H) Vertical angle - 1.98 deg - Potentially Noticeable (M) Overall Potential Visual Prominence - High Visual Prominence

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**Potential Visual Impact
(accounting for existing
vegetation and built-form)**

Low.

With the relatively minimal topographic variation and the presence of numerous buildings and vegetation that provide screening, views to the project would be unlikely.

For most viewers in Mortlake there will be a low to non-apparent impact due to no views being possible.



FIGURE 52 – THE HAMILTON HIGHWAY AT MORTLAKE – CHARACTER OF SETTING AND VIEW TO MT SHADWELL

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FIGURE 53 – THE HAMILTON HIGHWAY AT MORTLAKE – VIEW TOWARDS PROJECT

(BLUE OUTLINE ILLUSTRATING PROPOSED TURBINES ABOVE EXISTING TOPOGRAPHY, BUT SCREENED BEHIND EXISTING VEGETATION AND BUILDINGS)

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VIEWPOINT 15 -
RESIDENCE 89 - PHOTO
OF UNNAMED
RESIDENCE CLOSEST
TO ROAD.

Viewing Situation	Veals Lane. Residence 89 located to rear.
Coordinates Easting / Northing	667,172m 5,804,567m
Viewing Distance (m)	5,512m from closest turbine (WTG_85)
Visual Setting	Sub-Regional (Near)
Landscape Character	<p>The residence is located within a generally flat, to slightly undulating, open pastoral landscape (Figure 54). There is limited vegetation along roadsides or paddocks. To the south of the residence in the direction of the project, the vegetation along Veals Lane is sparse. There is limited vegetation around the residence apart from a dense windbreak located approximately 20 m to its east.</p> <p>The wind break immediately adjacent to the residence would provide partial screening of views to the northern part of the project. Views from the residence south towards the project would be also be partially screened by the intervening vegetation, particularly that along Woorndoo – Dundonnell Road (Figure 55). Blades may be visible above the vegetation where the lower parts of the turbines are screened or whole turbines may be visible where there is no intervening vegetation. From the nearby local roads, the project will be visible between scattered vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Minimal Screening</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low

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Duration of View

Static

Potential Visual Prominence

(assumes no vegetation or buildings)

Horizontal angle - 73 deg - Potentially Dominant (H)

Vertical angle - 2.08 deg - Potentially Noticeable (M)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

Moderate.

The vegetation around the residence would provide a degree of visual screening. Given the distance from the project, scattered vegetation in the middle distance would partially screen views to the project, potentially allowing views to the blades. In these instances, there will be a low apparent impact. Where views are possible through breaks in vegetation around the residence and between middle distance vegetation, the high sensitivity combined with a low level of visual prominence will result in a moderate potential visual impact.



FIGURE 54 – RESIDENCE 89 ON VEALS LANE (DERELICT HOUSE IN FRONT OF MAIN RESIDENCE) – CHARACTER OF SETTING

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FIGURE 55 – RESIDENCE 89 ON VEALS LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 16 - RESIDENCE 50.

Viewing Situation	N Road.
Coordinates Easting / Northing	662,757m 5,794,157m
Viewing Distance (m)	3,087m from closest turbine (WTG_65)
Visual Setting	Local
Landscape Character	<p>The residence is located within a generally flat, to slightly undulating, open pastoral landscape (Figure 56). Away from the immediate vicinity of the residence, there are occasional areas of vegetation along roadsides or paddocks.</p> <p>There is limited vegetation to the east of the residence. However, the windbreak vegetation to the south and west of the residence is dense. This windbreak vegetation would provide screening of views of the project to the south and west. Views of the project to the east and northeast would be possible with partial screening of the lower parts of the turbines provided by intervening middle distance vegetation (Figure 57).</p> <p>Blades may be visible above the vegetation where the lower parts of the turbines are screened or whole turbines may be visible where there is no intervening vegetation. From the nearby local roads, the project will be visible between and above scattered vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 234 deg - Potentially Dominant (H)

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Vertical angle - 3.71 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Moderate.

The vegetation around the residence would provide full screening of views to the project to the north, west and southwest. Views would be possible to the project to the southeast, east and northeast. However, sheds and tanks in the foreground and scattered vegetation in the middle distance would partially to fully screen views to the project, potentially allowing views only to more distant, or a limited numbers of individual turbines to the south east.

The high sensitivity combined with a low level of visual prominence will result in a moderate potential visual impact.



FIGURE 56 – RESIDENCE 50 ON N ROAD – CHARACTER OF SETTING

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FIGURE 57 – RESIDENCE 50 ON N ROAD – VIEW TOWARDS PROJECT

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VIEWPOINT 17 -
RESIDENCE 157.

Viewing Situation	Hamilton Highway.
Coordinates Easting / Northing	655,035m 5,788,080m
Viewing Distance (m)	2,494m from closest turbine (WTG_05)
Visual Setting	Local
Landscape Character	<p>The residence is located within a generally flat, to slightly undulating, open pastoral landscape (Figure 58).</p> <p>Away from the immediate vicinity of the residence, there are areas of vegetation along roadsides or paddocks. There is limited vegetation to the north of the residence. However, the windbreak vegetation to the south, east and west of the residence is dense. This windbreak vegetation would provide screening of views of the project to the east and northeast. Views of the project to the north and northwest would be possible with partial screening of the lower parts of the turbines provided by intervening middle distance vegetation (Figure 58).</p> <p>Blades may be visible above the vegetation where the lower parts of the turbines are screened or whole turbines may be visible where there is no intervening vegetation. From the nearby local roads, the project will be visible between and above scattered vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Highly Screened Residential (Rural - Isolated)
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 109 deg - Potentially Dominant (H)

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Vertical angle - 4.58 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing vegetation and built-form)

High.
Where views are possible to north and northwest to the project, wind break vegetation in the middle distance would partially screen views to the project, potentially allowing views only to the blades.
The high sensitivity combined with a moderate to high level of visual prominence will result in a high potential visual impact.



FIGURE 58 – RESIDENCE 157 ON HAMILTON HIGHWAY – CHARACTER OF SETTING AND VIEW TOWARDS PROJECT

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**VIEWPOINT 18 -
RESIDENCE 57.**

Viewing Situation	Hamilton Highway.
Coordinates Easting / Northing	662,256m 5,785,696m
Viewing Distance (m)	2,086m from closest turbine (WTG_40)
Visual Setting	Local
Landscape Character	<p>The residence is located within a generally flat, to slightly undulating, open pastoral landscape (Figure 59). Away from the immediate vicinity of the residence, there are areas of vegetation along roadsides or paddocks. There is limited vegetation to the north of the residence. However, the windbreak vegetation to the south, east and west of the residence is dense. This windbreak vegetation would provide screening of views of the project to the east and northeast. Views of the project to the north and northwest would be possible with partial screening of the lower parts of the turbines provided by intervening middle distance vegetation (Figure 60). Blades may be visible above the vegetation where the lower parts of the turbines are screened or whole turbines may be visible where there is no intervening vegetation. From the nearby local roads, the project will be visible between and above scattered vegetation.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Highly Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 106 deg - Potentially Dominant (H)

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Vertical angle - 5.48 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Low to Moderate.

Tall and dense vegetation to the north and west of the residence provides a significant degree of screening. However, it is noted that some of the vegetation is suffering dieback and their effectiveness at screening is reducing.

The high sensitivity combined with a low to non-apparent level of visual prominence will result in a low to moderate potential visual impact.



FIGURE 59 – RESIDENCE 57 ON THE HAMILTON HIGHWAY – CHARACTER OF SETTING

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FIGURE 60 – RESIDENCE 57 ON THE HAMILTON HIGHWAY – VIEW TOWARDS PROJECT

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VIEWPOINT 19 - HAMILTON HIGHWAY.

Viewing Situation	Intersection Hamilton Highway and Five Mile Lane.
Coordinates Easting / Northing	665,883m 5,786,716m
Viewing Distance (m)	1,664m from closest turbine (WTG_44)
Visual Setting	Local
Landscape Character	<p>The highway at this location is set within a pastoral landscape defined by occasional rectilinear windbreaks of exotic and native vegetation along roads and paddock boundaries.</p> <p>The direction of the road aligns with Mt Shadwell and the views to the west towards it are open and unimpeded from this location where there is lightly scattered roadside vegetation (Figure 61).</p> <p>From the Hamilton Highway, the project will be visible offset from the direction of travel by approximately 30 degrees. A number of turbines will be highly visible through breaks in vegetation, while others will be totally or partially screened by scattered trees or dense hedgerow planting (Figure 62).</p> <p>However, the viewline to Mt Shadwell, including a buffering distance to the north of Mt Shadwell will not have wind turbines impede the existing view.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Not Applicable</p> <p>Highways / Tourist Roads</p>
Visual Sensitivity	High
Number of Viewers	High
Duration of View	Dynamic
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 113 deg - Potentially Dominant (H)

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Vertical angle - 6.85 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact (accounting for existing vegetation and built-form)

High.

The vegetation to the north of the highway would provide a degree of visual screening. Windbreaks would partially to fully screen views to the project. Views to blade tips may be possible. In these instances, there will be a low to no apparent impact. Where views are possible through breaks in, and over vegetation, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact.

However, the turbines will not interfere with the viewline to Mt Shadwell from this location where the viewer is traversing the landscape of the setting at speed.



FIGURE 61 – VIEW FROM HAMILTON HIGHWAY TOWARDS MT SHADWELL – CHARACTER OF SETTING

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FIGURE 62 – VIEW FROM HAMILTON HIGHWAY TOWARDS PROJECT

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VIEWPOINT 20 -
RESIDENCE 58.

Viewing Situation	Six Mile Lane.
Coordinates Easting / Northing	668,373m 5,791,636m
Viewing Distance (m)	1,216m from closest turbine (WTG_60)
Visual Setting	Local
Landscape Character	<p>The residence is located within a pastoral landscape defined by occasional rectilinear windbreaks of native and exotic, primarily coniferous, vegetation along roads and paddock boundaries.</p> <p>The residence is located to the east of Six Mile Lane. Dense native planting is located along the roadside adjacent to the residence. However, a section of vegetation approximately 50 m in length has been cleared in the area immediately between the residence and the roadway (Figure 63).</p> <p>Views from the residence west towards the project would be limited to a narrow cone of approximately 20 degrees through the break in roadside vegetation. A limited number of closest turbines will be fully open to view. More distant turbines would have their towers and parts of the blades partially screened by windbreaks of vegetation in the distance (Figure 64).</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 176 deg - Potentially Dominant (H)

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Vertical angle - 9.34 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

Potential Visual Impact
(accounting for existing
vegetation and built-form)

Moderate.

The vegetation around the residence would provide full screening to all but a narrow 20 degree cone. Four turbines, which are between 1 km to 2.2 km distant, would be highly visible. Windbreaks would partially screen views to more distant turbines extending to approximately 13 km from the residence.

The high level of sensitivity combined with a low level of visual prominence will result in a moderate potential visual impact.



FIGURE 63 – RESIDENCE 58 ON SIX MILE LANE – CHARACTER OF SETTING

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FIGURE 64 – RESIDENCE 58 ON SIX MILE LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 21 -
RESIDENCE 169

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Viewing Situation	Mortlake-Ararat Rd
Coordinates Easting / Northing	659,552m 5,786,534m
Viewing Distance (m)	2,929m from closest turbine (WTG_35)
Visual Setting	Local
Landscape Character	<p>The residence is located adjacent to the road, and proximate to a quarry.</p> <p>The broader landscape is mostly cleared, with occasional bands of dense vegetation located along roads and paddock boundaries.</p> <p>The residence is set within scattered vegetation and has a number of adjacent sheds. As a result, foreground views towards the project will be partially screened (refer to Figure 65). Bands of intervening vegetation in the middle to background will screen views of the lower parts of the turbines.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 123 deg - Potentially Dominant (H)</p> <p>Vertical angle - 3.91 deg - Potentially Dominant (H)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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**Potential Visual Impact
(accounting for existing
vegetation and built-form)**

High.

Windbreaks in the middle to background would partially screen views to the project but the blades and upper parts of the turbines would be possible. In these instances, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact.



FIGURE 65 – RESIDENCE 169 ON MORTLAKE ARARAT ROAD – CHARACTER OF SETTING

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FIGURE 66 – RESIDENCE 169 ON MORTLAKE ARARAT ROAD – VIEW TOWARDS PROJECT
(BLUE OUTLINE ILLUSTRATING PROPOSED TURBINES ABOVE EXISTING TOPOGRAPHY, BUT SCREENED BEHIND EXISTING VEGETATION AND BUILDINGS)

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VIEWPOINT 22 - RESIDENCE 63

Viewing Situation	Woodcutters Lane.
Coordinates Easting / Northing	652,114m 5,792,635m
Viewing Distance (m)	2,125m from closest turbine (WTG_01)
Visual Setting	Local
Landscape Character	<p>The residence is located within a landscape which is mostly cleared, with occasional bands of dense vegetation located along roads and paddock boundaries.</p> <p>The residence is set within a dense band of surrounding vegetation (refer to Figure 67). Consequently, views to the turbines will be mostly screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Highly Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 63 deg - Potentially Dominant (H)</p> <p>Vertical angle - 5.38 deg - Potentially Dominant (H)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>
Potential Visual Impact (accounting for existing vegetation and built-form)	<p>Low.</p> <p>Tall and dense vegetation surrounding the residence provides a significant degree of screening (refer to Figure 68).</p> <p>Consequently, the high sensitivity combined with a very low to non-apparent level of visual prominence will result in a low potential visual impact.</p>

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FIGURE 67 – RESIDENCE 63 ON WOODCUTTERS LANE – CHARACTER OF SETTING



FIGURE 68 – RESIDENCE 63 ON WOODCUTTERS LANE – VIEW TOWARDS PROJECT

(BLUE OUTLINE ILLUSTRATING PROPOSED TURBINES ABOVE EXISTING TOPOGRAPHY, BUT SCREENED BEHIND EXISTING VEGETATION AND BUILDINGS)

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VIEWPOINT 23 - RESIDENCE 17

Viewing Situation	South Road
Coordinates Easting / Northing	665,174m 5,792,252m
Viewing Distance (m)	1,467m from closest turbine (WTG_62)
Visual Setting	Local
Landscape Character	<p>The residence in a landscape that is mostly cleared, with occasional bands of dense vegetation located along roads and paddock boundaries.</p> <p>The residence is set within scattered vegetation, with a very wide and dense band of vegetation located to its south (refer to Figure 69).</p> <p>Foreground views towards the project are mostly open (refer to Figure 70). However, bands of intervening vegetation in the middle to background will screen views of the lower parts of the turbines.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Partially Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 270 deg - Potentially Dominant (H)</p> <p>Vertical angle - 7.76 deg - Potentially Dominant (H)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

High.
Windbreaks in the middle to background would partially screen views to the project but the blades and upper parts of the turbines would be possible. In these instances, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact.



FIGURE 69 – RESIDENCE 17 ON SOUTH LANE – CHARACTER OF SETTING

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FIGURE 70 – RESIDENCE 17 ON SOUTH LANE – VIEW TOWARDS PROJECT

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VIEWPOINT 24 - MORTLAKE-ARARAT ROAD, NEAR CASTLE CAREY ROAD

Viewing Situation	Mortlake-Ararat Road, northbound towards Castle Carey Road
Coordinates Easting / Northing	659,283m 5,790,807m
Viewing Distance (m)	1,085m from closest turbine (WTG_26 & 527m to pole)
Visual Setting	Local
Landscape Character	<p>The landscape is mostly cleared, with occasional bands of dense vegetation located along roads and paddock boundaries.</p> <p>The viewpoint location is set within bands of vegetation, with a very wide and dense band of vegetation located to its north (refer to Figure 71).</p> <p>Views towards the eastern part of the project are open. However, surrounding vegetation will screen views to the western part of the project (refer to Figure 72).</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology	Not Applicable
Land Use	Highways / Tourist Roads
Visual Sensitivity	High
Number of Viewers	High
Duration of View	Dynamic
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 227 deg - Potentially Dominant (H)</p> <p>Vertical angle - 10.44 deg - Potentially Dominant (H)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>

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**Potential Visual Impact
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High.

The turbines in the eastern part of the project would be visible in their entirety. As a result, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact.



