5.0 Visual Impact (contd.)

5.5 Reflectivity

There is a perceived issue of glint and glare surrounding the reflectivity of the proposed PV solar panels. As a result of the perceived reflection levels, there is a concern of possible distractions to motorists, aircraft and the hazard of eye damage.

The Poly-Crystalline Solar Panels proposed for the installation (see figure 12) are designed to absorb the suns energy and directly convert it to electricity. The PV modules being used in the installation for the Nyngan Solar Farm absorb approximately 82-90% of the light received. The SunTech Solar Panels proposed for the Nyngan Solar Farm have been designed using two anti-reflective coatings which effectively reduces the reflectivity. Innovative methods of developing the required metal contact on the face of the solar panel reduces the metal surface area and further reduces any potential glare.

The Nyngan Airport is located just under 3km north of the Site and a number of landing grounds are located within close proximity to the area. PV Solar Panels have been installed at a number of airports in the USA, including Denver and the Oakland FedEx International Airport Hub. These precedents and further studies have found that the reflection created would not cause problems for aircraft, particularly at the critical take off and landing stage.

The level of glare and reflectance from the PV solar panels are considerably lower than the level of glare and reflectance of in common surfaces and those surrounding the proposed Solar Farm. The PV panels would reflect approximately 10-18% of energy which is less than typical rural environments which have a reflectivity of approximately 15-30%. Figure 11 compares the percentage of reflected energy from common reflective surfaces to that of a PV Solar Panel.

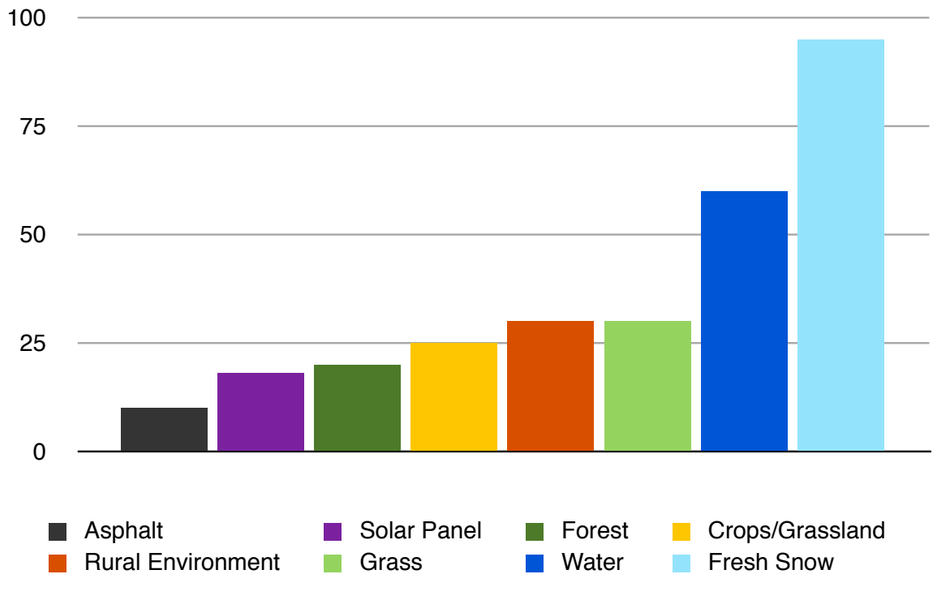


Figure 11: Comparative reflection analysis.

