

13.1 Introduction

The assessment involved an evaluation of the visual character of the surrounding landscape, and an assessment of the potential visual impacts that could result from the construction and operation of the EnergyAustralia Facility on the Marulan Site. The assessment also addressed the cumulative impacts of the EnergyAustralia Facility with the proposed Delta Electricity Facility.

The main objective of the visual impact assessment was to determine the potential impact of the proposed Facility on people living and working in, or travelling through, surrounding areas.

The assessment of visual amenity was conducted by Green Bean Design. This chapter presents a summary of the visual impact assessment and the full report is presented in **Appendix G**.

13.2 Methodology

The methodology for this assessment comprised the following activities:

- a desktop study to identify the potential view catchment of the proposed Facility referencing topographic maps and aerial photographs of the Site and surrounding area to identify potential view locations to be verified during the fieldwork component of the assessment;
- fieldwork to determine the potential extent of visibility of the proposed Facility and to determine the various view locations from which the proposed Facility could potentially be visible;
- an assessment of visual impact, based on the combination of two factors: the level of visibility or extent to which the Facility structures would be visible from surrounding areas, and the degree of visual contrast between the structures and the landscape surrounding the Site that would form the visible background from surrounding view locations;
- the preparation of a series of cross sections to provide a representative sample of view locations from around the Site;
- site visits to further ascertain the visual impacts on those residences considered to have a high visual impact and
- the preparation of visual simulations to illustrate the cumulative impact at residences with a high visual impact.

13.2.1 Visual Impact

The potential visual impact of the proposed EnergyAustralia Facility results primarily from a combination of the following factors:

- site topography, existing visual screening and the final design of the Facilities and associated infrastructure (relative to surrounding areas); and
- the degree of visual contrast between the proposed Facility structures and the landscape surrounding the Site that would form the background from surrounding view locations.

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The potential visual impact from particular view locations 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 13-1**.

13.2.2 Visibility

Visibility is a measure of the extent to which the proposed Facility and associated infrastructure would 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 a part of the proposed Facility 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 the proposed Facility 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 potential visual impact 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.

13.2.3 Visual Assessment Criteria

The potential visual impact of the proposed Facility from key view situations has been assessed against the criteria described in **Table 13-1**.

Table 13-1 **Visibility Criteria**

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

The levels of visibility resulting from various combinations of the above criteria are listed in **Table 13-2**.

Table 13-2 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 there are no views toward the Facility is recorded as Nil).

13.2.4 Key Visual Aspects

Details of the various components and structural elements associated with the proposed Facility are described in detail in **Chapter 4**. The key visual aspects of the EnergyAustralia Facility are summarised below.

General Infrastructure

The EnergyAustralia Facility will include the following systems and/or built elements:

- two gas turbine enclosures (incorporating air inlet, gas turbine, generator) generally up to 10 m high depending upon final plant selection and two associated exhaust stacks (up to 30 m high);
- two electricity step-up transformers and associated equipment for connection to the existing Marulan switchyard;
- control room incorporating offices and ablutions, switch room, workshop and auxiliary structures;
- various storage tanks generally up to 8 m high;
- a gated security fence around the proposed Facility;
- an access road from the Canyonleigh Road; and
- an underground natural gas supply pipeline with metering and regulating station.

Built Form

For the purpose of this visual assessment, the following assumptions of the built form were made:

- the Facility would be located to the west of a gently sloping low ridgeline falling north west from around 626 m AHD to the Wollondilly River corridor at around 590 m AHD;
- the proposed Facility would be constructed on a generally level platform approximately 605 m AHD;
- the gas turbine exhaust stacks would be the tallest built elements of the Facility, and assumed in this assessment to extend to a height of around 645 m AHD; and

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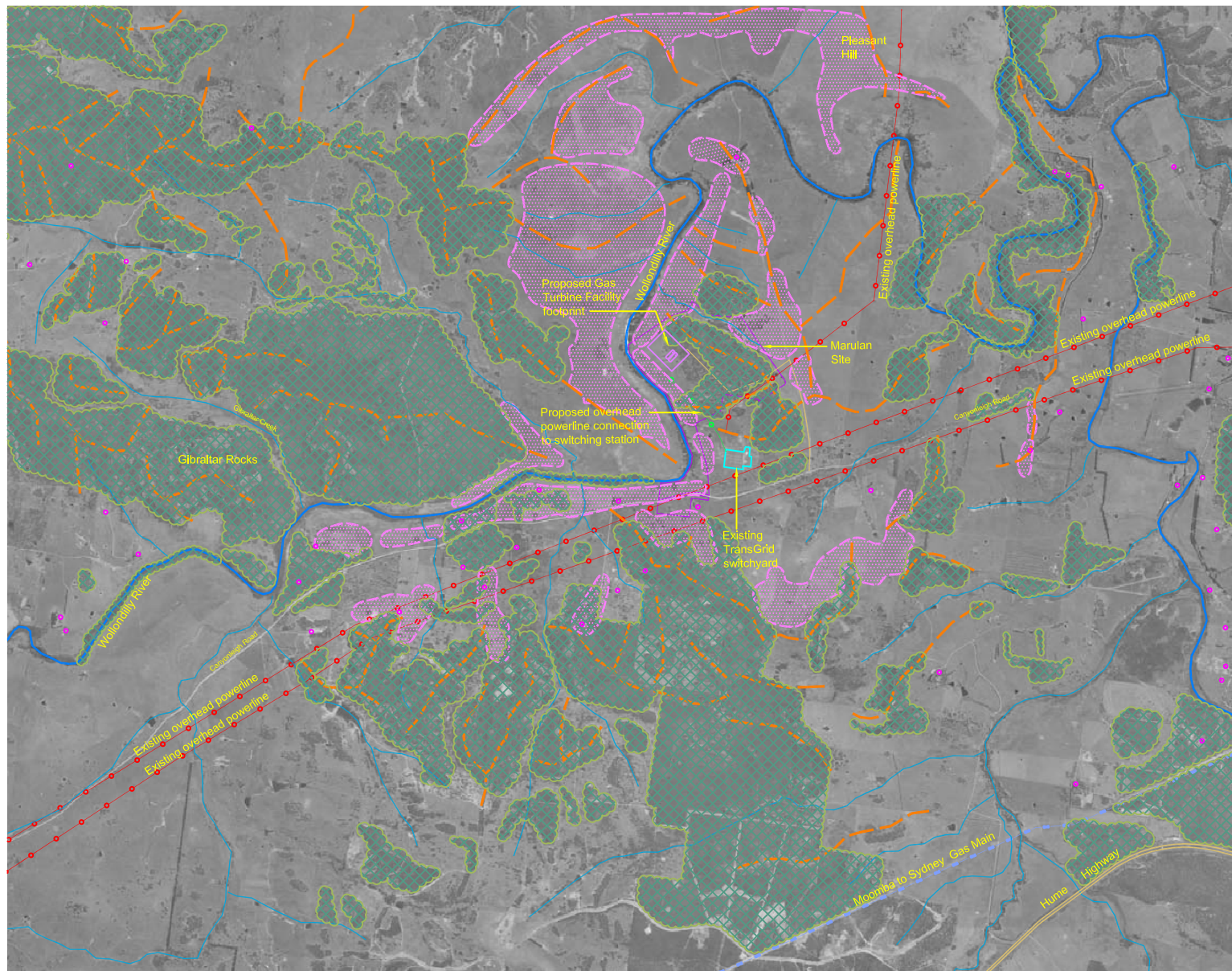
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- the Delta Electricity Stage 2 Facility would also include the construction of an air cooled condenser which is assumed in this assessment to extend to a height around 637 m AHD.

