# Key views and visual impact

Section 9

## 9.1 Introduction

The overall determination of visual impacts resulting from the construction and operation of the Mura Warra Wind Farm will result primarily from a combination of receiver sensitivity and the magnitude of visual effects.

A determination of visual impact from the combination of receiver sensitivity and the magnitude of visual effect is a well established methodology and has been applied extensively on wind farm LVIA in Victoria and across Australia. The standard methodology is set out in industry and best practice guidelines including the Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment, 2013 – Chapter 6 Assessment of visual effects.

## 9.2 Sensitivity of visual receivers

Judging the sensitivity of visual receivers needs to take account of the occupation or activity of people experiencing the view at particular locations and the extent to which their attention or interest is focussed on views within and surrounding the wind farm site.

## 9.3 Magnitude of visual effects

Judging the magnitude of the visual effects needs to take account of:

- the scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the proposed development
- the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line height, colour and texture
- the nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses.

The combination of sensitivity and magnitude will provide the rating of visual impact for viewpoints. **Table 5** sets out the relative visual impact grading values which combines issues of sensitivity and magnitude for the Murra Warra Wind Farm project.

**Table 5** Visual impact grading matrix

| | | | Scale or magnitude of visual effects | | | |
|---|---|---|---|---|---|---|
| | | | High | Moderate | Low | Negligible |
| | | | Very short distance view over a long duration of time. A high extent of wind turbine visibility will tend to dominate the available skyline view and significantly disrupt existing views or vistas. Total loss or major change to pre-development view or introduction of elements which are uncharacteristic to the existing landscape features. | Short to medium distance views over a medium duration of time. A moderate extent of wind turbine visibility will have the potential to dominate available views with visibility recessing over increasing distance. Partial alteration to pre-development view or introduction of elements that may be prominent but not uncharacteristic with the existing landscape. | Medium to long distance views over a low to medium duration of time. Wind turbines in views, at long distances or visible for a short duration not expected to be significantly distinct in the existing view. Minor alteration to pre-development view or introduction of elements that may not be uncharacteristic with the existing landscape. | Visible change perceptible at a very long distance, or visible for a very short duration, and/or is expected to be less distinct within the existing view. Very minor loss or alteration to pre-development view or introduction of elements which are not uncharacteristic with the existing landscape features. |
| **Sensitivity of visual receptor** | High | **Indicator** | | | | |
| | | People with a proprietary interest and prolonged viewing opportunities such as those in dwellings or visitors to attractive and/or well-used recreational facilities. Views from a regionally important location whose interest is specifically focussed on the landscape e.g. from lookouts or areas within National Parks. | **High impact** | **High-moderate** | **Moderate** | **Negligible** |
| | Moderate | People with an interest in their environment e.g. visitors to environmental areas, bush walkers and horse riders etc…those travelling with an interest in their surroundings | **High-moderate** | **Moderate** | **Moderate-low** | **Negligible** |
| | Low | People with a passing interest in their surroundings e.g. those travelling along local roads between townships, or people whose interest is not specifically focussed on the wider landscape e.g. service providers or commuters. | **Moderate** | **Moderate-low** | **Low** | **Negligible** |
| | Negligible | People with no specific interest in their surroundings or those with occasional and transient views travelling at speed along highways or from a place of work where attention may not be focussed on surrounding views. | **Negligible** | **Negligible** | **Negligible** | **Negligible** |

## 9.4 Key views and visual impacts

The Horsham and Yarriambiack Planning Schemes identify key view situations within their respective municipal areas that are subject to planning considerations with regard to their potential visual amenity value. These locations include:

- Mount Arapiles (Horsham Planning Scheme); and
- Grampian & Black Range Environs (Horsham Planning Scheme).

The location of Mount Arapiles and the Grampian & Black Range Environs is illustrated in **Figure 1** which indicates that the closest wind turbine would be located within the order of 50 km from these view locations. At this distance it is unlikely that the proposed Murra Warra Wind Farm will result in any significant level of visual impact and would not be readily discernible depending on climatic conditions.

