

## 10. Landscape Mitigation

For wind energy projects landscape screening of views from sensitive viewing locations particularly residential dwellings is one method which can be applied to ameliorate visual impacts that are predicted to be high.

Landscaping is one mitigation option available for residential properties in proximity to the proposed Wind Farm. When compared to views from roads and working areas on farms and larger properties, views from dwellings and their immediate areas of private open space are relatively fixed allowing planting to be carefully designed to screen or reduce the visual dominance of wind turbines through filtering of views.

Many of the more established residential dwellings in the areas surrounding the Project include trees and extensive areas of canopy and screening vegetation. At these dwellings, existing vegetation can and will assist to screen or to filter views to the proposed wind farm.

The landscape patterns of the area also include many planted wind breaks and hedgerows, vegetation within road reserves and property boundaries, areas of managed timber plantations and conservations areas. This vegetation and its screening properties were discussed in various viewpoints in Section 8 of this report. It is clear from these examples that landscape mitigation is possible for the many residential dwellings in proximity to the Project.

Project imagery which includes photomontages, virtual reality and augmented reality prepared to show a range of viewing angles, distances and landscape settings that exist within the Project viewshed demonstrate how landscape mitigation can be effective at screening or filtering views towards the proposed wind turbines particularly from viewing locations that are near to the proposed turbines.

It must however be recognised that not all landowners may wish to screen views of turbines either through a preference to see the turbines, the potential to remove views or for other aesthetic reasons.

Landscape mitigation measures should be determined on a case by case basis in consultation with landholders to minimise adverse impacts. Such a process has occurred in past projects, after approval of the wind farm with advice and funding being supplied by the proponent.

All wind farm projects within Victoria are required to provide landscape mitigation for residential dwellings within an area where a high level of visual impacts is predicted. This area is based upon the overall height of the proposed turbines. For recent projects this distance has been established at a distance of 5.0 km from an approved turbine. This requirement translates into a condition within the Permit that requires the permit holder to implement measures to reduce the visual impact of turbines from all non-participant dwellings, both from their primary dwelling as well as the attached outdoor areas of private open space.

Those area that are eligible or required to be screened are those views from within dwellings and attached outdoor private open space such as:

- habitable rooms from within the dwelling
- primary or common dwellings entrances
- Artist's studios
- Adjoining outdoor private open space

The following section sets out the considerations and requirements for screening of views from residential dwellings.

### 10.1 Placement and Screening

Figure 10-1 shows an example of existing vegetation and placement of new landscaping to assist with screening views to turbines. This example is based on the owner's desire that the views to wind turbines should be screened or filtered.

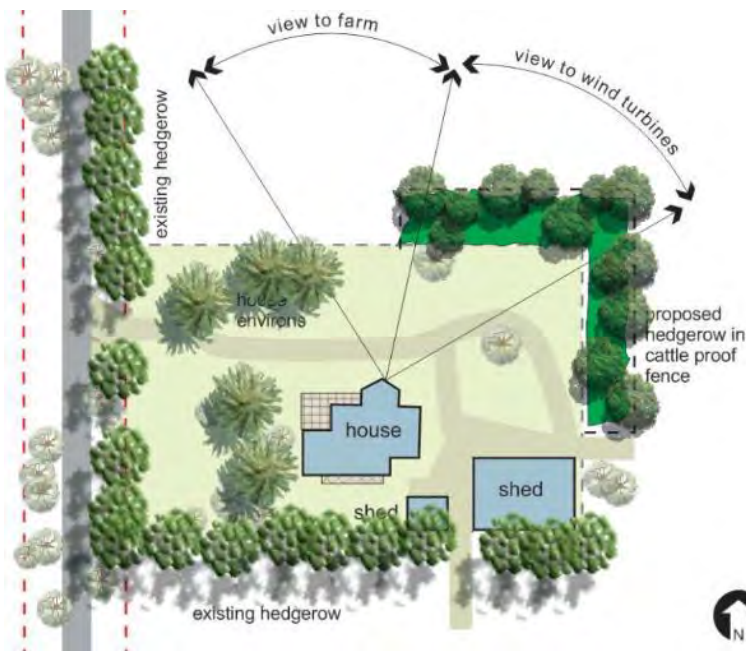


Figure 10-1: Potential Landscape Mitigation Measure

Alternatives may include careful placement of single trees or clusters to screen views to the nearest and most visually noticeable turbine.