View Catchment

The potential view catchment for the proposed Facility is illustrated in **Figure 13-1** and key visibility aspects summarised below:

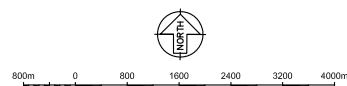
- the potential view catchment is generally restricted to local views within the Arthursleigh property and to areas of land to the south and south west of the site located between the Wollondilly River and Canyonleigh Road.
- the view catchment would include potential views toward the 30 m high exhaust stacks as well as other structures within the Facility;
- views toward the proposed Facility 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 Facility is unlikely to be directly visible to motorists travelling along Canyonleigh Road. Indirect views toward the Site are partially screened by a combination of landform and vegetation along the road corridor. There is some potential for indirect views toward the construction footprint through gaps in roadside vegetation to the south of the Facility;
- trees and undulating landform generally block potential views from residential properties to the west of the Site, although a small area of land on a ridgeline to the west of the Site was identified as having a potential view across the top of the general site area. Views from this location would generally be restricted to the upper portions of the Facility; and
- there were no dedicated public lookouts identified in the immediate area that would have views to the proposed Facility.



LEGEND

- MARULAN SITE AREA
- NOTED ENERGYAUSTRALIA FACILITY INDICATIVE FOOTPRINT
- NOTED PROPOSED OVERHEAD POWERLINE
- NOTED EXISTING TRANSGRID SWITCHYARD
- EXISTING RESIDENTIAL BUILDING OR OTHER BUILT STRUCTURE
- NOTED EXISTING OVERHEAD POWERLINE
- NOTED MOOMBA TO SYDNEY GAS MAIN - EXISTING
- RIDGELINES AND SPURS
- VEGETATION
- RIVER, CREEK OR GULLY DRAINAGE LINE
- POTENTIAL VIEW CATCHMENT

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



Client	Project	Title
ENERGYAUSTRALIA	MARULAN GAS TURBINE FACILITY	POTENTIAL VIEW CATCHMENT
	Drawn: AH	Approved: NB
	Date: 22/12/07	Figure: 13-1
	Job No: 43177371	
	File No: 43177371/13-1	

Figure: 13-1

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Visual Simulations

In order to illustrate how the proposed Facilities may appear following construction, visual simulations were prepared from residential view locations determined to have a high visual impact.

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;
- visually significant components were modelled;
- the digital photographs were matched with the 3D model using camera angle location and direction as well as reference objects in the photographs; and
- 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 vista (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.

13.3 Existing Environment

13.3.1 Site Context

The construction footprint for the proposed Facility is located to the north of the existing TransGrid switchyard and accessed off Canyonleigh Road.

The local character of the landscape around the proposed Facility is largely dominated by the existing TransGrid switchyard, which is located around 500 m to the south of the Site. The landscape to the south of the Site also includes two high voltage overhead power line easements, which are generally visible from a wide area around the proposed Facilities.

The construction footprint for the proposed Facility is located on gently sloping land falling west toward the Wollondilly River corridor. The river corridor extends along the west boundary of the Site. The Wollondilly River is generally not visible from the Facility construction footprint or surrounding public areas, and is contained by steep embankments with mature tree vegetation growing along each side.

The Site has been extensively cleared for grazing although some woodland occurs to the east of the Facility. It is likely that some tree clearing would be necessary to construct the Facility and provide a lay down area.

A small number of rural residential properties are located in the landscape surrounding the proposed Facility. Most of the residences are not visually prominent from the Facility due to screening by surrounding undulating landform or the presence of trees around them. Visibility from residential properties was determined during the site analysis and fieldwork carried out as part of the visual assessment process. Additional site visits were also undertaken to further confirm the visual impacts on those residences considered to have a high visual impact.

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The landscape surrounding the EnergyAustralia Facility contains a number of built elements that contribute to the local visual character, and includes:

- two 330 kV and 66 kV overhead transmission lines, running parallel to the Canyonleigh Road corridor;
- the 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 **Plate 13-1**, and in the photographs taken from a number of selected viewpoints.

The following photographs illustrate existing views from a number of locations within the landscape surrounding the proposed Gas Turbine Facility, including views toward the existing TransGrid switchyard. The location of the proposed EnergyAustralia Facility and the photograph locations are illustrated in **Appendix G**.

