EnergyAustralia

Delta electricity

Marulan Gas Turbine Facilities

Submissions Response & Preferred Project Report

VOLUME 1 | MAIN REPORT | May 2009

URS

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Date: 12 May 2009
Reference: 43177371/ 43177585
Status: FINAL

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Appendices

Introduction Section 1

1.1 Background

A suite of three Environmental Assessments were prepared for Delta Electricity and EnergyAustralia (collectively referred to as 'the Proponent') to assess the environmental impacts of the proposed Marulan Gas Turbine Facilities on a site approximately 12 kilometres (km) north of Marulan and 25 km east of Goulburn.

The Environmental Assessments were prepared under Part 3A of the *Environmental Planning and Assessment Act, 1979* (the EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation).

1.2 Purpose and Structure of this Report

This Submissions Response and Preferred Project Report (Report) supports the Environmental Assessments of the proposed Marulan Gas Turbine Facilities applications MP 07_0174, MP 07_0175 and MP 07_0176 by providing a response to matters raised during the public exhibition period as well as providing additional project information.

This Submissions Response and Preferred Project Report are divided into the following five sections:

Part A – Overview and Response to Submissions

1) **Project Overview and Consultation (Section 2):** Overview of the project description of the Marulan Gas Turbine Facilities, consultation undertaken for the Project and the public exhibition phase.

2) **Response to Submissions (Section 3):** Proponent responses to each of:

   – government agencies; and

   – the community.

Part B – Preferred Project Report

3) **Preferred Project Information (Section 4):** Provision of additional project information relating to:

   – traffic assessment;

   – traffic noise assessment;

   – water assessment;

   – Gas Pipeline Options assessment;

   – Facilities' infrastructure;

   – biodiversity assessment – Marulan Site;

   – Project biodiversity offset assessment; and

   – plume rise assessment.

4) **Statement of Commitments (Section 5):** revised Statement of Commitments.

5) **Conclusion (Section 6)**.

Section 1 Introduction

1.3 Approvals Process

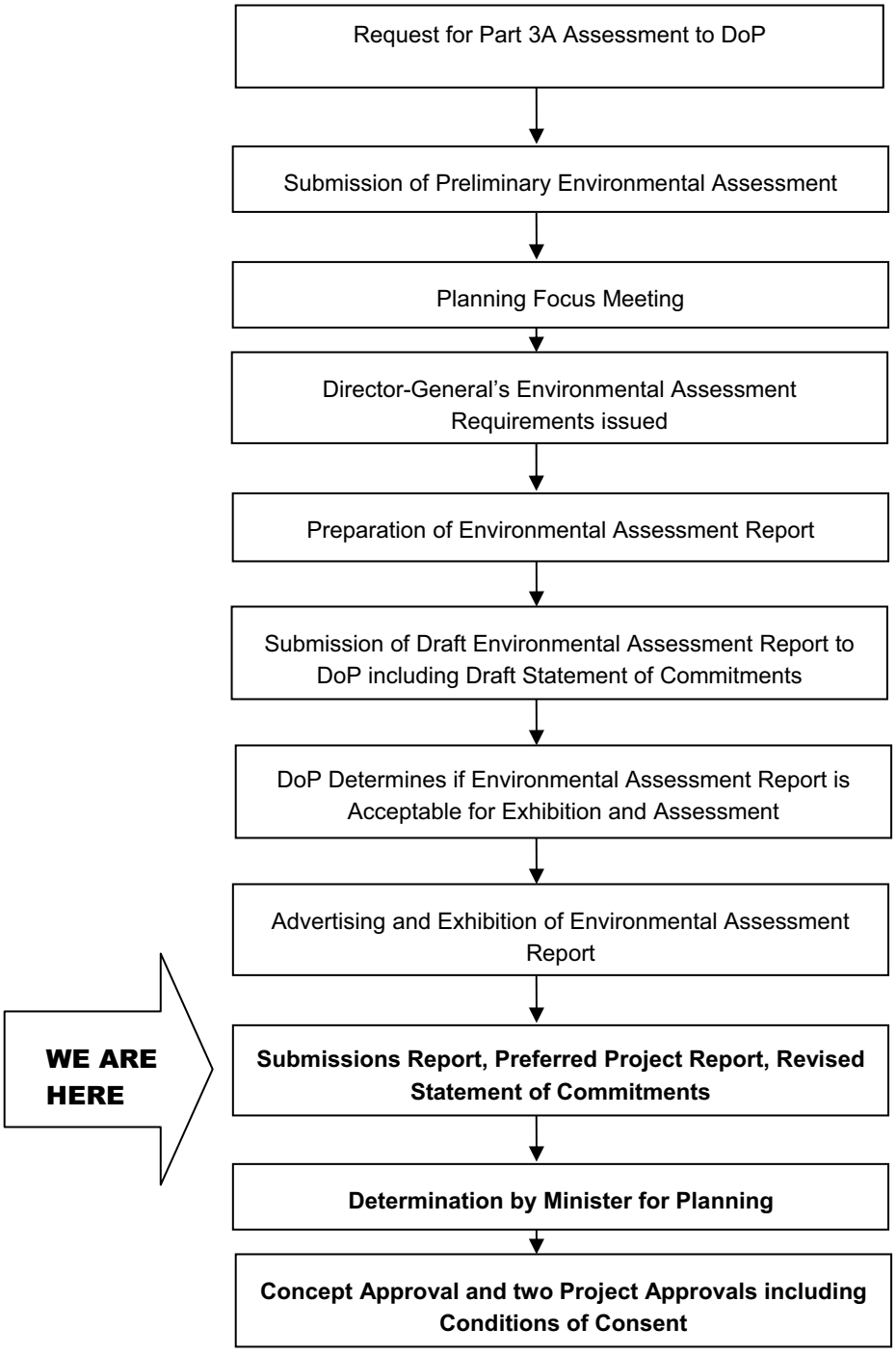
1.3.1 Decisions and Assessments

Following exhibition of the Environmental Assessments, copies of all submissions to the NSW Department of Planning (DoP) were provided to Delta Electricity and EnergyAustralia. Delta Electricity and EnergyAustralia have reviewed the submissions and responded to issues raised in the context of this Report.

The Director-General of the DoP will prepare an assessment report on the Marulan Gas Turbine Facilities, which will take into account comments from relevant Government authorities, other stakeholders and the community. The assessment report will be provided to the Minister for Planning who will determine whether to grant approval for the Project and the conditions under which the Project would operate in accordance with the EP&A Act.

A flow diagram of the assessment process under Part 3A of the EP&A Act is shown in **Figure 1-1**.

Figure 1-1 Approval Process under Part 3A of EP&A Act



Section 1 Introduction

1.3.2 Application Overview

The Environmental Assessment for the Marulan Gas Turbine Facilities was addressed as a suite of **three** documents. An overview of three documents and the reference used in this Report is presented in **Table 1-1**.

Table 1-1 Assessment Summary and Reference Term

Assessment	Reference in this Report
1. Marulan Gas Turbine Facilities – Joint Concept Application seeking: – Concept Approval for all components of the proposed Marulan Gas Turbine Facilities; and – Project Approval for the Common Shared Works.	Joint Concept Environmental Assessment
2. Delta Electricity Marulan Gas Turbine Facility – Project Application seeking approval for Stage 1 of its Facility and Concept Application for Stage 2.	Delta Electricity Project Application or Project Application
3. EnergyAustralia Marulan Gas Turbine Facility – Project Application seeking approval for its Facility.	EnergyAustralia Project Application or Project Application

1.3.3 Definitions

As for the Environmental Assessments, the following definitions apply to this Report:

- **Project:** Construction and operation of two separate Gas Turbine Facilities and associated infrastructure.
- **Marulan Site or Site:** The location proposed for the Gas Turbine Facilities, which is a portion of land surrounding the existing TransGrid switchyard site.
- **Delta Electricity Facility:** The proposed Delta Electricity Facility (Stage 1 and Stage 2) and the portion of the Site on which the Delta Electricity Facility would be located. Approximately 6 to 8 ha would be the Facility pad area (or footprint).
- **EnergyAustralia Facility:** The proposed EnergyAustralia Facility and the portion of the Site on which the EnergyAustralia Facility would be located. Approximately 6 to 8 ha would be the Facility pad area (or footprint).
- **Facility or Facilities**: Collective reference to the Delta Electricity and EnergyAustralia Facilities.
- **Proposed Laydown Area:** The portion of the Site where the laydown area may be located. For the purpose of this assessment, this area is considered as a single area for Delta Electricity and EnergyAustralia.

Introduction Section 1

- **Common infrastructure:** The portion of the Site where the following common infrastructure would be located:
  - proposed Laydown Area; and
  - portion of the gas pipeline within the Marulan Site.
- **Common Shared Works**:
  - bulk earthworks on the Site noting that works may be staged;
  - access road from Canyonleigh Road noting that the portion along the current access into the adjacent property would be under an existing easement and a formed road; and
  - transmission line connection to the TransGrid switchyard.
- **Gas Pipeline Corridor:** The area between the Marulan Site and the Moomba to Sydney gas pipeline identified as a corridor in Figure 1-4 in the Environmental Assessment and updated in **Figure 4-3** of this Report. This Report also addresses the options being considered for the gas pipeline alignments following subsequent assessment and studies.
- **Gas Pipeline Options:** The options and assessment of the routes considered for the portion of the gas pipeline from the Marulan Site (commencing at the gully adjacent to the TransGrid Site) to the Moomba to Sydney Pipeline.
- **Development footprint:** The construction footprint for the proposed development comprising the Delta Electricity Facility footprint, the EnergyAustralia Facility footprint and indicative footprint for the Common Shared Works.
- **Marulan Gas Turbine Facilities or Facilities:** Collective term for development of both the Delta Electricity and EnergyAustralia Facilities on the Marulan Site.
- **Proponent:** Collectively Delta Electricity and EnergyAustralia.

Section 2 Project Overview and Consultation

2.1 Overview of the Project

Delta Electricity and EnergyAustralia are proposing to construct and operate two separate gas turbine facilities at a site referred to as the 'Marulan Site' located approximately 12 km north of Marulan and 25 km east of Goulburn (**Figures 2-1** to **2-4**).

The proposed Delta Electricity Gas Turbine Facility would be developed in two stages. Stage 1 consists of two open cycle gas turbines with a total capacity approximately 350 megawatts (MW) depending on the final equipment selected. Stage 2 involves the conversion of the open cycle facility to a combined cycle facility to generate electricity for intermediate / base load electricity demand. The proposed capacity of the Stage 2 combined cycle plant is approximately 450 MW. Depending on future electricity demand and other generation projects, Delta Electricity could implement the combined cycle plant directly.

The proposed EnergyAustralia Gas Turbine Facility would be developed in a single stage. This would consist of two open cycle gas turbines with a total capacity of around 350 MW. Each turbine could have a capacity in the order of 175 MW depending on the final equipment selected.

The Delta Electricity Stage 1 Facility and the EnergyAustralia Facility would operate only during times of peak electricity demand. It is expected that the EnergyAustralia Facility would operate for approximately 10 % of the year and the Delta Electricity Stage 1 Facility would operate for approximately 5 % of the year. The Delta Electricity Stage 2 Facility would operate at approximately 90 % capacity.

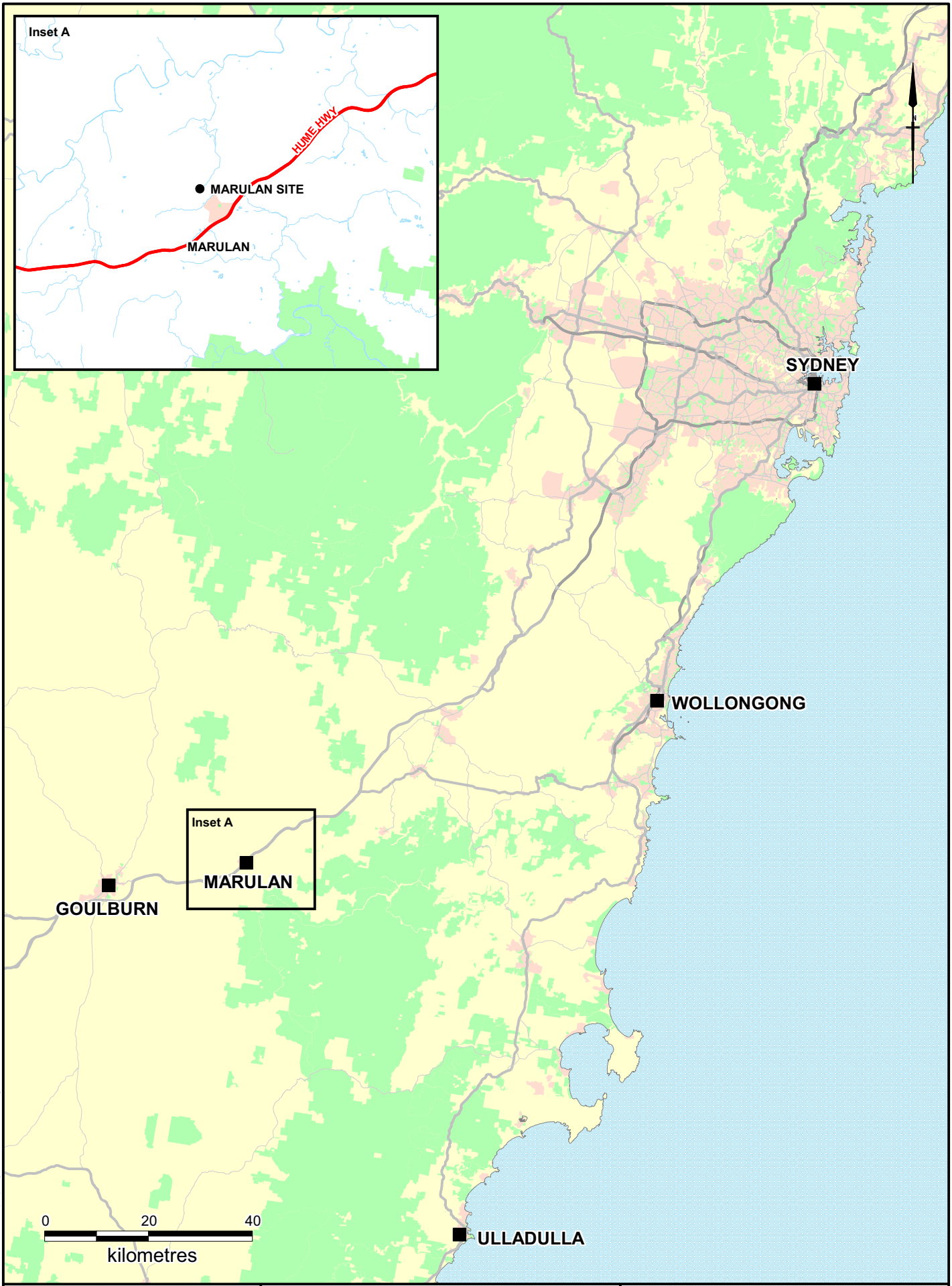
The development also requires the following common infrastructure:

- access road;
- transmission line; and
- gas pipeline to connect to the Moomba to Sydney Gas Pipeline.

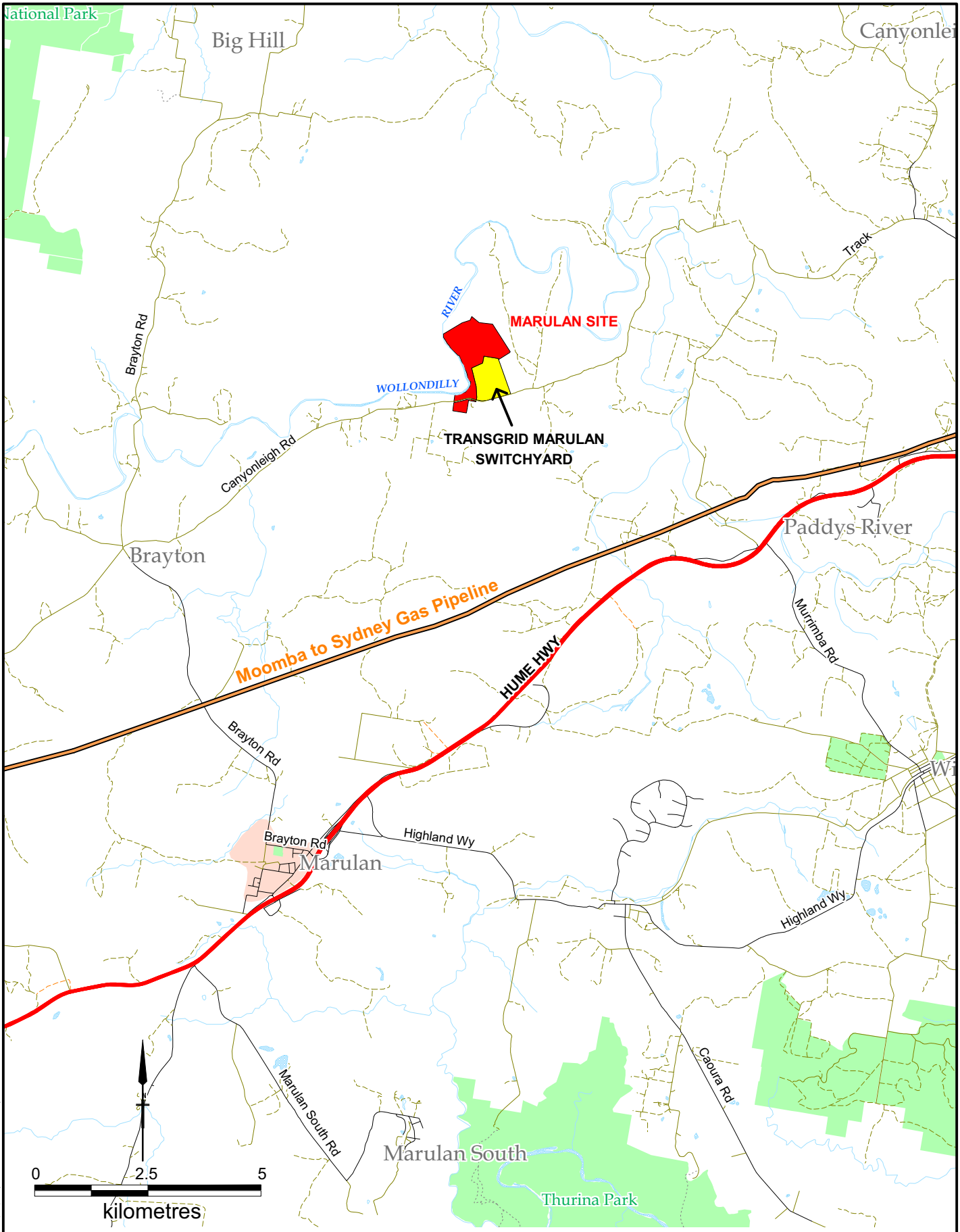
The Environmental Assessments sought approval for:

- Delta Electricity Stage 1 Facility;
- Delta Electricity Stage 2 Facility (progressed depending on electricity market demand);
- EnergyAustralia Facility;
- Shared infrastructure: access road and transmission line; and
- Shared infrastructure: gas pipeline corridor.

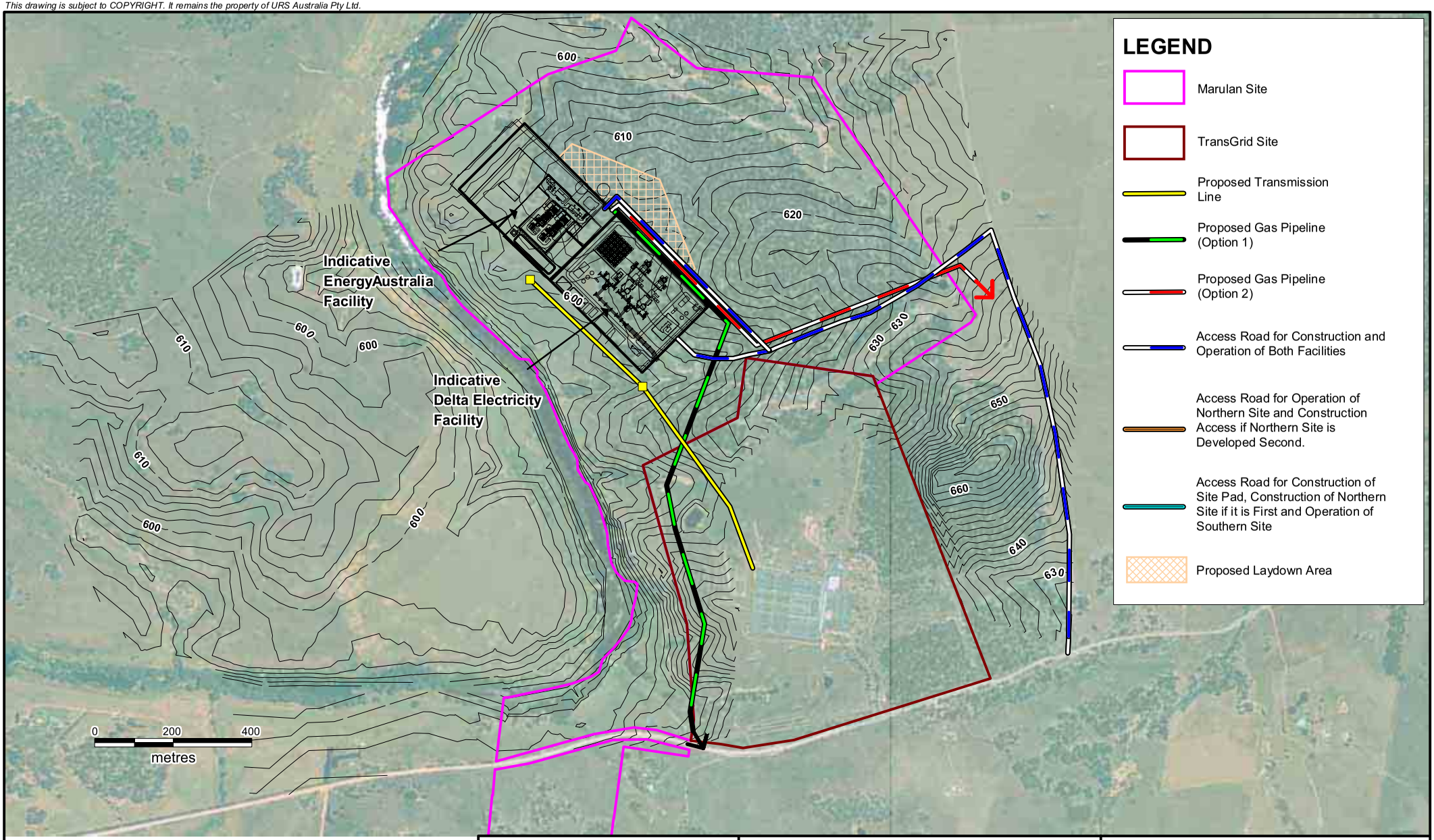
The above components as a whole are referred to as the Marulan Gas Turbine Facilities.



Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES - SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **REGIONAL LOCATION MAP**
URS	Drawn: AJW; Approved: NB; Date: 04/03/2009; Job No: **43177371**; File No: 43177371-205.wor	Figure: **2-1**



Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES - SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **LOCAL CONTEXT MAP**
URS	Drawn: AJW · Approved: NB · Date: 02/03/2009 · Job No: **43177371** · File No: 43177371-206.wor	Figure: **2-2**



NOTE: LOCATION AND LAYOUT AS PRESENTED IN ENVIRONMENTAL ASSESSMENTS (AUGUST 2008). REFER TO FIGURE 2-4 FOR UPDATED LOCATION AND LAYOUT.

Source: Delta Electricity, EnergyAustralia, Southern Cross Consulting Surveyors

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA

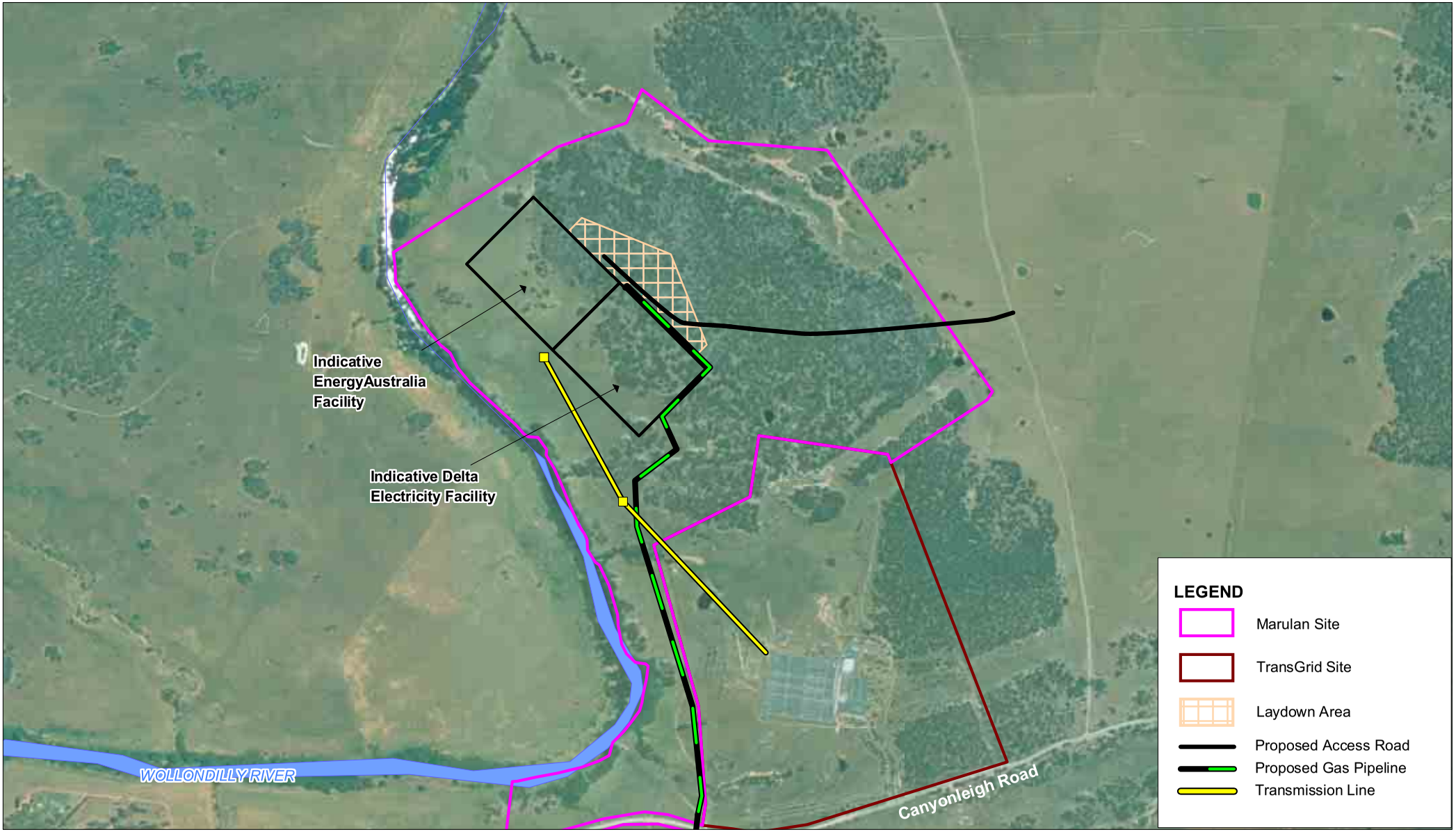
URS

Project: MARULAN GAS TURBINE FACILITIES - SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT

Drawn: AO	Approved: NB	Date: 23/04/2009
Job No: **43177371**	File No: 43177371-207.wor	

Title: **INDICATIVE LOCATION AND LAYOUT**

Figure: **2-3**



0 200 400
metres

Source: Delta Electricity, EnergyAustralia

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES – SUBMISSION RESPONSE AND PREFERRED PROJECT REPORT		Title: **REVISED INDICATIVE LOCATION AND LAYOUT**
URS	Drawn: AO	Approved: NB	Date: 02/03/2009
	Job No: **43177371**	File No: 43177371-228.wor	Figure: **2-4**

2.2 Consultation Program

Delta Electricity and EnergyAustralia have engaged with key statutory and public authority stakeholders and the local community during the planning process for the Environmental Assessment.

The consultation program has included the following:

Ongoing

- Project information made available on the Delta Electricity and EnergyAustralia websites.
- A freecall community information telephone line and prompt response provided to enquiries for the duration of the assessment process.
- Email address made available and prompt response provided to enquiries for the duration of the assessment process.

December 2007

- Letters sent to residential stakeholders surrounding the Marulan Site and located close to the most direct route of the gas pipeline and Councils to provide project information on 13 December 2007.

January 2008

- Letters sent to Goulburn Mulwaree and Upper Lachlan Shire Councils and local Members on 23 January 2008.
- Project Newsletter 1 issued in the week of 10 January 2008 to residential stakeholders surrounding the Marulan Site, located close to the most direct route of the gas pipeline, along Canyonleigh and Brayton Roads and those on the project database.
- Project information advertisement placed in the Goulburn Post on 25 January 2008 regarding the project generally.
- Meetings with eight groups of residential stakeholders (i.e. one family = one group) surrounding the Marulan Site and located close to the most direct route of the gas pipeline between 31 January 2008 and 1 February 2008.

September / October 2008

- Environmental Assessment available on DoP / Delta Electricity / EnergyAustralia websites during exhibition from 10 September 2008 to 13 October 2008.
- Project Newsletter 2 issued in September 2008 to residential stakeholders surrounding the Marulan Site, those located close to the most direct route of the gas pipeline, those along Canyonleigh and Brayton Roads and those on the project database.
- Project information advertisement placed in the Goulburn Post on 15 September 2008 regarding the Project generally and the upcoming information day.

Section 2 Project Overview and Consultation

- Notice to landowners in the Sydney Morning Herald on 10 September 2008 and Goulburn Post on 12 September 2008.
- Letters sent to Councils and local Members on 11 September 2008.
- Community Information Day in Wattle Glen Tea Rooms 17 September 2008 attended by approximately six groups. CD copies of the Environmental Assessments were made available.
- Meetings with six groups of residential stakeholders surrounding the Marulan Site and located close to the most direct route of the gas pipeline between 16 September 2008 and 17 September 2008. A CD or hard copy of Joint Concept Environmental Assessment and Project Applications was provided.
- Meeting between the Proponent and NSW MP Pru Goward on 24 October 2008 in relation to the Project and community concerns.

November 2008 – April 2009

- Refinement of the gas pipeline routes and discussions with those landholders potentially affected by the proposed gas pipeline routes.

2.3 Public exhibition

The exhibition period for public comment on the Environmental Assessments was determined by the DoP and undertaken for a total of 30 days from Wednesday 10 September 2008 until Monday 13 October 2008.

Advertisements addressing the release and availability of the Environmental Assessments were placed by the DoP in the Goulburn Post on 10 and 24 September 2008 and copies of the Environmental Assessments were made available for public viewing at the following locations:

- DoP, Information Centre, 23-33 Bridge Street, Sydney;
- Nature Conservation Council of NSW, Level 2, 301 Kent Street, Sydney;
- Upper Lachlan Shire Council, 44 Spring Street, Crookwell; and
- Goulburn Mulwaree Council, Civic Centre at 184-194 Bourke Street, Goulburn.

Additionally, hard copies of each of the Environmental Assessments were placed by the Proponent at the Marulan Post Office for viewing by the community.

The Environmental Assessments were also available on the websites of DoP, Delta Electricity and EnergyAustralia. A total of seven hard copies and nine electronic copies of each of the three Environmental Assessments were provided to the following agencies:

- Department of Environment and Climate Change (DECC): three hard copies and one CD copy.
- Department of Water and Energy (DWE): two hard copies and one CD copy.
- Sydney Catchment Authority (SCA): one hard copy and one CD copy.
- Goulburn Mulwaree Council and Upper Lachlan Shire Council: one hard copy and one CD copy.
- Catchment Management Authority: one CD copy.

- Rural Fire Service (RFS): one CD copy.
- Department of Defence (DoD): one CD copy.
- Civil Aviation Safety Authority (CASA): one CD copy.
- AirServices Australia: one CD copy.

A total of 20 submissions were received by DoP during the exhibition period. They comprised eight responses from agencies and 12 community submissions.

Additionally, one CD copy was provided to the Roads and Traffic Authority who made a representation directly to the Proponent.

All issues raised in relation to the Environmental Assessments have been addressed in **Section 3** of this Report.

Section 2 Project Overview and Consultation

EnergyAustralia

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Marulan Gas Turbine Facilities

Submissions Response & Preferred Project Report

SUBMISSIONS RESPONSE REPORT

VOLUME 1	MAIN REPORT	May 2009

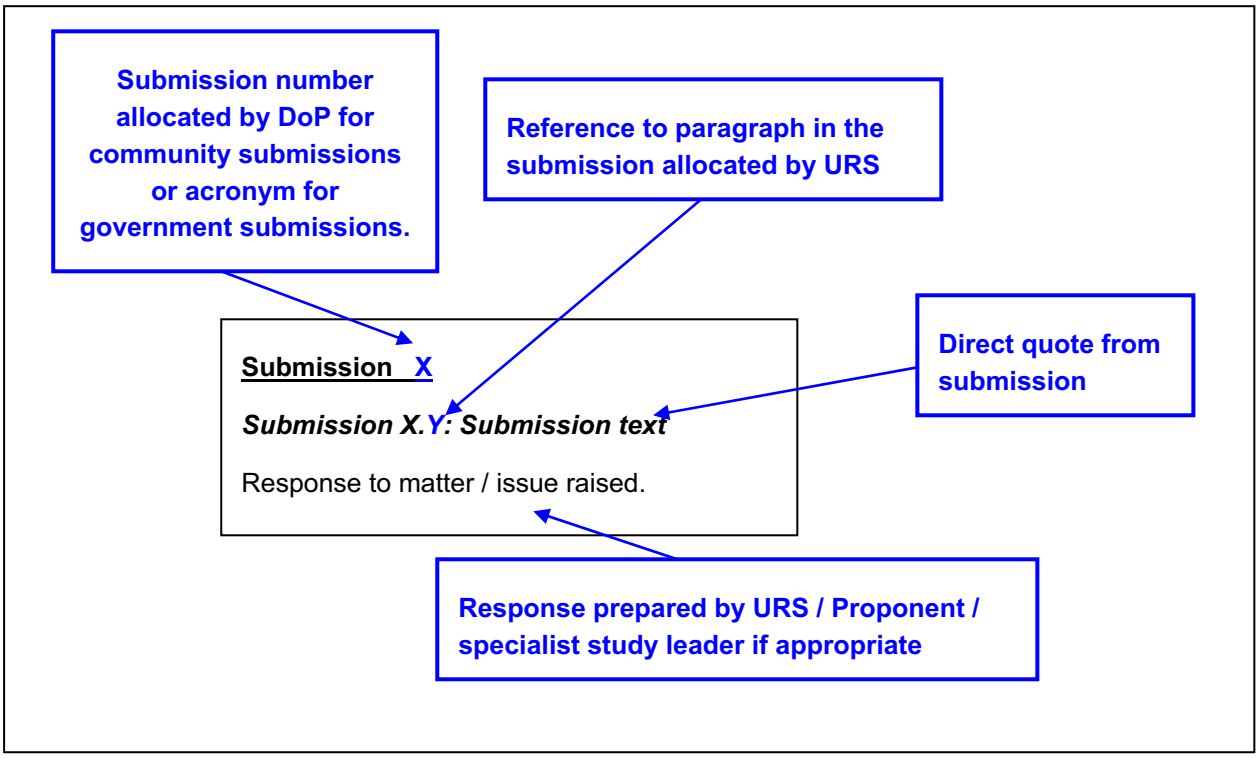
URS

3.1 Introduction

This Section provides a response to each of the government and community submissions received by DoP regarding the Project.

In order to provide a detailed response to submissions, each submission is reproduced below in *italics* referenced with the submission number it was given by the DoP for community submissions and the acronym of the agency for the government agency responses. In the interests of privacy, personal contact details of the submitters have not been presented. For ease of reference, each paragraph is then consecutively numbered. A response prepared by URS and the Proponent is then presented below each paragraph or suite of paragraphs if they relate to one matter. **Figure 3-1** below illustrates the referencing system.

Table 3-1 Illustration of referencing used in this Report



Where section and figure references occur in this Report the following nomenclature has been adopted:

- cross referencing to sections / figures within this Report appear in **bold**; and
- cross referencing to sections / figures in the Environmental Assessments do not appear in bold.

Section 3 Response to Submissions

3.2 Government Agencies and Local Government Submissions

A total of eight submissions were received from government agencies and local governments. Copies of these submissions are provided in **Appendix A**.

Submissions were received from the following government agencies and local governments:

- Department of Environment and Climate Change (DECC);
- Department of Defence (DoD);
- Department of Water and Energy (DWE);
- Hawkesbury Nepean Catchment Management Authority (CMA);
- Sydney Catchment Authority (SCA);
- Upper Lachlan Shire Council (ULSC); and
- Goulburn Mulwaree Council (GMC).

A response from RTA was also received after the exhibition period.

Each submission is addressed below.

3.2.1 Department of Environment and Climate Change (DECC) – Part A

Submission DECC-A.01: ***The currently proposed location of the power station will result in the loss of 22 hectares of high conservation value grassy woodland, including important habitats for threatened species. Accordingly, DECC recommends that the proponents assess how these impacts can be avoided. For example, large areas of cleared land are available in the areas that are unlikely to be similarly constrained.***

As discussed in Chapter 3 of the Environmental Assessments, other site options were investigated. Both Delta Electricity and EnergyAustralia considered a number of regions across NSW for location of the Facilities. Both determined that the Marulan area was the preferred location due to its proximity to Moomba to Sydney Gas Pipeline, proximity to high voltage transmission lines, availability of sites for purchase; and that the land use zoning permits the proposed Facilities as presented in Section 3.2.5 and Section 3.3.3 of the Joint Concept Environmental Assessment.

Following initial assessment, the Marulan Site was identified as the preferred site for the following reasons:

- availability of land for purchase; and
- advantage of collocating the proposed Facilities within close proximity to significant infrastructure (TransGrid switchyard) and associated reduction in infrastructure (gas pipeline and electricity transmission lines) required.

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment and additionally in the Preferred Project Report (**Section 4.6** of this Report). Consideration was given to the following factors for the location of the Facilities' footprint within the proposed Marulan Site:

- proximity to the Wollondilly River in relation to flooding issues and required setbacks;
- potential visual catchment;
- flora and fauna implications, including the presence of Endangered Ecological Communities (EEC); and
- noise implications.

Considering the cumulative effect of the above constraints as presented in Section 3.7 of the Joint Concept Environmental Assessment, the proposed location of the Facilities is in the area within the Marulan Site identified on **Figure 2-4** of this Report.

Further biodiversity assessment has been conducted on the Marulan Site and as a result, changes are proposed to the Facility infrastructure and footprint to minimise the area of clearing and avoid areas of high conservation significance. These are discussed in further detail in the Preferred Project Report (**Sections 4.6** and **4.7** of this Report). In summary, in order to avoid the areas of significant woodland within the Site, the following changes have been made:

- the southern boundary of the Facilities' footprint is further north west;
- the gas pipeline within the Marulan Site is now proposed to be located further west and north;
- the access road within the Marulan Site is now proposed to be located further north east; and
- the transmission line is now to proposed to be located further west.

Submission DECC-A.02: ***In the event that the proponent concludes that impacts at this location cannot be avoided, DECC advises that a much larger offset than currently proposed would be necessary to maintain or improve biodiversity values. ATTACHMENT II provides guidance on offset principles. DECC would be pleased to further discuss these comments.***

Refer to the response to Submission DECC-A.33-DECC-A.35 where the detail of this issue is addressed.

Submission DECC-A.03: ***Identification of noise sensitive receivers - The Noise Impact Assessment (NIA) identifies potentially most affected noise receivers in the area surrounding the proposed site. The receivers are all rural residential receivers and the NIA lists twelve receivers designated R15 to R26.***

This matter is noted.

Submission DECC-A.04: ***Existing Ambient Noise Levels - The NIA provides a summary of results of unattended ambient noise monitoring. The unattended monitoring was conducted between Sunday 7th of May 2006 and Thursday 18th of May 2006. DECC notes that periods of inclement weather appear to have been appropriately removed from the data set before the information was processed. Table 1 below reproduces the ambient noise data presented in the NIA.***

Section 3 Response to Submissions

Table 1: Summary of Ambient Noise Levels

Monitoring Locations	*Rating Background Level (RBL)*		
	Day	*Evening*	*Night*
1. R26	*28*	*30*	*31*
2. MS Site	*27*	*29*	*29*
3. R24,R25	*29*	*42*	*31*
4. R15, R16, R17, R18, R19, R20, R21, R22, R23	*27*	*29*	*29*

The cited Project details provided in the submission are confirmed by the Proponent.

Submission DECC-A.05: ***The Proponent indicated that the background (RBL) noise level for all the sites should be 30 dB(A) and this approach is consistent with Industrial Noise Policy (INP) 2000.***

DECC concurrence is noted.

Submission DECC-A.06: ***Project Specific Noise Levels - The proponent concluded that the Project Specific Noise level (PSNL) of 35 dB(A) LAeq min apply to all affected sites surrounding the proposed facility and that a Sleep disturbance criteria of 45 dB(A) LAMax apply. DECC agrees with these recommended noise levels as they are consistent with the INP 2000.***

DECC concurrence is noted.

Submission DECC-A.07: ***Construction Activity - DECC note that limited construction activity will occur at both the Delta Electricity and Energy Australia sites for construction and set up of turbines and infrastructure. DECC will regulate construction activity through time of use that construction can occur. Details of this are provided in the attached licence limits recommended at the end of this document.***

This issue is noted.

Submission DECC-A.08: ***Meteorological Conditions - DECC note that the proponent has processed hourly data for an entire year (2006) using CALMET and TAPM using two meteorological stations in the area surrounding Marulan. NAU are unsure of the distances between the site and the met stations and are unsure of the details that have been used to process the measured met data against CALMET and TAPM. NAU will recommend in the attached licence limits that compliance be determined against day time and evening wind speeds of 3m/s taken at 10 metres above the ground surface, and inversion conditions.***

Section 5.2 of the noise assessments for each of the Project Applications makes reference to the detailed information and justification of meteorological data and provides a summary of stability class frequencies being presented in the Marulan Gas Turbine Facility - Air Quality Assessment (URS 2008) for Delta Electricity and EnergyAustralia respectively.

As discussed in Appendix A of the Air Quality Assessments (appendices to the Environmental Assessments), the nearest meteorological stations were:

1) Goulburn Airport AWS (Station 070330), operated by the Bureau of Meteorology (located approximately 37 km south west of the Site);

2) Lynwood AWS, operated by ReadyMix Holdings Pty Limited, located approximately 12 km south south west of the Site;

3) Berrima AWS, operated by Blue Circle Southern Cement Ltd, located approximately 28 km east north east of the Site; and

4) Moss Vale AWS (Station 068045), operated by the Bureau of Meteorology, located approximately 36 km east north east of the Site; and

5) South Marulan AWS, operated by Boral Resources (NSW), located approximately 19 km south of the Site.

The first three meteorological stations were considered appropriate for incorporation into the dispersion modelling whilst Moss Vale was considered suitable for the assessment of meteorology in the region. Both Moss Vale and South Marulan AWS's were omitted from the meteorological modelling, given that both stations are located near to, yet beyond the Berrima and Lynwood AWS's respectively. Hence these stations consequently have limited ability to contribute significantly to those winds predicted in the region. In particular, the presence of strong local terrain features surrounding the South Marulan AWS means that wind records from the Site are most likely dominated by highly localised terrain effects. Meteorological models are not able to resolve these effects with meaningful implications for broader scale meteorology. Refer to Appendix A of the Air Quality Assessment in the Project Applications for further detailed discussion.

The Proponent notes the request for compliance against day time and evening wind speeds of 3 metres per second taken at 10 m above the ground surface, and inversion conditions.

Submission DECC-A.09: ***Predicted Noise Level Impact - Noise levels were predicted by the proponent using the Environmental Noise Model (ENM) applying prevailing meteorological conditions for the scenarios applied to day, evening and night time periods.***

The cited Project details provided in the submission are confirmed by the Proponent.

Submission DECC-A.10: ***No correction has been applied to predicted noise levels regarding modifying factors associated with low frequency noise impacts (Reference Chapter 4 INP 2000). DECC conclude that the proponent will eliminate all low frequency noise impacts from the turbines. The following table contains predicted noise levels based on Table 12 contained within the NIA in Section 7.1.2.***

Table 2. Predicted Noise levels (dBA) for modelled scenarios.

Receiver	Time	EA & DE Cumulative Noise
R15	Day	30
	Evening	32
	Night	31
R16	Day	31
	Evening	33
	Night	32
R17	Day	31
	Evening	34
	Night	32
R18	Day	30
	Evening	32
	Night	31
R19	Day	31

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Receiver	Time	EA & DE Cumulative Noise
	Evening	32
	Night	32
R20	Day	33
	Evening	35
	Night	35
R21	Day	33
	Evening	35
	Night	35
R22	Day	30
	Evening	34
	Night	32
R23	Day	39
	Evening	**41**
	Night	40
R24	Day	40
	Evening	**43**
	Night	**42**
R25	Day	27
	Evening	36
	Night	34
R26	Day	37
	Evening	38
	Night	38
Noise Limit dB(A)		**35**

The two noise assessments presented in the Project Applications and summaries presented in the Main Report of the Environmental Assessments for the Facilities discuss low frequency noise and the reasoning behind why it has been considered in a different manner to the approach taken in the INP.

Section 6.3 of the two noise assessments presented in the Project Applications state that:

> *"Recent international research has shown that the use of this difference approach is not suitable when the noise levels are low, since the low frequencies may then be below threshold of hearing levels (A review of Published Research on Low Frequency Noise and its Effects, Report for Department for Environment, Food and Rural Affairs (UK) by Dr Geoff Leventhall, 2003). Current research suggests that (dBC-dBA) difference should not be used as an annoyance predictor, but as a simple indicator of whether further investigation may be necessary (Low Frequency Noise and Annoyance, Noise & Health 2004, 6:23, 59-72)."*

Section 6.3 of the Project Applications go on to state that

> *"Low frequency noise issues for the Project during detailed design would be addressed consistent with the most recent low frequency noise assessment process that have been developed overseas in lieu of the INP, namely:*

- *Proposed criteria for the assessment of low frequency noise disturbance, 2005, Prepared for DEFRA by Dr. Andy Moorhouse, Dr. David Waddington, Dr. Mags Adams; and*
- *Procedure for the assessment of low frequency noise complaints 2005, Prepared for DEFRA by Dr. Andy Moorhouse, Dr. David Waddington, Dr. Mags Adams."*

This conclusion is reflected in the Statement of Commitments (Tables 8-8 and 19-1 of the Joint Concept Environmental Assessment and Section 5 of this Report) where the commitment is made that low frequency noise would be addressed during detailed design, consistent with the most recent assessment process that has been developed overseas in lieu of the INP.

Submission DECC-A.11: ***DECC does not normally licence to noise levels more than five decibels above the PSNL. DECC understand the Department of Planning (DoP) would assign acquisition rights to the receivers greater than 5 decibels above the PSNL identified in Table 3 above highlighted in BOLD.***

Submission DECC-A.12: ***DECC understands that DoP would assign architectural treatment rights to the receivers predicted to be affected by noise levels between three and five decibels above the PSNL. The relevant receivers are highlighted above in Table 3 above in grey shading and in italics.***

Submission DECC-A.13: ***DECC recommends that acquisition and architectural treatment rights be granted on the basis of the noise levels predicted in the EA, without the need for noise monitoring to confirm levels. This recommendation is made on the basis that the proponent presents, and the DECC accepts, the modelling as reasonably accurate, and to prevent the potential for lengthy disagreements about monitoring results.***

The Proponent agrees that where operational noise is predicted to exceed the noise criteria for residential dwellings (established in accordance with the Industrial Noise Policy (INP) guideline and most recent assessment process) property acquisition or negotiated agreements would be put in place. This commitment is reflected in the Statement of Commitments (Tables 8-8 and 19-1 of the Joint Concept Environmental Assessment and **Section 5** of this Report).

Noise modelling for worst case scenario of operation of the EnergyAustralia and Delta Electricity Stage 2 Facilities indicated that there would be significant exceedance of greater than 5 dB above criteria at residences R23 and R24 under adverse weather conditions. The Proponent has therefore purchased these residences.

Noise modelling for the EnergyAustralia and Delta Electricity Stage 2 Facilities indicated that there would be a marginal exceedance of 2-3 dB at residence R26. As a result the Proponent has initiated negotiations with the owners of residence R26 to discuss architectural treatments. Furthermore, discussions have also been initiated with the owners of residence R25.

DECC's concurrence with the modelling as being "reasonably accurate" is noted.

Submission DECC-A.14: ***The recommended daytime, evening and night time licence noise limits below apply to any receiver that does not have a negotiated agreement with the proponent including acquisition rights.***

The Proponent notes the request for a condition of this nature. As noted above, the Proponent has purchased residences, R23 and R24 and negotiations have been initiated with the owners of residence R26. Furthermore, discussions have also been initiated with the owners of residence R25.

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Submission DECC-A.15: ***Road Traffic Noise - The EA indicates that road traffic noise impacts are likely to be limited and NAU accept this conclusion.***

DECC's concurrence is noted. However, a further traffic noise assessment has been undertaken as a result of additional traffic studies. This assessment is presented in **Appendix C** and **Section 4.2** of this Report and addressed the traffic noise during operation and construction along the proposed access routes to the Site and from transport from the potential water supply sources during operation.

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case 'day hour' and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase is likely to be during the worst case three months during construction.

Construction traffic noise associated with the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

Submission DECC-A.16: ***Vibration - The vibration impacts associated with construction are expected to be minimal as the affected receivers are separated by significant distance. Therefore DECC accept that vibration impacts will not be noticeable.***

DECC's concurrence is noted.

Submission DECC-A.17: ***Recommended License Noise Limits. - DECC recommends inclusion of the following conditions in any consent that may be issued to the proposal, and would be mirrored in any Environment Protection Licence issued.***

Submission DECC-A.18: ***L6.1 Noise from the premises must not exceed the sound pressure level (noise) limits presented in the Table 6.1 below. The noise limits apply to the cumulative noise impacts of both Delta Electricity and Energy Australia facilities. Note the limits represent the sound pressure level (noise) contribution, at the nominated receiver locations in the table.***

Table 6.1 - Noise Limits (dB(A))

Locations	Day	Evening	Night	
	LAeq (15 minute)	LAeq (15 minute)	LAeq (15 minute	LAmax or LA1(1minule)
R15, R16, R17, R18. R19, R20, R21, R22	35	35	35	45
R25	36	36	35	45
R26	38	38	38	35

– ***DECC recommend that DoP may wish to consider that architectural treatment be applied to receiver R26.***

– ***DECC are unable to recommend licence limits to receiver R23 and R24 and DECC would expect that DoP would require that property acquisition be applied to these receivers***.

In response to Submission DECC-A.18, as noted in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment and **Section 5** of this Report), where operational noise is predicted to exceed the noise criteria for residential dwellings (established in accordance with the Industrial Noise Policy (INP) guideline and most recent assessment process) property acquisition or negotiated agreements would be put in place.

As noted above, the Proponent has purchased residences, R23 and R24 and negotiations have been initiated with the owners of residence R26. Furthermore, discussions have also been initiated with the owners of residence R25.

Submission DECC-A.19: ***L6.2 For the purpose of Condition 6.1:***

1. ***Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays,***
2. ***Evening is defined as the period from 6pm to 10pm***
3. ***Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays***

The Proponent notes the request for a condition of this nature.

