

The dark colour of the forested areas contrasts with both the lighter colours of the sky and areas of grassland in the foreground and mid distance views from the Marulan site. Distant views to discrete areas of rock outcrop are also visible in some elevated areas of the landscape to the south west of the Marulan site.

A small number of rural residential properties are located in the landscape surrounding the proposed Facilities. Most of the residences are not visually prominent from the Marulan site due to screening by surrounding undulating landform or the presence of trees around them. Visibility from residential properties was determined during the desktop studies and fieldwork carried out as part of the visual assessment process, although private property was not accessed during the fieldwork.

The landscape surrounding the proposed Facilities contains a number of built elements that contribute to the local visual character, and include:

- 330kV and 66kV overhead power lines, running parallel to the Canyonleigh Road corridor;
- TransGrid switchyard;
- A microwave communication tower;
- Local sealed and unsealed roads; and
- Residential dwellings and agricultural structures.

Key elements that combine to create the visual character of the area are illustrated in **Figure 2**, and in the photographs taken from a number of selected viewpoints.

### 3.2 Site Photographs

The following photographs illustrate existing views from a number of locations within the landscape surrounding the proposed Facilities, including views toward the existing TransGrid switchyard. The approximate location and direction of each photograph is illustrated in **Figure 1**.



**Photo Location 1** – View northeast from Canyonleigh Road on residential property boundary, with views toward the proposed construction footprint above tree line along river corridor.



**Photo Location 2** – View northeast from Canyonleigh Road on residential property boundary with views toward the proposed construction footprint above tree line along river corridor.



**Photo Location 3** – View east along Canyonleigh Road toward the existing TransGrid Marulan 330/132kV switchyard.



**Photo Location 4** – View west from Canyonleigh Road in the general direction of the proposed Facilities. Views toward the proposed Facilities are blocked by a combination of landform and vegetation.



**Photo Location 5** – View west from Canyonleigh Road along existing transmission line corridor. Views toward the proposed Facilities are blocked by a combination of landform and vegetation.



**Photo Location 6** – View west from Canyonleigh Road along existing transmission line corridor. Views toward the proposed Facilities are blocked by a combination of landform and vegetation.



**Photo Location 7** – View west to north west from Arthursleigh access track. View toward the proposed Facilities is generally blocked by a combination of landform and vegetation, although upper portions of taller structures, including the exhaust stacks, may be visible above the tree line.



**Photo Location 8** – View south from existing transmission line easement toward TransGrid switchyard.



**Photo Location 9** – View south to west from rocky outcrop to the north of the construction footprint within the Marulan site area. Tree line in foreground follows Wollondilly River corridor to the west of the Marulan site area.



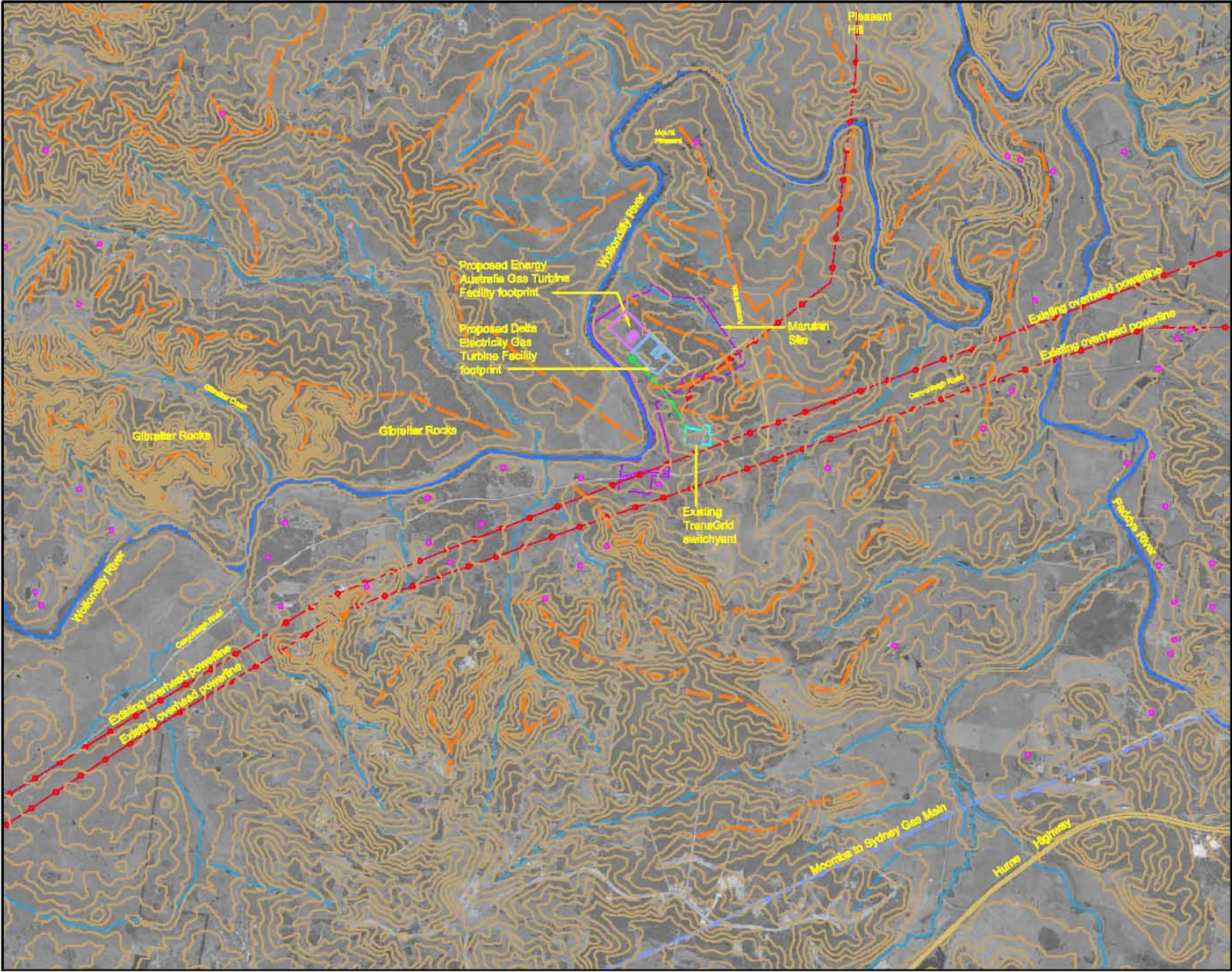
**Photo Location 10** – View south to south east from high point to the east of the Arthursleigh access track with existing transmission line crossing east to west in middle distance. Views toward existing rural residences generally screened by surrounding vegetation.

### 3.3 Landform

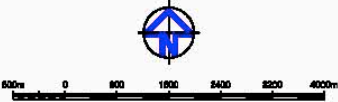
Landform patterns are a significant influence on the extent to which the proposed Facilities, transmission lines and associated infrastructure may be visible from surrounding areas. Landform patterns are illustrated in **Figure 3**, and the key aspects summarised below:

- The proposed Facilities would be located to the west of a gently sloping low ridgeline falling north west from around 626m AHD to the Wollondilly River corridor at around 590m AHD.
- Land immediately surrounding the Marulan site is characterised by a series of ridges, gullies and the Wollondilly River corridor. A prominent ridgeline falling from around the RL650m contour runs north south along the access track leading to the Mount Pleasant residence, with a number of smaller ridgelines and spurs branching off to the northeast and northwest of the ridgeline.





NOTE:  
Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.