Plate 13-1 Selected Site Photographs



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 3 – View east along Canyonleigh Road toward the existing TransGrid switchyard.

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13.3.2 Landform and Drainage

Landform and drainage patterns have a significant influence on the extent to which the proposed Facility may be visible from surrounding areas. Existing landform and drainage features include:

- land immediately surrounding the Site is characterised by a series of ridges, gullies and the Wollondilly River corridor. A main ridgeline falling from around the RL650 m contour runs south to north 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;
- landform between the ridgelines forms a number of gullies that act as tributaries to the Wollondilly River; and
- 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.

13.4 Assessment of Potential Impacts – EnergyAustralia Facility

13.4.1 Visibility of the Facility

The proposed Facility structures, (described in **Section 13.2.4**) are aligned in an east-west direction. Consequently there would be some degree of mutual screening of structures in views from the west and south west. Any structures that are visible at the west end of the Facility will block views to other structures located further east. The exhaust stacks, which will be around 30 m high, will be the tallest structures in the Facility.

No visible emissions will be generated from the exhaust stacks.

13.4.2 Visual Contrast

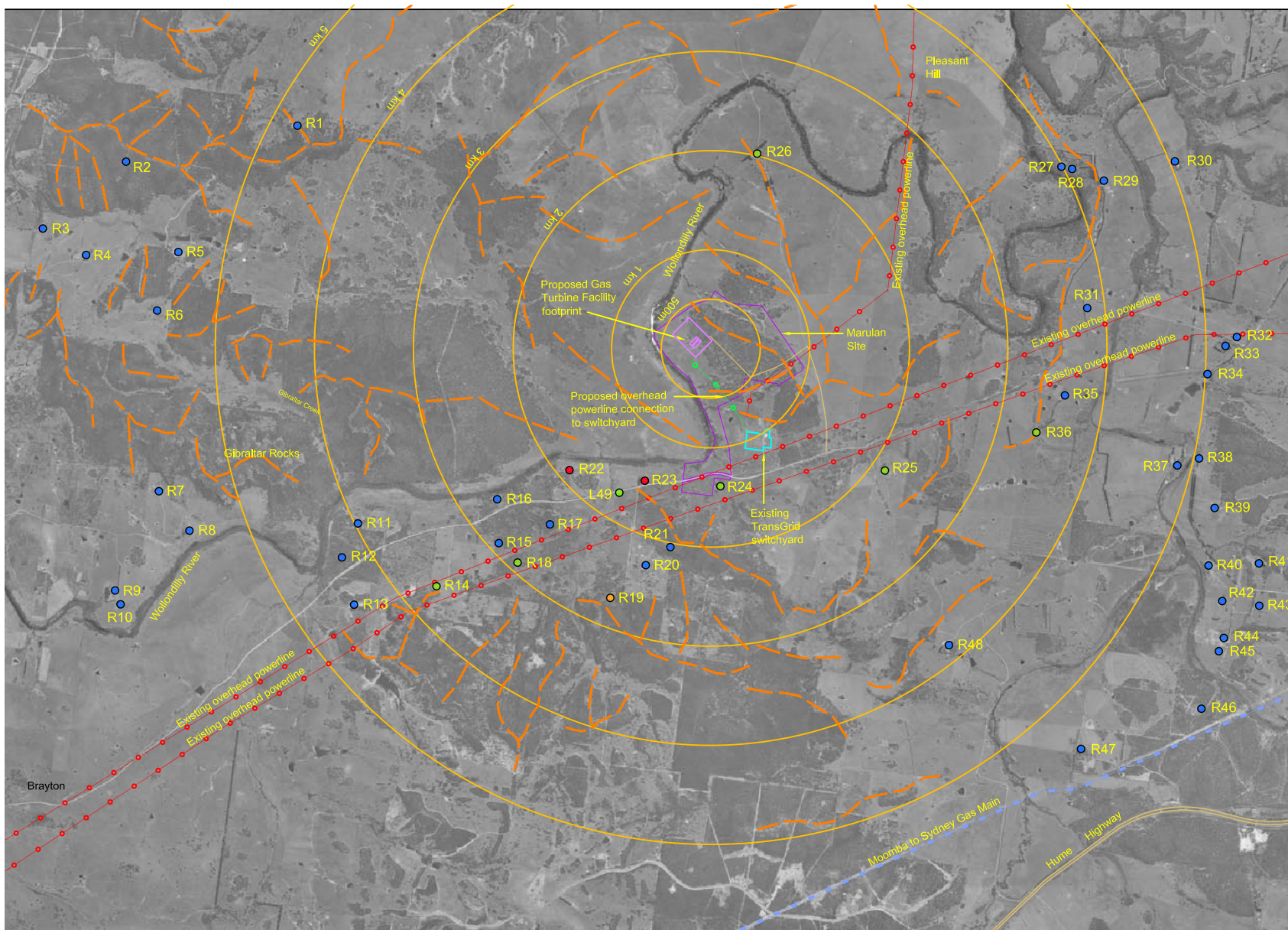
Visual contrast between the proposed Facility and the background against which it is viewed determines the capacity of the existing landscape setting to visually absorb the new structures without creating a significant change in visual character or producing a reduction in visual quality of the landscape. 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 Facility and the landscape setting in which it is viewed. The reduced visual contrast could result in a lower level of visual impact. If the main built elements of the proposed Facility were dark in tone and non-reflective then the visual contrast may be further reduced.

13.4.3 Visibility Matrix

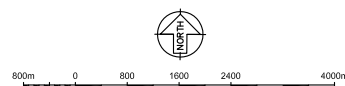
The results of the visibility assessment from the view locations identified during the field inspection are presented within **Table 13-3**. The visibility matrix table includes view location; approximate distance to site; category of viewer; period of view; relative number of viewers; level of visibility; and visibility rating.

It is noted that a development application has recently been lodged to construct a dwelling on at the location of R23 (identified on **Figure 13-2**). The visual assessment was developed based on an approximate position of the proposed dwelling on the site.



