# APPENDIX G VISUAL IMPACT ASSESSMENT

EPURON

# Visual Impact Assessment

## NEVERTIRE SOLAR FARM

JANUARY 2017

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# 1 INTRODUCTION

NGH Environmental completed a Visual Impact Assessment (VIA) of the proposed Nevertire Solar Farm, proposed to be located approximately 1 kilometre (km) west of Nevertire in central New South Wales (refer Appendix A.1). This report has been prepared on behalf of the proponent, Nevertire Solar Pty Ltd (Epuron), to assess the potential visual impacts of the proposed solar array and electrical transmission infrastructure.

As visual amenity values and visual impacts can be subjective, the assessment includes a transparent, systematic evaluation with reference to existing guidelines, to address subjectivity as much as possible.

## 1.1 PROJECT OVERVIEW

The Nevertire Solar Farm proposal ('the proposal') would comprise of the installation of a solar plant with a capacity up to 105MW that would supply electricity to the national electricity grid. Epuron proposes to develop around 200 hectares (ha) of the 255 ha solar farm site, retaining existing viable native vegetation remnants that occur on the array site. An indicative development area is illustrated in Appendix A.2.

The proposal would include the following elements:

- Flat plate PV modules in a fixed or tracking arrangement.
- A site office and maintenance building.
- An access track off the Mitchell Highway.
- Internal inverter stations to allow conversion of DC module output to AC electricity.
- Underground electrical conduits and cabling to connect the arrays on the array site.
- Internal access tracks to allow for site maintenance.
- Perimeter security fencing.
- Onsite substation.
- Grid connection to the existing substation approximately 1.5km east of the site via an overhead line, overhead colocation line or underground line (22-33kv).
- Native vegetation screening, where required to break up views of infrastructure.

Construction of the proposal may be undertaken in stages. In total, the construction phase of the proposal is expected to take 12 months. The Nevertire Solar Farm is expected to operate for around 30 years. The solar farm would be decommissioned at the end of its operational life, removing all above ground infrastructure and returning the site to its existing land capability.

## 1.2 SITE CONTEXT

The site is located approximately 1km west of Nevertire, NSW, on the Mitchell Highway. Nevertire is a small village located on the junction of the Mitchell Highway and Oxley Highway. Surrounding towns along the Mitchell Highway include Trangie (33km south east), Narromine (68km southeast), Dubbo (90km southeast) and Nyngan (56km north west). The Mitchell Highway and adjacent rail line are important regional transport corridors in close proximity to the site.

The visual character of the village of Nevertire is defined by one divided and sealed tree lined main residential street and one main highway facing commercial street. The village features new and historic buildings with surrounding cropped paddocks, pastures, silos and other agricultural infrastructure in the mid distance. Two high voltage electricity easements are located to the north of the residential area.

Approximately 48 residences are located in close proximity (within 1km) of the solar farm site. The solar farm site is currently used as cropping land and for sheep grazing. It retains native vegetation remnants within the west, north and north-east of the site.

## 1.3 OBJECTIVES OF THIS REPORT

This VIA includes a full assessment of the visual impacts associated with the proposed Nevertire Solar Farm. Specifically, it includes an assessment of:

- Landscape character and scenic vistas in the locality.
- Stakeholder values regarding visual amenity.
- Potential impacts on representative viewpoints, including residences and road corridors.

Secretary's Environmental Assessment Requirements (SEARs) for the proposal were provided by NSW Department of Environment and Planning (DPE) on 5 December 2016. The SEARs are intended to guide the structure and content of the Environmental Impact Statement (EIS) and reflect the responsibilities and concerns of NSW government agencies in relation to the environmental assessment of the proposal. This report addresses the SEARs for the proposed Nevertire Solar Farm relevant to potential visual impacts, as shown in Table 1-1.

Table 1-1 Secretary's Environmental Assessment Requirements for visual impact assessment of the Nevertire Solar Farm

| Requirement | Addressed in this report |
|---|---|
| Visual – including an assessment of the likely visual impacts of the development (including any glare, reflectivity and night lighting) on surrounding residences, scenic or significant vistas, air traffic and road corridors in the public domain, including a draft landscaping plan for on-site perimeter planting (particularly along the Mitchell Highway), with evidence it has been developed in consultation with affected landowners; | The following matters are addressed in this report:<br>• Likely visual impacts on surrounding residences, road corridors, scenic or significant vistas<br>• Glare, reflectivity and night lighting<br>• A draft landscaping plan for on-site perimeter planting (particularly along the Mitchell Highway)<br>It is noted that air traffic is considered separately in the EIS.<br>The key affected landowner has declined input into this assessment. |

## 1.4 TERMINOLOGY

Terminology used in this report includes:

| | |
|---|---|
| **Study area** | Defined as within 16km of the proposed solar farm site. |
| **Solar farm site / site** | The lot boundaries within which the solar farm development is proposed, excluding offsite infrastructure such as transmission lines and connections. |
| **Project** | All infrastructure and activities required for the construction, operation and decommissioning of the solar farm. |
| **Landscape Character Unit (LCU)** | LCUs take into account topography, vegetation, land use, and other distinct landscape features. They are a way to categorise the existing scenic quality of the receiving environment and consider the ability of the environment to absorb visual change at the landscape scale. |
| **Viewer sensitivity** | Viewer sensitivity is subject but can be assumed based on factors such as whether the view relates to recreational or work environments, or whether the view is experienced continuously or intermittently. |
| **Landscape Management Zone (LMZ)** | LMZs are derived by combining scenic quality with viewer sensitivity and proximity to the proposed infrastructure at the landscape scale. A three-tiered management hierarchy sets out appropriate management objectives for each zone. |
| **Zone of Visual Influence (ZVI)** | ZVI modelling uses GIS modelling and topography to determine areas which would be shielded from views of infrastructure at the proposed solar farm site. It does not take into account other existing or proposed screening features such as vegetation or built structures. |

# 2 METHODOLOGY

## 2.1 OVERVIEW

The VIA has been completed in the following stages:

1. Background investigations, mapping and modelling.
2. Field survey including reconnaissance, ground truthing and photography.
3. Community consultation.
4. Impact assessment.
5. Development of a visual impact mitigation strategy.

These methods are detailed below.

## 2.2 BACKGROUND INVESTIGATIONS, MAPPING AND MODELLING

Background investigations included identifying key landscape features within the landscape that may be affected by the visual impacts of the proposed solar farm. This was done using existing literature and aerial photos.

Mapping and modelling were undertaken to:

- Identify and classify LCUs within 16km of the proposed solar farm. This was done based on aerial imagery and later validated with field inspection. LCUs are a way to summarise differences in landscape amenity and the sensitivity of different areas within the landscape to visual impacts.
- Define areas in which the infrastructure may be visible, using ZVI modelling. A map identifying the ZVI (or viewshed) of the proposal was produced. This method uses topographic information to determine areas in which views of infrastructure may be visible. The infrastructure was modelled as a 3m high rectangular block, equivalent to the project boundaries. Topography was based on a 25m resolution Digital Elevation Model (DEM) derived from 25m contours. Modelling does not take into account screening that may be provided by existing vegetation or structures.
- Identify key viewpoints such as major travel routes, public recreation areas, potential receivers (dwellings and other structures), and built up areas. This step excluded areas deemed not to be visible from the ZVI modelling.
- Understand the feasibility of screening to mitigate visual impacts.

The results were used to inform the field survey.

## 2.3 FIELD SURVEY

With reference to the mapping and modelling, field reconnaissance and ground truthing was undertaken to:

- Verify and document the existing LCUs in the study area (16km).
- Identify representative viewpoints within the LCUs, including foreground, middle ground and background viewpoints.
- Understand the likely sensitivity of the LCUs to views of the proposed solar farm.

Fieldwork consisted of driving along major roads (and minor roads that were publically accessible), investigating and documenting dominant visual character elements and potential views to the proposed infrastructure. Photographs were taken at representative locations. No residences were specifically targeted however, nearby roadside viewpoints have been tagged 'residential' where they occur near a residence.

Representative view point locations used in this assessment are provided in Appendix B. Selected viewpoint panoramas are provided in Section 5 (Figure 5-6).

## 2.4 COMMUNITY CONSULTATION

Community consultation specific to this assessment of visual impacts was required to:

- Understand how the community values existing visual amenity in the study area.
- Document the perceptions of the community to the proposed development.

Community consultation is being undertaken as part of the Development Application process, in accordance with a Community Consultation Plan. As part of the plan, respondents are being surveyed on their views regarding solar farm development and local visual amenity.

Specific questions relating to visual impacts were included in a feedback form distributed via:

- The project website.
- At a public information session to introduce the proposal, on 18 November 2016 in Nevertire.
- Direct meetings and mail outs to near neighbours and the broader community.

These questions related to:

- Local values, including views.
- Identification of views or landscape characteristics in the region and local area important to respondents.
- Perceptions and concerns about solar farm development.

The feedback form questions are included in Appendix D. The results are used in the impact assessment and are summarised in Section 3.3.2.

## 2.5 IMPACT ASSESSMENT

The impact assessment methodology used in this VIA is based on the Bureau of Land Management (BLM) Visual Resource Management System, developed by the BLM, US Department of the Interior (n.d). The BLM developed a systematic process to analyse the visual impact of proposed developments. The basic philosophy states that the degree to which a development affects the visual landscape depends on the visual contrast imposed by the project.

Key steps undertaken to assess the visual impact are as follows:

- Define LMZs for the representative viewpoints, based on:
    - The scenic quality of the study area's LCUs.
    - The expected sensitivity at representative viewpoints.
    - The proximity of each representative viewpoint.
- Evaluate the degree of contrast the solar farm would result in at representative viewpoints in consideration of the management objectives of the relevant LMZ.
- Determine the acceptability of the contrast with the management objectives of the relevant LMZ; this is the resultant visual impact, rated as high, medium or low.

Criteria for scenic quality, sensitivity, proximity, contrast and visual impact are included in the assessment, in Section 5.

Mitigation measures are considered to be required for 'high impact' receivers, for whom unmitigated impacts are considered greater than what is acceptable. For 'medium impact' receivers, the contrast is considered acceptable; mitigation may be recommended. For 'low impact' receivers, the contrast is considered unlikely to be perceived and therefore acceptable.

# 3 EXISTING ENVIRONMENT

## 3.1 NEVERTIRE

Nevertire is a small village located 26.2km south of Warren on the junction of the Mitchell Highway and Oxley Highway. The population in (ABS) 2011 was approximately 225 people. Education and income statistics are above average; 9.5% of the population had a bachelor degree or higher (ABS 2011a).

Services in the village include a café, a pub that provides accommodation and meals, a mechanic's workshop and rural supplies store. Nevertire is a service centre to surrounding properties and a stopover point on the Mitchell and Oxley Highways for regional motorists. The village also includes a GrainCorp grain storage and loading facility and a Rural Fire Service station. The Nevertire Public School and Country Womens Association Hall have closed. Today, the village features a recreational community park as well as a sports oval and tennis courts.

Infrastructure includes a sewage treatment plant, electricity substation and a railway. Smaller allotments surrounding the village indicate further urban development is anticipated although several vacant blocks remain on Narromine and Gunningbar Streets; the two main residential streets. About half of the residential streets are sealed.

Approximately 48 residences are located in close proximity (within 1km) of the site. None of these are project-involved. All but four occur within the residential centre of Nevertire. The remainder occur on larger land holdings either:

- Immediately north of the northern transmission line options (Receivers 43 and 44).
- Immediately north-west of the array site, screened behind vegetation (Receiver 39).
- Immediately south of the array site, unscreened (Receiver 42).

The location of these residences is shown in Figure 5-6 and in the Appendix B map set.

Local land uses include cropping (including relatively intensive canal infrastructure) and grazing (sheep and cattle) on lot sizes of approximately 300 ha.

## 3.2 SIGNIFICANT VISTAS

No look outs or promoted scenic areas are located within 16km of the site however, features that contribute to the scenic character of the area include:

- Nevertire village.
- Roadside native vegetation remnants.
- Expansive pastoral views.

### *3.2.1 Nevertire village*

The visual character of the village is defined by wide tree lined streets, with new and historic buildings. Garden plantings that extend onto the nature strip, street trees and well maintained residences provide visual amenity. Surrounding cropped paddocks, silos and other agricultural infrastructure in the mid distance reinforce the local agricultural land use of surrounding lands.

### *3.2.2 Roadside native vegetation remnants*

The Mitchell Highway and adjacent rail line are important regional transport corridors. The roads, rail and electricity transmission infrastructure create linear built elements in the landscape. Within the corridors however, native vegetation is quite mature and provides a relatively well connected series of remnants, breaking up or framing views of pastures for travellers.

### *3.2.3 Expansive pastoral views*

The pastures and cropping lands range from relatively low input (cattle grazing) to high input (high rotation cropping and canal infrastructure). The views would change with the seasons, from brown fallow areas, to yellow canola, green wheat and green and white cotton crops.