FIGURE 71 – MORTLAKE-ARARAT ROAD, NEAR CASTLE CAREY ROAD – CHARACTER OF SETTING

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FIGURE 72 – MORTLAKE-ARARAT ROAD, NEAR CASTLE CAREY ROAD - VIEW TOWARDS PROJECT (SHOWING THE PROPOSED MT FYANS WIND FARM POWERLINE AND THE APPROVED DUNDONNELL POWERLINE)

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VIEWPOINT 25 -
HAMILTON HIGHWAY WEST, NEAR CASTLE CAREY ROAD

Viewing Situation Hamilton Highway west, southbound near Castle Carey Road

**Coordinates
Easting / Northing** 653,239m 5,791,772m

Viewing Distance (m) 1,040m from closest turbine (WTG_01 & 125m to transmission line)

Visual Setting Local

Landscape Character The Hamilton Highway traverses an open landscape with occasional bands of vegetation along the road side and around paddock boundaries.
The driving experience is one of opening and closing views to the surrounding landscape. The project is located to the east of the highway.
Existing power infrastructure crosses the road near this viewpoint (refer to **Figure 73**).

Landscape Unit / Scenic Quality Foreground: Western Plains Agricultural / Pastoral Areas

Residential Viewpoint Not Applicable

Landscape Setting

Typology

Land Use Highways / Tourist Roads

Visual Sensitivity High

Number of Viewers High

Duration of View Dynamic

Potential Visual Prominence Horizontal angle - 79 deg - Potentially Dominant (H)

(assumes no vegetation or buildings)

Vertical angle - 10.88 deg - Potentially Dominant (H)

Overall Potential Visual Prominence - High Visual Prominence

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Potential Visual Impact
(accounting for existing
vegetation and built-form)

High.
Where there are breaks in the roadside vegetation, the turbines in the southern part of the project would be visible in their entirety. As a result, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact. However, it should be noted that the driving experience varies from open views to filtered views and fully screened views as drivers traverse the landscape.
The powerline will cross the road along the same alignment as the approved Dundonnell powerline. Due to its collocation, it will only result in a low to moderate level of visual impact.



FIGURE 73 – HAMILTON HIGHWAY NEAR CASTLE CAREY ROAD – CHARACTER OF SETTING

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FIGURE 74 – HAMILTON HIGHWAY NEAR CASTLE CAREY ROAD – VIEW TOWARDS PROJECT (SHOWING THE PROPOSED MT FYANS WIND FARM POWERLINE AND THE DUNDONNELL POWERLINE)

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VIEWPOINT 26 - INTERSECTION HAMILTON HWY & SIX MILE LANE

Viewing Situation	Intersection Hamilton Hwy & Six Mile Lane
Coordinates Easting / Northing	667,612m 5,786,959m
Viewing Distance (m)	2,288m from closest turbine (WTG_51)
Visual Setting	Local
Landscape Character	The Hamilton Highway traverses an open landscape with occasional bands of vegetation along the road side and around paddock boundaries (refer to Figure 75). The driving experience is one of opening and closing views to the surrounding landscape.
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Not Applicable Highways / Tourist Roads
Visual Sensitivity	High
Number of Viewers	High
Duration of View	Dynamic
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 101 deg - Potentially Dominant (H) Vertical angle - 5 deg - Potentially Dominant (H) Overall Potential Visual Prominence - High Visual Prominence
Potential Visual Impact (accounting for existing vegetation and built-form)	High. Where there are breaks in the roadside vegetation, the turbines in the southern part of the project would be visible in their entirety. As a result, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact. However, it should be noted that the driving experience varies from open views to filtered views and fully screened views as drivers traverse the landscape.

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FIGURE 75 – HAMILTON HIGHWAY AND SIX MILE LANE – CHARACTER OF SETTING



FIGURE 76 – HAMILTON HIGHWAY AND SIX MILE LANE – VIEW TOWARDS PROJECT

VIEWPOINT 27 - RESIDENCE 18

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Viewing Situation	North Road
Coordinates Easting / Northing	664,177m 5,794,033m
Viewing Distance (m)	1,686m from closest turbine (WTG_65)
Visual Setting	Local
Landscape Character	<p>The residence in a landscape that is mostly cleared, with occasional bands of dense vegetation located along roads and paddock boundaries.</p> <p>The residence is set within surrounding vegetation, with a very wide and dense band of vegetation located to its west and south (refer to Figure 77).</p> <p>Views towards the project are highly screened.</p>
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	<p>Highly Screened</p> <p>Residential (Rural - Isolated)</p>
Visual Sensitivity	High
Number of Viewers	Low
Duration of View	Static
Potential Visual Prominence (assumes no vegetation or buildings)	<p>Horizontal angle - 244 deg - Potentially Dominant (H)</p> <p>Vertical angle - 6.77 deg - Potentially Dominant (H)</p> <p>Overall Potential Visual Prominence - High Visual Prominence</p>
Potential Visual Impact (accounting for existing vegetation and built-form)	<p>Low to Moderate.</p> <p>Tall, dense vegetation surrounding the residence provides a significant degree of screening (refer to Figure 78)</p> <p>Consequently, the high sensitivity combined with a low to moderate level of visual prominence will result in a low to moderate potential visual impact.</p>

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VIEWPOINT 28 - HAMILTON HIGHWAY WEST, NEAR WOODCUTTERS LANE

Viewing Situation	Hamilton Highway west, southbound near Woodcutters Lane
Coordinates Easting / Northing	652,543m 5,792,239m
Viewing Distance (m)	1,681m from closest turbine (WTG_01)
Visual Setting	Local
Landscape Character	The Hamilton Highway traverses an open landscape with occasional bands of vegetation along the road side and around paddock boundaries (refer to Figure 79). The driving experience is one of opening and closing views to the surrounding landscape. The project is located to the east of the highway.
Landscape Unit / Scenic Quality	Foreground: Western Plains Agricultural / Pastoral Areas
Residential Viewpoint Landscape Setting Typology Land Use	Not Applicable Highways / Tourist Roads
Visual Sensitivity	High
Number of Viewers	High
Duration of View	Dynamic
Potential Visual Prominence (assumes no vegetation or buildings)	Horizontal angle - 69 deg - Potentially Dominant (H) Vertical angle - 6.78 deg - Potentially Dominant (H) Overall Potential Visual Prominence - High Visual Prominence
Potential Visual Impact (accounting for existing vegetation and built-form)	High. Where there are breaks in the roadside vegetation, the turbines in the southern part of the project would be visible in their entirety. As a result, the high sensitivity combined with a high level of visual prominence will result in a high potential visual impact for the wind turbines. However, it

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should be noted that the driving experience varies from open views to filtered views and fully screened views as drivers traverse the landscape. The powerline will cross the road along the same alignment as the approved Dundonnell powerline. Due to its collocation, it will only result in a low to moderate level of visual impact.



FIGURE 79 – HAMILTON HIGHWAY NEAR WOODCUTTERS LANE – CHARACTER OF SETTING

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FIGURE 80 – HAMILTON HIGHWAY NEAR WOODCUTTERS LANE – VIEW TOWARDS PROJECT (SHOWING THE PROPOSED MT FYANS WIND FARM POWERLINE AND THE APPROVED DUNDONNELL POWERLINE)

5.7 ASSESSMENT OF CONNECTING POWERLINE

5.7.1 OVERVIEW

It is intended that the sub-station at the wind farm be connected to the network at the Mortlake Power Station, approximately 12 km west of Mortlake. For a significant extent of its length, the powerline will follow the same easement as the approved 220 kV powerline, connecting Dundonnell Wind Farm to Mortlake Power Station.

The design of the power line is yet to be finalised but steel pole construction is likely.

The approved Dundonnell power line is 38 km in length and generally does not require any vegetation clearing. The proposed Mt Fyans connecting powerline will be parallel with the Dundonnell powerline for approximately 16 km.

5.7.2 DESCRIPTION AND EASEMENT REQUIREMENTS

Given its alignment through mostly cleared agricultural land, minimal, if any clearing of vegetation is required and the easement alone will not result in any apparent impacts.

Two types of transmission line are proposed. A 220 kV line with a length of 19.0 km is proposed between the on-site substation and the grid connection substation. A 500 kV line is proposed over a distance of approx. 400m between the grid connection substation and the Mortlake Power Station.

The 220 kV transmission line will be either a single or double circuit line and the majority of poles will have a height of around 38 m. In some locations poles with a height of 43m will be required due to topographical or engineering site conditions. The poles are approximately 1.3 m to 1.5 m in diameter.

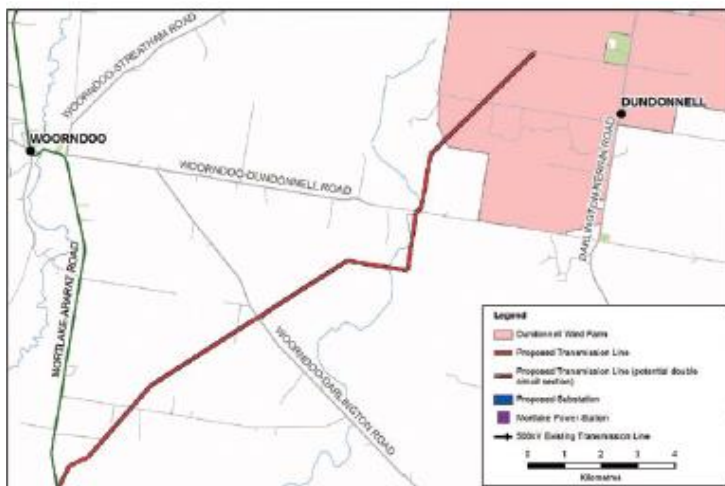
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Spacing of poles will typically be approximately 300 m apart, with a narrower spacing at changes of direction and at road crossings.



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FIGURE 81 – INDICATIVE 220 KV STRAINER POLE CONFIGURATION



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FIGURE 82 – APPROVED DUNDONNELL WIND FARM POWERLINE ROUTE
(SOURCE: DUNDONNELL WIND FARM)

5.7.3 POWER LINE ROUTE ASSESSMENT OVERVIEW

The corridor is located through a number of landscape settings with varying levels of existing visual modification, as well as differing levels of visual sensitivity, which influence the level of impact.

5.7.4 WIND FARM SUB-STATION TO MORTLAKE ARARAT ROAD

The proposed powerline is located parallel to a local rural road for a distance of 2.8 km. The western part of the road side is fully cleared of canopy vegetation while the eastern part is lined on either one, or both sides, with dense, semi-mature native vegetation. The land to the north of South Road is part of the wind farm site and may contain four turbines within 500 m of the proposed line.

Visual Sensitivity Level

South Road has a low level of sensitivity due to the relatively infrequent level of use of this road. The perpendicular crossing of Mortlake Ararat Road has a low to moderate level of sensitivity, due to the increased level of use.

Visual Modification Level

Moderate, due to the proposed power line being located within a setting devoid of any tall elements of infrastructure.

Potential Visual Impact

The low to moderate level of visual sensitivity combined with a high visual modification level will result in a moderate visual impact for this section of the proposed power line.

5.7.5 CASTLE CAREY ROAD – MORTLAKE ARARAT ROAD TO HAMILTON HIGHWAY

The proposed 220 kV powerline will be located on cleared farming land to north of the Castle Carey Road reserve for a distance of 6.8 km. The line is adjacent to, and parallel with, the approved Dundonnell Wind Farm powerline.

Visual Sensitivity Level

Low for Castle Carey Road due to the relatively infrequent level of use.

High for Hamilton Highway, due to it being a tourist route with a high level of use.

Visual Modification Level

Low, due to the proposed power line being located adjacent to existing vertical power already infrastructure elements which modify the setting.

Potential Visual Impact

The low level of visual sensitivity combined with a low visual modification level will result in a low visual impact for the section of the proposed power line route adjacent to Castle Carey Road.

A low to moderate impact will result for the crossing point at the Hamilton Highway.

5.7.6 HAMILTON HIGHWAY TO MORTLAKE POWER STATION

Existing easements and power line infrastructure are located through rural land between the Hamilton Highway and the Mortlake Power Station.

Visual Sensitivity Level

Low, due to the rural land use and low number of viewers.

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Visual Modification Level

Low, due to the proposed power line being located adjacent to existing vertical infrastructure elements, such as the 500kV transmission line and Salt Creek transmission line which already significantly modify the setting.

Potential Visual Impact

The low level of visual sensitivity combined with a low visual modification level will result in a low visual impact for this section of the proposed power line route.

5.7.7 SUMMARY

The proposed power line route is generally located in a setting that has been subject to modification – clearing and power infrastructure development. Much of the route is located away from areas of higher viewer sensitivity but where it is located adjacent to a higher sensitivity viewpoint, the presence of existing infrastructure and modification to the visual and landscape setting reduces the overall impact level.

In the event that the Mt Fyans Wind farm powerline is constructed after the Dundonnell powerline, it is recommended that poles be sited to be directly adjacent to the existing poles in order to establish a uniform and orderly pattern of development.

5.8 CUMULATIVE IMPACT

The landscape and visual impact of the project cannot be considered in isolation, as the site is located within a regional setting that includes a number of projects currently under construction and approved projects that may commence construction in the near future.

Adjacent operating, approved or lodged projects within the wider region surrounding the project area are shown in **Table 14**.

It should be noted that three of the closer, previously approved wind farms, Naroghid, The Sisters and Drysdale, are no longer proceeding and their initial planning permits have expired. This significantly reduces the total number of turbines within 30 km of the project.

WIND FARM	STATUS	NUMBER OF TURBINES*	DISTANCE/DIRECTION (BETWEEN TURBINES)
Darlington	Proposed	61	<1 km E
Dundonnell	Operating	88	5 km N
Salt Creek	Operating	15	5 km NNW
Mortlake South	Under Construction	42	9 km S
Hexham	Proposed	108	9 km WSW
The Sisters	Not Proceeding	12	18 km S
Naroghid	Not Proceeding	12	26 km SW
Drysdale	Not Proceeding	13	30 km SW
Woolsthorpe	Approved	20	40 km SW

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WIND FARM	STATUS	NUMBER OF TURBINES*	DISTANCE/DIRECTION (BETWEEN TURBINES)
Hawkeedale	Approved	26	40 km W
Oaklands Hills	Operating	32	41 km NW
Berrybank	Under Construction	79	48 km E
Willatook	Proposed	59	48 km WSW
Morton's Lane	Operating	13	53 km NW
Timboon West	Under Construction	2	55 km S
Newfield	Not Proceeding	15	56 km S
Ryan's Corner	Approved	56	56 km SW
Stockyard Hill	Under Construction	149	58 km NE
Golden Plains	Approved	228	65 km E
Challicum Hills	Operating	35	67 km N
Macarthur	Operating	140	68 km W
Ferguson	Proposed	3	70 km SE
Mt Gellibrand	Operating	44	74 km SE
Yambuk	Operating	20	76 km SW
Codrington	Operating	14	80 km SW
Ararat	Operating	75	80 km NNE

* Maximum number of turbines allowable under Planning Permit

Source: Department of Economic Development, Jobs, Transport and Resources as at 21st June 2018

TABLE 14 – OPERATING, APPROVED OR LODGED WIND FARM PROJECTS IN THE BROADER REGION – BY ORDER OF PROXIMITY

5.8.1 PRECEDENTS FOR ASSESSMENT OF CUMULATIVE IMPACT

With regard to the assessment of cumulative impact, Scottish National Heritage (2005) identified what it considered was appropriate to include in the assessment of cumulative impact. This included existing projects, projects being built, projects approved and projects going through the planning and positioning

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phase. Other United Kingdom jurisdictions often rely on this report as the starting point for their assessments. North American jurisdictions also follow similar approaches.

In the definition of what projects are included in a cumulative impact assessment, the question of 'reasonable foreseeable future actions' should be considered in defining which projects are included in the cumulative impact assessment. That is, some approved projects could be shown to have little or no prospect of being developed and could be excluded from the assessment process.

Using the criteria that approved applications should be considered in the assessment of cumulative impact, the following wind farms within a 40 km radius have been included (refer to **Figure 83**):

- Mortlake South.
- Salt Creek.
- Dundonnell.

In total, these three wind farms, which are generally quite small compared to many that have been approved, propose the construction of 145 turbines, which are similar in size as some of the current larger wind farms, such as Macarthur (140 turbines), Stockyard Hill (149 turbines) and Golden Plains (228 turbines), but spread over a more extensive geographical area.

Generally, wind farms may be visible within a flat topography over a distance of approximately 20kms. However, the degree of visibility will be limited by vegetation throughout the landscape. The distribution of existing and proposed wind farms throughout the region will result in a number of locations that would be able to view more than a single wind farm. At the broader regional level, particularly for motorists traversing the road network, wind farms may become a common element throughout the landscape.

It is conceivable that the regularity of occurrence of wind farms may result in a cumulative impact in the future as spatial and landscape separation between the various wind farms decrease.