- LEGEND**
- NOTED ENERGYAUSTRALIA 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

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



Client ENERGYAUSTRALIA	Project MARULAN GAS TURBINE FACILITY			Title POTENTIAL VIEW LOCATIONS AND VISIBILITY RATINGS FOR THE ENERGYAUSTRALIA FACILITY
	Drawn: AH	Approved: DC	Date: 15/06/07	
URS		Job No: 43177371	File No: 43177371/13-2	Figure: 13-2

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Table 13-3 Visibility Matrix – EnergyAustralia Facility

View Location	Approximate Distance To Site	Category Of Viewer	Approx. Period Of View	Relative No. Of Viewers	Level Of Visibility	Visibility Rating
R 1 to R 10 Rural residences	Long	Residents	Moderate to Long term	Very Low	Views east from residences toward the proposed Facility are blocked by a combination of landform and vegetation.	Nil
R 11 to R 13 Rural residences	Long	Resident	Moderate to Long term	Very Low	Views east and northeast from residences toward the proposed Facility are blocked by a combination of landform and vegetation.	Nil
R 14 Rural residence	Long	Resident	Moderate to Long term	Very Low	Elevated views from residential property on hillside southwest of proposed Facility. Views from residences toward the proposed Facility may be partially screened by vegetation surrounding the residence.	Low
R 15 to R 17 Rural residences	Long	Resident	Moderate to Long term	Very Low	Views northeast from residences toward the proposed Facility generally blocked by a combination of landform and vegetation.	Nil
R 18 Rural residence	Long	Resident	Moderate to Long term	Very Low	View northeast from residence toward proposed Facility generally blocked by a combination of landform and vegetation.	Low
R 19 Rural residence	Long	Resident	Moderate to Long term	Very Low	Elevated views from residential property on hillside southwest of proposed Facility. Views from residence toward the proposed Facility may be partially screened by vegetation surrounding the residence.	Medium
R 20 to R21 Rural residence	Medium	Resident	Moderate to Long term	Very Low	Views north from residences toward proposed Facility are blocked by a combination of landform and trees.	Nil
R 22 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 Facility.	High
R 23 Rural residence	Medium	Resident	Moderate to Long term	Very Low	Generally short distance views north and northeast from residence toward proposed Facility. Views from residence are partially screened by existing trees.	High

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View Location	Approximate Distance To Site	Category Of Viewer	Approx. Period Of View	Relative No. Of Viewers	Level Of Visibility	Visibility Rating
R 24 Rural residence	Medium	Resident	Moderate to Long term	Very Low	Views north from residence toward proposed Facility are blocked by a combination of landform and trees.	Low
R 25 Rural residence	Long	Resident	Moderate to Long term	Very Low	View northwest from residence toward proposed Facility is generally blocked by a combination of landform and trees. Potential view to upper portion of exhaust stacks from within limited areas property	Low
R 26 Rural residence	Medium to Long	Resident	Moderate to Long term	Very Low	View southwest from residence toward Facility is partially screened by a combination of landform and trees. Potential view toward proposed Facility from areas of the property south of the residence.	Low
R 27 to R 35 Rural residences	Long	Resident	Moderate to Long term	Very Low	Views southwest to west from residences toward proposed Facility generally blocked by a combination of landform and vegetation.	Nil
R 36 Rural residence	Long	Resident	Moderate to Long term	Very Low	View north west from residence toward proposed Facility is generally blocked by a combination of landform and vegetation. Possible distant view toward upper portions of exhaust stacks.	Nil
R 37to R 48 Rural residences	Long	Resident	Moderate to Long term	Very Low	View west to north west from residences toward proposed Facility generally blocked by a combination of landform and vegetation.	Nil
L 48 Canyonleigh Road	Medium to Long	Motorist	Short term	Low	View from road corridor north and northeast toward proposed Facility generally restricted to indirect views through gaps in roadside vegetation.	Low

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13.4.4 Summary of Visibility Assessment

A total of 49 view locations were identified and included views from:

- residential properties;
- vacant/rural land;
- public road corridors (motorists); and
- private access roads.

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 have 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 potential view locations assessed were determined to have no (Nil visibility). Seven locations were determined to have a Low visibility rating and included a potential partial view to the proposed Facility from rural land surrounding residences. One view location (R19) was determined to have a Medium visibility rating. Two view locations (R22 and R23) were determined to have a High visibility rating.

The visual impact assessment concluded that the Facility would 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 Facility. There is potential for a High visual impact on two residential properties.

The overall Medium visual impact would 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 13-1**) 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 Facility 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 Facility;
- the potential view catchment of the proposed Facility illustrated in **Figure 13-1** indicates that the majority of views toward the proposed Facility, or portions of the Facility where views may be partially screened by vegetation or landform, occur from areas of unoccupied rural landscape generally maintained as pasture;

- the landscape surrounding the proposed Facility contains built elements similar in form and scale to the proposed Facility 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 30 m high, are the tallest structures associated with the proposed Facility, would only be directly visible from a small number of surrounding properties and the exhaust stacks may be partially screened by landform and vegetation;
- an appropriate selection of colour schemes and non-reflective materials would help to minimise visual contrast between the proposed Facility and tree canopy background from some surrounding view locations;
- tree planting within the general site area may provide a visual screen over the long term to minimise potential visual impacts from some surrounding view locations;
- tree planting within selected private residential properties, subject to negotiation and agreement by property owners, may provide long term positive screening potential;
- night time lighting around the Facility 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 practicable, lighting around and within the proposed Facility should be designed and installed to avoid a direct line of sight toward surrounding residences; and
- no visible emissions would be discharged from the turbine exhaust stacks.