**Table 6** Visual impact grading

| | |
|---|---|
| Sensitivity of visual receiver | High |
| Magnitude of visual effects | Negligible |
| **Visual Impact** | **Negligible** |

## 9.5 Views from Townships and settlements

Regional Cities, Townships and Localities within the landscape surrounding the Murra Warra Wind Farm include:

- Horsham (around 28 km south of the wind farm);
- Warracknabeal (around 16 km north of the wind farm);
- Dimboola (around 20 km west of the wind farm);
- Minyip (around 19 km east of the wind farm); and
- Murtoa (around 21 km south east of the wind farm).

Whilst wind turbines are theoretically visible over the distances between the Townships and the wind farm, views toward the wind turbines will be partially restricted by development and built structures within urban areas. Potential views toward the wind farm will also tend to be disrupted by discrete areas of vegetation both within and beyond urban areas.

Subject to a detailed assessment, it is considered unlikely that the wind farm will have any significant visual impact on people within Townships surrounding the proposed wind farm development.

**Table 7** Visual impact grading

| | |
|---|---|
| Sensitivity of visual receiver | High |
| Magnitude of visual effects | Negligible |
| **Visual Impact** | **Negligible** |

## 9.6 Views from highways and local roads

The main roads as illustrated in **Figure 11** include the Henty Highway, Western Highway and the Borung Highway. Whilst further assessment will be undertaken within the detailed LVIA it is noted that the proposed Murra Warra Wind Farm will only be partially visible from sections of the Highways and that views from the main roads will be influenced by vegetation and tree planting alongside some sections of the road corridors. The dynamic and constantly changing nature of views from vehicles travelling along local roads will tend to be transitory in nature and generally short term; however views from local roads are likely to offer proximate and direct views toward the wind turbines. As the sensitivity of receivers travelling along highways and local roads tends to be low, in combination with the generally short duration of views, the overall visual impact from roads is likely to be negligible to low.

**Table 8** Visual impact grading (highways)

| | |
|---|---|
| Sensitivity of visual receiver | Low |
| Magnitude of visual effects | Low |
| **Visual Impact** | **Low** |

**Table 9** Visual impact grading (local roads)

| | |
|---|---|
| Sensitivity of visual receiver | Low |
| Magnitude of visual effects | Moderate |
| **Visual Impact** | **Moderate-low** |

## 9.7 Views from agricultural land

GBD acknowledge that the proposed Murra Warra Wind Farm may have the potential to impact people engaged in predominantly farming activities, where views toward wind turbines occur from surrounding and

non-associated agricultural areas. Ultimately the level of impact would depend on the type of activities engaged in as well as the location of the activities together with the degree of screening provided by local vegetation within individual properties. Whilst views toward the turbines will occur from a wide area of surrounding rural agricultural land, this Preliminary LVIA has determined that the sensitivity of visual impacts is less for those employed or carrying out work in rural areas compared to potential views from residential dwellings; however the sensitivity of individual view locations will also depend on the perception of the viewer.

**Table 10** Visual impact grading

| | |
|---|---|
| Sensitivity of visual receiver | Low |
| Magnitude of visual effects | Moderate |
| **Visual Impact** | **Moderate-low** |

## 9.8 View from publically accessible locations

Publically accessible locations, other than road corridors, include various public open spaces, recreational areas, reserves or public meeting places. The majority of public open spaces and recreational areas are those associated and located within surrounding urban localities, where the influence of both distance and existing vegetative cover is likely to screen any potential views toward the Murra Warra Wind Farm site.

Locations within proximity to the wind farm site include the Barrett State Forest (adjoining the wind farm site) and the Sailors Home Hall (and cemetery approximately 1.5 kilometres to the south west of the Hall) at the junction of the Old Minyip Road and the Blue Ribbon Road. Whilst proximate and direct views toward wind turbines will be available from both locations, visitation frequency and number of people at these locations is likely to be low.