Submission DECC-A.20: L6.3 Noise from the premise is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise level limits in Condition L6.1.

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the DECC may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

The Proponent notes the request for a condition described in relation to the distance of measurement and the acceptance of alternative means of noise measurement. However, the Proponent does not agree with the condition relating to modification factors. As noted in the response to DECC-A.10, the two noise assessments presented in the Project Applications and summaries presented in the main report of the Environmental Assessments for the Facilities discuss why low frequency noise has been considered in a different manner to the INP using precedent international benchmarking.

This conclusion is reflected in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment and **Section 5** of this Report) where the commitment is made that low frequency noise would be addressed during detailed design, consistent with the most recent assessment process that has been developed overseas in lieu of the INP.

Submission DECC-A.21: L64 The noise emission limits identified in Condition L6.1 apply under meteorological conditions of wind speed up to 3 metres per second at 10 metres above ground level, and temperature inversion conditions.

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The Proponent notes the request for a condition of this nature.

Submission DECC-A.22: ***L6.5 A noise compliance assessment for the operations of the facility shall be submitted to the DECC within three (3) months of commencement of Stage 2 operations. The assessment shall be prepared by a suitably qualified and experienced acoustical practitioner and demonstrate compliance and that no low frequency noise emissions shall be emitted from the facility demonstrating compliance with the New South Wales Government's Industrial Noise Policy (INP 2000) Chapter 4 Modifying factors.***

The Proponent notes the request for a condition of this nature for the Delta Electricity Stage 2 operations.

The Proponent does not agree with the condition relating to the assessment complying with the INP Chapter 4 Modifying factors. As noted in the response to DECC-A.10, the two noise assessments presented in the Project Applications and summaries presented in the main report of the Environmental Assessments for the Facilities discuss why low frequency noise has been considered in a different manner to the INP using precedent international benchmarking.

This conclusion is reflected in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment) where the commitment is made that low frequency noise would be addressed during detailed design, consistent with the most recent assessment process that has been developed overseas in lieu of the INP.

Submission DECC-A.23: ***L6.6 All construction work associated with the development must be conducted between 7am and 6pm Monday to Friday and between 8am and 1pm Saturdays and at no time on Sundays and public holidays, unless inaudible at any residential premises. Inaudible means not to be heard at the nearest most affected receiver(s).***

The Proponent notes the request for a condition of this nature.

Submission DECC-A.24: ***The proponent shall implement the commitments made in the Draft Statement of Commitments in the EA in specific relation to noise.***

The Proponent notes the request for a condition of this nature. As noted in the response to DECC-A.10, the two noise assessments presented in the Project Applications and summaries presented in the main report of the Environmental Assessments for the Facilities clearly state that low frequency noise has been considered in a different manner to the INP.

This conclusion is reflected in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment) where the commitment is made that low frequency noise would be addressed during detailed design, consistent with the most recent assessment process that has been developed overseas in lieu of the INP. The Proponent confirms its agreement with a condition committing to implement the commitments made in the Statement of Commitments in the Environmental Assessment in specific relation to noise.

Submission DECC-A.25: ***Biodiversity Impact Assessment - DECC has reviewed the Biodiversity Impact Assessment Report prepared by URS lodged with the Joint Concept Application and wishes to raise the following matters.***

Refer to responses below.

Submission DECC-A.26: ***Impacts on Tree Hollow Resources - The size classes of the hollows and the number of hollows in each of the hollow-bearing trees to be removed and retained have not been***

provided in the report. This does not allow for adequate comparison of the tree hollow resources to be removed for the proposal with those to be retained.

The Joint Concept Environmental Assessment Appendix F Flora and Fauna Assessment, provides information on the mean number of tree hollows per area within the development site (those to be removed) and within the proposed offset area (those to be retained). It is considered that there is sufficient information provided in the Assessment to allow DECC to assess the relative abundance of tree-hollows and impacts on hollows.

As noted in the Flora and Fauna Assessment, the woodland to be cleared within the development footprint is part of a contiguous patch of woodland that includes the offset. Hence the biodiversity values (including tree-hollows) of the offset are equivalent or greater than those within the development footprint.

In addition, as detailed in the Preferred Project Report (**Section 4.7** of this Report), further assessment of the Marulan Site has identified an area to the south of the Facilities' footprint as Box Gum Woodland which is consistent with the Endangered Ecological Community White Box Yellow Box Blakely's red gum woodland as listed under the *Threatened Species Conservation Act 1995* (TSC Act) (referred to herein as 'TSC EEC Box Gum Woodland'). As discussed in **Section 4.6**, the Facility infrastructure alignments within the Marulan Site have been altered to avoid this TSC EEC and therefore the proposed Project offset now includes an area of greater conservation value than is being cleared for the Project. Based on characteristics of the TSC EEC it is likely to support a higher density of hollows than the other woodland communities on the site. Further detail on the overall Project biodiversity offset is provided in the Preferred Project Report (**Section 4.8** of this Report).

Submission DECC-A.27: ***Impacts on Threatened Species - DECC has identified that the key threatened species impacts of the proposal are the loss of habitat for Eastern False Pipistrelle, Hooded Robin and Diamond Firetail and that these impacts have not been appropriately assessed.***

Submission DECC-A.28: ***Stag-watching surveys do not appear to have achieved the coverage that would discount the use of hollow-bearing trees and stags for breeding by the Eastern False Pipistrelle in the areas to be cleared for the proposal. The stags on the indicative Delta Electricity Facility site do not appear to have been stag-watched and stag-watching location 4 on Figure 3 does not correlate with any locations of hollow-bearing trees or stags on Figure 6. The loss of breeding sites would have significant effects on the viability of the local population of this species and DECC does not support such impacts.***

The flora and fauna surveys included stag watching at selected stags located within and around the development footprint. As noted in Section 3.2.3 of the Flora and Fauna Assessment, stag watching was conducted on hollows assessed as having the potential to shelter arboreal fauna, including mammals, bats and hollow-nesting birds. Nominated hollows were observed during dusk between 6 and 7 pm by two field staff over two nights, noting any fauna emerging from hollows or nests. The distribution of stags (and trees deemed to be appropriate for stag-watching) is not regular throughout the development site. Hence, their locations, as mapped in Figure 3 and Figure 6 of the Flora and Fauna Assessment, are not evenly distributed and may not appear to be achieving a 'coverage' of the site. Given the number of tree hollows, it is not considered feasible to stag-watch every hollow-bearing tree during a given survey period.

Whether or not the proposal would clear breeding sites for the Eastern False Pipistrelle is not possible to determine without extensive or prolonged surveys. However, the preservation of potential roosting, breeding and foraging habitat within the offset area would ensure that if a local population of this species is present on the Site, then its habitat would be preserved in perpetuity.

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To further minimise the impact of the Proposal on roost sites for this species, nest boxes would be erected within the offset area.

***Submission DECC-A.29**: The presence of the Hooded Robin in cleared areas and riparian vegetation adjacent to the Wollondilly River does not rule out its use of the woodland vegetation to be removed by the proposal. The report states that the loss of 22ha of woodland would not have significant detrimental impacts on this species, but various studies have suggested that the species abandons woodland habitats when patch size drops below about 100ha. The lack of other records for this species in the locality and its sedentary habits suggest that the woodland on the Marulan site could be very important for the Hooded Robin. Hence the proposal could have significant effects on the viability of the local population of this species and DECC does not support such impacts.*

As part of the Flora and Fauna Assessment (presented in Appendix F of the Joint Concept Environmental Assessment), targeted fauna surveys were carried out from 22 to 24 October 2007. The survey design was based on the likelihood of threatened species identified in the literature review occurring on Site and the initial habitat assessment. Threatened woodland birds, including the Hooded Robin (*Melanodryas cucullata cucullata)* were particularly targeted at this time as it correlates with their breeding and / or peak activity periods.

The Hooded Robin, a threatened species under Schedule 2 of the TSC Act, was recorded on Site. This species was recorded in woodland habitats within the central to northern parts of the Site.

The Flora and Fauna Assessment concluded that the Site could support a 'viable local population' of the Hooded Robin. This population may occur on a temporary or seasonal basis during season expansion of a breeding pair's home range or may support breeding pairs during some seasons. No nests or other direct evidence of breeding activity were observed within the development footprint over three separate surveys undertaken by URS.

The offset area also contains potential foraging and nesting resources for this, and other, woodland bird species, as noted in the assessment. The Robins' sedentary habit allows the assessment to be more conclusive about its presence on the Site.

The proposed works would not disturb known nesting or roosting sites for individuals, breeding pairs, or local populations of these species. Impacts associated with the proposal are likely to be limited to the loss of potential foraging, roosting and breeding resources. Substantial areas of equivalent or better grade habitat are available in the local area, including woodland within the Site that would be retained for the offset area. Therefore it was concluded that the habitat to be impacted is probably of minor importance to the long-term survival of the species in the locality. Accordingly the proposed works are not likely to have 'an adverse effect on the life cycle' of these species such that local populations of these species would be placed 'at risk of extinction'.

The reference to the lack of records of a species such as the Hooded Robin may be indicative of a lack of previous research and consultant work within the locality.

DECC notes that various studies have suggested that the species abandons woodland habitats when patch size drops below 100 ha. It is noted woodland vegetation occurs on the Marulan Site on elevated slopes above the Wollondilly River and currently occupies approximately 62.9 ha of the Site, and therefore is currently already less than 100 ha.

Proposed rehabilitation of the riparian zone in the north east section of the Marulan Site is consistent with recovery actions identified for the Hooded Robin by DECC, and would provide greater connectivity for the species within the region.

Submission DECC-A.30: ***The Diamond Firetail is likely to be resident on the site as it was recorded in 2006 and 2007. The proposal will reduce foraging habitat tor the species and the patch size of the vegetation on the site, which could render the remaining habitat unsuitable. The lack of previous records for the species in the locality suggests that the woodland on the Marulan site could also be very important for the Diamond Firetail. Hence the proposal could have significant effects on the viability of the local population of this species and DECC does not support such impacts.***

As part of the Flora and Fauna Assessment, targeted fauna surveys were carried out from 22 to 24 October 2007. The survey design was based on the likelihood of threatened species identified in the literature review occurring on Site and the initial habitat assessment. Threatened woodland birds, including the Diamond Firetail (*Stagonopleura guttata*) were particularly targeted at this time as it correlates with their breeding and / or peak activity periods.

The Diamond Firetail (*Stagonopleura guttata*), a threatened species under Schedule 2 of the TSC Act was recorded on Site. This species was recorded in woodland habitats within the central to northern parts of the Site.

The Flora and Fauna Assessment concluded that the Diamond Firetail is likely to use foraging resources present on Site, but the absence of a dense, shrubby understorey on the Site means that it is unlikely to comprise breeding habitat. The Firetail's sedentary habit allows the assessment to be more conclusive about its presence on the Site. No nests or other direct evidence of breeding activity were observed within the development footprint over three separate surveys. Hence, the likelihood of the proposal affecting breeding habitat is low. Moreover, the offset area contains potential foraging and nesting resources for this, and other, woodland bird species, as noted in the assessment.

Impacts on the species are likely to be limited to the removal of foraging habitat. Accordingly the proposed works are not likely to have 'an adverse effect on the life cycle' of these species such that local populations of these species would be placed 'at risk of extinction'. The proposal would probably constitute a minor impact on the foraging resources available to the Diamond Firetail in this locality as bird species are mobile and would travel to utilise suitable habitats. Significant areas of equivalent or better grade habitat are available in the local area, including extant woodland within the Site that would not be impacted by the proposal and maintained as the offset area.

The reference to the lack of records of a species such as the Diamond Firetail may be indicative of a lack of previous research and consultant work within the locality.

Submission DECC-A.31: ***Impacts on Endangered Ecological Communities - The report states that the Tableland Hills Grassy Woodland contains an area with a small number of scattered individuals of Blakely's Red Gum. The presence of this tree species in conjunction with a grassy groundcover including Austrostipe scabra and Themetie australis (as stated in the report) indicates to DECC that this part of the site is likely to comprise the White Box, Yellow Box, Blakely's Red Gum Woodland endangered ecological community (EEC). Furthermore, the report has not appropriately considered the potential for cleared areas containing native grasses and isolated paddock trees to comprise part of the EEC and has not identified these tree species. The impacts of the proposal on this EEC have not been assessed and there is no map to indicate where the EEC occurs on the site. These matters require further clarification by the proponent.***

The Flora and Fauna Assessment determined that the majority of the Site was the community of Tableland Hills Grassy Woodland.

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Further survey work was conducted in November 2008 and January 2009 on the Marulan Site which identified an area in the southern portion of the Marulan Site and two small non-contiguous areas in the north west of the Site as being the TSC EEC Box Gum Woodland, with the majority of the rest of the Marulan Site still identified as Tableland Hills Grassy Woodland. Further detail and mapping is presented in **Section 4.7** of this Report.

The area identified as Tableland Hills Grassy Woodland was based on the following key reasons as outlined in the Flora and Fauna Assessment:

- The key characteristic canopy species of Box-Gum Woodland are white box *Eucalyptus albens*, yellow box *Eucalyptus melliodora* and Blakely's red gum *Eucalyptus blakelyi*. These species are not the characteristic canopy species within the Tableland Hills Grassy Woodland community.
- The canopy species recorded within the Tableland Hills Grassy Woodland community (*Eucalyptus cinerea, E. rossii* and *E. eugenioides*) are not listed as 'characteristic' species under the definition of Box-Gum Woodland in the *Final Determination* of the NSW Scientific Committee (2004).
- The Box-Gum Woodland *Identification Guidelines* (NPWS, undated) states that 'Whether the characteristic trees of the Site are (or are likely to have been) White Box, Yellow Box or Blakely's Red Gum'. As noted above, these species are not the characteristic species of the Site and are not likely to have ever been.
- Reference to the most recent publicly available regional vegetation mapping and report (Tindall *et al.* 2004) indicates that Tableland Hills Grassy Woodland is not part of the Box-Gum Woodland association.

On the basis of further assessment (discussed in detail in **Section 4.7** of this Report) identifying areas of TSC EEC Box Gum Woodland, in accordance with the DECC's first principle of 'avoidance', measures were investigated to alter the alignment of the infrastructure proposed in that area of woodland to avoid this EEC. The alignments of the gas pipeline within the Marulan Site, transmission line, access road and southern boundary of the Facilities' footprint have been moved such that the impact on the larger area of TSC EEC Box Gum Woodland within the Marulan Site is avoided. One small non-contiguous patch (approximately 0.1 ha) in the north western portion of the Site cannot be avoided by moving the Facilities' footprint based on the other constraints within the Site.

Based on these revised infrastructure alignments, clearing of the Box Gum Woodland EEC within Site has been avoided. The proposed Project offset area has been increased (as discussed in detail in **Section 4.8** of this Report) to include this area of TSC EEC Box Gum Woodland to be preserved in perpetuity.

Submission DECC-A.32: Habitat Fragmentation and Vegetation Loss - DECC has identified that the Tableland Hills Grassy Woodland to be cleared for the proposal has high conservation values. The proponent has not indicated why this impact cannot be avoided by the use of existing cleared land in the vicinity of the site for the proposal. The proposed shared infrastructure corridor increases fragmentation of remnant vegetation on the site. The proponent has not indicated why existing cleared areas cannot be used for the corridor to avoid or mitigate vegetation disturbance and fragmentation.

As noted in response to Submission DECC-A.01 and DECC-A.31, Chapter 3 of the Environmental Assessments details that both Delta Electricity and EnergyAustralia considered a number of regions across NSW. Both determined that the Marulan area was the preferred location due to its proximity to Moomba to Sydney Gas Pipeline, proximity to high voltage transmission lines, availability of sites for purchase; and the land use zoning permits the proposed Facilities as presented in Section 3.2.5 and Section 3.3.3 of the Joint Concept Environmental Assessment.

Following initial assessment, the Marulan Site was identified by the Proponent as the preferred site for following reasons:

- availability of land for purchase; and
- advantage of co-locating the proposed Facilities within close proximity to significant infrastructure (TransGrid switchyard) and associated reduction in infrastructure (gas pipeline and electricity transmission lines) required thereby reducing further impacts.

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment. Consideration was given to the location of the Facility footprint within the proposed Marulan Site.

Considering the cumulative effect of the above constraints as presented in Section 3.7 of the Joint Concept Environmental Assessment, the proposed location of the Facilities is in the area within the Marulan Site identified on Figure 1-3 of the Joint Concept Environmental Assessment.

As noted in response to Submission DECC-A.01 and DECC-A.31, further biodiversity assessment has been conducted on the Marulan Site and as a result, changes are proposed to the Facility infrastructure and footprint to minimise the area of clearing and avoid areas of high conservation significance. These are discussed in further detail in the Preferred Project Report (**Sections 4.6** and **4.7** of this Report). In summary, in order to avoid the areas of significant woodland the following changes have been made:

- the southern boundary of the Facilities' footprint is further north west;
- the gas pipeline within the Marulan Site is now proposed to be located further west and north;
- the access road within the Marulan Site is now proposed to be located further north east; and
- the transmission line is now to proposed to be located further west.

Submission DECC-A.33: Offsets - The offsets proposed for the clearing of 22ha of Tableland Hills Grassy Woodland containing habitats for eight threatened species comprise 32ha of adjoining woodland with similar habitat attributes and 6.8ha of cleared grassland to be revegetated mostly with riparian vegetation. The report does not indicate whether the EEC containing Blakely's Red Gum will be cleared and hence does not provide offsets for it.

Submission DECC-A.34: DECC has identified that the extent of the proposed offset (1 :1.5) is not adequate to meet the improve-or-maintain test. A much higher offset ratio is required. The proponent will also need to factor any clearing of EEC into the offset calculation following further assessment of the impacts of the proposal on the EEC.

Submission DECC-A.35: Conclusions and Recommendations - DECC does not support the proposal in its current location. The habitats to be affected are of high conservation value and the offsets provided fall well short of improving or maintaining biodiversity values.

As noted in response to Submission DECC-A.01 and DECC-A.31, further survey work was conducted in November 2008 and January 2009 on the Marulan Site which identified an area in the south of the Marulan Site and two small non-contiguous areas in the north west of the Site as being the TSC EEC Box Gum Woodland, with the rest of the Marulan Site still identified as Tableland Hills Grassy Woodland. Further detail and mapping is presented in **Section 4.7** of this Report. The southern boundary of the Facilities' footprint and the alignments

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of gas pipeline within the Marulan Site, transmission line and access road have also been altered based on this data to avoid the TSC EEC Box Gum Woodland as discussed in **Section 4.6** of this Report.

The key features of the proposed Project Biodiversity Offset as discussed in **Section 4.7** of this Report and shown in **Figure 4-10** are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern parts of the Site.

A summary of the Project Biodiversity Offset components is provided in **Table 4-14** and presented on **Figure 4-9**.

On the basis of the assessment, it is considered that the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values. Over and above this, the Proponent is also proposing an additional offset area of 0.4 ha of Box Gum Woodland TSC EEC in a portion of Lot 153 DP 750053 located to the south of the Site (also owned by the Proponent).

The total Project biodiversity offset package proposed (45.7 ha) is therefore considered to adequately 'maintain' the biodiversity values of the Site, as it would allow the permanent conservation of vegetation which is currently unprotected, to be managed for the improvement of habitat and other biodiversity values.

Submission DECC-A.36: ***DECC concludes that alternative locations on cleared land nearby would avoid or mitigate impacts on biodiversity values for the facilities and recommends that the proponents should investigate these other site options.***

As discussed in the response to DECC-A.01, other site options were investigated. Both Delta Electricity and EnergyAustralia considered a number of regions across NSW for location of the Facilities. Both determined that the Marulan area met their site selection criteria due to its proximity to Moomba to Sydney Gas Pipeline, proximity to high voltage transmission lines, availability of sites for purchase; and the land use zoning permits the proposed Facility as presented in Section 3.2.5 and Section 3.3.3 of the Joint Concept Environmental Assessment.

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment and additionally in the Preferred Project Report (**Section 4.6** of this Report). Consideration was given to the location of the Facilities' footprint within the proposed Marulan Site. These factors included:

- proximity to the Wollondilly River in relation to flooding issues and required setbacks;
- potential visual catchment;
- flora and fauna implications, including the presence of Endangered Ecological Communities (EEC); and
- noise implications.

Considering the cumulative effect of the above constraints, the proposed location of the Facilities is in the area within the Marulan Site identified on **Figure 2-4** of this Report.

3.2.2 Department of Environment and Climate Change (DECC) – Part B

Submission DECC-B.01: This letter provides DECC's submission in relation to the assessment of Aboriginal heritage impacts of the proposal.

Submission DECC-B.02: DECC prefers subsurface testing to be carried out prior to consent, in order to assess the impact to Aboriginal heritage. DECC notes the proponent's preference, documented in the Environmental Assessment (EA), that subsurface testing will be carried out prior to construction. This essentially constitutes salvage, since by that time options to avoid impact will be limited or absent. DECC notes that the nearby Lynwood quarry project found high densities of subsurface Aboriginal heritage objects in pre-construction salvage and this may occur for the Marulan Power Station project.

The Proponent notes DECC's comments.

Submission DECC-B.03: DECC has received the relevant archaeological reports and site cards for the Aboriginal Heritage Management System.

The Proponent notes DECC's comments.

Submission DECC-B.04: DECC is satisfied that adequate Aboriginal community consultation has occurred. DECC supports the recommended Cultural Heritage Assessment and Management Report.

DECC's support for the Cultural Heritage Assessment and Management Report is noted.

Submission DECC-B.05: DECC recognises that, given the status of this Major Project as critical infrastructure, the Department of Planning may be inclined to approve the proposal on the basis of salvage prior to construction. In this event, DECC recommends that conditions of consent require an Aboriginal Heritage Management Plan be prepared to guide salvage and construction. This Plan should include procedures to be followed in the event of identification of potential burials. The Plan should also include procedures to be followed in the event of identification of highly significant heritage objects. DECC recommends that conditions of consent require consultation with the relevant Aboriginal community and community involvement in salvage and relocation of Aboriginal heritage objects.

The Proponent notes the request for a condition of this nature and also notes that the Statement of Commitments (Table 19-1 of the Joint Concept Environmental Assessment and **Section 5** of this Report) includes the following commitments:

- All reasonable attempts would be made to avoid significant Aboriginal archaeological sites within the Study Area through changes to the proposed design and construction methods.
- If the Aboriginal archaeological cultural material cannot be avoided, then all reasonable attempts to reduce impact would be made through the development of a Cultural Heritage Management Plan (CHMP). The CHMP would outline strategies for dealing with recorded and un-recorded Aboriginal archaeological sites encountered within the proposed development area.

3.2.3 Department of Defence

Submission DOD.01: I refer to your letter dated 5 September 2008 (Your Ref: S08/00661) advising of a proposal for two gas-fired power stations and associated infrastructure to be constructed near Marulan

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in NSW. The proposal will include four exhaust stacks up to 40m above ground level (AGL) in height and the above mean sea level elevation of the site is approx 605m AHD. From an aviation safety perspective, it is not only the height exhaust stacks which need to be assessed but also the impact of the exhaust plume emanating from the stacks.

A Plume Rise Assessment was prepared for the respective Project Application Environmental Assessments. The Plume Rise Assessment has been subsequently revised and a summary is presented in the Preferred Project Report in **Section 4.9** and the full assessment presented in **Appendix I**. The assessment concluded that for one year (2006) of modelled open cycle operation, the Obstacle Limitation Surface (OLS) is exceeded during approximately 70 % of the year as a worst case scenario. Whilst this assessment is considered conservative with respect to the modelled operating times and operating conditions, consideration would be given for the Facilities to be designated a potential hazard to aircraft operators in the area. The implementation of such designation is at the discretion of the Civil Aviation Safety Authority (CASA). Further consultation with CASA would be undertaken following detailed design.

Submission DOD .02: ***Defence has assessed the proposal for any possible impact on the safety of military flying operations. The Department advises the proposed power stations will be located outside any areas affected by the Defence (Areas Control) Regulations (DACR). The DACR control the height of objects (both man-made structures and vegetation) and the purpose for which they may be used within approximately 15km radius of Defence airfields.***

The Proponent notes that the Facilities are located outside any areas affected by the Defence (Areas Control) Regulations.

Submission DOD .03: ***The Civil Aviation Safety Authority (CASA) has published an Advisory Circular AC 139-05(0) - Guidelines For Conducting Plume Rise Assessments dated June 2004. This Circular identifies the need to assess the potential hazards to aviation because the vertical velocity from gas efflux may cause airframe damage and/or affect the handling characteristics of an aircraft in flight. The Advisory Circular defines hazardous gaseous efflux as being the vertical and horizontal limits of the exhaust plume at which the vertical velocity reduces to a value of 4.3 metres/second (m/s).***

The Plume Rise Assessment has been revised and a summary is presented in the Preferred Project Report in **Section 4.9** and the full assessment presented in **Appendix I**. The Plume Rise Assessment was prepared in accordance with the Civil Aviation Safety Authority's (CASA) Advisory Circular "*Guidelines for Conducting Plume Rise Assessments*" (June, 2004). As noted in response to Submission DOD.01 the assessment concluded that for one year (2006) of modelled open cycle operation, the Obstacle Limitation Surface (OLS) is exceeded during approximately 70 % of the year as a worst case scenario. Whilst this assessment is considered conservative with respect to the modelled operating times and operating conditions, consideration would be given for the Facilities to be designated a potential hazard to aircraft operators in the area. The implementation of such designation is at the discretion of the Civil Aviation Safety Authority (CASA). Further consultation with CASA would be undertaken following detailed design.

Submission DOD .04: ***A plume rise assessment has been undertaken for the two power station exhaust stacks and the exhaust plume will rise to a height of approximately 852m AGL with horizontal extent of 262m (where the vertical velocity reduces to 4.3m/s). As the exhaust plume will be higher than 110m AGL the proponent will need to have the proposal assessed by CASA for the potential hazard to aircraft operations.***

Consultation with CASA has been initiated and would continue throughout detailed design.

Submission DOD .05: ***The Department of Defence has no objection to the proposal subject to a hazard assessment being undertaken by CASA.***

The Proponent notes that DoD has no objection to the Facilities.

3.2.4 Department of Water and Energy

Submission DWE.01: ***The Department advises that it has reviewed the Joint Concept Application EA, and the two Project Application EA's and it would appear that issues raised during the Test of Adequacy submission relating to the proposed gas pipeline route and water management have not been addressed prior to exhibition.***

Submission DWE.02: ***Consequently, DWE is unable to provide more specific information on relevant aspects of the proposal to assist the Department of Planning (DoP) assess the proposed development, to that which has been detailed below.***

During the Adequacy Review process, the DoP advised of the issues that needed to be addressed prior to exhibition. Following submission of revised Environmental Assessments, the DoP confirmed that the documents adequately addressed the Environmental Assessment requirements specified in the D-G Requirements.

However, subsequent to the Environmental Assessments exhibition, further detailed assessments have been undertaken on the gas pipeline route and water management which are presented in the Preferred Project Report (**Sections 4.3** and **4.5** of this Report).

Submission DWE.03: ***Gas Pipe Line Route - In terms of the proposed gas pipeline route, the Joint Concept Application and two Project Application EA's have identified a broad pipeline corridor (with lands specified within that corridor) that outlines two possible options for that route within the corridor. One of those options is indicated as "preferred" and it is stated that "an alignment will be refined during Subsequent approvals".***

Submission DWE.04: ***As the pipeline is an essential element of the overall project, it is our contention that one or the other (if not both), of the Project Application EA's should have included a more detailed environmental assessment of the corridor or the preferred route to allow an adequate assessment of the "entire" project.***

In response to DWE.03 and DWE.04, it is noted that the assessment of the gas pipeline corridor in the Joint Concept Environmental Assessment reflected that the Proponent was seeking Concept Approval for that component with a commitment to undertaking further assessment to decide the preferred location for the gas main connection and the pipeline routes at a later date.

Additional studies have since been conducted and further detail on the gas pipeline route is provided in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G**.

Submission DWE.05: ***Consequently, the only information DWE is able to offer is that the proposed gas pipe line will require a licence under the Pipelines Act 1967. This is a statutory process which is not exempt from Part 3A of the Environmental Planning and Assessment Act 1979, and until the process is complete, DWE are unable to advise of the likelihood of a licence being granted.***

Further consultation with the DWE would be undertaken throughout the approvals process and during the detailed design and licencing process for the gas pipeline. It is noted that the Proponent has submitted a notice and application for a licence under the *Pipelines Act 1967*.

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Submission DWE.06: ***It is recommended that applicant be advised of the requirement for the licence through the conditions of consent.***

The Proponent notes the request for a condition of this nature.

Submission DWE.07: ***Water Supply - It should be noted that whilst all three of the EA's have highlighted potential water sources for the projects, there does not appear to be a commitment that any of the sources identified in the EA's have been secured.***

Submission DWE.08: ***Whilst it is recognised that the main water sources for the project identified in the EA's are not administered by DWE, it is the view of the Department that prior to being granted a Ministerial Approval to construct the proposed development, the proponent should be required to demonstrate they have the ability to secure the nominated water supplies.***

In response to Submission DWE.07 and DWE.08, it is noted that the potential sources for water were considered in the Environmental Assessments for the combined requirements of both the Delta Electricity and EnergyAustralia Facilities. Any of the water servicing options identified in the Environmental Assessments, for each of the water types (e.g. potable, non-potable) could be adopted in conjunction with the other options. A decision would be made on the preferred option or options following appropriate assessment of economic and non-economic factors. The Integrated Water Management (IWM) report presented in **Appendix D** and a summary presented in **Section 4.3** of this Report indicates a number of viable options exist for sourcing the water.

Submission DWE.09: ***Consequently, it may be prudent to inform the proponent that should there be any future requirement to obtain water licences from sources administered by DWE due to complications with the nominated water sources, these water licences are outside any approval issued under Part 3A of the Environmental Planning and Assessment Act 1979, can not be guaranteed and are subject to commercial risk.***

The Proponent notes this comment.

Submission DWE.10: ***In terms of capturing surface water runoff from the site, the Applicant will require surface water licences should the total water storage on the subject site exceed the Maximum Harvestable Right Dam Capacity (MHRDC) in accordance with section 53 of the Water Management Act 2000. However, should water storages be constructed to manage environmental impacts from the disturbance of the site, DWE may exempt these storages from the MHRDC.***

The Proponent notes this comment.

Submission DWE.11: ***DWE requests a condition be included in the development consent that requires the Applicant to formally request an exemption from DWE for any water storages that are required for legitimate environmental management purposes.***

The Proponent notes the request for a condition of this nature.

Submission DWE.12: ***Waterway Crossings - Whilst the pipeline route has not been finalised for the project, the proponent has been unable to provide specific information on the requirement for waterway crossings in the Project Application EA's. Instead, the Applicant has nominated that this information would be identified prior to construction.***

Submission DWE.13: ***DWE requests a condition of consent be included which requires the Applicant to identify any watercourse crossings necessary for the project and submit the proposed crossing***

designs to DWE within a Surface Water Management Plan to ensure they are consistent with NSW Government Policy.

The Proponent notes the request for a condition of this nature to identify any watercourse crossings necessary for the Project, and to submit the proposed crossing designs to DWE within a Surface Water Management Plan. Further it is noted that additional detail on the proposed gas pipeline route options is provided in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G**.

Submission DWE.14: Waste Storage Structures - DWE requests a condition of consent be included which requires the Applicant to identify all waste storages, the proposed construction details, and methodology to demonstrate that all these structures are compacted to an impermeability equal to or greater than $1x10^{-9}$ metres/second to ensure minimal risk of groundwater aquifers being impacted by leachate from the storages.

The Proponent notes the request for a condition of this nature.

Submission DWE.13: Groundwater Interception - The Applicant did not demonstrate in the EA's that groundwater would not be intercepted during construction of the proposed power stations, and proposed to undertake more detailed investigations during the pre tender phase of the project.

Submission DWE.14: Consequently, as DWE can not determine if a licence under the Water Act 1912 & Water Management Act 2000 is required for groundwater interception, it is requested a condition of consent be included which requires the Applicant to cease construction and contact DWE should groundwater be intercepted during construction.

In response to Submission DWE.13 and DWE.14, the Proponent notes the request for a condition of this nature. The Proponent does not expect to intercept groundwater during construction of the proposed Facilities. However, during the development of the Construction Environmental Management Plan, the need for a licence under the *Water Act 1912* and *Water Management Act 2000* would be assessed. If required, a licence would be applied for prior to the commencement of excavation activities.

3.2.5 Hawkesbury Nepean Catchment Management Authority (CMA)

Submission CMA.01: Catchment Management Authorities (CMA) are approval authorities for clearing of native vegetation under the Native Vegetation Act 2003 (NV Act), and are responsible for implementing the objectives of this Act. These include:

- ***"to prevent broad scale clearing unless it improves or maintains environmental outcomes, and***
- ***to protect native vegetation of high conservation value having regard to its contribution to such matters as water quality, biodiversity, or the prevention of salinity or land degradation"***

Submission CMA.02: HNCMA supports activities that achieve the objects of the NV Act, and considers proposed developments should be located and designed to minimise impacts on native vegetation, with any clearing required mitigated by establishing offset areas.

Submission CMA.03: I note that the project is a development to which Part 3A of the Environmental Planning and Assessment Act 1979 applies and the project will therefore be assessed and determined by the Minister for Planning. An approval under the NV Act for the clearing of native vegetation as part of the proposed development is therefore not required (NV Act s25(g)). As such, HNCMA has no approval role for any clearing of native vegetation required for this development.

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CMA's concurrence that the Project being assessed under Part 3A of the EP&A Act and that certain authorisations are not required such as those under the NV Act is confirmed by the Proponent.

Submission CMA.04: ***It is understood that Priority E4 of the NSW State Plan, the Catchment Condition Targets of the Hawkesbury-Nepean Catchment Action Plan, and the objects of the NV Act represent NSW government policy on native vegetation. Collectively, these require a maintenance or increase in the extent of native vegetation, an improvement in native vegetation condition, and the need for clearing of native vegetation to result in an "Improved or Maintained" environmental outcome through the use of secured off-set areas.***

The comments raised have been noted. As noted in Section 11.7.9 of the Joint Concept Environmental Assessment, the *Draft Guidelines for Threatened Species Assessments* (DEC 2004) guidelines identify matters that are relevant to the assessment of impacts to threatened species, populations or ecological communities, or their habitats, arising from a development proposal assessed under Part 3A. The assessment was conducted in accordance with these guidelines as required by the Environmental Assessment Requirements issued by the Director-General of DoP.

Section 4.8 details the proposed Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Biodiversity Offset. The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site;
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern parts of the Site.

A summary of the Project Biodiversity Offset components is provided in **Table 4-14** and presented on **Figure 4-9**.

On the basis of the assessment, it is considered that the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values. Over and above this, the Proponent is also proposing an additional offset area of 0.4 ha of Box Gum Woodland TSC EEC in a portion of Lot 153 DP 750053 located to the south of the Site (also owned by the Proponent).

Therefore, the total Project Biodiversity Offset package proposed (45.7 ha) is therefore considered to adequately 'maintain' the biodiversity values of the Site, as it would allow the permanent conservation of vegetation which is currently unprotected, to be managed for the improvement of habitat and other biodiversity values.

Submission CMA.05: ***Determination of whether a clearing and offset proposal will result in an improved or maintained environmental outcome is made by the Environmental Outcomes Assessment Methodology, or the BioBanking Assessment Methodology. These have been authorised by the Minister for this purpose, and are used for assessment of clearing proposals under the NV Act, and NSW Biodiversity Banking and Offsets Scheme (i.e. BioBanking) respectively. The Environmental Outcomes Assessment Methodology (EOAM) provides a scientifically recognised and established means of determining vegetation values and the impacts of clearing. The "PVP developer" is the assessment***

mechanism used to apply the EOAM to specific vegetation clearing proposals requiring approval under the NV Act. The EOAM also provides the basis of the assessment methodology used in the BioBanking Scheme.

Comments raised have been noted although have limited relevance to Part 3A projects. The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the proposed offset. On the basis of the assessment conducted, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset.

DoP, with the input of the DECC, is responsible for confirming the biodiversity offset with the Proponent.

Submission CMA.06: ***The 117 ha site is located approximately 12 km north of Marulan and 25 km east of Goulburn.***

Submission CMA.07: ***Energy Australia and Delta Electricity each propose the development of an electricity generating facility consisting of open gas turbines and associated infrastructure at a site adjacent to the existing TransGrid Marulan 330 / 132kV Switchyard site. The two separate facilities would be constructed side by side on the site and owned and operated independently. Natural gas for the turbines will be sourced via an underground lateral pipeline from the Moomba to Sydney Gas Pipeline. This is located approx. 5 km south of the development site. The preferred route for the lateral pipeline has not been determined, and no assessment of this part of the proposed development is given in the EA. A corridor for the part of this lateral pipeline within the development site is included in the EA.***

The Proponent confirms these Project details.

Submission CMA.08: ***The following comments deal with the adequacy of the EA in assessing the environmental significance of the native vegetation in the development areas, the impacts of the proposed development on this vegetation, and the extent to which any mitigation measures proposed are realistic and effective. Recommendations are given on how the proposed development could reasonably reduce the impacts on native vegetation and associated biodiversity. These comments are provided in our capacity as the authority for implementing the Native Vegetation Act 2003 in the Hawkesbury-Nepean catchment.***

Submission CMA.09: ***The recommendations made are based on application of NSW government policy and NV Act objects and principles to the proposed development.***

These comments are noted, although as noted in the response to Submission CMA.04 the assessment was conducted in accordance with the DEC (2004) guidelines as required by the Environmental Assessment Requirements issued by the Director-General of DoP.

The Project was assessed according to the principles of avoid, mitigate and offset. The Facility footprint and infrastructure was sited with consideration of issues such as vegetation clearing and distance from the Wollondilly River. As discussed in response to DECC-A.01, further biodiversity assessment has been conducted on the Marulan Site and as a result, changes are proposed to the Facility infrastructure and footprint to minimise

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the area of clearing and avoid areas of high conservation significance. In summary, in order to avoid the areas of significant woodland the following changes have been made:

- the southern boundary of the Facilities' footprint is further north west;
- the gas pipeline within the Marulan Site is now proposed to be located further west and north;
- the access road within the Marulan Site is now proposed to be located further north east; and
- the transmission line is now to proposed to be located further west.

The Proponent has committed to a suite of mitigation measures that are presented in the Statement of Commitments in **Section 5**. As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset. The assessment in **Section 4.8** concludes that the proposed offset meets the DECC principles for 'maintain or improve' and would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values. In particular it is noted that the offset also includes a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent).

Submission CMA.10: ***Native vegetation at the development site - The development site is located within an extensively cleared pastoral landscape, characterised by large areas of cleared grazing land interspersed with remnant patches of native forest. The site itself occupies one of these remnant patches, together with a smaller area of adjacent cleared grazing land.***

Submission CMA.11: ***The general nature and distribution of native vegetation at the development site as described in the EA is as follows: Approximately 63 ha of the 117 ha development site is covered in a mature and relatively intact eucalypt woodland, classified as Tableland Hills Grassy Woodland. This contains a well developed canopy layer, with a dense groundcover layer comprising native and exotic grasses and herbs. The shrub layer is sparse to absent.***

Submission CMA.12: ***Approximately 46 ha of the development site are covered in grassland with scattered remnant trees, resulting from clearing of the original woodland vegetation.***

Submission CMA.13: ***These areas have been extensively modified by clearing and grazing, and the introduction of exotic pasture species. Patches of native grasses are present but the areas are generally dominated by exotic species. The grassland areas also include 'moderate to severe' infestations of the noxious weed Serrated Tussock.***

Submission CMA.14: ***The riparian zone along both sides of the Wollondilly River for several kilometres in the vicinity of the site is occupied by Riverbank Forest, dominated by mature River She-oaks. In the northern portion of the development site the river features broad (50 - 100m wide) banks with steep levee banks rising to the surrounding cleared farmland.***

Submission CMA.15: ***Approximately 1.5 ha of Snow Gum Woodland is present near the southern end of the corridor of the proposed gas pipeline. The remnant features a moderately dense canopy, no shrubby understorey and either a dense (EA p.11-6) or sparse (EA p.11-10) grassy understorey.***

The Proponent confirms these project details in Submission CMA.10-15 as provided in the flora and fauna assessment as presented in the Environmental Assessment.

Submission CMA.16: ***Conservation value of native vegetation - The EA does not adequately identify the conservation values of native vegetation present in the development area. Specifically:***

Submission CMA.17: ***The only criteria used in the EA to determine the conservation value of native vegetation is whether the vegetation is an Endangered Ecological Community (EEC) or is a threatened species, listed under the TSC or EPBC Acts. While these are valid criteria, there are many other factors that also determine conservation value. The EA has ignored these, and therefore has underestimated the extent of vegetation of conservation significance. The criteria generally recognised as determining high conservation value native vegetation include:***

- ***EECs***
- ***Overcleared vegetation types***
- ***Vegetation in overcleared Mitchell Landscapes***
- ***Vegetation in Regional Biodiversity Corridors***
- ***Riparian vegetation***
- ***Known habitat for threatened flora or fauna species***

Submission CMA.18: ***The Snow Gum Woodland present within the site may be included within the 'Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodlands of south-eastern NSW' association of woodlands which has been nominated for listing as an Endangered Ecological Community in NSW. Although not yet listed by the NSW Scientific Committee, the nomination of this community is nevertheless an indication of its high conservation value. The EA does not recognise the conservation value of this vegetation.***

In response to Submission CMA.17 and 18, at the time of drafting, there is no published Preliminary Determination for listing this community as an endangered ecological community. Hence, URS cannot comment on its provisional listing unless this proposed listing is published.

The discussion presented in **Section 4.7** recognises that although the woodland is not listed .as threatened at the state level, on a regional scale it has been highly cleared within the CMA.

The Flora and Fauna Assessment provides detail on the results of desktop studies and several field surveys in Section 4 of that report. The potential impacts of the development are discussed in Section 5 of that report relating to potential construction and operation impacts which discusses the impacts in relation to flora, fauna and threatened species. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005). In addition, the *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

Submission CMA.19: ***Any vegetation type of which more than 70% has been cleared in the Catchment Management Area is listed as an overcleared vegetation type. Riverbank Forest (90% cleared) and Tableland Hills Grassy Woodland (99% cleared) are both listed as overcleared vegetation types. The Snow Gum Woodland present within the site - if included within the 'Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodlands of south-eastern NSW' - may be 95% cleared. All these***

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vegetation types must therefore be considered as having high conservation value. Any overcleared vegetation type can not be approved for clearing under the NV Act, if the vegetation is in moderate to good condition. The EA does not recognise the overcleared status of these vegetation types.

The Flora and Fauna Assessment states that the vegetation is of high conservation value. Additional information on the conservation status of the vegetation is available publicly, however, this additional information if added to the assessment would not change the assessment of impacts on the vegetation, as the Flora and Fauna Assessment already assumes that the vegetation is of high conservation value.

It is noted that there is no proposed impact from the Project on the Riverbank Forest on the Marulan Site.

Submission CMA.20: The EA does not adequately consider the presence of biodiversity corridors and connectivity of the vegetation at a local or regional scale.

Submission CMA.21: The EA acknowledges that 'the strip of Riparian vegetation (i.e. Riverbank Forest) is significant in a regional context due to the connectivity it provides between other patches of native vegetation along the Wollondilly River' (p. 4-12). However the EA fails to consider that the Wollondilly River also connects the site to the Abercrombie River to Morton National Park Regional Biodiversity Corridor approximately 17 km to the south-west and the Bargo to Morton National Park Regional Biodiversity Corridor approximately 5 km to the north east. The connectivity of native vegetation is recognised as contributing to conservation value.

Submission CMA.22: The remnant vegetation at the site - including both Riverbank Forest and Tableland Hills Grassy Woodland - is therefore a significant component of regional biodiversity corridors and the impacts of any proposed clearing should be assessed within this context.

Submission CMA.23: The significance of the impact on the removal of remnant vegetation at the site has not been adequately considered.

The Environmental Assessment for the Marulan Site addresses the presence of biodiversity corridors and connectivity of the vegetation at a local or regional scale as it states in that the woodland within the proposed offset adjoins and is contiguous with woodland within the development footprint. The Environmental Assessment further states that the rehabilitation of 9 ha of riparian vegetation and adjoining cleared land in the Riparian Rehabilitation Zone would create a vegetated corridor connecting the offset area to nearby woodland stands and adjacent riparian zone.

The Flora and Fauna Assessment for the Marulan Site concludes that clearing of woodland at the Marulan Site is unlikely to result in significant isolation or fragmentation of habitat. The position of the proposed Facilities is such that contiguity of woodland is maintained in areas adjoining the proposed Facilities. Within the Marulan Site, the alignments of the proposed access road, gas pipeline and transmission line have been altered to avoid areas of significant vegetation. In addition woodland on the Site is already highly fragmented by existing infrastructure including the TransGrid switchyard, access tracks and transmission line easements.

As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset. The assessment in **Section 4.8** concludes that the proposed offset meets the DECC principles for ‘maintain or improve’.

The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern part of the Site.

A summary of the Project Biodiversity Offset components is provided in **Table 4-14** and presented on **Figure 4-9**.

Submission CMA.24: ***Impacts of the Proposed Development - The development as proposed will require the removal of approximately 22 ha of the 63 ha of Tableland Hills Grassy Woodland present within the development site. The EA indicates that this community provides a range of habitats suitable for a diversity of fauna species and given that Tableland Hills Grassy Woodland is listed as an overcleared vegetation type - I consider that the clearing of approximately 30% of this community from the development site to be a significant impact.***

As a result of the changes to alignments of Facility infrastructure within the Marulan Site (transmission line, access road, gas pipeline and Facilities' footprint), the area of vegetation clearing, has been reduced. In particular it is noted that the area of Tableland Grassy Hills Woodland within the construction footprint is reduced to 15.3 ha. As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset and includes conservation of an area of 21.7 ha of Tableland Grassy Hills Woodland.

The Flora and Fauna Assessment for the Marulan Site provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005). In addition, the *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

The Flora and Fauna Assessment states that the vegetation is of high conservation value. Additional information on the conservation status of the vegetation is available publicly, however, this additional information if added to the assessment would not change the assessment of impacts on the vegetation, as the Flora and Fauna Assessment already assumes that the vegetation is of high conservation value.

Submission CMA.25: ***The development as proposed will also require the removal of approximately 12.5 ha of the 51 ha of Cleared Grassland present at the site. Although these areas are reported to be dominated by exotic species, the EA notes that grassland areas 'contained isolated hollow bearing paddock trees and stags' ... 'which are likely to contain habitat for birds and potentially micro-bats' (p. 4-11). However, the number of hollow-bearing trees to be removed is not indicated.***

As a result of the changes to alignments of Facility infrastructure within the Marulan Site (transmission line, access road, gas pipeline and Facilities' footprint), the area of vegetation clearing, has been reduced. In particular it is noted that the area of Tableland Grassy Hills Woodland within the construction footprint is

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reduced to 15.3 ha, however the area of cleared grassland has increased slightly to 14.4 ha. As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset and includes an area of 21.7 ha of Tableland Grassy Hills Woodland, 14.2 ha of Box-Gum Woodland TSC EEC and 8.2 ha of cleared grassland.

As noted in Section 11.2.2 of the Joint Concept Environmental Assessment, the locations of trees containing hollows (stem and/or branch hollows, or hollow stags) were recorded using a hand-held GPS and subsequently mapped. GIS software was later used to calculate a mean density of hollow-bearing trees within the stands of woodland within the Site. Stag watching was conducted on hollows assessed as having the potential to shelter arboreal fauna, including mammals, bats and hollow-nesting birds.

Net improvements to biodiversity values from the offset area would be made through removal of grazing stock (fencing), weed control, retention of fallen timber and tree-hollows, erosion control and rehabilitation of degraded land. The combination of avoidance, mitigation and offset measures, proposed in this assessment is deemed to maintain the biodiversity values of the Site.

As noted in Section 4.2.4 of the Flora and Fauna Assessment of the Marulan Site, the stands of modified grassy woodland feature a highly disturbed understorey with little intact leaf litter and small amounts of fallen timber. The habitat value of these areas for small woodland birds, reptiles and native mammals is likely to be much lower than intact areas of grassy woodland. However these areas contain large isolated paddock trees, including trees with hollows. These may provide significant habitat for native parrots, woodland birds, arboreal mammals and micro bats. Hollow-bearing trees may provide highly significant roosting habitat when located in extensively cleared landscapes. In this context it is unlikely that they play this role considering the availability hollow-bearing trees in intact woodland and forest habitat in close proximity.

Submission CMA.26: ***The EA does not adequately identify the conservation values of native vegetation nor adequately detail the impacts of the proposed development on native vegetation, and therefore does not allow the extent of environmental impacts of the proposal to be determined.***

Submission CMA.27: ***As noted above, the site is of high conservation value as the remnant vegetation:***

- ***includes two vegetation types listed as overcleared and one that is potentially overcleared,***
- ***provides connectivity between two Regional Biodiversity Corridors and***
- ***provides potential habitat for a diversity of fauna species including Threatened Species***

The Flora and Fauna Assessment provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005). In addition, the *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

As noted in Section 3.2.2 of the Biodiversity Assessment, conservation values of species communities mapped across the study area were determined with reference to relevant legislation including the TSC Act and the EPBC Act applicable at the time of the surveys.

The Flora and Fauna Assessment of the Marulan Site states that the vegetation is of high conservation value. Further details on the vegetation have been discussed in **Section 4.7**.

Submission CMA.28: ***I therefore conclude that the impacts of the proposed development are substantially higher than presented in the EA.***

The Flora and Fauna Assessment provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition, a biodiversity offset is proposed.

As noted in response to Submission CMA.04, **Section 4.8** details the proposed Project Biodiversity Offset. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset. The assessment in **Section 4.8** concludes that the proposed offset meets the DECC principles for 'maintain or improve'.

The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern part of the Site.

A summary of the Project Biodiversity Offset components is provided in **Table 4-14** and presented on **Figure 4-9**.

Submission CMA.29: ***The EA does not identify why a remnant area of high conservation value native vegetation was selected for the development, when extensive areas of cleared land exist adjacent to the site, and appear to satisfy the same selection criteria.***

As noted in the response to DECC-A.01, Chapter 3 of the Environmental Assessments outlines that both Delta and EnergyAustralia considered a number of regions across NSW. Both determined that the Marulan area met the site selection criteria due to its proximity to Moomba to Sydney Gas Pipeline, proximity to high voltage transmission lines, availability of sites for purchase; and the land use zoning permits the proposed Facility as presented in Section 3.2.5 and Section 3.3.3 of the Joint Concept Environmental Assessment.

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment and considered further in **Section 4,6** of this Report. Consideration was given to the location of the Facility footprint within the proposed Marulan Site. Consideration was given to the location of the Facility footprint within the proposed Marulan Site. These factors included:

- proximity to the Wollondilly River in relation to flooding issues and required setbacks;
- potential visual catchment;
- flora and fauna implications including the presence of Endangered Ecological Communities (EEC); and

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- noise implications.

Considering the cumulative effect of these constraints, the proposed location of the Facilities is in the area within the Marulan Site identified as presented on **Figure 2-4** of this Report.

Submission CMA.30: ***I also note that no environmental assessment of the proposed lateral gas pipeline from the turbines to the Moomba to Sydney Gas Pipeline has been undertaken. This part of the proposed development has the potential to substantially increase the impacts of the entire development on native vegetation and associated biodiversity.***

Submission CMA.31: ***As this pipeline is an integral part of the proposed development it is not possible to conclusively assess impacts of the development in their entirety without it. This is a major deficiency in the environmental assessment process and for this reason I consider the EA to be substantially inadequate.***

As noted in response to DWE.04, the assessment of the gas pipeline corridor in the Joint Concept Environmental Assessment reflected that the Proponent was seeking Concept Approval for that component with a commitment to undertaking further assessment to decide the preferred location for the gas main connection and the pipeline routes at a later date.