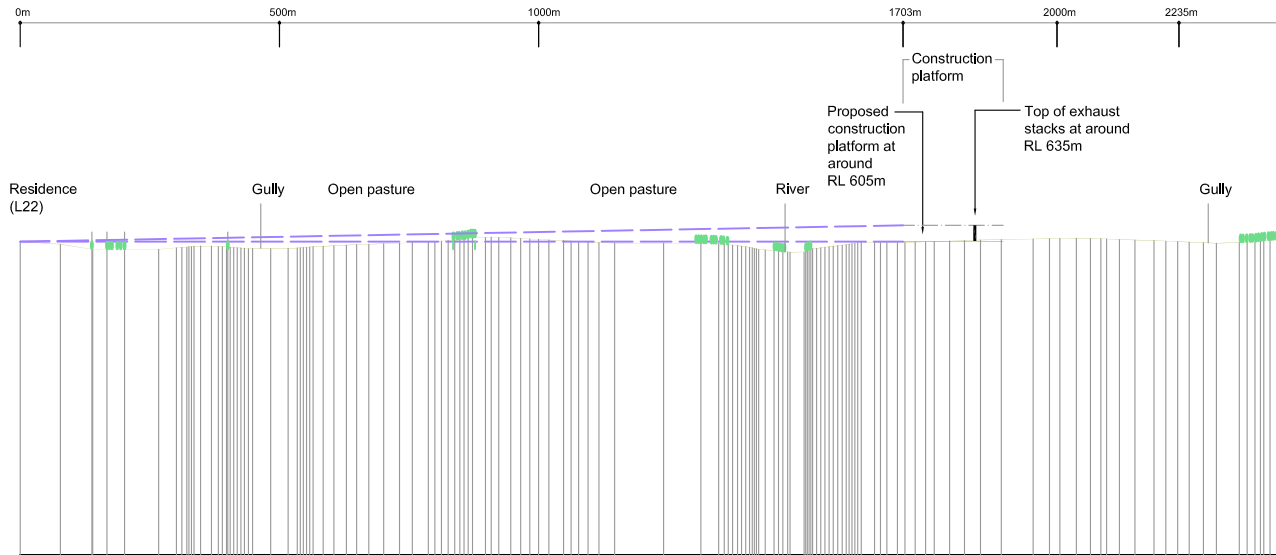
13.4.5 Indicative Cross Sections

In order to illustrate the potential extent to which portions of the Delta Electricity Facility may be visible, a series of indicative cross sections were prepared extending from a number of view locations to the proposed Facility. These view locations are illustrated in **Figure 13-2**. The locations of the indicative cross sections were prepared from view locations 19, 22, 23, 24, 25 and 26. **Figures 13-3** and **13-4** illustrate the cross sections from R22 and R23 as they are considered to have a high visual impact. The other cross sections are presented in **Appendix G**.

Cross Sections Analysis

The indicative cross sections illustrate the relative scale of the 40 m high exhaust stacks within the landscape. The reduction in relative scale results from the distances from some of the view locations.

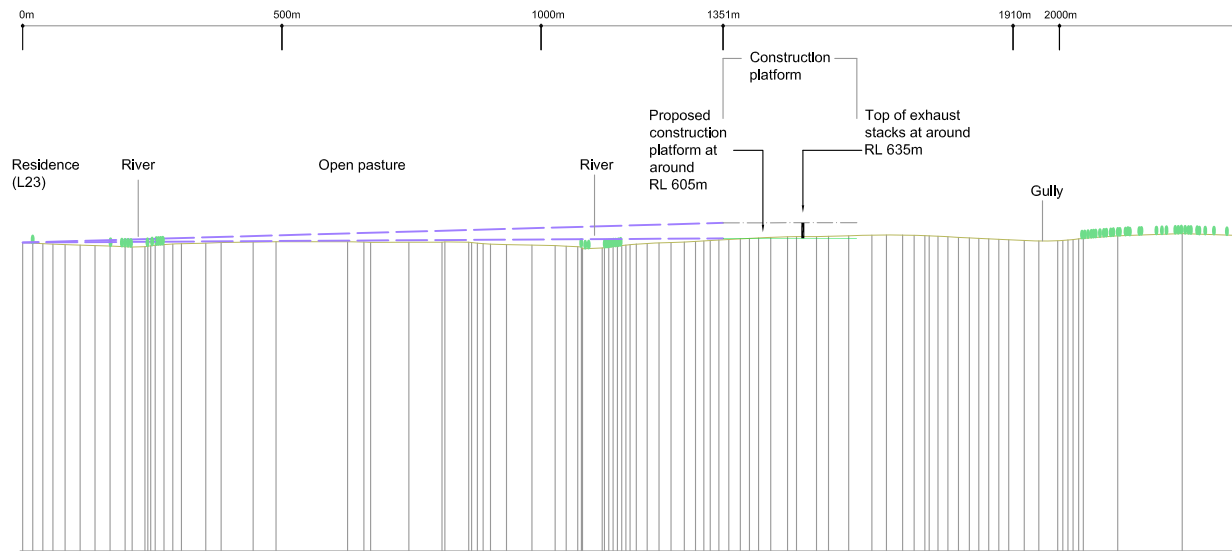
The indicative cross sections also illustrate potential view lines from residential properties toward the EnergyAustralia Facility that may be blocked by undulating landform and tree cover that surrounds the general Site area.



Cross Section L22

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

Client ENERGYAUSTRALIA 	Project MARULAN GAS TURBINE FACILITY			Title INDICATIVE CROSS SECTION LOCATION 22 FOR THE ENERGYAUSTRALIA FACILITY Figure: 13-3
	Drawn: AH	Approved: NB	Date: 22/12/07 Job No: 43177371 File No: 43177371/13-3	



Cross Section L23

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

Client ENERGYAUSTRALIA URS	Project MARULAN GAS TURBINE FACILITY			Title INDICATIVE CROSS SECTION LOCATION 23 FOR ENERGYAUSTRALIA FACILITY Figure: 13-4
	Drawn: AH	Approved: NB	Date: 22/12/07	
	Job No: 43177371	File No: 43177371/13-4		

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13.5 Assessment of Impacts – Cumulative

A visual assessment of the impact was also conducted for the Delta Electricity Facility and the EnergyAustralia Facility.