Figure 3-1 provides examples of local vistas.

a)

b)

c)

Figure 3-1 Scenic vistas in the study area

a) Nevertire village; built structures and gardens
b) Road and rail corridor native vegetation remnants
c) Expansive pastures

## 3.3 COMMUNITY VALUES

### *3.3.1 General attitudes to solar infrastructure*

Research indicates there is widespread support for solar energy as a source of energy for electricity generation in Australia (ARENA n.d); 78% of respondents are in favour of large scale solar energy facilities and 87% are in favour of domestic installations. The large scale solar energy sector is still at a relatively early stage of development in Australia. While most members of the community are aware of large scale solar energy, many do not know a great deal about their impacts (ARENA n.d.), including visual impacts.

Three approaches to improving community understanding of the visual impacts of large scale installations include:

- Provision of images (from many angles) of large scale solar facilities, particularly in the early stages of a proposal.
- Understanding the similarities between highly supported domestic scale installations and large scale facilities.
- Understanding the current function of the land proposed to hold the facility and the additional value the installation allows for.

(Source: extracted from ARENA n.d).

This report endeavours to address these issues.

### *3.3.2 Perceptions of the local community, regarding solar farm visual impacts*

Community consultation specific to the assessment of visual impacts for the proposal was required in order to:

- Understand how the community values existing visual amenity in the study area.
- Document the perceptions of the community toward the proposed development.

As part of the community engagement for the proposal, respondents were surveyed on their views regarding the solar farm development and local visual amenity. Specific questions relating to visual impacts were included in a feedback form distributed, via:

- The proposal website.
- At public open house session to introduce the proposal, conducted on 18 November 2016.
- Direct meetings and mail-outs to nearby neighbours.

These questions related to:

- Local values, including views.
- Identification of views or landscape characteristics in the region and local area important to respondents.
- Perceptions and concerns about solar farm development.

The feedback form questions are included in Appendix D.

### Nearest neighbours

Epuron and NGH Environmental representatives met with the nearest neighbours to the site on 18 October 2016. Information about the proposed solar farm was provided at the meetings and the neighbours were invited to raise concerns about the proposal. The following concerns were raised:

- The nearest neighbour to the south of the site was concerned about the view of the solar panels as they would be visible living and outdoor recreational area of his home. Possible vegetation screening buffers were discussed to obscure the view of the panels.

### Broader community

Thirteen people attended the Nevertire Solar Farm open house held in Nevertire on 18 November 2016. Twelve attendees were local, with one from Nyngan. Attendees were invited to complete feedback forms however none were completed on the day. Attendees viewed maps of the proposal layout and photographs of other solar farms and discussed the proposal with staff from Epuron and NGH Environmental.

Attendees were generally supportive of the proposal and the following issues, relevant to visual impacts, were discussed:

- Visual impact of the proposal and screening preferences - attendees were not generally concerned about the view of the proposal from Nevertire or the Mitchell Highway. Several attendees thought that screening of the public views would be a good idea, while others thought screening was unnecessary or suggested that a more visible project could be beneficial in terms of tourist/ visitor interest.
- Driver distraction.
- Stopping areas for travellers and visitors to view the solar farm once constructed.

### Feedback forms

Three feedback forms were returned, by respondents. One was less than 1km, one less than 2km and the third was more than 5km from the proposed solar farm site. Their combined comments included:

- Primary production was the most valued characteristic of the Nevertire local area. One respondent also noted the views, community/family ties, historic values, small town and natural values. Another respondent mentions the work opportunities.
- The open landscape was identified as the most important view or landscape characteristic for the region and local area. One respondent specifically outlines the open plains, grasslands, cropping, livestock and native fauna including Kangaroos and Emus.
- All three respondents cited renewable energy generation as what they liked most about solar farms generally. Two respondents cited local economic opportunities and diversification of land use.
- Two respondents cited potential visual impacts and land use or land value impacts as a concern regarding solar farms generally.
- One respondent cited concerns about potential community, noise, traffic impacts, as well as effects on natural areas and habitats.
- One respondent had specific concerns about the location of the proposed Nevertire Solar Farm. The concerns were in relation to impacts on views and rural lifestyle and potential to devalue land.

While uptake levels of community engagement activities for the proposal have been relatively low, it is considered that this reflects a low level of concern about the proposal. The issued identified through the consultation process have been addressed in the EIA and proposal design.

## 3.4 LANDSCAPE CHARACTER UNITS (LCU)

LCUs take into account topography, vegetation, land use, and other distinct landscape features. They are a way to summarise differences in the receiving environment that may affect the visual impact of the proposed solar farm at different locations.

Three key LCUs were identified within 16km of the proposed solar farm site:

- Agricultural (both cropping and grazing lands).
- Rural village (retail, recreational and residential areas).
- Industrial (road, rail, electricity and agricultural built infrastructure).

The scenic quality was rated in each LCU as follows:

- A high scenic quality rating describes areas with outstanding, unusual or diverse features.
- A moderate scenic quality rating applies to areas with the features and variety normally present in the character type.
- A low scenic quality rating is given for areas lacking features and variety.

The three LCUs identified within 16km of the proposed solar farm site are characterised in Table 3-1 in terms of their scenic quality and illustrated in the following plates.

Table 3-1 Landscape Characteristic Units (LCUs) within 16km of the Nevertire Solar Farm

| Landscape Character Unit | Key features |
|---|---|
| Agricultural | The pastures and cropping lands are very flat, creating expansive views. The views would change with the seasons, brown fallow paddocks, yellow canola, green wheat and green and white cotton crops. Unsealed roads and bare paddocks are deep chocolate browns, light orange and reds.<br><br>The Oxley and Mitchell Highways are the main vantage points from which to view agricultural areas. Few connecting roads in the locality are publically accessible. From the road corridor, cropping lands and pastures are usually viewed through a screen of native vegetation of varying density. In some locations, this vegetation is dense with a well-developed midstorey that entirely screens views. In other areas, where the vegetation is lacking, wide pastoral views are afforded.<br><br>In addition to the long sections of straight highway, overhead powerlines and rail corridors are often visible and reinforce the rectilinear shapes.<br><br>Residences within this landscape are sparsely distributed and commonly associated with some additional plantings, presumably to separate the residential spaces from the farmland. Other infrastructure includes sheds and low open fences.<br><br>**Scenic quality is low to moderate. Built elements are production related and include linear fences, powerlines, roads, rail corridors and agricultural buildings and rural houses. Forms are generally uniform, of low elevation and linear. However, the colours would change with the seasons and where framed by road side vegetation remnants, expansive pastures and crops can have a higher scenic quality. This LCU is common in the study area. The proposed solar farm site is located within this LCU, but is on the edge of the rural village.** |

| Landscape Character Unit | Key features |
|---|---|
| Rural village | Nevertire is a service centre for surrounding large land holdings and a stop for motorists between larger service centres of Trangie, Warren and Nyngan. The village includes:<br>• A retail strip, facing the Mitchell Highway, where the pub, café and mechanic's workshop are located. An adjacent pull over area provides an overnight rest area for truck drivers.<br>• A tree lined divided main residential street (Narromine Street). Garden plantings that extend onto the nature strip, street trees and well maintained residences provide visual amenity.<br>• New and historic buildings are located side by side. Residences are well maintained. Outlooks are generally limited, onto low relief rural views but are more expansive for lots on the east and west end of town.<br>• Recreational areas, in the main street (new play equipment, well maintained lawn) and to the west of the village (sports oval, tennis courts, pony club; the tennis court and toilet block show signs of age / disuse).<br>Gardens and lawns are vivid green with large feature trees. Approximately half of the residential roads are unsealed. Two large electricity easements dissect the residential areas, connecting to a substation on the east edge of the village.<br>**Scenic quality is considered moderate. These areas have variety in colour and form normal in this character type. Elements include recreational aspects; parks and gardens. This LCU is common in the study area.** |
| Industrial | To the east and south of the village, industrial infrastructure dominates landscape. To the north, the Auscott agricultural infrastructure creates another localised industrial precinct. Industrial features include:<br>• Agricultural silos and processing infrastructure to the south. A large stockpile of produce, transit vehicles and large trucks actively work this area.<br>• A substation on the eastern edge of the village. Connecting powerlines and fencing contribute to the industrial character.<br>• Auscott buildings and silos to the north create a localised industrial character.<br>**Scenic quality is considered low. Elements are production related. The structures match the land use and have historic references. They have limited screening to break up views. This LCU is common in the study area.** |

## Agricultural LCU plates











## Residential LCU plates









## Industrial LCU plates



ENTRY

## 3.5 VIEWPOINT SENSITIVITY

### *3.5.1 Identifying viewpoints*

The BLM methodology requires identification of representative viewpoints in the study area. These may be travel routes such as roads, waterways and recreational tracks, residential areas, tourist facilities, houses and farmland.

The ZVI modelling produced a set of maps that estimated the areas that would be shielded from views of infrastructure at the proposed solar farm site, based on topography. A height of 3m was used to model onsite infrastructure. This is realistic approximation of the height of panels and inverter containers, which may actually be 2.3m and 3.4m, respectively. Viewpoints were not selected in areas predicted to be shielded from views of the solar farm. Twenty representative viewpoints were identified within the ZVI and are mapped in Appendix B, which colour codes the LCU of each viewpoint.

### *3.5.2 Rating proximity and assessing sensitivity of viewpoints*

The predicted sensitivity of each viewpoint can be determined, considering its proximity to the proposed solar farm site and factors such as use, scenic quality and regional significance.

Criteria for proximity are as follows:

- Foreground 0 – 1 kilometres
- Middle ground 1 – 5 kilometres
- Background 5 – 16 kilometres

Criteria for sensitivity are as follows:

- High sensitivity:
  - high use routes or areas
  - routes or areas of national or state significance
  - areas with high scenic quality
- Moderate sensitivity:
  - moderate use routes or areas
  - routes or areas of regional or local significance
  - areas with moderate scenic quality
- Low sensitivity:
  - low use routes or areas
  - routes or areas of low local significance
  - areas with low scenic quality

Considering the sensitivity of local viewpoints, the following assessments were made:

- **Residential / recreational viewpoints** were assessed as having high sensitivity generally. While the population is relatively low, in these locations, if there were a view to the solar farm infrastructure, the view duration could be expected to be high for a receiver. Maintenance of gardens and recreational areas in Nevertire and surrounds demonstrate the areas are valued for their visual amenity.
- **Road viewpoints** were assessed as having generally moderate sensitivity. While the Mitchell and Oxley Highways are high use corridors, in the 110km speed zones, motorists would have limited view durations, if there were a view to the solar farm infrastructure. There are limited pull over areas. As motorists approach the village of Nevertire however, view durations increase as vehicle speed reduces. The entrance to the village is therefore assessed as having high sensitivity, within the 80 and 60km speed limit areas.
- **Commercial viewpoints** were assessed as having low sensitivity. In these locations, receivers would be more likely to be focused on work activities and view durations, if there were a view to the solar farm infrastructure, would be limited due to this work focus. While sites are tidy and well kept, there is limited effort expended on visual amenity, such as garden plantings in Nevertire and surrounds. Built structure is more commonly functional than aesthetic in these commercial settings.

The sensitivity of each viewpoint is tabulated below.

Table 3-2 Representative viewpoints and assessed proximity, scenic quality and sensitivity

| ID | LCU | View location | Distance to site | Scenic quality | Sensitivity |
|---|---|---|---|---|---|
| 1 | Agricultural | Road | Middle ground | Moderate | Moderate |
| 2 | Agricultural | Residential | Background | Moderate | High |
| 3 | Agricultural | Residential | Middle ground | Moderate | High |
| 8 | Agricultural | Residential | Middle ground | Low | High |
| 10 | Agricultural | Road | Background | Moderate | Moderate |
| 11 | Industrial | Road | Middle ground | Low | Moderate |
| 13 | Residential | Recreational | Foreground | Moderate | High |
| 14 | Industrial | Residential | Foreground | Low | High |
| 15 | Residential | Residential | Foreground | Moderate | High |
| 16 | Residential | Residential | Foreground | Moderate | High |
| 17 | Industrial | Commercial | Foreground | Low | Low |
| 18 | Agricultural | Road | Middle ground | Low | Moderate |
| 19 | Agricultural | Road | Middle ground | Moderate | Moderate |
| 21 | Industrial | Commercial | Foreground | Low | Low |
| 22 | Residential | Residential | Foreground | Moderate | High |
| 23 | Agricultural | Road | Middle ground | Low | Moderate |
| 25 | Agricultural | Commercial | Background | Low | Low |
| 30 | Agricultural | Residential | Foreground | Moderate | Moderate |
| 36 | Agricultural | Road | Foreground | Low | High |
| 39 | Agricultural | Road | Foreground | Low | High |

# 4 VISUAL CHARACTERISTICS OF KEY INFRASTRUCTURE COMPONENTS

The key infrastructure components of the proposed Nevertire Solar Farm, with reference to the stage of the project and the potential visual amenity impacts they may generate are discussed below and referenced in the visual impact assessment, Section 5.