- LEGEND**
- MARULAN SITE AREA
  - NOTED DELTA ENERGY GAS TURBINE FACILITY INDICATIVE FOOTPRINT
  - NOTED ENERGY AUSTRALIA GAS TURBINE FACILITY INDICATIVE FOOTPRINT
  - NOTED PROPOSED OVERHEAD POWERLINE
  - EXISTING RESIDENTIAL BUILDING OR OTHER BUILT STRUCTURE
  - EXISTING OVERHEAD POWERLINE
  - NOTED MOOMBA TO SYDNEY GAS MAIN - EXISTING
  - RIDGELINES AND SPURS
  - GROUND SURFACE CONTOURS
  - RIVER, CREEK OR GULLY DRAINAGE LINE

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**GREEN BEAN DESIGN**  
*landscape architects*

PO BOX 5173,  
ALBURY, NSW 2170

MOB: 0436 989 986

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LANDFORM AND DRAINAGE

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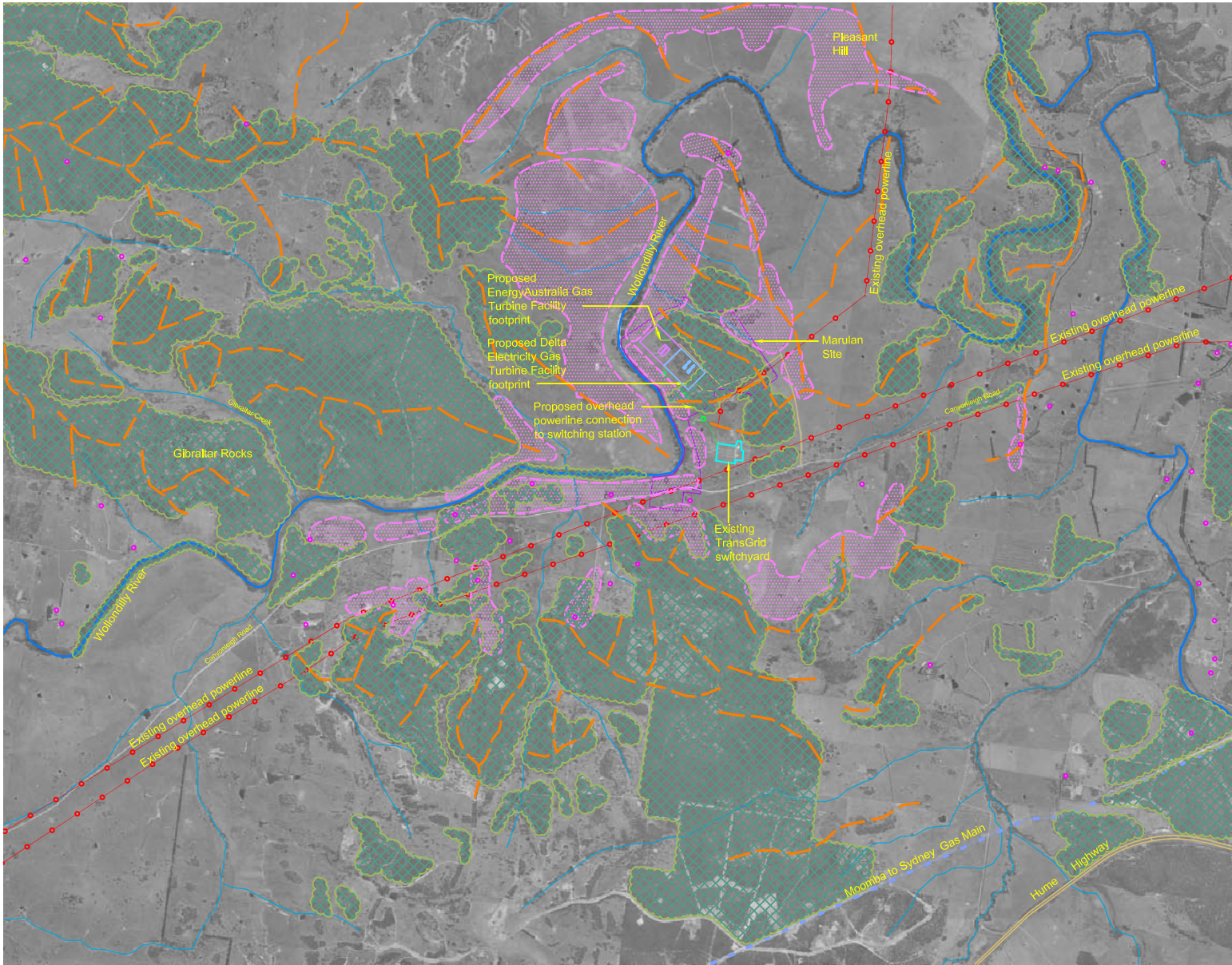
- Landform between the ridgelines forms a number of gullies that act as tributaries to the Wollondilly River.
- The Wollondilly River follows a meandering route to the west and north of the site. Views from surrounding areas toward the river corridor are generally obscured by mature trees along the river embankments and landform adjacent to the river corridor.
- The proposed transmission line route would generally follow the 598m AHD contour to the south east of the construction footprint. The transmission line would cross a gulley and small spur before connecting to the TransGrid switchyard.

### 3.4 View Catchment

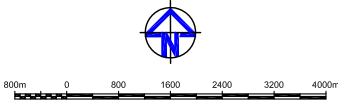
The potential view catchment is illustrated in **Figure 4** and key visibility aspects summarised by the following points:

- The majority of the potential view catchment is generally restricted to local views within the Arthursleigh property and to areas of land to the south and south west of the Facilities located between the Wollondilly River and Canyonleigh Road.
- The view catchment will include potential views toward the exhaust stacks as well as other structures within the Facilities, including the proposed transmission line.
- Views toward some of the proposed Facilities structures may also occur from a small number of surrounding view locations on elevated ground to the south of Canyonleigh Road, although the majority of these would occur from vacant rural land and in a small number of instances from land surrounding residences.
- The proposed Facilities are unlikely to be directly visible to motorists travelling along the Canyonleigh Road. Indirect views toward the Marulan site are partially screened by a combination of landform and vegetation alongside the road corridor, although there will be some potential for indirect views toward the Facilities through gaps in roadside vegetation.
- Trees and undulating landform generally block potential views from residential properties to the west of the proposed Facilities, although a small area of land on a ridgeline to the west of the site was identified as having a potential view toward the Marulan site. Views from this location would generally be restricted to the upper portions of the Facilities structures.
- There were no dedicated public lookouts identified in the immediate area that would have views to the proposed Facilities.





NOTE:  
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LEGEND

MARULAN SITE AREA

NOTED  
DELTA ENERGY GAS TURBINE FACILITY INDICATIVE FOOTPRINT

NOTED  
ENERGY AUSTRALIA GAS TURBINE FACILITY INDICATIVE FOOTPRINT

NOTED  
PROPOSED OVERHEAD POWERLINE

NOTED  
EXISTING TRANSGRID SWITCHYARD

EXISTING RESIDENTIAL BUILDING OR OTHER BUILT STRUCTURE

EXISTING OVERHEAD POWERLINE

NOTED  
MOOMBA TO SYDNEY GAS MAIN - EXISTING

RIDGELINES AND SPURS

VEGETATION

RIVER, CREEK OR GULLY DRAINAGE LINE

POTENTIAL VIEW CATCHMENT

A

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GREEN BEAN DESIGN

landscape architects

PO BOX 3178

AUSTRAL, NSW 2179

MOB: 0430 599 995

PROJECT

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Marulan Gas Turbine Facilities

TITLE

POTENTIAL VIEW CATCHMENT

Figure 4

DATE:

03/04/08

DRAWN/CHECKED:

AH

### 4.1 Introduction

The potential visual impact of the proposed Facilities may result primarily from a combination of the following factors:

- The level of visibility or extent to which proposed structures would be visible from surrounding areas; and
- The degree of visual contrast between the proposed Facilities structures and the landscape surrounding the Marulan site area that would form a background and would be visible from surrounding view locations.

The potential visual impact from a particular view location is strongly dependent on the level of visibility from that location, which in turn is dependent on a number of criteria that are defined in **Table 1**.

### 4.2 Assumptions

The key assumptions used in this assessment are summarised below:

- The proposed Facilities would be built on a generally level platform formed by cut and fill operations. The platform would be constructed at around the 605m AHD contour; this level will be refined at the detailed design stage.
- The gas turbine exhaust stacks would be the tallest built elements of the Facilities. The physical appearance of the Delta Electricity exhaust stacks may be altered by the construction of additional infrastructure as part of the Stage 2 Combined Cycle Facility.
- The Delta Electricity Stage 2 Combined Cycle Facility will also include the construction of an air cooled condenser which will extend to a height around 637m AHD.
- The proposed transmission line route would generally follow the 598m AHD contour to the south east of the construction footprint. The transmission line would cross a gully and small spur before connecting to the TransGrid switchyard.

### 4.3 Visibility

Visibility is a measure of the extent to which particular structures of the proposed Facilities will be visible from surrounding areas, the relative number of viewers, the period of the view, view distance and context of the view.