**Table 11** Visual impact grading

| | |
|---|---|
| Sensitivity of visual receiver | Low |
| Magnitude of visual effects | Moderate |
| **Visual Impact** | **Moderate-low** |

## 9.9 Views from residential dwellings

This Preliminary LVIA has not carried out an assessment of the potential visual impact of the proposed Murra Warra Wind Farm on surrounding residential dwellings; however, this will be undertaken for the detailed LVIA and include a cumulative visual impact assessment with regard to the location of turbines within other wind

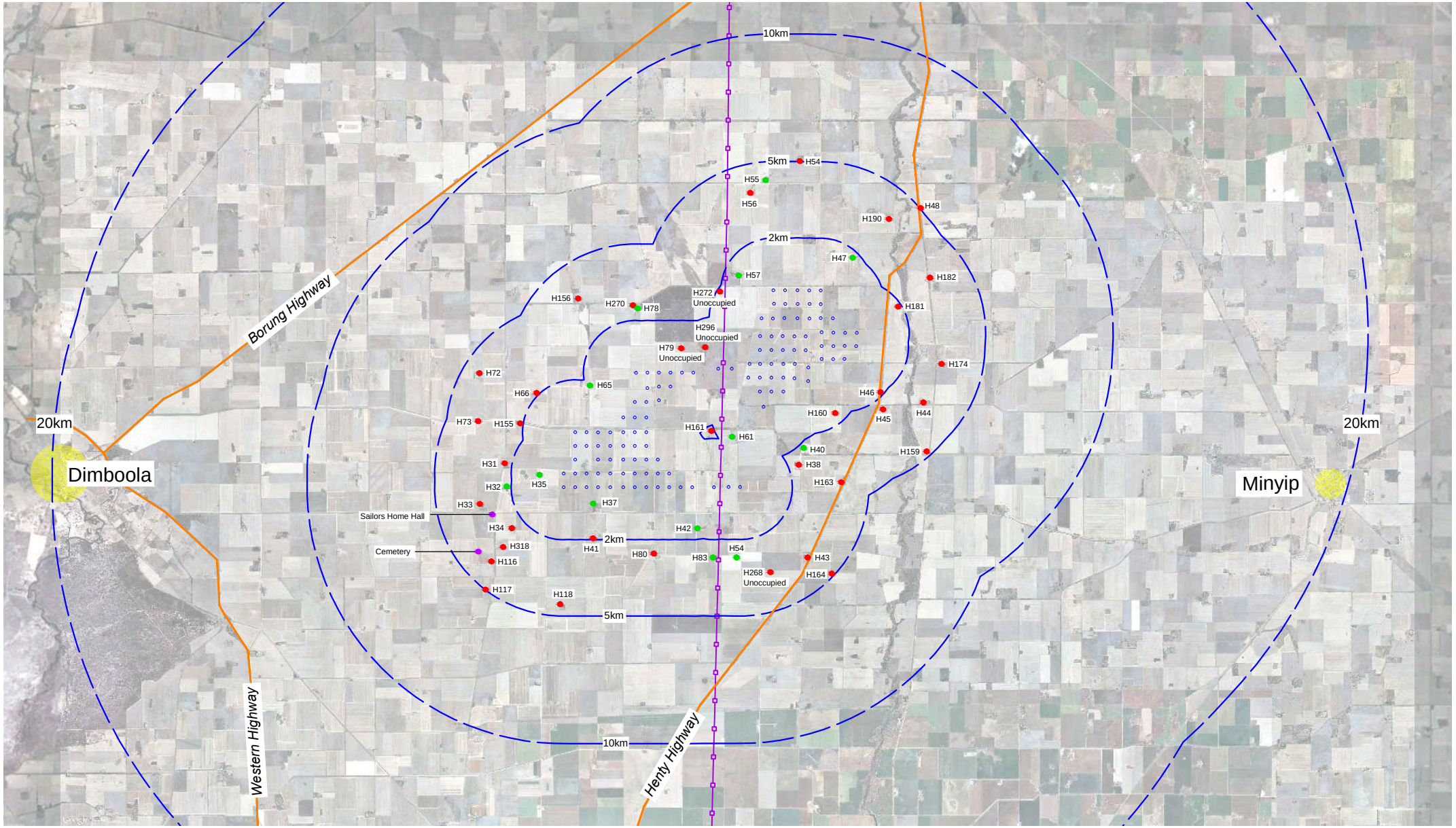
farm projects as well as other large scale infrastructure projects within the proposed Murra Warra Wind Farm viewshed.