## 4.1 INFRASTRUCTURE COMPONENTS

Key infrastructure for the Nevertire Solar Farm proposal would include:

- Solar arrays comprised of approximately 364,000 modules (solar panels).
- Mounting frames: single axis-tracker units or fixed mounting frames.
- Inverter stations: between 24 and 55 inverter stations, each containing an inverter between 2.2 and 4.92MW capacity and a 400V/22-33kV transformer.
- Cabling, electrical connections and switch-gear, attached to the mounting frame structures, to interconnect modules.
- Underground cabling interconnecting arrays and inverter stations.
- An onsite substation containing one 22-33/132kV transformer and associated switchgear.
- Internal access tracks to allow for proposal maintenance.
- Permanent staff amenities and offices with a small number of permanent parking spaces for the minimal staff required and occasional visitors.
- Perimeter security fencing: a chain-mail/ barbed-wire security fence up to 3m in height.
- Specific native vegetation screening (to be informed by this visual assessment).
- A 132kV power line connecting the solar farm to the Nevertire zone substation approximately 1.5km east of the proposal.

As illustrated on site layout, Appendix A.2, the development envelope covers approximately 200ha of the 255ha solar farm site. The 200ha area is already disturbed due to farming activities and is relatively flat. No grading works are required to level the site and ground disturbance will be minimal and limited to:

- Grass slashing, removal of rock and timber debris (by raking the site) as required in preparation for construction.
- The installation of the piles supporting the solar panels, which would be driven or screwed into the ground to a depth of approximately 1.5m.
- Construction of internal access tracks.
- Concrete foundations for the inverter stations, onsite substation and maintenance building.
- Trenches for the installation of cables.
- Establishment of temporary staff amenities and offices for construction.
- Construction of perimeter security fencing including.

The ground disturbance from pile foundations would be less than 1% (approximately 3.2ha) of the total site area. Panels within the solar array area would sit above the ground and existing ground cover would be maintained underneath the panels. Approximately 40% of the total site area ground cover will be affected by shading to varying degrees depending of time of year and time of day. Additional ground disturbance would result from construction of the internal access tracks, trenches for cabling and footings for other equipment. Apart from the permanent infrastructure footprint, any disturbed areas would be restored to grassed ground cover post construction.

Ancillary facilities would be located within the site boundary and would include:

- Material laydown areas.
- Temporary construction site offices.
- Temporary car and bus parking areas for construction workers' transportation. Once the plant has been commissioned a small car park would remain for the minimal operational/maintenance staff required and occasional visitors.
- Staff amenities. Once constructed, the solar farm would be monitored and operated remotely and would therefore require a minimum number of maintenance personnel (1-2 full time equivalent staff) to be onsite.

It is noted that the location of the ancillary facilities is not specified on the Proposed Infrastructure map in Appendix A.2 and will be determined at the detailed design phase. They would be located within the solar farm site boundaries.

These components are discussed in terms of their visual impacts potential below.

### *4.1.1 Construction components*

Construction impacts would be temporary, confined to approximately 12 months. Visual impacts could be generated during this time by:

- Development of site compound areas, site offices and stock piles, located within the site boundaries. Steel sheds can generate reflectivity and glare although would be a similar look to existing farm sheds. Material stockpiles may detract from visual amenity, particularly if dispersed across broad areas.
- Construction traffic will increase visual impacts and add to dust generation on the entry to Nevertire, Mitchell Highway. Onsite parking areas, material laydown, site offices etc. would be visible from the highway and may also be visible from Noel Waters Oval.
- Areas of bare soil created through grading or trenching cables could contribute to dust and detract from visual amenity until they are rehabilitated. These areas would be visible to the Mitchell Highway.

### *4.1.2 Operational components*

Operational impacts centre on the look of the solar farm, once construction is complete.

- The solar arrays would be no higher than 3m (more likely approximately 2.3m).
- Several different solar PV mounting technology options are still being considered:
    - North facing fixed tilt.
    - East-west facing fixed tilt (lower cost of installation and better density).
    - Single-axis trackers (lower density but higher yield).

  The mounting technology will affect the views of infrastructure; that is, whether panels or mountings are the dominant element from a specific viewing location.

  The potential for glare associated with non-concentrating photovoltaic systems which do not involve mirrors or lenses is relatively limited. PV solar panels are designed to reflect as little sunlight as possible (generally around 2% of the light received; Spaven Consulting 2011), resulting in negligible glare. The reason for this is that PV panels are designed to absorb as much solar energy as possible in order to generate the maximum amount of electricity or heat. The panels will not generally create noticeable glare compared with an existing roof or building surfaces (NSW Department of Planning 2010). Seen from above (such as from aircraft) they appear dark grey and do not cause a glare or reflectivity hazard. Solar photovoltaic farms have been installed on a number of airports around the world.

  Other onsite infrastructure that may cause glare or reflections depending on the sun angle, include:

    - Steel array mounting - array mounting would be steel or aluminium.
    - Temporary site offices, sheds, containerised inverter stations.
    - The onsite substation
    - Perimeter fencing
    - Permanent staff amenities.

  This infrastructure would be relatively dispersed and unlikely to present a glare or reflectivity hazard to motorists or aircraft.

- Inverter and transformer stations and could measure up to 3.4m.
- Electricity cables would be installed between the array modules, either underground or mounted to the underside of the array, producing negligible additional visual impact.
- The electrical connection from the site would be via a 132 kV overhead and underground line running to the existing Nevertire Essential Energy substation, approximately 1.5km east of the site. The powerline would include approximately 600 m of overhead located within private property and road reserve through Belerenga Street. The overhead powerline would be installed on 15-35m high power poles. Minimal vegetation clearing is required in this already disturbed route however, the additional infrastructure would add a cumulative adverse impact to this area. An underground section of powerline would be located within the road reserve of for approximately 900 m, minimising visual impacts.
- The onsite substation and site offices would add visual impact, mostly to eastern receivers. While unlikely to be visible from residential areas, they are likely to be noticed from fields to the east including the Noel Waters Oval.
- Fencing would be up to 3m high security fencing along the site boundaries. It is expected to be cyclone fencing with a strand of barbed wire at the top. While much higher than the array, the fence would not be solid. Views would be afforded beyond the fence.

- The main access to the site will be established via the Mitchell Highway. A minimal widening intersection treatment is proposed, producing minimal visual impact.
- An area for parking would be included within the site boundaries.

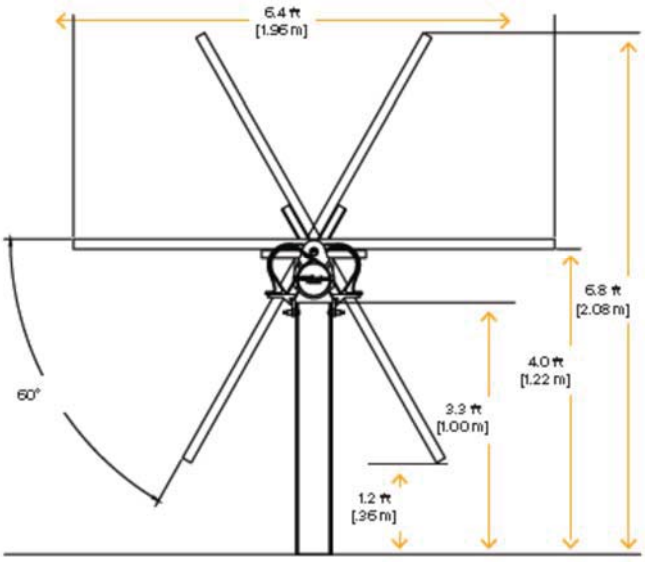
With the exception of the power poles, infrastructure would be of low height, less than 3m, and in this low relief landscape, relatively easily screened as part of the project. Examples of the look of some of the key infrastructure components are provided in Figure 4-1 below.

a) Example of poles driven into the ground

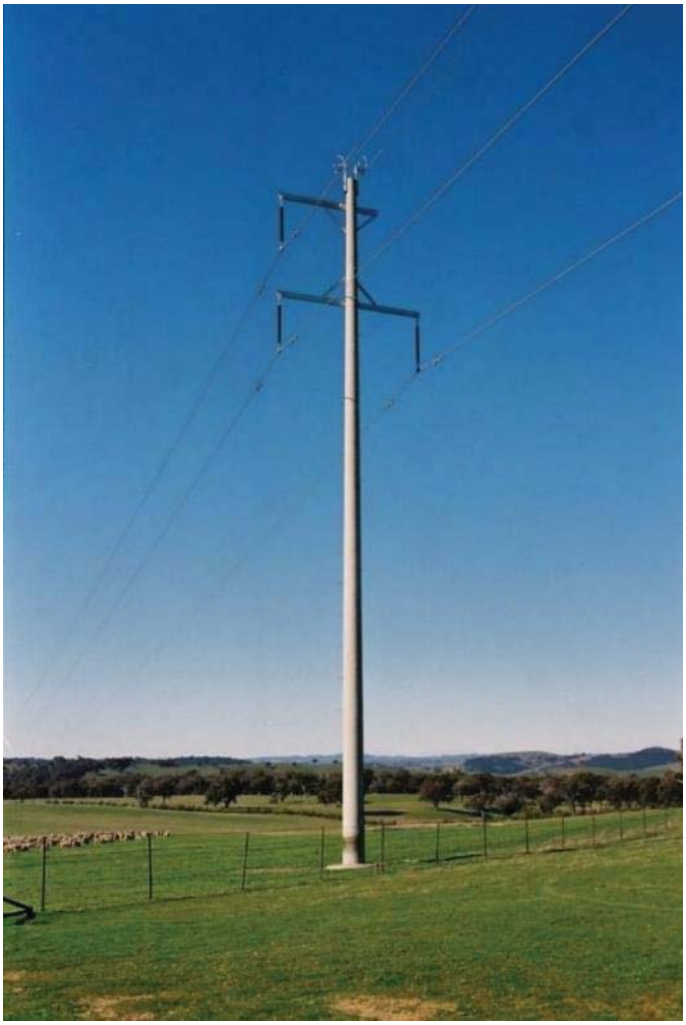
b) Example of tracker mounting system installation

c) Example of array module assembly.

d) The operational solar array




e) Example of fixed-tilt, self-powered tracking unit and solar module position.



f) Example 132kV powerline and pole.

g) Example onsite substation


h) Example perimeter fencing

Figure 4-1 Images representative of infrastructure components proposed (a to h)

# 5 IMPACT ASSESSMENT

The VIA was undertaken considering:

- The infrastructure components, described in Section 4.
- Their potential to be viewed from representative viewpoints.
- The degree of contrast they would have within identified LMZ.

LMZs were assigned to each viewpoint and the contrast at that viewpoint was evaluated, as described below.

## 5.1 DEFINITION OF LANDSCAPE MANAGEMENT ZONES

Visual LMZs were assigned to each representative viewpoint. The zones were derived by combining scenic quality (from the LCU, Section 3.2), viewer sensitivity and the distance to the proposed solar farm site (from Section 3.3). Combined they produce a three-tiered management hierarchy: A – C, as shown in Table 5-1.

Table 5-1 Visual Landscape Management Zone decision matrix

| | | Proximity / sensitivity | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **Foreground High** | **Middle ground High** | **Background High** | **Foreground Moderate** | **Middle ground Moderate** | **Background Moderate** | **Foreground Low** |
| **Scenic quality** | **High** | A | A | A | A | B | B | B |
| | **Moderate** | A | B | B | B | B | C | C |
| | **Low** | B | B | B | B | C | C | C |

Each zone has associated objectives to guide management of visual change and to help evaluate proposed project impacts. These are shown in Table 5-2:

Table 5-2 Visual Landscape Management Zone management objectives

| Management priority | Management objectives |
|---|---|
| **A** | Maximise retention of existing visual amenity.<br>Landscapes are least able to absorb change. Developments may lead to a major change. |
| **B** | Maintain existing visual amenity, where possible.<br>Protect dominant visual features. Developments may be allowed to be visually apparent. |
| **C** | Less importance for retaining existing visual amenity.<br>Landscapes are able to absorb change. Developments may be allowed to dominate but should reflect existing forms and colours where possible. |

## 5.2 VISUAL IMPACT ASSESSMENT AT REPRESENTATIVE VIEWPOINTS

### *5.2.1 Evaluation criteria*

The ratings for the degree of contrast created by the proposed solar farm infrastructure in each viewpoint have the following definitions (BLM n.d.).

- High contrast: the proposal would be dominant within the landscape and generally not overlooked by the observer, the visual change would not be absorbed.
- Medium contrast: the proposal would be moderately dominant and noticed, the visual change would be partially absorbed.
- Low contrast: the proposal would be seen but would not attract attention, the visual change would be well absorbed.
- Indistinct: contrast would not be seen or would not attract attention, the visual change would be imperceptible.

To determine if the objectives for the VLM zone are met, the contrast rating for the viewpoint is compared with the relevant management objectives to give a visual impact level. The visual impact level is consequently defined as:

- High impact: contrast is greater than what is acceptable.
- Medium impact: contrast is acceptable.
- Low impact: visual contrast is little or not perceived and is acceptable.

For high impact viewpoints, mitigation must be considered.

Table 5-3 below evaluates the representative viewpoints. They are ordered in terms of highest visual impact rating. The result summary is presented in Section 5.2.