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

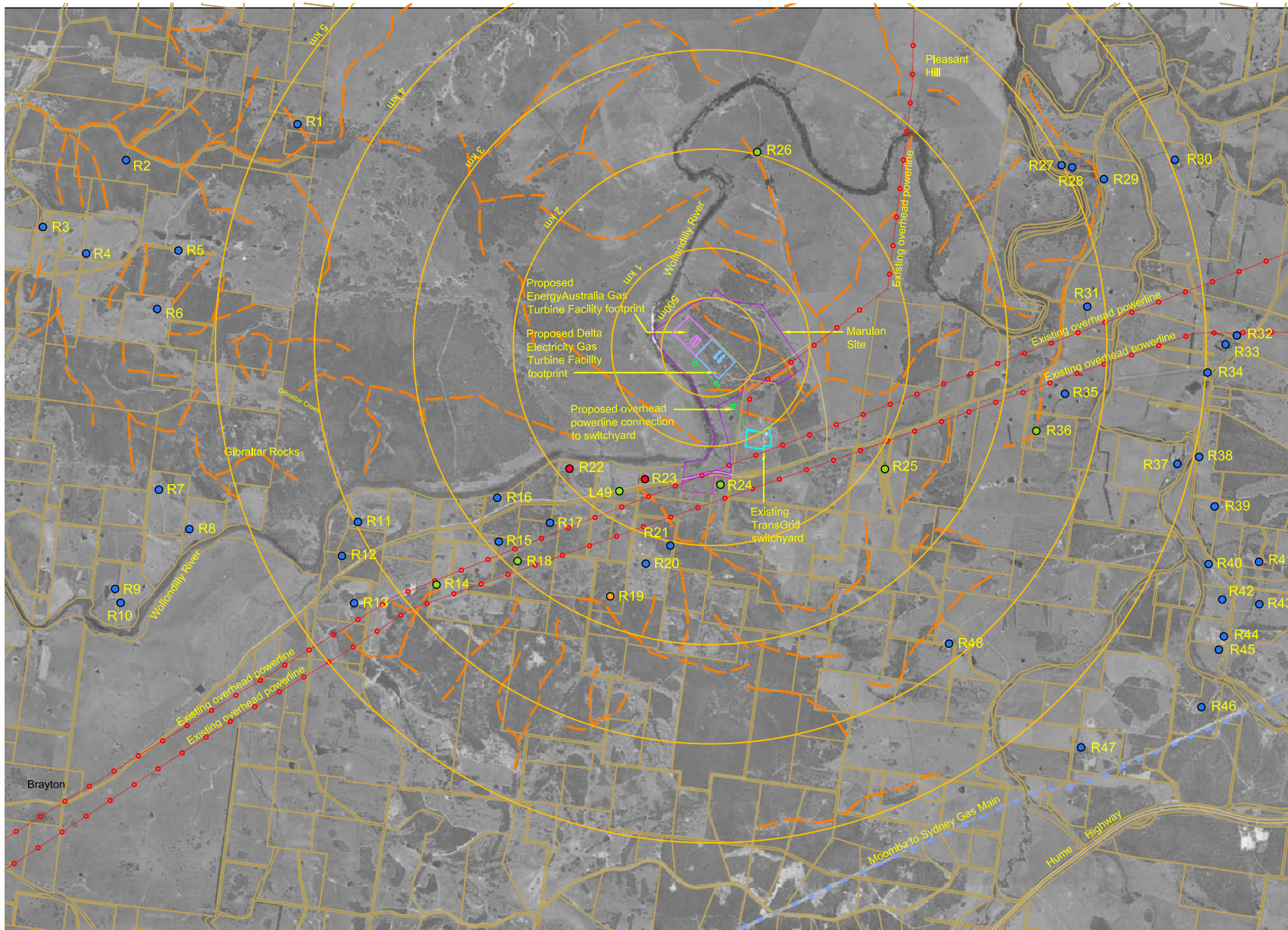
- 39 of the 49 view locations have been determined to have a NIL visibility rating;
- 7 of the 49 view locations have been determined to have a LOW visibility rating;
- 1 of the 49 view locations has been determined to have a MEDIUM visibility rating; and
- 2 of the 49 view locations have been determined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

The majority of potential view locations assessed were determined to have no (Nil visibility). Seven locations were determined to have a Low visibility rating and included a potential partial view to the proposed Facility from rural land surrounding residences. One view location (R19) was determined to have a Medium visibility rating. Two view locations (R22 and R23) were determined to have a High visibility rating. The view locations and a summary of the visual assessment for the Facilities are presented on **Figure 13-5**.

The visual impact assessment concluded that the Facility would have an overall Medium visual impact on people living in or travelling through the local area, although the potential visual impact would be generally low for the majority of people, including residential view locations, in areas surrounding the Facility. There is potential for a high visual impact on a small number of surrounding residential properties.

13.5.1 Cross Section Analysis

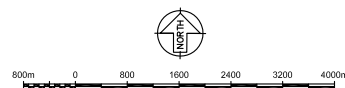
In order to illustrate the potential extent to which portions of the proposed Facilities may be visible, a series of indicative cross sections were prepared extending from a number of view locations toward the proposed Facilities. Cross sections were prepared from view locations 19, 22, 23, 24, 25 and 26. All the cross sections are presented for reference in **Appendix G**.