Existing residential dwellings are illustrated in **Figure 11** and include dwellings on properties that are not associated with the proposed Murra Warra Wind Farm development as well as those that are.

There are approximately:

- 7 non-associated and 7 associated residential dwellings within a 2km distance from the proposed Murra Warra Wind Farm wind turbines;
- 28 non-associated and 6 associated residential dwellings between a 2 kilometre and 5 kilometre distance from the proposed Murra Warra wind turbines; and
- In excess of 50 non-associated between a 5 kilometre and 10 kilometre distance from the proposed Murra Warra wind turbines.

The site inspection noted that a large number of residential dwellings within the landscape surrounding the wind farm were screened by tree and/or windbreak shelter planting. It is possible that not all residential dwellings will have direct or significant views toward the proposed Murra Warra wind turbines. This will be considered and determined within the detailed LVIA.




Source: Google Earth Pro 2015 CNES/Astrium

Legend

- Proposed wind turbine
- Existing transmission line
- Highway
- Non associated dwelling
- Distance from turbine
- Township
- Associated dwelling
- Distance from turbine

Figure 11
Residential dwellings & hall

House ID noted out to 5 km from wind turbine location

0m 5km

# Murra Warra Wind Farm

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# Preliminary cumulative assessment

Section 10

## 10.1 What is Cumulative Impact Assessment?

A cumulative landscape and visual impact may result from a wind farm being constructed in conjunction with other existing or proposed wind farm developments or other large scale infrastructure projects, and may be either associated or separate to it.

Separate wind farm or other developments may occur within the established viewshed of the proposed wind farm, or may be located within a regional context where visibility is dependent on a journey between each site or project viewshed.

'Direct' cumulative visual impacts may occur where two or more winds farms or other infrastructure developments have been constructed within the same locality, and may be viewed from the same view location simultaneously.

'Indirect' cumulative visual impacts may occur where two or more wind farms or other infrastructure developments have been constructed within the same locality, and may be viewed from the same view location but not within the same field of view (i.e. the viewer has to turn their head in order to view both wind farms).

'Sequential' cumulative visual impacts may arise as a result of multiple wind farms or other infrastructure developments being observed at different locations during the course of a journey (e.g. from a vehicle travelling along a highway or from a network of local roads), which may form an impression of greater magnitude within the construct of short term memory.

An assessment and determination of cumulative visual impact will be included with the detailed LVIA; however, the Preliminary LVIA notes that one proposed wind farm, the Kiata Wind Farm project, is located within a 50 kilometre radius of the Murra Warra Wind Farm site.

The proposed Kiata Wind Farm project would be located in excess of 40 kilometres to the west of the Murra Warra Wind Farm site and include around thirteen wind turbines. Both direct and indirect cumulative impacts would be unlikely due to the distance between the two wind farm sites and sequential impacts limited for the majority of journeys along main roads and highways between populated areas.

# Preliminary photomontages

Section 11

## 11.1 Preliminary photomontages

Preliminary photomontages have been prepared by Garrad Hassan Pacific Pty Ltd to illustrate the general appearance of the proposed Murra Warra Wind Farm following construction. Three locations were selected to illustrate the proposed Murra Warra Wind Farm from view locations in surrounding areas.

The photomontage locations were selected following a review of preliminary ZVI maps, together with a site inspection to identify potential representative viewpoints. The photomontage locations were selected from surrounding road corridors and at a range of distances between the viewpoint and wind turbine (between 4.9 kilometres and 1.3 kilometres) to illustrate the potential influence of distance on visibility.

Additional photomontages will be prepared for the detailed LVIA, with locations to be selected following further consultation with the local community and Councils. The detailed LVIA may also include photomontage prepared from neighbouring properties and non associated dwellings.