The underlying rationale for this component of the visual assessment is that, if any part of the proposed Facilities and associated infrastructure is not visible from a particular area then the potential visual impact will be nil. Similarly, if the number of people who would potentially see any part of the proposed Facilities and associated infrastructure is low, then the visual impact would be low compared to a situation in which a large number of people have the



same view. Distance is a strong influence on visibility as the proportion of the total view occupied by the structure decreases with distance and atmospheric effects reduce the visual contrast between the structure and the surrounding landscape.

The gas turbine structures are generally aligned in an east-west direction. Consequently there would be some degree of mutual screening of structures in views from the west, and some partial mutual screening of views from the south west.

#### 4.4 Visual Contrast

Visual contrast between the proposed Facilities and the background against which they are viewed determines the capacity of the existing landscape setting to visually absorb the new structures without creating a significant change in visual character or producing a reduction in visual quality of the landscape. The capacity to absorb new development is dependent on existing structures, vegetation cover and landform.

At a distance, atmospheric effects could reduce the level of visual contrast between the proposed Facilities and the landscape setting in which they are viewed. The reduced visual contrast could result in a lower level of visual impact. If the main built elements of the proposed Facilities were dark in tone and non-reflective then the visual contrast may be further reduced.

#### 4.5 Visual Assessment Criteria

The potential visual impact of the proposed Facilities from key view locations has been assessed against the criteria described in **Table 1**.

Table 1 Visibility Criteria

| Criteria                 | Definition             |
|--------------------------|------------------------|
| <i>Number of Viewers</i> |                        |
| High                     | >1000 people per day   |
| Moderate                 | 500-1000people per day |
| Low                      | 250-500 people per day |
| Very Low                 | <250 people per day    |
| <i>View Distance</i>     |                        |
| Long                     | >2km                   |
| Medium                   | 1km – 2km              |
| Short                    | 500m – 1km             |
| Very short               | <500m                  |
| <i>Period of View</i>    |                        |
| Long term                | >120 minutes           |
| Moderate term            | 1-120 minutes          |
| Short term               | <1minute               |

The levels of visibility resulting from various combinations of the above criteria are listed in **Table 2**.

Table 2 Visibility Criteria Matrix

|                         | Long Distance |   |   | Medium Distance |   |   | Short Distance |   |   | Very Short Distance |   |   |
|-------------------------|---------------|---|---|-----------------|---|---|----------------|---|---|---------------------|---|---|
| Period of View          | L             | M | S | L               | M | S | L              | M | S | L                   | M | S |
| High No. of Viewers     | M             | L | L | H               | M | M | H              | H | M | H                   | H | H |
| Medium No. of Viewers   | L             | L | L | M               | M | L | H              | M | M | H                   | H | M |
| Low No. of Viewers      | L             | L | L | M               | L | L | M              | M | L | H                   | M | L |
| Very Low No. of Viewers | L             | L | L | L               | L | L | L              | L | L | M                   | L | L |

- **Period of View** L=long, M=moderate, S=short
- **Levels of visibility** L=low, M=medium and H=high (The visibility level from view locations where no view toward either Facility is determined and recorded as Nil).

#### 4.6 Visibility Matrix

**Table 3** presents the results of the visibility assessment from the various potential view locations identified during the field inspection. The potential view locations are illustrated in **Fig 5**.

Table 3 Visibility Matrix

| VIEW LOCATION                           | APPROXIMATE DISTANCE TO SITE | CATEGORY OF VIEWER | APPROX. PERIOD OF VIEW | RELATIVE No. OF VIEWERS | LEVEL OF VISIBILITY                                                                                                                                                                                            | VISIBILITY RATING |
|-----------------------------------------|------------------------------|--------------------|------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>R 1 to R 10</b><br>Rural residences  | Long                         | Residents          | Moderate to Long term  | Very Low                | Views east from residences toward the proposed Facilities are blocked by a combination of landform and vegetation.                                                                                             | Nil               |
| <b>R 11 to R 13</b><br>Rural residences | Long                         | Resident           | Moderate to Long term  | Very Low                | Views east and northeast from residences toward the proposed Facilities are blocked by a combination of landform and vegetation.                                                                               | Nil               |
| <b>R 14.</b><br>Rural residence         | Long                         | Resident           | Moderate to Long term  | Very Low                | Elevated views from residential property on hillside southwest of proposed Facilities. Views from residences toward the proposed facilities may be partially screened by vegetation surrounding the residence. | Low               |
| <b>R 15 to R 17</b>                     | Long                         | Resident           | Moderate to            | Very Low                | Views northeast from                                                                                                                                                                                           | Nil               |

| VIEW LOCATION                         | APPROXIMATE DISTANCE TO SITE | CATEGORY OF VIEWER | APPROX. PERIOD OF VIEW | RELATIVE No. OF VIEWERS | LEVEL OF VISIBILITY                                                                                                                                                                                           | VISIBILITY RATING |
|---------------------------------------|------------------------------|--------------------|------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Rural residences                      |                              |                    | Long term              |                         | residences toward the proposed Facilities generally blocked by a combination of landform and vegetation.                                                                                                      |                   |
| <b>R 18</b><br>Rural residence        | Long                         | Resident           | Moderate to Long term  | Very Low                | View northeast from residence toward proposed Facilities generally blocked by a combination of landform and vegetation.                                                                                       | Low               |
| <b>R 19</b><br>Rural residence        | Long                         | Resident           | Moderate to Long term  | Very Low                | Elevated views from residential property on hillside southwest of proposed Facilities. Views from residence toward the proposed facilities may be partially screened by vegetation surrounding the residence. | Medium            |
| <b>R 20 to R21</b><br>Rural residence | Medium                       | Resident           | Moderate to Long term  | Very Low                | Views north from residences toward proposed Facilities are blocked by a combination of landform and trees.                                                                                                    | Nil               |
| <b>R 22</b><br>Rural residence        | Medium                       | Resident           | Moderate to Long term  | Very Low                | Generally short distance views to the north and northeast from rear of residence including views to proposed Facilities.                                                                                      | High              |
| <b>R 23</b><br>Rural residence        | Medium                       | Resident           | Moderate to Long term  | Very Low                | Generally short distance views north and northeast from residence toward proposed Facilities. Views from residence are partially screened by existing trees.                                                  | High              |
| <b>R 24</b><br>Rural residence        | Medium                       | Resident           | Moderate to Long term  | Very Low                | Views north from residence toward proposed Facilities are blocked by a combination of landform and trees.                                                                                                     | Low               |
| <b>R 25</b><br>Rural residence        | Long                         | Resident           | Moderate to Long term  | Very Low                | View northwest from residence toward proposed Facilities is generally blocked by a combination of landform and trees. Potential view to upper portion of exhaust stacks from within limited areas property.   | Low               |