#### Photomontages

To inform the evaluation, three photomontages were commissioned in areas identified in the preliminary stage of the assessment as likely to be most affected. The montages are presented in Appendix C and were considered when assessing the visual contrast that the array infrastructure would have with the existing landscape; specifically, how dominant the solar array infrastructure would be and how able to be 'absorbed' into the existing landscape.

Table 5-3 Visual impact at representative viewpoints with reference to the Nevertire Solar Farm

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 13 | Residential | Recreational (foreground) | A Maximise existing visual quality | Medium | **Medium** | This viewpoint is located on the edge of the Noel Waters Oval. It would be used by large groups. View extent to the solar farm site is relatively unimpeded. View durations would be long, several hours at a time.<br>With reference to the photomontages, Appendix C Montage 1 shows the infrastructure at this distance can be seen to be well absorbed vertically, but occupying a wide horizontal view.<br>**Mitigation is suggested**<br>Views of the array site could be effectively screened along its eastern boundary to break up views of the array infrastructure.<br>While not mandatory, it is recommended that any additional overhead electricity infrastructure should be minimised, where possible, to address cumulative impacts.<br>The mitigated visual impact would be considered low. |  |

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 30 | Agricultural | Residential (foreground) | B Protect dominant visual features | Medium | **Medium** | This viewpoint is representative of a residence immediately south of the array site (Receiver 42). The front entrance, north facing windows and recreational areas to the north of the residence would have extended view of the site, broken up only by plantings around the residence.<br>With reference to the photomontages, Appendix C, Montage 2 shows the infrastructure at this distance[1] can is well absorbed vertically, but occupying a wide horizontal view. Montage 3 is a higher contrast, being closer to the infrastructure (taken from the roadside; the closest possible vantage point). This provides a worst case representation of the view seen from Receiver 42 from the site boundary and access road, not the residence.<br>**Mitigation is suggested**<br>The array site could be effectively screened along its southern boundary to break up views of the array infrastructure. It is noted that from this location, this treatment may reduce the expansiveness of existing pastoral views. Onsite vegetation screening in this location should be undertaken in consultation with the affected landowner.<br>The mitigated visual impact would be considered low. |  |

[1] The Montage 2 distance was selected to represent the view from this receiver but as site access could not be obtained, the montage is taken from the south east, not the south.

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 39 | Agricultural | Road (foreground) | B Protect dominant visual features | Medium | **Medium** | This viewpoint is located at the entrance to Nevertire (for east-bound traffic). Dominant visual features include the road corridor, rail signage, overhead electricity transmission infrastructure and fencing. View extent to the solar farm site is relatively unimpeded for west-bound traffic. View durations would be relatively short in this 60km/hr zone.<br>With reference to the photomontages, Appendix C, Montage 1 provides the closest representation of this view and shows the infrastructure is well absorbed vertically, but occupying a wide horizontal view.<br>**Mitigation is suggested**<br>The array site could be effectively screened along its south-eastern corner to break up views of the array infrastructure. The aim in this area will be to minimise the cumulative impact of built elements.<br>The mitigated visual impact would be considered low. |  |
| 14 | Industrial | Residential (foreground) | B Protect dominant visual features | Medium | **Low-medium** | Dominant visual features at this viewpoint include the overhead electricity easement, water tank and unsealed roads. Only glimpse views of solar array infrastructure are likely.<br>**No mitigation required**<br>While not mandatory, it is recommended that any additional overhead electricity infrastructure should be minimised, where possible, to address cumulative impacts. |  |

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 36 | Agricultural | Road (foreground) | B Protect dominant visual features | Low | **Low** | Given the existing vegetation on the western site boundary, the infrastructure would only be glimpsed by motorists along this access road and the Mitchell Hwy; views would be small in extent and duration.<br>**No mitigation required** |  |
| 19 | Agricultural | Road (middle ground) | B Protect dominant visual features | Low | **Low** | Dominant visual features at this viewpoint include the road corridor, farm gates, overhead electricity easement with glimpse views to expansive pasture areas and fringing trees in the distance.<br>View extent and duration would be limited by distance and the height of foreground pasture (which would vary seasonally). The contrast of new built elements would be low and would not substantively affect existing dominant features.<br>**No mitigation required** |  |
| 15 | Residential | Residential (foreground) | A Maximise existing visual quality | Low | **Low** | Proposed infrastructure unlikely to be discernible.<br>**No mitigation required** | NA |
| 16 | Residential | Residential (foreground) | A Maximise existing visual quality | Low | **Low** | Proposed infrastructure unlikely to be discernible.<br>**No mitigation required** | NA |

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 17 | Industrial | Commercial (foreground) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 21 | Industrial | Commercial (foreground) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 22 | Residential | Residential (foreground) | A Maximise existing visual quality | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 1 | Agricultural | Road (middle ground) | B Protect dominant visual features | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 3 | Agricultural | Residential (middle ground) | B Protect dominant visual features | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 8 | Agricultural | Residential (middle ground) | B Protect dominant visual features | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 11 | Industrial | Road (middle ground) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 18 | Agricultural | Road (middle ground) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 23 | Agricultural | Road (middle ground) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 2 | Agricultural | Residential (back ground) | B Protect dominant visual features | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |

| ID | LCU | Viewpoint | LMZ objective | Contrast | Visual Impact | Comment | Image |
|---|---|---|---|---|---|---|---|
| 10 | Agricultural | Road (background) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |
| 25 | Agricultural | Commercial (background) | C Reflect existing forms and colours | Indistinct | **Low** | Proposed infrastructure unlikely to be discernible. **No mitigation required** | NA |

Figures 5-2 to 5-5 illustrate, where possible, the indicative horizontal extent of the view of solar array infrastructure from high and medium impact viewpoints.

- Red is estimated extent of arrays visible (unshielded) within the view field.
- Green is estimated total extent of arrays but shielded by trees/buildings within the view field.
- Yellow is the estimated extent of the property boundary within the view field.

The locations of each panorama viewpoint are shown on Figure 5-6.

Figure 5-1 Panorama of ID 13, showing the horizontal extent of array infrastructure that would be visible from this location

Figure 5-2 Panorama of ID 30, showing the horizontal extent of array infrastructure that would be visible from this location

Figure 5-3 Panorama of ID 39, showing the horizontal extent of array infrastructure that would be visible from this location

Figure 5-4 Panorama of ID 14, showing the horizontal extent of array infrastructure that would be visible from this location

Figure 5-5 Panorama of ID 27, showing the horizontal extent of array infrastructure that would be visible from this location

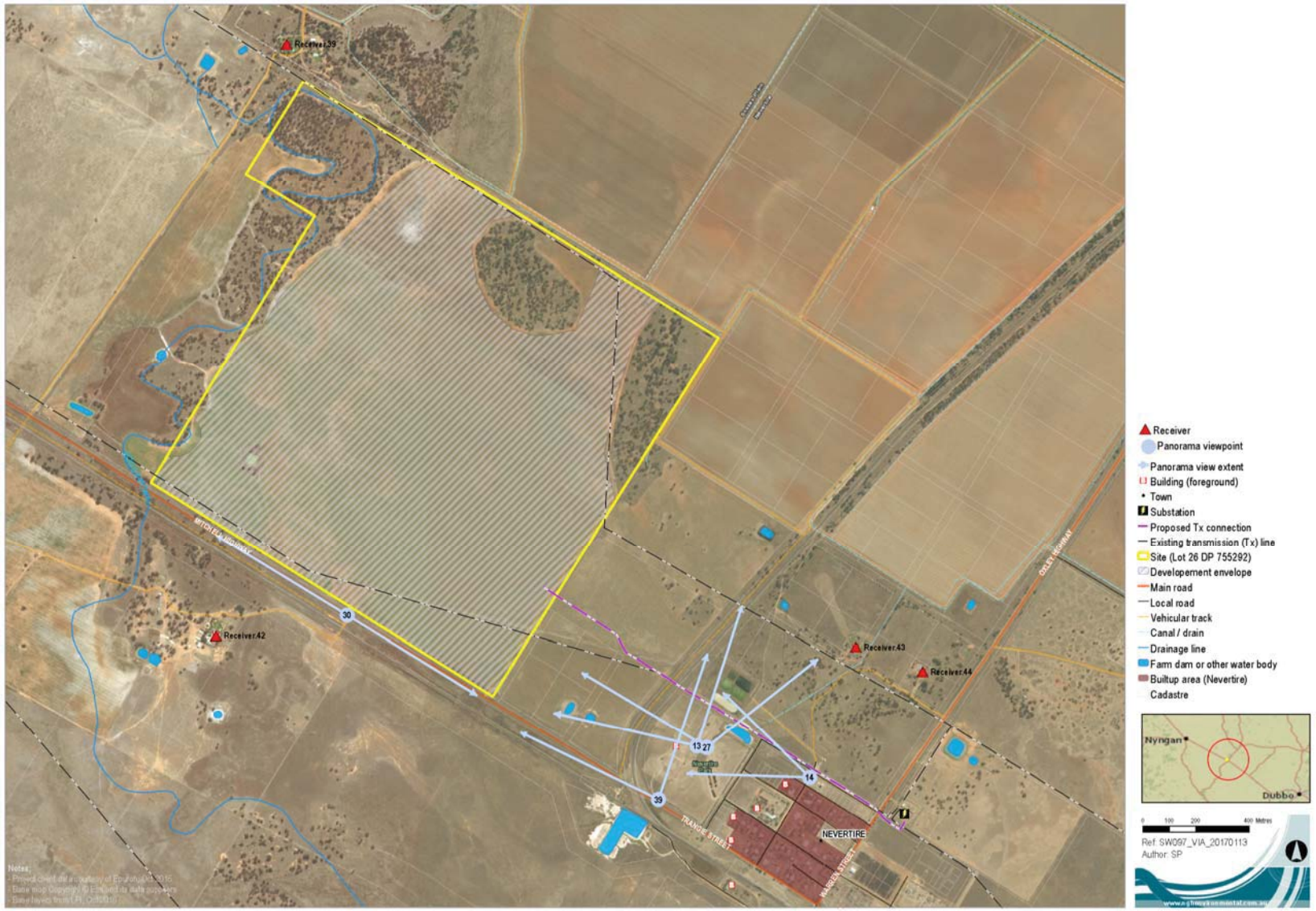



Figure 5-6 The location of the five panorama viewpoints: 13, 14, 27, 30 and 39

### *5.2.2 Results summary*

#### Foreground views

Considering foreground views, the low profile of the proposed solar array infrastructure, and the existing overhead transmission easements present on the northern edge of Nevertire village and existing residential and commercial buildings ensure that the proposed infrastructure would not be dominant or present an unacceptable contrast from most foreground locations.

The highest impacts (rated medium visual impact) are the uninterrupted foreground views in two discrete areas:

- To the immediate east of the site where limited vegetation screening is present and recreational areas occur in close proximity to the site (Viewpoint 13). Although the distance will mean the low height of infrastructure does not 'overshadow' the area, this recreational area will have groups present for extended durations, increasing the impact rating. Only glimpse views will be afforded from residential areas further from the site, at the western ends of Gunningbar and Narromine Streets.
- To the immediate south of the site where no road side vegetation is present, producing an expansive view of the site to the Mitchell Highway motorists and one residential receiver whose residence faces the site (Viewpoints 39 and 30, respectively). The existing view of expansive crops will be replaced by infrastructure visible from the residence and access way, producing a medium degree of contrast with existing views and impacting on the ability to 'Protect dominant visual features'.

**Mitigation is recommended to address views of the array site from these locations.**

The locality is extremely flat ensuring that any screening vegetation planted close to the solar array infrastructure will be very effective in screening the site from foreground and middle ground locations. It is recommended to plant screening vegetation within the southern and eastern site boundaries, supplementing existing onsite vegetation to the north-east. This will reduce the medium impact rating to a low and acceptable level. A suggested screening plan has been developed (refer Appendix E) to specifically consider views in these areas. This is discussed further in Section 6.1.

It is noted that the cadastre mapping indicates that growth of the residential areas are likely to expand north of the existing village. This screening would also reduce the medium and low impact ratings within other area of the residential LCU and potential growth to the north. Onsite vegetation that would be retained, to the west, north and north-east would act to break up views of infrastructure in these directions, though receivers here are few.

It is noted that any additional overhead transmission lines will add a cumulative adverse visual impacts to the residential LCU. Although this does not present a high impact requiring mitigation from any viewpoint, impact minimisation should be considered, where practical, to minimise impacts.

#### Middle and background views

Given the extremely flat landscape and the extensive road side corridor and rail corridor overstorey and midstorey native vegetation remnants, most middle and background viewpoints would have indiscernible visual contrast and low visual impact.

**No mitigation is required for middle and background viewpoints.**

It is noted that in these areas, the native vegetation community consists of low eucalypts (approximately 18m) and a lower height of dense shrub species that create a dense visual screen for some road side remnants. In most cases, visual mitigation screening aims to 'break up' rather than block entirely views of infrastructure. However, using species native to the area for onsite planting, it is anticipated that a high degree of screening could be achieved for this site, for the foreground views discussed above. Suggested screening plants are discussed further in Section 6.1.