Denver International Airport Solar Farm
http://www.oureverydayearth.com

Nellis Air Force Base
http://www.seqsoftware.com.au

Figure 12: Suntech VD 280 PV Solar Panel
http://am.suntech-power.com/

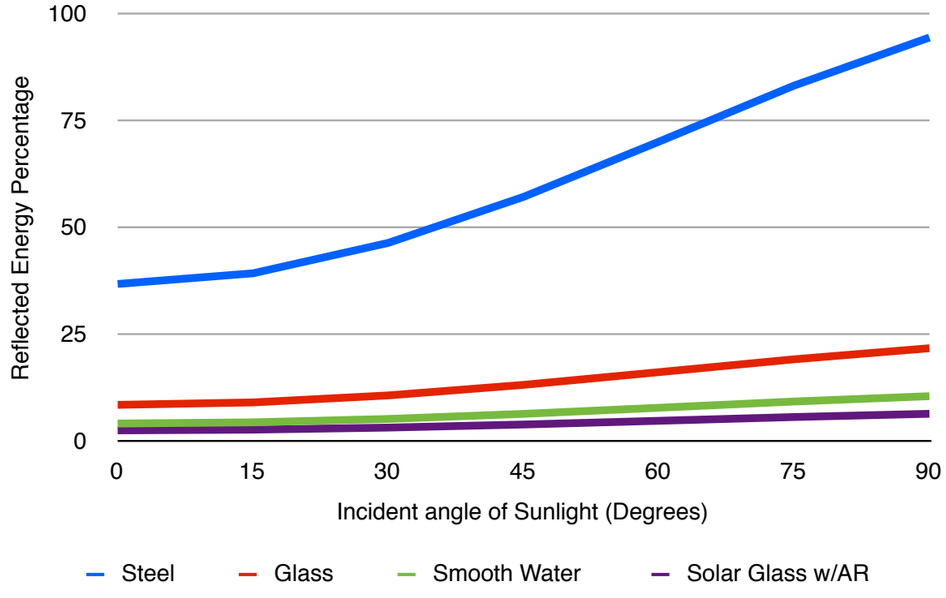


Figure 13: Analysis of typical material reflectivity.

6.0 Conclusion

The proposed Nyngan Solar Farm is a renewable energy source which involves the installation of solar panels over approximately 200ha of existing rural landscape.

With all visual impact assessments the objective is not to determine whether the proposed impact is visible or not visible, it is to determine how the proposal will impact on the existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

The characteristics which influence the visual impacts associated with the proposal include:

- the sensitivity of the viewing location;
- the visibility of the development for residence and general public;
- the layout of the solar farm and size of the panels;
- the visual appearance of solar panels and associated ancillary works.

Overall the proposed Nyngan Solar Farm would result in impacts on the existing surrounding environment in terms of landscape and scenic values. The proposed solar farm contrasts with the existing landscape character of the region which is typically rural, agricultural land. The Site is situated upon currently uninhabited, flat, cleared, grazing land.

The Solar Farm is within close proximity to the town of Nyngan, associated residential properties and major transport infrastructure, and therefore it is possible it will be visible from some areas surrounding the Site.

The developed area nearest the Site is located approximately 600m to the north of the proposed solar farm, in the rural residential precinct of Nyngan. These properties are all located to the north of the flood levee which, due to its height and the low height of the solar panels, obscures views to the Solar Farm.

Overall, visibility of the Site will be limited to the cleared grazing land to the east of the Site. This land is typically uninhabited with the exception of an isolated homestead. The homestead is located approximately 350m to the north east of the eastern section of the proposed development. The Site will be visible from this property, however a combination of existing mallee scrub vegetation on and foreground planting surrounding the provides a limited visual buffer between the property and the Site. The employment of additional impact mitigation principles as outlined in section 7 of this report will significantly reduce the visual impact from areas to the east.

Glimpses of the proposed development will be seen from the Mitchell Highway, traveling in both directions. These views are fleeting and in relation to the speed of travel and distance from the site, will have a minor impact. One impact mitigation strategies have been employed, the visual impact of the proposed development will be significantly reduced.

To assist in quantifying the visual impact of the solar farm, 9 viewpoints were selected from a range of distances and elevations. Of all 9 viewpoints assessed, the solar farm would be visible from only 3 of these positions.

Overall, the proposed solar farm is relatively low lying, with the panels spanning to a height of approximately 2-3m. The panels are north facing on an angle of approximately 30 degrees. Resultantly the biggest visual impact of the solar panels is expected to occur from the north and south. Looking at the panels from a side elevation on the east or west, the visibility would be limited on a level ground.

Proposed methods of mitigation for these areas form section 7 of this report, focusing on the areas with the highest visual impact. These suggested recommendations have the ability to significantly reduce the visual impact of the Nyngan Solar Farm to achieve a better visual integration at both a local and regional scale.

It is undeniable that the proposed development of a Solar Farm on land identified as the ‘Study Site would have an impact on the existing landscape character of the area. However, in our professional opinion, the impact of the proposed Nyngan Solar Farm is considered to be low. The greatest visual impact would be apparent within the immediate vicinity of the solar farm however once landscape mitigation methods have been implemented and the growth of screen planting surrounding the site has matured, the visual impact of the Solar Farm will be negible.

7.0 Recommendations

7.1 Impact Mitigation Strategies

7.1.1 OVERVIEW OF IMPACT MITIGATION

A range of methods for mitigating the visual impact of the proposed development have been identified and are outlined in this section of the VIA. The recommendations seek to achieve a better visual integration of the proposed Nyngan Solar Farm and the retention of existing landscape character at both local, and regional scales. The mitigation measures attempt to lessen the visual impact of the proposed development whilst enhancing the visual character of the surrounding environment. They are made notwithstanding issues raised by other consultants (eg. engineering, ecology, geology etc).