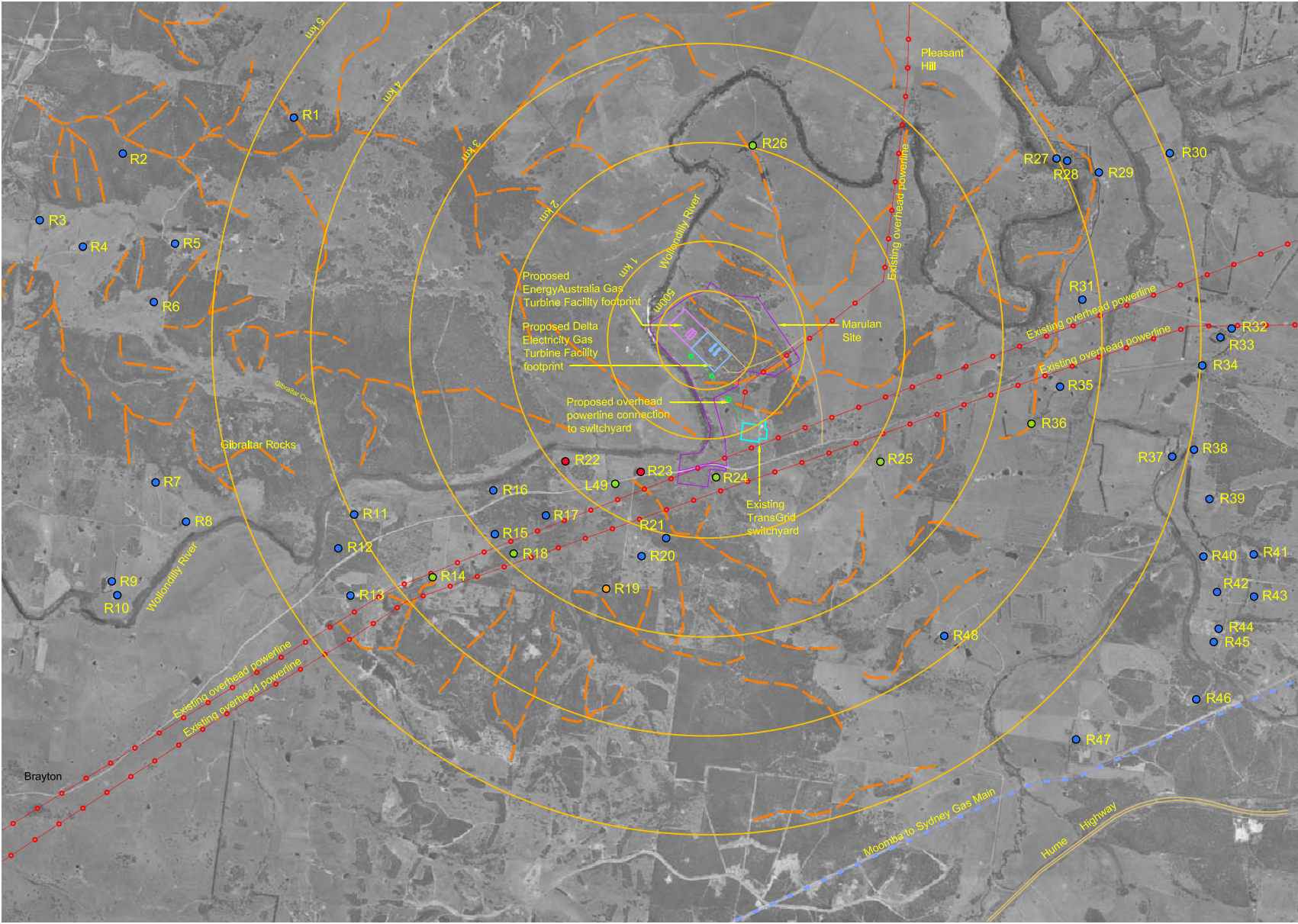


| VIEW LOCATION                           | APPROXIMATE DISTANCE TO SITE | CATEGORY OF VIEWER | APPROX. PERIOD OF VIEW | RELATIVE No. OF VIEWERS | LEVEL OF VISIBILITY                                                                                                                                                                                        | VISIBILITY RATING |
|-----------------------------------------|------------------------------|--------------------|------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>R 26</b><br>Rural residence          | Medium to Long               | Resident           | Moderate to Long term  | Very Low                | View southwest from residence toward Facilities is partially screened by a combination of landform and trees. Potential view toward proposed Facilities from areas of the property south of the residence. | Low               |
| <b>R 27 to R 35</b><br>Rural residences | Long                         | Resident           | Moderate to Long term  | Very Low                | Views southwest to west from residences toward proposed Facilities generally blocked by a combination of landform and vegetation.                                                                          | Nil               |
| <b>R 36</b><br>Rural residence          | Long                         | Resident           | Moderate to Long term  | Very Low                | View north west from residence toward proposed Facilities is generally blocked by a combination of landform and vegetation. Possible distant view toward upper portions of exhaust stacks.                 | Low               |
| <b>R 37 to R48</b><br>Rural residence   | Long                         | Resident           | Moderate to Long term  | Very Low                | View west to north west from residences toward proposed Facilities generally blocked by a combination of landform and vegetation.                                                                          | Nil               |
| <b>L 49</b><br>Canyonleigh Road         | Medium to Long               | Motorist           | Short term             | Low                     | View from road corridor north and northeast toward proposed Facilities generally restricted to indirect views through gaps in roadside vegetation.                                                         | Low               |

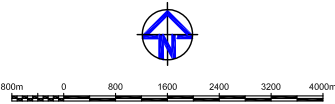
## 4.7 Summary of Visibility Assessment

A total of 49 view locations were identified as part of the visual assessment process, and included views from:

- Residential properties;
- Vacant/rural land;
- Public road corridors (motorists); and
- Private access roads.



NOTE:  
Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.



LEGEND

MARULAN SITE AREA

NOTED

DELTA ENERGY FACILITY INDICATIVE FOOTPRINT

NOTED

ENERGY AUSTRALIA FACILITY INDICATIVE FOOTPRINT

NOTED

PROPOSED OVERHEAD POWERLINE

R21

VIEW LOCATION WITH HIGH VISIBILITY RATING

R18

VIEW LOCATION WITH MEDIUM VISIBILITY RATING

R23

VIEW LOCATION WITH LOW VISIBILITY RATING

R19

VIEW LOCATION WITH NIL VISIBILITY RATING

EXISTING OVERHEAD POWERLINE

NOTED

MOOMBA TO SYDNEY GAS MAIN - EXISTING

RIDGELINES AND SPURS

INDICATIVE CADASTRAL BOUNDARIES

R

POTENTIAL VIEW LOCATION (RESIDENTIAL)

L

POTENTIAL VIEW LOCATION (ROAD)

DISTANCE MARKER

|       |                    |          |
|-------|--------------------|----------|
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**GREEN BEAN DESIGN**  
*landscape architects*

PO BOX 3178, AUSTRAL, NSW 2179 MOB: 0430 599 995

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DELTA ELECTRICITY & ENERGYAUSTRALIA  
Marulan Gas Turbine Facilities

TITLE  
POTENTIAL VIEW LOCATIONS

Figure 5

|                   |                      |
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An assessment of the visibility rating for each view location indicated that:

- 39 of the 49 view locations have been determined to have a **NIL** visibility rating;
- 7 of the 49 view locations has been determined to have a **LOW** visibility rating;
- 1 of the 49 view locations has been determined to have a **MEDIUM** visibility rating; and
- 2 of the 49 view locations have been determined to have a **HIGH** visibility rating.

The majority of view locations were determined to have **Nil** visibility rating (no view to the proposed Facilities), although one view location (R19) was determined to have a **Medium** visibility rating, and seven view locations were determined to have a **Low** visibility rating, and included a potential partial view to the proposed Gas Turbine Facilities from rural land surrounding residences.

Two view locations (R22 and R23) were determined to have a **High** visibility rating. The visibility criteria (outlined in **Table 1**) applied to these view locations indicated a potential **Low** visibility rating, (medium distance view, long term view and very low number of viewers), however these view locations were considered to have a relatively confined view toward the proposed Facilities due to the influence local landform and vegetation, and therefore the proposed Facilities would potentially have a greater degree of visibility in the overall view available from areas surrounding each view location. The residential category of the visual receptor has also been taken into account is the determination of a **High** visibility rating for these view locations, as views from residential properties are considered to have a greater degree of sensitivity than other categories of receptors such as motorists.

A development application has recently been lodged to construct a single dwelling on the location of R23 (identified on Figure 5). The visual assessment was based on an approximate position of the proposed dwelling on the site.

### 5.1 Indicative Cross-Sections

In order to illustrate the potential extent to which portions of the proposed Facilities may be visible, a series of indicative cross-sections were prepared extending from a number of view locations to the proposed Facilities. The locations of the indicative cross sections include:

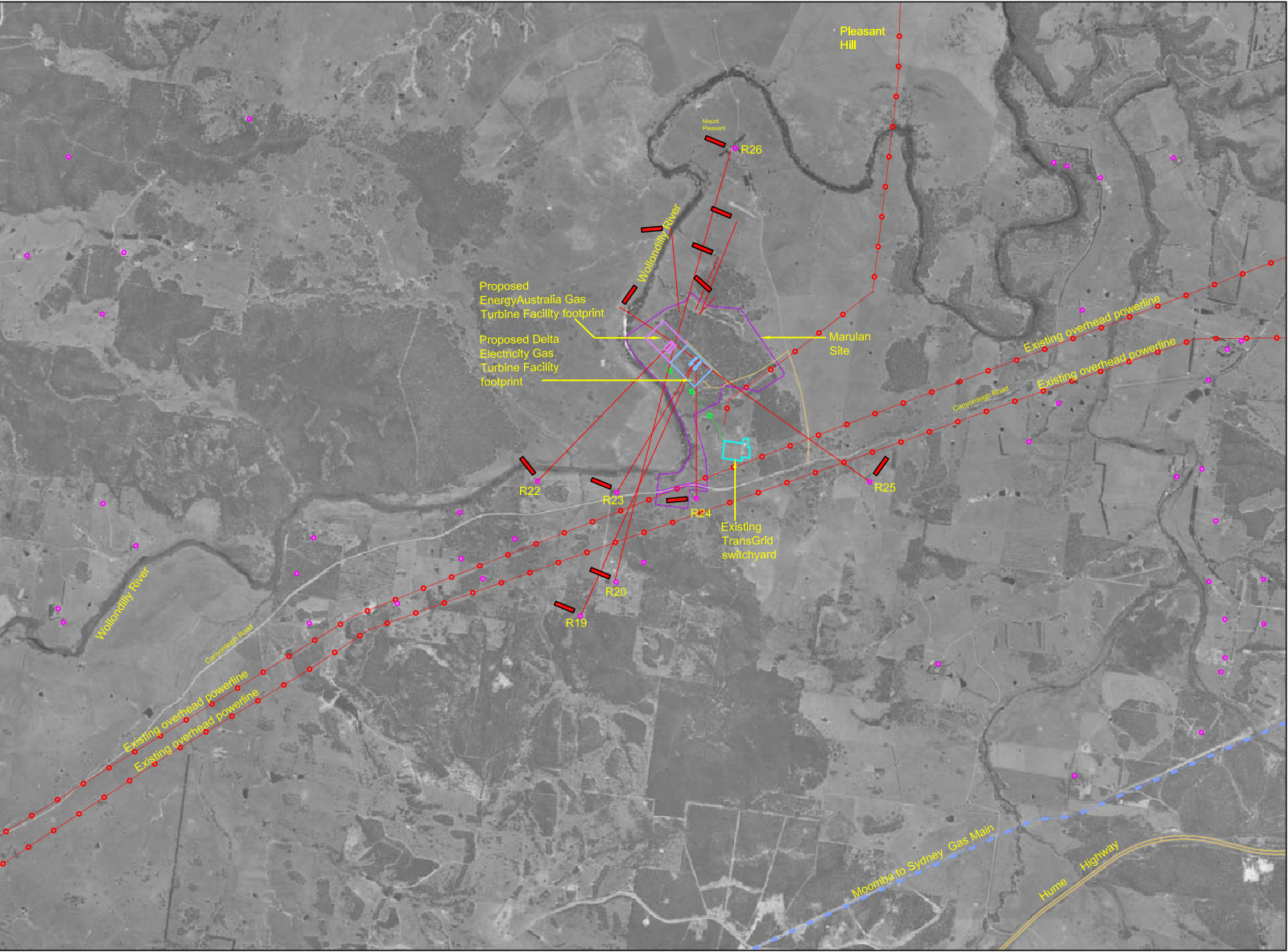
- R19 from rural residential property;
- R20 and R26 from rural residential property;
- R22 from rural residential property;
- R23 from rural residential property;
- R24 from rural residential property; and
- R25 from rural residential property.

The indicative cross section locations are illustrated in **Figure 6**. The indicative cross-sections, which are illustrated in **Figures 7 to 12**, are drawn with the same horizontal and vertical scales and therefore do not include any vertical exaggeration.

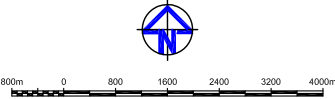
The indicative cross sections illustrate the relative scale of the exhaust stacks within the landscape. The reduction in relative scale results from the distances from some of the view locations.

The indicative cross sections also illustrate potential view lines from residential properties toward the proposed Facilities that may be blocked by undulating landform and tree cover that surrounds the Marulan site.





NOTE:  
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LEGEND



MARULAN SITE AREA



DELTA ENERGY GAS TURBINE FACILITY INDICATIVE FOOTPRINT



ENERGY AUSTRALIA GAS TURBINE FACILITY INDICATIVE FOOTPRINT



CROSS SECTION LOCATION



CROSS SECTION DIRECTION



EXISTING TRANSGRID SWITCHYARD



PROPOSED OVERHEAD POWERLINE



EXISTING OVERHEAD POWERLINE



MOOMBA TO SYDNEY GAS MAIN - EXISTING



EXISTING RESIDENTIAL BUILDING OR OTHER BUILT STRUCTURE

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GREEN BEAN DESIGN

landscape architects

PO BOX 3178,  
AUSTRAL, NSW 2179

MOB: 0430 599 995

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Marulan Gas Turbine Facilities

TITLE

INDICATIVE CROSS SECTION  
LOCATIONS

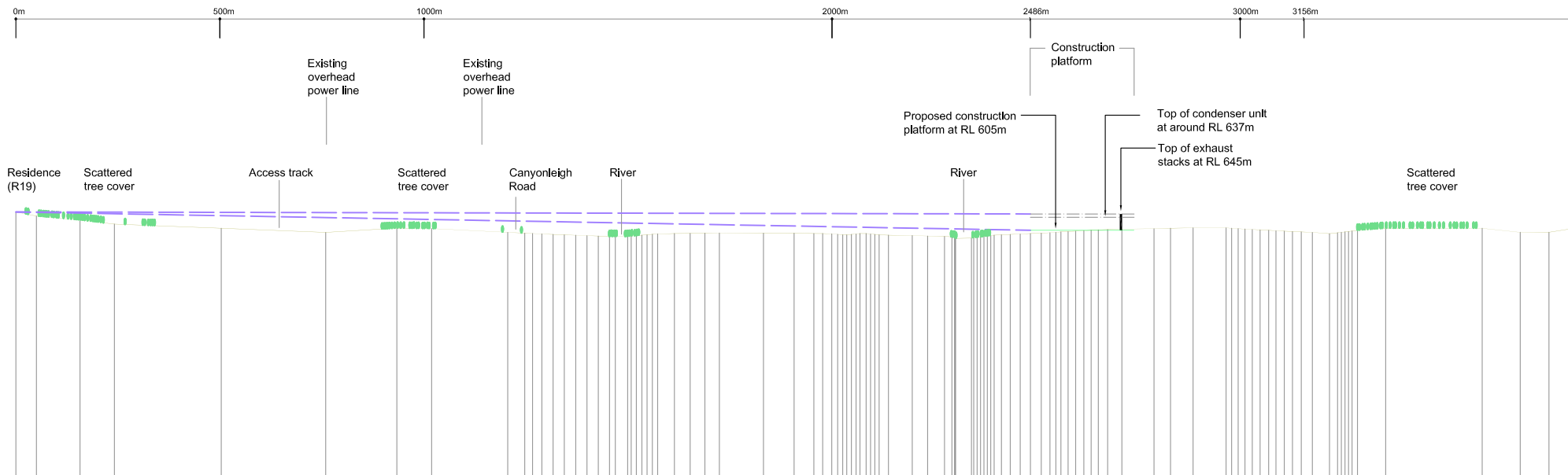
Figure 6

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Cross Section R19

**NOTE:**  
Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.

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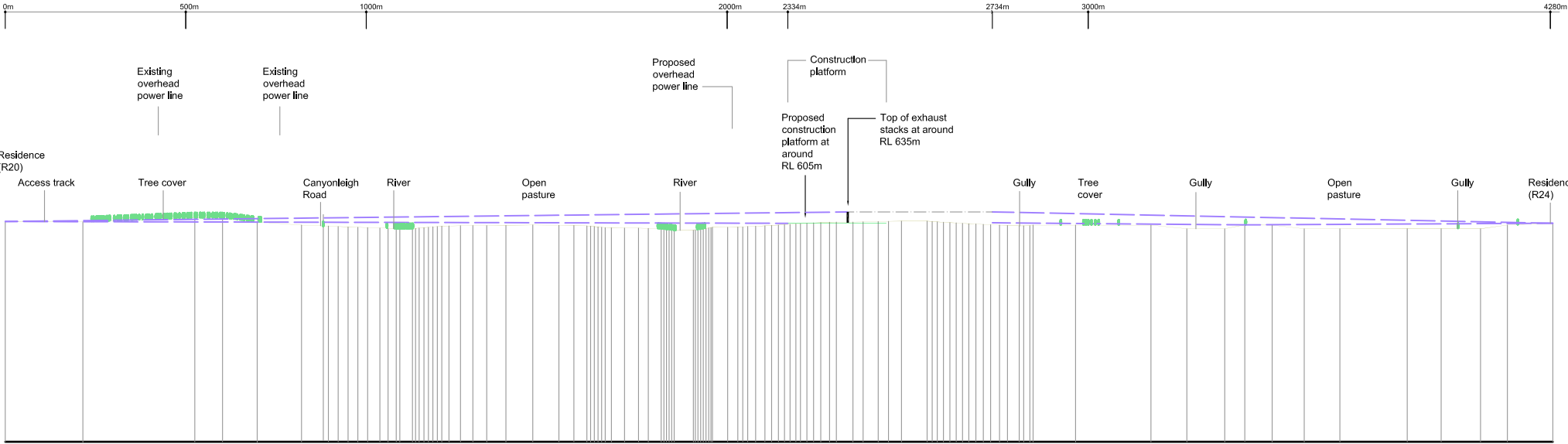
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TITLE  
CROSS SECTION R19