## 5.3 CUMULATIVE IMPACTS

Adverse cumulative impacts occur when the infrastructure or activities at the solar farm site exacerbate the negative impacts of other infrastructure or activities occurring nearby.

### *5.3.1 Construction*

During construction, the additional traffic impact is probably the greatest potential for cumulative visual impacts. The Mitchell Highway is a high use road corridor carrying a large proportion of heavy and oversized vehicles. The visual impact of increased traffic movements to the site would be predominantly limited to construction (approximately 12 months). It is understood a Traffic Management Plan would be developed to minimise vehicle movements as much as practical for construction.

### *5.3.2 Operation*

The operational view of the solar farm may generate a cumulative impact with the existing substation and powerlines. The array site and substation require security fencing and steel dominated infrastructure.

Further, at the western entry to Nevertire, the solar array may add to existing transmission line, road, rail and fencing infrastructure, to detract from the visual amenity. The screening strategy suggested for the southern and eastern corner of the site would address this impact.

During operation, excepting unusual maintenance operations such as inverter or transformer replacement, a small maintenance team using standard vehicles are all that will be required. Cumulative visual traffic impacts are considered negligible.

It is possible another large scale development could be approved within view of the proposed solar farm, however none are known to be proposed at this time.

Generally, adverse cumulative visual impacts are anticipated to be manageable due to the ability to effectively screen infrastructure in this low relief landscape.

# 6 MITIGATION STRATEGY

A Visual Impact Management Plan is recommended to address the 'as built' visual impacts of the proposed solar farm. The plan would include:

- Onsite vegetation screening for viewpoints 13, 30 and 39. This would be aimed at 'breaking up' not blocking views of onsite infrastructure, although sections of denser plantings may be considered for the residence to the immediate south of the site (Receiver 42), in consultation with this landowner.
- Verification of predicted and actual impacts. This would improve the reliability of the measures and provide a trigger to undertake additional mitigation if required.

Guidance regarding these measures is provided below. They are considered feasible, in that the proponent has agreed the measures can be implemented as part of the project. They are considered effective, as the measures would be implemented post construction and in consultation with affected landholders (where they agree). It is noted that vegetation screens can take time to grow, grow differently than expected or expire before effective height is achieved. Furthermore, the as built infrastructure may differ from that assessed in this report, predicted impacts may be found to be different to actual impacts. For this reason, a verification process and monitoring requirements are included in the plan.

## 6.1 SCREENING

### *6.1.1 Screen location*

To address the highest impact locations (rated as medium visual impact), screening vegetation would be planted within the south-west and south-eastern site boundaries, supplementing existing onsite vegetation to the north-east. This will reduce the impact ratings to an acceptable level. The mitigated visual impact would be considered low. A draft planting layout is provided in Appendix E.

The final screening plan should be developed in consultation with the affected landowners (the residence 340m south-west of the site and managers of the Noel Waters Oval (where they wish to be consulted).

### *6.1.2 Screen requirements*

- Onsite plantings would be 1-3 rows deep and be located on the outside of the security fence, so that it breaks up views of the fencing as well as onsite infrastructure.
- The plant species to be used in the screen are recommended to be native, derived from the naturally occurring vegetation community in this area. They should be fast growing, with spreading habitat; heights of 3-4m would be sufficient to screen infrastructure but occasional higher species may be considered to achieve a more natural (less hedge like) effect. Species selection should be undertaken in consultation with affected near neighbours and a botanist or landscape architect.
- Planting should be undertaken as soon as practical in the construction process, as it will take time for the plants to establish and become effective as a screen. In this regard, more mature plants could be planted if early planting is not possible. Seasonal requirements for planting should also be considered.
- A post construction audit would be undertaken to assess the effectiveness of the screening layout with reference to the final constructed infrastructure and augment the former as required.
- The screen would be maintained for the operational life of the solar farm. Dead plants would be replaced. Pruning and weeding would be undertaken as required to maintain the screen's visual amenity and effectiveness in breaking up views.

It is noted that the aim of plant screens is to break up the view and not eliminate it entirely. Partial views are considered likely, particularly while vegetation is developing to maturity.

## 6.2 GENERAL MEASURES

The following measures are recommended to reduce the general visual impact of the development for all other receivers:

### *6.2.1 Design*

- If feasible, underground rather than overhead power lines would be considered.
- If feasible, co-location of powerlines would be undertaken to minimise the look of additional power poles. If additional poles are required, these would match existing pole design as much as possible.
- The materials and colour of onsite infrastructure will, where practical, be non-reflective and in keeping with the materials and colouring of existing infrastructure or of a colour that will blend with the landscape. Where practical:
    - Buildings will non-reflective and in eucalypt green, beige or muted brown.
    - Pole mounts will be non-reflective.
    - Security fencing posts and wire would be non-reflective; green or black rather than grey would reduce the industrial character of the fence.

### *6.2.2 Construction*

- During construction, dust would be controlled in response to visual cues.
- Parking areas, material stock piles and other construction activities would be located as far as practical from nearby residences or screened (by existing vegetation or constructed screens) for the period of construction.
- Areas of soil disturbed by the project would be rehabilitated progressively or immediately post-construction, reducing views of bare soil.
- Ground cover would be maintained beneath the panels and within the site boundary, to break up views of the infrastructure from the side and back views.
- Night lighting would be minimised to the maximum extent possible (i.e. manually operated safety lighting at main component locations). It would be directed away from the Mitchell Highway, so as not to cause light spill that may be hazardous to drivers.

# 7 CONCLUSION

This report has been prepared to assess the potential visual impacts of the proposed Nevertire Solar Farm. A systematic evaluation has been undertaken to address subjectivity as much as possible. The report was informed by background investigations, mapping and modelling, field survey including reconnaissance, ground truthing and photography and the results of project-specific community consultation. Additionally, specific photomontages were commissioned to inform the evaluation and feasibility of screening to reduce the visual impact.

The proposed Nevertire Solar Farm is located on the edge of a residential area, in an area of moderate scenic quality. It is located next to a high use transport corridor and in close proximity (<1km) of approximately 48 residences. A medium impact was determined for three representative viewpoints. Onsite vegetation screening is proposed to break up views of the proposed infrastructure from these locations. This would reduce the impact to a low and acceptable level.

General measures to reduce impacts for all receivers have also been recommended. These centre on use of design elements to reduce visual contrast, mitigation of construction impacts such as dust and traffic that may reduce visual amenity and mitigation of operation impacts, such as maintaining ground cover beneath the panels, to break up side on and back views of infrastructure and soften the appearance of the facility.

Large scale solar farms are still relatively new in Australia. While they enjoy support from many in the community, provision of information on expected visual impacts and involvement in mitigating impacts (for affected receivers) is considered very important to obtaining social license to operate. With the involvement of the affected landowners in the mitigation strategy set out in Section 6, the visual impacts of the proposal are considered acceptable and manageable.

# 8 REFERENCES

Australian Renewable Energy Agency (ARENA) no date. Establishing the social licence to operate large scale facilities in Australia; insights from social research for industry.

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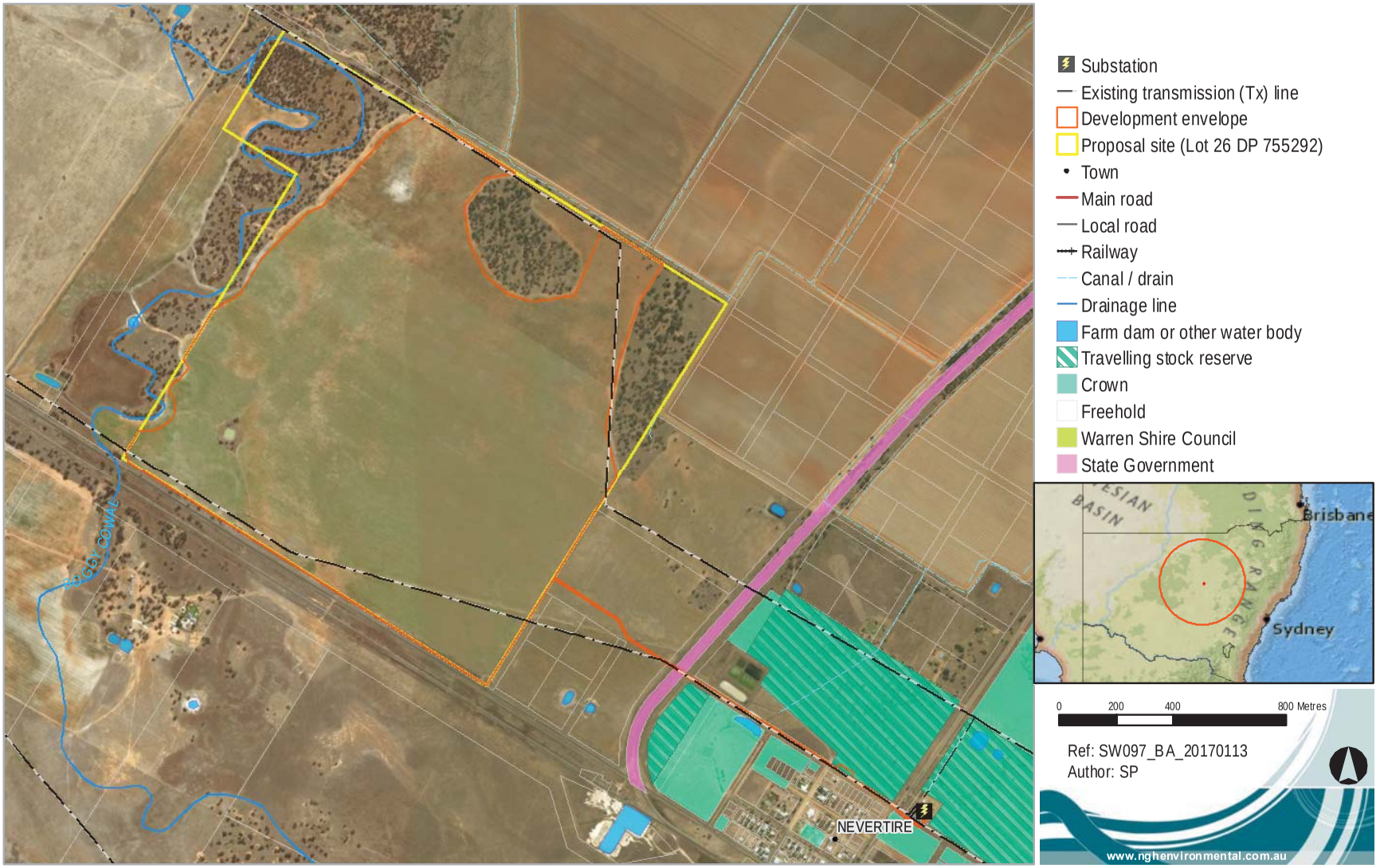
NSW Department of Planning (2010). Discussion Paper On Planning For Renewable Energy Generation - Solar Energy, prepared April, 2010.

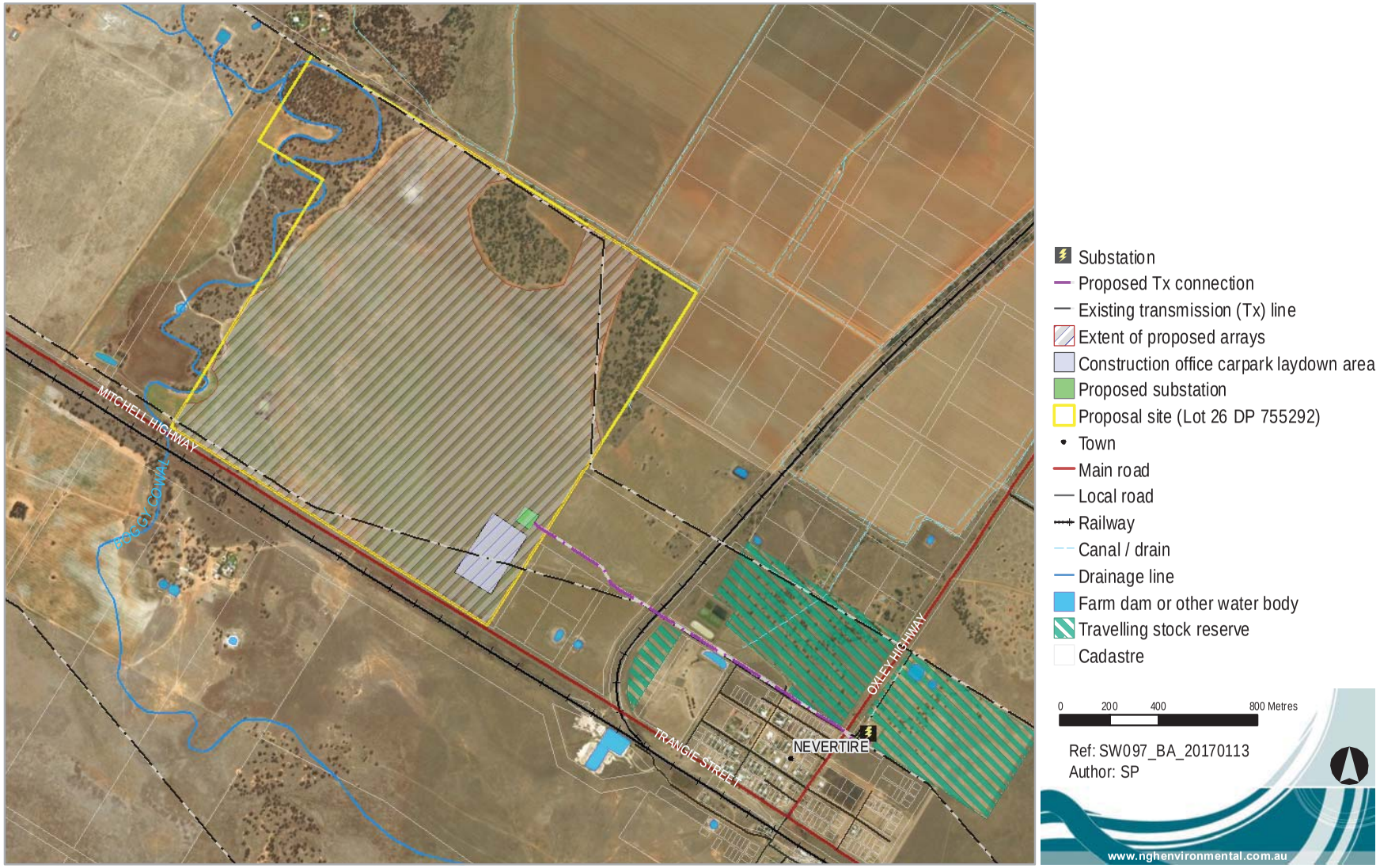
Spaven Consulting (2011). Solar Photovoltaic Energy Facilities: Assessment of potential for impact on aviation. Report prepared January 2011, for RPS Planning and Development.