5.8.2 CUMULATIVE ZVI ANALYSIS MAPPING

A ZVI analysis was prepared for the project as well as existing, approved and planned wind farms within a 40 km radius. The analysis was based on approved or constructed wind farms layouts and blade tip heights. The results were bundled in order to demonstrate the total number of turbines that may be theoretically visible from a particular location. It should be noted that the results are a worst-case scenario and do not represent the screening effects of buildings or vegetation (refer to **Figure 83**).

5.8.3 THE CUMULATIVE IMPACT SETTING

The project is roughly "U" shaped with the base of the "U" located to the south, approximately 3 km to the north of the rising form of Mount Shadwell, which visually separates views to much of it from the town of Mortlake, which is located close to Mount Shadwell's southern base.

Salt Creek Wind Farm is located at the northern extent of the most westerly upright of the "U" and Dundonnell Wind Farm is located to the north of the most easterly "U". The distance between the turbine locations proposed in the Mt Fyans Wind Farm and the turbines constructed or approved in these projects is 5.2 km and 5 km respectively.

Mount Shadwell provides visual screening of Mortlake from the much of the project as well as the Salt Creek and Dundonnell wind farms, resulting in Mortlake's visual exposure primarily relating to the Mortlake South Wind Farm.

Dundonnell Wind Farm is located in a sparsely populated area with dwelling density increasing slightly to the south in the vicinity of the Hamilton Highway.

The relatively small Salt Creek Wind Farm (15 turbines) occupies a distinct rise to the south of the township of Woorndoo.

Each wind farm is perceived as a separate entity within the landscape, although they contribute to an overall coherent and distinctive character.

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5.8.4 SIMULTANEOUS CUMULATIVE IMPACT

Simultaneous cumulative impact refers to occurrences where an impact may result from a number of potential visual intrusions being visible from an individual location at the one time.

Approved wind farm projects that may contribute to simultaneous cumulative impact are:

- Mortlake South – 42 turbines.
- Salt Creek – 15 turbines.
- Dundonnell – 88 turbines.

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It is expected that the simultaneous cumulative visual impact resulting from the project in the context of existing and approved wind farms will be low to moderate due to the project increasing the extent of visible turbines within a modified landscape. However, the total number of turbines visible within the local setting from a single viewpoint is relatively low when compared to current larger wind farms, such as Macarthur and Stockyard Hill, and spread over a more extensive geographical area.

TOWNS AND SETTLEMENTS

Locations primarily impacted by simultaneous cumulative include:

- Woorndoo – approximately 30 residences set in the context of tree lined streets and private gardens. The cumulative impact is expected to be low as a result of limited views, the location of the wind farms to the one aspect of the township and the approximately 10 km separation between the township and the main body of Dundonnell wind farm and the Mt Fyans wind farm to the east and south east.
- Mortlake – approximately 700 residences within the context of a dense urban form with tree lined streets and private gardens. The cumulative impact is expected to be low given the location of the project and the Salt Creek and Dundonnell wind farms to the north and north east, where they are mostly blocked from view by Mt Shadwell. Where views to the project towards the north east may be possible, views from most residences, apart from those at the outer town perimeter, will typically be screened by built form and vegetation. Mortlake South wind farm will be the primary visible element.

RURAL RESIDENCES

The degree of visual exposure of rural residences resulting from the screening effects of surrounding vegetation is outlined in **Section 5.4.1**, which considers vegetation density and the orientation of the residence and external living spaces to the surrounding landscape and potential insertions within the landscape, such as the Project. The assessment of cumulative impact, based on worst case ZVI analysis, must be considered within the context of these residential vegetation typologies, particularly with regards to the bundled results which indicate that a relatively large number of residences will potentially be visually exposed to over 200 turbines.

The detailed viewpoint analysis and **Figure 26** clearly demonstrate that a large percentage of residences will have views to any turbine partially to fully screened, and that the number of residences with views to all of the turbines of the project, as well as of approved and proposed wind farms, would be limited. Therefore, for the vast majority of residences, it is unlikely that there would be a meaningful cumulative impact from a single viewpoint.

Only one residence that does not have an agreement with the project is located within a 4 km (highest visual prominence distance) catchment overlap between multiple wind farms. This residence is located to the north east of the project, between it and Dundonnell wind farm (refer to **Figure 84**). This residence will be subject to a moderate cumulative impact. However, the overall cumulative impact on residences is considered low.

Surrounding wind farm projects have had planning permit conditions imposed requiring off-site landscaping plans to be offered to residents whose dwellings are located within 4 km of the Dundonnell and Mortlake South Wind Farms and within 3 km of the Salt Creek Wind Farm. Where accepted, the plans are to be prepared in consultation with the owners and involve the siting of landscaping to ameliorate the impacts of the relevant wind farm.

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The landscaping will also assist in reducing the visibility of adjoining wind farms. The post amelioration cumulative visual impact of other wind farms in the locality, such as the Mt Fyans Wind Farm, should be lower where dwellings within 4 km of Dundonnell and Mortlake South Wind Farm and 3 km of Salt Creek Wind Farm have taken the option for off-site landscaping.

5.8.5 SEQUENTIAL CUMULATIVE IMPACT

Sequential cumulative impact refers to occurrences when the viewer has to move to another viewpoint to see different developments. Sequential cumulative impacts most typically apply to road users as they traverse the landscape along major roads.

The occurrences may range from developments that appear regularly with short time lapses in between, to those that appear after long time lapses. The duration and frequency depend on speed of movement as well as the regularity of occurrence of a development.

The Hamilton, Glenelg and Princes Highways provide access to south western Victoria. The project is located adjacent to the Hamilton Highway. The Glenelg Highway is located 23 km to the north of the project and 16 km to the north of Dundonnell wind farm. The Princes Highway is located 20 km south of the Project and 8 km to the south of Mortlake South wind farm.

The Hamilton Highway, a road with a 100 kmh speed limit, will be the key viewpoint from which sequential cumulative impacts may occur. In addition to the project, existing and proposed wind farms will contribute to sequential cumulative impact to users of the Highway. The ZVI analysis indicates that some part of over 200 turbines may be visible for a length of approximately 30 km. However, it is expected that the sequential cumulative visual impact resulting from the project will be low, particularly in the context of the speed at which viewers will traverse the landscape in conjunction with the effects of the distribution of vegetation which will result in varying conditions of fully screened views out from the road, filtered views, or open views. Additionally, a large proportion of the 30 km length is beyond 4 km distance from the closest turbine, with visual prominence reducing from dominant to noticeable.

Views from the Glenelg Highway will primarily be of Dundonnell wind farm, 16 km to the south. The closest turbines of the project will be located to the south of Dundonnell wind farm and will be distant objects viewed between closer, more prominent elements.

The Princess Highway will be primarily exposed to views to the Mortlake South wind farm, with the project in excess of 20 km distant.

For both the Glenelg and Princes Highways, it is expected that the sequential cumulative visual impact resulting from the project will be low given the distance from the project and Dundonnell wind farm, the speed at which viewers will traverse the landscape in and the effects of vegetation which will provide some screening and filtering of views.

The Hopkins Highway, a lower order highway connecting the Hamilton Highway to the Princes Highway at Warrnambool, will be primarily exposed to Mortlake South wind farm. Views to the project and Salt Creek and Dundonnell wind farms will be mostly screened by Mt Shadwell.

5.8.6 CUMULATIVE IMPACT VIEWPOINT ASSESSMENT

Photo-simulations have been prepared for a number of viewpoints which would have views to both the project as well as constructed (Salt Creek wind farm and Dundonnell wind farm) (refer to **Appendix E**).

For the purposes of determining the vertical visual prominence of the wind turbines, the following heights have been applied:

- Mt Fyans wind farm – blade tip height of 200m maximum proposed.
- Dundonnell wind farm - blade tip height of 189m actual operating.
- Salt Creek wind farm - blade tip height of 150m actual operating.

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Views from the selected locations demonstrate views to adjacent groups of wind turbines as well as views through arrays of turbines of the proposal towards distant arrays associated with adjacent wind farms.

The following viewpoints have been selected as being representative of both simultaneous and sequential views that would be experienced in the study area.

The selected viewpoints show a greater extent of view than can typically be viewed within a person's central field of view. This has been done to include the maximum number of visible turbines from a given location. A person's central view is generally restricted to objects within a 90 to 120 degree field of view, meaning that the panoramic photo-simulations show a greater field of view compared with what a person is capable of experiencing. Given the greater amount of detail contained within the expanded field of view, a blue outline has been used to enhance visibility to the project elements.

VP A – Woorndoo – Darlington Road

Location

This viewpoint shows a 230 degree horizontal field of vision and is located on the roadway at the south eastern edge of the project, with proposed turbines located to the north and south side of the road. The closest turbine of the project is 900 m to the southwest and a meteorological mast is located 250m to the west. The Salt Creek wind farm is located over 13 km to the northwest, located in gap in the project turbines.

Over such a significant distance, the Salt Creek wind turbines are barely discernible, with their blades being the main visible component.

Applying the assessment of visual prominence (refer to **Table 3**), the 150 m high wind turbines have a vertical angle of 0.6 degrees, resulting in them being at the lower scale of potentially noticeable.

The wind turbines of the Dundonnell Wind farm are located 8 km to the north and behind 10 of the project's wind turbines. Over this distance, the 189 m high wind turbines have a vertical angle of 1.3 degrees, resulting in them being potentially noticeable. However, given their distant location behind the wind turbines of the project, the eye of the viewer would not be particularly drawn towards them.

For this location, the distance of the wind turbines on adjacent wind farms significantly reduces their visual prominence and, as a result, the overall cumulative visual impact is considered low.

VP B – Hamilton Highway

This viewpoint shows a 170 degree horizontal field of vision and is located on the roadway at the southern edge of the Project, with proposed turbines located to the north of the road. The closest turbine of the project is 1.5 km to the north. The Salt Creek Wind Farm is located over 16 km to the north northwest, behind the project turbines.

Over such a significant distance, the Salt Creek wind turbines are barely discernible, with their blades being the main visible component. Applying the assessment of visual prominence (refer to **Table 3**), the 150 m high wind turbines have a vertical angle of 0.5 degrees, resulting in them being insignificant, or at the lower end of the scale of potentially noticeable.

The wind turbines of the Dundonnell Wind Farm are located 18 km to the north northeast and behind a large cluster of the Project's wind turbines. Over this distance, the 189 m high wind turbines have a vertical angle of 0.6 degrees, resulting in them being at the lower scale of potentially noticeable. However, given their distant location behind the wind turbines of the project, the eye of the viewer would not be drawn towards them.

For this location, the distance of the wind turbines on adjacent wind farms significantly reduces their visual prominence and, as a result, the overall cumulative visual impact is considered low to very low.

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VP C – Hamilton Highway

This viewpoint shows a 170 degree horizontal field of vision and is located on the roadway at the south western edge of the Project, with proposed turbines located to the east of the road. The closest turbine of the project is 2.5 km to the north east. The Salt Creek Wind Farm is located over 12 km to the north, behind the Project turbines.

Over such a significant distance, the Salt Creek wind turbines are barely discernible, with their blades being the main visible component. Applying the assessment of visual prominence (refer to **Table 3**), the 150 m high wind turbines have a vertical angle of 0.7 degrees, resulting in them being at the lower scale of potentially noticeable.

The wind turbines of the Dundonnell Wind Farm are located 22 km to the north east and behind a large cluster of the project's wind turbines. Over this distance, the 189 m high wind turbines have a vertical angle of 0.5 degrees, resulting in them being insignificant, or at the lower end of the scale of potentially noticeable.

For this location, the distance of the wind turbines on adjacent wind farms significantly reduces their visual prominence and, as a result, the overall cumulative visual impact is considered very low.

VP D – Darlington – Nerrin Road / Woorndoo – Dundonnell Road

This viewpoint shows a 200 degree horizontal field of vision and is located at intersection of roadways to the north west of the project. The proposed turbines are all located to south of Woorndoo – Dundonnell Road. The closest turbine of the project is located 5.6 km to the south west. The Salt Creek Wind Farm is located over 16 km to the west in a gap between the Project and the Dundonnell Wind Farm.

Over such a significant distance, the Salt Creek wind turbines are barely discernible, with most obscured from view by vegetation. Applying the assessment of visual prominence (refer to **Table 3**), the 150 m high wind turbines have a vertical angle of 0.5 degrees, resulting in them being insignificant, or at the lower end of the scale of potentially noticeable.

The wind turbines of the Dundonnell Wind Farm are located 2.2 km to the north northeast. Over this distance, the 189 m high wind turbines have a vertical angle of 5 degrees, resulting in them being potentially dominant.

For this location, the over 5 km spatial separation between the wind turbines of the project and the Dundonnell Wind Farm, combined with the distance of the Salt Creek Wind Farm which reduces its visual prominence, the overall cumulative visual impact is considered low to moderate.

VP E – Mortlake – Ararat Road

This viewpoint shows a 250 degree horizontal field of vision and is located on the roadway in the central, southern edge of the project, with proposed turbines located to the west and east of the road. The closest turbine of the project is 1.0km to the north northeast. The Salt Creek Wind Farm is located over 10 km to the north, behind the project turbines.

Over such a significant distance, the Salt Creek wind turbines are barely discernible, with their blades being the main visible component. Applying the assessment of visual prominence (refer to **Table 3**), the 150 m high wind turbines have a vertical angle of 0.8 degrees, resulting in them being at the lower end of the scale of potentially noticeable.

The wind turbines of the Dundonnell Wind farm are located 17 km to the north east and behind a large cluster of trees. Over this distance, where visible, the 189 m high wind turbines have a vertical angle of 0.6 degrees, resulting in them being at the lower end of the scale of potentially noticeable.

For this location, the distance of the wind turbines on adjacent wind farms significantly reduces their visual prominence and, as a result, the overall cumulative visual impact is considered very low.

VP F - Mortlake – Ararat Road / Woorndoo – Darlington Road

This viewpoint shows a 200 degree horizontal field of vision and is located on the roadway to the north of the project, approximately 2.1 km to the north east of the Salt Creek Wind Farm. The wind turbines of the project are located to the west and east of the road, approximately 9 km to the south of the Dundonnell

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Wind Farm is located over 10 km to the east, mostly concealed from view by a dense clump of vegetation.

Over such a significant distance, even without the effect of screening vegetation, the Dundonnell wind turbines are barely discernible. Applying the assessment of visual prominence (refer to **Table 3**), the 189 m high wind turbines have a vertical angle of 1 degree, resulting in them being potentially noticeable.

The wind turbines of the Salt Creek Wind Farm are located approximately 2.1 km to the south west. Over this distance, the 150 m high wind turbines have a vertical angle of 4 degrees, resulting in them being potentially dominant.

The wind turbines of the project are located 9 km to the south. Over this distance, the 189 m high wind turbines have a vertical angle of 1.2 degrees, resulting in them being potentially noticeable.

For this location, the varying distances of the wind turbines reduces their visual prominence and, as a result, the overall cumulative visual impact is considered to be low.

5.8.7 CHANGES TO VIEWER PERCEPTIONS

As a baseline for the determination of viewer sensitivity to wind farms, the cumulative impact needs to be considered in the context of the generally positive perceptual responses to wind farms and wind turbines in the rural landscape.

An additional factor in the assessment of cumulative impact is a viewer's perception of the landscape of a region due to the presence of multiple developments or landscape modifying elements.

An accumulation of these elements, and an historic familiarity with them, may lead to a desensitisation of viewer perceptual responses. For example, over time, viewers may have become used to the landscape with these elements. This is particularly the case when many in the population gain benefit from the activities through employment or indirect financial gain.

An accumulation may also result in a threshold or tipping point being reached whereby the presence of the elements becomes overwhelming and the viewer finds the modified landscape oppressive.