Further detail on the gas pipeline route is provided in the Preferred Project Report **Section 4.5** of this Report and **Appendices F** and **G.** Detailed flora and fauna assessment have been conducted of the proposed gas pipeline route options. The results of the assessment of the proposed gas pipeline routes and alternatives have been considered in the overall Project Biodiversity Offset as discussed in **Section 4.8** of this Report.

Submission CMA.32: ***Mitigation of Impacts and Offsets - The EA states that 'a biodiversity offsets package has also been proposed, in consultation with DECC, to compensate for direct permanent loss of biodiversity values' (p. ES-8) and that the proposed strategy 'adopts the DECC principles for offsets' (p. 11-20). The main features of the 'biodiversity offsets package' are:***

- ***Permanent conservation of the 32.3 ha of Tableland Hills Grassy Woodland remaining in the development site after clearing, and***
- ***Rehabilitation of 9 ha of riparian land along a degraded drainage line within the development site.***

As noted in response to Submission CMA.04, **Section 4.8** details the proposed overall Project Biodiversity Offset which has increased from that presented in the Environmental Assessments. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset. The assessment in **Section 4.8** concludes that the proposed offset meets the DECC principles for ‘maintain or improve’.

The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern part of the Site.

Submission CMA.32: ***The two schemes presently administered by DECC that provide for the use of offsets are Property Vegetation Plans (PVPs) under the Native Vegetation Act 2003 and the Threatened Species Conservation Amendment (Biodiversity Banking) Act 2006. The assessment methodologies utilised for both offset and development sites are based on the BioMetric and Threatened Species Tools. The methodology establishes the principles and circumstances where a development and corresponding offset area/s can be regarded as improving or maintaining biodiversity values. This includes where the impacts of clearing on biodiversity values at the development site are offset by the beneficial impacts of management actions at offset sites.***

Submission CMA.33: ***Although the biodiversity offsets package proposed for the development adopts some DECC principles, it does not satisfy other key criteria for assessing the suitability of offsets. As noted above, the Environmental Outcomes Assessment Methodology (EOAM) provides a scientifically recognised and established means of determining vegetation values and the impacts of clearing. It has been authorised by the Minister for the purpose of determining whether a clearing and offset proposal will result in an improved or maintained environmental outcome. Relevant to this proposed development, the EOAM indicates that:***

- ***'clearing of native vegetation is not permitted in vegetation types or landscapes that are already overcleared or listed as threatened at the national, regional or landscape scales, unless the vegetation is in low condition',***
- ***'clearing of overcleared vegetation does not improve or maintain environmental outcomes for biodiversity' and***
- ***'offsets cannot be used to balance the impacts of clearing in these circumstances.'***

Submission CMA.34: ***The description of the Tableland Hills Grassy Woodland provided in the EA (p. 11-5) indicates that this vegetation is not in low condition according to the definition of low condition contained in the EOAM. Clearing of this vegetation type would therefore not be approved under the EOAM. Even if clearing could be approved, the proposed offset area would fail to meet the required improve or maintain environmental outcomes for biodiversity due to substantially inadequate size.***

Submission CMA.35: ***Therefore the mitigation package proposed i.e. the 32.3 ha offset area and rehabilitation of 9 ha of riparian area, is not adequate to result in an improved or maintained environmental outcome. As such, the proposed mitigation of impacts is not adequate.***

The assessment of impacts presented in the URS report and the approach adopted by URS to impact assessment in the Environmental Assessment and updated in this Report is consistent with the current DECC policy for Part 3A proposals, which is stated in the working draft guideline by DEC (2005). That is, all available means were utilised to avoid direct impacts on biodiversity (noting the constraints applicable to the Site and to locating the Facilities at a minimum of 150 metres (m) from the Wollondilly River), and then to devise appropriate mitigation and management strategies to lessen or reduce the severity of impacts, and then to propose a suitable offset to compensate for unavoidable biodiversity loss.

As stated in the Environmental Assessments, the biodiversity offset package is proposed as a means to ensuring that construction and operation of the proposed Facilities maintains or improves biodiversity values at the Site.

The proposed overall Project Biodiversity Offset has increased from that presented in the Environmental Assessments. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset.

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The offset would protect and conserve, in perpetuity, threatened species habitats, vegetation types, habitat types and landscape features similar or equivalent to those found within the development footprint. Moreover, the proposed offset package would improve biodiversity values at the Site due to the following:

- conservation of an area of Box Gum Woodland TSC EEC;
- the woodland offset area is larger than the area of woodland impacted by the Project;
- ongoing management of the offset area would improve its condition and biodiversity values;
- rehabilitation of the degraded drainage line in the northern portion of the Site would provide substantial improvements in the biodiversity values of riparian and aquatic habitats.

On the basis of the assessment, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

Submission CMA.36: ***I conclude the following in respect of the likely impacts of the proposed development on native vegetation, and the extent to which the EA addresses these:***

Submission CMA.37: ***The Environmental Assessment does not adequately identify the conservation values of native vegetation present in the development area of the two proposed power stations.***

The Flora and Fauna Assessment for the Marulan Site provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005). In addition, the *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

The discussion presented in **Section 4.7** recognises that although the woodland is not listed .as threatened at the state level, on a regional scale it has been highly cleared within the CMA.

As stated in the Environmental Assessments, the biodiversity offset package is proposed as a means to ensuring that construction and operation of the proposed Facilities maintains or improves biodiversity values at the Site. The offset would protect and conserve, in perpetuity, threatened species habitats, vegetation types, habitat types and landscape features similar or equivalent to those found within the development footprint. Moreover, the proposed offset package would improve biodiversity values at the Site.

On the basis of the assessment, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

Submission CMA.38: ***The Environmental Assessment does not adequately detail the impacts of the proposed development on native vegetation, and therefore does not allow the extent of environmental impacts of the proposal to be determined.***

As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005).The Flora and Fauna Assessment for the Marulan Site provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

As stated in the Environmental Assessments, the biodiversity offset package is proposed as a means to ensuring that construction and operation of the proposed Facilities maintains or improves biodiversity values at the Site. The offset would protect and conserve, in perpetuity, threatened species habitats, vegetation types, habitat types and landscape features similar or equivalent to those found within the development footprint. Moreover, the proposed offset package would improve biodiversity values at the Site. In addition, the proposed overall Project Biodiversity Offset has increased from that presented in the Environmental Assessments.

On the basis of the assessment, the proposed Project Biodiversity Offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

Submission CMA.39: ***The EA does not in any way address the impacts of the gas pipeline between the proposed power stations and the existing Moomba - Sydney gas pipeline, despite this being an essential and integral part of the power station development. It also has the potential to substantially increase the impacts of the entire development on native vegetation and associated biodiversity.***

As noted in response to CMA.30 and DWE.04, the assessment of the gas pipeline corridor in the Joint Concept Environmental Assessment reflected that the Proponent was seeking Concept Approval for that component with a commitment to undertaking further assessment to decide the preferred location for the gas main connection and the pipeline routes at a later date.

Further detail on the gas pipeline routes are provided in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G.** The results of the assessment of the proposed gas pipeline routes and alternatives have been considered in the overall Project Biodiversity Offset as discussed in **Section 4.8** of this Report.

Submission CMA.40: ***The offset package proposed is inadequate to achieve an 'improve or maintain environmental outcome' for the development as proposed.***

As noted in response to Submission CMA.04, **Section 4.8** details the proposed overall Project Biodiversity Offset which has increased from that presented in the Environmental Assessments. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset. The assessment in **Section 4.8** concludes that the proposed offset meets the DECC principles for ‘maintain or improve’.

The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);

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- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern parts of the Site.

The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the proposed offset. On the basis of the assessment conducted, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

DoP, with the input of the DECC, is responsible for confirming the biodiversity offset with the Proponent.

Submission CMA.44: ***The clearing proposed for the development could not be given approval under the NV Act, because of the intention to clear Tableland Hills Grassy Woodland, an overcleared vegetation type.***

Certain authorisations, such as those under the *Native Vegetation Act* are not required by an approved Part 3A project under clause 1 of Section 75U of the EP&A Act.

The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the proposed offset. On the basis of the assessment conducted, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

DoP, with the input of the DECC, is responsible for confirming the biodiversity offset with the Proponent.

Submission CMA.45: ***If the Minister for Planning is considering giving approval to this proposal, I recommend the following:***

Submission CMA.46: ***The proponent undertakes an Environmental Assessment of the proposed gas pipeline corridor before the gas turbine proposal is determined. This is considered essential to allow impacts of the project to be identified and considered in their entirety.***

As noted in response to CMA.30 and DWE.04, further detail on the gas pipeline route is provided in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G**. This assessment included detailed flora and fauna studies.

Submission CMA.47: ***The proponent is encouraged to acquire and utilise more of the existing areas of cleared land surrounding the development site, to avoid the need to clear extensive areas of high conservation native vegetation.***

As noted in the response to CMA.28 and DECC-A.01, Chapter 3 of the Environmental Assessments outlines that both Delta and EnergyAustralia considered a number of regions across NSW for the Facilities, sites within Marulan and location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment and considered further in the Preferred Project Report (**Section 4.6** of this Report). Consideration was given to the location of the Facilities' footprint within the proposed Marulan Site. Considering the cumulative effect of the above constraints as presented in Section 3.7 of the Joint Concept Environmental Assessment, the proposed location of the Facilities is in the area within the Marulan Site identified as presented on **Figure 2-4** of this Report.

Submission CMA.48: ***To minimise the impacts of the proposal on native vegetation, all works and structures should be located and designed to prevent or minimise clearing. As an example, this would include locating all works and structures within areas of cleared grassland rather than within a significant remnant of vegetation.***

As discussed in Chapter 3 of the Environmental Assessments, both Delta and EnergyAustralia considered a number of regions across NSW. Both determined that the Marulan area was the preferred location due to its proximity to Moomba to Sydney Gas Pipeline, proximity to high voltage transmission lines, availability of sites for purchase; and that the land use zoning permits the proposed Facility as presented in Section 3.2.5 and Section 3.3.3 of the Joint Concept Environmental Assessment.

Following initial assessment, the Marulan Site was identified as the preferred site for the following reasons:

- availability of land for purchase; and
- advantage of collocating the proposed Facility within close proximity to significant infrastructure (TransGrid switchyard) and associated reduction in infrastructure (gas pipeline and electricity transmission lines)

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment and additionally in the Preferred Project Report (**Section 4.6** of this Report). Consideration was given to the location of the Facilities' footprint within the proposed Marulan Site. Consideration was given to the following factors for the location of the Facility footprint within the proposed Marulan Site:

- proximity to the Wollondilly River in relation to flooding issues and required setbacks;
- potential visual catchment;
- flora and fauna implications including the presence of Endangered Ecological Communities (EEC); and
- noise implications.

Considering the cumulative effect of these constraints the proposed location of the Facilities is in the area within the Marulan Site identified as presented on **Figure 2-4** of this Report.

As stated in the Environmental Assessments, the biodiversity offset package is proposed as a means to ensuring that construction and operation of the proposed Facilities maintains or improves biodiversity values at the Site. The offset would protect and conserve, in perpetuity, threatened species habitats, vegetation types, habitat types and landscape features similar or equivalent to those found within the development footprint. Moreover, the proposed offset package would improve biodiversity values at the Site.

Submission CMA.49: ***All clearing of native vegetation should be offset. This is intended to provide both a disincentive to unnecessary clearing of native vegetation, and effective mitigation of the impacts of any clearing.***

As noted in response to Submission CMA.04, **Section 4.8** details the proposed overall Project Biodiversity Offset which has increased from that presented in the Environmental Assessments. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset.

As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2004).The Biodiversity Assessment provides detail on the results of several field surveys in Section 4 of that

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report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

On the basis of the assessment conducted, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

As described in Section 11.7.9 of the Joint Concept Environmental Assessment, a biodiversity offset is proposed for the Project and on the basis of the assessment, the proposed offset was considered to be consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset was considered to adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

Submission CMA.50: ***Offsets for the clearing of native vegetation should be determined using either of the two mechanisms established by the NSW Government for this purpose, i.e. the Environmental Outcomes Assessment Methodology of the Native Vegetation Act 2003, or the BioBanking Assessment Methodology.***

The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset. On the basis of the assessment conducted, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

At the time of publication BioBanking Assessment Methodology was only available as a working draft and the associated credit calculator was unavailable, therefore this assessment process was not viable.

As noted in response to Submission CMA.04, **Section 4.8** details the proposed overall Project Biodiversity Offset which has increased from that presented in the Environmental Assessments. A total area of approximately 45.7 ha is proposed as the Project Biodiversity Offset.

Submission CMA.51: ***Offsets should be identified, assessed and secured by a legally binding contract in perpetuity that is registered on land title prior to any clearing occurring within each development envelope.***

As stated in Table 11-2 and 19-1 of the Joint Concept Environmental Assessment, the Proponent commits to maintenance of woodland biodiversity values through permanent conservation of approximately 45.7 ha. The land portion would be re-titled (with Voluntary Conservation Agreement or equivalent) for this purpose in perpetuity.

Submission CMA.52: ***Any clearing that can not be offset, due to failing to meet the offset requirements of the EOAM, can not occur. Specifically, Tableland Hills Grassy Woodland cannot be offset due to its overcleared status.***

Submission CMA.53: ***Assessment of offset areas should be done by persons accredited in the use of the methodology.***

Submission CMA.54: ***These measures will ensure that the Proponent's stated objectives of avoiding impacts on biodiversity and areas of high conservation value (p ES-8) are achieved.***

As required by the Environmental Assessment Requirements issued by the Department of Planning, the assessment was conducted in accordance with the *Draft Guidelines for Part 3A Biodiversity Assessments* (DEC 2005).The Biodiversity Assessment provides detail on the results of several field surveys in Section 4 of that report and also details the potential impacts of the development in Section 5 of that report relating to potential construction and operation impacts. On this basis, impact mitigation is discussed in relation to an Environmental Management Plan, tree fauna management, groundcover clearance, site management, exclusion of grazing, weed and pest management, bushfire management and soil erosion / runoff management. In addition a biodiversity offset is proposed. The *Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft* (DECC 2007) were used in assessing the offset.

On the basis of the assessment, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

It is noted that the biodiversity offset now also includes a significant area of Box Gum Woodland TSC EEC.

3.2.6 Sydney Catchment Authority

Submission SCA.01: ***The SCA notes and supports the following proposed in the EAs with regards to addressing water quality impacts:***

Submission SCA.02: ***The maintenance of a 150 m buffer from the Wollondilly River for the project site facilities including sewage treatment and water treatment facilities;***

Submission SCA.03: ***No clearing or degradation of watercourses, existing dams or riparian corridors as a result of the project;***

Submission SCA.04: ***Water management strategies to ensure zero discharge of wastewater or polluted water from the site to Wollondilly River;***

Submission SCA.05: ***Erosion, sediment and water management controls during the construction stage of the Common Shared Works to be detailed in the construction stage Environmental Management Plan (EMP); and***

Submission SCA.06: ***Biodiversity offsets including a woodland offset area involving permanent conservation of a 32.3 ha portion of land that contains Tableland Hills Grassy Woodland and a riparian rehabilitation area of 9 ha located along a degraded drainage line draining directly to the Wollondilly River in the northern part of the site.***

SCA's support of the management measures outlined in the Environmental Assessment is noted.

Submission SCA.07: ***The SCA is satisfied that the EAs have adequately addressed the requirements of the Drinking Water Catchments Regional Environmental Plan No.1 with regards to the Neutral or Beneficial Effect Test on water quality during the construction and operation stages of the gas turbine facilities. The SCA considers that if the proposed environmental safeguards and mitigation measures outlined in the EAs are adequately designed, implemented and maintained, the Delta Electricity and***

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Energy Australia gas turbine facilities will have a neutral effect on water quality both during the construction and operation stages.

SCA's concurrence is noted.

Submission SCA.08: ***The SCA notes that the environmental impacts of the proposed gas pipeline are not assessed in the EAs. The SCA understands that these will be subject to a future, separate project application with appropriate environmental assessment of key impacts. The SCA is unable to comment on this part of the proposal at this stage.***

Further detail on the gas pipeline route options is provided in the Preferred Project Report **Section 4.5** of this Report and **Appendices F** and **G**.

Submission SCA.09: ***The SCA requests the following information to be provided with regards to the environmental assessment:***

Submission SCA.10: ***Copies of submissions received from other agencies and organisations.***

This issue is deferred to DoP for consideration.

Submission SCA.11: ***Copies of the construction and operation EMPs for review and comments.***

This issue is deferred to DoP for consideration.

3.2.7 Upper Lachlan Shire Council

Submission ULC.01: ***Council resolved to support the proposed developments and request the following conditions be imposed on any consent issued by the Department:***

Submission ULC.02: ***Canyonleigh Road - The section of Canyonleigh Road located within the Upper Lachlan Council area being reconstructed to Auspec standards providing a bitumen sealed pavement 7.0m wide.***

As a contribution to community and in response to various submissions, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access prior to the start of Project construction. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission ULC.03: ***Financial Contribution to Upper Lachlan Shire Council for Community Enhancement - Prior to the commencement of construction, the applicants shall enter into a legally binding agreement with Upper Lachlan Shire Council for a financial contribution to Council being 1.5% of the total capital cost of the development for the purpose of community enhancement to mitigate social, amenity and associated community infrastructure requirements emanating from the operation of the development.***

As a way of further enhancing public infrastructure, the Proponent has committed, if deemed viable, such works including upgrade works to local sewage treatment facilities to meet the Facilities' operational water requirements. The Proponent considers that this type of investment creates a clear nexus between the Project and the benefit to the community.

It is noted that while the Facilities' Site are hosted by the Upper Lachlan Shire Council, the potential impacts particularly in terms of infrastructure fall within the Goulburn Mulwaree local government area.

3.2.8 Goulburn Mulwaree Council

<u>Submission GMC.01:</u> Council considered the proposal at its Meeting on 21 October 2008 and determined that an objection be lodged on the basis that the environmental and amenity impacts of the haulage route have not been adequately addressed.

<u>Submission GMC.02:</u> Council's primary concerns are as follows:

Lack of a suitable water supply: It is acknowledged that there is a moratorium on water extraction licenses along the Wollondilly River. However, the rationale of trucking potable water from the Marulan Water Supply network to Canyonleigh Road seems highly questionable, given that it will ultimately come from the same river, and with a much higher cost to the community by way of road damage, traffic related noise, and general impacts on amenity.

Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. To meet the construction and operational water requirements for the Facilities, it is proposed to use treated effluent from offsite sources and rainwater captured from the hardstand areas of the Facilities for the majority of water requirements. A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities which could meet and exceed the requirements of the proposed Facilities. These include:

- Marulan water supply network - able to fulfil the potable water requirements of the Facilities (less than 1 % of the Facilities' total water requirements);
- Marulan sewage treatment plant - may augment supply of the Facilities' non-potable water requirements;
- Moss Vale sewage treatment plant able to supply the Facilities' non-potable water requirements; and
- Site stormwater runoff - may augment supply of the Facilities' non-potable water requirements.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The Environmental Assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors.

Further information on the potential water options is presented in the Preferred Project Report in **Section 4.3** and **Appendix D**. It is noted that there are differing types of water demanded by the Facilities with these being referred to as:

- **Potable water** which is necessary for domestic type uses (admin building, showering, drinking etc.).
- **Demineralised water** which is a high quality water required as part of the power plant process.
- **Process water** which has generally been referred to here as non-potable water, required for various uses within the power stations and during construction.

Small quantities of potable water are required for the Facilities. The large majority of the water required the Facilities is for process water. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff.

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It is noted that supply of water from the Marulan Water Treatment Plant is proposed for supply of only the potable water requirements being small quantities for domestic type uses.

The revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from operational water delivery as well as the construction workforce, major facility maintenance workforce, and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

The assessment concluded that in peak periods, the level of service along Canyonleigh Road would be maintained at Level of Service A, defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow. The assessment concluded that Brayton Road the east west portion of Brayton Road (adjacent to Marulan township) would be maintained at Level of Service A during normal Facilities' operation and major Facility maintenance. During construction, the east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. During construction, the north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. Level of Service B is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

While the worst-case scenario considered in the assessment was for construction of the two Facilities occurring at the same time, it is noted that the assessment is very conservative for the following reasons:

- traffic volumes for the peak three months of construction traffic were assumed to continue for the whole construction period of 12 months; and
- peak three months of construction traffic were assumed to occur at the same time for both Facilities however, construction of the EnergyAustralia Facility is likely to occur before the construction of the Delta Electricity Facility and therefore this scenario is unlikely to occur.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise along the proposed access routes to the Site and from the potential water supply sources during operation and construction.

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise impact. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this maximum increase would be over a limited duration (peak three months) during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

Submission GMC.03: ***Conversely, if the proponents import treated effluent from either the Moss Vale or Marulan Sewage Treatment Plants, the trucks would need to pass through the village of Marulan, before travelling along the Brayton and Canyonleigh Roads for some 12kms before reaching the site.***

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low. Further assessment of the traffic impacts is presented in the Preferred Project Report in **Section 4.1**.

The feasibility of constructing a water pipeline would be considered and subject to further consultation, detailed design and approvals. Further information on the potential water supply pipeline routes from the Marulan sewage treatment plant and Moss Vale sewage treatment plant are presented in the Preferred Project Report in **Section 4.4**.

The traffic assessment and traffic noise assessment both addressed the impact of traffic associated with the Facilities travelling along Brayton Road from the Hume Highway, through part of the Marulan township and to the Site. The assessment concluded that the Level of Service during operation would be maintained during normal Facility operation (i.e. the predominant period of water delivery) at Level of Service A which is defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.

***Submission GMC.04:* Traffic Impacts: The submitted documentation indicates that the proposal will result in a traffic increase of 9 percent. However, this figure may understate the true impacts of the proposal, given that:**

- No consideration appears to have been given to the cumulative impact of the development when operating concurrently with the proposed Gunlake Quarry, which is also under assessment by the Minister.

- A considerable proportion of the additional traffic will be generated by large vehicles.

- The submitted documentation does not stipulate the times of day (or night) when traffic movements will occur.

The revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along Canyonleigh Road would be approximately 25-27 % during construction, 26 % during normal Facilities' operation and approximately 27 % during major Facilities' maintenance.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.

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- *Construction:*
  The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 20 % during construction and normal Facility operation and approximately 17 % during major Facilities' maintenance.
  The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 55 % during construction, 27 % during normal Facility operation and approximately 26 % during major Facilities' maintenance.

The assessment concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. Overall, the resultant level of service is still anticipated to be, at worst, remaining at Level of Service B which is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

Traffic associated with the Project has been assumed to coincide with the peak traffic flows during the day to consider a worst case scenario. In general it is anticipated that the traffic flow during construction would be during the morning and late afternoon for the Facilities' construction workforce and during the day for other supplies and equipment. Traffic associated with operation is likely to the spread throughout the day with the Facilities' operation workforce traffic likely to be during the morning and late afternoon.

Submission GMC.05: ***Impacts on the Marulan Village: While a detailed assessment has been undertaken for the impacts along Brayton and Canyonleigh Roads, little or no consideration appears to have been given to the impacts on the Marulan Village. As vehicles must pass through the village in order to reach the site, it forms a key part of the haulage route, and as such, must be given equal consideration.***

Further assessment of the traffic impact is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. It is noted that the route from the Hume Highway would be along the exit that feeds directly onto the east west portion of Brayton Road before Brayton Road turns north. Therefore the assessment of Brayton Road and Canyonleigh Roads represents the route that Project traffic would be travelling.

The assessment concluded that the east-west portion of Brayton Road (from the Hume Highway) would be maintained at Level of Service A during construction, normal Facilities' operation and major Facility maintenance.

During normal Facilities' operation and major Facility maintenance, the north-south portion of Brayton Road (closer to the Canyonleigh Road intersection) would be maintained at Level of Service A. During construction, the north-south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. Level of Service B is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise along the proposed access routes to the Site and from the potential water supply sources during operation and construction,

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic nosie impact. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission GMC.06**: The "Ardmore Park" decision provides an important precedent in this regard. In this case, the court established that an assessment of a defined haulage route should not only demonstrate compliance with published standards (eg. for noise and vibration) but also consider the potential impacts on all the aspects that contribute to the overall "pleasantness" of the locality. The submitted documentation does not adequately address these requirements.*

As noted above, the assessment concluded that in peak periods, the level of service along Canyonleigh Road would be maintained at Level of Service A. The assessment concluded that east-west portion of Brayton Road (from the Hume Highway) would be maintained at Level of Service A during construction, normal Facilities' operation and major Facility maintenance. The assessment concluded that the north-south portion of Brayton Road (closer to the Canyonleigh Road intersection) during normal Facilities' operation and major Facility maintenance would be maintained at Level of Service A. During construction, this portion would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road.

The Land and Environment Court case referenced is understood to have related to a proposal for a sand and rock quarry. The traffic impact of quarries tends to be less during the construction / preparation and greater during the lifetime of operation. It is noted that the greatest potential traffic impact relating to the Marulan Facilities is during the construction phase. While this would be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan, it is considered a relatively short term impact, approximately 18 - 24 months, relative to the lifetime of the Facilities. The longer term impact is during normal Facilities operation, which the assessment concluded the traffic increase would be between 9 and 20 % depending on the portion of the route.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential operations water supply sources,

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for

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construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission GMC.07** (Attachment): The Department of Planning is seeking Council's comments in relation to a joint Major Project proposal by Delta Electricity and Energy Australia. The proposal involves the construction of two separate gas turbine facilities adjacent to the existing TransGrid Substation on Canyonleigh Road, Marulan. The development site currently straddles the Local Government boundary, with the proposed turbine sites in the Upper Lachlan LGA, and the common infrastructure falling within Goulburn Mulwaree. A Locality Plan is included in the Enclosure.*

***Submission GMC.08:** The proposal is classified as a Major Project with the Minister for Planning being the Consent Authority not Council.*

***Submission GMC.09**: While Council provides input into the assessment process, the decision to approve or refuse the proposal lies with the Minister not Council. The responsibility for a full assessment of the project and review of all community submissions also lies with the Department.*

***Submission GMC.10:** Proposal: The proposal involves:*

> *A Concept Application, incorporating both turbine facilities, as well as shared infrastructure, including transmission lines to the TransGrid Substation, access roads, and a pipeline connecting the facilities to the Moomba to Sydney Gas Main located approximately 5km south of the development site.*
>
> *A Project Application for the transmission lines, access roads and earthworks. The gas pipeline will be the subject of a future Project Application when the precise route has been determined. At this stage, the proponents have only identified a 'Gas Pipeline Corridor'.*
>
> *A Project Application for an Open Cycle Peaking Plant for Energy Australia.*
>
> *A Project Application for an Open Cycle Peaking Plant for Delta Electricity. Delta is also seeking conceptual approval for a second stage, involving the establishment of a Combined Cycle Base Load Plant. This will also be the subject of a future Project Application.*

***Submission GMC.11:** Three separate Environmental Assessments have been prepared for the proposal, which include specialised investigation of the following matters:*

- *Air Quality*
- *Noise and Vibration*
- *Traffic Impacts*
- *Flora and Fauna Impacts*
- *Visual Amenity*
- *Soil and Water Management*
- *Bushfire and Hazard Analysis*

Submission GMC.12: ***The Executive Summary of the Environmental Assessment for the Joint Concept Application is included in the Enclosure.***

The cited Project details in Submission GMC.07 – GMC.12 are confirmed by the Proponent.

Submission GMC.13: ***The public exhibition period for the proposal concludes on 13 October 2008. At the time of compiling this report, it is not known if any submissions have been made by the local community. Details of any such submissions have been requested from the Department.***

Submissions have been made by the community and responses to those submissions are presented in this Report.

This request is referred to DoP for consideration.

Submission GMC.14: ***The key issues for this project from a local perspective are outlined and addressed below.***

Water Supply: While the development site is located adjacent to the Wollondilly River, this has apparently been ruled out as a potential water source due to a moratorium on extraction licences. Similarly, the option of a bore has been eliminated, as preliminary investigations indicate that groundwater is likely to be of unreliable yield and quality. Instead, the proponents intend to utilise a combination of sources, including on-site collection of stormwater, as well as the carting of water/treated effluent from the Marulan water supply network, the Marulan Sewage Treatment Plant or the Moss Vale Sewage Treatment Plant.

Submission GMC.15:

No detail has been provided regarding any discussions or negotiations with respect to the extraction of water from the Wollondilly River. However, the rationale of trucking potable water from the Marulan Water Supply network to Canyonleigh Road seems highly questionable, given that it will ultimately come from the same river, and with a much higher cost to the community by way of road damage, traffic related noise, and general impacts on amenity.

As noted in response to Submission GMC.01-.02, a number of options are being considered for the supply of water to the Facilities. Further information on the potential water supply options is presented in the Preferred Project Report in **Section 4.3** and **Appendix D**.

The Integrated Water Management Strategy (IWM) does not consider the Wollondilly River as a potential water source. The IWM states that:

> *"Wollondilly River flows are relatively high compared to the development sites demands. However, there is a risk that the Wollondilly River flows will be estimated as not having any flows somewhere between 0-32% of the time.*
>
> *Water from the Wollondilly River would only be able to be extracted with an access licence under the Water Act 1912, (although this is progressively moving towards the Water Management Act 2000). Access to water through either the purchase of existing access licenses or a new license, is likely to be difficult or greatly restricted. In addition, the quality of water in the Wollondilly River was examined in the GMC Water Management Strategy (PB, 2007) where it was found that the health of the river is severely compromised and subject to high nutrient loads.*

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As such, extraction of water from the Wollondilly River will not be considered further as a source of non-potable water for the development due to the water source potentially being quality compromised (requiring treatment), requiring an additional substitutional source of water (when the River does not flow), and potentially being subject to a moratorium on extraction licences."

Small quantities of potable water are required for the Facilities with the large majority required for process water. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff.

It is noted that supply of water from the Marulan Water Treatment Plant is proposed for supply of only the potable water requirements being comparatively small quantities for domestic type uses.

Submission GMC.16: Conversely, if the proponents import treated effluent from either the Moss Vale or Marulan Sewage Treatment Plants, the trucks would need to pass through the village of Marulan, before travelling along the Brayton and Canyonleigh Roads for some 12kms before reaching the site.

Further assessment of the traffic impacts is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. The assessment addressed traffic associated with the Facilities from the operational water delivery as well as the construction workforce, major facility maintenance workforce, and operational workforce. As noted in response to GMC.04 which raises a similar issue, the assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The assessment concluded that east-west portion of Brayton Road (from the Hume Highway) would be maintained at Level of Service A during construction, normal Facilities' operation and major Facility maintenance.

The assessment concluded that the north south portion of Brayton Road (closer to the Canyonleigh Road intersection) during normal Facilities' operation and major Facility maintenance would be maintained at Level of Service A. During construction, this portion would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. Level of Service B is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

The assessment concluded that in peak periods, the level of service along Canyonleigh Road would be maintained at Level of Service A.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources:

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

The feasibility of constructing a water supply pipeline would be considered and subject to further consultation, detailed design and approvals. Further information on the potential water supply pipeline routes from the Marulan sewage treatment plant and Moss Vale sewage treatment plant are presented in the Preferred Project Report in **Section 4.4** and **Appendix E**.

Submission GMC.17: Traffic Impacts

Traffic Assessments have been carried out with respect to the potential impacts on Brayton and Canyonleigh Roads both during and after construction. Under the worst case scenario, with both facilities being erected at the same time (over a 12 to 18 month period), there would be traffic increase of 64% during the construction phase.

Submission GMC.18: ***It is estimated that the Peaking Plants will be operational for 40 days per year, with approximately 24 vehicle trips (using 30,000L tankers) each day of operation to supply the facilities with water. There would also be approximately 16 trips for staff members each day.***

Submission GMC.19: ***The Base Load Plant proposed by Delta Energy in Stage 2 would be operational for approximately 330 days per year, requiring an additional 13 water tanker trips. This stage would also increase the total number of staff trips to 48 vehicle movements per day.***

Submission GMC.20: ***It is estimated that, once operational, this would constitute an overall increase of 9 percent. However, this figure may understate the true impacts of the proposal, given that:***

- No consideration appears to have been given to the cumulative impact of the development when operating concurrently with the proposed Gunlake Quarry, which is also under assessment by the Minister.

- A considerable proportion of the additional traffic will be generated by large vehicles.

- The submitted documentation does not stipulate the times of day (or night) when traffic movements will occur.

As noted in response to Submission GMC.04 which also queried the traffic assessment, the revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along Canyonleigh Road would be approximately 25-27 % during construction, 26 % during normal Facilities' operation and approximately 27 % during major Facilities' maintenance.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of

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Brayton Road would be approximately 20 % during construction and normal Facility operation and approximately 17 % during major Facilities' maintenance.
The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 55 % during construction, 27 % during normal Facility operation and approximately 26 % during major Facilities' maintenance.

The assessment concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. Overall, the resultant level of service is still anticipated to be at worst, remaining at Level of Service B which is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

Traffic associated with the Project has been assumed to coincide with the peak traffic flows during the day to consider a worst case scenario. In general it is anticipated that the traffic flow during construction would be during the morning and late afternoon for the Facilities' construction workforce and during the day for other supplies and equipment, Traffic associated with operation is likely to the spread throughout the day with the Facilities' operation workforce traffic likely to be during the morning and late afternoon.

Submission GMC.21: Impacts on Marulan Village:

While a detailed assessment has been undertaken for the impacts along Brayton and Canyonleigh Roads, little or no consideration appears to have been given to the impacts on the Marulan Village. As vehicles must pass through the village in order to reach the site, it forms a key part of the haulage route, and as such, must be given equal consideration.

As noted in response to Submission GMC.09, further assessment of the traffic impact is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. It is noted that the route from the Hume Highway would be along the exit that feeds directly onto the east west portion of Brayton Road before Brayton Road turns north. Therefore the assessment of Brayton Road and Canyonleigh Roads represents the route that Project traffic would be travelling.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The assessment concluded that east-west portion of Brayton Road (from the Hume Highway) would be maintained at Level of Service A during construction, normal Facilities' operation and major Facility maintenance. Level of Service A is defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.

The assessment concluded that the north south portion of Brayton Road (closer to the Canyonleigh Road intersection) during normal Facilities' operation and major Facility maintenance would be maintained at Level of Service A. During construction, this portion would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. Level of Service B is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

The assessment concluded that in peak periods, the level of service along Canyonleigh Road would be maintained at Level of Service A.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from transport from the potential water supply sources.

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted along the routes adjacent to the village of Marulan and towards the Site.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. Construction traffic for the scenario where the Facilities are constructed consecutively is predicted to be less than this scenario. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction. The construction traffic generation estimates assume that the traffic volumes that are expected to occur in the peak three month period are double the expected monthly average over a twelve month period. For the purposes of this assessment, the peak traffic volumes have been adopted to represent the worst case scenario.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

Submission GMC.22: ***The "Ardmore Park" decision provides an important precedent in this regard. In this case, the court established that an assessment of a defined haulage route should not only demonstrate compliance with published standards (eg. for noise and vibration) but also consider the potential impacts on all the aspects that contribute to the overall "pleasantness" of the locality. The submitted documentation does not adequately address these requirements.***

As noted in response to other submissions by GMC regarding traffic, the assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The Land and Environment Court case referenced is understood to have related to a proposal for a sand and rock quarry. The traffic impact of quarries tends to be less during the construction / preparation and greater during the lifetime of operation. It is noted that the greatest potential traffic impact relating to the Marulan Facilities is during the construction phase. While this would be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan, it is considered a relatively short term impact, approximately 18 - 24 months, relative to the lifetime of the Facilities. The longer term impact is during normal Facilities operation, which the assessment concluded the traffic increase would be between 9 and 20 % depending on the portion of the route.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources,

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The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission GMC.23:* Noise Impacts**

Acoustic modelling suggests that the development may produce noise exceeding established thresholds at three separate nearby residences. One of the residences may experience marginal noise exceedance under adverse weather conditions, which may be mitigated by architectural treatments to the existing dwelling. The remaining two residences may experience a significant exceedance of greater than 5dB under adverse weather conditions. The applicants propose to address by negotiating agreements or in the most extreme case acquisition.

The cited Project details provided in Submission GMC.23 are confirmed by the Proponent.

***Submission GMC.24:* Vibration impacts for the development appear to be minimal.**

The cited Project details provided in Submission GMC.24 are confirmed by the Proponent.

***Submission GMC.25:* Visual Amenity**

The EIS concludes that the development will have an overall medium visual impact on the locality with two residences in particular experiencing a high visibility rating. This is due primarily to the proposed exhaust stacks, which stand approximately 30-40m high. A range of mitigation methods are proposed to address this, including screen planting, material selection and lighting design.

The cited Project details provided in Submission GMC.25 are confirmed by the Proponent.

***Submission GMC.26:* Conclusion**

While the onsite issues of noise and amenity impacts are of some concern, it is considered that these matters may be mitigated through a range of design measures and operational control. However, the lack of a suitable water supply and the associated impacts on the Marulan village by way of noise, traffic and general amenity, have not been sufficiently addressed.

***Submission GMC.27:* It is recommended that the application not be supported in its current format. A further assessment should be undertaken with the respect to the potential impact on the Marulan village during both construction and operation of the facilities.**

GMC's concerns have been noted and response provided above to each of the issues noted.

As noted in previous responses regarding traffic, the revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational

workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. In general the assessment concluded that traffic impacts from the Facilities would be minimal and impacts during construction would be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan.

In addition to the revised traffic assessment, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources. Traffic noise impacts during construction would be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan.

Additional detail has also been presented in the above responses and the Preferred Project Report in relation to the water supply for the Facilities to demonstrate that there is sufficient water supply available for the Facilities.

It is considered that the issues of water supply and impacts such as traffic and noise on the Marulan village have been sufficiently addressed in the Environmental Assessments and in additional information presented in the Preferred Project Report in Section 4 of this Report.

***Submission GMC.28*: Budget Implications: Nil**

Policy Considerations:

- Mulwaree LEP

-Mulwaree s94 Development Contribution Plan

- Draft Goulburn Mulwaree LEP

- Draft Goulburn Mulwaree DCP

- Draft s94A Contribution Plan

No response required to GMC.28.

Submission GMC.29: Recommendation - That an objection be lodged to the proposed Gas Turbine Facilities at Canyonleigh Road, Marulan on the basis that the environmental and amenity impacts of the haulage route have not been adequately addressed.

As noted in response to GMC.27, GMC's concerns have been noted and response provided above to each of the issues noted. Further information on the water supply, traffic and traffic noise impacts are presented in the Preferred Project Report in **Sections 4.1, 4.2** and **4.3.**

3.2.9 Roads and Traffic Authority

Submission RTA.01: I refer to your letter dated 27 November regarding the subject development application forwarded to the RTA for consideration.

Submission RTA.02: The RTA has reviewed the submitted information and notes that the Environmental Assessment indicates additional traffic analysis is being undertaken for the subject proposal. Whilst the RTA has no information on the type of additional assessment currently being completed, the RTA's major concern with the subject proposal relates to the impact associated with the proposed heavy

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vehicle route as well as the additional light vehicle traffic generated during the construction stage of the project.

Submission RTA.03: The RTA therefore requests that the additional traffic analysis identify the proposed heavy vehicle route and consider the suitability of this route to accommodate the turning movements of heavy/oversized vehicles. This will require swept path analysis for key junctions along the identified route as well as details regarding proposed upgrades/changes to existing infrastructure required to ameliorate the potential impact of construction traffic. In determining the proposed heavy vehicle route, the applicant should give consideration to the location of town centres and where possible avoid these areas.

The Proponent notes the concerns of the RTA and notes that it has committed (as per Statement of Commitments in **Section 6** of this Report) to undertaking further traffic assessments to:

- review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities;
- identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known;
- identify any flood potential and remedial works required for the access to the Site along Brayton and Canyonleigh Road; and
- in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils and the RTA as appropriate.

A traffic management plan would be developed as part of the CEMP and OEMP addressing detailed traffic management measures and include measures to address:

- safety;
- potential hazards – eg flooding, stock;
- maintenance of roads; and
- cumulative impacts with other movements for quarries.

Submission RTA.04: The RTA will recommence its assessment of the subject application once the aforementioned matters are addressed and incorporated into the revised traffic assessment.

The additional assessments described in response to Submissions RTA.01-RTA.03 would be undertaken once the nature of construction traffic is better known and the actual weight and dimensions of the proposed plant are known. This would be undertaken in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils and the RTA as appropriate.

3.3 Community Submissions

A total of 12 submissions were received from community members. In order to maintain privacy of the submitters, copies of these submissions have not been presented in an appendix and references to names have been omitted.

3.3.1 Submission 1

Submission 1.02: ***My greatest concern, is the amount of noise generated by the facility. I am dissatisfied by the "noise assessment" in the report, in particular by the determination of what is referred to as "ambient noise." Noise is, by definition, undesirable sound, and the sound of, for example, wind in the trees or grasses, or the sounds of birds or animals should not be classified as "noise," in this quiet-rural setting.***

Section 8.3.2 of the Environmental Assessment discusses the background monitoring conducted as part of the noise assessment. The Environmental Assessment Requirements issued by the DoP specifically for this Project, stipulate that the assessment be conducted in accordance with the NSW DECC Industrial Noise Policy (INP). According to the INP, the background noise level is defined as 'the underlying level of noise present in ambient noise when all unusual extraneous noise is removed'. Sound levels contributing to background levels can include sound from nearby traffic birds, insects, animals, machinery and similar sources if these sounds are a normal feature of the location. The INP does not distinguish between noise sources according to the aesthetic quality or character; it aims simply to detail the ambient noise environment which exists.

The INP sets out the minimum background noise level to be 30 dB(A). Where the background noise level is found to be less than 30 dB(A), the applicable noise limit for the location is still 35 dB(A) (30 + 5). It is noted that 35 dBA is a relatively low noise level, similar to that of the noise measured inside a bedroom at night time. It is the DECC's view that a noise level of 35 dB(A) would be unlikely to cause annoyance to local residents providing the noise does not contain certain characteristics like tonality and impulsiveness.

It is considered that adequate and representative background noise monitoring has been undertaken as part of the environmental assessment.

Submission 1.03: ***The addition of the constant drone caused by the operation of a gas turbine generating plant can be compared to, attendance at Symphony Concert where there is a constant hum in the public address system. The measured dBA of the "hum" may be below that of the measured dBA of the orchestra, but the concert will still be ruined.***

The noise assessment has been conducted consistent with the NSW DECC Industrial Noise Policy (INP).

Within the community, there is a very large range of human reaction to noise. There are those in the community who are very sensitive to noise. This noise-sensitive sector of the population would react, often strongly, to intruding noises that are barely audible within the overall noise environment, or would have an expectation of very low environmental noise levels. On the other hand, there are those within the community who find living in noisy environments, such as near major industry, on main roads or under aircraft flight paths, an acceptable situation. The bulk of the population lies within these two extremes, being unaffected by low levels of noise and being prepared to accept a certain level of noise.

The criteria in the INP have been selected to protect at least 90 % of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90 % of the time and as such it is unlikely that most people would consider the resultant noise levels excessive.

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Submission 1.04: ***I do not trust the figures quoted in regard to the level of ambient sound recorded and believe them to be excessive. Also, it is not appropriate to "average" sound levels over a long period as Gas Turbine noise output is constant and should be compared against the "quietest" time periods where it will be the most intrusive. Averaging does not accommodate for this. The noise from the operation of a Power Generating Facility, as proposed, is not compatible with this rural location.***

Consistent with the INP, long term unattended background noise measurements were conducted at four locations from Sunday, 7 May 2006 to Thursday, 18 May 2006 around the proposed Facility. The measured background noise levels analysed using the procedure presented in the INP varied between 27 and 31 dBA L_{A90}. The L_{A90} level is the noise level which is exceeded for 90 % of the sample period and can be referred to as the average minimum level. (**Figure 3-2**)

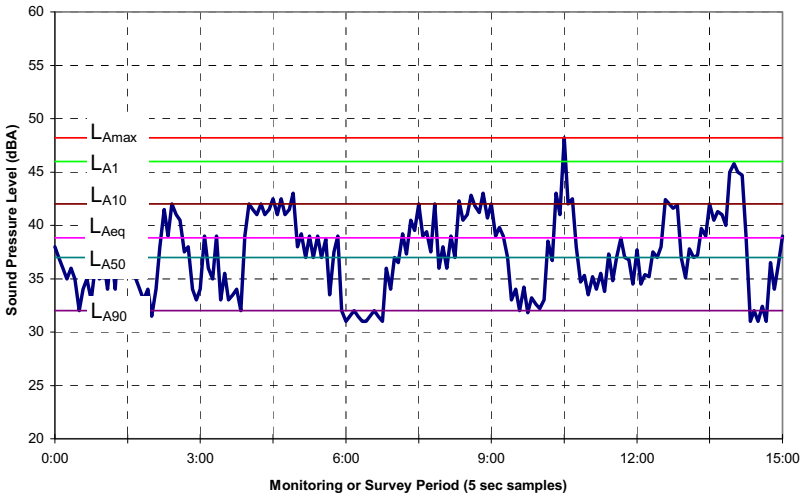

Figure 3-2 Illustration of Sound Pressure Levels

The project specific noise level of 35 dBA $L_{Aeq,15minutes}$ based on a 5 dBA above the lowest permissible RBL of 30 dBA as recommended within the INP is adopted for all residential receivers. This criterion is the most stringent criterion that can be developed by the procedures in the INP. As the residential receivers are rural, the criterion applies within 30 m of the existing residence.

Noise levels experienced by a receiver at relatively large distances from a source can vary considerably under different meteorological conditions, particularly in the evening and at night. Prevailing wind and air temperature gradients would change over the course of the night time period, and hence noise levels at receivers would change, even when the noise source level is constant.

The Southern Highlands region is an area where occurrence of temperature inversions is frequent and as such the effect of metrological conditions was addressed in the prediction of noise levels in the noise assessment for the Project.

Noise predictions at residences were calculated under a varied set of existing meteorological conditions and the 10^{th} percentile exceedance noise level calculated were calculated from the proposed Facilities (which can be referred to as the maximum average level). This level was then compared with relevant criteria.

Therefore it can be seen from the above description, the noise assessment has not averaged out noise "levels over a long period of time". In fact the average maximum noise levels from the Facility was compared to the most stringent criterion that can be developed by the procedures in the INP considering the average minimum background noise levels measured within the locality.

Submission 1.05: ***I am also concerned about the misleading assumption about the number of residents "affected" as quoted in Volume 1, Main Report, Chapter 8, and limited to 12. Anyone who owns a block of land in the area should be regarded as "affected" because each one is entitled to the expectation that they have the option to build a residence on their property. The inclusion of existing residences only, greatly under states the number of residents potentially affected.***

The process of the environmental impact assessment is essentially to determine the likely environmental impacts of the proposed development on the surrounding area. Consistent with the INP, the Environmental Assessment has specifically focused on noise-sensitive locations which for this development were residential premises. In assessing noise levels at residences, the noise level is assessed at the most affected point on or within the residential property boundary or, if this is more than 30 m from the residence, at the most-affected point within 30 m of the residence.

Chapter 17 of the Environmental Assessment explores potential future land use conflicts and the potential for future residential development on land surrounding the Marulan Site. Residential development is restricted as a 40 hectare minimum allotment size restriction applies to proposed residential development. The Environmental Assessment considers the likely impact of the Draft Goulburn Mulwaree Local Environmental Plan 2007 which increases the minimum lot size for subdivisions from 40 ha to 100 ha for land zoned RU2 Rural Landscape with the view to maintaining the rural character of the area. It is considered that applications for subdivision in the area surrounding the Marulan Site would become less common in the future. Given Goulburn Mulwaree Council's move towards promoting the rural characteristics of the landscape, it is unlikely that any of the land surrounding the Marulan Site would be zoned Residential in the future.

Submission 1.06: ***I also have a concern about the credibility of the report, and in this regard, draw attention to Appendix E, Section 2, "Existing Environment". The facility sites would be accessed from Canyonleigh Road. Not Brayton Road, as detailed in paragraph one.***

To clarify the intention of the two paragraphs in question, the first statement was describing the general route to the proposed site from Marulan (rather than the Site entrance). The ambiguity in the description is noted, and care has been taken to rectify the additional traffic assessment presented in the Preferred Project Report in **Section 4.1**.

Submission 1.07: ***2.Canyonleigh Road branches off Brayton Road approximately nine km from Marulan not four, as detailed in paragraph two, and a further 10 Km must be travelled along Canyonleigh Road to reach the proposed access point (not mentioned).***

Section 2.1 of the Traffic Assessment incorrectly states that approximately 4 km north of Marulan, Canyonleigh Road branches to the east off Brayton Road and passes the TransGrid Switchyard site. It is noted that as stated in Submission 1.07, Canyonleigh branches off Brayton Road approximately nine km from Marulan. The Site is located approx 9.8 km along Canyonleigh Road from the Brayton Road intersection. It is noted that although this distance was incorrectly stated, the distance quoted does not influence the outcomes of the traffic impact assessment. Additional information relating to the traffic assessment is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

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Submission 1.08: ***3.The mention, in the final paragraph, that Brayton Road spans two local government areas, is irrelevant, as the route to the site would only use the Goulburn Mulwaree section of the road.***

It is noted that the majority of the route to the Site is located in Goulburn Mulwaree Local Government Area (LGA), however the Facilities and associated on-site infrastructure would be located in the Upper Lachlan Shire LGA. This information is relevant to the characterisation of the existing traffic environs given the close proximity of the LGA boundaries to the Site, and also as both local authorities would be consulted about possible road upgrades / improved infrastructure proposed as part of the development.

Submission 1.09: ***4.The Canyonleigh Road section of the route comprises approximately 9.5 km of gravel road which raises the issue of dust "hazard". This issue is not addressed.***

Chapter 7 of the Environmental Assessment addresses air emissions from the project. Table 7-9 summarises the mitigation measures and commitments of the Proponent. It is noted that a Construction Environmental Management Plan (CEMP) would be prepared to outline the implementation of mitigation measures. The CEMP would consider the most appropriate dust mitigation method suited to the activity and circumstances. This would likely include measures such as watering, spraying, scheduling activities for more favourable meteorological conditions, covering or limiting truck soil loads; reducing speed limits on unsealed surfaces; and cleaning soil off the undercarriage and wheels of trucks, when required.

Further it is noted that as a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 1.10: ***5.Canyonleigh Road is largely surfaced with shale that builds up thickly on the shoulders. This presents a danger to "passenger vehicle" occupants forced over by transports travelling in the opposite direction. This danger presents itself in punctured tyres and accidents caused by the loose surface and the presence of culverts at the side of the narrow roadway. This has not been considered.***

Proposed mitigation measures are detailed in Section 10.5.3 of the Environmental Assessment. These include the need for further traffic assessments to identify remedial treatments required to facilitate passage to the Site along Canyonleigh and Brayton Roads including assessing the condition of culverts and width of the road.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 1.11: ***I would not give a stranger to the area, much chance of finding the site while following the description given in this section of the report. More to the point, just how much of the overall report has been prepared with the carelessness of this section?***

The ambiguity in some of the descriptions is noted, and care has been taken to rectify the additional traffic assessment presented in the Preferred Project Report in **Section 4.1**. The revised traffic assessment is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. This additional traffic assessment was undertaken to take into account to the inconsistencies pointed out in the submissions and in response to additional information which has become available.