# APPENDIX A LOCATION AND PROPOSED INFRASTRUCTURE LAYOUT

## A.1 LOCATION OF SOLAR FARM SITE



## A.2 PROPOSED INFRASTRUCTURE



# APPENDIX B ZONE OF VISUAL INFLUENCE AND REPRESENTATIVE VIEW POINTS

## B1 – B4 ZONE OF VISUAL INFLUENCE (ZVI) MAP SET

The ZVI (or view shed) of the proposal was produced using topographic information. Topography was based on a 25m resolution Digital Elevation Model (DEM) derived from 25m contours. The ZVIs do not take into account screening such as vegetation or infrastructure and on this basis is considered a 'worst case' model. They are used to assist in selecting representative viewpoints for the impact assessment.

**B.1 and B.2 Array infrastructure**

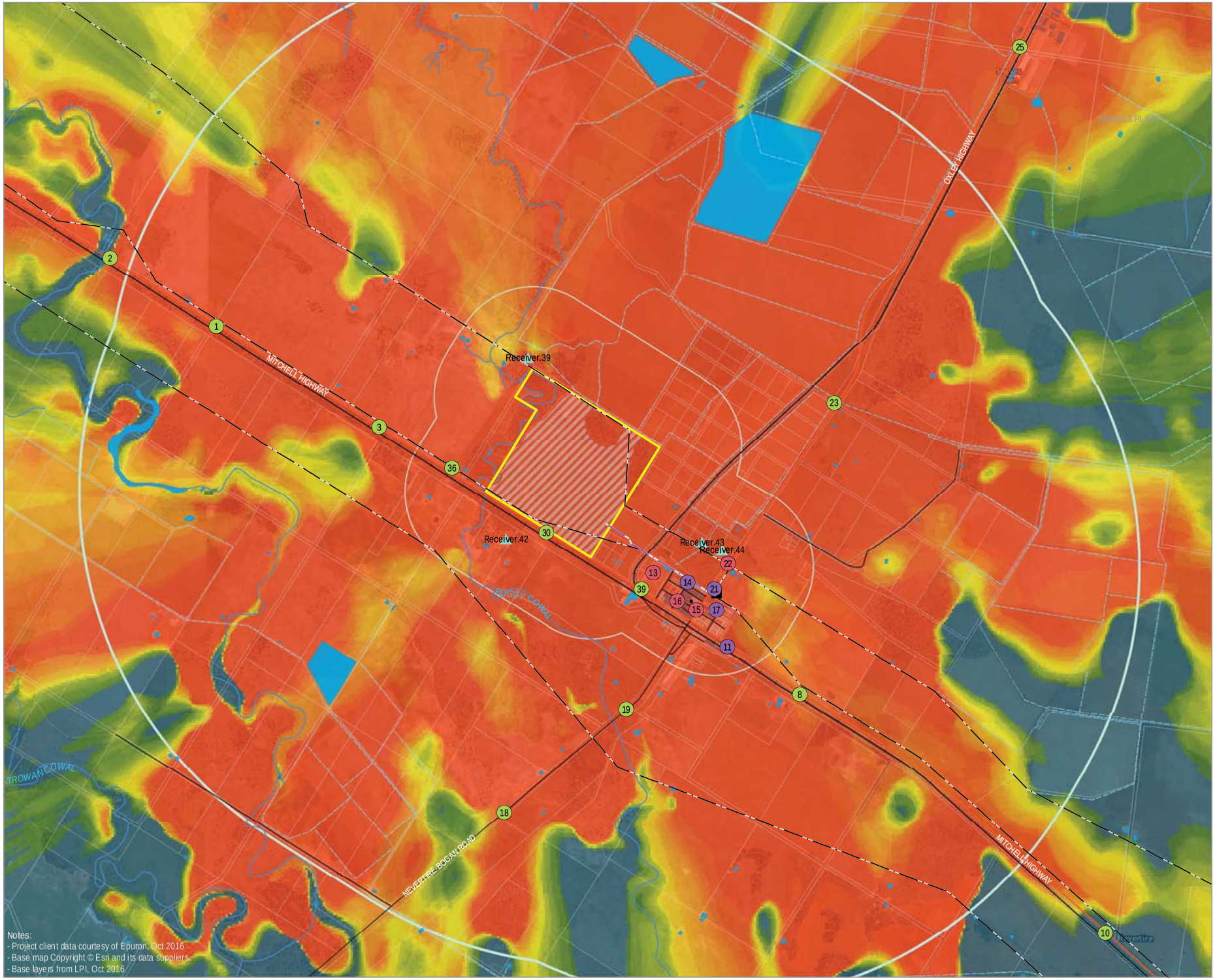
A height of 3m was used to model onsite array infrastructure. This is a realistic approximation of the height of panels and inverter containers, which may actually be 2.3m and 3.4m, respectively. B.1 shows the middleground view shed (5km) and B.2 extends to the background view shed (16km).

**B.3 and B.4 35m Transmission line**

A second ZVI was produced to model the view shed of a 35m transmission line from the array site to the existing substation to the east of the site. B.3 shows the middleground view shed (5km) and B.4 extends to the background view shed (16km).

**Representative view points**

All representative viewpoints assessed in this report are shown on the ZVI map set. Representative viewpoints are used instead of assessing impacts from all actual receivers in the view shed. Only four receivers are shown. These are residential dwellings referred to specifically in the visual assessment.




# B1
# ZVI FOR 3M ARRAY, MIDGROUND VIEW

- Receiver
- Viewpoint (Landscape Character Unit)
- Agricultural
- Industrial
- Residential
- Town
- Substation
- Proposed Tx connection
- Existing transmission (Tx) line
- Site (Lot 26 DP 755292)
- Developement envelope
- Main road
- Local road
- Railway
- Canal / drain
- Drainage line
- Farm dam or other water body
- Builtup area (Nevertire)
- Cadastre
- Foreground (1km)
- Midground (5km)
- Proposed arrays not visible
- Proposed arrays visible

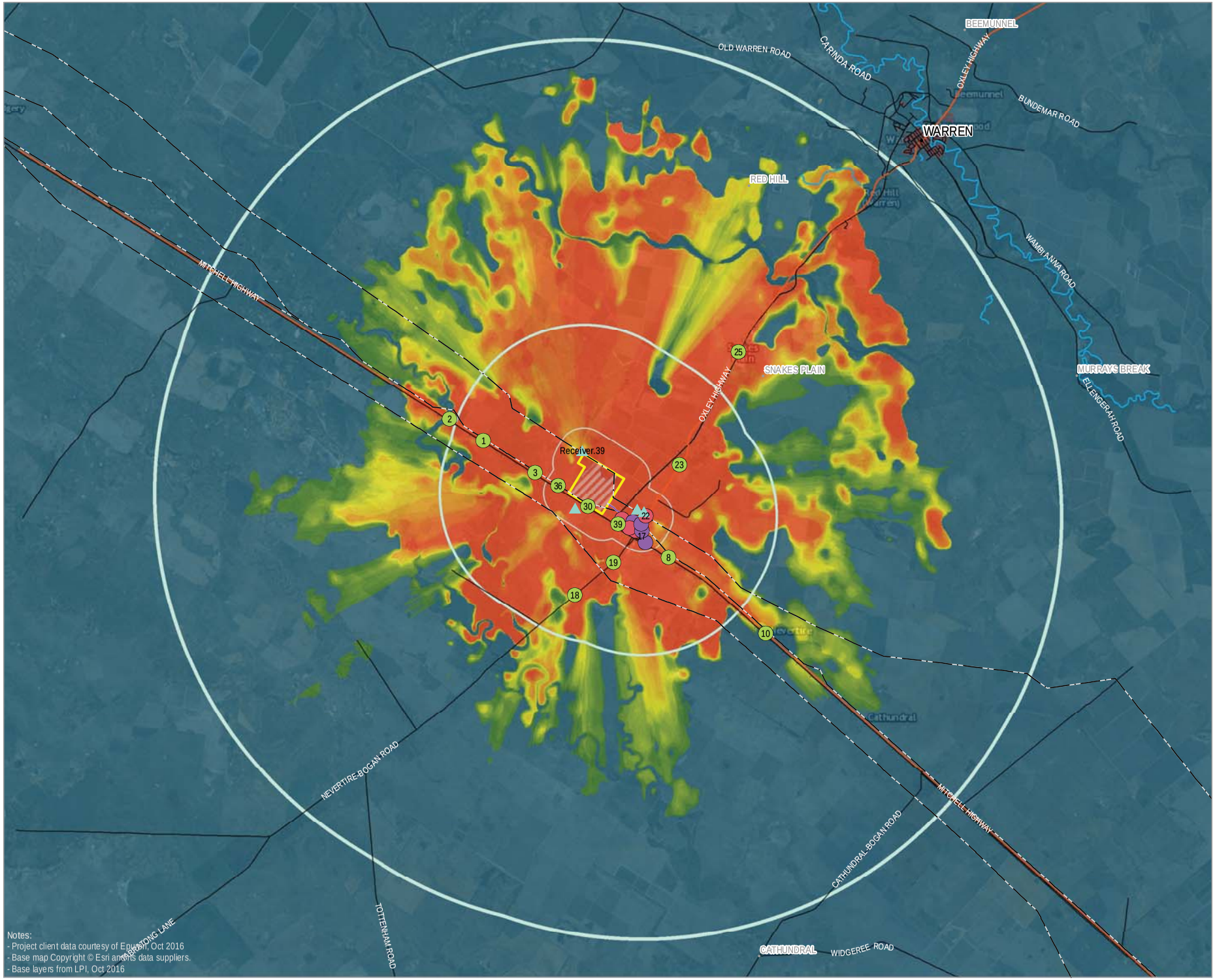
Relative visibility index

| | | |
|---|---|---|
| 0 | 9 | 19 |
| 1 - Low | 10 | 20 |
| 2 | 11 | 21 |
| 3 | 12 | 22 |
| 4 | 13 | 23 |
| 5 | 14 | 24 |
| 6 | 15 | 25 |
| 7 | 16 | 26 |
| 8 | 17 | 27 |
| | 18 | 28 |
| | | 29 - High |


0 0.5 1 2 Km

Ref: SW097_VIA_20170113
Author: SP

www.nghenvironmental.com.au




Notes:
- Project client data courtesy of Evolution, Oct 2016
- Base map Copyright © Esri and its data suppliers.
- Base layers from LPI, Oct 2016