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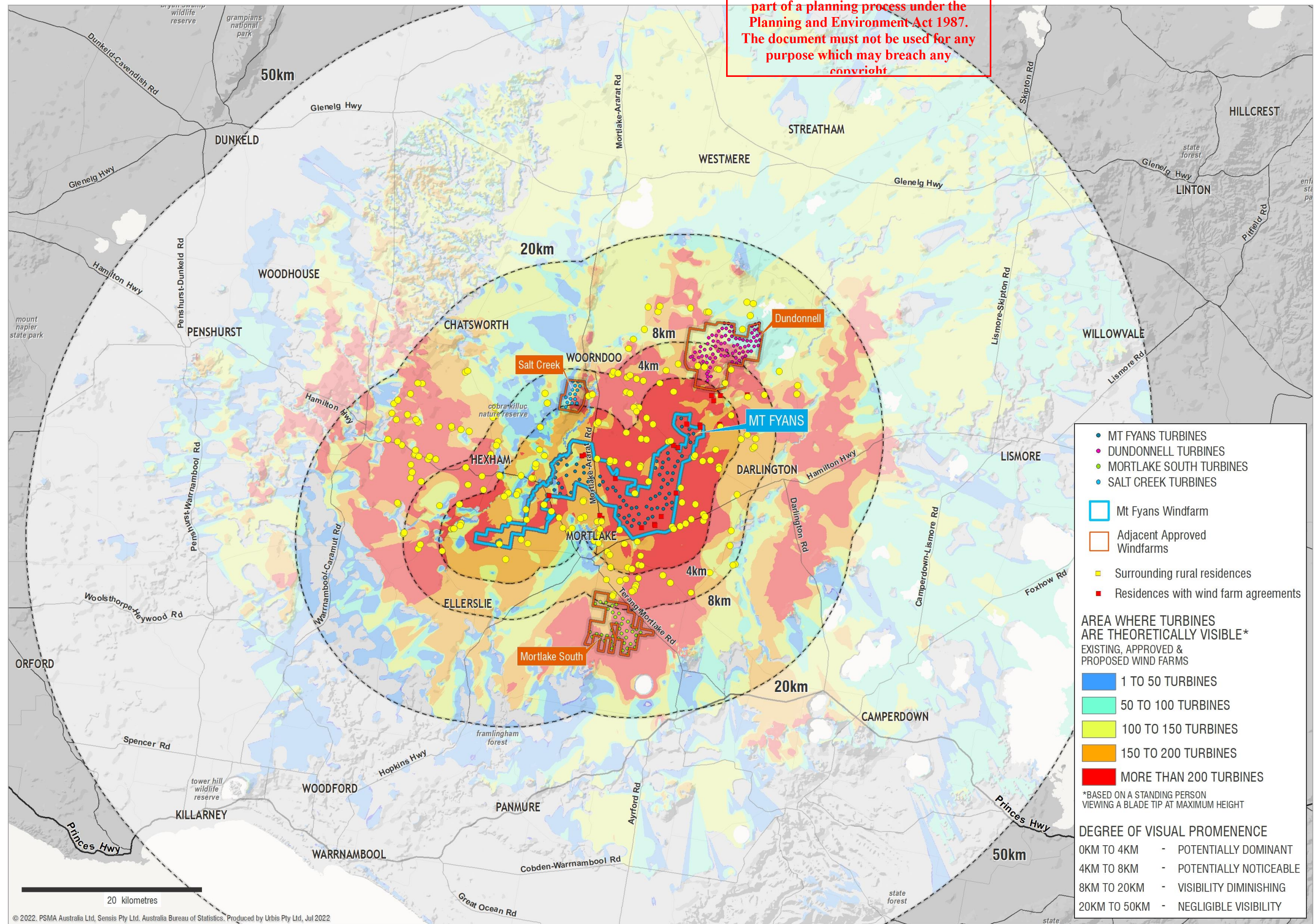


FIGURE 83 – ZVI CUMULATIVE IMPACT – MT FYANS WIND FARM AND APPROVED WIND FARMS (BLADE TIP)

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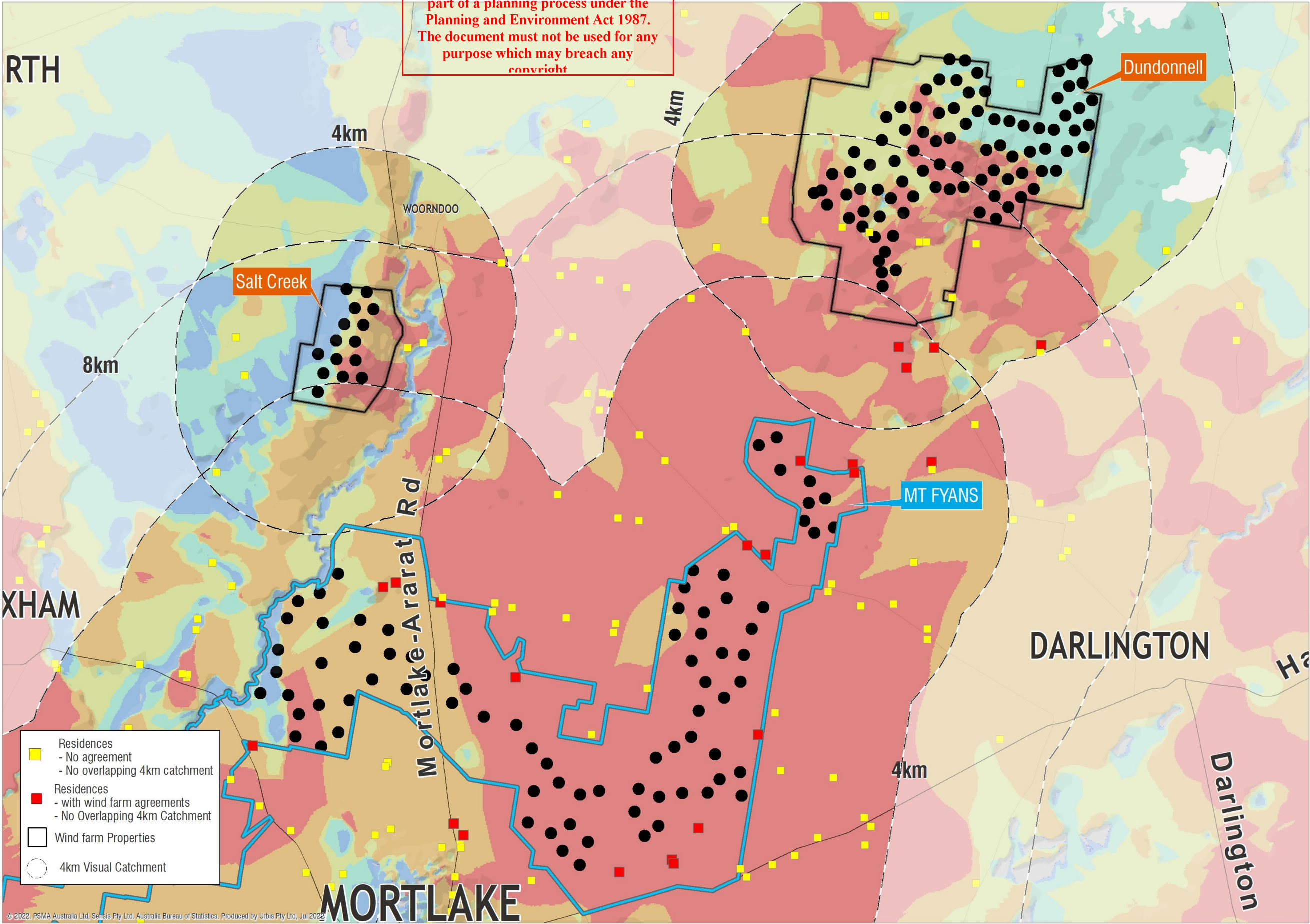


FIGURE 84 – CUMULATIVE IMPACT – RURAL RESIDENCES

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6 Design Guidelines for Amelioration of Visual Impacts

6.1 WIND FARM DESIGN AND REHABILITATION STRATEGIES

The following visual treatments, derived from background research and past experience, have been incorporated into the design of the proposed project for planning approval to assist in reducing the impact levels of the development (refer to **Appendix C**).

6.1.1 FOREGROUND VISUAL SCREENING / FORWARD PLANTING

In areas of high visual sensitivity, such as close to residences and other areas where amelioration of views to the wind farm may be required, planting may be able to be implemented close to the viewer location. Planting should be placed between the viewing location and the source of intrusion, to achieve effective screening. Planting to screen views of the wind farm should attempt to avoid impeding the existing views to the broader landscape, as this action in itself may result in a visual impact or negative change in views from a sensitive viewpoint. It should be recognised that given the scale, particularly the height of wind generators, that visual screening within a setting is most effective when the screening is close to viewing points.

6.1.2 DETAILED WIND FARM DESIGN CONSIDERATIONS

INFRASTRUCTURE

It is preferable for there to be no permanent above ground structures associated with wind farms apart from the wind generators themselves and the MV transformers and above ground RMU's adjacent to the turbines (dependent on the ultimate turbine model). Service and maintenance buildings located on the site should reflect architectural elements already present in the setting or be screened with planting to reduce visual intrusion upon the surrounding landscape.

The construction of formal access tracks and construction lay down areas within wind farms should be kept to a minimum as access road construction can have a significant physical and visual impact. Allow tracks and lay downs to visually soften through the establishment of naturally generating grass / vegetation cover over their surface, (essentially a reinforced surface with some vegetation for occasional vehicle use), or along their edges and on cut and fill slopes so that they appear like a low key farm track.

Summary of Infrastructure Actions

- Use the local groupings of vegetation to minimise visibility of access and service tracks from key vantage points. Avoid aligning large sections of tracks in straight lines.
- Site service and access roads so that cut and fill are minimised and ensure soils are protected from erosion and slippage.
- Consolidate roads and reduce the need for clearance of large areas of ground cover vegetation for roads. Allow grass to regrow over any areas of disturbance.
- Use of low-profile and unobtrusive building designs to minimise the urbanised appearance or industrial character of sites located in rural or remote areas.
- Use traditional rural building styles of the area in the construction of the substations and other above ground structures.
- Underground all power lines within the site and integrate equipment wherever possible.
- Provide screen planting to the perimeter of substation, maintenance and control compounds.

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TURBINE DESIGN AND COLOURING

The wind turbines will have a uniform design, rotational direction and speed, colour, height and rotor diameter to assist in achieving visual consistency throughout the wind farm. Visual uniformity assists in developing harmony between the landscape and the wind turbines.

A light grey or off-white colour works best in temperate climates, where sky is the dominant background, and blades, nacelle and tower should all appear the same colour, so the wind turbine appears visually balanced.

Visual impact can also be minimised by the use of slim, freestanding and tapered towers.

Summary of Turbine Design Actions

- Use of uniform colour, structure types, surface finishes and direction of rotation to minimise project visibility.
- A light blue / white / grey colour has proven to work best in locations where the turbines are back dropped by sky and clouds.
- Non-reflective coatings must cover all of the structure, including fastenings between the blades and the hub.
- Control the placement and limit the size, colour and number of labels or markings placed on individual turbines or advertising on fences and facilities.

TURBINE PLACEMENT AND PATTERN

The placing and size of wind farms is very important in terms of the impact created on the landscape. Fewer and more widely spaced turbines present a more pleasing appearance than tightly packed arrays.

The spacing of turbines should be generally regular to give a consistent and repetitive pattern. The perception of motion is intensified when turbines are closely spaced, are of mixed designs or rotate in different directions.

The current design of the proposed wind farm provides for a generally regular spacing.

The definition of an absolute maximum number of wind turbines in the vicinity of sensitive viewpoints is somewhat problematic, as the visibility of wind turbines can be affected by vegetation, which can screen views.

With regards to the distance of wind turbines from residential viewpoints, 4 km is the distance at which the overall height of a 200 m tall wind turbine is considered dominant, applying the vertical field of view occupied methodology.

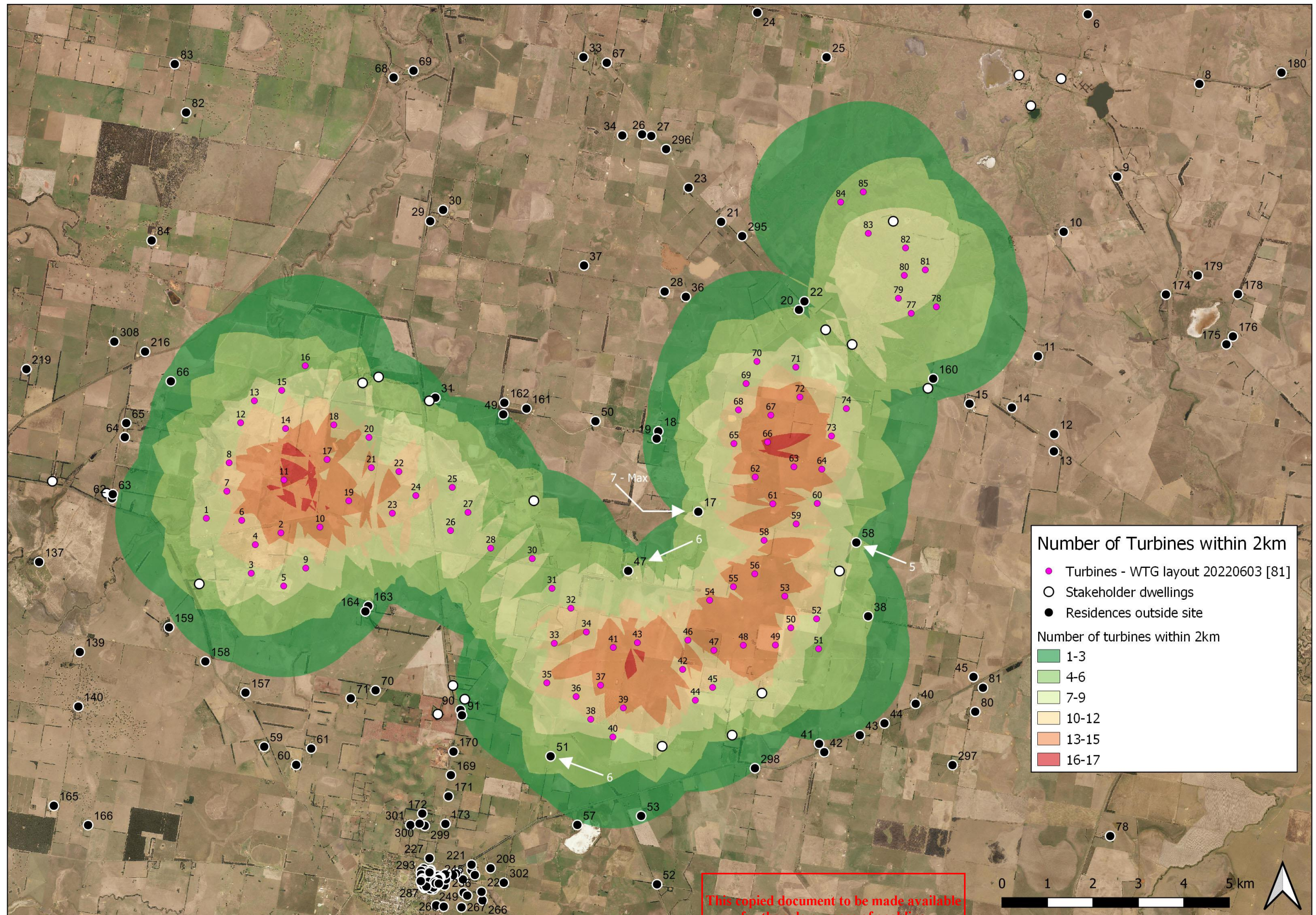
The number of wind turbines within 4 km of a residence should be limited to manage adverse visual impacts. For the proposed development, it is recommended that no more than 40 wind turbines be located within 4 km, and that no more than 10 wind turbines be located within 2 km of an individual residence.