LEGEND

- MARULAN SITE AREA
- DELTA ENERGY FACILITY INDICATIVE FOOTPRINT
- ENERGYAUSTRALIA FACILITY INDICATIVE FOOTPRINT
- PROPOSED OVERHEAD POWERLINE
- VIEW LOCATION WITH HIGH VISIBILITY RATING
- VIEW LOCATION WITH MEDIUM VISIBILITY RATING
- VIEW LOCATION WITH LOW VISIBILITY RATING
- VIEW LOCATION WITH NIL VISIBILITY RATING
- EXISTING OVERHEAD POWERLINE
- MOOMBA TO SYDNEY GAS MAIN - EXISTING
- RIDGELINES AND SPURS
- INDICATIVE CADASTRAL BOUNDARIES
- POTENTIAL VIEW LOCATION (RESIDENTIAL)
- POTENTIAL VIEW LOCATION (ROAD)
- DISTANCE MARKER

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



Client ENERGYAUSTRALIA	Project MARULAN GAS TURBINE FACILITY	Title POTENTIAL VIEW LOCATIONS AND VISIBILITY RATINGS FOR THE COMBINED FACILITIES	
		Figure: 13-5	
	Drawn: AH	Approved: NB	Date: 15/06/07
	Job No: 43177371	File No: 43177371/13-2	

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13.5.2 Visual Simulations

The visual simulation illustrated on **Figure 13-6** indicates that some portions of the proposed Facilities would be visible from the north side of residence R22. Views toward the Facility would 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 will be visible generally against a backdrop of trees, with a partial section of these elements visible above the horizon.

The EnergyAustralia Facility would 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 on **Figure 13-7** indicates that portions of the proposed Facilities would be visible from the general development envelope of the proposed dwelling at view location R21. Views toward the Facilities would 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 autumn and winter, and therefore provide a lesser degree of screening throughout the winter season.

The upper portions of the Delta Electricity exhaust stacks and Stage 2 condenser would 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 would be partially visible through tree foliage, and would extend to around the same height of the trees beyond the Facility.

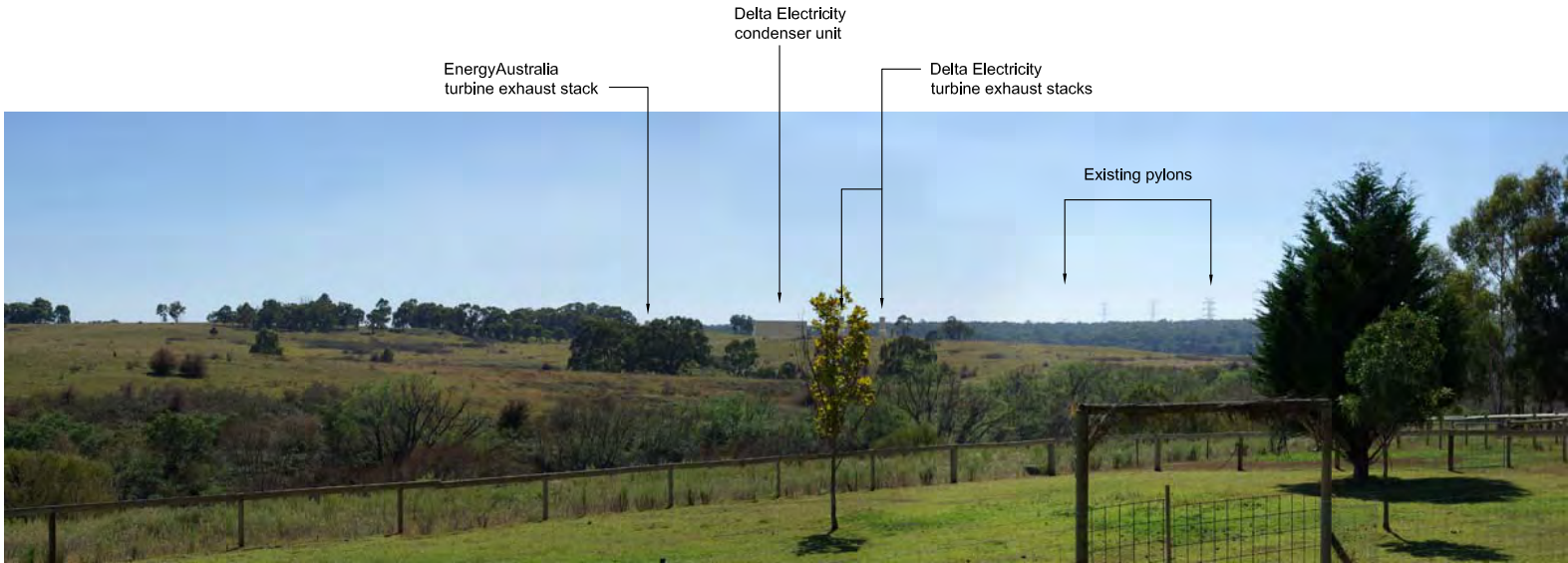
13.5.3 Conclusion

Mitigation measures to be incorporated into the design of each of the Facilities would potentially reduce the level of visual impact of each Facility.

- Tree and shrub planting, utilising woodland species indigenous to the area, would provide additional screening in the long term for the two Facilities. Planting on earth mounding would create the potential to increase the effective height of screening provided by tree planting. Earth mounding would be designed to integrate with existing and proposed site contours.
- Tree planting undertaken prior to, and during the construction phase of the Facility that proceeds first would have the benefit of establishment and growth prior to the operation of that Facility and the construction of the subsequent Facility.



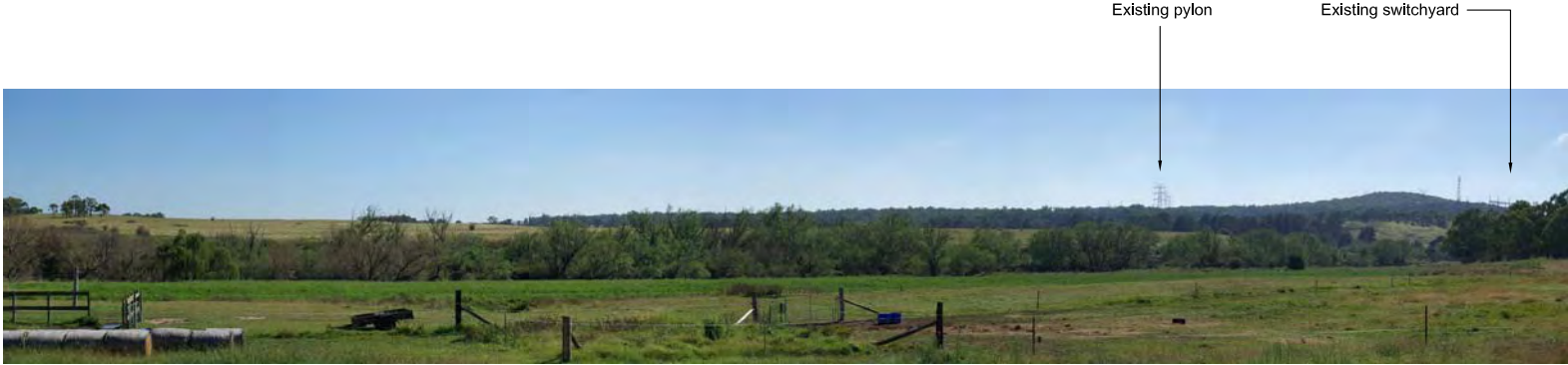
Existing View from R22 - North facing verandah