# B2
# ZVI FOR 3M ARRAY, BACKGROUND VIEW

- Receiver

Viewpoint (Landscape Character Unit)
- Agricultural
- Industrial
- Residential

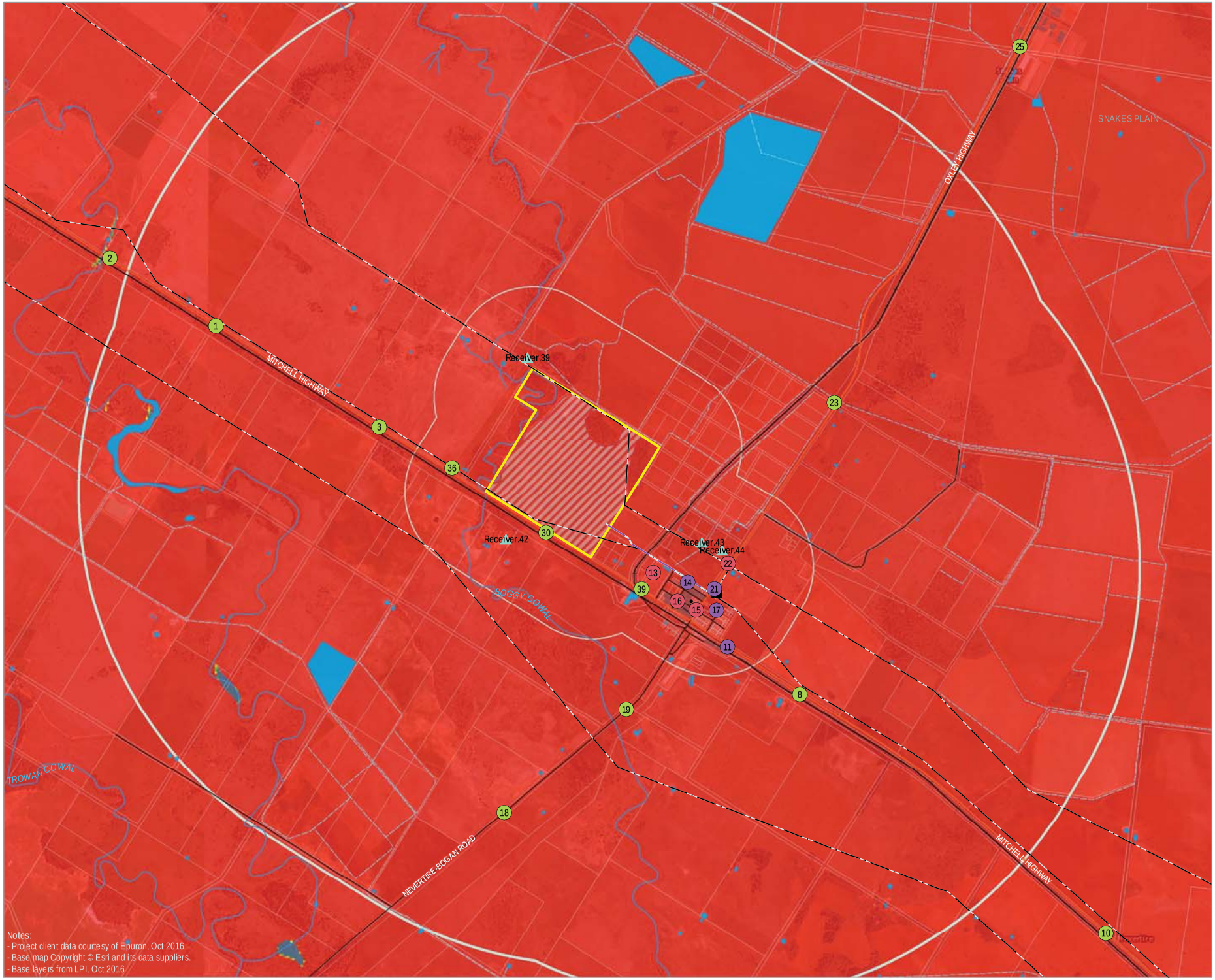
- Locality
- Town
- Substation
- Proposed Tx connection
- Existing transmission (Tx) line
- Site (Lot 26 DP 755292)
- Developement envelope
- Main road
- Local road
- Railway
- Perennial watercourse
- Builtup area (Nevertire)
- Foreground (1km)
- Midground (5km)
- Background (16km)
- Proposed arrays not visible
- Proposed arrays visible

Relative visibility index
0
1 - Low
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29 - High


0 0.5 1 2Km

Ref: SW097_VIA_20170113
Author: SP

www.nghenvironmental.com.au



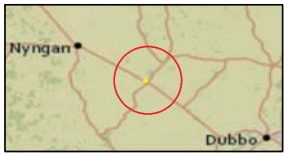

**B3**
**ZVI FOR TRANSMISSION LINE, MIDGROUND VIEW**

- Receiver
- Viewpoint (Landscape Character Unit)
- Agricultural
- Industrial
- Residential
- Town
- Substation
- Proposed Tx connection
- Existing transmission (Tx) line
- Site (Lot 26 DP 755292)
- Developement envelope
- Main road
- Local road
- Railway
- Canal / drain
- Drainage line
- Farm dam or other water body
- Builtup area (Nevertire)
- Cadastre
- Foreground (1km)
- Midground (5km)

- Tx line options not visible
- Tx line options visible

Relative visibilty index

- 0
- 1 - Low
- 2
- 3
- 4
- 5
- 6
- 7 - High




0 0.5 1 2 Km

Ref: SW097_VIA_20170113
Author: SP

Notes:
- Project client data courtesy of Epuron, Oct 2016
- Base map Copyright © Esri and its data suppliers.
- Base layers from LPI, Oct 2016

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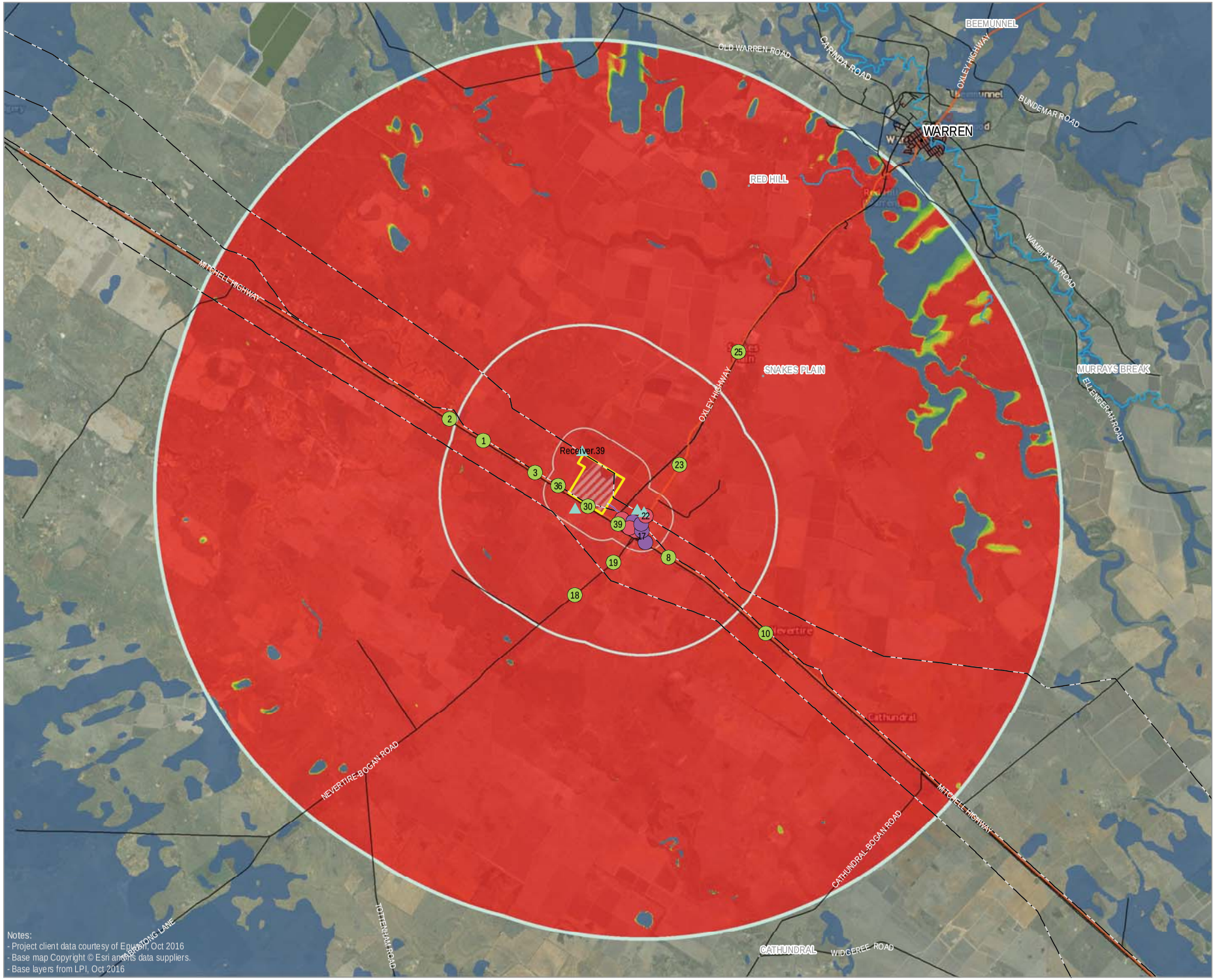


Notes:
- Project client data courtesy of Evolution, Oct 2016
- Base map Copyright © Esri and its data suppliers.
- Base layers from LPI, Oct 2016

**B4**
**ZVI FOR TRANSMISSION LINE, BACKGROUND VIEW**

- Receiver
- Viewpoint (Landscape Character Unit)
- Agricultural
- Industrial
- Residential
- Locality
- Town
- Substation
- Proposed Tx connection
- Existing transmission (Tx) line
- Site (Lot 26 DP 755292)
- Developement envelope
- Main road
- Local road
- Railway
- Perennial watercourse
- Builtup area (Nevertire)
- Foreground (1km)
- Midground (5km)
- Background (16km)

- Tx line options not visible
- Tx line options visible

Relative visibilty index
- 0
- 1 - Low
- 2
- 3
- 4
- 5
- 6
- 7 - High


0 0.5 1 2Km

Ref: SW097_VIA_20170113
Author: SP

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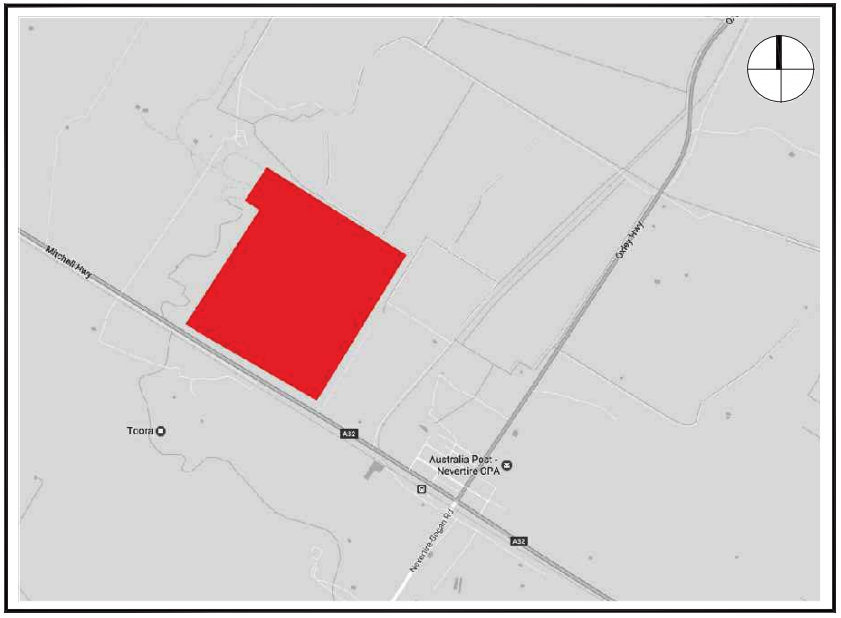
# APPENDIX C PHOTOMONTAGES

To inform the visual impact evaluation in Section 5, three photomontages were commissioned in areas identified in the preliminary stage of the visual assessment as likely to be most affected. The photomontages are presented overleaf and were considered when assessing the visual contrast that the array infrastructure would have with the existing landscape; specifically, how dominant the solar array infrastructure would be and how able to be 'absorbed' into the existing landscape. The photomontages also demonstrate the ability of vegetation screening to break up views of infrastructure from this location.

# SOLAR FARM, VISUAL IMPACT PHOTOMONTAGES
# NEVERTIRE, NSW
## EPURON

| SCHEDULE OF DRAWINGS | | | |
|---|---|---|---|
| DRAWING | TITLE | REVISION | DATE |
| A001 | TITLE SHEET | B | 18.01.2017 |
| A002 | VIEW 01 - EXISTING | B | 18.01.2017 |
| A003 | VIEW 01 - SOLAR ARRAY WITH NO SCREENING | B | 18.01.2017 |
| A004 | VIEW 01 - SOLAR ARRAY WITH VEGETATION SCREENING | B | 18.01.2017 |
| A005 | VIEW 02 - EXISTING | B | 18.01.2017 |
| A006 | VIEW 02 - SOLAR ARRAY WITH NO SCREENING | B | 18.01.2017 |
| A007 | VIEW 02 - SOLAR ARRAY WITH VEGETATION SCREENING | B | 18.01.2017 |
| A008 | VIEW 03 - EXISTING | B | 18.01.2017 |
| A009 | VIEW 03 - SOLAR ARRAY WITH NO SCREENING | B | 18.01.2017 |
| A010 | VIEW 03 - SOLAR ARRAY WITH VEGETATION SCREENING | B | 18.01.2017 |




SITE LOCALITY
NOT TO SCALE

GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

ALL WORK SHOWN ON THE DRAWINGS COMPRISING THE SET SHALL COMPLY WITH THE 'BUILDING CODE OF AUSTRALIA' & THE REQUIREMENTS OF RELEVANT AUTHORITIES & THEIR CONDITIONS OF CONSENT.