The photomontages locations are illustrated in **Figures 4** and **4A**, and photomontages presented in the following figures:

- **Figure 12** Photomontage P1, from Horsham Minyip Road;
- **Figure 13** Photomontage P7, from Dimboola Minyip Road; and
- **Figure 14** Photomontage P9, from Dimboola Minyip Road.

Each photomontage was generated through the following steps:

- A digital terrain model (DTM) of the proposed Murra Warra Wind Farm site was created from a terrain model of the surrounding area using digital contours;
- The site DTM was loaded in the Garrad Hassan 'WindFarmer' software package;
- The layout of the wind farm and 3 dimensional representation of the wind turbine was configured in GH WindFarmer;
- The location of each viewpoint (photo location) was configured in WindFarmer – the sun position for each viewpoint was configured by using the time and date of the photographs from that viewpoint;
- The view from each photomontage location was then assessed in WindFarmer. This process requires accurate mapping of the terrain as modelled, with that as seen in the photographs. The photographs, taken from each photomontage location were loaded into WindFarmer and the visible turbines superimposed on the photographs;
- The photomontage were adjusted using Photoshop CS3 to compensate for fogging due to haze or distance, as well as screening by vegetation or obstacles; and
- The final image was converted to JPG format and imported and annotated as the final figure.

The horizontal and vertical field of view within the majority of the photomontages exceeds the parameters of normal human vision. However, in reality the eyes, head and body can all move and under normal conditions a person would sample a broad area of landscape within a panorama view. Rather than restricting the extent of each photomontage to a single photographic image, a broader field of view is presented to more fully illustrate the extent of the wind turbines.

Whilst a photomontage can provide an image that illustrates a very accurate representation of a wind turbine in relation to its proposed location and scale relative to the surrounding landscape, this Preliminary LVIA acknowledges that large scale objects in the landscape can appear smaller in photomontage than in real life and is partly due to the fact that a flat image does not allow the viewer to perceive any information relating to depth or distance.


Photomontage Location P7 Dimboola Minyip Road - Existing view, panorama north to south east (Bearing 348° to 128°)


Photomontage Location P7 Dimboola Minyip Road - Proposed view, panorama north to south east (Bearing 348° to 128°)

Refer Figure 4A for Photomontage Location

Individual panorama photos taken with a Nikon D700 digital SLR camera with 50 mm prime lens.

Photo coordinates:
Easting 617353
Northing 5966468 (GDA 94)

Approximate distance to nearest visible turbine 2,790 m

Figure 13
Photomontage location P7

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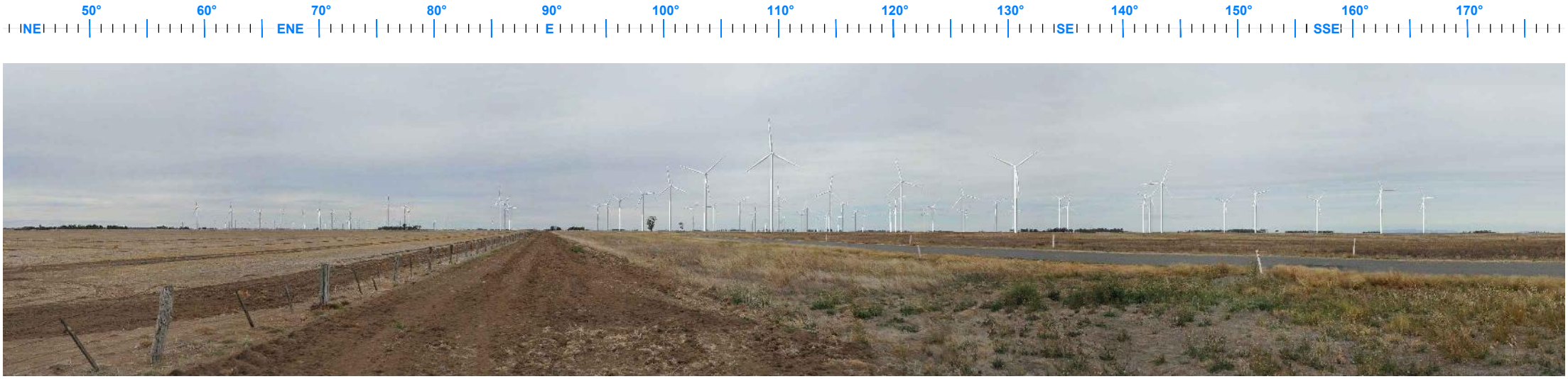
Photomontage Location P9 Dimboola Minyip Road - Existing view, panorama north east to south (Bearing 042° to 180°)