## 10.2 Vegetation heights

Vertical view angles consider the overall height of the turbines and the distance of the dwelling to the turbine and this is relevant to determining the heights that vegetation will be required to achieve to screen views. Similar to the discussions on determining the Zones of Visual Influence discussed in Section 4 of this report, the view angle, or visual scale of turbines will change over distance. The greater the distance between a viewing location and a turbine the smaller the turbine will appear, similarly the closer the viewing location the larger the turbine will appear.

By analysing view angles for a 250 m height it is possible to determine the approximate height that landscape mitigation would be required to achieve to ameliorate visual impacts from residential dwellings.

To be conservative, the following will describe view angle at a distance of 1.0 km from a turbine and how this translates to landscape mitigation. Figure 10-2 shows the view angle for a 250 m high turbine at 1.0 km. By analysing view angles for a 250 m turbine it is possible to gauge the approximate height that landscape mitigation would be required to achieve to ameliorate visual impacts from residential dwellings.

For dwellings located within a Bushfire Management Overlay (BMO) it will be important to consider design requirements such as canopy separation, defendable space and distance from the dwelling. For these reasons, vegetation has been shown at varying distances from the dwelling assuming flat terrain. These heights are shown in Table 10.1.

Table 10.1: Landscape Mitigation Indicative Heights

Nearest Turbine Distance	Vegetation height at 20m from dwelling	Vegetation height at 30m from dwelling	Vegetation height at 50m from dwelling
1.0km	6.6m	9.2m	14m
1.5km	5.0m	6.6m	10m
2.0km	4.1m	5.3m	7.8m
2.5km	3.6m	4.6m	6.6m
3.0km	3.4m	4.1m	5.9m
3.5km	3.1m	3.8m	5.2m
4.0km	2.8m	3.5m	4.7m
4.5km	2.8m	3.3m	4.4m
5.0km	2.6m	3.1m	4.1m
5.5km	2.5m	3.0m	3.9m
6.0km	2.5m	2.9m	3.7m

Figure 10-2 shows an example of the vegetation heights described in Table 10.1.

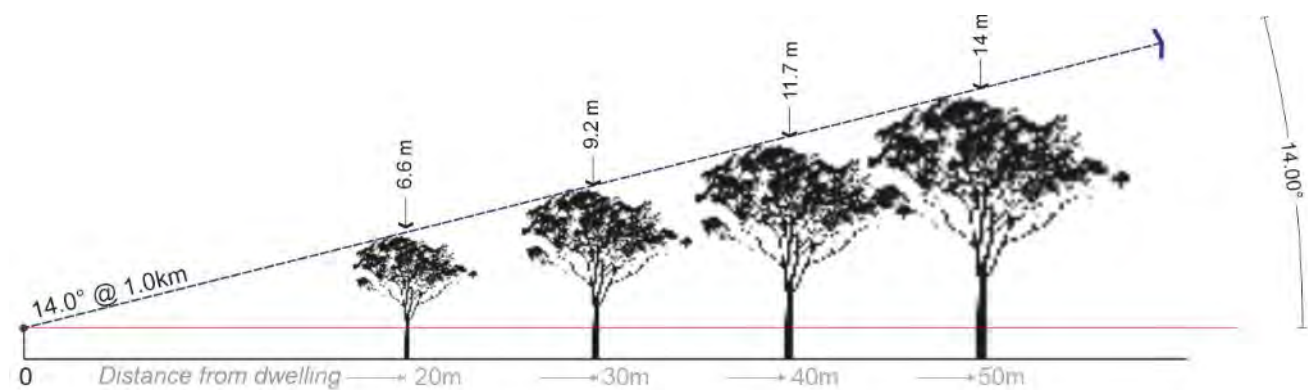


Figure 10-2: Vegetation height requirements

Distance, elevation, topography and landscape setting will vary from dwelling to dwelling. The above figures assume a flat plain.

Figure 10-3 shows an example of how this would vary from a turbine on an elevated hill or a house on an elevated hill with a view to a turbine in the valley.