**Figure 7**

|                   |                      |
|-------------------|----------------------|
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Cross Section R20 & R26

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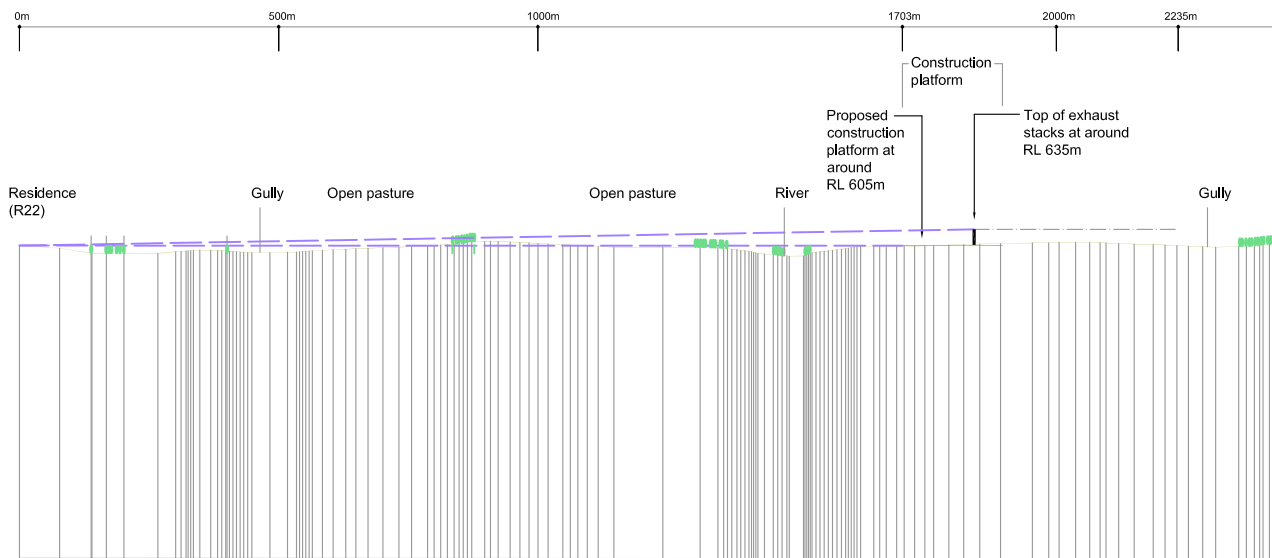
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Marulan Gas Turbine Facilities

TITLE  
CROSS SECTION R20 & R26

|                   |                      |
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Cross Section R22

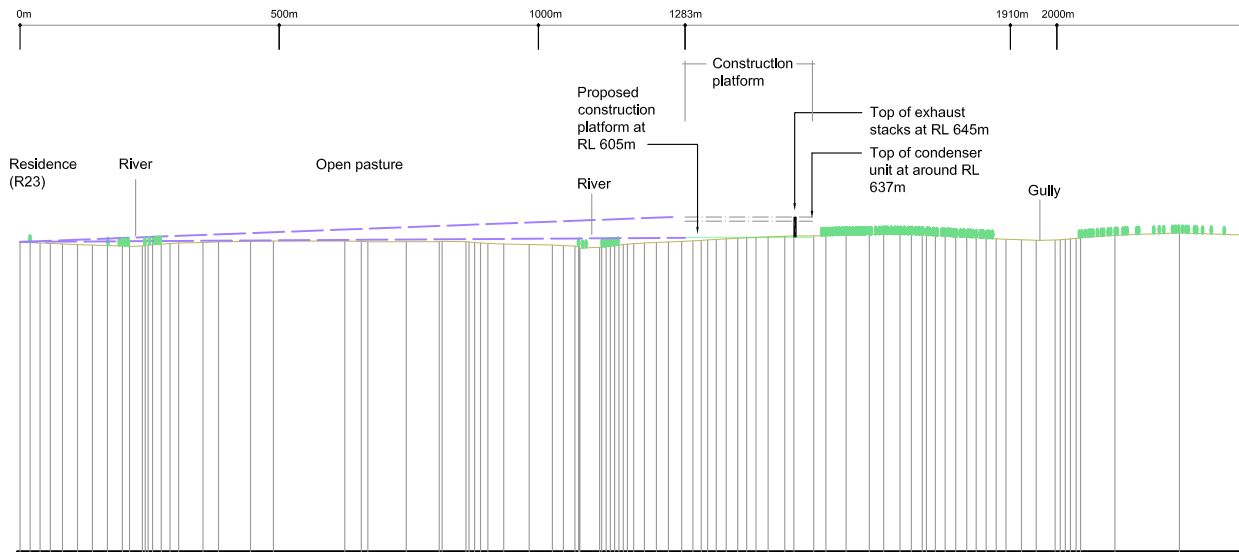
NOTE:  
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| PROJECT<br>DELTA ELECTRICITY & ENERGY AUSTRALIA<br>Marulan Gas Turbine Facilities |                    |                   |
| TITLE                                                                             |                    |                   |
| CROSS SECTION R22                                                                 |                    |                   |

Figure 9

|                   |                      |
|-------------------|----------------------|
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Cross Section R23

NOTE:  
Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.

|       |                    |          |
|-------|--------------------|----------|
| A     | FINAL              | 03-04-08 |
| ISSUE | REVISION/AMENDMENT | DATE     |

**GREEN BEAN DESIGN**  
*l a n d s c a p e   a r c h i t e c t s*

PO BOX 3178,  
AUSTRAL, NSW 2179

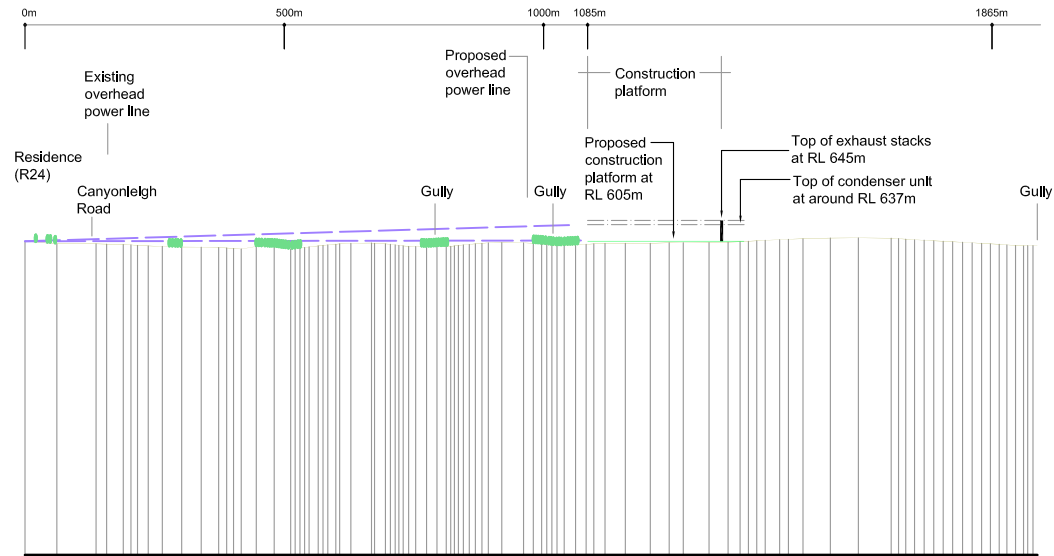
MOB: 0430 599 995

PROJECT  
DELTA ELECTRICITY & ENERGY AUSTRALIA  
Marulan Gas Turbine Facilities

TITLE  
CROSS SECTION R23

**Figure 10**

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



Cross Section R24

NOTE:  
Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.

|       |                    |          |
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| ISSUE | REVISION/AMENDMENT | DATE     |