When site planning the Solar Farm the design should consider some or all of the following mitigation strategies to lessen the visual impact of the proposal. This is by no means an exhaustive list, however the adoption of these recommendations will assist considerably in ensuring the proposal contributes positively to the visual quality and character of the area.

In addition to the impact mitigation strategies outlined in the following sections, a visual impact mitigation plan has been prepared and is included as figure 14 on the following page of this report.

7.1.2 CONSTRUCTION MITIGATION

It is likely the greatest visual impact will occur through the construction stage. Though the construction phase would be temporary practical methods should be employed to reduce the impact of this stage. These include but are not limited to the following:
- Dust reduction throughout the construction process
- Restoration of any earthworks required for the construction
- Clearing of existing vegetation is to be kept to a minimum

7.1.3 SOLAR PANELS & ASSOCIATED INFRASTRUCTURE

Once construction has been completed, the solar farm will be a relatively low lying development, with panels having a vertical height of approximately 2.3m above ground level. Due to the low height, visibility of the solar panels can be potentially be significantly reduced through a variety of mitigation methods.

Although the PV Solar Panels are the most visible feature of the landscape, a considerable amount of associated infrastructure is to be included in the proposal. This infrastructure associated with the solar panels is outlined in the project proposal section of this report. Methods of mitigation which will be incorporated into the project include:
- Colour of above ground infrastructure to be sympathetic to the landscape character
- Underground cabling to be utilised where possible
- The design and location of ancillary works are to incorporate measures which will reduce thie visual impact

7.1.4 LANDSCAPING & VISUAL SCREENING

Visual screen planting is a beneficial mitigation method used to assist in the reduction of the Solar Farm s visual impact. Visual screen planting can be undertaken in the form of boundary planting around the solar farm, foreground planting at affected viewpoints and residential tree planting.

Existing Mallee Scrub vegetation is a character of the area, with a large component of the vegetation currently providing a visual screen for the Site from the west, northeast and some extents of the south and north.

The selection of endemic species would enhance the existing landscape character, and be a seen as a continuation of the existing vegetation. This planting would be best implemented in areas where natural vegetation has been removed for access roads and agricultural activity.

To assist in concealing the Study Site from areas not currently screened, a continuation of existing Mallee scrubland vegetation is proposed. Screening vegetation has been proposed along the eastern edge of the proposed solar farm, which would prevent any glimpses of the Site from the Mitchell Highway and further buffer views from residence to the east of the site.

Boundary planting along the northern edge of the Site would also assist in minimising any potential views to the site from the south of Nyngan.

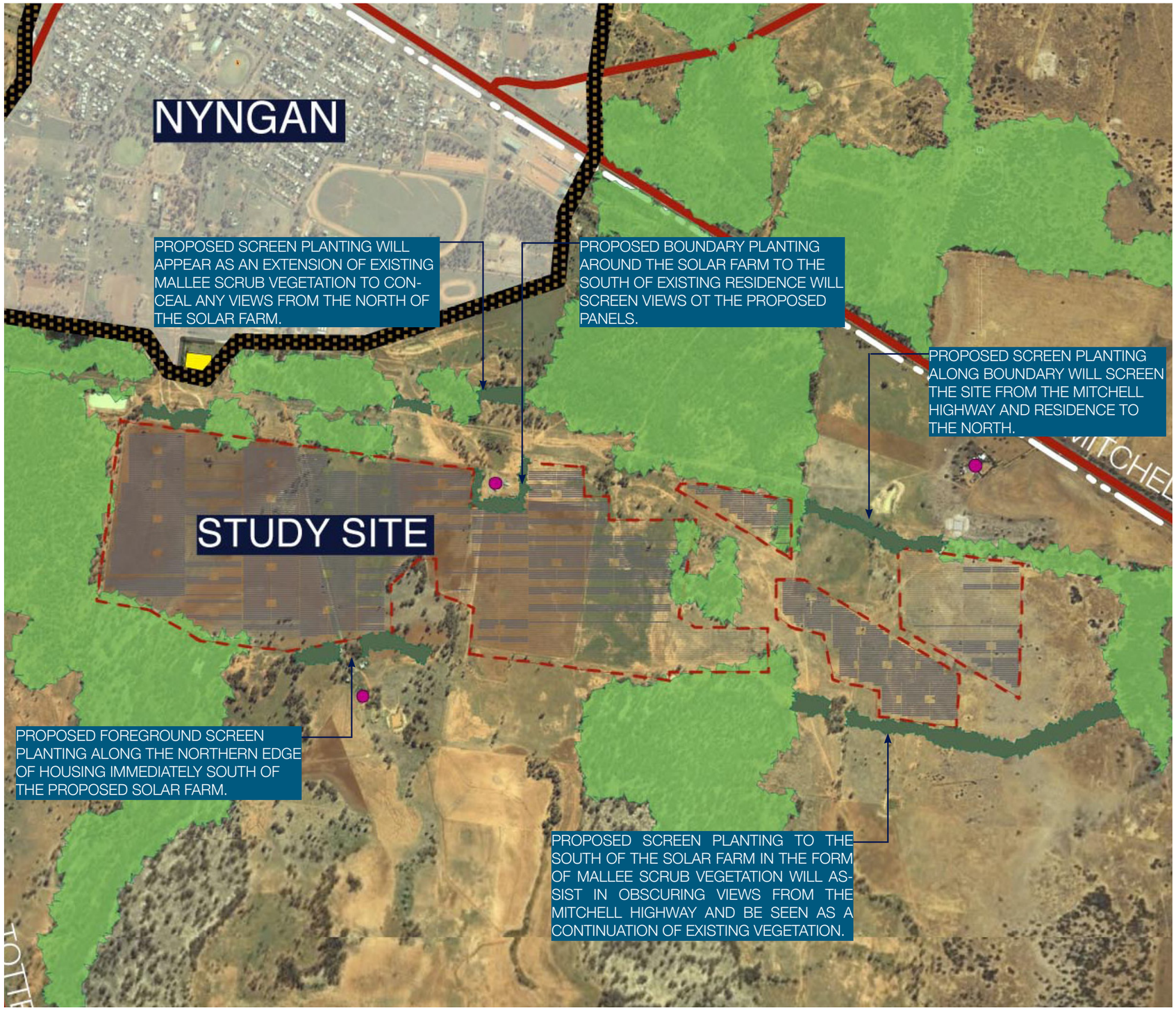
Measures to buffer the proposed solar farm from the residences within close proximity to the Site include foreground buffer planting around the homesteads affected. It is unlikely that once vegetation growth has occured around the perimeter of the Site, that the Site will be visible from these homesteads.