Submission 1.12: ***I do not believe that a development of this kind is compatible with this area and that approval should be refused. Please consider my comments in your deliberation.***

As noted in Section 3.2.5 of the Environmental Assessment, the Marulan Site was selected primarily because of its close proximity to the high voltage electricity distribution system, existing TransGrid Switchyard and close proximity to a major gas supply pipeline. Other desirable characteristics for the Site included existing easements / corridors for electricity transmission; the distance from built up areas; appropriate land use zoning permitting the location of a power generating facility; and the availability of an appropriately sized site that permits for an adequate buffer between the facility and surrounding land uses. The Marulan Site was assessed as the preferred location from a range of other potential sites investigated. Under the Mulwaree Local Environmental Plan (MLEP) 1995, the Site is zoned 1(a) General Rural and the proposed development is permissible subject to the granting of consent by the Minster for Planning.

Mitigation measures detailed in the Environmental Assessments relating to the control of noise levels, air and water quality, traffic and transportation, visual amenity and other environmental matters, as detailed in Chapter 7 through Chapter 18 of the Environmental Assessment, would be implemented to ensure that the proposal is managed in an effective and efficient manner, with minimal impact on existing surrounding land uses.

3.3.2 Submission 2

Submission 2.01: I would like to draw your attention to the Environmental Assessment: Traffic Assessment: Section 3. I believe the current "estimations" of traffic levels to be grossly overinflated. This applies both to Brayton Road and also to Canyonleigh Road.

Submission 2.02: Canyonleigh Road, while comprising about 10 km of the proposed route, is a "local traffic" road only. While the road does extend through to Canyonleigh and on to the Hume Highway, the road, after the first 10 Km or so, reduces to a single lane which passes through farm gates and properties. This road is rarely used for through traffic. The "estimates" in the report are ludicrous with regard to the current volume of local traffic, and the amount of change that would be caused by the proposed development.

Submission 2.03: Brayton Road has considerably more traffic than Canyonleigh Road but it also serves for local traffic only. Again, Brayton Road can be used to get through to Taralga, but (about 10Km after the Canyonleigh Road intersection) it also reduces to unsealed single lane and passes through properties. It includes at least one river crossing suitable for 4WD vehicles only.

Submission 2.04: To state that the proposed development would only cause only a 25% increase to current conditions, (as stated in the table on the last page of section 4) shows inaccuracies that reflect a lack of local knowledge and lack of proper investigation of the actual conditions.

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It is noted that the above statements (Submissions 2.01 – 2.04) have been taken into consideration, and additional traffic impact investigations have been undertaken. Information from Council was sought at the time of the investigation, however traffic data tends to be limited to large built up areas and major intersections, particularly in rural settings.

The revised traffic assessment is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A.
    The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road.

While the worst-case scenario in the assessment was for construction of the two Facilities occurring at the same time, it is noted that the assessment of both Canyonleigh and Brayton Roads is very conservative for the following reasons:

- traffic volumes for the peak three months of construction traffic were assumed to continue for the whole construction period of 12 months; and
- peak three months of construction traffic were assumed to occur at the same time for both Facilities however, construction of the EnergyAustralia Facility is likely to occur before the construction of the Delta Electricity Facility and therefore this scenario is unlikely to occur.

The Proponent has committed to the following:

- development of detailed Transport Plan (including obtaining approvals) for the transportation of turbine components and equipment;
- development of detailed Traffic Management Plan for the construction phase of the Facilities; and
- development of detailed Traffic Management Plan for the operation phase Facilities.

<u>Submission 2.05</u>: It is interesting that in the Pre and Post Construction Evaluation of the roadways, itemised in Paragraph 4.1.1, Canyonleigh Road has been omitted, and only Brayton Road mentioned. Since Canyonleigh Road comprises the greater distance in the proposed route from Marulan, I would question whether this omission is deliberate, or whether, as included in my previous comments, could

be taken as further evidence of carelessness in the preparation of this report. Please consider these further comments in your deliberation.

In order to clarify the above, a review of the traffic assessments as presented in the application documents has been carried out. The stated omission referenced above in Submission 2.05 was located; however the context of this paragraph must be noted. Section 4.1.1 is specifically discussing road infrastructure issues and constraints beyond the Site boundary, which is why the emphasis has been placed on Brayton Road rather than Canyonleigh Road.

It is noted that the pre and post- evaluation of the roads would apply to both Canyonleigh and Brayton Roads, as detailed throughout the documents prepared and submitted as part of the Environmental Assessment. The commitment in the Environmental Assessment (Table 19-1 and **Section 5**) states that a *"pre construction evaluation of pavement condition of Brayton Road intersection (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site)"* would be undertaken as a mitigation measure considered necessary for the Common Shared Works. A *"post construction evaluation of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site)"* is also listed as necessary to determine remedial action requirements following the passage of oversized vehicles.

3.3.3 Submission 3

Submission 3.01: I am one of many residents that these two gas power turbines are going to affect. Some of our concerns are as follows in relation to how these gas power turbines will affect our area are follows:

1. What impact is the noise levels going to have on our residents and our environment as they will be operating 24 hours a day 7 days a week being mainly at night time. As we all know noise travels so the noise is going to affect not just the near by properties its going to affect a lot more residents than what Delta and Energy Australia suggest.

Although the Joint Concept Environmental Assessment notes that the Facilities may operate at any time in a 24 hour period, and that Stage 2 of the Delta Facility would have continuous operation to about 90 % of the year, the EnergyAustralia Facility and Stage 1 of the Delta Electricity Facility are most likely to operate at the time of peak electricity demand periods. In NSW these are generally 2.00pm – 8.00pm during the summer, and 5.00pm – 7.00pm during the winter.

Where peak noise levels would potentially occur during night time, DECC requires that consideration be given to the potential for sleep arousal within residences. The noise and vibration assessment assessed the potential for sleep arousal as a result of the proposed development. The assessment indicated that the potential for sleep disturbance would likely be greatest during the early morning hours when background noises are at their lowest. The assessment determined that the maximum anticipated noise level during abnormal (emergency) operating conditions would be 41 dBA. Given that this is below the permissible 45 dBA, the potential impact was found to be within appropriate goals recommended by DECC.

Submission 3.02: 2. Extra traffic on narrow dirt dusty road, which is only five metres wide. How will the road handle extra 1000 thousand vehicles extra per week.

The Environmental Assessment set out a number of specific mitigation measures which are considered necessary for the Common Shared Works. Included in these commitments were further assessments to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along

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Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities. The need to identify and cater for necessary remedial treatments to facilitate passage to the Site along Canyonleigh Road once the actual weight and dimensions of the proposed plant are determined, was also a commitment of the Proponent as stated mitigation measures of the Environmental Assessments.

The Proponent has also committed to the following:

- Development of detailed Transport Plan (including obtaining approvals) for the transportation of turbine components and equipment.
- Development of detailed Traffic Management Plan for the construction phase of the Facilities.
- Development of detailed Traffic Management Plan for the operation phase Facilities.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 3.03: ***3. Marulan Township will be under much noise and traffic impact from vehicle movements as the roads will not be upgraded and are unsuitable to handle the extra traffic flow.***

A traffic noise assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources.

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 3.04**: 4. Dust and deterioration of our road pavement have not been adequately addressed.**

As noted in response to Submission 3.02 and 3.03,as a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

***Submission 3.05*: 5. Lack of water supply in the area.**

Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. To meet the construction and operational water requirements for non-potable water for the Facilities, it is proposed to use treated effluent from offsite sources and / or rainwater captured from the hardstand areas of the Facilities for the majority of water requirements. A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities which could meet and exceed the requirements of the proposed Facilities. These include:

- Marulan water supply network - able to fulfil the potable water requirements of the Facilities (less than 1% of the Facilities' total water requirements);
- Marulan sewage treatment plant - may augment the Facilities' non-potable water requirements;
- Moss Vale sewage treatment plant - able to supply the Facilities' non-potable water requirements, and
- Site stormwater runoff - may augment the Facilities' non-potable water requirements.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The environmental assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors. Further information on consideration of the potential water sources is provided in the Preferred Project Report in **Section 4.3** and **Appendix D** and further information on potential water pipeline routes are presented in **Section 4.3.4**.

Small quantities of potable water are required for the Facilities with the large majority required for process (non potable) water. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff. It is noted that supply of water from the Marulan Water Supply Network is proposed for supply of only the potable water requirements being comparatively small quantities for domestic type uses.

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low. Further detail on the proposed water pipeline option is provided in the Preferred Project Report in **Section 4.4** of this Report and **Appendix E**.

It is noted that water would not be extracted from the Wollondilly River.

***Submission 3.06*: 6. The location of these towers is on the drinking water catchment authority area consisting of Paddys and Wollondilly rivers.**

The Environmental Assessment has considered the proximity of the proposed Site location to rivers and the wider catchment area. The Wollondilly River and associated riparian vegetation lie in close proximity and downslope of the Project footprint. The Marulan Site is within the Wollondilly River subcatchment of the Warragamba catchment and is part of the Sydney Drinking Water Catchment as discussed in Section 3.7 of the Joint Concept Environmental Assessment. The Environmental Assessment Requirements request that as the proposed development falls within the area covered by the Drinking Water Catchments Regional Environmental Plan (REP) No.1, the development should assess the impacts on drinking water quality.

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The Sydney Catchment Authority (SCA) was consulted as a key stakeholder during the Environmental Assessment. The SCA has stipulated that effluent management areas are to be located at least 150 m from the Wollondilly River, 100 m from a creek and 40 m from onsite drainage depressions. A 150 m buffer between water ways and onsite sewerage systems and water treatment facilities has been established for the proposed site.

A Soil and Water Management Plan is to be prepared as part of the CEMP for the Project. Surface waters falling or flowing through the Site would be managed in accordance this plan and management actions would include:

- water retained within the harvestable rights for the Site;
- water of suitable quality being diverted to a natural watercourse; and
- water treatment for those waters originating from disturbed areas.

The Construction Environmental Management Plan (CEMP) would include safeguards and mitigation measures to minimise potential impacts from additional runoff, erosion and transported sediments. Providing erosion and sediment controls plus other mitigation measures outlined in the CEMP are followed, the Project is unlikely to result in significant impacts.

Paddys River is located to the south east of the Marulan Site and would not be impacted by the Facilities. Paddys River is located on the eastern extent of the proposed gas pipeline corridor. Further route refinement and studies have been undertaken for the gas pipeline and the proposed gas pipeline options are located away from Paddys River. Refer to the Preferred Project Report in **Section 4.5** for further information on the gas pipeline assessments.

It is noted that water would not be extracted from the Wollondilly River or Paddys River.

Chapter 14 details the Water Cycle Management proposed for the Marulan Gas Turbine Facilities. The Environmental Assessment details that stormwater and wastewater would be managed within each Facility to be effectively self-contained. Section 14.8 outlines a wide range of measures to be implemented during all stages of the Project in order to prevent the pollution of water. Areas where there is a higher likelihood of spills or leaks occurring would be bunded. There would be no direct drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero water discharge from the Site except for natural surface flow.

***Submission 3.07*: 7. Pollution Levels for the township of Marulan have not been adequately addressed.**

The Environmental Assessment addresses the likely impacts of the proposed development on air quality, water quality and noise impacts:

- The air quality assessment as summarised in Chapter 7 of the Environmental Assessment considers local air quality. The air quality assessment carried out was in accordance with the *Approved Methods* as stipulated by the NSW Department of Conservation and Climate Change (DECC) as discussed in Section 7.3.1. The results of the dispersion modelling predicted the impact of the Facilities emissions on air quality based on both Facilities operating all hours of the year. The approach taken was conservative to assess the likely impacts under worst case operating and atmospheric conditions. No exceedences of the DECC regulatory criteria were observed and it is considered that the impacts on air quality from the proposed development would be minor, with adverse impacts unlikely.

- Chapter 14 details the Water Cycle Management proposed for the Marulan Gas Turbine Facilities. The Environmental Assessment details that stormwater and wastewater would be managed within each Facility to be effectively self-contained. Section 14.8 outlines a wide range of measures to be implemented during all stages of the project in order to prevent the pollution of water. Areas where there is a higher likelihood of spills or leaks occurring would be bunded. There would be no direct drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero water discharge from the Site except for natural surface flow.
- Noise and vibration impacts from the proposed EnergyAustralia and Delta Electricity Facilities have been assessed in accordance with appropriate environmental standards, notably the NSW DECC Industrial Noise Policy. Impacts at relevant sensitive receivers such as residential dwellings have been quantified and where possible, measures have been proposed that would reduce these impacts. An assessment of potential for sleep arousal was carried out and the potential impact was found to be within appropriate goals recommended by DECC.

Submission 3.08: 8. ***What impact will this have on adjoining towns, which haven't been informed?***

A consultation strategy was developed to initiate and maintain open communication with key stakeholders and to provide a forum to proactively respond and work with the community and key statutory and public authority stakeholders. Whilst the Environmental Assessment necessarily focused on the likely impacts of the proposed development in those areas closer to the Site (therefore the areas most likely to be directly impacted by the proposal), Delta Electricity and EnergyAustralia have engaged the broader community through press releases in the Goulburn Post, consultation with the Goulburn Mulwaree and Upper Lachlan Shire Councils, as well as various State Government agencies in order to ensure wider concerns and issues would be appropriately considered and addressed.

It is noted that the additional traffic studies include specific reference to wider traffic impacts of the proposed development, and Chapter 18 of the Joint Concept Environmental Assessment provides a qualitative assessment of the local and regional benefits which the Project would convey.

Submission 3.09: 9. What precautions are in place for fires, contamination, spillages and explosions that may occur?

Environmental Management Plans (EMP) including a Construction EMP and an Operation EMP would be prepared and would dictate the specific environmental policies and management plans that the Facilities would operate in accordance with.

As detailed in the Environmental Assessment, a Preliminary Hazard Analysis (PHA) has been carried out for the proposed Facilities and the gas pipeline. The PHA assessment was carried out in accordance with the Department of Planning's Hazardous Industry Planning Advisory Paper (HIPAP) No 6 (Guidelines for Hazard Analysis) and HIPAP No 4 (Risk Criteria for Land Use Planning). The main hazard associated with the proposed Project is associated with the transport of natural gas (predominantly composed of methane gas), which is a flammable gas held under pressure. The Environmental Assessment notes that many assumptions used in the analysis were very conservative, but despite this the results show that the risk associated with the development is very low. The most stringent risk criteria are adhered to as required by the Department of Planning.

The Marulan Site has been identified as bush fire prone within the Goulburn Mulwaree Shire Bush Fire Prone Land Map and has been assessed in accordance with the guidelines set out in the Rural Fire Service document, *Planning for Bush Fire Protection*. Consideration was given to Rural Fire Service guidelines and requirements, and consultation was undertaken with the Yass Rural Fire Service to seek feedback on the proposed bush fire

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management issues. Mitigation measures are provided to ensure any risk of bush fire at the proposed Marulan Site is appropriately managed.

In addition, both the Construction and Operation Environmental Management Plan would include an emergency response plan to be developed in consultation with the appropriate authorities (for example, rural bush fire brigade, ambulance service).

Chapter 14 details the Water Cycle Management proposed for the Marulan Gas Turbine Facilities. The Environmental Assessment details that stormwater and wastewater would be managed within each Facility to be effectively self-contained. Section 14.8 outlines a wide range of measures to be implemented during all stages of the Project in order to prevent the pollution of water. Areas where there is a higher likelihood of spills or leaks occurring would be bunded. There would be no direct drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero water discharge from the Site except for natural surface flow.

Submission 3.10: 10. Lack of information, co-operation for location of the gas line and time to under take independent studies.

The Joint Concept Environmental Assessment stated that Delta Electricity and EnergyAustralia were seeking concept approval for the gas pipeline corridor under Part 3A of the EP&A Act. The exact location of the gas pipeline between the Facilities and the Moomba to Sydney gas pipeline had not been confirmed at the time of submission of the Joint Concept Environmental Assessment, therefore the investigation was limited to a desktop study of a potential corridor. Further investigation into potential routes and continued consultation and negotiation with landholders potentially affected by the proposed gas pipeline route options has progressed, and further information about this consultation and about the preferred pipeline route options are presented in the Preferred Project Report in **Section 4.5** for consideration.

Submission 3.11: *11. What impact is it going to have on our future.*

It is recognised that there is potential for positive and negative impacts of the proposed Marulan Gas Turbine Facilities Project. The Environmental Assessment has offered a comprehensive overview of the proposed management and mitigation strategies which would be implemented in order to limit and reduce as far as practicable, those negative impacts of the development.

A project such as the proposed Facilities, would influence economic activity, employment and trade in the region. Project benefits as discussed in the assessment of economic impact (Chapter 18) would be delivered by adding peaking generating capacity to the national electricity market (Delta Electricity Stage 1 and EnergyAustralia) and intermediate / base load capacity to the national electricity market (Delta Electricity Stage 2). This would achieve improvements in supply reliability, and increase competition amongst generation participants in the electricity market. A competitive market helps promote lower electricity prices for consumers. Direct impacts of a project include output, expenditure, economic value added, jobs and household income.

Submission 3.12: Please consider our submissions on this project carefully as these Towers will impact our town negatively.

A thorough site selection process was undertaken to determine the most appropriate location for the Delta Electricity and EnergyAustralia Gas Turbine Facilities. The Marulan Site was selected as the most appropriate available location with suitable land potentially available close to TransGrid's switchyard and to the Moomba to Sydney gas pipeline.

As for the response offered to Submission 3.11 above, it is recognised that there is potential for positive and negative impacts of the proposed Marulan Gas Turbine Facilities Project. The Environmental Assessment has offered a comprehensive overview of the proposed management and mitigation strategies which would be enacted in order to limit and reduce as far as practicable, those negative impacts of the development.

The visual assessment addressed 49 view locations and found that the majority of view locations would have no view to the proposed Facilities or very restricted views of the proposed Facilities. One view location was determined to have a medium visibility rating. Two view locations were determined to have a high visibility rating. As the Proponent has negotiated purchase of the one of these residences in relation to noise issues, there is one remaining location with high visibility. A number of mitigation measures such as vegetation screening, choice of colour and lighting selection are proposed to reduce impacts further.

The visual impact assessment concluded that the Facilities 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 Facilities.

As stated in Chapter 13 of the Joint Concept Environmental Assessment, it is also noted that no visible emissions would be discharged from the turbine exhaust stacks.

3.3.4 Submission 4

***Submission 4.01*: Summary: In face of the financial crisis, peak oil and the rapid disappearance of the Arctic summer sea ice, the function of the proposed gas fired power plants has to be reviewed. One option would be to use them as a back-up for wind farms now under construction or planned.**

As discussed in Section 2.7 of the Joint Concept Environmental Assessment, the proposed Project would benefit the local and regional community on a number of levels. Potential benefits include the increased reliability of supply during peak demand periods; improved security of electricity supply during system emergencies; the ability to quickly convert to a base load plant should there be a substantial increase in electricity demand; improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies; and the provision of social and economic benefits associated with the ability of the NSW supply network to meet peak energy demands in the short term and base load demands in the longer term. Increased competition amongst generation participants in the electricity market helps promote lower electricity prices for consumers.

The Environmental Assessments have considered a range of power generation technology alternatives to the open cycle gas turbine facilities in the instance of Delta Electricity Stage 1 and EnergyAustralia and combined cycle gas turbine facilities in the instance of Delta Electricity Stage 2. Gas powered generation is viewed as the most efficient way to supply peaking electricity load. Gas power generation has a similar thermal efficiency to coal fired power stations, but with a lower greenhouse gas emission per unit of energy generated. The combustion of natural gas produces only a fraction of the nitrogen oxide and carbon dioxide emissions of oil and coal, and also results in much smaller quantities of particulate matter and sulphur dioxide emissions. Solar and wind technologies do not provide suitable alternatives that can service peak load demand due to the intermittent nature of the resource. In addition, the storage technology is not sufficiently advanced to store large amounts of energy for later use.

***Submission 4.02*: These will have 2 purposes: REPLACE coal fired power plants (which have to be decommissioned) and serve as a power supply for electric rail (which has to replace oil based transport). Waste heat has to be used in connection with industry manufacturing components for the renewable energy sector.**

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Natural gas is seen as an attractive “transition” fuel as the energy supply moves away from greenhouse intensive sources such as coal and towards cleaner, less greenhouse intensive technologies. This was described in the Environmental Assessments as a key determining factor in the choice of generation technology proposed.

The Delta Electricity Stage 2 (combined cycle) Facility would require the addition of two heat recovery steam generators, steam turbine, generator and an air cooled condenser. The heat recovery steam generator acts to recover the heat energy previously emitted to atmosphere by the open cycle system by generating steam and producing electricity.

***Submission 4.03**: I am referring to the executive summary http://www.planning.nsw.gov.au/asp/pdf/07_0174_marulan_concept_ea_exsum.pdf with following comments:*

(1) Forecasts of strong economic growth have to be revised. The combination of the debt crisis, peak oil and the necessity to REPLACE coal fired power plants AS SOON AS POSSIBLE change all planning parameters. Governments have been slow to adapt to these changed requirements and continue with their approach of perpetual economic growth. New projects have to find new objectives if they want to be economic in future.

The Environmental Assessments have considered a range of power generation technology alternatives to the open cycle gas turbine facilities in the instance of Delta Electricity Stage 1 and EnergyAustralia and combined cycle gas turbine facilities in the instance of Delta Electricity Stage 2. Gas powered generation is viewed as the most efficient way to supply peaking electricity load. Gas power generation has a similar thermal efficiency to coal fired power stations, but with a lower greenhouse gas emission per unit of energy generated. The combustion of natural gas produces only a fraction of the nitrogen oxide and carbon dioxide emissions of oil and coal, and also results in much smaller quantities of particulate matter and sulphur dioxide emissions. Solar and wind technologies do not provide suitable alternatives that can service peak load demand due to the intermittent nature of the resource. In addition, the storage technology is not sufficiently advanced to store large amounts of energy for later use.

Natural gas is seen as an attractive “transition” fuel as the energy supply moves away from greenhouse intensive sources such as coal and towards cleaner, less greenhouse intensive technologies. This was described in the Environmental Assessments as a key determining factor in the choice of generation technology proposed.

The Delta Electricity Stage 2 (combined cycle) Facility would require the addition of two heat recovery steam generators, steam turbine, generator and an air cooled condenser. The heat recovery steam generator acts to recover the heat energy previously emitted to atmosphere by the open cycle system by generating steam and producing electricity.

***Submission 4.04**: The debt bubble burst starting with the subprime mortgage crisis in the US as a result of peak oil (crude oil production peaking since mid 2005) which limited the further expansion of suburbia and exurbia by high petrol prices which brought millions of US households into financial problems. What we have at hand is episode #1 in "The end of suburbia". http://www.endofsuburbia.com/ http://www.youtube.com/watch?v=Q3uvzcY2Xug*

As for the response to Submission 3.11, the Project is being proposed in order to ensure the state’s future electricity demands can be met. Over the coming decade, it is predicted that rising electricity demand from NSW would exceed existing generation capacity unless a new source of electricity generation is constructed and fully

operational by 2009. Gas fired power generation represents an efficient transition fuel as discussed in the above response to Submission 4.02.

***Submission 4.05**: After the events of the last weeks the world will never be the same again. The housing affordability and mortgage crisis has led to the government buying residential mortgage-backed securities (RMBS) of $4bn. This cannot continue. Immigration to the capital cities will have to be reduced, thereby slowing population growth and demand for energy. The recession now predicted by many economists will also change the energy outlook.*

***Submission 4.06**: (2) WA crude oil production will dramatically decline after its 2008/09 peak at a whopping rate of 11% pa while at the same time global oil supplies are set to decline. Please note Russian oil production has peaked. Global peaking means the end of the internal combustion engine and our car culture in general as there will be no time (and clean primary energy) for a smooth transition to electric or hydrogen cars. In any event credit for car loans will dry up. As a result, we have to electrify our rail transport system.*

***Submission 4.07**: In urban areas this means electric rail on all freeways and toll-ways (Transperth model) and light rail on all major roads. In intercity services, domestic flights will have to be replaced by electric night trains. Long distance trucks have to be moved by roll-on, roll-off electric trains. All these peak oil solutions require additional electric power.*

In response to the above Submissions 4.05 – 4.07, it is noted that natural gas is seen as an appropriate "transition" fuel from a more greenhouse intensive energy sector to a more diversified energy mix including a greater proportion of alternative and renewable energy sources. The security of energy supply is a critical issue for the future of NSW, and over the coming decade, it is predicted that rising electricity demand from NSW will exceed existing generation capacity unless a new source of electricity generation is constructed and fully operation by 2009.

As outlined in Chapter 2 of the Environmental Assessments, based on the forecasts provided by NEMMCOs Statement of Opportunities report, the Owen Inquiry and Delta Electricity's and EnergyAustralia's own analysis of current market conditions and potential future demand scenarios, the Proponent has identified the need to provide additional generating capacity to meet the likely short to medium term shortfall in electrical supply during peak demand periods and potentially in the future for base load supply. The Proponent notes that the proposed Facilities do not appear to contradict the central message conveyed within Submission 4.07; that additional electric power is an important future requirement.

***Submission 4.08:** (3) The function of any new gas fired power plant CANNOT be to support the continuation of our carbon based consumer society. Please find attached a summary of global warming related tipping points. The most far-reaching event will be the disappearance of the Arctic summer sea ice already in 5 years time, which will change the climate on the Northern hemisphere with yet incalculable consequences for the rest of the globe. The whole economic ball-game will change from emitting CO2 to EXTRACTING CO2. This means coal fired power plants will have to be de-commissioned. Nature will force us to do this much earlier than is generally assumed. With the coming summer, our focus will go to West-Antarctica, where temperatures have been abnormally high. The world is truly in a multi front war with nature.*

Natural gas is seen as an attractive "transition" fuel as the energy supply moves away from greenhouse intensive sources such as coal and towards cleaner, less greenhouse intensive technologies. This was

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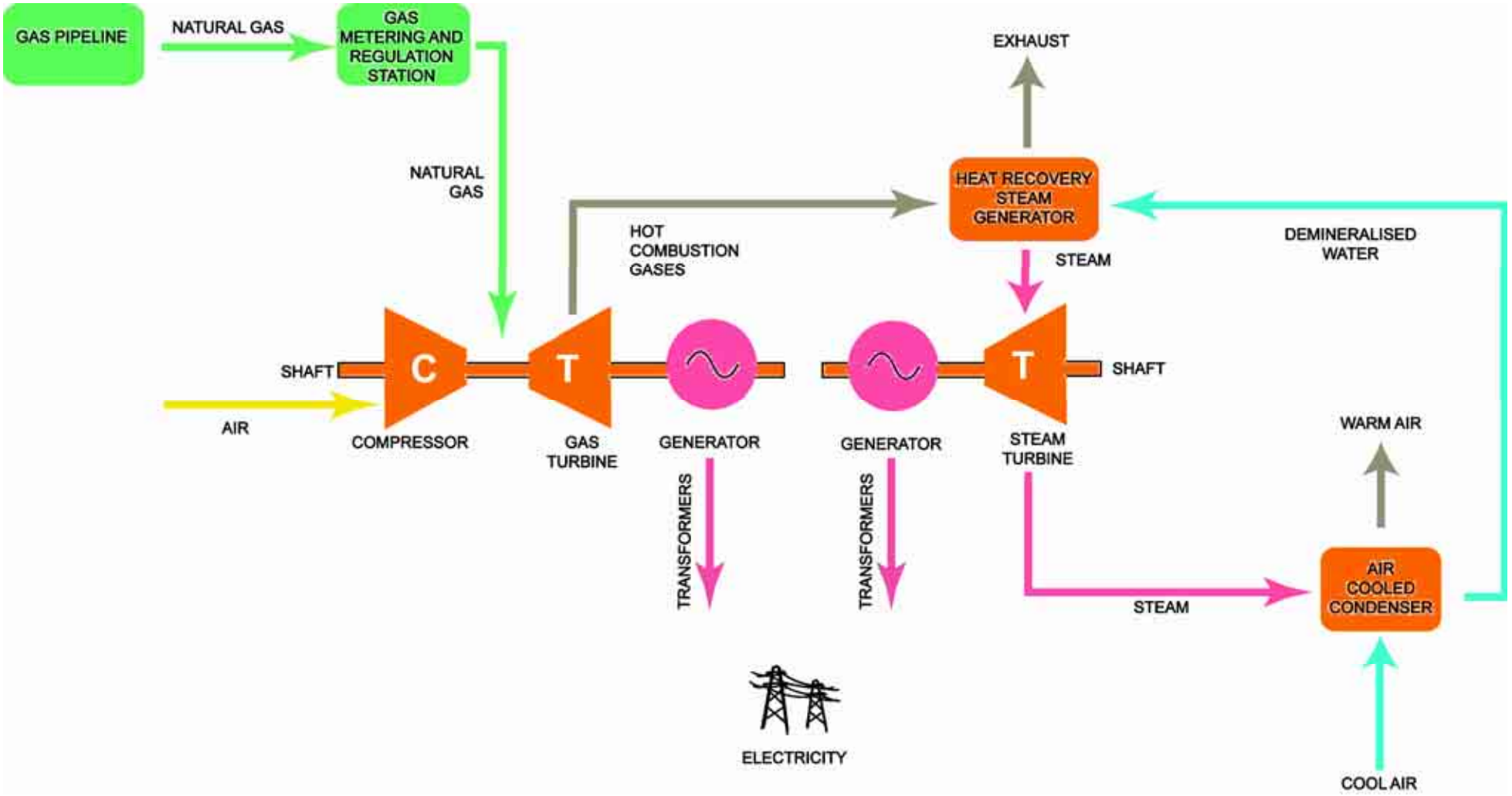
described in the Environmental Assessments as a key determining factor in the choice of generation technology proposed.

The Delta Electricity Stage 2 (combined cycle) Facility would require the addition of two heat recovery steam generators, steam turbine, generator and an air cooled condenser. The heat recovery steam generator acts to recover the heat energy previously emitted to atmosphere by the open cycle system by generating steam and producing electricity. An illustration of the process for the Delta Electricity Facility Stage 2 is presented in **Figure 3-3**.

The security of energy supply is a critical issue for the future of NSW, and over the coming decade, it is predicted that rising electricity demand from NSW will exceed existing generation capacity unless a new source of electricity generation is constructed and fully operation by 2009.



Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES - SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **PROCESS DIAGRAM - COMBINED CYCLE (DELTA ELECTRICITY STAGE 2)**
URS	Drawn: AO | Approved: NB | Date: 04/03/2009 Job No: **43177371** | File No: 43177371-220.wor	Figure: **3-3**

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***Submission 4.09*: (4) Back to the drawing board. The above means that the role of gas-fired power plants will have to be reviewed from scratch. There can be no business as usual. One option would be to use gas fired power plants as a back-up for wind farms now being built or planned e.g. the Silverton Wind Farm (MP 08_0022). It should also be a pre-condition that waste heat be used in an industrial process, preferably in a factory to manufacture energy intensive components for the renewable energy industry, e.g. for solar water heaters or solar panels.**

In terms of project feasibility and proposed timeframes, coupling a gas turbine facility with a wind generation project would be hampered by a shortage of potentially suitable sites able to facilitate both technologies and plant, and the wide range of specific infrastructure requirements. Electrical power generation facilities have tended to be large scale, centralised and stand alone projects, however both EnergyAustralia and Delta Electricity have made the strategic decision to occupy the same location to reduce the environmental footprint of their respective gas turbine facilities for this current project.

The Owen Inquiry Report released in September 2007 found that energy consumption in NSW is forecast to increase to 91,000 GWh a year by 2013-14, an increase of 10,500 GWh from 2006-07.

The Owen Inquiry Report stated that NSW's innovative energy efficiency measures are currently playing, and will continue to play, a significant role in reducing energy consumption and that renewable energy and other small-scale generation are forecast to provide over 1,500 GWh of the 10,500 GWh needed.

The Owen Inquiry Report found the remaining 9,000 GWh base load electricity required annually by 2013-14 is likely to be met by gas- or coal-fired generation. Other technologies such as solar or geothermal are expected to contribute significantly in the longer term.

It is noted that the concept design of the proposed Delta Electricity Facility has taken into account the potential harnessing of heat for additional utilisation and improved efficiency for Stage 2 of the Delta Electricity Facility. To note Section 4.6 of the Environmental Assessment, the proposed Stage 2 for Delta Electricity's Facility proposes to upgrade or convert the Stage 1 open cycle facility to a combined cycle facility which would include two heat recovery steam generators. A heat recovery steam generator would act to recover the heat energy previously emitted to the atmosphere by the open cycle system by generating steam and producing electricity.

3.3.5 Submission 5

***Submission 5.01*: The Dairy Road Community Alliance, representing the landowners on Dairy Road and parts of Canyonleigh Road in Brayton and Marulan, Goulburn Mulwaree shire, makes this response to the planning documents and assessments for these projects proposed to be located near their farms and residences:**

***Submission 5.02*: Firstly, we reiterate our earlier position communicated verbally in mid-February, wherein we VEHEMENTLY and UNANIMOUSLY OBJECTED TO THE PROJECTS in their entirety.**

***Submission 5.03*: Secondly, the principal reason for our objection is unchanged from our initial position: We re-iterate that we have chosen to be in the countryside with its quiet and healthful natural qualities, and as such take advantage of a lifestyle choice available to people living in Australia for more than two centuries. Picture, if you will, the lifestyle of a community living on 40-100+ acre lots that is not much changed from early times. Here we have long sought to preserve the peaceful rural character of the place, protecting native bushland and open space to ensure a sustainable future for ourselves and our children in the time-honoured tradition of our families, many of which have been resident in the Australian countryside for generations. But, we're city folk too, spending time between both locations**

which allows us to more fully appreciate the benefits of the rural calm of our clean out-of-town environment where we can spend time in the outdoors, let our children run free, swim in the local rivers and enjoy the company of our neighbours. You can therefore easily empathize with us when we say that your proposal essentially robs us of many of these benefits. Moreover, we raise these additional concerns and objections:

The Proponent notes the points raised in Submissions 5.02 and 5.03. As noted in Section 3.2.5 of the Joint Concept Environmental Assessment, the Marulan Site was selected primarily because of its close proximity to the high voltage electricity distribution system and close proximity to a major gas supply pipeline. Other desirable characteristics for the site included existing easements / corridors for electricity transmission; the distance from built up areas; appropriate land use zoning permitting the location of a power generating facility; and the availability of an appropriately sized site that permits for an adequate buffer between the facility and surrounding land uses. The Marulan Site was assessed as the preferred location from a range of other potential sites investigated.

The Environmental Assessment discusses the many benefits for the local and regional community which the proposed development may offer. The proposed Facilities in the Marulan region are expected to have positive economic and social impacts during both construction and operation phases. The Project would result in the increased reliability of electricity supply during peak demand periods; improved security of electricity supply during system emergencies; the ability to quickly convert to a base load plant should there be a substantial increase in electricity demand; improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies; and the provision of social and economic benefits associated with the ability of the NSW supply network to meet peak energy demands in the short term and base load demands in the longer term. As a way of further enhancing public infrastructure and if deemed viable, upgrade works would be undertaken to local sewage treatment facilities to meet the Facilities' operational water requirements.

The Environmental Assessment has offered a comprehensive overview of the proposed management and mitigation strategies which would be enacted in order to limit and reduce as far as practicable, impacts of the development.

Submission 5.04: The Marulan area is becoming a rural dumping ground for pollution-making utilities serving cities and offering zero benefit to the communities potentially hosting them. Marulan, Brayton and the neighbouring hamlets are now faced with absorbing in one seemingly unplanned onslaught, seven quarries, two or three major power plants, the loss of use of the choicest stretches of the Wollondilly River, heavy duty road traffic on secondary roads and the progressive degradation of their quiet bucolic environment.

The Environmental Assessment addresses the likely impacts of the proposed development on air quality, water quality and noise impacts.

- The air quality assessment as summarised in Chapter 7 of the Environmental Assessment considers local air quality. The air quality assessment carried out was in accordance with the *Approved Methods* as stipulated by the NSW Department of Conservation and Climate Change (DECC) as discussed in Section 7.3.1. The results of the dispersion modelling predicted the impact of the Facilities emissions on air quality based on both Facilities operating all hours of the year. The approach taken was conservative to assess the likely impacts under worst case operating and atmospheric conditions. No exceedences of the DECC regulatory criteria were observed and it is considered that the impacts on air quality from the proposed development would be minor, with adverse impacts unlikely.

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- Chapter 14 details the Water Cycle Management proposed for the Marulan Gas Turbine Facilities. The Environmental Assessment details that stormwater and wastewater would be managed within each facility to be effectively self-contained. Section 14.8 outlines a wide range of measures to be implemented during all stages of the project in order to prevent the pollution of water. Areas where there is a higher likelihood of spills or leaks occurring would be bunded.. There would be no direct drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero discharge from the Site except for natural surface flow.
- Noise and vibration impacts from the proposed EnergyAustralia and Delta Electricity Facilities have been assessed in accordance with appropriate environmental standards, notably the NSW DECC Industrial Noise Policy. Feasible and reasonable noise control measures have been considered for both Facilities and are included in the proposal. The Delta Electricity Stage 1 Facility and EnergyAustralia Facility would have inherent noise mitigation measures incorporated such as air intake silencers, generator transformer walls on three sides and exhaust air silencers. Impacts at relevant sensitive receivers such as residential dwellings have been quantified as presented in Chapter 8 of the Environmental Assessments. The exceedances predicted at three residential properties (R23, R24 and R26) indicate that noise mitigation in addition to the inherent noise mitigation features in plant and equipment is required for the project. EnergyAustralia and Delta Electricity have entered into negotiations with the affected residences. An assessment of potential for sleep arousal was carried out and the potential impact was found to be with appropriate goals recommended by DECC.

Additional traffic assessments have been undertaken and are presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. This assessment considers the cumulative traffic impacts of the proposal in light of information about the proposed Gunlake Quarry located on Brayton Road Marulan.

To avoid confusion regarding the number of facilities proposed, it is confirmed that the Project in total is for two gas fired facilities, one proposed by Delta Electricity (comprising two stages) and one proposed by EnergyAustralia.

***Submission 5.05*: Air Pollution: even though the results of the environmental assessment conveniently appear to fall within the acceptable standards set by the various regulatory authorities, the air we breathe will no longer be pure and fresh because it will contain traces of toxins and unhealthy pollutants, such as nitrous oxides and Sulphur Dioxide. We are also concerned about the potential for these chemical plumes to trigger asthma.**

An air quality assessment was undertaken for the Project in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (NSW EPA, 2005). Conservative predictions of emissions into the air under a range of scenarios were added to the existing background air quality data to determine the potential impact of the Marulan Gas Turbine Facilities on air quality.

The *Approved Methods* set emission limits (criteria) to protect the health and amenity of the surrounding community. The *Approved Methods* state that it provides:

> *"a. health- and amenity-based impact assessment criteria for the protection of ambient air quality*
>
> *b. the process for assessing the impacts of air pollutant emissions on ambient air quality and the surrounding community."*

The outputs of the dispersion modelling are added to existing maximum background concentrations of pollutants to determine the predicted concentrations at ground level of sulphur dioxide, nitrogen dioxide particulate matter,

carbon monoxide and hazardous air pollutants. These ground level concentrations are compared with the DECC's impact assessment criteria. DECC states in the *Approved Methods* that *"compliance indicates the proposal is unlikely to result in adverse air quality impacts"*.

All modelled emission species, for the suite of the scenarios modelled, were found to be below the DECC criteria. In accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW,* as no exceedances of DECC regulatory criteria were observed, it is considered that the impacts on air quality from this development would be minor and adverse impacts are unlikely.

***Submission 5.06*: Visual impact: our rural countryside of rolling hills and bushland will be marred by four ugly 40-metre high exhaust stacks, emitting noxious plumes. Additionally, there will be night lights and the night sky will be permanently lit up by industrial lighting and will loose its natural celestial magnificence. We hope therefore that the proponents understand that the residents did not move to Marulan to view emission stacks and will therefore take all steps to minimize this visual intrusion. We have noted over the past 15 years that the tree planting from tube stock, around the adjacent Transgrid Switching Yard, has had little affect to mitigate against the noise and visual impact of the facility. The trees are slow growing and of an insufficient height and density to be used as a screen. It is an appalling example of what not to do around the proposed gas turbine facilities.**

The assessment of visual amenity concluded that the majority of potential view locations assessed were determined to have nil or low visibility. One view location was determined to have a medium visibility rating. Two view locations were determined to have a high visibility rating. The visual impact assessment concluded that both Facilities 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 Facilities.

As detailed in Chapter 13 of the Joint Concept Environmental Assessment, where practicable, lighting around and within the proposed Facilities would be designed and installed to avoid a direct line of sight toward surrounding residences and that the top of the exhaust stacks would not have lighting unless requested by the Civil Aviation Safety Authority (CASA) for the purposes of aviation safety. A number of mitigation measures such as vegetation screening and choice of colour are proposed to reduce impacts further.

***Submission 5.07*: Noise: even though the proposed industrial noise levels are supposedly engineered to fall beneath the normal parameters for human comfort, the constant noise from the facilities will nevertheless be clearly heard by us and be an intrusion upon our peace and quiet.**

Noise impacts from the proposed EnergyAustralia and Delta Electricity Facilities have been assessed in accordance with appropriate environmental standards, notably the NSW DECC INP. The impacts at sensitive receiving locations have been quantified and where possible, measures have been proposed that would reduce these impacts. Chapter 8 of the Joint Concept Environmental Assessment has discussed the specific noise mitigation measures to be implemented in addition to the inherent noise mitigation features in plant and equipment.

Notwithstanding the measures considered for both Facilities, the assessment of operational noise concluded that two neighbouring residential dwellings are predicted to have 10th percentile noise levels that exceed 40 dBA. Delta Electricity and EnergyAustralia have purchased these properties. One neighbouring residential dwelling is predicted to have a marginal exceedance. Delta Electricity and EnergyAustralia have entered into negotiations with the owner of this residence to address the noise impacts. The impact at other receivers was

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predicted to be within the DECC criteria. The potential for sleep disturbance from the operation of the Facilities was found to be negligible.

***Submission 5.08*: Greenhouse gas emission: we did not see that the environmental impact assessment specifically addressed the level of greenhouse gas emission compliance consistent with the Kyoto Protocol or any successor treaty. We not only oppose the project upon pragmatic grounds as have been outlined, but we also oppose it upon ideological grounds. Why is it, when so many countries throughout the developed world are working to reduce greenhouse gases by developing sustainable energy forms, that our government is still planning to build a technology which is essentially already outdated?**

The Environmental Assessment has considered a range of power generation technology alternatives to the open cycle gas turbine facilities. Gas powered generation is viewed as the most efficient way to supply peaking electricity load. Gas power generation has a similar thermal efficiency to coal fired power stations, but with a lower greenhouse gas emission per unit of energy generated. The combustion of natural gas produces only a fraction of the nitrogen oxide and carbon dioxide emissions of oil and coal, and also results in much smaller quantities of particulate matter and sulphur dioxide emissions. Solar and wind technologies do not provide suitable alternatives that can service peak load demand due to the intermittent nature of the resource. In addition, the storage technology is not sufficiently advanced to store large amounts of energy for later use.

Natural gas is seen as an attractive “transition” fuel as the energy supply moves away from greenhouse intensive sources such as coal and towards cleaner, less greenhouse intensive technologies.

The Greenhouse Gas Assessment was conducted in accordance with the methodology required in the Environmental Assessment Requirements. The greenhouse gas emission inventory for the Facilities was based on the methodology detailed in the *Greenhouse Gas Protocol* (WBC for SD&WRI, 2004), and the relevant emission factors in the *National Greenhouse Accounting (NGA) Factors* (DECC 2008).

***Submission 5.09*: Notwithstanding these fervently expressed objections, we realize from the historical record that Not in My Backyard (NIMBY) projects such as these are often imposed on the few by the many with little avenue for recourse, which prompts us now to state that failing the complete rejection of the proposed exploitations, the Dairy Road Community Alliance seeks, de minimus, appropriate compensation in the form of these mitigation measures:**

***Submission 5.10*: 1. There are no other plans being considered for additional power plants within a hundred kilometre radius of the proposed joint-site. (It has come to our attention that there is a proposal for a further gas fired turbine plant on Hanging Rock Road in Wingcarribee shire).**

A commitment of this nature is beyond the control of the Proponents. The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), and its supporting legislation, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), provide the framework for development and environmental assessment. Just as for this Project proposal, if the siting of an additional project / plant or facility is proposed in the future, that project would be required to follow the appropriate environmental assessment and approvals process according to the nature of that proposed development or activity. The cumulative impact of any proposed project upon the surrounding area would need to be considered as it has been in this current Environmental Assessment.

***Submission 5.11*: 2. The people of Sydney will be made fully aware that gas fired power stations are to be built directly on the banks of the Wollondilly River, which forms part of the catchment for Sydney's water supply.**

The Environmental Assessment has considered the proximity of the proposed Site location to rivers and the wider catchment area. The Marulan Site is within the Warragamba catchment and is part of the Sydney Drinking Water Catchment as discussed in Section 3.6 of the Joint Concept Environmental Assessment. The Sydney Catchment Authority (SCA) was consulted as a key stakeholder during the Environmental Assessment.

The Marulan Gas Turbine Facilities would not discharge effluent to the Wollondilly River. Chapter 14 details the Water Cycle Management proposed for the Marulan Gas Turbine Facilities. The Environmental Assessments detail that stormwater and wastewater would be managed within each Facility to be effectively self-contained. Section 14.8 of the Joint Concept Environmental Assessment outlines a wide range of measures to be implemented during all stages of the Project in order to prevent the pollution of water. Areas where there is a higher likelihood of spills or leaks occurring would be bunded. There would be no direct water drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero discharge from the Site except for natural surface flow. These would be detailed in the Construction Environmental Management Plan and Operation Environmental Management Plan to be developed for the proposed Facilities as outlined in response to Submission 3.06.

SCA in their submission to the DoP (refer to **Section 3.2.5** and **Appendix A**) state their support for the management measures outlined in the Environmental Assessment. Further the SCA states that

> *"The SCA is satisfied that the EAs have adequately addressed the requirements of the Drinking Water Catchments Regional Environmental Plan No.1"*

Submission 5.12: Guarantees that: a) there will be no expansion of the site or change of purpose or capacity of the plants, such as has recently occurred at a similar project at Nowra.

Delta Electricity and EnergyAustralia propose the Marulan Gas Turbine Facilities as detailed within the Environmental Assessments. The proposed project scope includes the Stage 1 and the Stage 2 Delta Electricity Facility and EnergyAustralia's Facility. Associated common or shared infrastructure is included in the concept approval being sought.

Submission 5.13: b) that the plants will operate solely and perpetually as gas-fired facilities and will not be used or converted to be used for the burning of garbage or other toxic waste materials or coal in any form.

It is noted that the gas turbine technology proposed for these Facilities would not permit burning of a fuel source other than gas. The Proponents have no intention to convert the proposed gas turbine facilities to burn garbage, other waste sources or coal in the future.

Submission 5.14: c) Canyonleigh Road will be sealed from Marulan through to the Hume Highway and upgraded and regularly maintained for the safe operation of heavy vehicles, including road markings, signage and lighting and vehicle passing zones. This was promised some years ago, at the time the Transgrid electrical switching yards were built at Brayton, but never materialized.

Chapter 10 and 19 of the Joint Concept Environmental Assessment outlines that a specific objective of the Project would be to provide management actions in relation to the control of construction traffic movements. A key objective of the CEMP would be to ensure that works are carried out in such a way as to manage the impact of works on neighbouring land uses.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust

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during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Delta Electricity and EnergyAustralia cannot comment on behalf of TransGrid.

***Submission 5.15*: d) all affected residents be granted perpetual river access upstream from the proposed sites by means of permanent right-of-way or similar ingress/egress integral to their land titles.**

Access to the river bank is limited by private land ownership. The Proponents cannot grant public thoroughfare to the bank of the Wollondilly River through the proposed Marulan Site boundaries at this stage but may consider in the future after more detailed assessment. Further consideration would need to be given to the safety implications and liability issues, as the Site would require secure fencing for public safety and controlled Site access through the designated Site entrance. Further, it is not within the Proponent's capacity to grant or facilitate upstream access to the river through adjacent private property.

***Submission 5.16*: e) additional river amenity, including blackberry control, willow control and flood control and any other such amenity that becomes necessary to facilitate the recreational use of the river by the residents.**

The Proponents would rehabilitate the degraded riparian area along the drainage line in the northern portion of the Site as described in Section 11.7.9 of the Joint Concept Environmental Assessment. It is noted that riparian rehabilitation of approximately 9 ha of land has been proposed as part of a biodiversity offset package in recognition of the scale and importance of the impact of the proposed development on the area's flora and fauna. The rehabilitation is not proposed to facilitate recreational use of the river within the stretch which is adjacent to the Site boundary, however the Proponent's view this contribution as a benefit to the surrounding community given the conservation significance and the contribution to ecological improvement.

The Proponent has committed to preparing and implementing a Vegetation Management Plan as part of the Environmental Management Plan, which complies with the DECC (2006a) guidelines. Management actions for the implementation of an offset strategy committed to be the Proponent would include measures (as appropriate) weed removal and control. It is noted that it is not within the Proponent's capacity to dictate weed management practices on adjacent private property.

***Submission 5.17*: f) noise mitigation through advanced growth tree planting and tube tree plantings on receiving properties, improvements to affected dwellings such as double glazing, eave sealing, installation of solid core doors and other sound-proofing measures that may be required to maintain the present low level of ambient noise.**

It is noted that the NSW Industrial Noise Policy states that any unacceptable impacts from a development proposal that are likely to persist after noise-mitigation action has been taken can be dealt with through negotiation, either by improved mitigation or by trade-offs with benefits.

Consideration of the abovementioned mitigation measures have been discussed in Section 8.6.2 of the Joint Concept Environmental Assessment. EnergyAustralia and Delta Electricity have entered into negotiations with the affected residences to negotiate agreements or in the most extreme cases, acquisition for the residential dwellings that are predicted to have a 10^{th} percentile noise level that exceeds 40 dBA (residences 23 and 24); and would negotiate agreement or possibly provide architectural treatments to the dwelling with a marginal noise exceedance (residence 26). As noted in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment), where operational noise is predicted to exceed the noise criteria for

residential dwellings (established in accordance with the INP guideline and most recent assessment process) property acquisition or negotiated agreements would be put in place.

The Proponent notes that as a conservative measure, the Proponent has purchased residences R23 and R24 and has initiated negotiations with the owner of R26.

Submission 5.18: g) in as much property values are likely to be substantially diminished because of the installation of these plants, all residents seek compensation for the cost of providing electricity grid connection.

It is noted that the existing value of land surrounding the Marulan Site is based on its current use, which is 1(a) General Rural. It is considered that other impacts of the Facilities are proposed to be mitigated such that there is no further impact or depreciation of future land value.

The Proponent cannot provide compensation for the cost of providing electricity grid connection.

Submission 5.19: h) residents enjoy improved levels of telephonic and electronic communication, such as high speed broadband, that will no doubt be available for the operation of the plants.

The proposed Facilities may bring improved telecommunications services to the local area, however the Proponent considers that a specific commitment of this nature is outside of the scope and range of community benefits proposed as part of the Project's Statement of Commitments.

Submission 5.20: Finally, we also strongly oppose the mooted stage 2 development of the combined cycle plant.

Submission 5.21: Community consultation must be sought to proceed with stage two. Stage two needs to be reassessed before proceeding, having an industrial facility operating for up to 90% of the year, 24 hours a day, is unacceptable for countryside that is zoned for rural purposes.

It should be noted that the current Environmental Assessment is seeking approval for the Delta Electricity Stage 1 Facility as well as the Stage 2 Facility which would progress in response to electricity market demand.