**GREEN BEAN DESIGN**  
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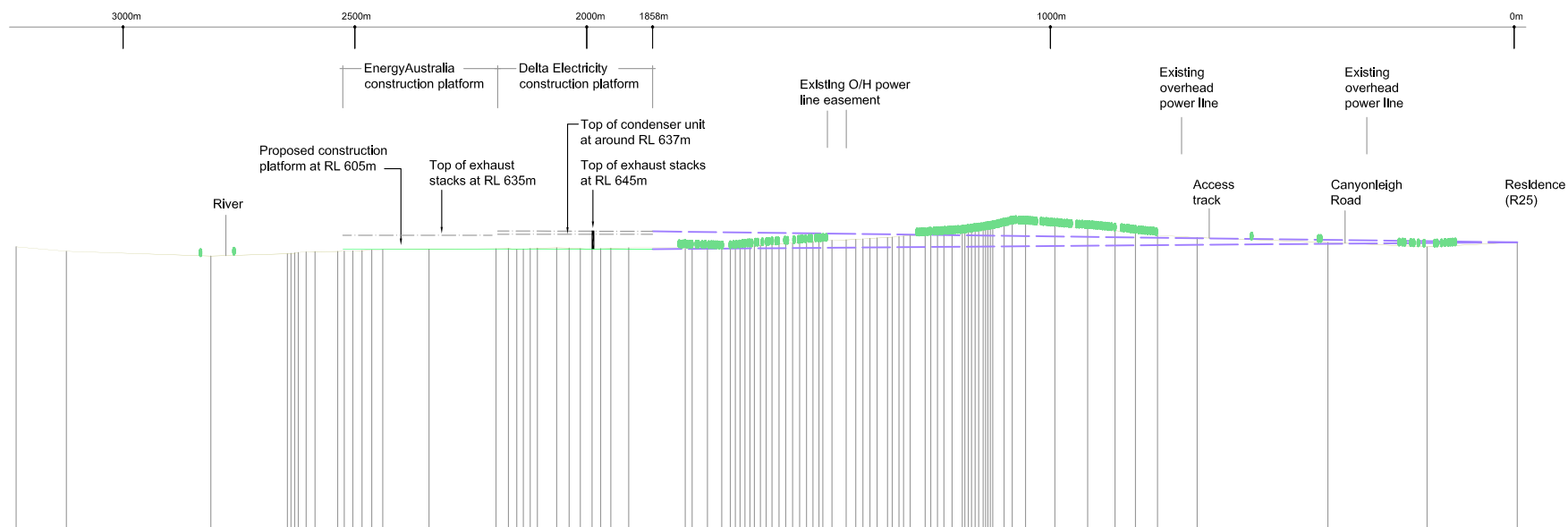
PO BOX 3178, AUSTRAL, NSW 2179 MOB: 0430 599 995

PROJECT  
DELTA ELECTRICITY & ENERGY AUSTRALIA  
Marulan Gas Turbine Facilities

TITLE  
CROSS SECTION R24

**Figure 11**

|                   |                      |
|-------------------|----------------------|
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Cross Section R25

**NOTE:**

Roads, boundaries and buildings have not been surveyed. All base information obtained from aerial photography and is not survey accurate.

|       |                    |          |
|-------|--------------------|----------|
| A     | FINAL              | 03-04-08 |
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 DELTA ELECTRICITY & ENERGYAUSTRALIA  
 Marulan Gas Turbine Facilities

TITLE  
 CROSS SECTION R25

**Figure 12**

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

### 6.1 Visual Simulations

In order to illustrate how the proposed Facilities may appear following construction, visual simulations were prepared from residential view locations R22 and R23. The visual simulation from R23 was prepared from the approximate location of the proposed dwelling as directed by the property owner.

The visual simulations were generated through the following steps:

- Photographs were taken from each of the view simulation locations and recorded with GPS coordinate data.
- A digital SLR at 50mm focal length camera was used to take the photographs, as this is generally accepted as most closely representing the primary view cone of the human eye.
- AutoCAD and 3d Studio Max were used for modelling visually significant components of the proposed structures, view locations (camera position), and surrounding digital terrain.
- The digital photographs were matched with the 3D model in 3D Studio Max software using camera angle location and direction as well as reference objects in the photographs. Lighting, material editing and surface rendering were also undertaken in 3DS Max.
- Finally the images were imported to Adobe Photoshop for final surface texturing to place the proposed structures within the context of the foreground and background elements of the photographs.

The visual simulations are illustrated in **Figure 13 and 14**.

The field of view for each visual simulation photograph generally exceeds that of the binocular field of view for the average human eye (around 124 degrees) and in some images includes areas of peripheral vision.

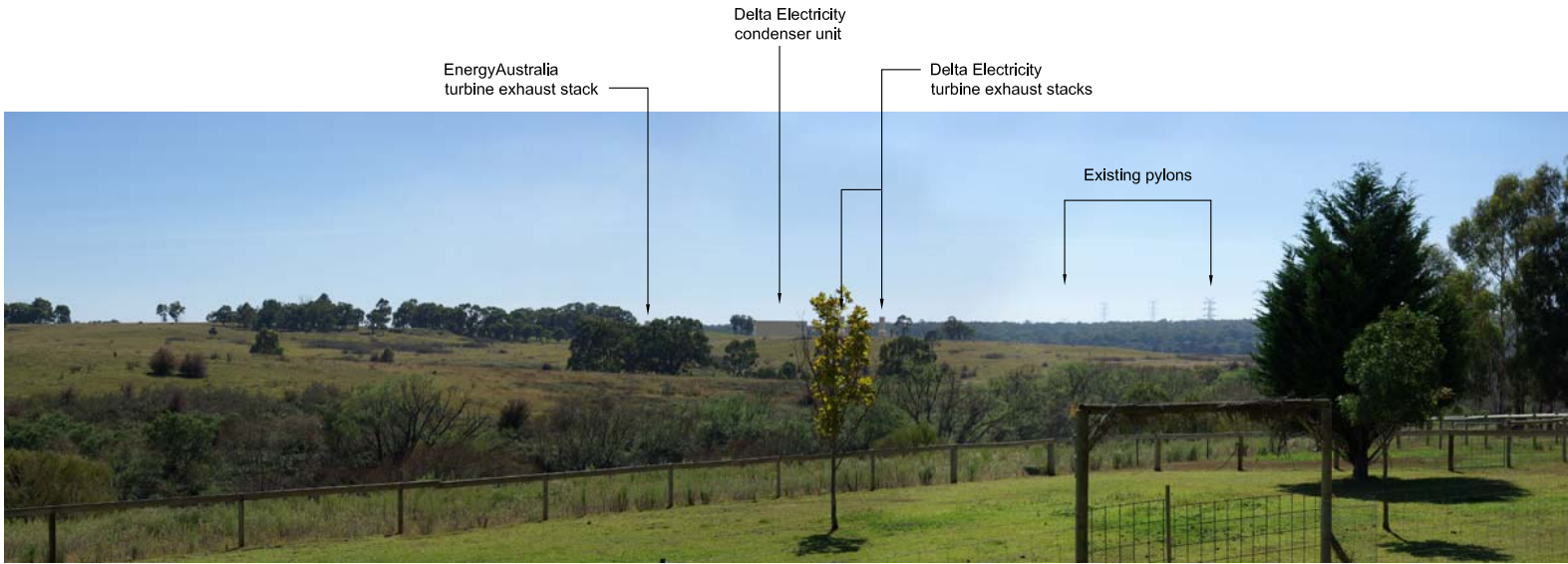
### 6.2 Summary of visual simulations

The visual simulation illustrated in **Figure 13** indicates that some portions of the proposed Facilities will be visible from the north side of residence R22. Views toward the Facilities will generally occur from a veranda around the north and east sections of the residence, as well as from some areas of the lawn below the veranda.

Some structures within the lower portions of the Facilities will be screened by a ridgeline falling south east toward the river, although the upper portions of the Delta Electricity exhaust stacks and Stage 2 condenser unit will be visible generally against a backdrop of trees, with a partial section of these elements visible above the horizon.