Photomontage Location P9 Dimboola Minyip Road - Proposed view, panorama north east to south (Bearing 042° to 180°)

Refer Figure 4 for Photomontage Location

Individual panorama photos taken with a Nikon D700 digital SLR camera with 50 mm prime lens.

Photo coordinates:
Easting 611539
Northing 5966608 (GDA 94)

Approximate distance to nearest visible turbine 1,135 m

Figure 14
Photomontage location P9

# Murra Warra Wind Farm

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Photomontage Location P1 Horsham Minyip Road - Existing view, panorama west south west to north north east (Bearing 240° to 020°)


Photomontage Location P1 Horsham Minyip Road - Proposed view, panorama west south west to north north east (Bearing 240° to 020°).

Refer Figure 4 for Photomontage Location

Individual panorama photos taken with a Nikon D700 digital SLR camera with 50 mm prime lens.

Photo coordinates:
Easting 620694
Northing 5959466 (GDA 94)

Approximate distance to nearest visible turbine 4,900 m

Figure 12
Photomontage Location P1

# Murra Warra Wind Farm

## Preliminary Landscape and Visual Impact Assessment

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# Conclusion and EES Referral requirement

Section 12

## 12.1 Conclusion

The key findings of the Murra Warra Wind Farm Preliminary LVIA are summarised below:

- the Murra Warra Wind Farm landscape character type, identified and described in this Preliminary LVIA, is generally well represented throughout the Horsham Rural City and Yarriambiack Shire Council areas and more generally within the western of Victoria and across the Wimmera.
- this Preliminary LVIA determined the overall landscape character sensitivity to be low. The majority of landscape characteristics are generally robust, and will be less affected by the proposed wind farm. The degree to which the landscape may accommodate the wind farm will not significantly alter the existing landscape character.
- the capability of the landscape to accommodate change is largely derived from the medium to large scale and open landscape character identified in this part of the Wimmera Plain, together with the relatively low density of people located within the immediate and surrounding area of the wind farm viewshed.
- views toward the proposed Murra Warra Wind Farm from local roads and highways will offer a range of transitory views which will be subject to direction of travel and potential screening influence of vegetation alongside road corridors.
- the proposed Murra Warra Wind Farm is unlikely to have any visual impact on the character of the surrounding Townships, where views toward the wind farm from the majority of residential view locations would be screened by adjoining residences, tree cover and broad low undulations in local landform.
- the majority of farm and residential dwellings surrounding the wind farm maintain windbreaks around dwellings. The extent of windbreak planting reduces the potential visibility of the wind farm from a number of residential view locations within the surrounding viewshed.
- the proposed Murra Warra Wind Farm would be located around 50 kilometres from prominent landscape features including the Grampian National Park and Mount Arapiles. Given that distance is one key determinant for establishing degrees of visual impact, the proposed Murra Warra Wind Farm turbines are unlikely to dominate or significantly detract from the existing view from these key view locations.

## 12.2 EES Referral requirement

In conclusion, the wind farm site and the broader landscape surrounds are not considered of such visual quality that an EES would be required to assess the visual impact of the Murra Warra Wind Farm. A more detailed evaluation of the landscape and visual impact, especially from residential properties, can be undertaken as part of a planning permit application.

## Limitations

GBD has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of RES Australia Pty Ltd and only those third parties who have been authorised in writing by GBD to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the GBD Proposal dated 27th January 2015.

The methodology adopted and sources of information used are outlined in this report. GBD has made no independent verification of this information beyond the agreed scope of works and GBD assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to GBD was false.

This report was prepared between February 2015 and November 2015 and is based on the conditions encountered and information reviewed at the time of preparation. GBD disclaims responsibility for any changes that may have occurred after this time.

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