Both stages of the Delta Electricity Facilities as well as the EnergyAustralia Facility, the required access road and transmission line and the gas pipeline corridor have been assessed in the Environmental Assessment. A suite of three documents have been prepared; a Project Application seeking project approval for Stage 1 of the Delta Electricity Marulan Gas Turbine Facility and concept approval for Stage 2; and a Project Application seeking project approval for the EnergyAustralia Marulan Gas Turbine Facility.

The technical investigations and studies included as part of the Environmental Assessments have been carried out for both Facilities to determine the likely cumulative impacts of both developments inclusive of Delta Electricity's proposed Stage 2 combined cycle gas turbine facility. The environmental investigations undertaken have accounted for the different operational scenarios for each of the Delta Electricity (both stages) and EnergyAustralia Facilities. Of particular note:

- For the air quality investigation, several scenarios were modelled due to the different operational scenarios for each of the Facilities and the varying emission characteristics. The assessment also conservatively modelled the Facilities operating all hours of the year to determine the worst case concentrations of emissions in a range of meteorological conditions.

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- The noise and vibration investigation presented the calculated cumulative $L_{Aeq,15min}$ 10^{th} percentile exceedance noise levels for the Energy Australia Facility and Delta Electricity Stage 2 Facility for daytime, evening and night time operations.
- The Water Management chapter of the Environmental Assessment considers the cumulative water requirements of the facilities inclusive of Delta Electricity's Stage 2 combined cycle gas turbine facility.

***Submission 5.22*: In closing, we also wish to make known to you our alliance's observation that during this entire process of proposal and evaluation, the proponents (apart from URS) have devoted a disappointing level of effort in informing landowners and residents, have circulated material in a proprietary, limited and disingenuous manner and generally behaved in an indifferent way that readily suggests that the exploitation is a fait accompli and that the affected citizens are entitled to little or no say in the matter.**

A consultation strategy was developed to initiate and maintain open communication with key stakeholders and to provide a forum to proactively respond and work with key community and key statutory and public authority stakeholders. A project newsletter was distributed to local residents and a free call number and email address were provided to facilitate open communication. The consultation strategy was undertaken by representatives of Delta Electricity, EnergyAustralia and members of URS as a team.

One-on-one meetings were held with neighbours and residents who would potentially be, or could perceive themselves to be, impacted by the location of the Facilities. During the project, Delta Electricity, EnergyAustralia and URS representatives met with eight residents to discuss the Project, environmental assessment and the planning approval process. Landowners potentially affected by the Project were contacted by phone and notified by mail of the Project proposal. Landholders potentially affected by the Gas Pipeline Corridor were sent a newsletter and would be further contacted prior to the detailed design stage. More recently, further discussions have occurred with the landholders affected by the refined gas pipeline route options as presented in the Preferred Project Report in **Section 4.5**.

Project information advertisements were placed in the Goulburn Post on 25 January 2008 and 15 September 2008 to inform the broader community of the Project generally and the information day held on 17 September 2008. This community information day provided the opportunity for any member of the community to discuss the Project with representatives of Delta Electricity, EnergyAustralia and URS team.

A detailed description of the consultation activities undertaken is provided in **Section 2.2.**

***Submission 5.23*: There was no exhibition of the planned projects for either the impacted residents or the general public. By way of further example, and for your future reference, we viewed the publication of the EA in PDF format in multiple parts as a mechanism to deter wide dissemination and thus a proper response. What's more, we had to line up for the single, 'borrow-only-to-read-there' copy of the Environmental Assessment that was made available at council chambers and at the local post office. This is further evidence of your lack of good intention. Surely people who may directly suffer from planning decisions deserve more pro-active consultation and contact. This is objectionable government, the recollection of which will not desert us the next time we approach a polling booth.**

Delta Electricity, EnergyAustralia and URS (the team) have been committed to providing all relevant information to the community for their consideration and response throughout the duration of the Environmental Assessments. A detailed description of the consultation activities undertaken is provided in **Section 2.2.**

During the public exhibition of the Environmental Assessment documents, the Proponent provided a hard copy / CD copy of the Joint Concept Environmental Assessment to landholders in immediate proximity to the Site along with an offer to meet and discuss the content of the Environmental Assessment.

It is noted that the two signatories to Submission 5, each received their own copy of the Joint Concept Environmental Assessment to keep: one was provided with a hard copy, the other was provided with a CD copy. In addition, of the other community members listed as their views being represented, three parties also received their own copies of the Environmental Assessment: one party of three received a hard copy of each of the Joint Concept and Project Application Environmental Assessments and another party received a hard copy of the Joint Concept Environmental Assessment. The offer was made to provide additional copies upon request however, further copies were not requested. In total the following numbers of copies of the Environmental Assessments were provided to members of the community:

- Joint Concept Environmental Assessments: eight hard copies and four CD copies;
- Delta Electricity Project Application Environmental Assessment: two hard copies and two CD copies
- EnergyAustralia Project Application Environmental Assessment: two hard copies and two CD copies

The Proponents have been diligent in meeting their requirements to provide the local councils, and the Post Office with copies of the Environmental Assessments for public viewing. The Proponents are not able to dictate to these entities how the copies are accessed.

The Proponents maintained the toll free telephone enquiry number as well as a direct email address throughout the public submissions period, and that an advertisement was placed in the local and regional newspapers at the commencement of the public exhibition of the Environmental Assessment.

As required by the DoP, the Environmental Assessment web copy was split into several documents of a smaller file size to ensure access to the documents for those with internet connections of differing speeds.

Delta Electricity and EnergyAustralia consider that they have made every effort for the Environmental Assessments to be accessible to the community for review and comment.

3.3.6 Submission 6

***Submission 6.01*: On the basis of the Environmental Assessment currently on exhibition, we oppose the application because the Environmental Assessment fails to properly address a number of critical issues. We set out details of these inadequacies and obfuscations below.**

***Submission 6.02*: Air Quality - Chapter 7 - The local community is a blend of those who have moved into the area (many from polluted Sydney) for the clean air and rural lifestyle and those who have been here for generations working the land. A major factor in choosing a rural area is to breathe clean air away from pollutants and toxins such as those which will be emitted from the proposed project. The site is not "slightly outside the Greater Metropolitan Area (GMR)" as claimed on page 7-13. It is a rural area far from the GMR and well away from any highway.**

The intention of the statement of concern in the Environmental Assessment was to explain that the proposed development site does not strictly fall within the definition of the Greater Metropolitan Area as applied by the Air Quality Management Plan (the 'Action for Air'), even though the air quality standards used as part of the environmental assessment are in line with the standards and objectives outlined in the NSW Government Air Quality Management Plan (NSW EPA, 2006).

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The rural character of the surrounding area to the proposed Site location is noted in numerous places throughout the Environmental Assessments. The air quality assessment makes particular note of the rural characteristics of the area surrounding the proposed Site. In discussing the background air quality and concentrations used for modelling purposes for the environmental assessment, this data was obtained from the DECC air monitoring sites at Bargo, Oakdale and Macarthur. The report noted that the Macarthur monitoring station is located adjacent to the Hume Highway and between the heavily trafficked roads, so as a consequence, the background CO concentrations used for the environmental assessment are considered conservative given that the Marulan Site is situated away from heavily trafficked roads and industrial areas.

The abovementioned statement did not impact in any negative way upon the results of the air quality assessment undertaken as part of the Marulan Gas Turbine Facilities Environmental Assessments.

***Submission 6.03*: One would expect that the standards of air quality control required in such a rural area would be significantly more stringent than those required in the GMR, but the application uses background levels measured at Macarthur and Oakdale as a justification of the levels expected to be emitted.**

It should be noted that adopting background air quality data which may be representative of poorer quality than actual site conditions deems the assessment of potential air quality impacts from the proposed Facilities to be more conservative. The outputs of dispersion modelling are added to the existing maximum background concentrations of pollutants to determine predicted ground level concentrations. The 'Maximum Cumulative Impact' presents the sum of the maximum background concentration and the maximum predicted ground level concentration. The results are then compared with the DECC air quality criteria to assess the likelihood that a proposed development would result in adverse air quality impacts.

As noted in response to Submission 5.05, all modelled emission species, for the suite of the scenarios modelled, were found to be below the DECC criteria.

***Submission 6.04*: In the case of Oxides of Nitrogen, the expected levels barely comply with even these metropolitan standards - not good enough.**

The air quality environmental assessment took an inherently conservative approach. The dispersion modelling predicted the impact of the Facilities emissions on air quality based on both Facilities operating all hours of the year. This conservative approach was taken to assess the likely impacts under worst case operating and atmospheric conditions. The assessment of potential impacts notes that concentrations of NO_2 were calculated using an equation for estimating the conversion of NO_x emitted from the facilities to NO_2. This calculation assumes that all NO_x is present as NO_2, leading to a significant overstating of the likely NO_2 concentrations. Given the background concentration of 14.0 µg/m^3, and the predicted worst case impact of concentrations at, or less than 0.67 µg/m^3, long term impacts are considered negligible.

***Submission 6.05*: Operational Noise and Vibration - chapter 8 - The Assessment openly admits that noise levels at 4 properties (numbered R23, R24, R25 and R26) will exceed acceptable levels, substantially in 3 cases even after mitigation works. It needs to be understood that these are not just dwelling places from which the occupants could move out if necessary to escape the noise. These properties are working farms which in at least some cases have been worked by many succeeding generations of a single family. They are part of the history of this historic region. It is absolutely intolerable that they should be subjected to this kind of intrusion.**

Submission 6.06: The level of noises with tonality (such as are inevitably emitted from any turbine) is of the greatest concern. The Assessment admits openly that research on this topic is far from having a

clear consensus, but seems to suggest at page 8-9 that it is OK if the levels just barely comply, with all windows double-glazed and shut tightly - even in summer.

It is noted that the NSW Industrial Noise Policy states that any unacceptable impacts from a development proposal that are likely to persist after noise-mitigation action has been taken can be dealt with through negotiation, either by improved mitigation or by trade-offs with benefits.

Consideration of the abovementioned mitigation measures have been discussed in Section 8.6.2 of the Joint Concept Environmental Assessment. EnergyAustralia and Delta Electricity have entered into negotiations with the affected residences to negotiate agreements or in the most extreme cases, acquisition for the residential dwellings that are predicted to have a 10^{th} percentile noise level that exceeds 40 dBA (residences R23 and R24); and would negotiate agreement or possibly provide architectural treatments to the dwelling with a marginal noise exceedance (residence R26). It is noted that the noise predictions for the EnergyAustralia Facility and Delta Electricity Stage 2 operations the cumulative noise predictions indicate that there is a minor 1 dB exceedance of the criteria at R25 under adverse weather conditions.

As noted in the Statement of Commitments (Table 8-8 and 19-1 of the Joint Concept Environmental Assessment), where operational noise is predicted to exceed the noise criteria for residential dwellings (established in accordance with the INP guideline and most recent assessment process) property acquisition or negotiated agreements would be put in place.

The Proponent notes that as a conservative measure, the Proponent has purchased residences R23 and R24 and has initiated negotiations with the owner of R26. Furthermore, discussions have also been initiated with residence R25.

The comment in Submission 6.06 regarding research being far from having a consensus appears to be referencing the discussion provided Section 8.4.1 of the Joint Concept Environmental Assessment regarding the low frequency noise assessment. Recent international research has shown that the use of the approach in the INP is not suitable when the noise levels are low, since the low frequencies may then be below threshold of hearing levels. Based on the more recent research, the assessment has indicated that the Facilities would be likely to meet the required criterion.

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***Submission 6.07**: The transmission of vibrations through the ground is summarily dismissed as irrelevant on page 8-5. Such transmission varies greatly, depending on the nature of the ground. The Marulan region is characterized by very rocky ground, with bedrock often very close to the surface.*

***Submission 6.08**: In such a situation perceptible vibrations can be observed at distances well over 1000m. Our own home is approximately 1000m from the Hume highway, and vibration from large trucks on that highway is certainly noticeable, especially at night.*

***Submission 6.09**: The structures to be built in the Project will surely be anchored firmly to the local bedrock, providing a ready mechanism for coupling vibrations into the ground. The applicants should be required to carry out a detailed and proper assessment of vibration effects, instead of simply deeming such a study to be unnecessary (page 8-5).*

It was deemed reasonable to exclude a detailed investigation of vibration impacts from the development given the distance of the Site from the nearest sensitive receptors, i.e. residential properties. The assessment concludes that vibration impacts are unlikely to be perceived from a distance of over 1 km, and in light of Submission 6.08, it is still deemed reasonable to consider any slight vibration impacts which may be experienced during the construction period insignificant. It would be unlikely that any vibration from construction would be felt and if any vibration was felt it would not be of major annoyance or inconvenience given the hours of the day over which such work would be undertaken. The standard working hours would be stipulated in the Environment Protection Licence issued by the NSW Environment Protection Authority (as part of Department of Environment and Climate Change).

***Submission 6.10**: Traffic and Transportation - chapter 10 - At page 10-4 in Table 10-1 the Environmental Assessment quotes a single current figure of 719 vehicles per day along "Canyonleigh and Brayton Roads" in 2008, together with estimates for subsequent years. There is no indication of the point along the 2 roads at which this figure is measured!*

Section 2.3 of the Traffic Assessment (Appendix F) in the Project Applications states that the Historical Average Annual Daily Traffic (AADT) was not available for either Canyonleigh Road or Brayton Road in the relevant locations for the Project. Further assessment has been provided of the traffic impact and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B** of this Report. The revised assessment provides a figure of the location of the traffic count data used and the assumptions used for interpolated data.

***Statement 6-11**: The route from Marulan to the project site in Canyonleigh Road can be usefully divided into 3 sections:*

1. Marulan to the "Quarry turnoff" on Brayton Road some 4 km north of Marulan.
2. The Quarry Turnoff to "Fiveways" at the intersection of Brayton and Canyonleigh Roads,
3.. Canyonleigh Road from Fiveways to the project site.

***Statement 6.12**: Fiveways is the point at which Canyonleigh Road, Carrick Road and Bulls Pit Road diverge from Brayton Road*

***Statement 6.13**: Section 1 carries substantial quarry traffic between Marulan and the Quarry, along with local traffic heading to/from further north.*

***Statement 6.14**: Section 2 carries local traffic to Brayton, Big Hill and beyond as far as Bannaby, Towrang, Carrick, and Canyonleigh.*

***Statement 6.15**: Section 3 carries only local traffic to Canyonleigh and properties along Canyonleigh Road.*

***Statement 6.16**: It would be reasonable to estimate that traffic to the Quarry comprises up to half the total traffic along Section 1.*

***Statement 6.17**: Of the traffic continuing along section 2 to Fiveways, the greater proportion continues north along Brayton Road towards Big Hill and beyond. Thus the traffic turning out of Brayton Road along Canyonleigh Road is a small fraction of that leaving Marulan.*

***Submission 6.18**: In the absence of any information about where the traffic was measured, it is reasonable to infer that the applicants have chosen to measure traffic in the location most favourable to their application, namely in the heavily trafficked Section 1, thus representing the percentage increases due to the project to be as small as possible. It is likely that the project traffic along section 2 of the route will contribute percentage increases above current levels far above those projected in Table 10-4, and much more so along Section 3.*

***Submission 6.19**: This approach seems to have been designed to deliberately conceal the impact on the local community of the traffic generated by the project. The applicants should be required to provide reliable figures for current traffic in each section of the route, so as to give a proper basis for comparison with levels at the various stages of the project.*

The above statements and submissions have been taken into consideration, and additional traffic impact studies have been undertaken. Further assessment has been provided of the traffic impact and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B** of this Report.

The revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. The revised assessment provides a figure of the location of the traffic count data used and the assumptions used for interpolated data.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

Although the assessment determined that in some instances the impact may be higher than first indicated, it made the following conclusions:

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.

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– *Construction:*
The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A.
The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road.

The assessment concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. Overall, the resultant level of service is still anticipated to be at worst, remaining at Level of Service B which is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

While the worst-case scenario is the assessment was for construction of the two Facilities occurring at the same time, it is noted that the assessment of both Canyonleigh and Brayton Roads is very conservative for the following reasons:

- traffic volumes for the peak three months of construction traffic were assumed to continue for the whole construction period of 12 months; and
- peak three months of construction traffic were assumed to occur at the same time for both Facilities however, construction of the EnergyAustralia Facility is likely to occur before the construction of the Delta Electricity Facility and therefore this scenario is unlikely to occur.

The Proponent has committed to the following:

- development of detailed Transport Plan (including obtaining approvals) for the transportation of turbine components and equipment;
- development of detailed Traffic Management Plan for the construction phase of the Facilities; and
- development of detailed Traffic Management Plan for the operation phase Facilities.

3.3.7 Submission 7

***Statement 7.01*: We disapprove strongly of the proposed project, on the following grounds:-**

1. ***Air Quality***
2. ***Noise and Vibration***
3. ***Traffic and Road Conditions***
4. ***Visual Amenity***
5. ***Land use and Values***

***Submission 7.02*: Our family has owned the property mentioned since the 1860's and part of our house was built 130 years ago. We are landholders that will not only be affected by the noise during construction and operation of the proposed gas turbine facility, but also the proposed gas line route. The family residence is approximately 1.8km from the proposed generation site, but our property boundary is much closer than that.**

***Submission 7.03**: Our concern's with air quality arise from emissions, including oxides of nitrogen sulphur dioxide carbon monoxide particulate matter, hazardous air pollutants associated with gas combustion and the possibility of photochemical smog which may arise under certain weather conditions. The rural nature of the area and relatively negligible number of industrial enterprises in the area mean our air quality will be significantly compromised, not to mention its cumulative affects on the local area and Sydney metropolitan's water supply.*

The Air Quality Assessment as summarised in Chapter 7 of the Environmental Assessment considers local air quality. The air quality assessment carried out was in accordance with the *Approved Methods* as stipulated by the NSW Department of Conservation and Climate Change (DECC). The results of the dispersion modelling predicted the impact of the Facilities' emissions on air quality based on both Facilities operating all hours of the year. The approach taken was conservative to assess the likely impacts under worst case operating and atmospheric conditions. No exceedences of the DECC regulatory criteria were observed and it is considered that the impacts on air quality from the proposed development would be minor, with adverse impacts unlikely.

The Air Quality Assessment noted that photochemical smog is produced as a result of complex reactions. There are few major industrial sources of hydrocarbons in the area and emissions of NO_x and VOCs from vehicles would be significantly lower than the levels experienced in major metropolitan air sheds such and Sydney and Melbourne. On this basis the Air Quality Assessment considered that the potential for smog generation in Marulan was considered to be low and photochemical smog is unlikely to occur due to operations of the gas turbine facility.

The emissions to air would not adversely affect the adjacent Wollondilly River, nor would it affect Sydney's water supply. As the emissions modelling showed that air quality guidelines have been met, the impact of emissions from the proposed development on the Wollondilly River would be negligible.

***Submission 7.04**: The other impact on air quality we are concerned about is the temperature and possible size of the exhaust plume, maximum vertical plume of over 800m high by over 250m wide with exit temperatures from the stack ranging from 400^o to over 500^o. Our concern with this plume extend to its effect on localised climate conditions. We are graziers and rely on the relatively safe farming area to keep our business viable. Any small impact on rainfall or increase in temperature could have devastating effects on our productivity.*

Changes in rainfall and temperature are affected by the large scale interaction of land, water and atmospheric processes. A comparatively small development such as the proposed Facilities within the context of these large scale interactions is not expected to change rainfall or temperature in the locality beyond the range which normally occurs. It should be noted that rainfall and temperature measurements at Sydney Airport over the last 70 - 80 years have not varied significantly around the mean suggesting relatively small developments such as this one, are unlikely to change local weather patterns.

***Submission 7.05**: Our concern with noise both during construction and operation are only heightened by the fact that neighbouring properties are proposed to be purchased due to the noise level concerns, and I believe may have already been purchased prior to approval of the site! Not to mention representatives from Delta Electricity and Energy Australia have mentioned that noise mitigation works may need to be carried out. Nothing has been confirmed and we believe present noise levels have been overstated and proposed noise levels understated. We recommend recording and measuring equipment be set up to confirm noise levels, by independent assessment. The noises will also be foreign to us so their relative levels will be of major annoyance. They operational time span of the units*

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during the night when noise carries further will no doubt have a dramatic effect on the actual noise levels encountered.

It is noted that the NSW Industrial Noise Policy states that any unacceptable impacts from a development proposal that are likely to persist after noise-mitigation action has been taken can be dealt with through negotiation, either by improved mitigation or by trade-offs with benefits. Consideration of the abovementioned mitigation measures have been discussed in Section 8.6.2 of the Joint Concept Environmental Assessment. EnergyAustralia and Delta Electricity have taken the conservative approach to advance the purchase of the residences that are predicted to have a 10^{th} percentile noise level that exceeds 40 dBA (residences 23 and 24) and commence negotiation with the owner of the residence with a marginal noise exceedance (residence 26).

Although the Joint Concept Environmental Assessment notes that the Facilities may operate at any time in a 24 hour period, and that Stage 2 of the Delta Facility would have continuous operation to about 90 % of the year, the EnergyAustralia Facility and Stage 1 of the Delta Electricity Facility are most likely to operate at the time of peak electricity demand periods. In NSW these are generally 2.00pm – 8.00pm during the summer, and 5.00pm – 7.00pm during the winter.

Where peak noise levels would potentially occur during night time, DECC requires that consideration be given to the potential for sleep arousal within residences. The noise and vibration assessment assessed the potential for sleep arousal as a result of the proposed development. The assessment indicated that the potential for sleep disturbance would likely be greatest during the early morning hours when background noises are at their lowest. The assessment determined that the maximum anticipated noise level during abnormal (emergency) operating conditions would be 41 dBA. Given that this is below the permissible 45 dBA, the potential impact was found to be within appropriate goals recommended by DECC.

In addition, it is noted that Section 8.3.2 of the Environmental Assessment discusses the background monitoring conducted as part of the noise study. According to the NSW Industrial Noise Policy (INP), the background noise level is defined as 'the underlying level of noise present in ambient noise when all unusual extraneous noise is removed'. The INP's intrusive goal is set 5dBA above the Rating Background Level for each time period. The RBLs are derived from the measured L_{A90} noise levels as per the DECC guidelines.

In summary, background noise measurements were conducted at four locations from Sunday, 7 May 2006 to Thursday, 18 May 2006 around the proposed Facility. The measured background noise levels analysed using the procedure presented in the INP varied between 27 and 31 dBA L_{A90}. The L_{A90} level is the noise level which is exceeded for 90 % of the sample period and can be referred to as the average minimum level.

The project specific noise level of 35 dBA $L_{Aeq,15minutes}$ based on a 5 dBA above the lowest permissible RBL of 30dBA as recommended within the INP is adopted for all residential receivers. This criterion is the most stringent criterion that can be developed by the procedures in the INP. As the residential receivers are rural, the criterion applies within 30m of the existing residence.

It is considered that adequate and representative background noise monitoring has been undertaken as part of the environmental assessment.

<u>Submission 7.06</u>: Our concerns with traffic levels and road conditions stem from a number of levels. Firstly we believe the present usage has been overstated and recommend that a meter be placed on both Brayton Road and Canyonleigh Road to confirm this and highlight the shortcoming of not improving the roads in mention. Of major concern is the road width, verge and shoulder width (with trees and limbs overhanging the road) along with the general condition and subsequent affect of the surfaces.

***Submission 7.07**: Two problems we see arising through increased traffic is passing and overtaking on narrow country roads and the deterioration of road surfaces and subsequent damage to our vehicles along with tyre damage.*

***Submission 7.08**: As rate payers we feel it is very unfair for us to subsidise the road repairs for the companies who will be doing the majority of the damage to the roads, with no proposed inputs from either firm. The number of heavy vehicles will also be of concern, 37 trucks per day carting water alone and 48 vehicles from staff during operation. Not the mention the numbers during construction, approximately 500 extra vehicles per day.*

***Submission 7.09**: We believe that the two companies should widen Brayton Road and improve the tar surface. The Canyonleigh Road should be tarred to make for safe driving conditions for the general public as well as improve safety for the school buses using the routes.*

The revised traffic assessment is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. This additional traffic assessment was undertaken in response to additional information which has become available.

The assessment addressed in detail the route from the Hume Highway to the Site along Brayton Road and along Canyonleigh Road. The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The assessment concluded that:

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow. The assessment indicated that the heavy vehicle component of the traffic flow along Canyonleigh Road would be approximately 25-27 % during construction, 26 % during normal Facilities' operation and approximately 27 % during major Facilities' maintenance.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 20 % during construction and normal Facility operation and approximately 17 % during major Facilities' maintenance.
    The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 55 % during construction, 27 % during normal Facility operation and approximately 26 % during major Facilities' maintenance.

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The Proponent has committed to the following:

- development of detailed Transport Plan (including obtaining approvals) for the transportation of turbine components and equipment;
- development of detailed Traffic Management Plan for the construction phase of the Facilities; and
- development of detailed Traffic Management Plan for the operation phase Facilities.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

***Submission 7.10*: Our concerns about the visual impacts on areas on our property arise from the fact that we are in a rural area, which has already been encroached upon by increasing number of varying sizes of power lines. Also the Transgrid site has increased in size and none of the mitigation spoken of has been carried out to minimise its visual impact, so we believe the proponents of the proposed facilities in mention will do the same.**

***Submission 7.11*: A proposed house site on our property will now have to be rejected because of visual impart by the proposed generation site. The rural outlook of the area will be lost through dramatically increased traffic flow and 40m exhaust towers.**

It is noted that 49 field locations were identified as part of the visual assessment process. The assessment of visual amenity concluded that the majority of potential view locations assessed were determined to have nil or low visibility. Most of the residences are not visually prominent from the Facilities generally due to screening by surrounding undulating landform or the presence of trees around them. One view location was determined to have a medium visibility rating. Two view locations were determined to have a high visibility rating. The visual impact assessment concluded that both Facilities 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 Facilities. Night-time lighting around the Facilities is likely to be visible from some surrounding locations, including views from a small number of surrounding properties. A number of mitigation measures such as vegetation screening, choice of colour and lighting selection are proposed to reduce impacts further.

At the time of the land use investigation, neither Goulburn Mulwaree Council or Upper Lachlan Shire Council were aware of any re-zoning applications lodged for the areas surrounding the Marulan Site. A six lot subdivision was approved by Goulburn Mulwaree Council on 6 July 2007. The affected Lots are located to the south-east of the Marulan Site, where the visibility rating was found to be low or nil.

Please note that both Delta Electricity and EnergyAustralia are committed to implementing all practicable mitigation measures which have been included in the Statement of Commitments.

The Proponent cannot comment on the activities of TransGrid.

***Submission 7.12*: Land use and land values will both be impacted on the varying degrees. Land use will have minimal effects but still significant, some of the impacts will include use of heavy machinery around and crossing pipelines and distance of building restrictions from the pipeline. But more heavily imparted on will be surrounding land values. They will drop dramatically relative to similar areas**

without such facilities. The possibility of use being able to sell some portions of the property in the future has now sadly reduced in value that is if we are even able to sell lifestyle blocks neighbouring a power generation site. The whole area has had its land values reduced for which someone should have to compensate affected landholders, be that monetary and possibly also an alteration of land rates.

It is noted that the existing value of land surrounding the Marulan Site is based on its current use, which is zoned 1(a) General Rural. It is considered that other impacts of the Facilities are proposed to be mitigated such that there is no further impact or depreciation of future land value.

Section 17 of the Joint Concept Environmental Assessment explores potential future land use conflicts and the potential for future residential development on land surrounding the Marulan Site. Residential development is restricted as a 40 ha minimum allotment size restriction applies to proposed residential development. The Environmental Assessment considers the likely impact of the Draft GMLEP 2007 which increases the minimum lot size for subdivisions from 40 ha to 100 ha for land zoned RU2 Rural Landscape with the view to maintaining the rural character of the area. It is considered that applications for subdivision in the area surrounding the Marulan Site would become less common in the future. Given Goulburn Mulwaree Council's move towards promoting the rural characteristics of the landscape, it is unlikely that any of the land surrounding the Marulan Site would be zoned Residential in the future. There is little potential, therefore, for the land to be developed for housing purposes.

It is not within the Proponent's capability to reduce land rates as this is the domain of the local council.

Discussions with residences affected by noise and properties affected by the proposed gas pipeline route options are underway.

Statement 7.13: In conclusion we believe Delta Electricity and Energy Australia have many aspects of this proposal to clarify to the local community as well as to your Department (Dept of Planning).

Submission 7.14: A number of the aspects of the proposal are still in their infancy with some key sections not confirmed. We believe a development of this nature and scale should have a solid plan on all aspects of their proposal before approval is granted, not just allow it to be a work in progress during approval and construction.

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), and its supporting legislation, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), provides the framework for development and environmental assessment. The Director-General declared that the Marulan Gas Turbine Facilities Project was considered a Major Project and to be assessed under the provisions of Part 3A. Part 3A provides for the approval of 'concept plans'. These are designed to provide up-front certainty for long-term or complex projects. A concept plan approval specifies whether any further environmental assessment is required for the project or a particular stage of it, in which case subsequent approvals must be generally consistent with the concept plan and the assessment requirements of the Minister.

Both stages of the Delta Electricity Facilities as well as the EnergyAustralia Facility, the required access road and transmission line and the gas pipeline corridor have been included in the Environmental Assessment. A suite of three documents have been prepared; a Project Application seeking project approval for Stage 1 of the Delta Electricity Marulan Gas Turbine Facility and concept approval for Stage 2; and a Project Application seeking project approval for the EnergyAustralia Marulan Gas Turbine Facility.

Further information about the refined pipeline options within the previously defined pipeline corridor is included in the Preferred Project Report in **Section 4.5** of this Report. The technical investigations and studies included

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as part of the Environmental Assessments were carried out for both Facilities to determine the likely cumulative impacts of both developments. The environmental investigations carried out have accounted for the different operational scenarios for each of the Delta Electricity (both stages) and EnergyAustralia Facilities, and it is the Proponent's view that the project information presented to date satisfies the requirement of the proposed approval under Part 3A of the EP&A Act.

***Submission 7.15**: We hope your department will address these shortcomings of the proposal and take the communities wishes and thoughts into consideration.*

***Submission 7.16**: P.S. Of major concern is the large number of Marulan and district residents who are not aware of the project and its implications for them. So I feel Delta and Energy Australia should again try to inform the public. The lack of knowledge of the project may explain why only 10 people attended their information day.*

A consultation strategy was developed to initiate and maintain open communication with key stakeholders and to provide a forum to proactively respond and work with the community and key statutory and public authority stakeholders. Whilst the Environmental Assessment necessarily focused on the likely impacts of the proposed development in those areas closer to the Site (therefore the areas most likely to be directly impacted by the proposal), Delta Electricity and EnergyAustralia have engaged the broader community through advertisements in the Goulburn Post, consultation with the Goulburn Mulwaree and Upper Lachlan Shire Councils, as well as various State Government agencies in order to ensure wider concerns and issues would be appropriately considered and addressed.

One-on-one meetings were held with neighbours and residents who would potentially be, or could perceive themselves to be, impacted by the location of the facilities. During the Project, Delta Electricity, EnergyAustralia and URS representatives met with eight residents to discuss the Project, environmental assessment and the planning approval process. Landowners potentially affected by the project were contacted by phone and notified by mail of the project proposal. Landholders potentially affected by the Gas Pipeline Corridor were sent a newsletter and would be further contacted prior to the detailed design stage. Further discussions have taken place more recently with the landholders affected by the proposed pipeline options as discussed in the Preferred Project Report in **Section 4.5**. Discussions would continue with these landholders.

Project information advertisements were placed in the Goulburn Post on 25 January 2008 and 15 September 2008 to inform the broader community of the Project generally and the information day held on 17 September 2008. This community information day provided the opportunity for any member of the community to discuss the Project with representatives of Delta Electricity, EnergyAustralia and URS team.

A detailed description of the consultation activities undertaken is also provided in **Section 2.2**.

3.3.8 Submission 8

***Submission 8.01**: Insufficient Water Supply - The application is dependent on a guaranteed water supply, however;*

***Submission 8.02**: There is a moratorium on water extraction from the Wollondilly River - no supply available*

***Submission 8.03**: The Marulan Water supply is inadequate as there have been recent water restriction on the village and the water is obtained from the Wollondilly River*

In response to Submissions 8.01 – 8.03, it is noted that water extraction directly from the Wollondilly River has not been proposed for the Facilities. It is proposed to supply the non-potable water requirements for the Facility from the use treated effluent from offsite sources and / or rainwater captured from the Facilities' hard stand areas. A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities.

Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. To meet the construction and operational water requirements for non-potable water for the Facilities, it is proposed to use treated effluent from offsite sources and / or rainwater captured from the hardstand areas of the Facilities for the majority of water requirements. A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities which could meet and exceed the requirements of the proposed Facilities. These include:

- Marulan water supply network - able to fulfil the potable water requirements of the Facilities (less than 1% of the Facilities' total water requirements);
- Marulan sewage treatment plant – may augment the Facilities' non-potable water requirements;
- Moss Vale sewage treatment plant - able to supply the Facilities' non-potable water requirements; and
- Site stormwater runoff - may augment the Facilities' non-potable water requirements.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The environmental assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors.

Small quantities of potable water are required for the Facilities with the large majority required for process (non-potable) water. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff. It is noted that supply of water from the Marulan Water Supply Network is proposed for supply of only the potable water requirements being comparatively small quantities for domestic type uses.

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low.

Further detail is provided in Chapters 3 and 14 of the Joint Concept Environmental Assessment and the Preferred Project Report in **Section 4.3** of this Report.

***Submission 8.04*: Marulan Water Treatment Plant requires 30 000L tankers crossing an unsafe intersection at the Marulan Highway Service Centre and heavy traffic through the village of Marulan.**

***Submission 8.05*: Moss Vale Wastewater Treatment Plant source requires 30,000 L vehicles trucking water through the village of Marulan and no assessment has been made on the adverse impact on the amenity of the village as required in the Land and Environment Court NSW judgment in relation to a proposed quarry at Ardmore Park. Bungonia. The citation for the judgment is CEAL Limited v Minister of Planning & Or, [2007] NSW LEC 302.**

As noted in response to Submission GMC.04 which raises similar issues, additional traffic studies have been undertaken addressing the impact during construction and operation of the Facilities. The assessment

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addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. The assessment has also considered the proportion of heavy vehicles.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A.
    The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road.

The Land and Environment Court case referenced is understood to have related to a proposal for a sand and rock quarry. The traffic impact of quarries tend to be less during the construction / site preparation and greater during the lifetime of operation. It is noted that the greatest potential traffic impact relating to the Marulan Facilities is during the construction phase. While this would need to be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan, it is considered a relatively short term impact, approximately 18 - 24 months, relative to the lifetime of the Facilities. The longer term impact is during normal Facilities operation, which the assessment concluded the traffic increase would be between 9 and 20 % depending on the portion of the route.

With respect to the amenity of the Marulan township, subsequent to additional traffic studies, an additional traffic noise assessment was undertaken for the routes along Brayton and Canyonleigh Roads and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources.

The traffic noise assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for

construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission 8.06**: Total on-site stormwater collection will reduce the natural hydrological catchment and may reduce the natural flow of water into the Wollondilly River. It should be noted that there is a nearby Platypus population east of the site on the Wollondilly River within Rural Address 1054 Canyonleigh Road. Numerous visitors have been taken to the water hole to view the platypus family including family from the United Kingdom who wondered at them swimming naturally. Any on-site water collection and disposal of waste water needs to assess the impact on this nearby platypus population particularly as there are becoming increasingly rare in the wild. The additional vibration impact from construction may further impact on the existing platypus population.*

The Environmental Assessment details that stormwater and wastewater would be managed within each Facility to be effectively self-contained. Section 14.8 of the Joint Concept Environmental Assessment outlines a wide range of measures to be implemented during all stages of the project in order to prevent the pollution of water. There would be no direct drainage from the Site to Wollondilly River other than natural surface flows. Water management strategies would be developed and implemented to maintain zero water discharge from the Site except for natural surface flow. Areas where there is a higher likelihood of spills or leaks occurring would be bunded.

As noted in Section 14.6.2 of the Joint Concept Environmental Assessment and further in **Section 4.6**, the proposed Project would result in a reduction of flows into the Wollondilly River; however, with individual areas of approximately 7.1 ha each and a total land area of 30.5 ha, these developments are very small in relation to the size of the overall catchment (some thousands of square kilometres). The reduction in overland flows reaching the Wollondilly River is not significant from an overall catchment or sub-catchment perspective.

Given that the site of this platypus population mentioned above is located beyond the Site boundaries and at a distance of more than 1 km from the construction footprint, it is unlikely that vibration from construction would be perceptible at this location.

***Submission 8.07**: The assessments quotes required water quantities "pa" (per annum) where as a daily assessment or weekly volume would be more meaningful as Marulan's water supply is extracted from the Wollondilly River and stored in 680 kilo litre concrete and 35 megalitre PVC lined reservoirs (Goulburn Mulwaree Strategy 2020 p192).*

***Submission 8.08**: It is noted that in accordance with Council's Water Restriction levels and trigger capacities "Extreme level" water restrictions require commercial, business, Industrial and institutional water consumers to reduce their consumption by 30 per cent. This has not been considered as a worst case scenario and where they would get an alternative water source. Alternative water sources with lesser impacts on the amenity of the locality needs to be considered and then consultation is required with the local community to assess impacts and mitigating measures should the development be approved.*

Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. To meet the construction and operational water requirements for non-potable water for the Facilities, it is proposed to use treated effluent from offsite sources and / or rainwater captured from the hardstand areas of the Facilities for the majority of water

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requirements. A number of current and potential water sources, including recycled water and stormwater have been identified to provide water quantities which could meet and exceed the non-potable requirements of the proposed Facilities. These non-potable sources include:

- Marulan sewage treatment plant,
- Moss Vale sewage treatment plant, and
- Site stormwater runoff.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The Environmental Assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors.

Small quantities of potable water are required for the Facilities. The large majority of water is required for process water. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff.

It is noted that supply of water from the Marulan Water Treatment Plant is proposed for supply of only the potable water requirements being comparatively small quantities for domestic type uses.

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low. Further detail on potential water pipeline routes is provided in the Preferred Project Report in **Section 4.4** of this Report and **Appendix E**.

It is noted that water would not be extracted from the Wollondilly River.

Further information on consideration of the potential water sources is provided in the Preferred Project Report in **Section 4.3** and **Appendix D**.

In addition, it should be noted that the water demand is expressed as a per annum volume in the Environmental Assessments given that the calculations were based on the predicted average operation of these Facilities. Both the Delta Electricity Stage 1 and EnergyAustralia Facilities would operate in time of peak electrical demand rather than continuously. As such, a daily water requirement was not considered.

It is noted that traffic movements associated with the supply of water were presented in the Environmental Assessment as approximate quantities of trucks per day.

***Submission 8.09*: Flood - The site is to be used for critical infrastructure, in accordance with NSW Flood Planning Manual infrastructure should be located outside the Probable Maximum Flood and outside the 1% ARI Flood. It is noted that in the proposed development the facility will be subject to the 1% ARI flood and parts of the proposed access routes will be subject to inundation during the Probable Maximum Flood and 1% Flood. Figure 1 shows survey location along the Canyonleigh Road and the approximate height of the road. There are numerous locations which will become periodically flooded preventing access to the facility for maintenance and monitoring during flood events.**

Flood levels for the Site were estimated with a HEC-RAS hydraulic model, utilising cross sections developed from detailed Site survey (0.5m contours) and topographic maps of the area (10 m contours) for areas outside

the surveyed areas. A range of flood flows were modelled to address the uncertainty of the design 1 in 100 year Average Recurrence Interval (ARI) flood estimate and to assess the sensitivity of the area to a range of floods.

The extreme flood estimate takes flood levels above the 600 m AHD level on the Site. Given all the uncertainties associated with the hydrology and hydraulic modelling, and lack of historical data, the potential for flooding of the area has influenced the location of the Facilities and the location of assets deemed risk-averse to the impacts of flooding. The ground level for the Facilities has therefore been set at a minimum of approximately 605 m AHD in order to minimise the potential for flooding.

In addition, it should be noted that Chapter 19 of the Environmental Assessments details the purpose of the Operational Environmental Management Plan (OEMP) which would be prepared for the Facilities. Response plans for contingency events such as flooding would be addressed in the OEMP.

***Statement 8.10*: Noise - It is contended that the noise assessment is inadequate and favourable to the development based on the following comments:**

***Submission 8.11*: Background noise monitoring was inadequate as monitoring sites should have been made at sensitive receivers that are at the actual dwelling houses sites, to obtain accurate background levels so as to make realistic predictive modelling. For Example R25 (Figure 2-3 joint Assessment Appendices) is located approximately 1.2 km from the proposed facilities. Monitoring should have been taken at R25 yet in the application the comparative location noted as "4'" was located:**

- ***On the Canyonleigh Road (whereas R25 is located approximately 295m off the Canyonleigh Road***
- ***On the south-western boundary and approximately 312m from the existing facility (where as R25 is located approximately 1.2 km to the south-east of the existing facility). It is believed that by using measurement location 4 the "Day", "Evening" and "Night" background levels are artificially elevated. No decision should be made based on the assumed background levels in the reports rather actual background noise levels should be obtained for the dwellings in the vicinity of the proposed developments to model impacts on actual data.***

Section 8.3.2 of the Environmental Assessment discusses the background monitoring conducted as part of the noise study. According to the NSW Industrial Noise Policy (INP), the policy for setting the noise criteria, the background noise level is defined as 'the underlying level of noise present in ambient noise when all unusual extraneous noise is removed'. The INP's intrusive goal is set 5 dBA above the Rating Background Level for each time period. The Rating Background Levels are derived from the measured L_{A90} noise levels as per the DECC guidelines.

In summary, background noise measurements were conducted at four locations from Sunday, 7 May 2006 to Thursday, 18 May 2006 around the proposed Facility. The measured background noise levels analysed using the procedure presented in the INP varied between 27 and 31 dBA L_{A90}. The L_{A90} level is the noise level which is exceeded for 90 % of the sample period and can be referred to as the average minimum level. In accordance with the *INP* the lowest permissible Rating Background Levels is 30 dBA for all residential receivers.

The project specific noise level of 35 dBA $L_{Aeq,15minutes}$ based on a 5 dBA above the lowest permissible RBL of 30 dBA as recommended within the *INP* is adopted for this Project for all residential receivers. This criterion is the most stringent criterion that can be developed by the procedures in the INP. As the residential receivers are rural, the criterion applies within 30 m of the existing residence. It is considered that adequate and representative background noise monitoring has been undertaken as part of the Environmental Assessment.

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***Submission 8.12*: No noise assessment was undertaken as a result of the Department of Planning Director General's requirements letter dated 3 March 2008.**

It is considered that an adequate noise assessment has been undertaken as part of the environmental assessment in accordance with the noise guidelines referenced in the Environmental Assessment Requirements issued by the Director-General of the DoP for this Project.

***Submission 8.13*: The data used for the assessment was based on only 4 locations collected in 2006 over two (2) years ago. A more recent noise assessment needs to be undertaken to ensure the full Impact of the proposal is made on the adjacent dwellings.**

Section 8.3.2 of the Environmental Assessment discusses the background monitoring conducted as part of the noise study. According to the NSW Industrial Noise Policy (INP), the background noise level is defined as 'the underlying level of noise present in ambient noise when all unusual extraneous noise is removed'. The INP's intrusive goal is set 5 dBA above the Rating Background Level for each time period. The Rating Background Levels are derived from the measured L_{A90} noise levels as per the DECC guidelines.

It is noted that the NSW DECC Industrial Noise Policy (INP) sets out the minimum background noise level to be 30 dB(A). For each of the four locations where background noise recording was undertaken, even where the background noise level was found to be less than 30 dB(A), the applicable background noise level was still determined to be 30 dB(A) in accordance with the INP. The criteria noise limit was determined as 35 dBA (30 + 5). It is the DECC's view that a noise level of 35 dB(A) would not cause annoyance to local residents providing the noise does not contain certain characteristics like tonality and impulsiveness. As such, it was set as the applicable noise limit.

In accordance with the *INP*, noise loggers are required to record background noise for a period of seven days (including one weekend) of satisfactory weather conditions. Background monitoring was conducted for a period from 7 May 2006 to 18 May 2006 and therefore longer than the required 7 days. It is considered that adequate and representative background noise monitoring has been undertaken in accordance with the *INP* as part of the environmental assessment. It is not considered that additional monitoring would reduce the criteria noise limit as it is already the lowest limit possible under the *INP*.

***Submission 8.14*: The assessment does not adequately consider the cumulative impacts of traffic and construction noise and the cumulative noise impacts for each stage of the proposal. No comparison data is included on the different stages of the operation of the development.**

The noise assessment considered the following operational noise scenarios:

- operation of only the EnergyAustralia Facility;
- operation of only Delta Electricity Facility Stage 1;
- operation of only Delta Electricity Facility Stage 2;
- cumulative impact of operation of the EnergyAustralia Facility and Delta Electricity Facility Stage 1; and
- cumulative impact of operation of the EnergyAustralia Facility and Delta Electricity Facility Stage 2.

Additionally the noise assessment considered the following construction scenarios:

- earthworks for the entire Site;
- construction of the EnergyAustralia Facility; and

- construction of the Delta Electricity Facility.

Additional traffic studies have been undertaken. With regard to traffic noise, the Joint Concept Environmental Assessment included a noise assessment that concluded that there would be minor increases in road noise during the operational stage and the peak construction activities and as such traffic noise impacts would be negligible not requiring a detailed traffic noise assessment.

As additional traffic studies have been undertaken, a commensurate traffic noise assessment was appropriate and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources,

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission 8.15*: There has been no negotiation with people at impacted receivers to determine "feasible and reasonable" mitigating measures (i.e. R25) as suggested in the reports. Noise attenuation over the distance of the facilities and the dwellings needs to be considered. To highlight the potential Impact of the approval and construction and operation of the facilities it should be noted that the telephone ringing at the existing facility can be clearly heard at R25.**

The calculated construction noise levels at residence 25 were predicted to comply with the Noise Criteria of 35 dBA. The calculated cumulative noise levels of operation of the Delta Electricity Stage 2 and EnergyAustralia Facilities predicted a minor exceedence of 1 dBA above the noise criteria predicted for residence 25 under adverse weather conditions when considering the cumulative impacts of Delta Electricity Stage 2 and EnergyAustralia facilities.

Generally receivers that experience noise levels that exceed the noise criteria can be separated into three noise exceedance categories, namely:

- 0-2 dB(A): minor exceedances;
- 2-5 dB(A): marginal exceedances; and
- >5 dB(A): significant exceedances

The exceedances of the criteria indicate that noise mitigation in addition to the reasonable and feasible mitigation measures is required for the Project. The noise exceedance categories trigger the implementation of appropriate noise management and/or mitigation strategies. That is, 'marginal' exceedences would generally trigger implementation of an appropriate noise management action like architectural treatments, while 'significant' noise exceedences could trigger a negotiated agreement or in an extreme case property acquisition.

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The Proponent has purchased those with significant noise exceedance (R23 and R24) and initiated negotiations with the owner of R26 which recorded a marginal exceedance.

Notwithstanding that minor exceedances (as is the case for residence R25) do not usually trigger the implementation of appropriate noise management and/or mitigation strategies, discussions have been initiated with the owners of residence R25.

Submission 8.18: Sound planning decisions need to be made with sound assessment results and in this proposal actual background assessment needs to be undertaken at the residential receivers to ensure the modelling and predictive measures are accurate.

Submission 8.19: New background results need to be undertaken and potential mitigating impacts discussed with adjacent residential receivers prior to the determination of the application.

As noted in response to Submission 8.10 to 8.13, Section 8.3.2 of the Environmental Assessment discusses the background monitoring conducted as part of the noise study with background noise measurements conducted at four locations from Sunday, 7 May 2006 to Thursday, 18 May 2006 around the proposed Facility. The measured background noise levels analysed using the procedure presented in the INP varied between 27 and 31 dBA L_{A90}. The L_{A90} level is the noise level which is exceeded for 90 % of the sample period and can be referred to as the average minimum level.

It is noted that the NSW DECC Industrial Noise Policy (INP) sets out the minimum background noise level to be 30 dB(A). For each of the four locations where background noise recording was undertaken, even where the background noise level was found to be less than 30 dB(A), the applicable background noise level was still determined to be 30 dB(A) in accordance with the INP. The criteria noise limit was determined as 35 dBA (30 + 5). It is the DECC's view that a noise level of 35 dB(A) would not cause annoyance to local residents providing the noise does not contain certain characteristics like tonality and impulsiveness. As such, it was set as the applicable noise limit.

It is considered that adequate and representative background noise monitoring has been undertaken as part of the Environmental Assessment. It is not considered that additional monitoring would reduce the criteria noise limit as it is already the lowest limit possible under the *INP*.

Submission 8.20: Construction Traffic – Insufficient information has been made available on the impact of the construction traffic and potential mitigating impacts. For example:

Submission 8.21: There is no mention on where the vehicles will park on the site;

Submission 8.22: There is no mention of where operational vehicles will park on site;

The proposed Site layout as offered in the Joint Concept Environmental Assessment (Figure 4-1) offers an indicative location and site layout plan. It is noted that the detailed deign phase of the Project would establish the preferable location for vehicle parking on site, would confirm the location of the operation and construction access roads through the Marulan Site.

***Submission 8.23**: There is no mention of the potential use of Canyonleigh Road (east of the site within Wingecarribee LGA i.e., a short: cut route from Moss Vale)*

Submission 8.23 correctly notes that there is no mention of the potential use of Canyonleigh Road east of the Site in the Environmental Assessments. This portion of the road is not mentioned as it is not proposed to use this road as access to the Site for the Project.

***Submission 8.24**: There is no mention of consultation with the RTA and no traffic and safety assessment of 30 000 L tankers crossing the Hume Highway to/from the Marulan Sewage Treatment Plant and crossing at the unsafe Marulan Highway Service Centre's;*

It is noted that two options for the transport of water to Site have been considered to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities. It has been proposed that water could be trucked to the Site given that the water requirements are regarded as relatively low. Additional traffic assessment studies are presented in the Preferred Project Report in **Section 4.1** of this Report. The Environmental Assessments discuss that a new pipeline may be considered to meet the combined requirements for the Facilities inclusive of the Delta Electricity Stage 2 Facility, and further to this, additional information about the water pipeline option is presented in **Section 4.4**.

The Roads and Traffic Authority (RTA) has been consulted. Its submission is discussed further is **Section 3.2.9** of this Report. In summary, it is noted that its concern relates to the proposed heavy vehicle route and the additional light vehicle traffic generated during construction. The Proponent has committed to undertaking further detailed assessment to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities, and to identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known. These would be undertaken in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils and the RTA as appropriate.

***Submission 8.25**: There is no assessment of the impact of vehicles including heavy vehicles through the village streets and impact on rural lifestyles along the rural roads;*

***Submission 8.26**: Ardmore Park Land and Environment Court decision refused heavy vehicle traffic through Bungonia Village because of the potential impact on the amenity of the area. No mention is made on the impact of tankers through the village or a similar assessment;*

***Submission 8.27**: Cumulative impacts of the proposed traffic and Gunlake Quarry traffic on the area and transport route has not been considered. Approximately 1000 additional daily traffic movements over a 4 year construction period are proposed and are significant and just as proposed by the Gunlake Quarry, the proposed traffic should be required to avoid the village of Marulan*;

As noted above in response to Submission GMC.04 raising similar issues, the assessment concluded that:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along Canyonleigh Road would be approximately 25-27 % during construction, 26 % during normal Facilities' operation and approximately 27 % during major Facilities' maintenance.
- ***Brayton Road:***

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- *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.