Existing View from R22- North facing verandah



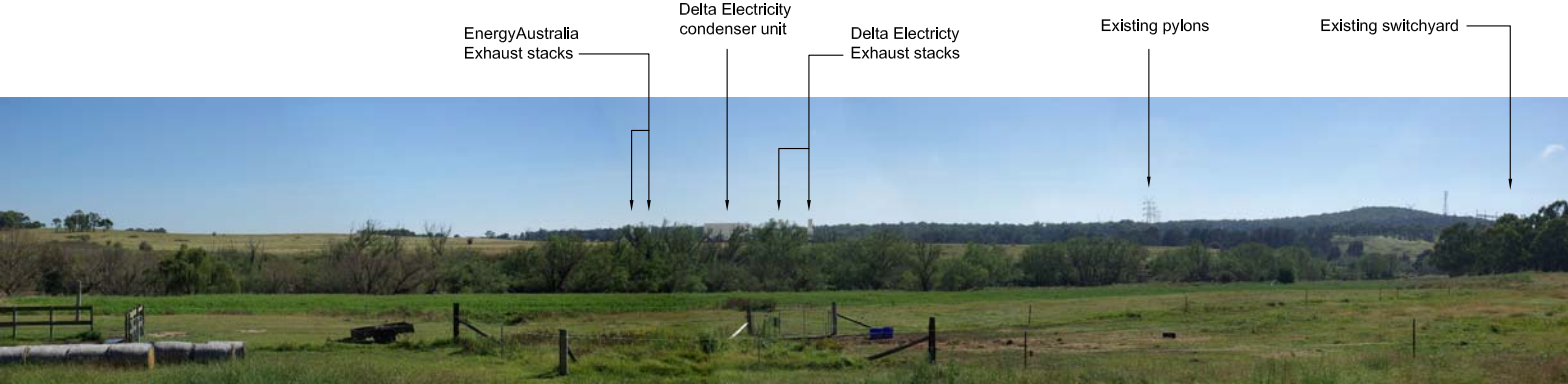
Proposed View from R22 - North facing verandah

|                                                                                  |                      |                   |
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| PROJECT<br>DELTA ELECTRICITY & ENERGYAUSTRALIA<br>Marulan Gas Turbine Facilities |                      |                   |
| TITLE<br>VISUAL SIMULATION R22                                                   |                      |                   |
| <b>Figure 13</b>                                                                 |                      |                   |
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Existing View from R23 - Location of proposed dwelling



Proposed View from R23 - Location of proposed dwelling

|                                                                                  |                      |                   |
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| <b>GREEN BEAN DESIGN</b><br><i>l a n d s c a p e   a r c h i t e c t s</i>       |                      |                   |
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| TITLE<br>VISUAL SIMULATION R23                                                   |                      |                   |
| <b>Figure 14</b>                                                                 |                      |                   |
| DATE:<br>03/04/08                                                                | DRAWN/CHECKED:<br>AH |                   |

The EnergyAustralia Facility will be largely screened by a combination of landform and vegetation, the upper portions of the exhaust stacks will be visible from some sections of the veranda.

The juvenile Plane tree, planted in the lawn area below the veranda, may increase in size over the long term, and screen the majority of the Delta Electricity Facility. However, as the Plane tree is a deciduous species it will lose its leaves through autumn and winter and provide a lesser degree of screening throughout the winter season.

The visual simulation illustrated in **Figure 14** indicates that portions of the proposed Facilities will be visible from the general development envelope of the proposed dwelling at view location R23. Views toward the Facilities will generally occur from the north facing sections of the proposed dwelling.

Some structures within the lower portions of the Facilities will be screened by a ridgeline falling south east toward the river together with trees along the river corridor. The majority of trees along the river in the foreground view are willow trees and will lose their leaves during the autumn and winter months, and therefore provide a lesser degree of screening at certain times of the year.

The upper portions of the Delta Electricity exhaust stacks and Stage 2 condenser will be generally visible against a backdrop of trees, with a partial section of these elements visible above the horizon. The upper portions of the EnergyAustralia Facility will be partially visible through tree foliage, and will extend to around the same height of the trees beyond the Facility.

# Mitigation Measures

## SECTION 7

### 7.1 Mitigation Measures

While the overall potential visual impact of the proposed Facilities has been assessed as **Medium**, the following mitigation measures may potentially reduce the level of visual impact.

The indicative mitigation measures involve a combination of screening of views and reducing the visual contrast between the visible portions of structure and the surrounding landscape.

### 7.2 Structures

- The colour of structures in the proposed Facilities should be selected to minimise visual contrast between structures and their background and textures should utilise non-reflective materials. This would potentially minimise the visual contrast between the structures and the tree-covered slopes and ridgelines surrounding the proposed Facilities.

### 7.3 Planting

- Subject to detail design, tree planting within the Marulan site may provide some screening potential over the long term to minimise potential visual impacts from some surrounding view locations.
- Planting on earth mounding would present an opportunity to increase the effective height of screening provided by tree planting. Subject to detail design, earth mounding would integrate with existing and proposed site contours.

### 7.4 Lighting

- Lighting associated with the Facilities should be designed to avoid direct line of sight to residential properties surrounding the site.
- Top of the exhaust stacks would not have lighting unless requested by CASA.
- Large floodlights would generally not be used, although it is likely that some lights may be required for lighting to allow for emergency maintenance as required.
- Security lighting should be designed so as not to spill light onto surrounding residences.

## 7.5 Summary of Mitigation Measures

A summary of the visual mitigation measures is presented in **Table 4**

Table 4 Summary of Visual Mitigation Measures

| Mitigation Measure                                                                                                                         | Implementation    |              |           |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|-----------|
|                                                                                                                                            | Planning & Design | Construction | Operation |
| Colour and texture of structures in the proposed Facilities should be appropriate and utilise non-reflective materials                     | ✓                 |              |           |
| Tree and shrub planting would be carried out within the Marulan site to provide additional screening to views from surrounding properties. |                   | ✓            | ✓         |
| Lighting design would avoid direct line of sight from properties surrounding the proposed Facilities.                                      | ✓                 |              | ✓         |
| Top of the exhaust stacks would not have lighting unless requested by CASA.                                                                | ✓                 |              | ✓         |
| Large floodlights not to be used other than for emergency lighting.                                                                        | ✓                 |              | ✓         |
| Security lighting would not spill onto surrounding residences.                                                                             | ✓                 |              | ✓         |

# Conclusion

## SECTION 8

### 8.1 Conclusion

The Visual Impact Assessment concluded that the proposed Facilities will have an overall **Medium** visual impact, although the potential visual impact would be generally **Low** for the majority of people living in, or travelling through areas surrounding the Facilities. There is potential for a **High** visual impact on two residential properties.

The overall **Medium** visual impact will result from a combination of the following factors:

- Two view locations were determined to have a **High** visibility rating. The visibility criteria (outlined in Table 1) applied to these view locations indicated a potential **Low** visibility rating, (medium distance, long term view and very low number of viewers), however these view locations were considered to have a relatively confined view catchment due to the influence of local landform and vegetation, and therefore the proposed Facilities would potentially have a greater degree of visibility in the overall view available from areas surrounding these view locations.
- A small number of rural residential properties, including residences located to the south of Canyonleigh Road situated on elevated hillside locations, may have distant views toward and beyond the proposed Facilities.
- The potential view catchment of the proposed Facilities illustrated in **Fig 4** indicates that the majority of views toward the proposed Facilities, or portions of the Facilities where views may be partially screened by vegetation or landform, occur from areas of unoccupied rural landscape generally maintained as grass pasture.
- The landscape surrounding the proposed Facilities contains built elements similar in form and scale to the proposed Facilities including the TransGrid switchyard, a communications tower, transmission towers, high voltage power lines and other associated high voltage electrical infrastructure.
- The exhaust stacks which, at around 30m and 40m high, are the tallest structures associated with the proposed Facilities, would only be directly visible from a small number of surrounding properties and the exhaust stacks may be partially screened by landform and vegetation.
- The air cooled condenser, at around 32m high (to be constructed as part of Delta Electricity Stage 2 Facility), would be partially viewed against a backdrop of existing trees on rising ground to the east of the Facility and would only be directly visible from a small number of surrounding properties.
- An appropriate selection of colour schemes and non-reflective materials would help to minimise visual contrast between the proposed Facilities and tree canopy background from some surrounding view locations.



- Subject to detail design, tree planting within the Marulan site may provide some screening potential over the long term to minimise potential visual impacts from some surrounding view locations.
- Tree planting within selected residential properties, subject to negotiation and agreement by property owners, may provide long term positive screening potential.
- Night time lighting around the Facilities is likely to be visible from some surrounding locations, including views from a small number of surrounding properties. Night time lighting may be more visible given the general absence of other significant sources of light. Where possible, lighting around and within the proposed Facilities should be designed and installed to avoid a direct line of sight toward surrounding residences.
- Delta Electricity and EnergyAustralia have advised that no visible emissions would be discharged from the exhaust stacks.