Summary of Placement Actions

- Controlling the location of different turbine types, densities and layout geometry to minimise visual impacts. Mixing of turbine types and rotational direction should be avoided.
- Lines of turbines responding to the contours work better in undulating locations.
- Roughly equally spaced turbines create better rhythm and harmony in the landscape, although a degree of consolidation is preferable to being too broadly spaced.
- Manage wind farm layouts to ensure that no more than 10 turbines are located within 2 km of any residence and no more than 40 turbines are located within 4 km of any residence. (refer to **Figure 85** and **Figure 86**)

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Figure 85 – Number of Turbines within 2km of a Residence

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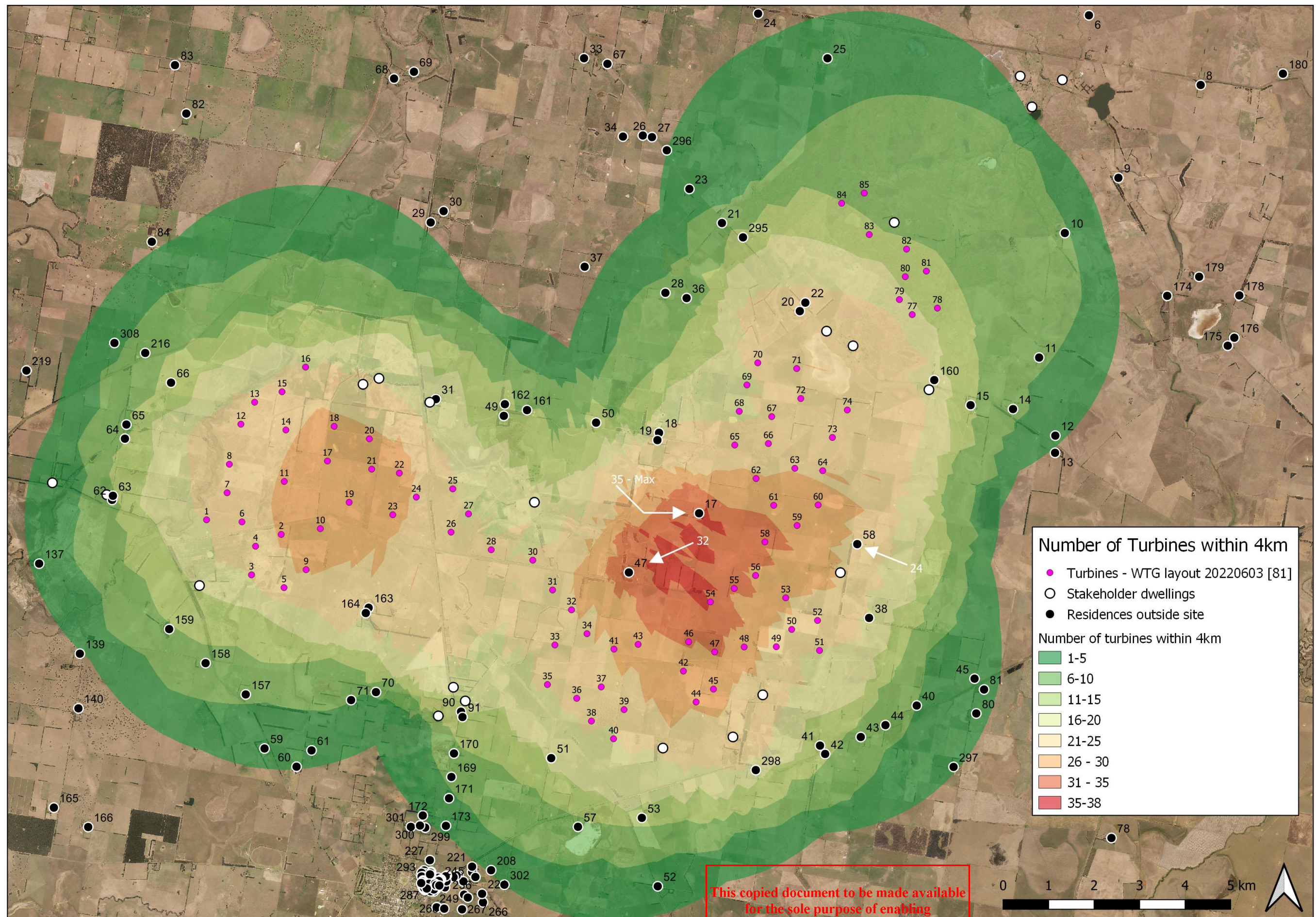


Figure 86 – Number of Turbines within 4km of a Residence

LIGHTING

Security lighting throughout the wind farm 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.

Air navigation lights are not likely to be required given the distance of the project from airfields.

REFLECTION / GLINTING

Glinting of the blades may occur when the sun reflects off them, depending on sun angle and viewing location. Glinting is significantly reduced when non - reflective paints are used. The connection points between the blades and the hubs can also potentially glint and these should be finished with non - reflective paint also.

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7 Conclusion

A key consideration in the assessment of visual impact will be the perception of local residents to the distinctive elements of the project that evoke a variety of responses.

7.1 PERCEPTIONS OF CHANGE

Whilst the degree to which a development the scale of the proposed Mt Fyans Wind Farm is visible from certain vantage points can be quantified, the degree to which the viewers will be impacted is influenced by an individual's perceptions of what change will bring.

As indicated by the research of other case studies of community perception, acceptance to the wind farm will vary widely depending on the viewer's preferences and biases. The residents and users of the landscape surrounding the site will reflect a range of sensitivities. However, the precedent studies indicate a strong acceptance for wind farms in both affected and non-affected communities.

7.2 VISUAL IMPACT

The project will change the landscape of the setting at the local, sub regional and, to a lesser extent, the regional level.

As mentioned in the assessment process previously, the landscape character of the broader setting exhibits a range of scenic qualities from low to high, with the project area occurring predominately within a landscape characterized by broad, cleared agricultural plains with few topographic variations which is assessed as having low level of scenic quality and moderate local cultural landscape significance.

The residential areas are classified as moderate scenic quality due to the aesthetic of then natural landform and the retention of significant vegetation.

Many of the residences in the area have a dense band of vegetation surrounding an intimate and secluded garden / living area. The effect of this, in the case of most residences, has been to effectively contain the viewshed from the house and surrounding living area itself, blocking more distant views. From the majority of residential and road viewpoints, views to the site will either not be possible or will be heavily filtered by existing vegetation. Therefore, the impacts will generally be low and minor alterations to the location of, and number of turbines, will not result in significant changes to the level of impact.

Roadside vegetation along sections of the Hamilton Highway reduce the level of visibility for people travelling on this road. The layout has been designed to minimise wind turbines viewed in the context of Mt Shadwell when viewed from the highway.

Therefore, the overall visual impact of the project from major transport routes has been assessed as low.

However, for a number of viewpoints within the open landscape setting, such as short sections of the Hamilton Highway adjacent to the project and residences lacking surrounding screening within 4 km, the visual impact will be high.

The turbines proposed as part of the Mt Fyans Wind Farm project are more than 4 km away from the Salt Creek and Dundonnell turbines and more than 8 km away from Mortlake South turbines. Each wind farm will be perceived as a separate entity within the landscape, while they contribute to an overall cohesive and distinctive character.

The simultaneous cumulative impact of the project in addition to approved and operating projects is considered to be low to moderate, primarily due to:

- the very low numbers of dwellings within 4 km of multiple projects;
- the distance between projects; and
- the distance between the project and townships in the area.

7.3 CONNECTOR POWER LINE

The proposed power line route is generally located in a setting that has been subject to modification, particularly land clearing and power infrastructure development. Much of the route is located away from areas of higher viewer sensitivity, but where it is located adjacent to a higher sensitivity viewpoint, the presence of existing infrastructure and the existing modification to the visual and landscape setting reduces the overall impact level.

7.4 EFFECTIVENESS OF AMELIORATION MEASURES

The amelioration measures incorporated into the design process, such as the design of access tracks to ensure minimisation of track length, in conjunction with recommended actions such as screen planting at sensitive residential viewpoints and around substations, will have a positive effect on reducing the visual impact of the proposed wind farm, particularly sensitive static viewpoints such as residences lacking screening provided by existing vegetation.

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Appendix A

Community Values and Perception

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A.1 AUSTRALIAN STUDIES

LAL LAL AREA – COMMUNITY PERCEPTION TOWARDS WIND FARMS

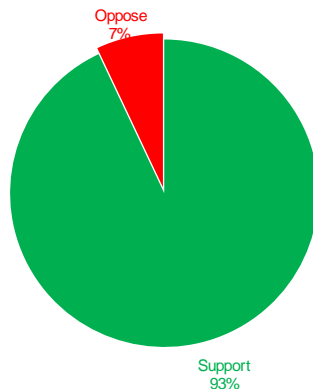
A study was undertaken by WestWind Pty Ltd in an area surrounding a proposed wind farm at Lal Lal. Lal Lal is located to the south east of Ballarat, between the Midland Highway and the Western Freeway.

This study (*Lal Lal Wind Farm, Report on Community Perceptions towards Wind Farms in Victoria for WestWind Pty Ltd*, prepared by ERM & Reark Pty Ltd, September 2007) has also shown that there is a high degree of acceptance of wind energy by residents within the area surrounding the Lal Lal Wind Farm.

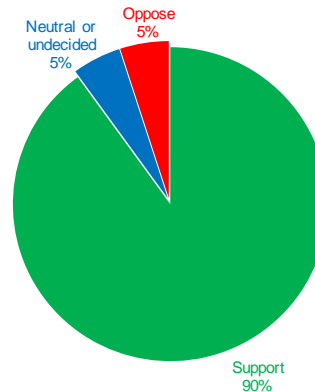
LAL LAL AREA: SUPPORT FOR WIND FARMS

CHART 1

Q13 Support for wind farms



Q14 Support for wind farms in SW Victoria



Results show an approval rating of more than 9 in 10 (93%) despite the visibility of wind turbines, most people felt that “we need to use wind power as a source of energy even if it means changing the appearance of some landscapes”.

In fact most respondents (82% favour, 8% opposed) were accepting of a wind farm that was set back 5 or 10 km from the coast on flat or undulating grazing land (62% favour, 8% opposed).

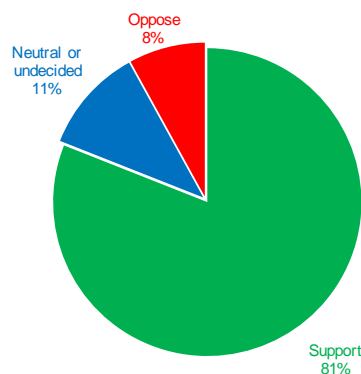
These acceptance figures are greater than those found in past Victorian and overseas studies; however they are very similar to the figures for the Ararat Wind Farm.

Similarly, the level of acceptance of a wind farms was also high when the proposed wind farm was near to a respondents place of residence. This is summarised in *Chart 2*.

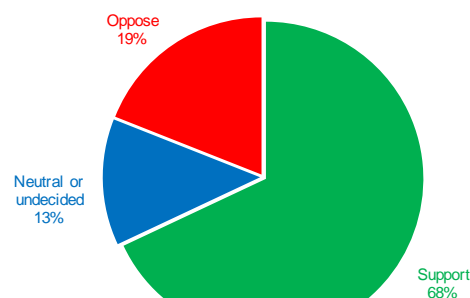
LAL LAL AREA: SUPPORT FOR WIND FARMS

CHART 2

Q18c Support for wind farm within 10km of residence



Q18a Support for wind farm within 1m of residence



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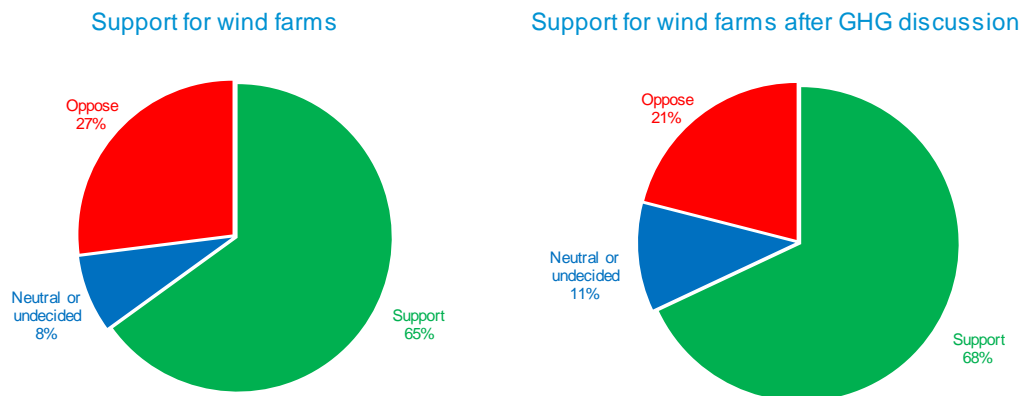
This research has demonstrated an increase in acceptability of wind farms to previous studies although it may be hypothesised that the increasing political and community awareness of global warming and its impact on the environment has also increased the level of acceptance within this community.

COASTAL HEADLANDS

In 2000, a study was undertaken for the Department of Natural Resources and Environment (Kantos & Quint, 2000) on the many issues concerning the Victorian Coastline including the construction of wind farms on coastal headlands. Chart 3 summarises the results of this particular component. The study involved a series of nine workshops as well as telephone interviews (n = 700).

WIND FARMS ON COASTAL HEADLANDS - PARTICIPANT RESPONSES

CHART 3



Study participants initial support or opposition to the construction of wind farms on coastal headlands was measured. After being exposed to arguments on renewable energy, greenhouse gas emissions and climate change issues their responses were measured again. This study found that there was only a slight increase in participants acceptance of wind farms on coastal headlands, from a 65% acceptance level before arguments on greenhouse gas emissions to 68% acceptance after these arguments were presented. However opposition reduced from 27% to 21%.

NIRRANDA WIND FARM

Similar figures have been found in a 2002 visitor survey undertaken for Stanwell Corporation Limited (Offer Sharp & Associates 2002) on the possible visual impacts of the proposed wind farm on the Bay of Islands viewing platform that is located adjacent to the Nirranda site, in the Shire of Moyne approximately 250km west of Melbourne.

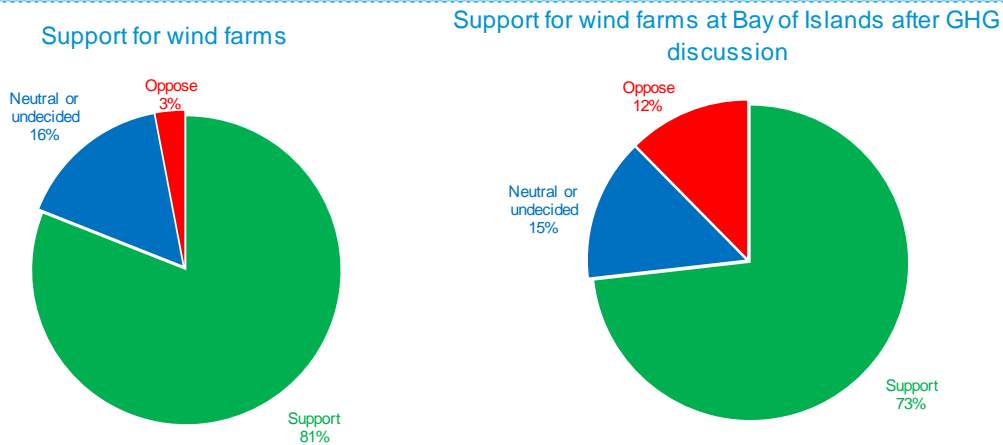
Approximately 80% of people were generally in support of wind farms, however when presented with a proposal for a wind farm visible from a scenic coastal lookout (the Bay of Islands) the support for a wind farm at this location reduced to approximately 71%, whilst opposition to the presence of a wind farm at this location increased from 3% to 12%.

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NIRRANDA WIND FARM RESPONDENTS ATTITUDES TO WIND FARMS

CHART 4



This figure of 71% support for wind farms is similar to the Kantos & Quint result of 68% reported previously for wind farms on exposed coastal headlands (refer Chart 3 Wind farms on Coastal Headlands – Participant Responses)

YALOOK WIND FARM

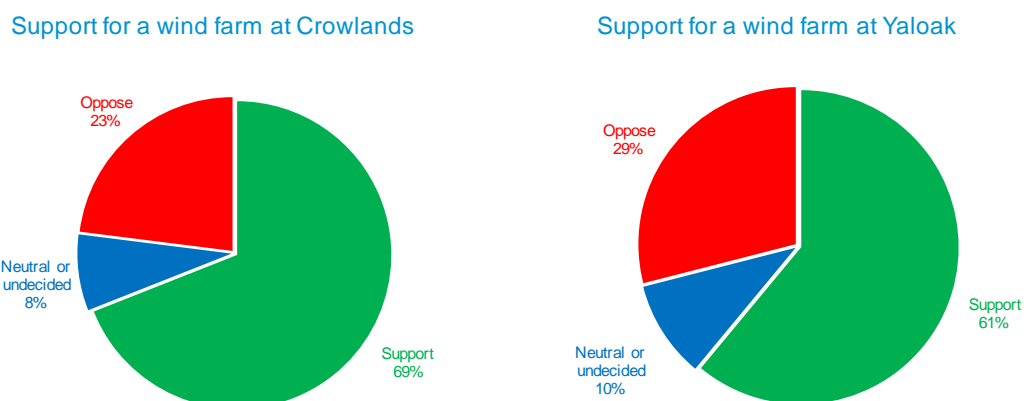
Research undertaken by Offer Sharp & Associates 2004 presented at the Yaloak Wind Farm panel hearing in 2005 showed a similar level of community acceptance to wind farms on this inland site near Ballan, Victoria.

The study assessed community reaction to images of a wind farm in the Yaloak landscape as well as at another site at Crowlands in Western Victoria. Neither location was identified, however the Yaloak proposal had been publicised for some time before the survey and the landscape may have been recognised by some, and particularly local, respondents. Community reaction to the siting of wind turbines in these landscapes was based on interviews with 200 respondents from each of Melbourne, Bacchus Marsh and Ballarat.