- *Construction:*
  The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 20 % during construction and normal Facility operation and approximately 17 % during major Facilities' maintenance.
  The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. The assessment indicated that the heavy vehicle component of the traffic flow along this portion of Brayton Road would be approximately 55 % during construction, 27 % during normal Facility operation and approximately 26 % during major Facilities' maintenance.

The Land and Environment Court case referenced is understood to have related to a proposal for a sand and rock quarry. The traffic impact of quarries tends to be less during the construction / preparation and greater during the lifetime of operation. It is noted that the greatest potential traffic impact relating to the Facilities is during the construction phase. While this would need to be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan, it is considered a relatively short term impact, approximately 18 - 24 months, relative to the lifetime of the Facilities. The longer term impact is during normal Facilities operation, which the assessment concluded the traffic increase would be between 9 and 20 % depending on the portion of the route.

Additional traffic studies have been undertaken. With regard to traffic noise, the Joint Concept Environmental Assessment included a noise assessment that concluded that there would be minor increases in road noise during the operational stage and the peak construction activities and as such traffic noise impacts would be negligible not requiring a detailed traffic noise assessment.

As additional traffic studies have been conducted, a commensurate traffic noise assessment was appropriate and is presented in the Preferred Project Report in **Section 4.2** and **Appendix C**. This assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources.

The assessment concluded that during the operation of the Facilities, negligible impact on road traffic noise is predicted.

During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. The scenario where the Facilities are constructed consecutively was predicted to have lower construction traffic noise. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction.

Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

***Submission 8.28*: There will be an increase potential traffic hazard with increased traffic on the roads over school bus routes;**

***Submission 8.29**: Parts of the Canyonleigh Road is not fenced and stock within the road reserve will create a continual traffic hazard'*

It is noted that specific traffic hazards (such as stock) would be addressed and mitigated against through the implementation of a Traffic Management Plan for the CEMP and OEMP for the Facilities. The Proponents would include traffic safety measures to be implemented as part of these EMPs.

***Submission 8.30**: A traffic counter should have been placed on Canyonleigh Road as it is questioned as to whether approximately 700 vehicle increments would occur per week. Counts need to be made to determine impact on Canyonleigh Road.*

It is noted that as indicated in the response to Submissions 2.01 – 2.04 additional traffic impact investigations have been undertaken. Additional traffic studies are presented in the Preferred Project Report in **Section 4.1** and **Appendix B** of this Report.

The revised assessment refined predictions made for existing traffic along Canyonleigh Road. As noted above, the revised assessment concluded that in peak periods, the level of service along Canyonleigh Road would be maintained at Level of Service A. The assessment indicated that the heavy vehicle component of the traffic flow along Canyonleigh Road would be approximately 25-27 % during construction, 26 % during normal Facilities' operation and approximately 27 % during major Facilities' maintenance.

***Submission 8.31**: The Goulburn Mulwaree Strategy 2020 (p218) noted that the RTA offered the following comments for consideration in developing the strategy …*

***Submission 8.32**: Refer any major developments to the RTA for consideration. The Roads and Traffic Authority may require contributions or for infrastructure under Section 94 of the environmental Planning and Assessment Act 1979.*

***Submission 8.33**: The Goulburn Mulwaree Strategy 2020 (p2l8) noted that as part of the community consultations undertaken as part of the Strategy preparation.....the "need" to divert quarry and through traffic away from Marulan, Bungonia and rural villages. The proposal conflicts with the community and RTA comments received as part of the Goulburn Strategy 2020.*

Additonal traffic studies addressed the impact during construction and operation of the Facilities. It is noted that the greatest potential traffic impact relating to the Facilities is during the construction phase. While this would need to be managed through a Traffic Management Plan as part of the Construction Environmental Management Plan, it is considered a relatively short term impact, approximately 18 - 24 months, relative to the lifetime of the Facilities. The longer term impact is during normal Facilities operation, which the assessment concluded the traffic increase would be between 9 and 20 % depending on the portion of the route.

The Roads and Traffic Authority (RTA) has been consulted. Its submission is discussed further is **Section 3.2.9** of this Report. In summary, it is noted that its concern relates to the proposed heavy vehicle route and the additional light vehicle traffic generated during construction. The Proponent has committed to undertaking further detailed assessment to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities, and to identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known. These studies would be undertaken in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils and the RTA as appropriate.

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The traffic studies concluded that the length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A during normal Facilities' operation and major Facility maintenance.

***Submission 8.34*: There is no commitment for on-going road maintenance during construction, rather an initial evaluation of road pavement condition prior to construction and a review post construction.**

Environmental management during the construction phase of the Project would be undertaken in compliance with the requirements of a CEMP. The CEMP is a tool that outlines environmental management practices, safeguard measures to be implemented, timing of their implementation, and management and monitoring of process and procedures.

Chapter 19 of the Joint Concept Environmental Assessment outlines that a specific objective of the CEMP would be to provide management actions in relation to the control of construction traffic movements. A key objective would be to ensure that works are carried out in such a way as to manage the impact of works on neighbouring land uses. The CEMP would include measures ensure that on-going road maintenance would be addressed as required throughout the construction phase. Further articulation of this commitment is reiterated in the Preferred Project Report in **Section 5** of this Report.

***Submission 8.35*: No water is available to wet down Canyonleigh Road to prevent dust nuisance to traffic and nearby dwellings. There will be traffic chaos from construction traffic from 2009 - 2012 and nothing proposed to overcome these impacts.**

Chapter 7 of the Environmental Assessment addresses air emissions from the project. Table 7-9 summarises the mitigation measures and commitments of the Proponent. It is noted that a Construction Environmental Management Plan (CEMP) would be prepared to outline the implementation of mitigation measures. The CEMP would consider the most appropriate dust mitigation method suited to the activity and circumstances. This would likely include measures such as watering, spraying, scheduling activities for more favourable meteorological conditions, covering or limiting truck soil loads; reducing speed limits on unsealed surfaces; and cleaning soil off the undercarriage and wheels of trucks, when required.

These measures would assist in managing dust along the unsealed portion of Canyonleigh Road.

The Integrated Water Management Strategy (IWM) prepared for the Project presented in **Section 4.3** and **Appendix D**, included the Project water needs including construction water needs. It assumed that negligible quantities of potable (drinking) water are required for construction and that the majority of the water required during construction would be non-potable water.

A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities which can meet and exceed the requirements of the proposed Facilities for construction and operation. Further details on the water supply sources are presented in the Preferred Project Report in **Section 4.3** and **Appendix D**.

The Environmental Assessment set out a number of specific mitigation measures which are considered necessary for the Common Shared Works. Included in these commitments were further assessments to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities. The need to identify and cater for necessary remedial treatments to facilitate passage to the Site along Canyonleigh Road once the actual weight and dimensions of the proposed plant are determined, was also a commitment of the Proponent as stated mitigation measures of the Environmental Assessments.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

***Submission 8.36*: Inadequate lane widths and lateral clearances exists over parts of the access routes;**

Additional traffic impact studies have been undertaken as are presented in the Preferred Project Report in **Section 4.1** of this Report. As committed in Chapter 10 and 19 of the Environmental Assessments, further traffic assessments would be undertaken:

- to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities;
- to identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known; and
- in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils.

These additional assessments would identify constraints over the access routes that may relate to lane widths and lateral clearances.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

***Submission 8.37*: Inadequate consultation with emergency services i.e. ambulance;**

Key statutory and public authority stakeholders have been consulted during the planning process for the Environmental Assessments. A Preliminary Hazard Analysis was prepared for the proposed Facilities and is presented in the assessment documentation. In addition, a bush fire assessment was prepared and Section 16.7 of the Joint Concept Environmental Assessment details that a Bush Fire Management Plan is to be prepared within the OEMP which would include measures such as management and maintenance of Asset Protection Zone(s), landscaping and vegetation management, water supply, access and other bush fire protection measures for the site. The assessment notes that consultation was undertaken with the Yass Rural Fire Service to seek feedback on the proposed bush fire management issues.

Emergency response provisions would be included in a Site emergency response plan prepared as part of the CEMP and OEMP in consultation with the relevant authorities such as the ambulance service.

***Submission 8.38*: The road is not proposed to be sealed to minimise dust, damage to vehicles and noise impacts on the nearby residents. As a minimum the road should be sealed to Council standard to cater for the proposed traffic numbers, reduce traffic hazard and dust impacts on adjacent properties. The applications mention incorporating best management practices, the maintenance of an existing unsealed rural road is not a method of best management practices. Sealing the Canyonleigh Road will contribute to achieving best management practices for the developments. By comparison a subdivision creating 1 additional allotment assessed under the Draft Goulburn Mulwaree Local Environmental Pl."**

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2008 will require Canyonleigh Road to be sealed. It would take many many years to create the traffic comparable to that proposed by Delta Electricity and Energy Australia at 10 vehicles trip' per day for one additional lot.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 8.39: Staged Development - The second stage should not be approved based on the continual operation of the gas turbine facility, and

It should be noted that the current Environmental Assessment is seeking approval for the Delta Electricity Stage 1 Facility as well as the Stage 2 Facility which would progress in response to electricity market demand.

Both stages of the Delta Electricity Facilities as well as the EnergyAustralia Facility, the required access road and transmission line and the gas pipeline corridor have been assessed in detail in the Environmental Assessments.

The technical investigations and studies included as part of the Environmental Assessment have been carried out for both Facilities to determine the likely cumulative impacts of both developments inclusive of Delta Electricity's proposed Stage 2 combined cycle gas turbine facility. The environmental investigations undertaken have accounted for the different operational scenarios for each of the Delta Electricity (both stages) and EnergyAustralia Facilities. Of particular note:

- For the air quality investigation, several scenarios were modelled due to the different operational scenarios for each of the Facilities and the varying emission characteristics. The assessment also conservatively modelled the Facilities (including Delta Electricity Stage 2) operating all hours of the year to determine the worst case concentrations of emissions in a range of meteorological conditions.
- The noise and vibration investigation presented the calculated cumulative $L_{Aeq,15min}$ 10^{th} percentile exceedance noise levels for the Energy Australia Facility and Delta Electricity Stage 2 Facility for daytime, evening and night time operations.
- The Water Management chapter of the Environmental Assessment and the IWM presented in **Section 4.3** of this Report consider the cumulative water requirements of the Facilities inclusive of Delta Electricity's Stage 2 combined cycle gas turbine facility.

Submission 8.40: Inadequate noise attenuation measures on site and to nearby residential receivers.

Noise and vibration impacts from the proposed EnergyAustralia and Delta Electricity Facilities have been assessed in accordance with appropriate environmental standards, notably the NSW DECC Industrial Noise Policy. Feasible and reasonable noise control measures have been considered for both Facilities and are included in the proposal. The Delta Electricity Stage 1 Facility and EnergyAustralia Facility would have inherent noise mitigation measures incorporated such as air intake silencers, generator transformer walls on three sides and exhaust air silencers.

Impacts at relevant sensitive receivers such as residential dwellings have been quantified as presented in Chapter 8 of the Environmental Assessments. Notwithstanding the measures considered for both Facilities, the assessment of operational noise for both Facilities (Delta Electricity Stage 2 and EnergyAustralia) operating

concluded that two neighbouring residential dwellings are predicted to have 10th percentile noise levels that exceed 40 dBA (R23 and R24). Delta Electricity and EnergyAustralia have purchased these properties. One neighbouring residential dwelling is predicted to have a marginal exceedance (R26). Delta Electricity and EnergyAustralia have entered into negotiations with the owners of this residence to address the noise impacts. An assessment of potential for sleep arousal was carried out and the potential impact was found to be negligible. Notwithstanding that minor exceedances (as is the case for residence R25) do not usually trigger the implementation of appropriate noise management and/or mitigation strategies, discussions have been initiated with the owners of residence R25.

***Submission 8.41*: Inadequate assessment of the need of emergency power generators and the potential noise impacts.**

Emergency power generators are not part of the proposed Project.

The noise assessment did not address this scenario as it was considered that the cumulative operational impacts present a conservative assessment.

***Submission 8.42*: Inadequate water supply**

As noted above in response to other submissions raising issues about the adequacy of water supply, Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. To meet the construction and operational water requirements for non-potable water for the Facilities, it is proposed to use treated effluent from offsite sources and rainwater captured from the hardstand areas of the Facilities for the majority of water requirements. A number of current and potential water sources, including potable, recycled and stormwater have been identified to provide water quantities which could meet and exceed the requirements of the proposed Facilities. These include:

- Marulan water supply network- able to fulfil the potable water requirements of the Facilities (less than 1% of the Facilities' total water requirements);
- Marulan sewage treatment plant- may augment the Facilities' non-potable water requirements;
- Moss Vale sewage treatment plant- able to supply the Facilities' non-potable water requirements; and
- Site stormwater runoff - may augment the Facilities' non-potable water requirements.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The Environmental Assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors.

Small quantities of potable water are required for the Facilities with the large majority required for process (non-potable) water. This small quantity of potable water is the only water requirement likely to be sourced from the Marulan Water Treatment Plant. It is noted that supply of water from the Marulan Water Treatment Plant is proposed for supply of only the potable water requirements being comparatively small quantities for domestic type uses.

It is noted that water would not be extracted from the Wollondilly River.

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low.

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Further information on consideration of the potential water sources is provided in the Preferred Project Report in **Section 4.3** and **Appendix D** and further information on potential water pipeline routes are presented in **Section 4.4**.

***Submission 8.43*: Potential for technological change and efficiencies.**

Stage 2 of the proposed Delta Electricity Gas Turbine Facility would involve the conversion of plant from an open cycle facility to a combined cycle facility. Efficiency and innovation informed the selection of the preferred power generation technology to be utilised for Stage 2.

The supplier, and hence the type of turbine plant selected would be determined through a competitive tender process as part of the overall procurement process. The type of turbine therefore has not been specified at this stage of the process for the Facilities; however the Environmental Assessment has been conducted on the basis of operation of the E Class turbines as a representative technology for emissions and other environmental impacts.

As outlined in Chapter 3 of the Environmental Assessments, a number of power generation technology options were considered to meet the project need. These options included renewables, coal fired generation and gas turbines. The assessment concluded that gas turbines represent one of the most effective options to provide electricity for short term demand. At a later stage, Delta Electricity proposes to convert the open cycle gas turbines to combined cycle turbines to generate intermediate / base load electricity.

As supported by the findings of the Owen Inquiry, combined cycle gas turbines are capable of running efficiently at high capacity factors and combined cycle turbine technology is amongst the most attractive for facilities catering to intermediate load generation. It is further noted that combined cycle turbines have less than half the carbon emissions of new coal-fired power stations.

***Submission 8.44*: Lack of consultation with Wingecarribee Council and RTA**

Consultation was initiated with key stakeholders inclusive of both Goulburn Mulwaree Council and Upper Lachlan Shire Councils as the local government authorities of the Marulan Site and immediate surrounds. The RTA has been consulted. Its submission is discussed further is **Section 3.2.9** of this Report. In summary, it is noted that concern relates to the proposed heavy vehicle route and the additional light vehicle traffic generated during construction. The Proponent has committed to undertaking further detailed assessment to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities, and to identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known.

Further consultation with the RTA would proceed throughout subsequent stages of the development. Consultation between Wingecarribee Council, Delta Electricity and EnergyAustralia has been undertaken regarding water supply options for the proposed development.

***Submission 8.45*: Pipeline - The pipeline is a critical component of the proposed developments. Land and Environment Court decisions have widely agreed that critical components of a development can not be deferred. It is therefore vital that the proposed pipeline be determined and agreed as part of the facilities proposal.**

Delta Electricity and EnergyAustralia are seeking concept approval for the gas pipeline corridor as permitted under Part 3A of the EP&A Act. The exact location of the gas pipeline between the Facilities and the Moomba to Sydney gas pipeline had not been confirmed at the time of submission of the Joint Concept Environmental

Assessment, therefore the investigation was limited to a desktop study of a potential corridor. Further investigation into potential pipeline route options and continued consultation and negotiation with landholders has proceeded, and further information is provided about these consultations and the proposed gas pipeline route options in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G**.

***Submission 8.46*: Summary - The developments need to easily accessible to the Hume Highway and separated from sensitive land uses such as the village of Marulan. The proposed Hanging Rock proposal in the local Government Area of Wingecarribee is a more suitable location which can achieve these objectives.**

Following a detailed site location investigation as presented in Chapter 3 of the Environmental Assessments, the Marulan area was identified as the preferred site due to proximity to the Moomba to Sydney Gas Pipeline, proximity to significant infrastructure (TransGrid switchyard), availability of sites for purchase and the advantage of collocating the proposed Facility. Proximity to the Hume Highway, although required for access to the Site for construction and operation, was not considered as high priority criteria as connection to the Moomba to Sydney gas pipeline and high voltage transmission network.

***Submission 8.47*: The existing RTA crossing at Marulan Highway Service Centres is widely considered inadequate and the RTA needs to be consulted with any such proposal.**

Further assessment of the traffic impacts is presented in the Preferred Project Report in **Section 4.1** and **Appendix B** of this Report. Further to the traffic assessment undertaken for the Environmental Assessment, the Gunlake Quarry, located on Brayton Road has recently received Project Approval under Part 3A of the EP&A Act. As noted in the Gunlake Quarry Conditions of Approval (DoP, MP07_0074 dated 24/9/08), that Proponent is required to construct the new roundabout at the intersection of Brayton Road, George Street and the Interchange underpass to the satisfaction of the Council.

The Gunlake Quarry is understood be operational in two stages with the Stage 2 (the main haulage of material) to be in approximately three to five years (i.e. approximately 2011/13). As noted in the traffic assessment the main cumulative operation proposed Marulan Gas Turbine Facilities would likely be after the Gunlake Quarry is fully operational.

The assessment of the Facilities concluded that east-west portion of Brayton Road (from the Hume Highway) would be maintained at Level of Service A during normal Facilities' operation and major Facility maintenance. During construction, the east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. The assessment concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. Overall, the resultant level of service is still anticipated to be at worst, remaining at Level of Service B which is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

The Roads and Traffic Authority (RTA) has been consulted. Its submission is discussed further is **Section 3.2.9** of this Report. In summary, it is noted that concern relates to the proposed heavy vehicle route and the additional light vehicle traffic generated during construction. The Proponent has committed to undertaking further detailed assessment to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities, and to identify and cater for any necessary remedial treatments to facilitate passage

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to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known.

***Submission 8.48*: The Goulburn Mulwaree Strategy 2020 recommends avoidance of development on ridgelines and requires 40 m protection either side of ridgeline (p 301). The development uses catch phrase of incorporating best management practices however this best management practice is overlooked.**

The proposed development for the purpose of gas fired power stations falls under the provisions of Part 3A of the EP&A Act. Part 3A of the EP&A Act provides a process for the assessment of developments, which are considered to be "Major Projects" as declared by *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP) or by order of the Minister in the Government Gazette.

The Minister for Planning may also declare development subject to Part 3A to be a "critical infrastructure project" if it is of a category that, in the opinion of the Minister, is essential to the State for economic, environmental or social reasons.

According to Section 75R(3) of the EP&A Act, given that the Marulan Gas Turbine Facilities has been declared a 'critical infrastructure' project, approval is not required to take into account the provisions of any environmental planning instrument apart from state environmental planning policies that substantially govern the carrying out of the Project.

Thorough investigation into appropriate siting of the proposed Marulan Gas Turbine Facilities has been undertaken. The Proponent investigated a range of possible sites available for purchase that meet the site location requirements. The distance from built up areas, the availability of an appropriately sized site that permits the facility to be adequately buffered from surrounding landuses, and the elevation of the site for flood mitigation risk were central determining factors in the choice for the site.

The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment. Consideration was given to the following factors for the location of the Facility footprint within the proposed Marulan Site:

- proximity to the Wollondilly River in relation to flooding issues and required setbacks;
- potential visual catchment;
- flora and fauna implications; and
- noise implications.

Considering the cumulative effect of the above constraints as presented in Section 3.7 of the Joint Concept Environmental Assessment, the proposed location of the Facilities is in the area within the Marulan Site identified on Figure 2-3 of this Report.

It is considered that adequate mitigation measures have been proposed to limit the risks of adverse environmental impacts to the surrounding area.

***Submission 8.49*: The development should have made an assessment of the proposal under the Mulwaree LEP 1995, Draft Goulburn Mulwaree LEP 2008, Goulburn Mulwaree 2020 Strategy and Goulburn Mulwaree Biodiversity Strategy for Impacts within the Goulburn Mulwaree Local Government Area. All these documents have constraints on this proposal that have not been addressed or satisfied including the High Conservation Value under the Biodiversity Strategy.**

The Minister declared the Marulan Gas Turbine Facility proposal a 'critical infrastructure' project under Part 3A of the EP&A Act. As such, in the opinion of the Minister, the Marulan Gas Turbine Facilities project is considered essential to NSW for economic, environmental or social reasons. As set out in Chapter 5 of the Environmental Assessment, according to Section 75R(3) of the EP&A Act, environmental planning instruments, approval for a project may (but is not required to) take into account the provisions of any environmental planning instrument for projects subject to Part 3A of the Act apart from state environmental planning policies that substantially govern the carrying out of the Project.

The provisions of the relevant environmental planning instruments were however considered in relation to the project and adequate mitigation measures against the potential negative impacts of the Facilities have been investigated and proposed as part of the Environmental Assessment.

The Site is zoned 1(a) General Rural and the proposed development is permissible subject to the granting of consent by the Minister.

A flora and fauna assessment was undertaken as part of the Environmental Assessment and presented in Appendix F of the Joint Concept Environmental Assessment. It was conducted in accordance with the guidelines referenced in the Environmental Assessment Requirements. Measures to avoid impacts on biodiversity have been developed, mainly through locating the proposed Facilities as far as possible within cleared grazing lands, whilst allowing for a suitable setback from the Wollondilly River and further developed in this Preferred Project Report in **Section 4.7** of this Report. Mitigation measures (to reduce or minimise biodiversity impacts) would be included in a Construction Environmental Management Plan (CEMP), including pre-clearance surveys, salvage and rescue of fauna and fauna habitats, weed control protocols and management of groundcover vegetation. A biodiversity offsets package has also been proposed, in consultation with DECC, to compensate for direct permanent loss of biodiversity values. The proposed offset strategy recognises the scale and importance of the impact on the woodland and adopts the DECC principles for offsets. The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9 ha, located along a degraded drainage line in the northern parts of the Site.

A management plan would be prepared and implemented for the agreed offset areas and would include measures to improve biodiversity values such as removal of grazing (through fencing), weed control, feral animal control and retention and salvage of habitat.

***Submission 8.50*: Marulan water supply is known to have an elevated manganese level, what are the potential atmospheric impacts of such a water supply?**

A detailed assessment of potential water sources was undertaken and further information is presented in the Preferred Project Report in **Section 4.3** and **Appendix D**. Marulan water supply is one of the options considered for the potable water requirements of the Facility. Small quantities of potable water are required for the Facilities for domestic type uses only such as the administration building showering and drinking. The non-potable water supply is unlikely to be sourced from the Marulan water treatment plant and therefore atmospheric

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impacts from the reported elevated manganese from this source would not be an issue. Adequate treatment of the non-potable water would ensure that the water supply is appropriate for use in the Facilities.

***Submission 8.51*: Goulburn Mulwaree Strategy 2020 (p213) state, "The Hume Highway at Marulan recorded the highest number of fatal, injury and non casualty crashes." Transportation by 30 000L tankers along the Hume Highway is clearly unsuitable as proposed.**

It is noted that two options for the transport of water to Site have been considered to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities. It has been proposed that water could be trucked to the Site given that the water requirements are regarded as relatively low.

The revised traffic assessment presented in the Preferred Project Report in **Section 4.1** and **Appendix B**, concluded that based on the RTA count station on the Hume Highway nearest to the Project Site, north of the railway line, Marulan, the traffic generated by Scenario 1 during construction (worst-case) and the operation of the Facilities would be negligible compared to the existing traffic volumes and impacts are likely to be insignificant. The Hume Highway is an existing freight route between Sydney and Melbourne and is therefore designed to accommodate significant volumes of heavy vehicles.

The Environmental Assessment also discusses that a new pipeline may be considered to meet the combined requirements for the Facilities inclusive of the Delta Electricity Stage 2 Facility, and further to this, additional information about the water pipeline option is presented in the Preferred Project Report in **Section 4.4** of this Report. Additional traffic studies are also presented in **Section 4.1** of this Report.

***Submission 8.52*: An agreed pipeline needs to be proposed and agreed to as part of this larger facilities, proposal. Why should this development be any different than other similar turbine facilities which had nominated pipeline routes within their application?**

Delta Electricity and EnergyAustralia are seeking concept approval for the gas pipeline corridor as permitted under Part 3A of the EP&A Act. The exact location of the gas pipeline between the Facilities and the Moomba to Sydney gas pipeline had not been confirmed at the time of submission of the Joint Concept Environmental Assessment, therefore the investigation was limited to a desktop study of a potential corridor. Further investigation into potential pipeline route options and continued consultation and negotiation with landholders has proceeded, and further information about these consultations and the preferred pipeline route options are presented in the Preferred Project Report in **Section 4.5** and **Appendices F** and **G**.

Submission 8.53: I urge the Department of Planning to consider the matters raised above, and refuse the application on the rounds of inadequate assessment and inadequate mitigation potential impacts. Prior to any further consideration further information needs to be made available to: Upper Lachlan LGA, Goulburn Mulwaree LGA, Wingecarribee LGA, RTA and Local residents and community.

The Proponents reiterate the detailed Environmental Assessment process undertaken and the additional information presented in this Report. This Report would be made available to councils, Government agencies and the community via the DoP website.

3.3.9 Submission 9

[It is noted that Submissions 9 and 10 are petitions signed by six (6) and sixty-eight (68) members of the community respectively].

***Statement 9.01*: We the undersigned, as members of the local community, object to the Marulan Gas Turbine Facilities proposed by Energy Australia and Delta Electricity because of the:**

Submission 9.02: Potential traffic impacts on the village of Marulan have not been considered – Ardmore Park land and Environment Court decision refused heavy vehicle traffic through Bungonia Village because of the potential impact on the amenity of the area. No mention is made on the impact of tankers through the village,

Submission 9.03: Water transported from Moss Vale or the Marulan Sewage Treatment Plant will be driven through the village streets in 30,000 L tankers.

It is noted that two options for the transport of water to Site have been considered to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities. It has been proposed that water could be trucked to the Site given that the water requirements are regarded as relatively low. The Environmental Assessment discusses that a new pipeline may be considered to meet the combined requirements for the Facilities inclusive of the Delta Electricity Stage 2 Facility, and further to this, additional information about the water pipeline option is presented in the Preferred Project Report in **Section 4.4** of this Report. Additional traffic studies are also presented in **Section 4.1** of this Report which includes an assessment traffic associated with the Facilities from water delivery as well as the construction workforce, major facility maintenance workforce and operational workforce.

Submission 9.04: Cumulative impacts of the proposed traffic and Gunlake Quarry traffic on the area has not been considered.

Further traffic studies have been undertaken and are presented in the Preferred Project Report in **Section 4.1** and **Appendix B**. This assessment considers the cumulative traffic impacts of the proposal in light of information about the proposed Gunlake Quarry located on Brayton Road Marulan.

The traffic studies concluded:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A.
    The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow and is still considered an acceptable level of service for the operation of Brayton Road.

The assessment concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. For this portion the resultant level of service if still anticipated to be at worst, remaining at Level of Service B.

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Submission 9.05: Traffic hazards during construction have not been adequately addressed - Approximately 1000 additional daily traffic movements over a 4 year construction period are proposed.

In response to Submission 9.05;

- An assessment of the predicted weekday traffic flow in Canyonleigh and Brayton Roads during the Site works construction phase is offered in Section 10 of the Environmental Assessment. The predicted daily construction traffic flow during the construction of the common infrastructure and Site works (during the peak three month period) is estimated at 60 heavy vehicles and 120 light vehicles per day (180 daily vehicle movements). The siteworks / earthworks are assumed to be undertaken at the same time for both Facilities, regardless of the timing of the Facility construction, and this would take approximately 6 months to complete.
- Construction works for the EnergyAustralia and Delta Electricity Facilities could occur either together or sequentially. The predicted traffic impacts as presented in the EA offer the peak daily construction traffic assuming concurrent construction of Stage 1 and 2 of the Delta Electricity facilities as well as the Energy Australia facility. The peak daily construction traffic including heavy vehicles totals 240 vehicles per day.
- To reiterate, the above predicted traffic figures considers the worst case scenario.

Chapter 10 and 19 of the Joint Concept Environmental Assessment outlines that a specific objective of the Project would be to provide management actions in relation to the control of construction traffic movements. A key objective of the CEMP would be to ensure that works are carried out in such a way as to manage the impact of works on neighbouring land uses. The CEMP would have a monitoring and reporting procedure documented to ensure that on-going road maintenance would be addressed as required throughout the construction phase.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 9.06: Potential traffic hazard with increased traffic on the roads over school bus routes

Environmental management during the construction phase of the proposed project would be undertaken in compliance with the requirements of a CEMP.

A key objective of the CEMP would be to ensure that works are carried out in such a way as to minimise the impacts of works on neighbouring land uses, and specifically, as detailed in Chapter 19 of the Environmental Assessments, the CEMP would provide management actions in relation to the control of construction traffic movements.

Submission 9.07: Part of the Canyonleigh Road is not fenced and stock within the road reserve will create a traffic hazard.

This hazard would be addressed and mitigated against through the implementation of a Traffic Management Plan for the CEMP and OEMP for the proposed Facilities. The Proponents would include a number of traffic safety measures to be implemented as part of their Statement of Commitments.

Submission 9.08: There is no commitment for on-going road maintenance during construction, rather an initial evaluation of road pavement condition prior to construction and a review post construction,

The Traffic Management Plan developed for the CEMP and OEMP for the proposed Facilities would address the key ongoing monitoring requirements for the project. Pre-construction and post-construction evaluations would be undertaken of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site) to determine remedial action required following passage of oversized vehicles.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 9.09: ***There is potential for periodic flooding of the public road access route and road access is periodically blocked by flood waters.***

As discussed in Section 10.4 of the Joint Concept Environmental Assessment, further assessments are proposed to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities. These studies would address what measures may be required to minimise flooding of the road. In addition the Traffic Management Plan prepared as part of the CEMP and OEMP for the proposed Facilities would develop measures to address periods when the road may be flooded.

Submission 9.10: ***Dust and deterioration of the road pavement have not been adequately addressed - No water is available to wet down Canyonleigh Road to prevent dust nuisance to traffic and nearby dwellings,***

Submission 9.11: ***The road is not proposed to be sealed to minimise dust, damage to vehicles and noise impacts on the nearby residents.***

It is noted that proposed mitigation measures are detailed in Section 10 of the Environmental Assessment. These include the need for further traffic assessments to identify remedial treatments required to facilitate passage to the Site along Canyonleigh and Brayton Roads.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.

Submission 9.12: ***Water supply source, a critical component, has not been confirmed and will need to be transported by 30,000L tankers (from Marulan or Moss Vale) with at least 20 tanker movements per day***

Submission 9.13: ***Marulan has been subject to water restrictions due to a lack of supply,***

Submission 9.14: ***Marulan town water is sourced from the Wollondilly River.***

Submission 9.15: ***Will the sourcing of water from Marulan reduce the availability of town water to village residents?***

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As noted in response to Submission 8 and GMC raising similar issues about the adequacy of water supply, Chapter 3 of the Environmental Assessment outlines a range of water servicing options which could be used to satisfy water demand considering both volumes and qualities required. These include:

- Marulan water supply network- able to fulfil the potable water requirements of the Facilities (less than 1% of the Facilities' total water requirements);
- Marulan sewage treatment plant- may augment the Facilities' non-potable water requirements;
- Moss Vale sewage treatment plant- able to supply the Facilities' non-potable water requirements; and
- Site stormwater runoff- may augment the Facilities' non-potable water requirements.

Any of the above water servicing options for each of the Facilities' water demands in conjunction or in combination with the other options could be adopted. The environmental assessment states that a decision would be made on the preferred option or option mix following appropriate assessment of economic and non-economic factors.

Small quantities of potable water are required for the Facilities. The large majority of water required for the Facilities is for process water. It is likely that only the potable water supply would be sourced from the Marulan Water Treatment Plant for small quantities relating to domestic uses. It is noted that water would not be extracted from the Wollondilly River. The options for process water are likely to be tertiary treated water from sources including the Marulan sewage treatment plant and Moss Vale sewage treatment plant and possibly from Site stormwater runoff.

It is proposed that water would be trucked to the Site to meet the operational requirements for the EnergyAustralia and Delta Electricity Facilities as these water requirements are relatively low. Further detail on the gas pipeline route is provided in the Preferred Project Report in **Section 4.5** of this Report and **Appendices F** and **G**.

Further information on consideration of the potential water sources is provided in the Preferred Project Report in **Section 4.3** and **Appendix D** and further information on potential water pipeline routes are presented in **Section 4.4**.

***Submission 9.16*: Amenity and the rural lifestyle of the area will be greatly reduced**

As noted in Section 3.2.5 of the Joint Concept Environmental Assessment, the Marulan Site was selected primarily because of its close proximity to the high voltage electricity distribution system and close proximity to a major gas supply pipeline. Other desirable characteristics for the site included existing easements / corridors for electricity transmission; the distance from built up areas; appropriate land use zoning permitting the location of a power generating facility; and the availability of an appropriately sized site that permits for an adequate buffer between the facility and surrounding land uses. The Marulan Site was assessed as the preferred location from a range of other potential sites investigated.

The Environmental Assessment discusses the many benefits for the local and regional community which the proposed development may offer. The proposed Facilities in the Marulan region are expected to have positive economic and social impacts during both construction and operation phases. The Project would result in the increased reliability of electricity supply during peak demand periods; improved security of electricity supply during system emergencies; the ability to quickly convert to a base load plant should there be a substantial increase in electricity demand; improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies; and the provision of social

and economic benefits associated with the ability of the NSW supply network to meet peak energy demands in the short term and base load demands in the longer term. As a way of further enhancing public infrastructure and if deemed viable, upgrade works would be undertaken to local sewage treatment facilities to meet the Facilities' operational water requirements.

The Environmental Assessment has offered a comprehensive overview of the proposed management and mitigation strategies which would be enacted in order to limit and reduce as far as practicable, impacts of the development.

As a contribution to community and in response to various submissions, prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road. This undertaking would improve the amenity for the Canyonleigh Road community by minimising dust generation and wear and tear on vehicles.

***Submission 9.17*: Chaos from construction traffic from 2009-2012,**

Chapter 10 and 19 of the Joint Concept Environmental Assessment outlines that a specific objective of the Project would be to provide management actions in relation to the control of construction traffic movements. A key objective of the CEMP would be to ensure that works are carried out in such a way as to manage the impact of works on neighbouring land uses.

The revised traffic impact assessment addressed the impact during construction and operation of the Facilities. The assessment addressed traffic associated with the Facilities from the construction workforce, major facility maintenance workforce, water delivery and operational workforce and is presented in the Preferred Project Report in **Section 4.1** and **Appendix B**.

The assessment addressed the route from the Hume Highway to the Marulan Site in three portions: Brayton Road (east-west portion from Hume Highway adjacent to Marulan township), Brayton Road (north-south portion up to Canyonleigh Road intersection) and Canyonleigh Road (portion from the intersection with Brayton Road to the Marulan Site).

The traffic studies concluded:

- ***Canyonleigh Road:*** In peak periods, the level of service would be maintained at Level of Service A defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom of for motorists to select speed and manoeuvre within traffic flow.
- ***Brayton Road:***
  - *Normal Facilities' operation and major Facility maintenance*: The length of Brayton Road considered (between the Hume Highway and Canyonleigh Road intersection) would be maintained at Level of Service A.
  - *Construction:*
    The east west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A.
    The north south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, defined as stable flow conditions, reasonable freedom to select speed and

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manoeuvre within traffic flow and is still considered an acceptable level of service for the operation of Brayton Road.

The traffic studies concluded that the proposed Gunlake Quarry traffic, in conjunction with the construction traffic for the Facilities would be similar to the impact presented in the assessment for Brayton Road with the exception of the portion of Brayton Road between Red Hills Road by-pass and the Gunlake Quarry access. Overall, the resultant level of service is still anticipated to be at worst, remaining at Level of Service B which is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

While the worst-case scenario is the assessment was for construction of the two Facilities occurring at the same time, it is noted that the assessment of both Canyonleigh and Brayton Roads is very conservative for the following reasons:

- traffic volumes for the peak three months of construction traffic were assumed to continue for the whole construction period of 12 months; and
- peak three months of construction traffic were assumed to occur at the same time for both Facilities however, construction of the EnergyAustralia Facility is likely to occur before the construction of the Delta Electricity Facility and therefore this scenario is unlikely to occur.

Environmental management during the construction phase of the proposed project would be undertaken in compliance with the requirements of a CEMP. A key objective of the CEMP would be to ensure that works are carried out in such a way as to minimise the impacts of works on neighbouring land uses, and specifically, the CEMP would provide management actions in relation to the control of construction traffic movements. The Traffic Management Plan developed for the CEMP and OEMP for the proposed Facilities would address the key ongoing monitoring requirements for the project. Pre-construction and post-construction evaluations would be undertaken of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site) to determine remedial action required following passage of oversized vehicles.

***Submission 9.18*: REASON: These impacts and hazards need to be reviewed and mitigating measures need to be assessed in consultation with the local community prior to the determination of these applications by the Department of Planning!**

Further information particularly in relation to water supply and traffic is provided in the Preferred Project Report in **Sections 4.1** and **4.2** of this Report. This Report would be made available for the community to review on the DoP website.

The Proponents reiterate the consultation strategy they have followed throughout the planning and approvals stage of the Marulan Gas Turbine Facilities Project.

As noted above, environmental management during the construction phase of the proposed Project would be undertaken in compliance with the requirements of a CEMP. A key objective of the CEMP would be to ensure that works are carried out in such a way as to minimise the impacts of works on neighbouring land uses, and specifically, the CEMP would provide management actions in relation to the control of construction traffic movements. The Traffic Management Plan developed for the CEMP and OEMP for the proposed Facilities would address the key ongoing monitoring requirements for the project. Pre-construction and post-construction evaluations would be undertaken of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site) to determine remedial action required following passage of oversized vehicles.

3.3.10 Submission 10

[It is noted that Submissions 9 and 10 are petitions signed by six (6) and sixty-eight (68) members of the community respectively].

Community Issues outlined as for Submission 9.

3.3.11 Submission 11

Submission 11.01: Greenhouse Emissions - The proposal represents a large increase of Australia's C02 emissions from electricity generation. While we recognise that this method of electricity generation is a vast improvement on Australia's outdated coal-fired plants we do find this increase in emissions disturbing. We would like to see such developments matched with a comparable decommission of Australia's ailing coal-fired generators.

The use of natural gas for both the Delta Electricity and EnergyAustralia Facilities results in electricity production at a lower greenhouse intensity than the NSW average. Progression of the Delta Electricity Facility to combined cycle operation further improves greenhouse efficiency to approximately half that of conventional coal-fired generation. For this reason, natural gas fired, combined cycle generation is widely considered as an important transitional mode of generation for the achievement of long-term greenhouse reduction targets.

It should be noted that the Marulan Gas Turbine Facilities project has been proposed in response to a widely held view that NSW's peak electricity demand would exceed existing generation capacity over the next decade. The Delta Electricity and EnergyAustralia facilities have been proposed to provide peak electricity generation capacity which essentially serves a different function to the base load supplied by coal generation at present.

The Proponent cannot make a commitment to decommissioning coal fired generation. The Marulan Gas Turbine Facilities are proposed to complement the existing power generation across the state of NSW.

Submission 11.02: The increase in emissions is compounded by the land clearing associated with the site. It is commonly held that land clearing contributes to global warming[1] and we would like to see that the clearing of 34.2 hectares of Tableland Hills Grassy Woodland and Cleared Grassland are reasonably abated.

The proposed offset strategy recognises the scale and importance of the impact on the woodland and adopts the DECC principles for offsets. Key features of the strategy include an offset area of 45.7 ha, involving permanent conservation of 13.8 ha of Box Gum Woodland TSC EEC, 21.7 ha of Tableland Hills Grassy Woodlands; and a riparian rehabilitation area of 9 ha located along a degraded drainage line in the northern parts of the site. This includes an area that the Proponent is also proposing an additional offset area of 0.4 ha of Box Gum Woodland TSC EEC in a portion of Lot 153 DP 750053 located to the south of the Site (also owned by the Proponent) over and above the offset within the Marulan Site (north of Canyonleigh Road) that was assessed in **Section 4.8** of this Report as providing an adequate offset for the proposed Project.

Submission 11.03: Threatened Species - The EA identified a number of threatened plant and animal species that have been observed at the site. During the surveys carried out during 2006 and 2007 a total of eight fauna species listed as vulnerable under the Threatened Species Conservation Act 1995 (NSW)

[1] IPCC, 2007: Climate Change2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S. D. Qin, M. Manning (eds.]

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(TSC Act 1995) were directly observed. These fauna comprised of four species of microbat (Falsistrellus tasmaniensis, Eastern False Pipistrelle; Miniopterus australis, Little Bentwing-bat; Miniopterus schreibersii oceanensis, Eastern Bentwing bat; and Scoteanax rueppellii, Greater Broad-nosed Bat) and four species of bird (Stagonopleura guttata, Diamond Firetail; Melanodryas cucullata cucullaia, Hood Robin; Callocephalon fimbriatum, Gang-gang Cockatoo; and Ninox strenua, Powerful Owl).

Submission 11.04: Suitable habitat for the Brown Treecreeper (Climacteris picumnus victoriae) was also identified (Eucalyptus cinerea and E. eugenioides). As this bird species is also identified under the TSC Act it should also receive species assessment.

Submission 11.05: Literature reviews suggested that there may be as many as 23 threatened flora species and 21 threatened fauna species. The assessment acknowledged that 22 of the plant and 12 animal species are likely to occur at the site. We would expect that these threatened species would also undergo full assessment similar to that applied to the eight species of microbat and bird. This is particularly important as many (for example, Grey-headed Flying Fox Pteropus poliocephalus) are also nationally recognised in the Environmental Protection and Biodiversity Conservation Act 1999 (Com).

The Marulan Gas Turbine Facilities are subject to development and assessment processes and requirements of Part 3A of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). In response to Submission 11.04 – 11.05, under the provisions of Part 3A, there is no requirement for Section 5A of the EP&A Act to be addressed as part of the environmental assessment and approvals process. Hence, there is no requirement for a Species Impact Statement. However, the approach taken for the biodiversity impact assessment of the Marulan Site has been to address Section 5A and complete the Seven-Part Test for eight species as a guide for assessing the impacts on threatened biota that could be affected by the proposal.

A Seven Part Test was carried out for a number of TSC Act listed species and communities recorded and/or predicted to occur at times on the Site or within adjoining areas. Consideration of suitable habitat as well as recent field sightings were used as the determining factors in the selection of the eight species selected for these tests. The Brown Treecreeper was excluded from the list of species as no individuals had been sighted during the field studies of the current environmental assessment or those reviewed as part of the literature review for the Marulan Site. Additional assessment of this species would be unnecessarily onerous and would not add value to the assessment.

There were no threatened species, ecological communities, migratory birds or other matters of national environmental significance listed under the EPBC Act recorded during the field surveys on the Site. Consideration of the *Significant Impact Guidelines* (DEH,2006) indicates that the project is not likely to impose a significant impact on any matters of National Environmental Significance (NES).

Submission 11.06: Current grazing at the site is highly detrimental to the availability of high-quality habitat. We acknowledge that the creation of a 32.3ha woodland and the riparian rehabilitation in the biodiversity offset area represent a vast improvement (for the Diamond Firetail in particular). Additionally, we would like clarification that the 8.9ha of scattered woodland patches will also receive permanent conservation, this is ambiguous in the EA, and as locally occurring patches remain highly connected for many aerial species[2] we feel that these patches have high conservation value.

[2] Bennett, A.F. *Linkages in the Landscape: The Role of Corridors and Connectivity in Wildlife Conservation,* IUCN, 1999

As noted above in response to DECC Submissions, the Biodiversity Offset Area is proposed to be larger than that presented in the Joint Concept Environmental Assessment and be made up of Box Gum Woodland TSC EEC, Tableland Grassy Hill Woodland and Riparian Rehabilitation Zone.

Impacts on biodiversity, specifically land clearing, have been avoided where possible. The location of the proposed development footprint was informed by the imperative to avoid wooded areas in favour of existing cleared land. The location of the proposed Facilities was constrained however by the need to set the site back 150 m from the Wollondilly River. Additional assessment presented in **Section 4.6** of this Report illustrates the Proponent's commitment to moving the southern boundary of the Facilities' northward to avoid the Box-Gum Woodland TSC EEC. Additionally, the alignments of infrastructure (gas pipeline, access road and transmission line) have been altered to further avoid clearing areas of high conservation significance.

The area of the woodland (Tableland Grassy Hills Woodland and Snow Gum / Candlebark / Applebox Woodland and a small portion of Box Gum Woodland) within the combined construction footprint which would be impacted upon through clearing is the 16.1 ha of woodland as described in **Section 4.8**. It is noted that clearing for construction footprint, a lay-down area, access roads, pipeline and transmission line have been included in this area. There are small patches of woodland beyond this area which exist outside the proposed development footprint and the Biodiversity Offset area. These fragment patches would not be included within the permanent conservation zone, however, beyond the buffer required around each facility (10-15 m) for fire protection, it is not envisaged that construction of the Facilities would likely impact upon them with the implementation of a CEMP and management plan for the Biodiversity Offset Areas.

It should be noted that **Section 4.7** of this Report details that the CEMP would detail procedures for pre-clearance surveying and fauna management.

Submission 11.06 requires confirmation that the 8.9 ha of 'scattered woodland patches' would be permanently set aside. It is assumed that Submission 11 is referring to the 8.9 ha 'Riparian Offset Area' shown on Figure 7. As indicated in the report and on Figure 7, the Riparian Offset forms part of the biodiversity offset proposed in the Environmental Assessment, and would be permanently set aside for biodiversity conservation, maintenance and improvement.

***Submission 11.07*: Habitat Fragmentation and Edge Effects - Habitat fragmentation and edge effects are often species specific.[3] We suggest that further assessment is made to determine the effect that fragmentation caused by the access road, transmission line and pipe line has upon each threatened species. Predator access may increase with fragmentation"[4]. Subsequently we also suggest that special measures are undertaken to exclude feral predators (such as cats, dogs and foxes) from the site.**

The Environmental Assessment noted that habitat within the Site and surrounding areas is already highly fragmented, due to the long term impacts of clearing and grazing activities. Woodland habitat on the Site is currently fragmented by existing infrastructure including the TransGrid Switchyard, access tracks and transmission line easements.

The assessment concluded that clearing of woodland at the Site is unlikely to result in significant isolation or fragmentation of habitat. The position of the proposed Delta Electricity and EnergyAustralia Facility footprints has minimised habitat fragmentation across the Site, maintaining connectivity along riparian corridors.

[3] reviewed in Lahti, D.C. (2001), 'The "edge effect on nest predation" hypothesis after twenty years' *Biological Conservation,* 99:3, 365-374.

[4] reviewed in Lahti, D.C. (2001), 'The "edge effect on nest predation" hypothesis after twenty years' *Biological Conservation,* 99:3, 365-374.

Section 3 Response to Submissions

Additionally the southern boundary of the Facilities' footprint has been moved to avoid EEC woodland. Fragmentation by the gas pipeline and transmission line has been reduced as much as possible by altering alignments to locate them beyond the edges of significant woodland. The alignment of the access road has been altered to reduce fragmentation of the larger area of Box-Gum Woodland TSC EEC, however it fragments larger patches of Tableland Grassy Hills Woodland. The Tableland Grassy Hills Woodland, as noted in the Flora and Fauna Report in the Environmental Assessments and subsequent studies in the Preferred Project Report (**Section 4.7**) is an open woodland with a grassy understorey and does not have a dense, shrubby mid-storey that would be significantly impacted by the access road. Impacts of the access road on this community are limited clearing of the canopy layer and minor modifications to the grassy understorey. Given the level of existing fragmentation across the Site, increased fragmentation as a result of the proposed works is not considered to significantly impact the movement of fauna through the Site. The Site is already subject to fragmentation due to existing transmission routes.

Section 4.7 of this Report confirms the commitment to a Weed and Pest Management Plan undertaken as part of the EMP for the site. Active control of feral animals, such as the Red Fox and European Rabbit, and noxious weeds would be required during and after construction.

The CEMP would include specific instructions on where to locate salvaged habitat features. A qualified ecologist would be present during salvage and construction to ensure appropriate placements.

Further assessment of the gas pipeline is presented in the Preferred Project Report in **Section 4.5** of this Report.

***Submission 11.08**: Habitat areas including tree hollows and logs should be preserved or relocated to adjacent areas of native vegetation, as well as the replacement of habitat to protected areas. The Nature Conservation Council suggests that placement of these hollows; logs and boxes are carefully considered. Insights into the breeding preferences of the target species, and the habits of nest predators can help determine safer and more efficient locations*[5]

Section 11.7.3 of the Environmental Assessment details that a Groundcover Clearance Protocol would be incorporated into the CEMP. The protocol would involve the following:

- remove large woody debris using excavator grabs or manual handling if practicable;
- place intact large woody debris within adjacent areas of intact vegetation;
- scrape and stockpile leaf litter and topsoil separately from deeper fill material; and
- reuse leaf litter and topsoil in rehabilitation works.

Given these measures and the proposed Biodiversity Offset Areas adjacent to the development footprint, it is considered that the measures to mitigate against the negative impacts of construction would be sufficient to protect the fauna populations present within the Site.

3.3.12 Submission 12

***Submission 12.01**: We act on behalf of* **[resident's name withheld]** *in relation to the above matter. You may be aware that, (the resident) is the registered proprietor of a number of lots over which it is*

[5] 5 Lahti, D.C. (2001), 'The "edge effect on nest predation" hypothesis after twenty years' *Biological Conservation, 99:3,* 365-374.

proposed that part of the gas pipeline be erected. We are instructed by our client to write to you in spite of the fact that the formal period for consultation has expired.

Submission 12.02: ***Our client was hospitalised in Sydney prior to and during the whole consultation period with a serious illness. As a consequence our client was unable to consider the matters contained in the substantial Environmental Assessment Report, nor had the opportunity to obtain any independent advice in relation thereto. Accordingly, our client has instructed our firm to write to you to make a number of submissions and respectfully request that you take those matters into account in formulating any view.***

Submission 12.03*: Our client,* **[name withheld]***, opposes the location of the gas pipeline anywhere within the boundaries of any parcel of his land. As you would be well aware from the concept area plan provided, our client is a very substantial land owner who would be most dramatically affected if you were to exercise route option number 1, option number 1 alternate and or route option number 2. You will note that our client's land holdings comprise approximately 16 lots in various Deposited Plans. Our client is against the options suggested for the following reasons:*

Submission 12.04*: The pipeline will have a negative financial effect on farm operations. We are advised that our client currently operates a significant farm within his land holdings and it is his view that to carry out the installation of the works for a specific time will cause significant adverse financial harm to the operations of his business. Our client is aware that the proposal to install the pipes will cause massive alterations to the land in achieving that objective. The time that the construction of the pipe would take would also have a severe impact on both livestock and agricultural crops;*

Further discussion on the refinement of the gas pipeline options is presented in the Preferred Project Report in **Section 4.5**. The final pipeline alignment would be confirmed in consultation with the affected landholders and appropriate easements confirmed. The proposed gas pipeline is an underground pipeline laid at a depth of 750 mm to 900 mm below ground level. The pipeline would be constructed in accordance with relevant Australian Standards. The construction footprint would be restored to original state though implementation of a CEMP. Once rehabilitation is complete, the only visual impact resulting from the pipeline would be above ground warning signs that would be placed along the pipeline route. Once constructed, the final easement would detail the requirements for activities conducted by land owners within the easement covering activities such as excavation, erecting a building / structures, planting / cultivating trees within certain distances and activities that may cause damage to the pipeline.