Proposed visual impact mitigation in the form of visual screen planting has been suggested in figure 14.

7.1.5 VISUAL OPPORTUNITIES

The proposed Nyngan Solar Farm is a flagship development for renewable energy which, due to the relatively large scale and new technology, is bound to be of interest to viewers. As the Solar Farm is concealed from all public areas, it is proposed a public viewpoint be incorporated into the Site. The integration of a viewing area would provide an insight into the function, output and benefits of large scale solar farms.

7.0 Recommendations (contd.)



LEGEND

- Extent of the Site
- River
- Railway Line
- Major Road
- Access Road
- Levee Wall
- Existing Substation
- Existing Mallee Scrubland
- Extent of Nyngan
- Occupied residential
- Proposed Screen Planting

N

0 1.0km

Figure 14: Visual impact mitigation principles.

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7.0 Recommendations (contd.)

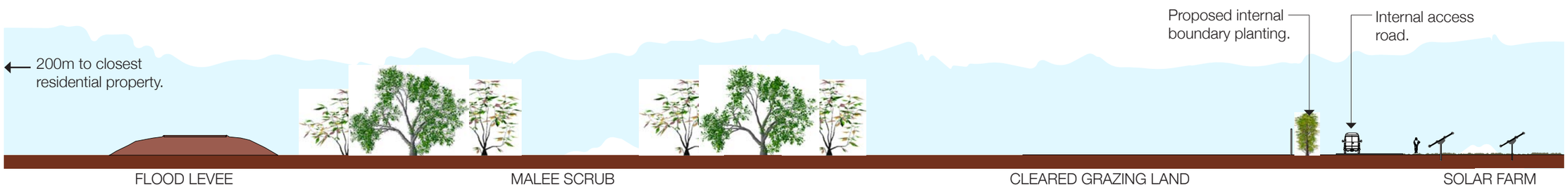
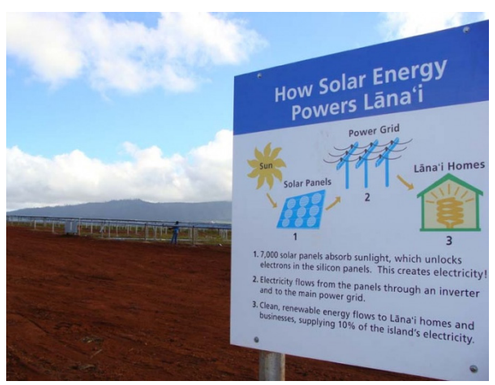


Figure 15: Section through flood levee and site.

1. Nyngan flood levee.

2. Screen planting in keeping with the existing landscape character.



3. Educational signage.

4. Public viewing area.

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Maps

http://map.google.com.au
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