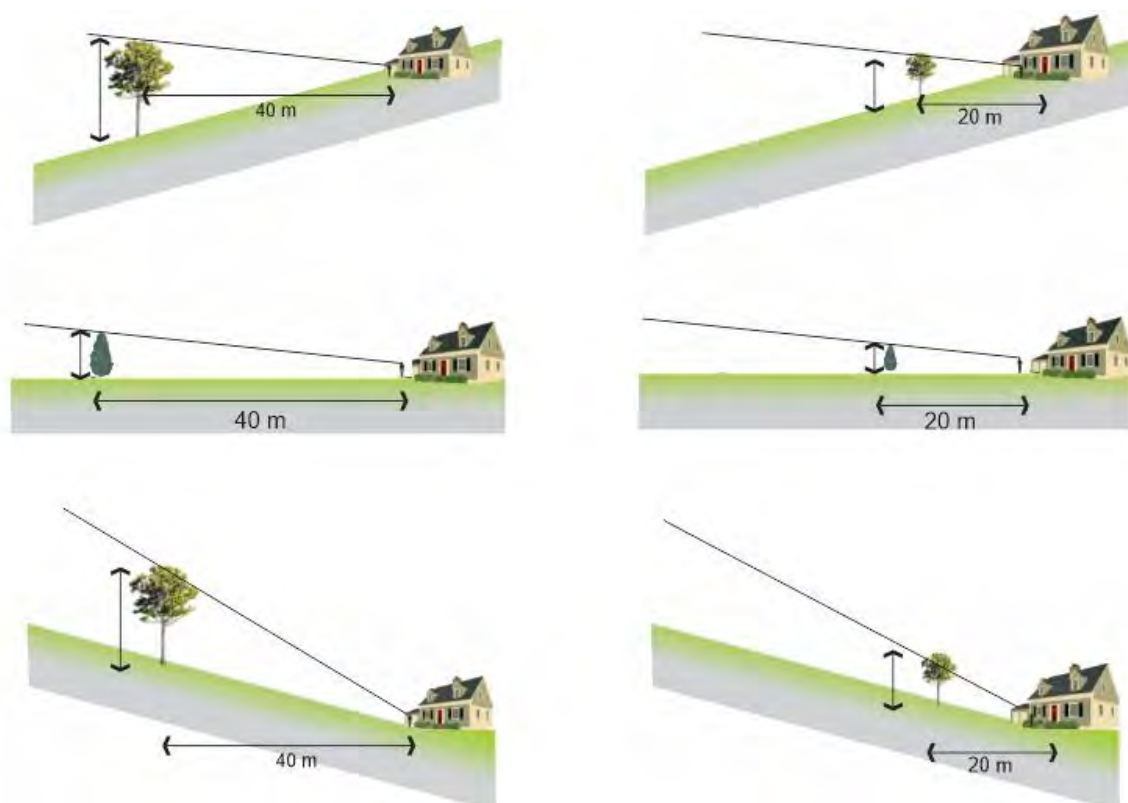


Figure 10-3: Landscape mitigation view angle examples

### 10.3 Bushfire considerations

For properties located within the Bushfire Management Overlay (BMO), it is important that any landscape mitigation does not increase bushfire risk to the dwelling and broader landscape. The BMO is triggered by the presence of tree canopy in excess of five hectares in size. Any property within the BMO, is in close proximity to an area of vegetation that could generate extreme bushfire behaviour.

To ensure there is no increase in bushfire risk to an existing dwelling, any landscape mitigation should only consist of trees and shrubs that are in a single row and not introduce multiple layers of vegetation (e.g. canopy, mid storey and understorey).

Where possible, plantings against existing forested areas should be avoided.

If landscape mitigation is required, a 20-metre buffer between any landscape mitigation planting and existing vegetation, and a 10-metre buffer from the residence should be maintained.

### 10.4 Other considerations

The preceding chapters and supporting photographs demonstrate that vegetation in the region is capable of exceeding the heights required to screen or filter the proposed 250m high turbines.

However, as also shown in the preceding residential assessment, views and visual impact are unique and diverse from property to property and vary across the site and there may also be constraints or locations where landscape screening may not be suitable or successful. For these reasons, landscape screening would need to be considered on a case by case basis.