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LEVEL OF SUPPORT FOR POTENTIAL WIND FARMS AT YALOOK AND CROWLAND

CHART 5



This data has been extracted from *Table 15 Crowlands* and *Table 19 Yaloak* in the Offer Sharp & Associates 2004 report and illustrates the acceptance levels for wind farms of each of these sites. The study also found slight differences in levels of support at Crowlands (67%, 66% and 73%) for respondents from Melbourne, Bacchus Marsh and Ballarat respectively, and slightly larger differences (61%, 55% and 68%) in support for the proposed wind farm at Yaloak.

However, the overall findings are similar to the earlier studies from the earlier Kantos & Quinn 2000 and Offer, Sharp 2002. All these Australian studies continually show a level of acceptance greater than 60%. Overseas studies show similar results.

EXPLORING COMMUNITY ACCEPTANCE OF RURAL WIND FARMS IN AUSTRALIA: A SNAPSHOT, CSIRO 2012

The research employed a range of methods, including a literature and information review, a media analysis of newspaper articles, case studies, and semi-structured qualitative interviews with a range of stakeholders associated with wind farms.

Nine wind farms were selected as case studies, represented by New South Wales, Victoria and South Australia, the states with greatest wind resources and with the greatest number of projects at varying stages of development and with a range of sizes below and above 30MW.

As the results were qualitative in nature, the study provided

- The key relevant findings relating to community perception of visual and landscape issues are:
- There is strong community support for the development of wind farms, including support from rural residents who do not seek media attention or political engagement to express their views.
- The actual and perceived local costs and benefits of wind farms are strongly influenced by the design, implementation, and community engagement processes.

COMMUNITY ATTITUDES TO WIND FARMS IN NSW, DEPARTMENT OF ENVIRONMENT, CLIMATE CHANGE AND WATER NSW (2010).

This study's objective was to establish a baseline on community attitudes towards wind farms and renewable energy across the six renewable energy precincts within New South Wales. The research, undertaken via telephone interviews, surveyed 2,022 residents, aged 18 years or older, and 300 businesses across the six Precincts.

The large majority of residents across the Precincts indicated they would support wind farms being built both in NSW (85%) as well as in their local region (80%). The majority of residents of the Precincts were supportive of wind farms being built in the vicinity of their residence. Over three quarters (79%) supported wind farms being built 10 kilometres from their residence, and more than half (60%) supported them at 1-2 kilometres. Overall support at 1-2 kilometres tended to be lower in two of the Precincts: New England Tablelands (54%) and Upper Hunter (44%).

Residents opposing wind farms being built 1-2 kilometres from their residence were much more likely than supporters to identify concerns about noise and the impact on the landscape, and much less likely to identify benefits of wind farms such as reducing pollution, and improving the community and economy. Notably, over two thirds (68%) of residents opposing wind farms at 1-2 kilometres still saw an overall benefit of wind farms to the local region.

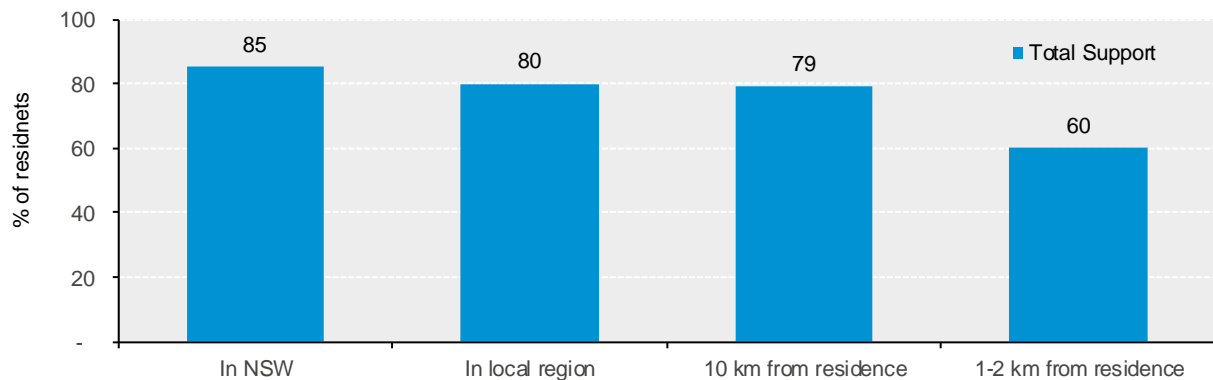
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OVERALL SUPPORT FOR WIND FARMS IN THE SIX PRECINCTS

CHART 6



The research indicates that there was substantial support and backing for wind farms in the state, in the local region and even up to 10 kilometres from the place of residence. Support reduced when considering wind farms closer to home, although a majority (60%) still supported wind farms at a distance of 1-2 kilometres from their residence.

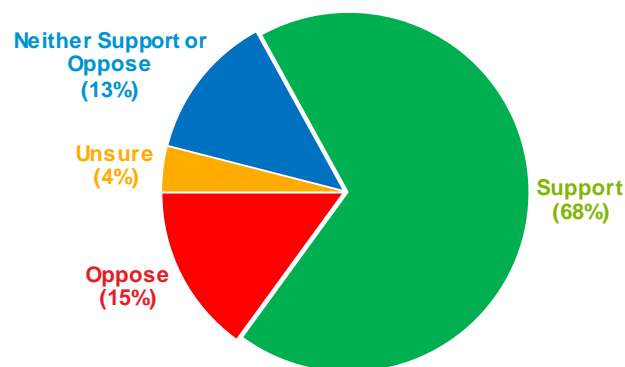
While overall acceptability of wind power was high, a significant number of residents of the Precincts (30-40%) had concerns about noise, negative visual impact, negative impact on property prices, safety concerns and heritage values. In addition, proximity to a wind farm reduced the level of support.

INFIGEN ENERGY: COMMUNITY PERCEPTIONS OF WIND FARMS (MAY 2012)

A telephone survey of 234 residents and local businesses within Bungendore and Tarago, New South Wales, was conducted to test local attitudes towards wind farms in the communities surrounding the Capital Wind Farm.

WOULD YOU SUPPORT OR OPPOSE SIMILAR WIND FARM DEVELOPMENTS
IN THE LOCAL AREA IN THE FUTURE?

CHART 7



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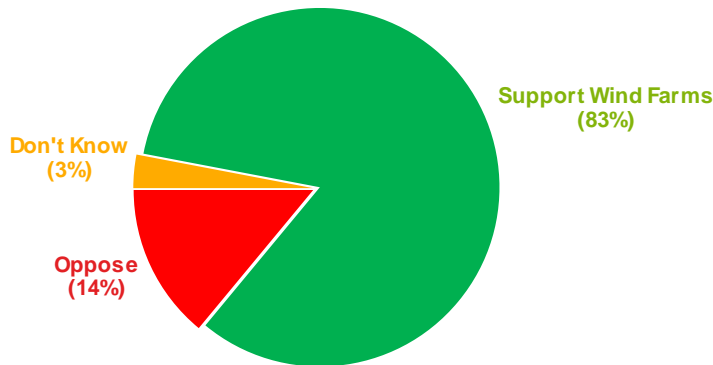
COMMUNITY POLLING RESULTS - ATTITUDES TO WIND ENERGY IN VICTORIA, NSW AND SOUTH AUSTRALIA, PACIFIC HYDRO (2011)

This 2011 study surveyed ten wind farm communities in areas where wind farms are operating or proposed in Victoria, New South Wales and South Australia.

The phone survey interviews of 1,000 respondents were conducted by an independent social research company.

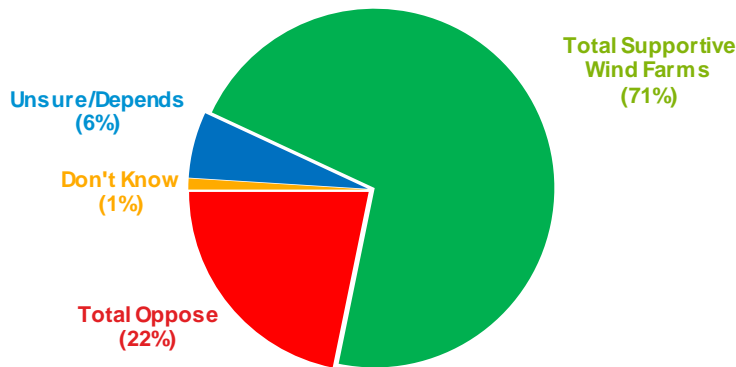
COMMUNITY SUPPORT (NATIONAL FOR WIND FARMS)

CHART 8



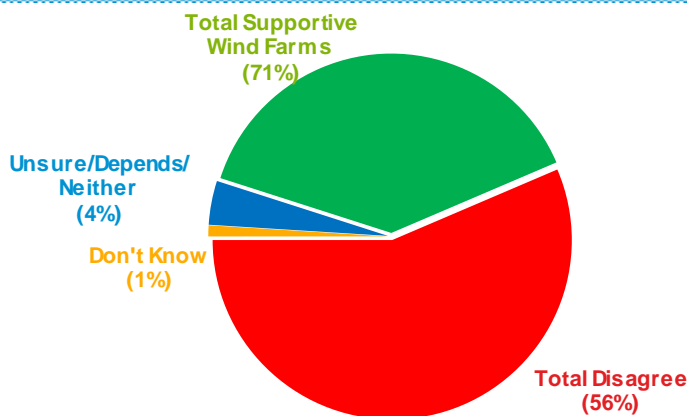
COMMUNITY SUPPORT FOR A WIND FARM BUILT NEAR RESPONDENT

CHART 9



WIND FARMS CAN BE A VISUAL BLIGHT ON THE LANDSCAPE

CHART 10



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A.2 OVERSEAS STUDIES

Community perception studies have also been undertaken overseas to gauge levels of community support and opposition to wind farms.

UNITED KINGDOM

A paper presented at the 20th British Wind Energy Association Conference (Anne Marie Simon Planning, 1996) gives an overview of thirteen studies undertaken between 1990 and 1996 by wind power proponents, opposition groups, the BBC, statutory authorities and a Liverpool University dissertation found that in all these studies:

- The overwhelming majority of respondents support the principal of development of wind power in the UK, and they also support their local wind farm;
- Those with direct experience of an operating wind farm are more supportive and positive than those without experience;
- Once wind farms are in operation, concerns about noise and visual impact decrease;
- The majority of people find the wind farms acceptable in the landscape and more find the wind turbines graceful than ugly; and
- A strong majority support and a small minority oppose wind farms, with more expressing no opinion than opposition (Freris 1998).

A summary of the results for eleven of these studies, which is taken from this paper (*Anne Marie Simon Planning, 1996*), are reproduced below.

TABLE 15 – SUMMARY OF ELEVEN STUDIES CONDUCTED IN THE UNITED KINGDOM INTO ATTITUDES TO WIND POWER FROM 1990-96

SUMMARY OF ELEVEN STUDIES CONDUCTED IN THE UNITED KINGDOM INTO ATTITUDES TO WIND POWER FROM 1990-96

TABLE 1

Location	Sponsor/Organiser	Date	In Favour	Against	Don't Know
Delabole, England	DTI	1992/3	84%	4%	11%
Cemmaes, Wales	DTI	1992/3	86%	1%	13%
Llandinam & Llangwryfon, Wales	CCW	1992/3	83%	3%	14%
Llandinam	BBC	1994	76%	17%	8%
Rhyd-y-Groes			61%	32%	7%
Taff Ely, Wales			74%	9%	17%
Kirkby Moor, England	National Wind Power	1994	82%	9%	9%
Bryn Titli, Wales	NWP (pre construction)	1996	68%	14%	19%
	NWP (open day)		94%	3%	3%
Trysglwyn, Wales	NWP (open day)	1996	96%	4%	-
Coal Clough, England	Liverpool University Dissertation	1996	96%	4%	-

Notes:

NWP = National Wind Power (a wind farm developer).

CCW= Countryside Council for Wales (a statutory body).

BBC = BBC (Wales) and the University of Wales

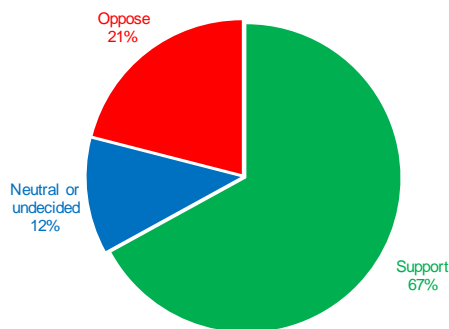
In all these studies between 61% and 96% of survey respondents were supportive of wind power.

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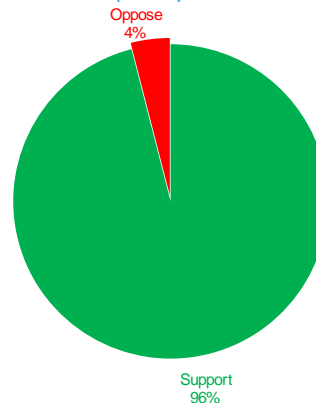
COMPARISON OF SELECTED WIND FARM COMMUNITY PERCEPTION STUDIES IN THE UNITED KINGDOM

CHART 11

Support for wind farms in Wales (1994)



Support for wind farm at Coal Clough, England (1996)



The lowest level of acceptance was one area within the BBC 1994 study which looked at attitudes towards wind farms in Wales (Interviews with 268 respondents, conducted in two stages; stage one being just after the wind farm was built and stage two one year later). The BBC study also looked at three locations, Llandinam, Rhyd-y-Groes and Taff Ely) with the lowest support for the wind farm at Rhyd-y-Groes with 61% support and 32% against, whilst overall the BBC study found that 67% of respondents were in favour of the development of wind power in Wales, and 21% were opposed.

The highest approval was that reported in the Coal Clough (Lancashire, England) study (Questionnaire completed by face to face interviews, sample of 50) with 96% approval and 4% opposition.

These figures are similar to those reported in the Australian studies.

SCOTLAND & IRELAND

A more recent study (November 2005) on community perception of wind farms in Scotland and Ireland also has similar, but higher approval ratings. (found at <http://www.yourenergyco.uk/pdf/windfarmpaper121205.pdf>).

TABLE 16 – COMPARISON OF LEVELS OF ACCEPTANCE BETWEEN WIND FARMS IN SCOTLAND AND IRELAND

COMPARISON OF LEVELS OF ACCEPTANCE BETWEEN WIND FARMS IN SCOTLAND & IRELAND TABLE 2

	Strongly Support		Support		Neutral		Oppose		Strongly Oppose	
	DL	BH	DL	BH	DL	BH	DL	BH	DL	BH
A. Wind power in Scotland	55%	55%	35%	22%	6%	16%	2%	0%	2%	7%
B. Local wind farm	63%	47%	25%	16%	3%	20%	3%	4%	5%	13%

Notes:

DL = Dun Law (operational site)

BH = Black Hill (proposed site)

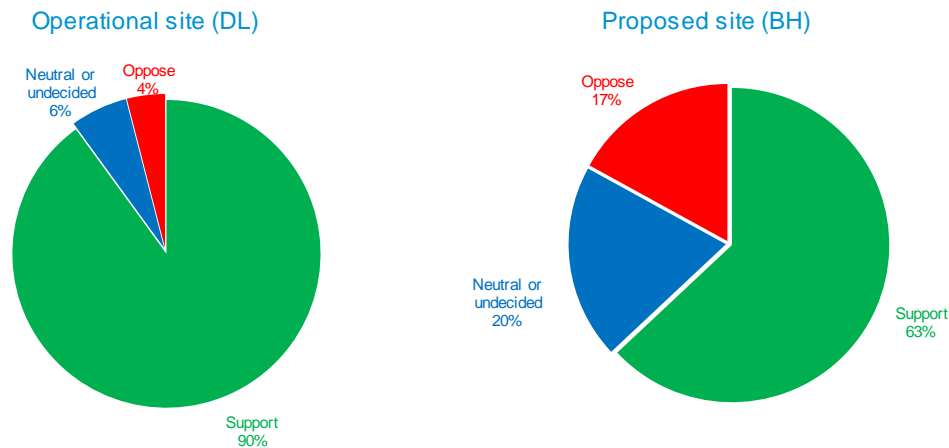
(from *Public Perceptions of Wind Power in Scotland and Ireland*, Charles R. Warren, Carolyn Lumsden, Simone O'Dowd & Richard V. Birnie, *Journal of Environmental Planning and Management*, Vol. 48, No. 6, 853 – 875, November 2005, Table 4, p862).