Submission 12.05*: Adverse environmental issues - Our client is concerned as to the hazards (despite the submissions made in the assessment of flows of gas under his property) the propensity for such gas lines to require maintenance from time to time would involve future disruptions and perceived danger. It is also unclear as to whether there is any possibility that there will be any odour omissions, noise or vibration issues which could appear to be normal but have impact particularly on livestock and or any homestead in the vicinity;*

The proposed gas pipeline is an underground pipeline laid at a depth of 0.75 m to 0.9 m below ground level. The pipeline would be constructed in accordance with relevant Australian Standards. The Preliminary Hazard Assessment presented in the Joint Concept Environmental Assessment addressed the potential hazard associated with the gas pipeline. Despite the fact that many of the assumptions in the PHA are highly conservative, the results show that the risk associated with this development is very low. The most stringent risk criteria, as required by the Department of Planning, are adhered to.

Section 3 Response to Submissions

During operation and maintenance of the of the pipeline an annual or biannual walk through along the pipeline easement would be required to check on the stability of the soil over the pipeline and monitor the re-establishment and maintenance of the vegetative cover over the pipeline easement.

The environmental assessment of the gas pipeline route options is presented in the Preferred Project Report in **Section 4.5** and **Appendices F** and **G**. The assessment notes that there may be fugitive emissions associated with the following components of the pipeline infrastructure:

- Gas delivery station water bath heater with minimised heater fuel consumption and exhaust emissions
- Occasional venting of limited gas volumes during maintenance activities.
- Design and testing of the pipeline and facilities to ensure there are no leaks.

It is noted that these activities are predominantly related to the gas delivery station at the Marulan Site and at the gas offtake station at the southern end of the proposed gas pipeline where it connects with the existing Moomba to Sydney Gas Pipeline both of which are located a considerable distances from any residence. There would be negligible noise emitted during these emissions.

There is no noise or vibration associated with the operation of underground sections of gas pipelines.

It is understood that the experience of the landowners in the project area of the operation and maintenance of the existing underground Moomba to Sydney Gas Pipeline since 1976 and the operation of the Main Line Valve at Uringalla would be likely to be consistent with the above response to the issues raised in this submission.

Submission 12.06: ***Aesthetic Consideration - our client is concerned that the excavation of the natural topography of the land and its reinstatement, firstly this would take a substantial period of time and he will never be able to reinstate the land to its current glory. The land currently enjoys a beautiful outlook and it seems to our client inappropriate that you consider our client to provide such easement in such circumstances in which there is nearby state owned land with forests that you could partially remove or excavate below and achieve the same objectives. As noted above our client's land comprises of 16 lots. Our client had the property on the market some two years ago roughly and was promoting it to developers. There is a substantial premium which is payable by the purchasers of land who are able to erect homesteads on already subdivided land to which Council's consent was already granted. It is our client's understanding after having communicated with a number of people in the development industry that the erection of any gas pipe, even though it was below the surface who significantly adversely effect the value of the land as the residential purchasers of the land do not wish to have any infrastructure below the surface and particularly in the nature of gas pipelines where it is perceived to have contingent adverse health implications. In addition, there may be certain limitations that would be imposed as to the construction of certain types of structures on the land so for example even a swimming pool which may require two to three metre excavation may be unable to be located in certain areas as a result of the pipeline. There is an add on negative effect so that the negative value perceived on the land will extend to other parcels of land which adjoin the development as there is a perception that the location of a gas pipeline below the land makes the land less attractive as it no longer enjoys the pure rural rustic farm but is a homestead/farm located adjacent or along the vicinity of a major piece of commercial infrastructure.***

As noted in Chapter 11 of the Joint Concept Environmental Assessment, a CEMP would be developed to address the construction of the gas pipeline. It would address revegetation of cleared areas following construction of the pipeline.

Further discussion on the refinement of the gas pipeline route options is presented in the Preferred Project Report in **Section 4.5**.

The pipeline route options have been developed in consultation with the landholders. The final pipeline alignment would be confirmed in consultation with the affected landholders and appropriate easements confirmed. The proposed gas pipeline is an underground pipeline laid at a depth of 0.75 m to 0.9 m below ground level. The pipeline would be constructed in accordance with relevant Australian Standards. The construction footprint would be restored to original state though implementation of a CEMP. Once rehabilitation is complete, the only visual impact resulting from the pipeline would be above ground warning signs that would be placed along the pipeline route. Once constructed, the final easement would place restrictions on activities conducted by land owners covering activities within the easement such as excavation, erecting a building / structures, planting / cultivating trees within certain distances and activities that may cause damage to the pipeline.

Once constructed, the final easement would detail the requirements for activities conducted by land owners within the easement covering activities such as excavation, erecting a building / structures, planting / cultivating trees within certain distances and activities that may cause damage to the pipeline.

***Submission 12.07*: (The Resident) informs us that his dwelling has been displayed in many publications and it seems quite iconic from an architectural point of view. The whole ambiance and quality of the property as a whole is its rural rustic and very relaxed farmhouse style. It is our client's submission that the amount of compensation which Energy Australia may ultimately be obliged to pay to our client, if despite the submissions, elects to proceed along one of the routes would be insufficient to compensate our client for the excessive intrusion that is being proposed and it is our further submission that Energy Australia ought to have a more detailed assessment of an alternative corridor, particularly that through or adjacent to the state forest and not through privately held land holdings.**

The pipeline route options have been developed in consultation with the landholders. The final pipeline alignment would be confirmed in consultation with the affected landholders and appropriate easements confirmed. The proposed gas pipeline is an underground pipeline laid at a depth greater than 900 mm below ground level. The pipeline would be constructed in accordance with relevant Australian Standards. The construction footprint would be restored to original state though implementation of a CEMP. Once rehabilitation is complete, the only visual impact resulting from the pipeline would be above ground warning signs that would be placed along the pipeline route. Once constructed, the final easement would place restrictions on activities conducted by land owners covering activities within the easement such as excavation, erecting a building / structures, planting / cultivating trees within certain distances and activities that may cause damage to the pipeline.

At the request of the land owners, an alternative route through the woodland was considered (the western route) and this presented in the Preferred Project Report.

Section 3 Response to Submissions

EnergyAustralia

Delta electricity

Marulan Gas Turbine Facilities

Submissions Response & Preferred Project Report

PREFERRED PROJECT REPORT

VOLUME 1	MAIN REPORT	May 2009

URS

Preferred Project Information | Section 4

In accordance with Section 75H (6) of the EP&A Act, a Preferred Project Report can be submitted to the Director-General that outlines any proposed changes to the project to minimise its environmental impact, and any revised statement of commitments. Section 4 of this report presents additional project information in the following areas:

- traffic assessment;
- traffic noise assessment;
- water supply assessment;
- water pipeline infrastructure assessment;
- gas pipeline assessment;
- biodiversity assessment;
- Facility Site infrastructure;
- Project biodiversity offset; and
- plume rise assessment.

Where appropriate these additional assessments are presented as appendices to this Report.

Section 5 presents the revised Statement of Commitments.

4.1 Traffic Assessment

Further assessment of the traffic impact of the Facilities was undertaken. This section summarises the outcomes of the assessment. The full assessment is presented in **Appendix B**.

4.1.1 Methodology

The methodology for the assessment involved the following steps:

- describing the existing conditions of the road environment in the locality of the Project as well as the locality of the Moss Vale Sewage Treatment (STP) facility, the latter is being assessed for the purpose of potentially transporting water to the Project site;
- detailing the traffic generation associated with the Delta Electricity and EnergyAustralia Gas Turbine Facilities including traffic during construction, operation and major maintenance of the Facilities;
- assessing the cumulative traffic generation for both the Delta Electricity and EnergyAustralia Facilities;
- identifying the impacts of the cumulative traffic generation; and
- providing mitigation and management measures to be implemented in order to minimise the impacts identified.

Construction works for the EnergyAustralia and Delta Electricity Facilities could occur either together or sequentially. Several scenarios can be foreseen for construction that would influence traffic generation. Of the scenarios considered, two scenarios provide limits as to the expected traffic during construction and operation of the two facilities:

Section 4 Preferred Project Information

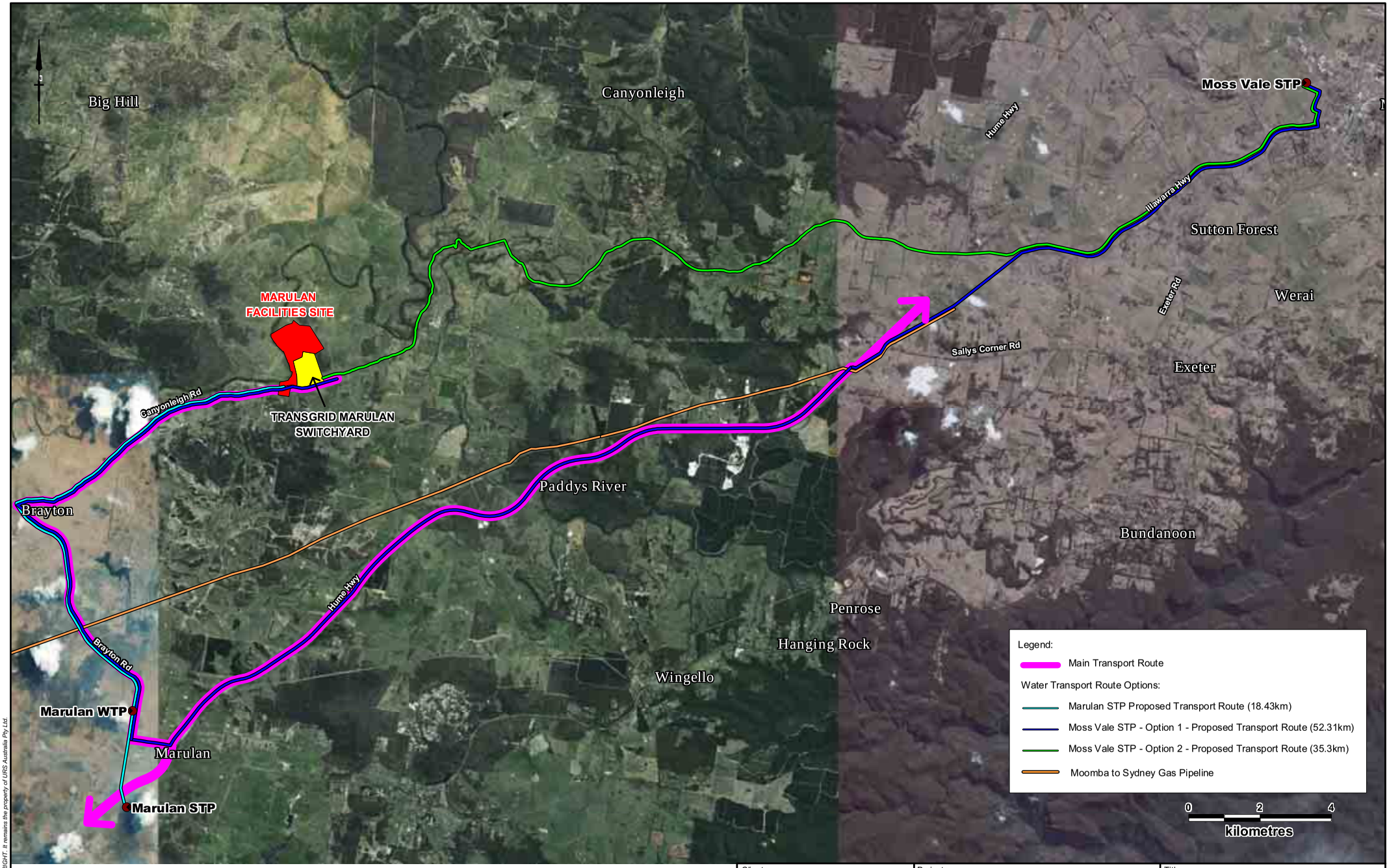
- Scenario 1: Two Facilities constructed at the same time, including EnergyAustralia and Delta Electricity Stage 1 followed some time after completion of Stage 1 by Delta Electricity Stage 2.
- Scenario 2: EnergyAustralia Facility is constructed first with some time lag to the construction of Delta Electricity Stages 1 and 2.

The assessment addressed the following traffic routes shown in **Table 4-1** and **Figure 4-1**.

Table 4-1 Routes Assessed in Traffic Assessment

Route	Portion	Existing Traffic Data	Facilities	Water trucking – Marulan STP / WTP	Water trucking – Moss Vale STP
Canyonleigh Road	From the Brayton Road intersection to the Facility Site access	Estimated based on the number of dwellings by applying a trip rate in accordance with *RTA Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002).	✓	✓	✓
Brayton Road	East-west portion from Hume Highway	Traffic counts were conducted along Brayton Road for the Gunlake Quarry Project Environmental Assessment (Christopher Hallam and Associates, February 2008).	✓	✓	✓
Brayton Road	North-south portion to the Canyonleigh Road intersection	Traffic counts were conducted along Brayton Road for the Gunlake Quarry Project Environmental Assessment (Christopher Hallam and Associates, February 2008).	✓	✓	✓
Red Hills Road		Traffic counts were conducted along Brayton Road for the Gunlake Quarry Project Environmental Assessment (Christopher Hallam and Associates, February 2008).	✓ (option)		✓ (option)
Hume Highway		RTA count station on the Hume Highway nearest to the Project site, north of the railway line, Marulan	✓	✓	✓
Illawarra Highway		Estimated based on the number of dwellings by applying a trip rate in accordance with *RTA Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002).			✓
Kennedy Close		Estimated based on the number of dwellings by applying a trip rate in accordance with *RTA Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002) and discussion with Moss Vale STP regarding existing operations			✓

Route	Portion	Existing Traffic Data	Facilities	Water trucking – Marulan STP / WTP	Water trucking – Moss Vale STP
Creek Street		Estimated based on the number of dwellings by applying a trip rate in accordance with *RTA Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002) and discussion with Moss Vale STP regarding existing operations.			✓



Source: GHD, Integrated Water Management Strategy, November 2008

Client
DELTA ELECTRICITY AND ENERGY AUSTRALIA

URS

Project
MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT

Drawn: AO	Approved: NB	Date: 04/03/2009
Job No: 43177371	File No: 43177371-232.wor	

Title
PROPOSED FACILITY TRANSPORT ROUTES

Figure: **4-1**

4.1.2 Summary of Assessment

Table 4-2 provides a summary of the traffic assessment outcomes. AUSTROADS (1999) provide the following definitions:

- **Level of Service A:** free flow conditions with a high degree of freedom for motorists to select speed and manoeuvre within traffic flow.
- **Level of Service B:** stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.

Table 4-2 Summary of Traffic Assessment Outcomes

Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)[1]	Average Daily Traffic (Major Maintenance)
Canyonleigh Road			
Existing Level of Service (No Development)	A	A	A
With Development (Scenario 1)			
Percentage Change (from No Development)	+102%	+17%	+43%
Midblock Level of Service (LoS)	**A**	**A**	**A**
With Development (Scenario 2)			
Percentage Change (from No Development)	+51%	+17%	+43%
Midblock Level of Service (LoS)	**A**	**A**	**A**
Brayton Road (north south portion)			
Existing Level of Service (No Development)	A	A	A
With Development (Scenario 1)			
Percentage Change (from No Development)	+120%	+20%	+50%
Midblock Level of Service (LoS)	**B**	**A**	**A**
With Development (Scenario 2)			
Percentage Change (from No Development)	+60%	+18%	+50%
Midblock Level of Service (LoS)	**A**	**A**	**A**
Brayton Road (east-west portion)			
Existing Level of Service (No Development)	A	A	A
Level of Service			
With Development (Scenario 1)			
Percentage Change (from No Development)	+53%	+9%	+22%
Midblock Level of Service (LoS)	**A**	**A**	**A**
With Development (Scenario 2)			
Percentage Change (from No Development)	+27%	+8%	+22%
Midblock Level of Service (LoS)	**A**	**A**	**A**
Hume Highway			
	Negligible volumes compared to the existing traffic volumes and impacts are likely to be insignificant		
Illawarra Highway			

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Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)[1]	Average Daily Traffic (Major Maintenance)
	Considering the existing traffic volume on the Illawarra Highway, these additional vehicle movements are likely to have an insignificant impact on the operation of this route and would be absorbed into the existing traffic flow		
Kennedy Close			
	It is assumed that since this road is used as an access route to the Moss Vale STP, the road is suitable for water tanker use and the additional vehicles are likely to have minimal impact of the existing road environment.		
Creek Street			
	It is assumed that since this road is used as an access route to the Moss Vale STP, the road is suitable for water tanker use and the additional vehicles are likely to have minimal impact of the existing road environment.		

In summary, the traffic assessment concluded that:

- **Brayton Road – Facilities' operation and maintenance:**
  - Brayton Road (from the Hume Highway to the Canyonleigh Road intersection) would be maintained at Level of Service A during normal Facilities' operation and major Facility maintenance. Level of Service A is defined by AUSTROADS (1999) as free flow conditions with a high degree of freedom for motorists to select speed and manoeuvre within traffic flow.
- **Brayton Road – Facilities' construction:**
  - During construction, the east-west portion of Brayton Road (adjacent to Marulan township) would maintain Level of Service A. During construction, the north-south portion of Brayton Road (closer to the Canyonleigh Road intersection) would decrease to be Level of Service B, although this is still considered an acceptable level of service for the operation of Brayton Road. Level of Service B is defined as stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow.
- **Canyonleigh Road – Facilities' construction, operation and maintenance:**
  - In peak periods, the level of service along Canyonleigh Road during construction, operation and maintenance would be maintained at Level of Service A.
- **Hume Highway, Illawarra Highway, Kennedy Close and Creek Street – Facilities' operation**:
  - There would be minimal impact along the Hume Highway, Illawarra Highway, Kennedy Close and Creek Street.

While the worst-case scenario (Scenario 1) is for construction of the two Facilities occurring at the same time, it is noted that the assessment is very conservative for the following reasons:

- traffic volumes for the peak three months of construction traffic were assumed to continue for the whole construction period of 12 months; and

- peak three months of construction traffic were assumed to occur at the same time for both Facilities however, construction of the EnergyAustralia Facility is likely to occur before the construction of the Delta Electricity Facility and therefore this scenario is unlikely to occur.

The construction period is assumed to be approximately 12 months with a peak construction traffic generation for three months within the 12 month period. The construction traffic generation assumed the traffic volumes that are expected to occur in the peak three month period are double the expected monthly average over a twelve month period. For the purposes of this assessment, the peak traffic volumes have been adopted to represent the worst case scenario.

4.2 Traffic Noise Assessment

4.2.1 Background

Based on the revised traffic assessment, further assessment was conducted of the potential for traffic noise by Wilkinson Murray. The report is presented in **Appendix C** and is summarised in this section.

The assessment addressed the traffic noise during operation and construction along the proposed access routes to the Site and from the potential water supply sources during operation.

4.2.2 Methodology and Criteria

The following criteria from the *Environmental Criteria for Road Traffic Noise* (ECRTN) apply to the Project with respect to traffic noise:

- *Operation:*
  - Operational traffic noise criteria are a function of the road functional category determined in accordance with the *RTA Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002).
  - In all cases, the development should be designed so as not to increase existing noise levels by more than 2 dB. Where feasible and reasonable, noise levels from existing roads should be reduced to meet the noise criteria. In many instances this may be achievable only through long-term strategies.
  - Canyonleigh and Brayton Roads: 60 dBA $L_{Aeq,1hr}$ during daytime and 55 dBA $L_{Aeq,1hr}$ during night time.
  - Hume Highway: 60 dBA $L_{Aeq,15hr}$ during daytime and 55 dBA $L_{Aeq,9hr}$ during night time.
  - Kennedy Close, Creek Street and Portland Avenue: 55 dBA $L_{Aeq,1hr}$ during daytime and 50 dBA $L_{Aeq,1hr}$ during night time.
- *Construction:*
  - No criteria exist for construction traffic noise.

4.2.3 Assessment of Potential Impacts

Table 4-3 summarises the outcomes of the traffic noise assessment.

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Table 4-3 Summary of Outcomes from Traffic Noise Assessment

Route	Predicted increase in existing traffic noise levels					
	Construction		Operation		Major Maintenance	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Canyonleigh Road	Increase by 3 dbA *No criteria*	Increase by 2 dbA *No criteria*	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	Increase by 2 dbA *Below criteria*	Increase by 2 dbA *Below criteria*
Brayton Road, north south portion	Increase by 4 dbA. *No criteria*	Increase by 3 dbA *No criteria*	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	Increase by 2 dbA *Below criteria*	Increase by 2 dbA *Below criteria*
Brayton Road east west portion	Increase by 3 dbA *No criteria*	Increase by 2 dbA *No criteria*	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*
Kennedy Close and Creek Street	NA	NA	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	NA	NA
Portland Ave	NA	NA	Increase by 1 dbA *Below criteria*	Increase by 1 dbA *Below criteria*	NA	NA

In summary, the traffic noise assessment concluded that:

- **Operation and Major Maintenance:** The assessment concluded that during the operation and major maintenance of the Facilities, it was predicted there would be negligible impact on road traffic noise.
- **Construction:** During construction of the Facilities there may be an increase to existing traffic noise levels by greater than 2 dB for the worst case day hour and worst case three months within a 12 month construction period for the scenario that assumes that both Facilities are constructed concurrently. Construction traffic for the scenario where the Facilities are constructed consecutively is predicted to be less than this scenario. It is noted that no criteria exist for construction traffic noise. Most construction traffic would be during daytime periods. It is noted that this increase would be over a limited duration during construction. Construction traffic noise from the Facilities would be managed through a Traffic Management Plan as part of the CEMP.

4.3 Water Supply Assessment

4.3.1 Background

Delta Electricity and EnergyAustralia commissioned GHD to prepare an Integrated Water Management Strategy (IWM) finalised in February 2009 with an objective to "*determine the preferred Integrated Water Management Program to meet the water requirements for the proposed gas-fired power stations and associated infrastructure near Marulan"*.

A summary of the assessment was presented in the Environmental Assessments with information from the draft IWM. Additional information is presented in this Report to further demonstrate the detailed assessment undertaken for water source options. This section summarises the key conclusions from the report and the full assessment is presented in **Appendix D.**

4.3.2 Water Demand

Water demands for each of the stages of operation were outlined in the Environmental Assessments and are summarised again here for completeness. There are differing types of water demanded by the Facilities with these being referred to as:

- **Potable water** which is necessary for domestic type uses (admin building, showering, drinking etc.).
- **Demineralised water** which is a high quality water source required as part of the power station process.
- **Process water** which has generally been referred to here as Non-Potable water. This water is required for various uses within the power stations and during construction. While a certain water quality would need to be achieved prior to use in the process, the uses do not preclude the use of a non-potable water source.

4.3.3 Water Sources

A number of water sources considered in the IWM were presented in Chapter 3 of the Environmental Assessments with a discussion on the sources considered viable for further consideration for the water servicing option. These included:

- Goulburn water supply network;
- Marulan water supply network;
- Marulan's sewage treatment plant (STP) effluent;
- Wingecarribee Council Moss Vale sewage treatment plant treated effluent;
- Industrial effluent;
- groundwater;
- Wollondilly River water;
- stormwater runoff;
- onsite wastewater recycling (domestic); and
- external sources.

As noted in Table 3-2 of the Joint Concept Environmental Assessment, not all options were feasible and warranted further consideration. **Table 4-4** summarises the feasible options developed in the IWM for water supply to the Facilities.

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Table 4-4 Summary of Servicing Options for Operation of the Facilities

Water Requirement		Option 1	Option 2	Option 3
Type	**Volume (ML pa)**			
Potable Water	0.7400	Marulan WTP (truck or pipeline)	Marulan WTP (truck or pipeline)	Marulan WTP (truck or pipeline)
Demineralised Water	0.2012	Truck Delivery EA and DE Stage 1 Onsite generation for DE Stage 2	Truck Delivery EA and DE Stage 1 Onsite generation for DE Stage 2ry	Truck Delivery EA and DE Stage 1 Onsite generation for DE Stage 2
Non-potable water	75.5000	Marulan STP Effluent (truck or pipeline)	Moss Vale STP Effluent (truck or pipeline)	Stormwater supplemented by Marulan WTP

Source: Summarised from GHD, 2008

As the source of potable water and demineralised water are essentially consistent through the options, the main differentiator is supply of non-potable water. **Table 4-5** provides a summary of the servicing options for supply of non-potable water. **Figure 4-1** illustrates the location of the water sources.

Table 4-5 Summary of Servicing Options for Non-Potable Water Supply

Option A		Option B		Option C
Marulan STP Effluent		**Moss Vale STP Effluent**		**Stormwater supplemented by Marulan WTP**
truck	pipeline	truck	pipeline	
	19 km		32.5 km	
Tertiary treated		Secondary treated		Consideration given in detailed design to runoff water being suitable for reuse.
Some capacity available. Additional capacity likely to result from an upgrade increasing capacity and to produce effluent of suitable quality.		Capacity available. Tertiary treatment and higher levels of disinfection required.		Dependent on more detailed design of Facilities and review of other factors such as soil type.
Some top up from Marulan WTP likely to be required during peak water usage periods		Some top up from Marulan WTP likely to be required during peak water usage periods		Requirement for top up dependent on receiving sufficient rainfall.
Beneficial reuse of an otherwise waste product		Beneficial reuse of an otherwise waste product		

Source: Summarised from GHD, 2009

The GHD assessment concluded that

> *"Each of the three options represents a 'viable option' in servicing the water needs of the proposed development though each exhibits differing advantages and disadvantages. Following the overall environmental assessment of the proposed development, more detailed investigations and liaison with stakeholders can determine the most 'sustainable', and thus preferred, option."*

.

4.4 Water Pipeline Infrastructure

4.4.1 Overview of proposed pipelines

The Environmental Assessments considered the supply of water to the Facilities by trucking and noted that a new pipeline may be considered to meet operational needs for Delta Electricity Stage 2 Facility and EnergyAustralia.

Further information is provided in this section on the potential water supply pipelines from each of the following sources to the Marulan Site:

- Marulan STP;
- Marulan WTP; and
- Moss Vale STP.

The water pipeline route information is based on the IWM provided in **Appendix D**.

Marulan WTP

The IWM noted that the potable water supply may nominally comprise a new pipeline and pump station directly from the WTP some 16 km to the south west of the Marulan Site. The pipeline route was assumed to follow the Marulan STP Effluent pipeline as shown in **Figure 4-2**. The pipeline diameter was assumed to be 40 mm.

It is noted that while the pipeline from Marulan's WTP to the Site is being constructed, it may be necessary to use tankered potable water.

Marulan STP

The IWM provided an indicative pipeline route of some 19 km from the Marulan STP located to the south west of the Marulan Site.

The pipeline route has been selected so that it would follow a similar path to the potable water pipeline (from Marulan WTP) wherever possible. It is noted that *AS/NZS 3500.1:2003 (Plumbing and drainage, Part 1)* indicates that in relation to (water and non-drinking water sources) pipelines (from the point of connection to the point of discharge), the non-drinking water services shall not be installed within 300 mm of any parallel drinking water supply for below-ground installations. Where possible the alignment of the pipeline route would follow road easements or similar.

Moss Vale STP

The treated effluent would be pumped from the Moss Vale STP to the Facilities. The indicative pipeline route as shown in **Figure 4-2** is some 32.5 km. Where possible the alignment of the pipeline would follow road easements and the power transmission line (near the power transmission line easement).

As for the Marulan STP option, while the STP treatment is upgraded, transfer pipeline and storage are being constructed at the Moss Vale STP, it may be necessary to supply both the potable and non-potable demands via tanker transport of potable water from the Marulan WTP.

Source: GHD, Integrated Water Management Strategy, November 2008

Client: DELTA ELECTRICITY AND ENERGY AUSTRALIA

Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT

Drawn: AJW | Approved: NB | Date: 04/03/2009

Job No: **43177371** | File No: 43177371-230.wor

Title: **POTENTIAL WATER SUPPLY PIPELINE ROUTES**

Figure: **4-2**

4.4.2 Desktop Ecology Assessment

A desktop ecology assessment was undertaken of the proposed water pipeline routes. This section presents a summary of the assessment. The full assessment is presented in **Appendix E**.

Methodology

The preliminary ecological desktop assessment was designed to gather information to assess the impact of the proposed activity, which may involve the removal of vegetation within a narrow discrete easement. This assessment includes an initial desktop review followed by a brief desktop assessment of the available data with particular emphasis on threatened flora and fauna species that may inhabit the Study Area.

Summary of pipeline route assessment

Based on the URS's desktop assessment of the proposed water pipeline routes, it is considered that two EEC's; Temperate Highland Peat Swamps and Box-Gum Woodland, may occur within the Study Area and possibly within the proposed works footprint. It should be noted that the presence of these communities needs to be confirmed through field surveys and further assessment.

This desktop assessment has also indicated the potential presence of threatened flora and fauna within the footprint of the proposed water pipeline(s) works. This includes three threatened fauna species (Koala (*Phascolarctos cinereus*), Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis)* and Speckled Warbler (*Chthonicola sagittatus*)) as well as one threatened flora species *Pomaderris pallida.* All four species have been previously recorded in the past 10 years within the area of proposed works. A further 18 threatened flora species, and 29 threatened fauna species have been recorded or predicted to occur based on the presence of habitat, within the vicinity of the study area (i.e. a 10 km radius of the area of proposed works). Further field surveys and further assessment would be conducted in order to confirm the presence or absence of the recorded and/or predicted threatened flora and fauna species with the proposed works area.

The estimated location of these threatened species and EEC's along the proposed water pipeline routes is identified in **Table 4-6**.

Table 4-6 Summary of Findings of Desktop Assessment of Water Pipeline Routes

Threatened Species/ EEC	Water Pipeline Route 1- Location	Water Pipeline Route 2- Location	Estimated length of pipeline intersecting the Community
Temperate Highland Peat Swamps	-	Approximately 12km South West of the Hume Highway and Illawarra Highway Junction, near Moss Vale. It is likely to occur in sandy drainage lines between the existing Moomba to Sydney Gas Pipeline and the Hume Highway in this area. May also occur on the southern side of the Hume Highway in this area.	Up to 1km

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Threatened Species/ EEC	Water Pipeline Route 1- Location	Water Pipeline Route 2- Location	Estimated length of pipeline intersecting the Community
Box-Gum Woodland	Approximately 4 km north of the Marulan STP along Brayton Road. It is likely to occur on both the eastern and western side of the Brayton Road. A smaller patch is likely to occur on the eastern side of Brayton Road approximately 2km south of the Brayton Road and Canyonleigh Road junction. A larger patch is likely to occur approximately 4km north north east of the Brayton Road and Canyonleigh Road junction, along Canyonleigh Road. The community is likely to occur on both the Northern and Southern side of the Road.	-	Up to 3.45km Up to 1km
Koala (*Phascolarctos cinereus)*	Less than 0.5km from the start of the route, within the village of Marulan.	Approximately 1 km south east of the Hume Highway and Illawarra Highway Junction, along the proposed route.	-
Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis)*	Approximately 1km north of the Marulan WTP, along the proposed route.	-	-
Speckled Warbler *(Chthonicola sagittatus)*	Approximately 1 km north of the Marulan WTP, along the proposed route.	-	-
Pomaderris pallida	Approximately 4 km south west of Moss Vale along the Illawarra Highway (2 individuals recorded)	-	-

It should be noted that the estimates of the pipeline length intersecting the vegetation community are approximate only and are conservative as they account for the mass of the area mapped along the route and not the separate portions of each mapped area.

Mitigation measures

The desktop assessment recommended that:

- Field surveys and further assessment are conducted in order to confirm the presence or absence of the recorded and/or predicted threatened flora and fauna species with the proposed works area.
- Proposed works be contained within a narrow easement that has previously been cleared for road development and/or gas pipeline instalment and maintenance. It is also assumed that these areas would be regularly maintained (i.e. reducing vegetation height) as part of the Australian Pipeline Association (APA)

maintenance obligations (along gas pipeline) and local council's obligation along roadsides. As such it is consider that large sections of the chosen route would only require the removal of already modified vegetation. The loss of vegetation within these areas would not be considered a significant loss for threatened species habitat. Furthermore it is assumed that the regeneration of the easement would occur once works are finished. This would assist in providing habitat that may be utilised by some fauna species.

- Based on the preliminary assessment it is anticipated that if any significant habitat features are required to be removed during works phases, provided that suitable mitigation measures are implemented to ameliorate the effects it is unlikely that the proposed works would have a significant impact on threatened species.

These mitigation measures are reflected in the Statement of Commitments in **Section 5** of this Report.

In addition, other assessments (e.g. heritage) would be undertaken if this option proceeds.

4.5 Gas Pipeline

A corridor was identified in the Joint Concept Environmental Assessment for the gas pipeline connecting the Moomba to Sydney Pipeline and the Facilities at the Marulan Site. Further refinement of the gas pipeline routes and assessment has been undertaken since the Environmental Assessment was prepared. This section of the Report summarises the assessment of the gas pipeline route options. The full assessments are presented in **Appendices F** and **G**.

It is noted that for the purposes of this section, the gas pipeline refers to the portion of the gas pipeline from the connection at the Moomba Sydney Gas Pipeline extending to the Marulan Site as far as the gully located east of the TransGrid Site. Beyond this, the gas pipeline is considered as part of the discussions relating to the Facilities (**Section 4.6.4**).

4.5.1 Project Description

The main function and objectives of the gas pipeline are to:

- transmit natural gas fuel from the Moomba to Sydney gas pipeline to the Marulan Gas Turbine Facilities;
- condition the delivered gas to the required characteristics of pressure, temperature, particulate filtration and condensate content to suit the gas turbine's fuel specification;
- meter the gas flow to each of the EnergyAustralia and the Delta Electricity facilities;
- provide compliant physical protection and integrity for gas containment under operational loads and resistance to fracture, corrosion and external impact; and
- allow for use of intelligent pigging devices for periodic internal inspections.

The pipeline would be approximately 6.5 km to 11 km in length. The estimated nominal pipeline size is DN 450 mm to DN 750 mm (457 mm or 760 mm outside diameter). The pipeline would be made of high strength carbon steel pipe manufactured to American Petroleum Institute specification API 5L. The pipeline and ancillaries would be designed to AS 2885 'Pipelines – Gas and Liquid Petroleum' and other standards as referenced and applicable therein.

The pipeline would be buried except at entry and exit ancillaries. The pipeline would be laid predominantly across rural land, therefore the minimum soil cover would be between 0.75 m and 0.90 m except for locations

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where special design and risk considerations require greater cover such as across roads, creeks, buried services or where the landowner proposes to undertake deep ploughing.

The pipeline would be constructed within a 20 m wide easement (also referred to as a 'right of way').

Other facilities that are part of the gas pipeline infrastructure are:

- offtake station from the Moomba Sydney Pipeline; and
- gas delivery station at the Facilities end of the pipeline.

A full description of the elements of the gas pipelines and the proposed construction methodology are provided in **Appendices F** and **G**.

4.5.2 Route Refinement and Methodology

Overview

The process of route refinement undertaken by the Proponent was:

1) Confirm the gas pipeline corridor.
2) Refine the study area through investigation of eastern and western quadrants within the corridor.
3) Focus on identifying routes in the preferred quadrant through desktop assessment.
4) Refine desktop route alignments and alternative section through field surveys and detailed discussions with affected landowners and other stakeholders.

A corridor was identified for the gas pipeline in the Joint Concept Environmental Assessment, shown in **Figure 4-3.** During refinement of the gas pipeline routes, the corridor was extended over a wider area to allow greater flexibility in optimising the route in relation to environmental, social, engineering and financial considerations. The revised corridor is also presented in **Figure 4-3**. For ease of reference the corridor is discussed in terms of the ***Eastern*** and ***Western*** quadrants within the corridor.

The route was refined with the following considerations:

- following paper / Crown Public Road / reserves (paper roads) where possible;
- detailed discussions with affected land owners; and
- technical considerations.

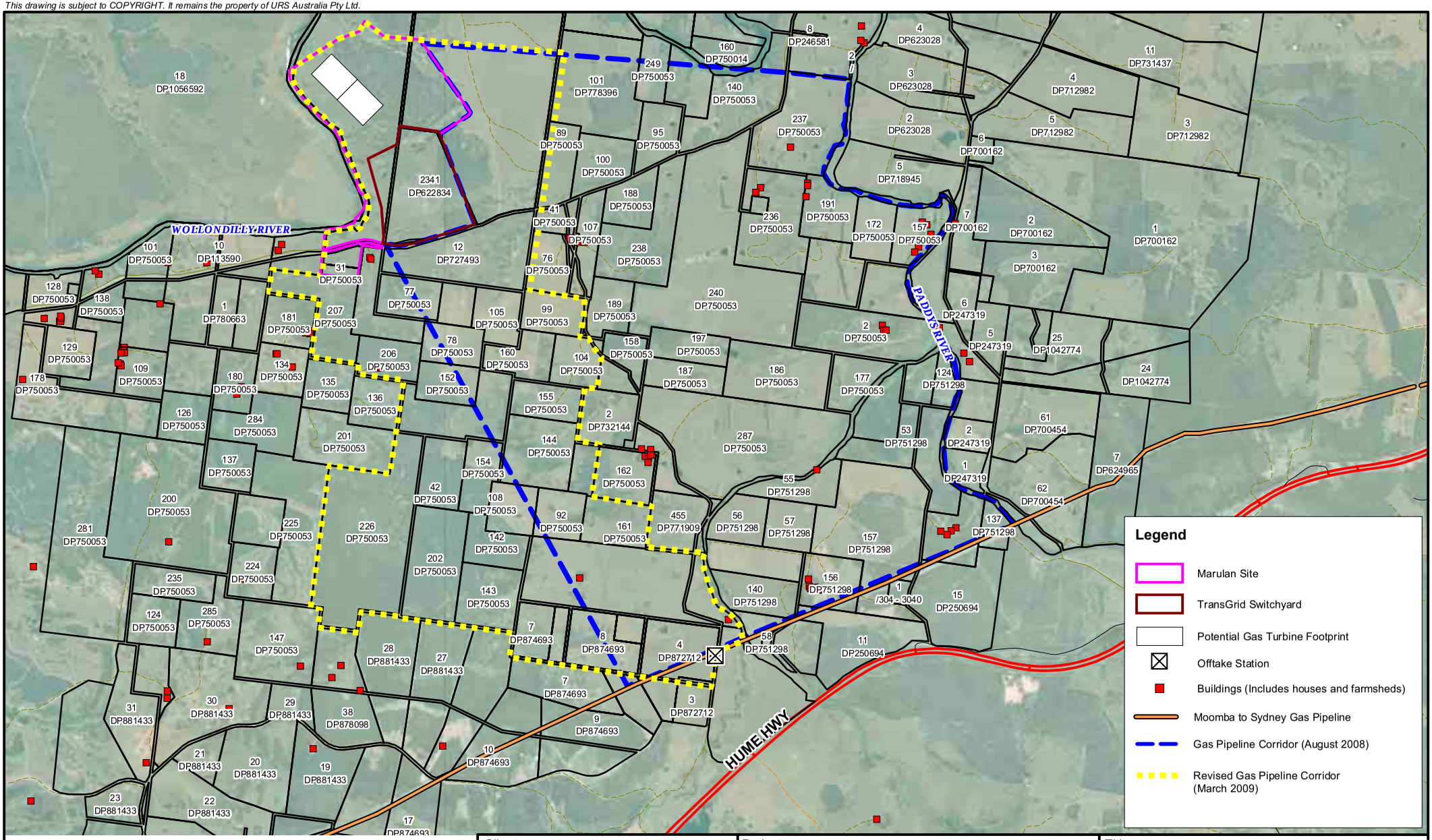
Assessment of quadrants within corridor – Western and Eastern Routes

In the eastern quadrant of the concept corridor, there is fragmented land ownership and a multitude of dams, including natural water courses that are present during and after heavy rain fall. As the Goulburn area is particularly arid and has recently suffered extensively from drought conditions, it was considered that these natural water courses should not be interfered with by pipeline construction. In addition, there are sporadic patches of native woodland that contain remnants of Tableland Hills Grassy Woodland including potential for Tableland Grassy Box-Gum Woodland that forms part of the EEC listed under the TSC Act (whereas the former community does not) which would have imposed further constraints to the corridor.

However, in order to minimise impacts to residents, as well as flora and fauna, in the extended larger corridor, a preference was given to routes in the mid to western quadrants that followed paper / Crown Public Road roads where possible. Using this principle, tentative routes were selected, surveyed and subsequently refined.

Route refinement - initial desktop route – Western and Eastern Routes

Initially, the route selected for preliminary review adopted what was understood to be the Crown Public Road reserves. Early assessment also examined the possibility of Native Title claims, but it was concluded that none exist at this particular location. However, it was later found that major sections of the identified roads being contemplated for a gas pipeline easement had been subject to a notification dated 19 April 1963 of an intention to resume land, and to open a road under Section 7 of the *Public Roads Act 1902* (NSW) (Public Roads Act). However, on the information found, no further steps have been taken to acquire the land from the land owners for a public road. The Public Roads Act was repealed in 1992 and was replaced with the *Crown and Other Roads Act 1990*. Thus, the route selected for initial review was rejected on the basis that the proposed roads remained privately owned property and the route was close to two land owners residences.



0 1 2
kilometres

Source: Delta Electricity, Energy Australia, GHD

Client
DELTA ELECTRICITY AND ENERGY AUSTRALIA

Project
MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT

Title
GAS PIPELINE CORRIDOR

Drawn: AO	Approved: NB	Date: 04/03/2009
Job No: **43177371**	File No: 43177371-115.wor	

Figure: **4-3**

Route refinement - refinement with landholders – Western and Eastern Routes

Two more detailed pipeline route options were then developed in consultation with potentially affected land owners. These routes are known for the purposes of this Report, as the ***Eastern*** and ***Western*** routes as identified in **Figure 4-4**.

Whilst the ***Eastern*** route provides a more direct route from the off-take valve station of the Moomba to Sydney Gas Pipeline, off Wollumbi Road to the Marulan Site, it has a number of impediments, for example:

- Landowners are opposed to having the pipeline directly through the land parcels that make up their properties for the following reasons:
  - There is a potential for severe impact on livestock and agricultural production.
  - Propensity for the gas pipeline to require maintenance.
  - Extensive improvements have been carried out and improved pastures established.
  - Paddocks are used for sheep and cattle grazing and any disruption would have a consequential effect on the landowner's livelihood - the pipeline would have negative financial effect on farm operations.
  - Substantial impact on the ability to subdivide lots with a pipeline located across the land parcels.
  - Inability to reinstate the land back to its former condition (that is, pipeline markers) and certain limitations would be imposed.
- Lot 12 is in probate and the Proponent has been unable to commence meaningful discussions with the legal representatives or relatives of the deceased.
- Identified potential Aboriginal archaeological deposits in Lot 153 DP 750053, land that is now owned by the Proponent.

During discussions with the land owners affected by the ***Eastern*** route, it was suggested that the Proponent should carry out assessment on an alternative corridor, particularly through or adjacent to the woodland area and not through privately held land holdings.

With this in mind, the Proponents aimed to review an alternative route, being the ***Western*** route as indicated in **Figure 4-4**. However, the ***Western*** route sits outside of the original identified concept corridor (Figure 4-9 of the Environmental Assessment and shown in **Figure 4-3** of this Report) and thus this Report also seeks to widen the corridor to include for assessment of this newly identified route.

The ***Western*** route begins at the off-take station of the Moomba to Sydney Gas Pipeline and then cuts the corner of Lot 4 in order to maintain the tree plantings on Wollumbi Road (which have been assumed to have been provided for aesthetic reasons and also to provide a wind break). The route then continues further west along Wollumbi Road to the Crown Public Road reserve between Lots 202 and 226. The route then continues north along the Crown Public Road reserves, traverses private property through Lots 206 and 207, then across Canyonleigh Road and onto the Marulan Site.

Ecology and heritage impact assessments have been carried out on both the ***Eastern*** and ***Western*** routes. These are discussed in **Section 4.5.4** of this Report.

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A meeting took place on 15 October 2008 with representatives from the Department of Planning, DECC, Rural Fire Service (RFS) and the Proponent. The purpose of the meeting was to understand all of the impacts which needed to be balanced to ensure an appropriate outcome.

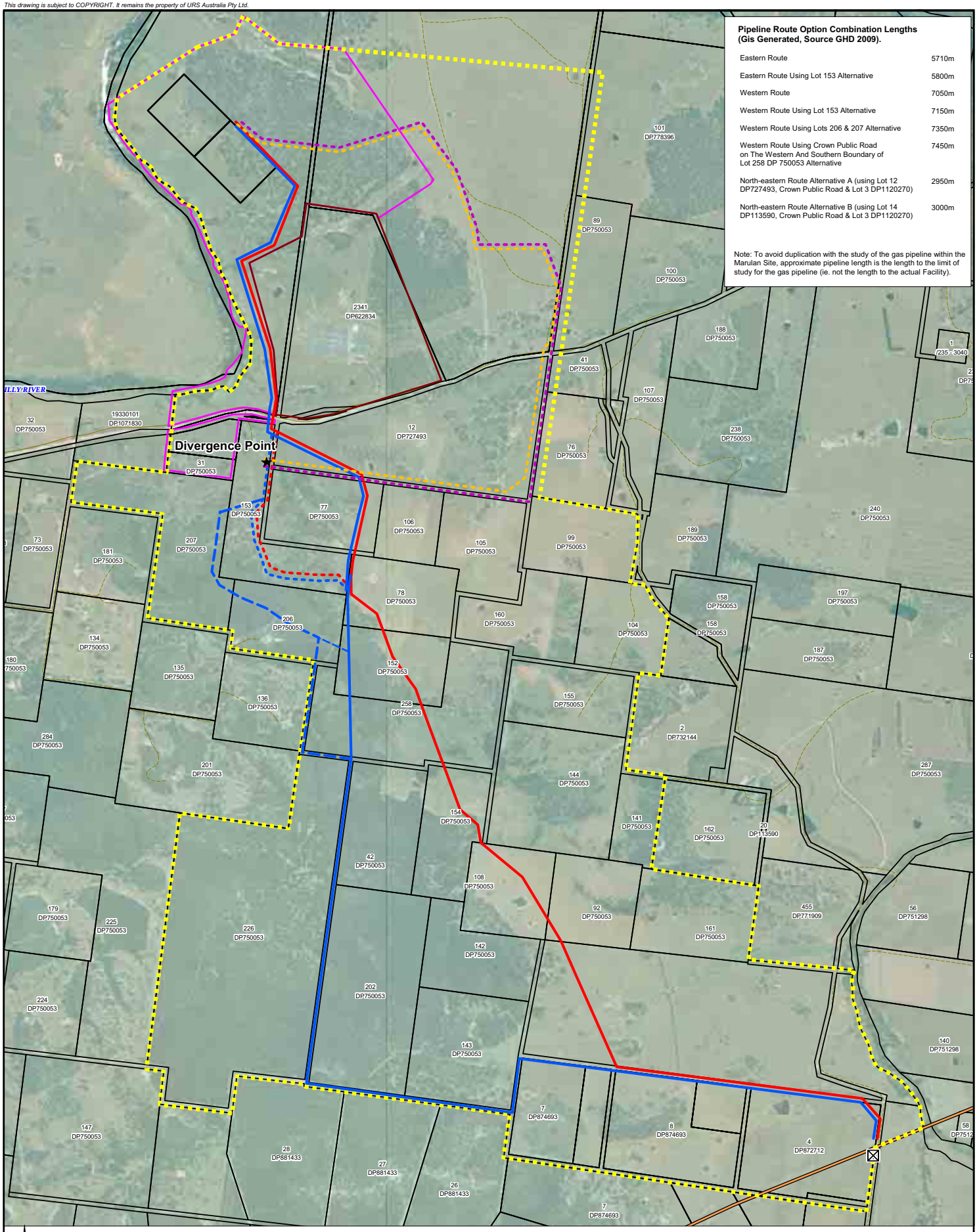
Although the ***Western*** route would require the removal / clearance of trees and vegetation within a 20 m easement through the Crown Public Road reserves, its had been understood from the RFS that a fair proportion of Lots 202 and 226 would be the subject of a controlled back burning (low intensity back burning) with a re-application by the RFS to commence with the works in Autumn 2009. The RFS' view was that the ***Western*** route (being a 20 m easement) would give an alternative access for bushfire management from the Hume Highway in the south and from Canyonleigh Road in the north, as well as create a fire break. Therefore the ***Western*** route is advantageous from the RFS' perspective.

A further site meeting took place with DECC on 18 November 2008. In the circumstances where the Proponent's preferred route (***Western*** route) is through an area that cannot be avoided, this Report addresses the mitigation strategies, commitments and off-sets proposed for the gas pipeline construction. However, in considering and offering the offset strategy, the Proponent proposes an entire Project off-set package encompassing the Facilities and the pipeline easement as a whole. These proposals are set out in **Section 4.8** of this Report.

Route refinement –North Eastern Route

Subsequent to the identification of the original route options, an alternative route in the northern part of the pipeline corridor was identified. This option is known as the ***North Eastern*** route option. The purpose of this route option is to overcome possible technical issues associated with the confluence of electricity transmission lines and the proximity of the TransGrid switchyard, on the Eastern and Western routes, which cross Canyonleigh Road and head directly north to the site of the proposed Facilities.

The North Eastern Route forms another set of options for the northern most part of the gas pipeline route and may be considered for the northern portion of either the Western or Eastern Routes. Two alternatives for the North Eastern Route are considered, known as alternative A and alternative B. The North Eastern Route commences approximately 200 m south of Canyonleigh travelling east, then north easterly from the Eastern and Western Routes to Canyonleigh Road. After crossing Canyonleigh Road, the route travels north to north westerly mainly through Lot 3 DP1120270, before it enters the Facilities' Site. These options start for each of the Western and Eastern gas pipeline routes at what has been termed the 'divergence point" as shown on **Figure 4-4**.



Pipeline Route Option Combination Lengths (Gis Generated, Source GHD 2009).

Eastern Route	5710m
Eastern Route Using Lot 153 Alternative	5800m
Western Route	7050m
Western Route Using Lot 153 Alternative	7150m
Western Route Using Lots 206 & 207 Alternative	7350m
Western Route Using Crown Public Road on The Western And Southern Boundary of Lot 258 DP 750053 Alternative	7450m
North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270)	2950m
North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270)	3000m

Note: To avoid duplication with the study of the gas pipeline within the Marulan Site, approximate pipeline length is the length to the limit of study for the gas pipeline (ie. not the length to the actual Facility).

0 200 400 metres

Legend

- Marulan Site
- Offtake Station
- 1 Eastern Route
- 2 Eastern Route using Lot 153 Alternative
- 3 Western Route (Blue)
- 4 Western Route using Lot 153 Alternative (Blue and Broken Blue)
- 5 Western Route using Lots 206 & 207 Alternative (Blue and Broken Blue)
- 6 Western Route using Crow Public Road ("L" Shape) Alternative
- 7 North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270
- 8 North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270
- Gas Pipeline Corridor
- Transgrid Switchyard
- Gas Turbine Footprint

Source: GHD, 2009

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URS	Drawn: AO / Approved: NB / Date: 11/05/2009 / Job No: **43177371** / File No: 43177371-235.wor	Figure: **4-4**

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4.5.3 Gas Pipeline Options

All of the permutations of the Western and Eastern Routes in combination with the North Eastern Routes total some 18 route options. **Table 4-7** provides a summary of the gas pipeline options. The route options are shown on **Figure 4-4**.