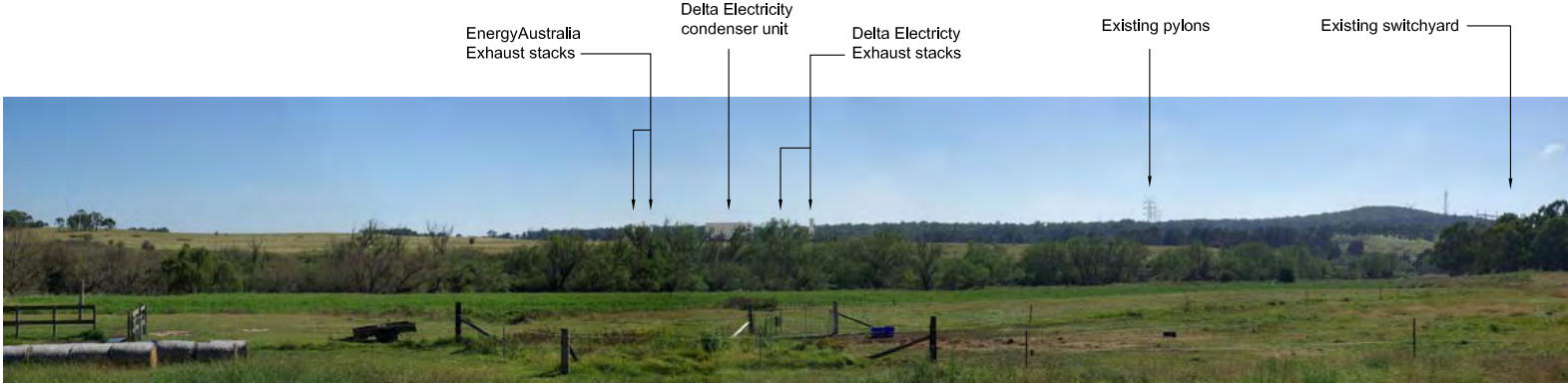
Proposed View from R22 - North facing verandah

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

Client ENERGYAUSTRALIA URS	Project MARULAN GAS TURBINE FACILITY			Title VISUAL SIMULATION LOCATION 22 FOR THE COMBINED FACILITIES Figure: 13-6
	Drawn: AH	Approved: NB	Date: 22/12/07	
	Job No: 43177371	File No: 43177371/13-6		



Existing View from R23 - Location of proposed dwelling



Proposed View from R23 - Location of proposed dwelling

Client ENERGYAUSTRALIA	Project MARULAN GAS TURBINE FACILITY			Title VISUAL SIMULATION - VIEW LOCATION R23 FOR THE COMBINED FACILITIES
	Drawn: AH			Figure: 13-7
	Job No: 43177371			
	Approved: NB			
	Date: 24/03/08			
	File No: 43177371/13-7			

13.6 Mitigation Measures

While the overall potential visual impact of the proposed Facility 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 strategies to potentially reduce the visual contrast between the visible structures of the Facility and the surrounding landscape.

13.6.1 Structures

- Subject to CASA requirements, where practicable, colour and texture of structures should be appropriate and utilise non-reflective materials. The colour of structures in the proposed Facility 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 Facility.

13.6.2 Screen Planting

- Tree and shrub planting would be carried out within the general Site area to provide additional screening views from surrounding properties. Considerations to be given to planting on each mounding within the Site.
- Where practicable, tree planting within selected private residential properties to be considered subject to negotiation and agreement by property owners.

13.6.3 Lighting

- Lighting design would avoid direct line of sight to properties surrounding the proposed Facilities.
- Top of the exhaust stacks would not have lighting unless requested by CASA.
- Where practicable, security lighting would not to spill light onto surrounding residences.

13.6.4 Summary of Mitigation Measures

A summary of the visual mitigation measures is presented in **Table 13-4**. The phase of implementation is indicated in the table by *Cons* – Construction *Ops* – Operation, Design and Planning.

Chapter 13

Visual Amenity

Table 13-4 Summary of Visual Mitigation Measures

Mitigation Measure	Implementation	
	EnergyAustralia Facility	Cumulative
Subject to CASA requirements, where practicable, colour and texture of structures in the proposed Facility would be appropriate and utilise non-reflective materials.	✓ (Design)	
Tree and shrub planting would be carried out within the general site area jointly by Delta Electricity and EnergyAustralia to provide additional screening to views from surrounding properties. Consideration would be given to planting on mounding within the Site.	✓ (Design, Cons & Ops)	✓ (Design, Cons & Ops)
Where practicable, tree planting within selected private residential properties would be considered jointly by Delta Electricity and EnergyAustralia, subject to negotiation and agreement by property owners.	✓ (Design & Ops)	✓ (Design & Ops)
Lighting design would avoid direct line of sight to properties surrounding the proposed Facility.	✓ (Design & Ops)	
Top of the exhaust stacks would not have lighting unless requested by CASA.	✓ (Design & Ops)	
Measures would be employed to avoid light spill from security lighting onto surrounding residences.	✓ (Design & Ops)	