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ACCEPTANCE LEVELS - SCOTLAND AND IRELAND

CHART 12



Once again this reconfirms that the high level of acceptance, and this report also goes further and shows the increased level of acceptance within a community following construction. This is discussed in the next section of this report.

NORTH CAROLINA, USA

Reported attitudes in a study from North Carolina (NC) in the USA are also similar. A paper prepared on public attitudes (Grady 2004) towards wind energy in eastern NC, which included coastal areas, and western NC, which includes mountainous areas, presented to the 'Efficient NC Conference' also found similar degrees of approval. Note: There was no information in this paper on the sample size.

TABLE 17 – PUBLIC ATTITUDE TO PLACEMENT OF WIND FARMS IN EASTERN NC

PUBLIC ATTITUDE TO PLACEMENT OF WIND FARMS IN EASTERN NC

TABLE 3

Placement	% Prohibited	% Not Prohibited	% Don't Know
Mainland	11.9	72.8	15.3
Mainland clustered	14.1	69.6	15.1
Sounds	16.6	63.6	19.8
Sounds clustered	28.0	50.2	20.5
Offshore	13.9	68.6	17.6
Offshore clustered	14.4	68.6	15.8

Table 3 shows the level of acceptance for clusters of wind turbines reduced to 50% for the Sounds which are the coastal areas along the eastern seaboard of North Carolina. The level of acceptance for clustered groups of wind turbines in the mainland area rose to 69.6%.

This paper (Grady, 2004) also presented levels of acceptance within the more mountainous areas of Western NC.

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TABLE 18 – PUBLIC ATTITUDES TO WIND FARM PLACEMENT – WESTERN NC

PUBLIC ATTITUDES TO WIND FARM PLACEMENT - WESTERN NC

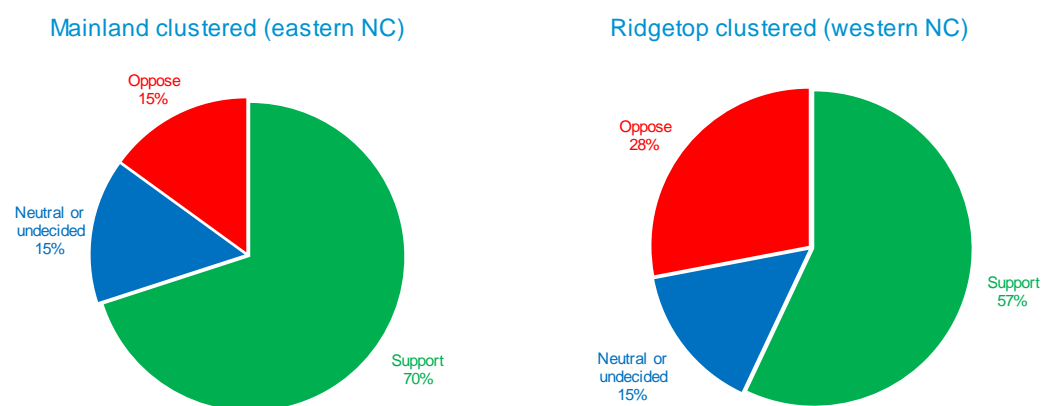
TABLE 4

Placement	% Prohibited	% Not Prohibited	% Don't Know
Ridgetops	20.0	64.0	17.0
Ridgetops clustered	28.0	57.0	15.0
Ridgetops with other towers	16.0	75.0	10.0

The western area of Northern Carolina is mountainous; many parts are uncleared and show few signs of human intervention. The level of acceptance for clustered groups of wind turbines on ridge tops in this area is less (57%) than the level of acceptance reported for the mainland areas of Eastern NC (69%), however if there are other towers on the ridge tops (i.e. there are obvious signs of human intervention) then the level of acceptance rises to 75%.

ACCEPTANCE LEVELS - NORTHERN CAROLINA, USA

CHART 13



In summary this paper reported that:

- *“within groups of middle aged, middle class, pragmatic, year round residents of the mountain and coastal regions of NC, there is support for developing renewable energy as a future source of fuel for electricity generation.*
- *More than 3 out of 4 would prefer to see more future electricity derived from solar and wind*
- *Less support for turbines in sounds or national forests*
- *2 out of 3 support turbines visible from home*
- *Over 80% support turbines for residential use.”(Grady, 2004)*

The degree to which the respondents believe that wind farms on mainland sites should not be prohibited is very similar to the previously cited United Kingdom and Australian studies; with between 69-73% believing that wind farms should not be prohibited.

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Appendix B

Citations for Landscape Significance

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TABLE 19 – CITATION FOR LANDSCAPE SIGNIFICANCE - CULTURAL & NATURAL: MOYNE

NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
<p>Tower Hill</p> <p>Extinct volcano 14 km East of Port Fairy, PORT FAIRY, Moyne Shire</p>	50 km	<p>STATEMENT OF CULTURAL HERITAGE SIGNIFICANCE</p> <p>Tower Hill State Game Reserve and surrounds is significant for scientific reasons, including geology and revegetation work, at an International/ national level. (Note that the "International" classification is based on the decision of the Geological Society of Australia to classify the geology and geomorphology at this level.)</p> <p>The site is significant for aesthetic and cultural reasons, including historic and social aspects, at a National level.</p> <p>Tower Hill is a geological and geomorphological site of International significance as a type example of a nested maar, a volcanic crater formed by a series of phreatic explosions with late stage scoria cone development.</p> <p>In terms of aesthetic significance, the scenic and visual qualities derive from the relationship of Tower Hill to the relatively flat and cleared coastal plain, the height and slope of the enlarged crater and the internal cones, the vegetation cover and the contrast between landform and vegetation and the lake and its associated marginal wetlands. Tower Hill and Surrounds is of National significance for heritage landscape values.</p> <p>The crater was reserved for public use in 1866 (Downes, 1969), and in 1892 it became the first National Park created in Victoria. The immediate surrounds still show the early colonial landscape of scattered Irish-style rural dwellings set alongside small roads dividing fields in which early settlers grew potatoes and onions. This rural landscape is integrated seamlessly with a historic market town, Koroit, one kilometre north of Tower Hill, where many of the buildings date from the 1850s and the main street have been recognized as significant by the National Trust.</p>	International
<p>Nirranda Coast</p> <p>NIRRANDA, Moyne Shire</p>	58 km	<p>The Nirranda Coast citation includes the Bay of Islands Coastal Park, originally reserved for public purposes in 1873, plus the hinterland of the park, mainly private land, extending inland to a distance which protects landscape character as seen in views from</p>	State

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
<p>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright</p>		<p>the coastal park. The citation includes the park outlier at Lake Gilleard and its viewshed.</p> <p>The Nirranda Coast is significant at a State level for aesthetic, archaeological, cultural, and scientific (geological and geomorphological) reasons. It is significant at a Regional level for flora and fauna and for educational purposes.</p> <p>The Nirranda Coast is of State significance for its aesthetic values: the area features some of the most scenic coastal cliffs in Victoria and is one of the few places along the Victorian coast with wide open views across farmland adjacent to the coast but not separated from it by a major road (Plate 1).</p> <p>The area is of State significance for its association with early historical events, notably the occurrence of maritime disasters on the coast, giving rise to its name, "the Shipwreck Coast".</p> <p>The geology and geomorphology are of State significance for the features associated with evolution of limestone landscapes and coastal processes.</p>	
		<p>Griffith Island has played an important part in the historical development of Port Fairy commencing with a whaling settlement (1833), followed by grazing and then designation as a public park and recreation zone. The original three islands have been consolidated by man-made breakwaters, walls and spoil deposition, and have a history of human intrusion which changed the island as successive generations sought to shape the land for their purposes.</p> <p>Griffith Island is an unusual landform as an isolated basalt outcrop, overlain with calcareous sand. It lies at the extremity of the Mount Rouse lava flow of 300,000 years ago, and it has been suggested that the South West Passage, which separates it from the mainland, is the remains of a collapsed lava tunnel (Eric C.F. Bird, The Coast of Victoria, Melbourne University Press, 1993, p.43). The seaward perimeter includes a number of small basalt ringed bays and lagoons.</p> <p>Griffith Island is significant for historic and scientific reasons at a State level and is significant as an example of a coastal landform which has a history of persistent human interference or use since the beginning of European settlement in Victoria, in the</p>	
<p>Griffith Island</p> <p>Rabbit/Goat/Griffith Island</p> <p>Ocean Drive, PORT FAIRY, Moyne Shire</p>	63 km		Regional

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
		expectation that the construction works would facilitate human use of the site. There is also some, if limited, evidence of earlier aboriginal occupation.	

TABLE 20 – CITATION FOR LANDSCAPE SIGNIFICANCE - CULTURAL & NATURAL: CORANGAMITE SHIRE

NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
Mount Leura Complex Corangamite Volcanic Plains, CAMPERDOWN, Corangamite Shire	30 km	<p>Mount Leura is the highest hill in a complex volcanic feature comprising several distinct cones and craters within the outer wall of a maar, or broad explosion crater. (Mt Leura Complex).</p> <p>The Mount Leura complex is of National Significance as a geological feature and of State Significance for its landscape value.</p> <p>The Mount Leura complex is significant as a geological site. It comprises an outstanding example of a group of scoria cones within a broad volcanic crater, or maar. Because it is a relatively young landform the features visible within it are very fresh and unaltered by erosion, so they show clearly the processes by which they were formed.</p> <p>The value of the Mount Leura complex for educational purposes and for general tourist interest is enhanced by the provision of easy access by road to the top, from which there are outstanding views across the surrounding area. This enables Mount Leura to be seen in context as one of the most prominent of a series of cones, representing the end stage of a phase of volcanic activity which began with the formation of the basalt plain on which they are superimposed.</p> <p>The Mount Leura complex has landscape significance for the striking appearance of steep sided cones rising out of the flat surrounding plain, and the intricate pattern of smaller cones and craters within the outer maar rim. The Schedule to the Corangamite Shire's Significant Landscape Overlay SLO1 states that it is part of one of the State's most significant volcanic landscapes and features. These areas provide visual interest with variation in topography and vegetation and should be protected from inappropriate</p>	National

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
		<p>development.</p> <p>The proximity of Mount Leura to the historic town of Camperdown makes it a local icon, and the complete view of the historic township available from the summit shows how early towns were designed around road and rail links.</p>	
Port Campbell National Park GELLIBRAND, Corangamite Shire	60+ km	This unusual and striking coastline with high visual, scientific and cultural importance possesses unique landforms of outstanding visual quality. The ecological community is largely intact and supports a collection of rare plants. The Twelve Apostles: 2007 National Trust Victorian Heritage Icon Award	National
Mount Elephant DERRINALLUM, Corangamite Shire	18 km	Mt Elephant is significant for its landscape cultural significance	State
Lake Bullen Merri Western District, CAMPERDOWN, Corangamite Shire	26 km	<p>Lake Bullen Merri is a maar, a broad volcanic crater formed by one or more major volcanic explosions during the late Tertiary period. Much of the ash and scoria ejected during the explosions fell nearby to create a raised rim around the crater. Within the crater, water has accumulated to form a brackish lake.</p> <p>Lake Bullen Merri is significant for scientific reasons at the International level, and for its aesthetic qualities at the National level.</p> <p>Lake Bullen Merri is a good example of a lake within volcanic maar, a crater formed by violent volcanic explosions, and the landform is classified by the Geological Society of Australia as of National Significance;</p> <p>Lake Bullen Merri is a striking blue lake in a deep hollow, with an attractive pastoral landscape on the ridge enclosing the lake. It remains full of water all year, so is a particularly valuable feature of the inland of the state during dry summer months.</p>	National
Hawks Nest Road And Environs, Stony Rises	47 km	Hawks Nest Road is an old road alignment across the Stony Rises, linking the early farming hamlet of Pomborneit East with the Princes Highway at Pomborneit in the west,	State

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
<p>The North-South Section Of The Road Between Pomborneit East And The Princes Highway At Pirron Yallock Is Sometimes Known As Bakers Road Or Bakers Lane.</p> <p>Hawks Nest Road, POMBORNEIT, Corangamite Shire</p>		<p>and Pirron Yallock in the south.</p> <p>The road runs through a farming landscape that has changed little since it was originally subdivided and sold for small dairy farms in the 1860s. In places there are extensive views across farmland with cattle sheds and stockyards. Several well-preserved dry stone walls are visible from the road.</p> <p>The road alignment is strongly influenced by the underlying topography, following an undulating, sinuous route through lava flows between Mount Porndon and the southern shore of Lake Corangamite. Important geological features are seen alongside the road. Roadside vegetation includes significant remnants of the open woodland that once covered much of the Western District.</p> <p>Views from the road are of a constantly changing panorama across an almost intact nineteenth century farming landscape scattered with trees and patches of woodland.</p> <p>Hawks Nest Road is significant for historic, scientific and aesthetic reasons at a State level</p> <p>Although much of the land alongside Hawks Nest Road was cleared for farming, the difficulty of access through the irregular rocky topography allowed the survival of several important remnants of Basalt Plains Woodland, a priority Endangered Vegetation Class. Elsewhere, residual trees and secondary re-growth on patches of abandoned farmland create an open woodland appearance. The result is an intricate and varied landscape with a scale of detail that is unusual in Victoria.</p>	
<p>Lake Gnotuk - Camperdown</p> <p>CAMPERDOWN, Corangamite Shire</p>	24 km	<p>Lake Gnotuk is a maar, a broad volcanic crater, bordered by a high steep rim formed by deposition of scoria (fragmented lava) and ash ejected during the eruptions. A hypersaline lake has formed within the crater.</p> <p>Lake Gnotuk is significant for scientific reasons at the International level, and for its aesthetic qualities at the State level.</p> <p>Lake Gnotuk is listed as one of the 25 geological features of International Significance in the State (RPD Group, 2001, p.4). It is described as of importance for representation of landform type, outstanding nature, and as a geological monument, important for</p>	State

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
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<p>Port Campbell Headland & Port</p> <p>The Headland is known to local Aboriginal people as Purroitchihoorrong 'the spirit voice that mocks you'.</p> <p>PORT CAMPBELL, Corangamite Shire</p>	62 km	<p>education, research, reference and recreation/aesthetic aspects (Joyce and King, 1980, p.37).</p> <p>The combination of a wholly enclosed, often blue lake, which emerges as a surprise to the viewer who climbs the bordering ridge, and the steep grassy hill backdrop, provides a visually pleasing feature in the rather flat lava plain of the Western District. It is an important component of the local tourist group's concept of "Lakes and Craters Country", listed in the Volcanoes Discovery Trail for motorists and a major feature of the proposed Kanawinka Geopark.</p> <p>Port Campbell's foreshore, port, bay and headland which includes Point Sturgess and Beacon Point, parts of which are located within the Port Campbell National Park; and the viewshed to the bay's western cliff and Two Mile Reef, which frames views to and from the area, and associated features.</p> <p>Port Campbell headland and port is highly significant for archaeological, historic, social, aesthetic and scientific reasons at a State level.</p> <p>Port Campbell headland's dramatic limestone cliffs and underlying sea caverns have been designated as a nationally significant coastal landscape and geological feature. The vegetation on the headland retains a highly significant remnant of endangered coastal heathland, which supports several highly significant faunal species.</p> <p>Port Campbell is highly significant as a place associated with early and current coastal tourism in Victoria and the nominated area has many features linked to this, such as the Great Ocean Road and Norfolk Island Pines. It retains its compact form of the earlier village.</p>	State
<p>Lake Purrumbete</p> <p>CAMPERDOWN, Corangamite Shire</p>	36 km	<p>What is significant?</p> <p>Lake Purrumbete is a maar, a broad, shallow volcanic crater formed by an explosive eruption, probably during the Pliocene period. Much of the material ejected was ash or scoria (fragments of basalt rock), which fell nearby to form a raised rim around the crater, particularly on the eastern, or downwind, side. The crater has subsequently partly filled</p>	State

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NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
		<p>with water to form a lake of fresh water.</p> <p>Around the lake almost all the natural vegetation has been cleared and replaced by a cover of pasture grasses which support pastoral farming, much of it associated with the heritage listed Purumbete Homestead, and providing an open, green backdrop for the lake.</p> <p>How is it significant?</p> <p>Lake Purumbete is significant for aesthetic and historic reasons at the State level, and for scientific reasons at the National level.</p> <p>Why is it significant?</p> <p>Lake Purumbete is described by the Geological Society of Australia as a near-perfect simple maar of National significance.</p> <p>Unlike all the other large lakes in this part of the Western District, the water in Lake Purumbete is fresh, and it supports a large number and variety of fish, birds and aquatic plant life, contributing to high scenic quality and rich biodiversity.</p> <p>The pastoral landscape around Lake Purumbete was developed in association with an important historic property, Purumbete Station. The Purumbete Homestead, which is classified by the National Trust (B0733), the Australian Heritage Commission (RNE 3757) and the Victorian Heritage Register (H0301), is situated near the northern edge of the lake. There is very little other development, and the pastoral setting of the lake and homestead remain virtually intact.</p> <p>Classified 18/04/2011</p>	

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TABLE 21 – CITATION FOR LANDSCAPE SIGNIFICANCE – CULTURAL AND NATURAL: SOUTHERN GRAMPIANS SHIRE

NAME	DISTANCE FROM PROJECT AREA	DETAIL	LEVEL
The Grampians GRAMPIANS, Southern Grampians Shire		<p>The Grampians comprise a complex of sandstone ranges rising abruptly from the Western Plain. From a distance they are most spectacular with their series of precipitous peaks rising to 1,164m at Mt. William. The area provides some of the most beautiful and diverse habitats for native flora in Victoria with over 1,000 species of ferns and flowering plants, many endemic to the area. A wide range of habitats resulting from the diverse topography, micro-climates and vegetation have provided secure refuges for many wildlife species including a number of rare species.</p> <p>The Grampians were of considerable significance to the Aborigines of the Western Plains, and evidence of their occupation can be found in cave paintings and axe quarries. These are of immense archaeological interest. The Heatherleigh Quarries and their associated stone buildings are also of great interest having been opened to provide stone for a number of public buildings in Melbourne.</p> <p>As a recreational resource the Grampians are of significance to the whole State. Many forms of recreation are possible in this diverse area.</p> <p>The area is also the primary source of hardwood timber for North Western Victoria and North Eastern South Australia.</p> <p>The farming country surrounding the Grampians is enhanced by the spectacular backdrop of the mountain range. Much of it is particularly attractive rural land with fine mature River Red Gums and other trees in paddocks and along roadsides and streamlines.</p>	Regional

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Appendix C

Research References

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Appendix D

Glossary of Terms

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Amelioration – The ability to reduce the visual impact of a development through siting, design, colour or screening.