ALL WORKMANSHIP & MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE RELEVANT AUSTRALIAN STANDARDS.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS & DOCUMENTATION COMPRISING THE SET (INCLUDING THE SPECIFICATION AND OTHER CONSULTANT'S DRAWINGS (WHERE SUPPLIED).

| REV. | DATE | DFTD. | APP'D. | DETAILS |
|---|---|---|---|---|
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| B | 18.01.2017 | jdb | jpb | FOR APPROVAL |
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| | | | | |
| | | | | |

| ARCHITECTURAL APPROVAL | INITIALS | DATE |
|---|---|---|
| | jpb | 18.01.17 |

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM


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NOMINATED ARCHITECTS:
JAMES BUCKLEY, NSW ARB 8504
ANTHONY GRAY, NSW ARB 9425


DRAWING: TITLE SHEET

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A001-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE 1:2 | A3 SCALE 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A001 OF 07 | | |

# View Location 1 - EXISTING VIEW


Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.27pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 55" S<br>LONG: 147° 42' 31" E |
| Height above ground: | 1.6 m |

GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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| B | 18.01.2017 | jpb | jpb | FOR APPROVAL |
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| ARCHITECTURAL APPROVAL | INITIALS | DATE |
|---|---|---|
| | jpb | 18.01.17 |

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

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NOMINATED ARCHITECTS:
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ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 01 EXISTING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A002 | OF 07 | |

# View Location 1 - VIEW WITH NO SCREENING

## 3m high block extruded above ground plane to represent panels and fence


Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.27pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 55" S<br>LONG: 147° 42' 31" E |
| Height above ground: | 1.6 m |

GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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ARCHITECTURAL APPROVAL — INITIALS: jpb — DATE: 30.01.17

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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NOMINATED ARCHITECTS:
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ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 01 NO SCREENING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A003 | OF 07 | |

# View Location 1 - VIEW WITH VEGETATION SCREENING

## 3m high block extruded above ground plane to represent panels and fence
## Screening shrubs with heights of approximately 3-4m

Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.27pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 55" S<br>LONG: 147° 42' 31" E |
| Height above ground: | 1.6 m |


GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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ARCHITECTURAL APPROVAL — INITIALS: jpb — DATE: 30.01.17

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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NOMINATED ARCHITECTS:
JAMES BUCKLEY, NSW ARB 8504
ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 01 WITH VEGETATION SCREENING

| | |
|---|---|
| PROJECT NUMBER | 217279 |
| DRAWING FILE | 217279_01A_A01-A010.dwg |
| ORIGINAL SIZE | A1 |
| A1 SCALE: | 1:2 |
| A3 SCALE: | 1:4 |
| IMAGE SOURCE | GOOGLE EARTH, GOOGLE MAPS |
| STATUS | FOR APPROVAL |
| SHEET | A004 OF 07 |
| SET | 01 |

# View Location 2 - EXISTING VIEW


Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.53pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 41" S<br>LONG: 147° 41' 55" E |
| Height above ground: | 1.6 m |

GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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| B | 18.01.2017 | jpb | jpb | FOR APPROVAL |
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| ARCHITECTURAL APPROVAL | INITIALS | DATE |
|---|---|---|
| | jpb | 18.01.17 |

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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NOMINATED ARCHITECTS:
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ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 02 EXISTING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE: GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS: FOR APPROVAL | SHEET A005 OF 07 | | |

# View Location 2 - VIEW WITH NO SCREENING

## 3m high block extruded above ground plane to represent panels and fence

Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.53pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 41" S<br>LONG: 147° 41' 55" E |
| Height above ground: | 1.6 m |


GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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| REV. | DATE | DFTD. | APPD. | DETAILS |
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| ARCHITECTURAL APPROVAL | INITIALS | DATE |
|---|---|---|
| | jpb | 18.01.17 |

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CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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NOMINATED ARCHITECTS:
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ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 02 NO SCREENING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A006 | OF 07 | |

# View Location 2 - VIEW WITH VEGETATION SCREENING

## 3m high block extruded above ground plane to represent panels and fence
## Screening shrubs with heights of approximately 3-4m

Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 12.53pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 41" S<br>LONG: 147° 41' 55" E |
| Height above ground: | 1.6 m |


GENERAL NOTES:

ALL DIMENSIONS GIVEN ARE IN MILLIMETRES (UNLESS SHOWN OTHERWISE) & ARE TO BE CHECKED AND VERIFIED PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS FOR DIMENSIONS. DIMENSIONS WITH ASTERISKS ARE APPROXIMATE ONLY AND ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO CONSTRUCTION.

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|---|---|---|---|---|
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| | | | | |

ARCHITECTURAL APPROVAL — INITIALS: jpb — DATE: 18.01.17

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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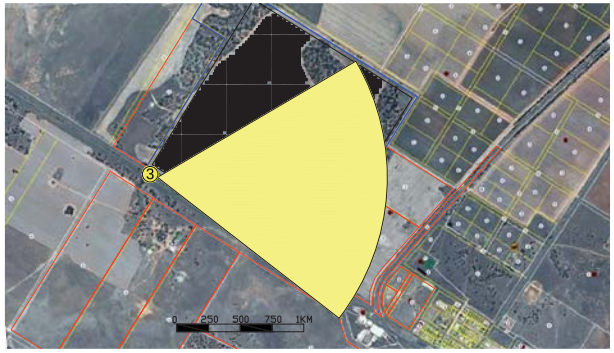
NOMINATED ARCHITECTS:
JAMES BUCKLEY, NSW ARB 8504
ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 02 WITH VEGETATION SCREENING

| | |
|---|---|
| PROJECT NUMBER | 217279 |
| DRAWING FILE | 217279_01A_A01-A010.dwg |
| ORIGINAL SIZE | A1 |
| A1 SCALE: | 1:2 |
| A3 SCALE: | 1:4 |
| IMAGE SOURCE | GOOGLE EARTH, GOOGLE MAPS |
| STATUS | FOR APPROVAL |
| SHEET | A007 OF 07 |
| SET | 01 |

# View Location 3 - EXISTING VIEW




Photomontage created by:

James Buckley - B.Arch(Hons) A.I.A
NSW Board of Architects registration No 8504

Photomontage Image created using:

AutoCAD 2016, Sketchup 2016, Thea Render, Adobe photoshop

Base photograph details:

| | |
|---|---|
| Camera: | Nikon Coolpix P600 |
| Photo taken: | 1.18pm on 11/01/2017 |
| Location of photo: | LAT: 31° 49' 39" S<br>LONG: 147° 41' 52" E |
| Height above ground: | 1.6 m |

GENERAL NOTES:

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ALL WORK SHOWN ON THE DRAWINGS COMPRISING THE SET SHALL COMPLY WITH THE 'BUILDING CODE OF AUSTRALIA' & THE REQUIREMENTS OF RELEVANT AUTHORITIES & THEIR CONDITIONS OF CONSENT.

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| B | 18.01.2017 | jpb | jpb | FOR APPROVAL |
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ARCHITECTURAL APPROVAL — INITIALS: jpb — DATE: 30.01.17

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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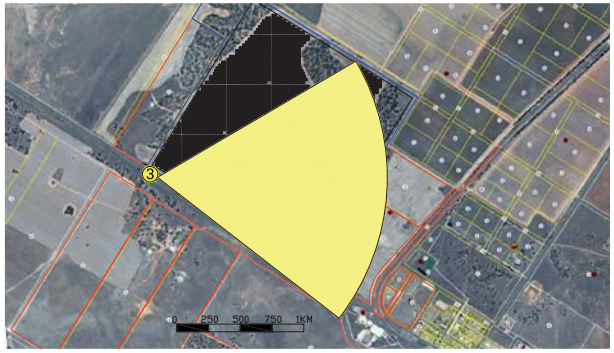
Fx. (02) 6393 5050

NOMINATED ARCHITECTS:
JAMES BUCKLEY, NSW ARB 8504
ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 03 EXISTING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A008 OF 07 | | |

# View Location 3 - VIEW WITH NO SCREENING

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| ARCHITECTURAL APPROVAL | INITIALS | DATE |
|---|---|---|
| | jpb | 18.01.17 |

APPROVAL AUTHORITY: NSW DEPARTMENT OF PLANNING

CLIENT: EPURON

PROJECT: NEVERTIRE SOLAR FARM

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NOMINATED ARCHITECTS:
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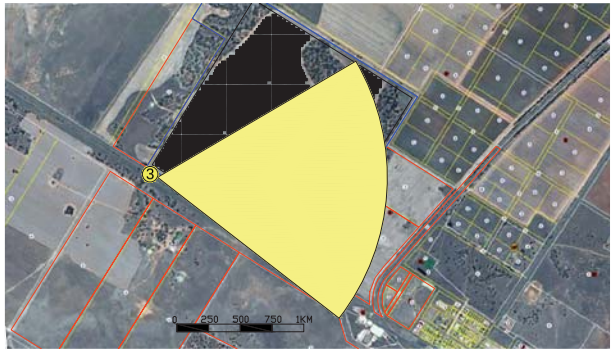
ANTHONY GRAY, NSW ARB 9425

DRAWING: VIEW 03 WITH NO SCREENING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A009 | OF 07 | |

# View Location 3 - VIEW WITH VEGETATION SCREENING

## Screening shrubs with heights of approximately 3-4m

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NOMINATED ARCHITECTS:
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DRAWING: VIEW 03 WITH VEGETATION SCREENING

| | | | |
|---|---|---|---|
| PROJECT NUMBER 217279 | DRAWING FILE 217279_01A_A01-A010.dwg | | |
| ORIGINAL SIZE A1 | A1 SCALE: 1:2 | A3 SCALE: 1:4 | SET 01 |
| IMAGE SOURCE GOOGLE EARTH, GOOGLE MAPS | | | |
| STATUS FOR APPROVAL | SHEET A010 | OF 07 | |

# APPENDIX D COMMUNITY FEEDBACK FORM QUESTIONS

# Nevertire Solar Farm

EPURON

## Community feed back form (Page 1 of 2)

**Your feedback is important to develop a solar farm project that best suits the local area and community.**
**Your feedback will ensure local concerns are understood by the developers and the environmental assessment team.**

**Your name:** (this will not be printed or recorded anywhere but is to ensure that we don't double count forms)

.....

**Select which answer best describes where you live:**

a) Less than 1 kilometre from the proposed solar plant
b) Less than 1-2 kilometres from the proposed solar plant
c) 2-5 kilometres from the proposed solar plant
d) More than 5 kilometres from the proposed solar plant
e) Not a member of the local community

**Tell us what you value about the local area:**
What do you value most about the local area? Circle one or more.

a) Views
b) Community / family ties
c) Historic values
d) Work opportunities
e) Recreation opportunities, including sporting, nature based etc.
f) Natural values
g) Other

Provide more detail about your answer:
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.....

**Which views or landscape characteristics in the region and local area are important to you?**
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.....

Provide more detail about your answer:
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.....

# Nevertire Solar Farm

EPURON

## Community feed back form (Page 2 of 2)

**Your feedback is important to develop a solar farm project that best suits the local area and community.**

**What do you like most about solar farms, generally?**

a) Renewable energy generation
b) Local economic opportunities – jobs, tourism, economic stimulus
c) Diversification of land use / income streams
d) Other

Discuss:

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.....
.....
.....

**What concerns do you have about solar farms, generally? Circle one or more.**

a) Community impacts
b) Visual impact
c) Noise, during construction or operation
d) Traffic, during construction or operation
e) Effects on land use or land values
f) Effects on recreation opportunities
g) Effects on natural areas and habitats
h) Other

**What specific concerns do you have about the solar farm proposed at Nevertire?**

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**Reflecting local values and character**

We would like the project to fit in with the local values and character of Nevertire. Can you suggest ways that we might achieve this? Ie – a competition to design the signage? Adopt a panel? Local viewing area?

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Epuron
Level 11, 75 Miller Street
North Sydney NSW
2060

info@epuron.com.au

# APPENDIX E PROPOSED ONSITE SCREENING

A vegetation buffer is part of the project description. A suggested location for the buffer is provided below, targeting specific sections of the project perimeter to mitigate medium visual impacts. Screening effectiveness would also be audited post construction and augmented if required.

Onsite plantings would be 1-3 rows deep and be located on the outside of the security fence, so that it breaks up views of the fencing as well as onsite infrastructure. The plant species to be used in the screen are recommended to be native, derived from the naturally occurring vegetation community in this area. They should be fast growing, with spreading habitat; heights of 3-4m would be sufficient to screen infrastructure but occasional higher species may be considered to achieve a more natural (less hedge like) effect. Species selection should be undertaken in consultation with affected near neighbours and a botanist or landscape architect.

Zone 1: dense planting, 2-3 rows mid and upper storey plantings

Zone 2: light planting, 1-2 rows mid and upper storey plantings