Modification Level – The degree to which a development contrasts or blends with its setting.

Sensitivity – The degree to which various user groups will respond to change based on their expectation of a particular experience in a given setting, i.e. the expectation of a high level of visual amenity in a national park.

Visual Impact – The result of assessing the sensitivity level of a viewer and the modification level of a development.

Viewshed – The area visible from a particular viewing location.

Visual Amenity – The qualities of a landscape setting that are appreciated and valued by a viewer.

Viewer Perception – The way in which people respond to what they are seeing as influenced by things other than purely visual, – i.e. noise and economic benefits.

Visual Prominence – The degree to which a development is visible. Calculated by assessment of the vertical and horizontal viewing angle and related the proportion of the central field of view of the human eye that is occupied.

Zone of Visual Influence (ZVI) – The area over which an object can be seen within the landscape. Also referred to as visual catchment.

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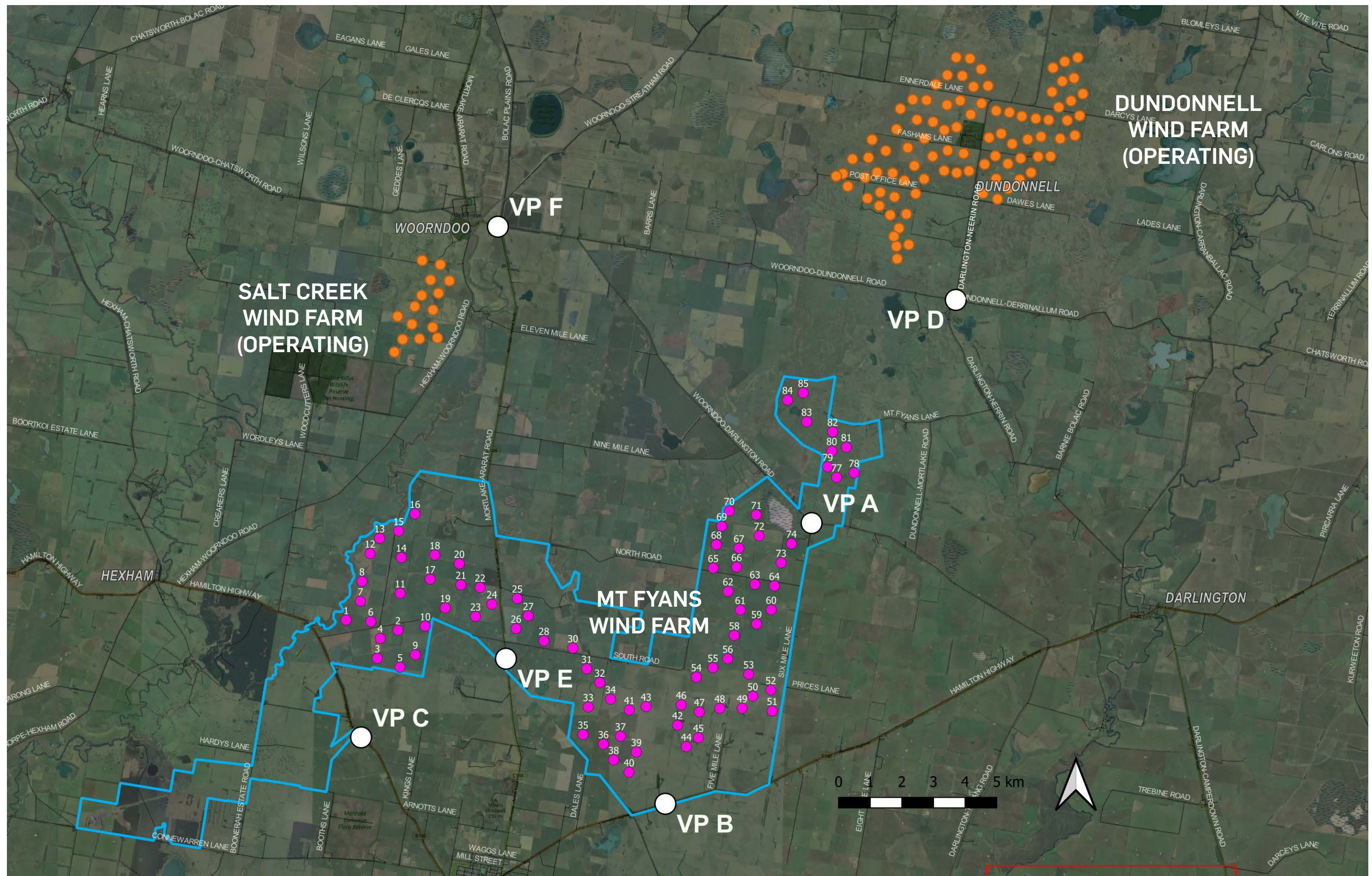
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Appendix E

Cumulative Photo-simulations

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CUMULATIVE VP A : INTERSECTION WOORNDOO-DARLINGTON RD & SIX MILE LANE - PANORAMIC PHOTOSIMULATION



CUMULATIVE VP B : HAMILTON HIGHWAY BETWEEN CASTLE CAREY RD AND FIVE MILE LANE - PANORAMIC PHOTOSIMULATION



MT FYANS WIND FARM PROJECT - MORTLAKE
CUMULATIVE PANORAMIC PHOTOSIMULATIONS

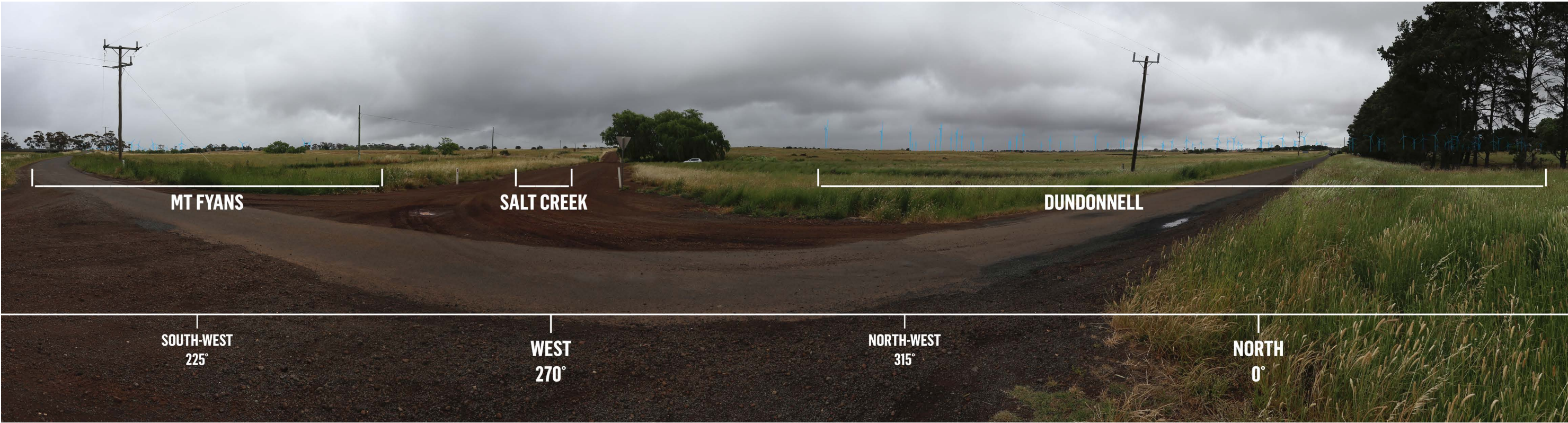
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CUMULATIVE VP C : HAMILTON HIGHWAY ~700M SOUTH-EAST OF BOONERAH ESTATE ROAD - PANORAMIC PHOTOSIMULATION



CUMULATIVE VP D : INTERSECTION WOORNDOO-DUNDONNELL AND DARLINGTON-NERRIN ROADS - PANORAMIC PHOTOSIMULATION



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CUMULATIVE VP E : MORTLAKE-ARARAT ROAD ~500M SOUTH OF CASTLE CAREY ROAD - PANORAMIC PHOTOSIMULATION



CUMULATIVE VP F : INTERSECTION WOORNDOO-DUNDONNELL & MORTLAKE-ARARAT ROADS - PANORAMIC PHOTOSIMULATION



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Appendix F

Visibility Rationale

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VISIBILITY – RELATIONSHIP WITH VIEWSHEDS

The report defines a number of viewsheds based on distance from the development for the purposes of assessment. The methodology is based on the reduction of impact with an increase in distance between a given viewpoint and the development. These viewsheds or settings are:

- **Local Setting** – up to 4 km from the development.
- **Sub-regional Setting** – between 4 km and 8 km from the development.
- **Regional Setting** – beyond 8 km of the development.

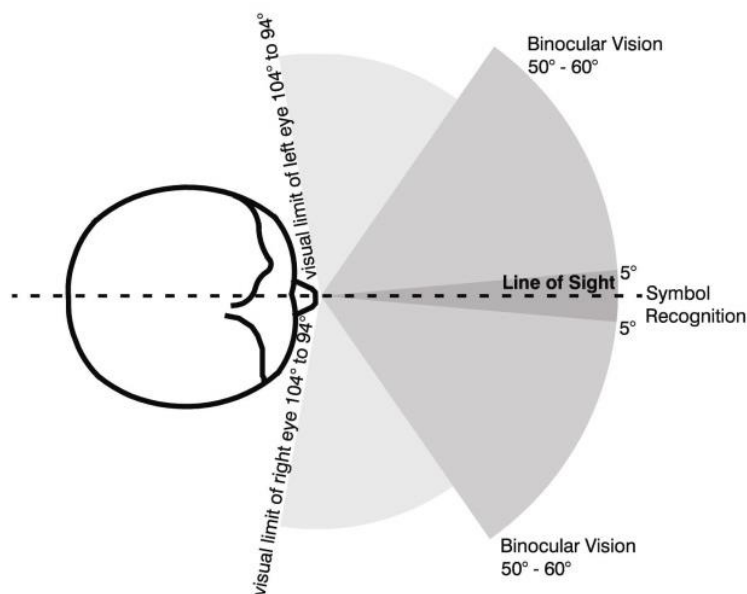
These distances have been established based on previous studies undertaken by URBIS. They are based on the reduction of visibility of objects in the distance as the field of view reduces.

HORIZONTAL LINE OF SIGHT

It is generally accepted that the central field of vision for the human eye covers a horizontal angle of approximately 50 degrees to 60 degrees. Given both eyes see simultaneously and that there is a degree of overlap, a central field of view results in a person looking straight ahead (**Figure A.1**).

HORIZONTAL LINE OF SIGHT

FIGURE A.1



In the production of visual simulations, a 50 mm lens on a 35 mm film format is most widely used as it captures a field of view of approximately 46 degrees, similar to that of the view from one eye. Two photos taken with a 50 mm lens produced as a panorama, with a degree of central overlap, capture the central field of view in a similar way to that of the human binocular view (binocular field).

Within the central field of vision, the viewed image is sharp, colours are separately defined and depth perception occurs.

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VISUAL IMPACT/VISUAL PROMINENCE

The potential visual impact of a development will, to a large extent, depend on how much of the central field of vision that it occupies. In relation to the assessment of mining sites that often extend across the landscape, the calculation of horizontal view angle is not the only factor to be considered.

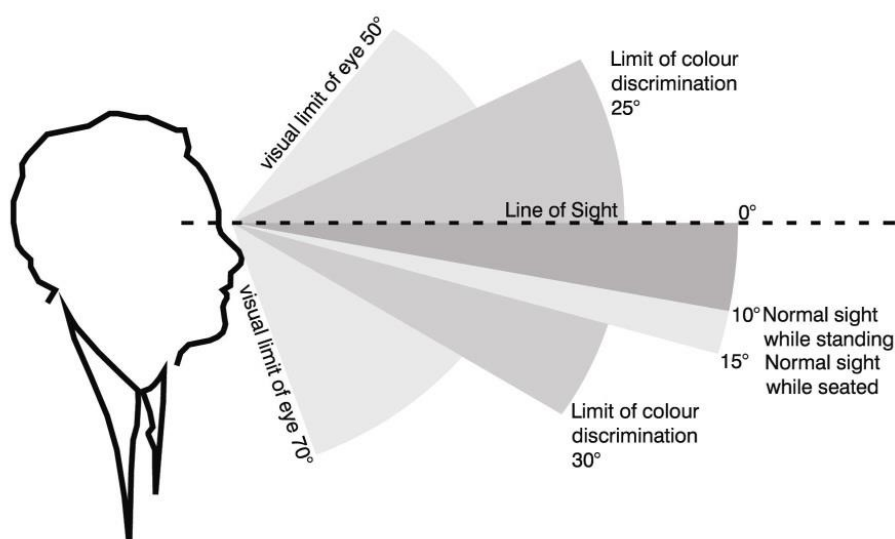
DEGREES OF FIELD OF VIEW OCCUPIED	POTENTIAL VISUAL PROMINENCE – HORIZONTAL FIELD OF VIEW
Less than 5°	Insignificant The development will not be highly visible in the view, unless it contrasts strongly with the background.
5° – 30°	Potentially Noticeable The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 30°	Potentially Dominant The development will be highly noticeable.

VERTICAL LINE OF SIGHT

As for the horizontal line of sight, there is also a vertical central field of view. If we assume that the horizon is 0° then the eye clearly defines colour, field of view and has image sharpness for an angle of approximately 25° upwards and 30° downwards. However, in reality, the typical line of sight for a standing person at ground level is approximately 10° below the horizon line (**Figure A.2**).

VERTICAL LINE OF SIGHT

FIGURE A.2



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VISUAL IMPACT / VISUAL PROMINENCE

Objects that occupy a small proportion of the vertical field of view are visible but not dominant, particularly when they occur within landscapes that have been modified by human activity.

DEGREES OF FIELD OF VIEW OCCUPIED	POTENTIAL VISUAL PROMINENCE – VERTICAL FIELD OF VIEW
Less than 0.5°	Insignificant A small thin line in the landscape.
0.5° – 2.5°	Potentially Noticeable The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 2.5°	Potentially Dominant The development will be highly noticeable, although the degree of visual intrusion will depend on the landscape setting and the width / thickness of the object.

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Sydney

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Sydney, NSW 2000
t +02 8233 9900
f +02 8233 9966

Brisbane

Level 32, 300 George Street
Brisbane, QLD 4000
t +07 3007 3800
f +07 3007 3811

Melbourne

Level 10, 477 Collins Street
Melbourne, VIC 3000
t +03 8663 4888
f +03 8663 4999

Perth

Level 14, 1 William Street
Perth, WA 6000
t +08 9346 0500
f +08 9221 1779

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