Table 4-7 Summary of Pipeline Routes

Route Description	Approx Length (m)[1]	Total Length (m)[1]	Variance (m)	Easement Area (20 m wide easement)	Number of Private Landowners on route
1. Eastern Route	5,710	5,710		11.42	3
1a. Eastern Route with North Eastern Route – Alternative A	2,950	7,400	+1,690	14.8	3
1b. Eastern Route with North Eastern Route – Alternative B	3,000	7,460	+1,750	14.92	2
2. Eastern Route Alternate using Lot 153	1,150	5,800	+90	11.6	3
2a. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative A	3,350	8,275	+2,565	16.55	4
2b. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative B	3,415	8,340	+2,630	16.68	3
3. Western Route	7,050	7,050	+1,340	14.1	3
3a. Western Route with North Eastern Route – Alternative A	2,950	9,775	+4,065	19.55	2
3b. Western Route with North Eastern Route – Alternative B	3,010	9,840	+4,130	19.68	1
4. Western Route Alternative using Lot 153	1,150	7,150	+1,440	14.3	2
4a. Western Route Alternative using Lot 153 with North Eastern Route – Alternative A	4,530	9,600	+3,890	19.2	3
4b. Western Route Alternative using Lot 153 with North Eastern Route – Alternative B	4,600	9,670	+3,960	19.34	2
5. Western Route Alternative using Route Lots 206 & 207	1,500	7,350	+1,640	14.7	3

Route Description	Approx Length (m)[1]	Total Length (m)[1]	Variance (m)	Easement Area (20 m wide easement)	Number of Private Landowners on route
5a. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative A	4,880	9,745	+4,025	19.49	4
5b. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative B	4,950	9,815	+4,095	19.63	3
6. Western Route Alternative using Crown Public Road	2,130	7,450	+1,740	14.9	2
6a. Western Route Alternative using Crown Public Road – Alternative A	5,510	9,850	+4,140	19.7	3
6b. Western Route Alternative using Crown Public Road – Alternative B	5,580	9,915	+4,205	19.83	2

Notes:
1 = To avoid duplication with the study of the gas pipeline within the Marulan Site, approximate length is the length to the limit of study for the gas pipeline (ie. not the length to the actual Facility).

4.5.4 Summary of Assessment

An environmental assessment was conducted for the gas pipeline route options. This section provides a summary of the environmental assessment. The full document and associated specialist studies are provided in **Appendices F** and **G**.

Ecology

A summary of the ecology impacts for each of the route options is presented in **Tables 4-8** and **4-9**. **Table 4-8** provides a summary of the areas of clearing for the 20 m easement and the resultant modified 6 m easement. The table groups the vegetation types into clearing of EEC, native woodland and forest, native grassland and exotic vegetation. **Table 4-9** provides a discussion of the potential impacts and the mitigation measures.

Figure 4-5 presents the vegetation communities in the proposed pipeline routes. The table details the clearance required for an initial 20 m corridor for construction as well as the final impact after the corridor is rehabilitated including an approximate 6 m maintained corridor of shrubs and ground-layer directly over the pipeline (noting that this is not relevant to areas of native pasture).

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Table 4-8 Summary of Ecological Impact of Gas Pipelines - Vegetation Clearing and Modification

Route Description	Area of vegetation clearing for 20m construction easement (ha)				Area of vegetation modification in 6m easement (ha)	
	EEC[1]	Native Woodland and Forest[2]	Native Grassland	Exotic Vegetation[3]	EEC	Native Woodland and Forest
1. Eastern Route	0.00	0.10	0.21	9.42	0.00	0.08
1a. Eastern Route with North Eastern Route – Alternative A	0.09	1.67	0.21	8.58	0.03	0.60
1b. Eastern Route with North Eastern Route – Alternative B	0.00	0.99	0.21	9.48	0.00	0.38
2. Eastern Route Alternate using Lot 153	0.03	1.50	0.21	8.12	0.01	0.41
2a. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative A	0.13	2.94	0.21	8.87	0.04	0.96
2b. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative B	0.03	2.87	0.21	9.26	0.01	0.94
3. Western Route	0.00	6.51	0.00	7.60	0.00	1.95
3a. Western Route with North Eastern Route – Alternative A	0.09	8.05	0.00	6.76	0.03	2.45
3b. Western Route with North Eastern Route – Alternative B	0.00	7.37	0.00	7.67	0.00	2.22
4. Western Route Alternative using Lot 153	0.03	7.88	0.00	6.31	0.01	2.25
4a. Western Route Alternative using Lot 153 with North Eastern Route – Alternative A	0.13	9.32	0.00	7.06	0.04	2.81
4b. Western Route Alternative using Lot 153 with North Eastern Route – Alternative B	0.03	9.25	0.00	7.45	0.01	2.78
5. Western Route Alternative using Route Lots 206 & 207	0.00	7.06	0.00	6.01	0.01	2.00
5a. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative A	0.13	8.47	0.00	6.77	0.04	2.56
5b. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative B	0.03	8.40	0.00	7.15	0.01	2.53
6. Western Route Alternative using Crown Public Road	0.03	7.22	0.00	6.01	0.01	2.05

Route Description	Area of vegetation clearing for 20m construction easement (ha)				Area of vegetation modification in 6m easement (ha)	
	EEC[1]	Native Woodland and Forest[2]	Native Grassland	Exotic Vegetation[3]	EEC	Native Woodland and Forest
6a. Western Route Alternative using Crown Public Road – Alternative A	0.13	8.66	0.00	6.77	0.04	2.61
6b. Western Route Alternative using Crown Public Road – Alternative B	0.03	8.59	0.00	7.15	0.01	2.58

Source: GHD, 2009

Notes:

1. EEC collectively refers to Box-Gum Woodland EEC.

2. Native Woodland and Forest refers to Stringybark/Black Sheoak forest, Candlebark Gully Forest, Argyle Apple Forest, Cabbage Gum/Stringybark Forest, Scribbly Gum Woodland, Acacia Scrub, Frost Hollow Grassy Woodland.

3. Exotic Vegetation refers to exotic grassland and garden.

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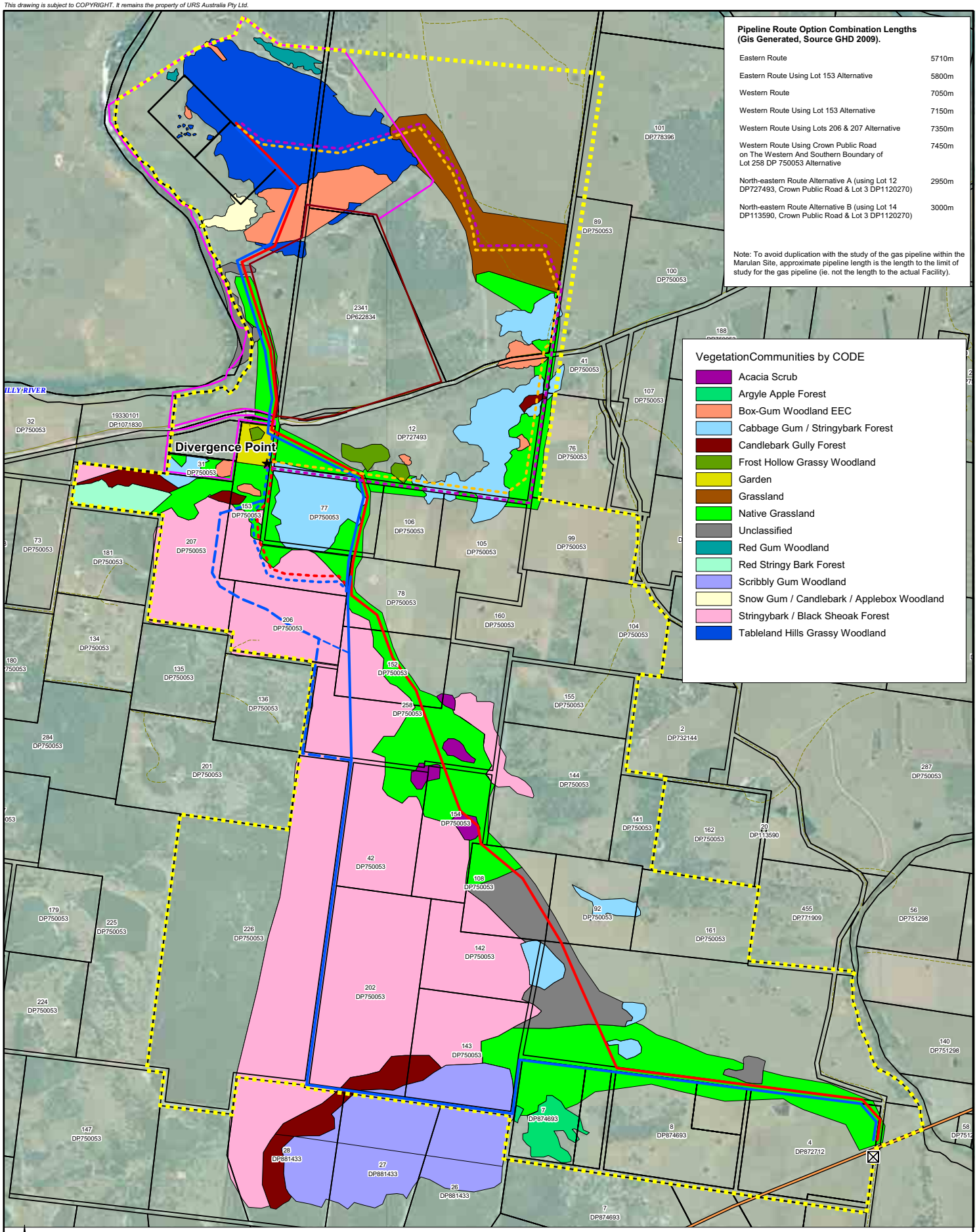
Table 4-9 Summary of Ecological Impact of Gas Pipelines – Potential Impact and Mitigation

Route Description	Potential Impacts	Impact Mitigation
1. Eastern Route	Route predominantly falls within cleared agricultural land which would be rehabilitated to existing condition. Would remove some native vegetation with moderate habitat value including native grassland and Acacia scrub. Less than 0.01 ha of native vegetation would be permanently modified within a 6m corridor maintained as understorey vegetation only.	-Impacts substantially avoided through selection of route through cleared agricultural land. - Additional minor, localised route variations to avoid patches of woodland where possible - Low impact construction techniques through native vegetation to reduce construction footprint to 10 m, wherever safe and practicable - CEMP - Management of soil erosion and runoff - Dust control - Pre clearance survey - Timing of works - Tree fauna management - Ground dwelling fauna management - Groundcover clearance protocol. - Site management - Phytophthora management - Remediation - Weed and pest management - Monitoring Given the position of the majority of the route in cleared agricultural land, limited extent of clearing, extent of retained native vegetation in the locality and mitigation measures proposed, construction of any of the pipeline route options is not likely to have a significant impact on species and communities listed under TSC or EPBC Acts.
1a. Eastern Route with North Eastern Route – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
1b. Eastern Route with North Eastern Route – Alternative B	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above.	
2. Eastern Route Alternate using Lot 153	Route predominantly falls within cleared agricultural land which would be rehabilitated to existing condition. Would remove some native vegetation with moderate habitat value including native grassland and Acacia scrub. Less than 0.01 ha of native vegetation would be permanently modified within a 6m corridor maintained as understorey vegetation only.	
2a. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
2b. Eastern Route Alternate using Lot 153 with North Eastern Route – Alternative B	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above.	
3. Western Route	Initial clearing of approximately 6.5 ha of native woodland and forest, of which approximately 2 ha would be permanently modified within a 6m corridor maintained as understorey vegetation only.	- Avoidance of impacts along some sections of the route by following existing disturbed corridors. - Additional minor, localised route variations to avoid patches of woodland where possible. - Low impact construction techniques through native vegetation to reduce construction footprint to 10 m, wherever safe and practicable. - CEMP - Management of soil erosion and runoff - Dust control
3a. Western Route with North Eastern Route – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
3b. Western Route with North Eastern Route – Alternative B	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above.	

Route Description	Potential Impacts	Impact Mitigation
4. Western Route Alternative using Lot 153	Initial clearing of approximately 8 ha of native woodland and forest, of which approximately 2.5 ha would be permanently modified within a 6m corridor maintained as understorey vegetation only.	- Pre clearance survey - Timing of works - Tree fauna management - Ground dwelling fauna management - Groundcover clearance protocol. - Site management - Phytophthora management - Remediation - Weed and pest management - Monitoring Given the limited extent of clearing, extent of retained native vegetation in the locality and mitigation measures proposed, construction of any of the pipeline route options is not likely to have a significant impact on species and communities listed under TSC or EPBC Acts.
4a. Western Route Alternative using Lot 153 with North Eastern Route – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
4b. Western Route Alternative using Lot 153 with North Eastern Route – Alternative B	Would remove 2-3 ha of native woodland and forest in addition to the impacts described above.	
5. Western Route Alternative using Route Lots 206 & 207	Initial clearing of approximately 7 ha of native woodland and forest, of which approximately 2 ha would be permanently modified within a 6m corridor maintained as understorey vegetation only.	
5a. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
5b. Western Route Alternative using Lots 206 & 207 with North Eastern Route – Alternative B	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above.	
6. Western Route Alternative using Crown Public Road	Initial clearing of approximately 7 ha of native woodland and forest, of which approximately 2 ha would be permanently modified within a 6m corridor maintained as understorey vegetation only.	
6a. Western Route Alternative using Crown Public Road – Alternative A	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above and potentially affect a small area of EEC.	
6b. Western Route Alternative using Crown Public Road – Alternative B	Would remove approximately 2 ha of native woodland and forest in addition to the impacts described above.	

Source: GHD, 2009



Pipeline Route Option Combination Lengths (Gis Generated, Source GHD 2009).

Eastern Route	5710m
Eastern Route Using Lot 153 Alternative	5800m
Western Route	7050m
Western Route Using Lot 153 Alternative	7150m
Western Route Using Lots 206 & 207 Alternative	7350m
Western Route Using Crown Public Road on The Western And Southern Boundary of Lot 258 DP 750053 Alternative	7450m
North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270)	2950m
North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270)	3000m

Note: To avoid duplication with the study of the gas pipeline within the Marulan Site, approximate pipeline length is the length to the limit of study for the gas pipeline (ie. not the length to the actual Facility).

VegetationCommunities by CODE

- Acacia Scrub
- Argyle Apple Forest
- Box-Gum Woodland EEC
- Cabbage Gum / Stringybark Forest
- Candlebark Gully Forest
- Frost Hollow Grassy Woodland
- Garden
- Grassland
- Native Grassland
- Unclassified
- Red Gum Woodland
- Red Stringy Bark Forest
- Scribbly Gum Woodland
- Snow Gum / Candlebark / Applebox Woodland
- Stringybark / Black Sheoak Forest
- Tableland Hills Grassy Woodland

0 200 400 metres

Source: GHD, 2009

Legend

- Marulan Site
- Offtake Station
- 1 Eastern Route
- 2 Eastern Route using Lot 153 Alternative
- 3 Western Route (Blue)
- 4 Western Route using Lot 153 Alternative (Blue and Broken Blue)
- 5 Western Route using Lots 206 & 207 Alternative (Blue and Broken Blue)
- 6 Western Route using Crow Public Road ("L" Shape) Alternative
- 7 North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270
- 8 North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270)
- Gas Pipeline Corridor
- Transgrid Switchyard
- Gas Turbine Footprint

Client: DELTA ELECTRICITY AND ENERGY AUSTRALIA

Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT

Title: **GAS PIPELINE- ROUTE OPTIONS & VEGETATION COMMUNITIES**

URS

Drawn: AO	Approved: NB	Date: 11/05/2009
Job No: **43177371**	File No: 43177371-236.wor	

Figure: **4-5**

Heritage

A summary of the heritage impacts for each of the route options is presented in **Table 4-10**. The heritage sites and potential sites referenced in the Table are presented on **Figure 4-6.**

Table 4-10 Summary of Heritage Impact of Gas Pipelines

Route	Potential Impacts	Mitigation Measures
Eastern Route	Four Aboriginal sites, BH1, BH3, MGPS2 and MGPS3, are located within the vicinity of the route and may be impacted by construction of the pipeline. If the BH1 isolated find is located in close proximity to an existing transmission line tower, then it is unlikely that this find would be impacted by the works, given the requirement for an adequate construction buffer around such structures. The exact location of this isolated find could not be confirmed during the present investigation.	Where possible, disturbance to archaeological sites BH1, BH3, MGPS1&PAD, MGPS2, MGPS3, MGPS 5, MGPS6 and area of potential archaeological deposit MGP PAD would be avoided. If impact to Aboriginal sites BH1, BH3, MGPS2, MGPS3, MGPS 5, MGPS6 cannot be avoided then the artefacts would be collected or relocated away from the area of impact. If disturbance is unavoidable in the vicinity of MGPS1&PAD and MGP PAD1, then a program of archaeological subsurface investigation would be conducted to determine the nature, extent and integrity of any potential archaeological deposits that may be present in these areas. The timing of the subsurface testing may occur after consent is granted and should be included in the conditions of consent for the project. Should the subsurface testing program determine the presence of high significance sites then archaeological salvage may be required. Alternatively, a redesign of the project infrastructure in that area may be required.
Eastern Route with North Eastern Route – Alternative A	As for Eastern Route with addition of two Aboriginal sites, MGPS5 and MGPS6, which are located within the vicinity of the route and may be impacted by construction of the pipeline. No heritage sites are located within the vicinity of the route.	
Eastern Route with North Eastern Route – Alternative B	As for Eastern Route with North Eastern Route Alternative A.	
Eastern Route Alternative using Lot 153	As for Eastern Route with addition of MGPS1&PAD, and one area of potential archaeological deposit, MGP PAD1, are located within the vicinity of the route and may be impacted by construction of the pipeline.	
Eastern Route Alternative using Lot 153 with North Eastern Route – Alternative A	As for Eastern Route Alternative using Lot 153 with addition of two Aboriginal sites, MGPS5 and MGPS6, which are located within the vicinity of the route and may be impacted by construction of the pipeline. No heritage sites are located within the vicinity of the route.	
Eastern Route Alternative using Lot 153 with North Eastern Route – Alternative B	As for Eastern Route Alternative using Lot 153 with North Eastern Route Alternative A.	

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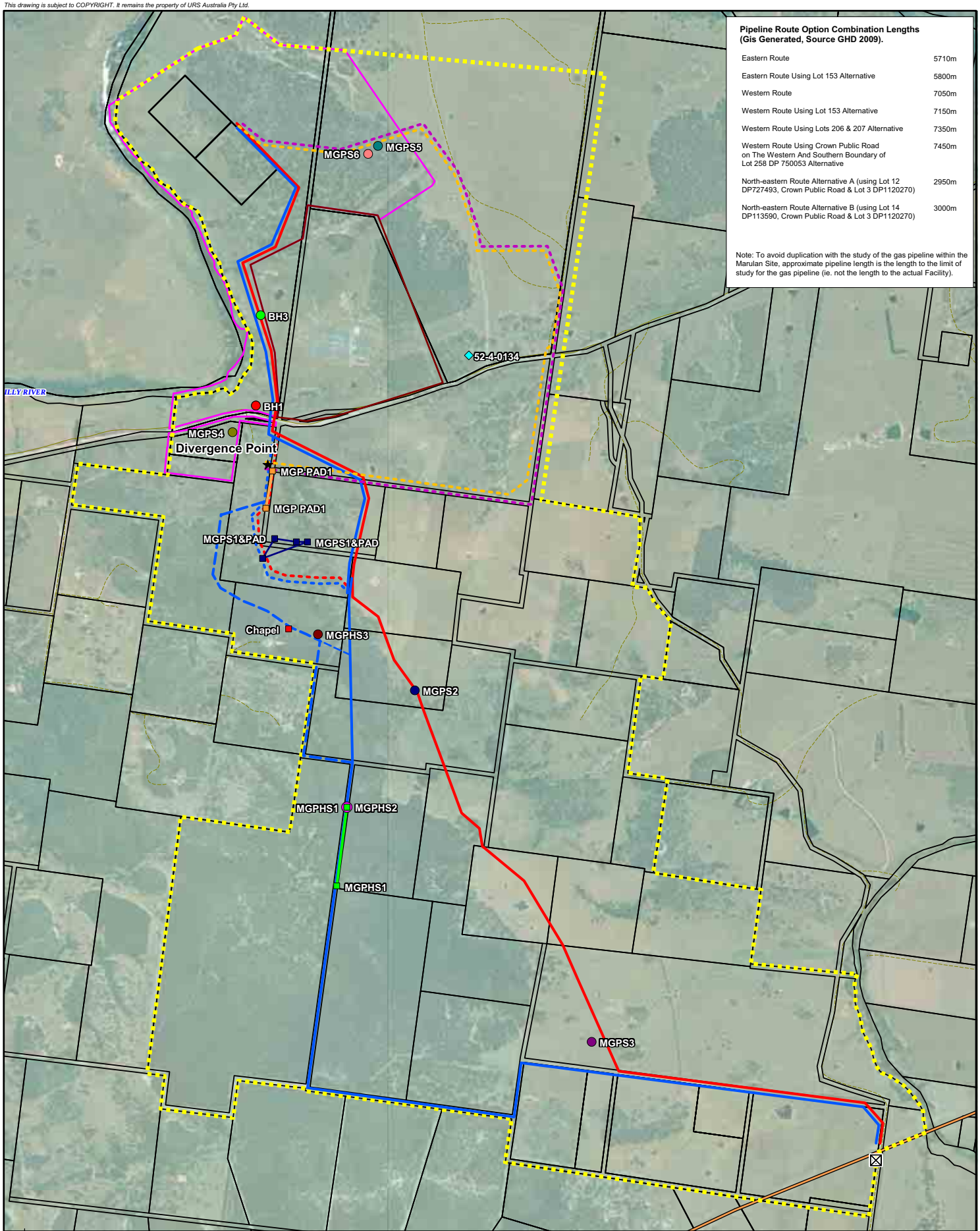
Route	Potential Impacts	Mitigation Measures
Western Route	Two Aboriginal sites, BH1, BH3 and two historical recordings MGPHS1 and MGPHS2 are located in the vicinity of the route and may be impacted by construction of the pipeline.	Where possible, disturbance to archaeological sites BH1, BH3, MGPS1&PAD, MGPS4, MGPS5, MGPS6 and area of potential archaeological deposit MGP PAD would be avoided. If impact to Aboriginal sites BH1 and BH3 cannot be avoided then the artefacts would be collected or relocated away from the area of impact. If disturbance is unavoidable in the vicinity of MGPS1&PAD and MGP PAD1, then a program of archaeological subsurface investigation would be conducted to determine the nature, extent and integrity of any potential archaeological deposits that may be present in these areas. The timing of the subsurface testing may occur after consent is granted and would be included in the conditions of consent for the project. Should the subsurface testing program determine the presence of high significance sites then archaeological salvage may be required. Alternatively, a redesign of the project infrastructure in that area may be required. If impact to Aboriginal site MGPS4, MGPS5, MGPS6 cannot be avoided then an archaeological test excavation program would be conducted within the construction footprint. The objectives of the program would be to determine the nature, extent and integrity of any archaeological deposits present, and to determine management requirements in the context of the pending construction disturbance. Should the testing program determine the presence of significant archaeological deposits, then a further program of salvage excavation may be required. The curation of any recovered Aboriginal objects would be the subject of consultation with the Department of Environment and Climate Change and the Aboriginal stakeholders. No further cultural heritage management actions are required in relation to historical recordings MGPHS1 and MGPHS2. Unnecessary direct impact to these recordings would be avoided where feasible. If it is anticipated that direct impact would occur to the movable heritage items in recording MGPHS3, then these items would be moved, in consultation with the owners of the items, to a location where there is no potential for construction impact.
Western Route with North Eastern Route – Alternative A	As for Western Route with addition of two Aboriginal sites, MGPS5 and MGPS6, which are located within the vicinity of the route and may be impacted by construction of the pipeline. No heritage sites are located within the vicinity of the route.	
Western Route with North Eastern Route – Alternative B	As for Western Route with North Eastern Route Alternative A.	
Western Route Alternative using Lot 153	As for Western Route with addition of MGPS1&PAD, one area of potential archaeological deposit, MGP1, located within the vicinity of the route and may be impacted by construction of the pipeline.	
Western Route Alternative using Lot 153 with North Eastern Route – Alternative A	As for Western Route with addition of two Aboriginal sites, MGPS5 and MGPS6, which are located within the vicinity of the route and may be impacted by construction of the pipeline. No heritage sites are located within the vicinity of the route.	
Western Route Alternative using Lot 153 with North Eastern Route – Alternative B	As for Western Route with North Eastern Route Alternative A.	
Western Route Alternative using Crown Public Road	As for Western Route with no additonal Aboriginal or historical objects, sites or places within alternative section.	
Western Route Alternative using Crown Public Road with North Eastern Route – Alternative A	As for Western Route with addition of two Aboriginal sites, MGPS5 and MGPS6, which are located within the vicinity of the route and may be impacted by construction of the pipeline. No heritage sites are located within the vicinity of the route.	

Route	Potential Impacts	Mitigation Measures
Western Route Alternative using Crown Public Road with North Eastern Route – Alternative B	As for Western Route with North Eastern Route Alternative A.	



Pipeline Route Option Combination Lengths (Gis Generated, Source GHD 2009).

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Western Route Using Crown Public Road on The Western And Southern Boundary of Lot 258 DP 750053 Alternative	7450m
North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270)	2950m
North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270)	3000m

Note: To avoid duplication with the study of the gas pipeline within the Marulan Site, approximate pipeline length is the length to the limit of study for the gas pipeline (ie. not the length to the actual Facility).

0 200 400
metres

Source: GHD, 2009

Legend

- Marulan Site
- Offtake Station
- 1 Eastern Route
- 2 Eastern Route using Lot 153 Alternative
- 3 Western Route (Blue)
- 4 Western Route using Lot 153 Alternative (Blue and Broken Blue)
- 5 Western Route using Lots 206 & 207 Alternative (Blue and Broken Blue)
- 6 Western Route using Crow Public Road ("L" Shape) Alternative
- 7 North-eastern Route Alternative A (using Lot 12 DP727493, Crown Public Road & Lot 3 DP1120270
- 8 North-eastern Route Alternative B (using Lot 14 DP113590, Crown Public Road & Lot 3 DP1120270
- Gas Pipeline Corridor
- Transgrid Switchyard
- Gas Turbine Footprint

Client: DELTA ELECTRICITY AND ENERGY AUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **LOCATIONS OF HERITAGE SITES AND POTENTIAL SITES**
URS	Drawn: AO; Approved: NB; Date: 11/05/2009; Job No: **43177371**; File No: 43177371-239.wor	Figure: **4-6**

Land use and infrastructure

The majority of the pipeline (to the south of Canyonleigh Road) would be located within the Goulburn Mulwaree local government area (LGA). The portion of the pipeline to the north of Canyonleigh Road would be located in the Upper Lachlan Shire LGA.

The relevant local environmental plan for the pipeline as a whole is the *Mulwaree Shire Local Environmental Plan 1995*. The route is located within Zone No. 1(a) (General Rural). Pipelines are permissible within this zone with development consent.

The pipeline would be laid in stages to ensure that only small sections of the easement are disturbed at anyone time. The topsoil would be replaced as soon as possible at the conclusion of each section. The topsoil would contain the original seed bank and rootstock of the pasture and, as such, the pasture may regrow unaided in many instances. However, as required, pasture seed and fertiliser compatible with the surrounding pasture would be re-sown to rehabilitate the area over the pipeline.

Once it has been rehabilitated the land above the pipeline route would be able to be returned to grazing and normal agricultural activities without the need for any further mitigation measures.

Access to the proposed gas pipeline route and the suitability of local roads would be considered during the further assessments that would be undertaken to confirm the traffic and access arrangements to the facilities' site.

Detailed services searches would be undertaken during detailed design to identify and locate underground services located in the road reserve. The pipeline design would aim to ensure that services are not impacted. Should impacts to underground services be unavoidable, consultation with the service provider would be undertaken and the services would be relocated prior to construction.

Environmental management measures would be implemented during construction as outlined in the CEMP to minimise the potential for impacts on the environment (including the nearest dwelling) with respect to air quality, noise and traffic impacts.

Water quality

Construction phase impacts would generally be managed by the implementation of standard environmental management measures as defined in the construction environmental management plan would be prepared regardless of which option proceeds. Such measures would significantly decrease the likelihood of adverse environmental impacts.

The construction environmental management plan would include a construction soil and water management plan detailing construction phase stormwater management strategies in accordance with *Landcom Soil and Construction, Managing Urban Stormwater* (Landcom, 4th edition, 2004). These would include amongst others:

- General site practices and responsibilities;
- Material management practices;
- Stockpile practises;
- Topsoil practices; and

Section 4 Preferred Project Information

- Erosion control practices (earth sediment basins, straw bales, sediment fences, turbidity barriers, stabilised site accesses, diversions and catch drains).

The trenching would be undertaken progressively in stages, to minimise the time that disturbed land is exposed and ensure that soil stockpiling is kept to a minimum. The stockpiles would be established in an appropriate manner and sediment fencing would be installed to ensure that no sediment is able to enter receiving waters through surfacewater runoff.

In the case where a trench would have to intersect the water table, a Groundwater Management Plan would be prepared. The water table would be intercepted and water extracted from the site in accordance with the Groundwater Management Plan. It is expected that construction areas would be rehabilitated and proposed stormwater controls would provide best practice management of potential erosion scour and sediment transport from the site during wet weather events.

Noise

A Construction Noise Management Plan would be prepared regardless of which option proceeds. This would include the following mitigation measures:

- where practical, machines would be switched off when not in use;
- machines found to produce excessive noise compared to normal industry standards would be removed from the site or stood down until repairs or modifications can be made;
- haulage and delivery trucks would be fitted with appropriate mufflers and be in good working order;
- construction hours would be limited to DECC guidelines; and
- a community liaison person would be appointed to communicate with potentially affected residents prior to particularly noisy works and to actively respond when complaints are received.

Air quality

A Dust Control Plan detailing measures to control the potential for dust generation would form part of the construction environmental management plan regardless of which option proceeds. Measures would target dust generation by vehicle movements and excavation works. Typical mitigation measures would include:

- ensuring exposure time of uncovered surfaces is minimised;
- covering stockpiles and loads; and
- site management controls.

Traffic

A Construction Traffic Management Plan would be prepared as part of the Construction Environmental Management Plan regardless of which option proceeds. It would be prepared in consultation with road authorities to minimise the potential for construction traffic impact on the surrounding road network and disruptions within roads and road reserves. The plan would include measures to ensure public safety and access is maintained, and that disruptions are minimised as far as possible.

The plan would include measures such as the use of one-way traffic and appropriate fencing, provision of detour routes, signs and traffic control measures that would be installed.

4.5.5 Route Options Analysis

A summary of the route options is presented in **Table 4-11**.

Table 4-11 Summary of Route Options

Aspect	Eastern pipeline and alternatives	Western pipeline and alternative
Landowners (no.)	2-4 1 landholding in probate	2-4
Ecology	Route predominantly falls within cleared agricultural land which would be rehabilitated to existing condition. Approximately 1-3 ha of native woodland would be cleared. Approximately 1 ha of native vegetation would be permanently modified within a 6 m corridor maintained as understorey vegetation only. Would remove some native vegetation with moderate habitat value, including native grassland that would be remediated to its original condition.	Initial clearing of approximately 7-9 ha of native woodland and forest, of which approximately 2-3 ha would be permanently modified within a 6 m corridor maintained as understorey vegetation only. Would remove some native vegetation with moderate habitat value, including native grassland that would be remediated to its original condition.
Heritage	4-6 sites and 1 PAD	2-4 sites and 1 PAD
Land use	Rehabilitation of land above the pipeline route to be returned to grazing and normal agricultural activities without the need for any further mitigation measures.	Rehabilitation of land above the pipeline route to maintain modified corridor of shrubs and groundlayer (not relevant to areas of native pasture).
Water Quality	Managed through CEMP including soil and erosion control measures.	
Noise	Managed through Construction Noise Management Plan.	
Air quality	Managed through Dust Management Plan as part of the CEMP.	
Traffic	Managed through Construction Traffic Management Plan.	
Indicative landowner views	Potential for severe impact on livestock and agricultural production. Propensity for the gas pipeline to require maintenance. Extensive improvements have been carried out and improved pastures established. Paddocks are used for sheep and cattle grazing and any disruption would have a consequential effect on the landowner's livelihood - the pipeline would have negative financial effect on farm operations. Substantial impact on the ability to subdivide lots with a pipeline located across the land parcels. Inability to reinstate the land back to its former condition (that is, pipeline markers) and certain limitations would be imposed.	Avoids improved and grazed pastures. Reduces impact on ability to subdivide lots.
Indicative RFS preference		Alternative access provided for bushfire management from the Hume Highway in the south and from Canyonleigh Road in the north, as well as creating a fire break.

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Although the Proponent is seeking approval for all of the gas pipeline routes (eastern, western and respective alternatives) in order to maintain flexibility in negotiations and detailed design, the Western pipeline route generally is the Proponent's preference.

In the circumstances where the Proponent's preferred route (Western pipeline route) is through a vegetated area that cannot be avoided, this Report addresses the mitigation strategies, commitments and offsets proposed for the gas pipeline construction.

4.6 Facilities' Infrastructure

Further to the information presented in the Joint Concept Environmental Assessment and Project Applications, the following refinements are made to the following Facility Site infrastructure:

- Facilities' southern boundary;
- Laydown Area;
- access road alignment within the Site;
- gas pipeline within the Site;
- transmission line; and
- Marulan Site boundary.

Each of these elements is discussed in more detail below.

4.6.1 Facilities' southern boundary

Based on further ecology assessments conducted on the Site (discussed further in **Section 4.7**), an area of Box-Gum Woodland (listed as and Endangered Ecological Community (EEC) under the *Threatened Species Conservation Act 1995* (TSC Act)) (referred to herein as TSC EEC) was identified within the Marulan Site. The Box-Gum Woodland TSC EEC was mapped as being predominantly in the south eastern corner of the Site with a small area that extended into the Facilities' footprint.

Based on the need to avoid the Box-Gum Woodland TSC EEC, the Proponent has committed to moving the southern boundary of the Facilities northward to avoid the Box-Gum Woodland TSC EEC. The proposed boundary presented in **Figure 4-7** does not intersect the mapped Box-Gum Woodland TSC EEC.

4.6.2 Laydown Area

Based on the Proponent's commitment to avoiding the Box-Gum Woodland TSC EEC, the southern boundary of the Facilities' footprint has been moved northward. On this basis there may be a need to utilise some or all of the laydown area for some non-critical components of the Facilities.

4.6.3 Access Road

Based on further ecology assessments conducted on the Site (discussed further in **Section 4.7**), Box-Gum Woodland TSC EEC was mapped as being predominantly in the south eastern corner of the Site in the area that the Joint Concept Environmental Assessment and Project Applications presented the access road and gas pipeline options.

Based on the need to avoid this TSC EEC, further assessment was undertaken to refine the access road alignment within the Site as far as possible and hence reduce the impact of the Facilities. Based on this assessment, the revised access road options are presented in **Figure 4-8**.

Of these two options, a preliminary assessment determined that Option D was a feasible option and therefore avoided clearing of the TSC EEC. This option is presented as the preferred alignment for the access road on the basis that while it requires clearing of Tableland Hills Grassy Woodland, it avoids the need for clearing of the Box-Gum Woodland TSC EEC. The final alignment would be refined during detailed design but would remain outside the area mapped in **Figure 4-7** as Box-Gum Woodland TSC EEC. It also allows the TSC EEC to be included in the revised Offset Area as discussed further in **Section 4.8**.

4.6.4 Gas Pipeline

It is noted that for the purposes of this section, the gas pipeline refers to the portion of the gas pipeline within the Marulan Site from the gully located east of the TransGrid Site to the connection at the Facilities' footprint. South of this, to the connection at the Moomba to Sydney Gas Pipeline, the gas pipeline is considered as part of gas pipeline assessment presented in **Section 4.5** of this Report.

The gas pipeline options within the Marulan Site presented in the Joint Concept Environmental Assessment considered the potential that the gas pipeline may be located in either the eastern or western quadrant of the gas pipeline corridor. Therefore a western (Option 1) and eastern (Option 2) option within the Marulan Site were presented in the Joint Concept Environmental Assessment.

Based on the refinement of the gas pipeline options presented in **Section 4.5**, the eastern pipeline option (Option 2) within the Marulan Site is unlikely to be required. In addition, removal of this option also reduces the potential impact on the dominant area of Box-Gum Woodland TSC EEC identified within the Site on **Figure 4-7**.

The western pipeline option within the Site has also been realigned to be contained wholly within the Marulan Site and not traversing the adjacent TransGrid property as presented originally.

The gas pipeline was also realigned to avoid the Box-Gum Woodland TSC EEC.

The revised pipeline route within the Marulan Site is presented on **Figure 4-7**.

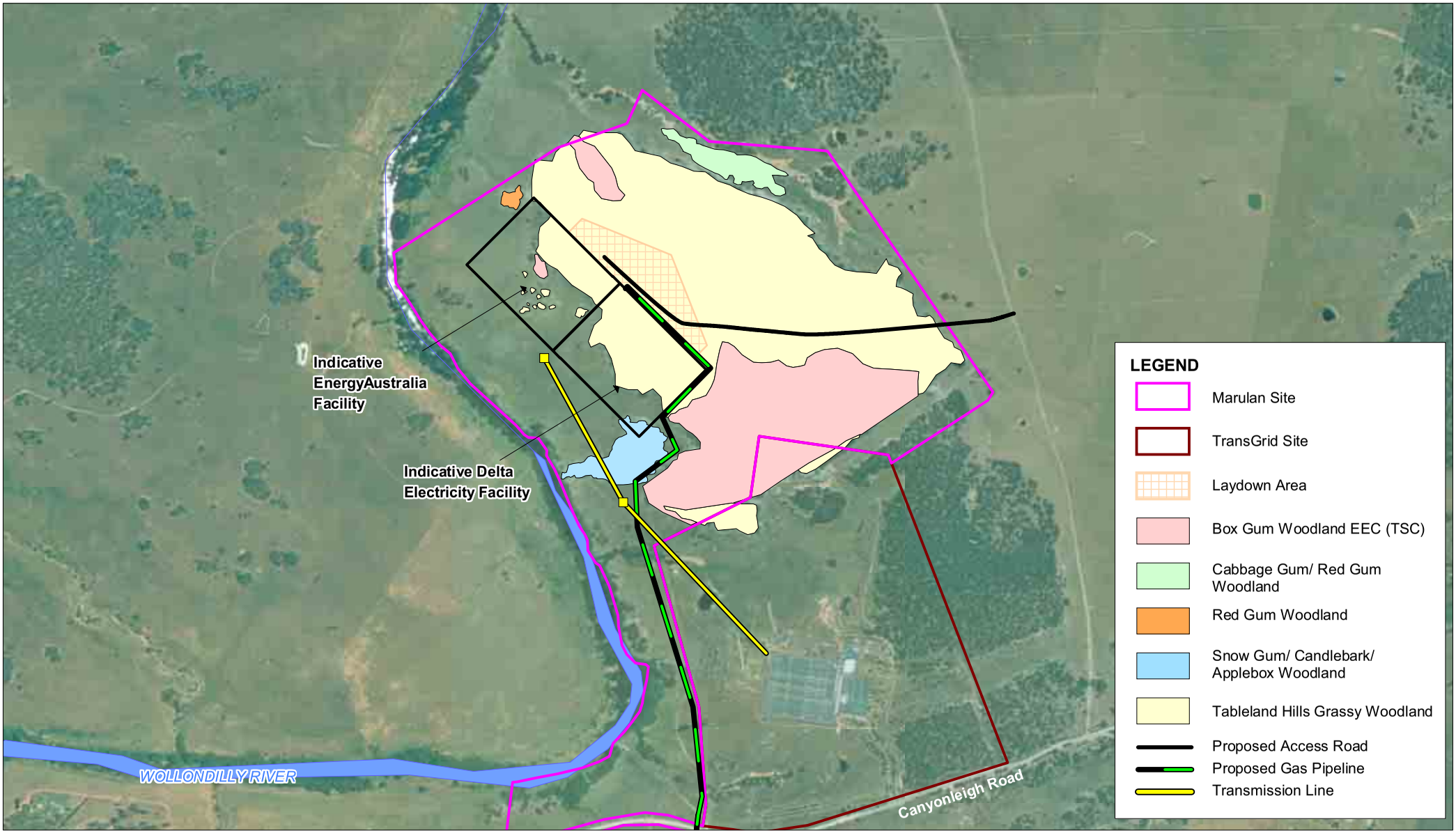
4.6.5 Transmission Line

The transmission line has been realigned to avoid fragmenting the Box-Gum Woodland TSC EEC. The revised transmission line route within the Marulan Site is presented on **Figure 4-7**.

The Joint Concept Environmental Assessment referenced the transmission line as likely to be rated 500 MVA. The correct proposed rating is 850 MVA. Other than the change to the rating, the footprint of impact for the transmission line is to be substantially the same as that shown for the 500 MVA transmission line and therefore no additional impact assessment is considered necessary.

4.6.6 Marulan Site boundary

It has been identified that illustrated figures in the Environmental Assessments did not present the entirety of the Marulan Site owned by the Proponent. A small area to the south of Canyonleigh Road was omitted from the Marulan Site boundary. This has been rectified and the correct boundary is presented in **Figure 4-7**.



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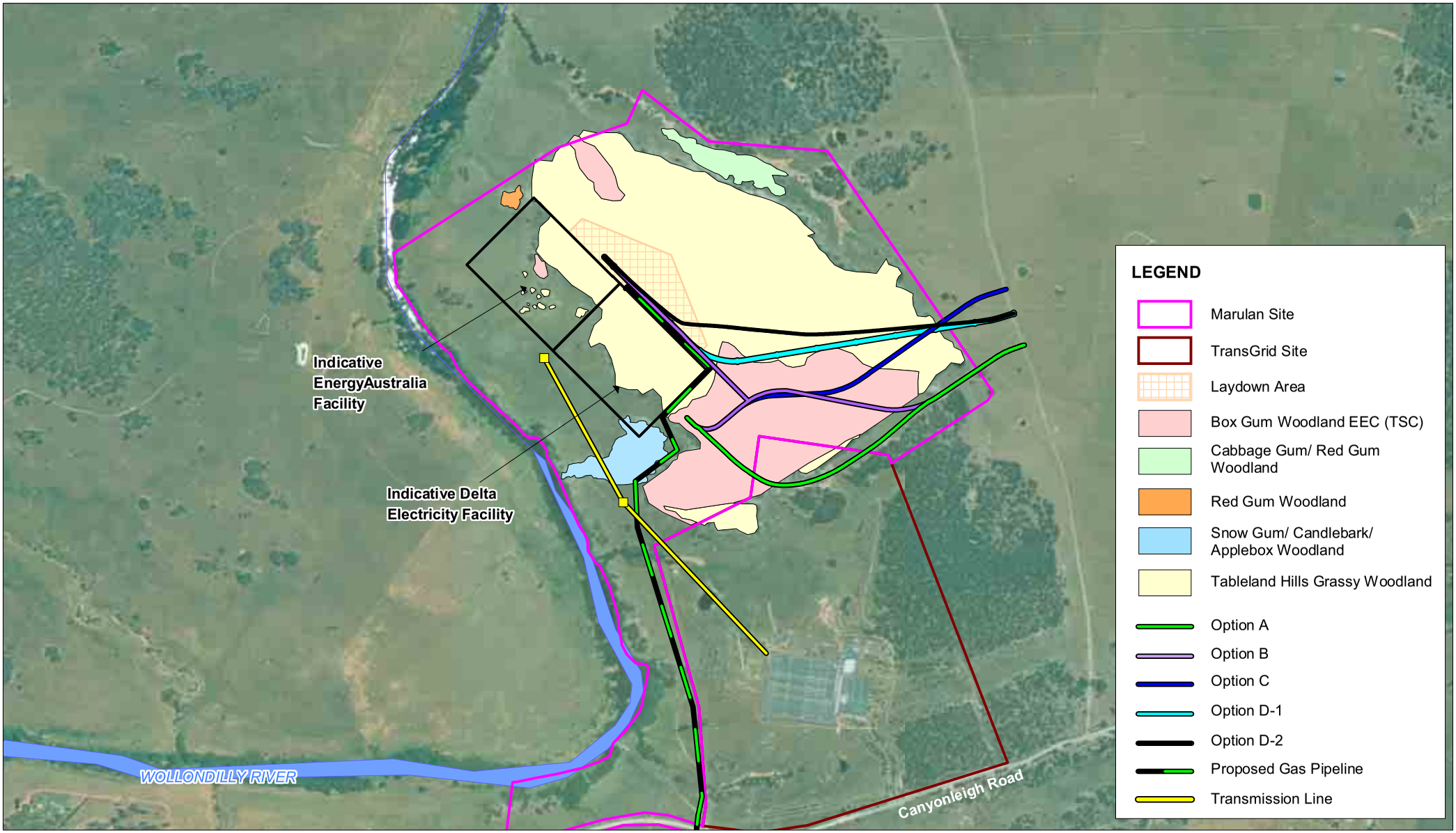
Source: Delta Electricity, EnergyAustralia

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES - TRAFFIC ASSESSMENT	Title: **REVISED INDICATIVE SITE LAYOUT AND VEGETATION COMMUNITIES**
URS	Drawn: AO · Approved: NB · Date: 04/03/2009 Job No: **43177371** · File No: 43177371-224.wor	Figure: **4-7**



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Source: Delta Electricity, EnergyAustralia

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **ROAD ACCESS OPTIONS**
URS	Drawn: AO; Approved: NB; Date: 04/03/2009 Job No: **43177371**; File No: 43177371-231.wor	Figure: **4-8**

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4.7 Biodiversity Assessment – Marulan Site

Further biodiversity surveys were undertaken on the Facility Site by GHD in November 2008 (preliminary survey) and by URS in January 2009. This mapping updates the mapping provided in the Biodiversity / Flora and Fauna Assessment presented in the Joint Concept Environmental Assessment. A discussion of the mapping of the EEC is presented in full in **Appendix H**. This section provides a summary of the assessment.

4.7.1 Methodology

The URS field survey aimed to:

- conduct detailed vegetation surveys of areas mapped as Box-Gum Woodland to confirm the condition and hence, level of listing of the EEC (State – NSW *Threatened Species Conservation Act* 1995 (TSC Act), or Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act));
- identify vegetation to species level where possible; and
- define the potential impacts of the project on the EEC within the study area.

The URS ecologists undertook the following tasks:

- Using existing vegetation mapping of the area, including broad scale vegetation mapping by Keith (2004) and previous mapping by URS and GHD, URS ecologists traversed the Site to confirm the community composition and boundaries of woodland vegetation communities. Boundaries of woodland communities were based on vegetation associations including dominant and associated species.
- To determine the quality and potential listing of box gum woodland under Commonwealth legislation random quadrats (20 m x 20 m) were established in areas mapped as box gum woodland. Flora species within each quadrat were identified to species level.

4.7.2 Summary of Assessment

The more recent assessment identified the following areas of Box Gum Woodland as shown on **Figure 4-7**:

- Area 1 – larger area in the south eastern portion of the Site with a small portion in the Facility footprint and part of the area traversed by the infrastructure as was proposed for the Joint Concept Environmental Assessment;
- Area 2 – small area in the north western portion of the Site within the Facilities footprint; and
- Area 3 - small area in the north western portion of the Site within the proposed offset area.

Table 4-12 provides a summary of the conclusions of the mapping undertaken by URS.

Table 4-12 Summary of Box Gum Woodland Mapping and TSC / EPBC Correlation

Area	Within proposed footprint	Description	Correlation with TSC Box Gum Woodland EEC Guidelines	Correlation with EPBC Box Gum Woodland EEC Guidelines
Area 1	Small portion in Facilities footprint Small portion traversed by transmission line	Based on assemblage composition the woodland community in Area 1 (15.81 ha) is comprised of two sub communities, mapped as Area 1a (11.39 ha) and 1b (4.42 ha)	Meets TSC EEC	Does not meet EPBC EEC
Area 2	Yes	The vegetation community in Area 2 (0.13 ha) was dominated by yellow box and argyle apple, with an exotic understorey of serrated tussock	Meets TSC EEC	Does not meet EPBC EEC
Area 3	No - within proposed offset area	The box gum woodland mapped as Area 3 was dominated by argyle apple and thin-leaved stringybark, with scattered immature yellow box. The understorey was dominated by the noxious weed serrated tussock	Meets TSC EEC	Does not meet EPBC EEC

Tableland Grassy Hills Woodland

The mapping of the remaining majority of the area Marulan Site as Tableland Grassy Hill Woodland remains consistent with the conclusions drawn in the Flora and Fauna Assessment presented in the Joint Concept Environmental Assessment. The assessment concluded that the vegetation structure and suite of species was characteristic of the Tableland Hills Grassy Woodland community of Tindall *et al.* (2004). Edges of this vegetation community are currently infested by the noxious weed serrated tussock, significantly reducing the quality of this vegetation community.

The Flora and Fauna Assessment concluded that Tableland Hills Grassy Woodland does not form part of the Box-Gum Woodland EEC. The key reasons supporting this position were presented as:

- The key characteristic canopy species of Box-Gum Woodland are white box *Eucalyptus albens*, yellow box *E. melliodora* and Blakely's gum *E. blakelyi*. These species are not present within the Tableland Hills Grassy Woodland community.
- The canopy species recorded within the Tableland Hills Grassy Woodland community (*Eucalyptus cinerea, E. rossii* and *E. eugenioides*) are not listed as 'characteristic' species under the definition of Box-Gum Woodland in the *Final Determination* of the NSW Scientific Committee (2004).
- The Box-Gum Woodland *Identification Guidelines* (NPWS, undated) states that 'Whether the characteristic trees of the site are (or are likely to have been) White Box, Yellow Box or Blakely's Red Gum'. As noted above, these species are not the characteristic species of the Site, and are unlikely to have ever been present within this community.
- Reference to the most recent publicly available regional vegetation mapping and report (Tindall *et al.* 2004) indicates that Tableland Hills Grassy Woodland is not part of the Box-Gum Woodland association.

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4.7.3 Potential Impacts

For the purposes of this assessment it has been assumed that the earthworks create a level pad to accommodate both Facilities. A laydown area for the Facilities would also be located on the Site. Other Common Shared Works include the proposed gas pipeline, access road from Canyonleigh Road and transmission line connection to the TransGrid Switchyard. As discussed in **Section 4.6** the alignment of the gas pipeline, transmission line and access road have been altered from that presented in the Joint Concept Environmental Assessment and this alignment is included in the summary below. It has been conservatively assumed that the entire 70 m easement for the access road and transmission line connections and 20 m for the gas pipeline would be cleared. Bulk earthworks for the Common Shared Works on the Site would require clearing of the areas identified in **Table 4-13**.

Table 4-13 Summary of Vegetation Clearing within Marulan Site

Component	Area of component within vegetation community (ha)					Total
	Box Gum Woodland TSC EEC	Cabbage Gum / Red Gum Woodland	Snow Gum / Candlebark / Applebox Woodland	Tableland Hills Grassy Woodland	Cleared Grassland	
Delta Facility			0.1	4.3	2.7	7.1
EnergyAustralia Facility	0.1			2.2	4.8	7.1
Laydown Area				4.2		4.2
Common Infrastructure[1]			0.6	4.6	6.9	12.1
Construction Footprint (Sum)[2]	***0.1***	***0***	***0.7***	***15.3***	***14.4***	***30.5***

Notes:

1: Assumptions for easements in calculations are as follows: Gas pipeline - 20 m easement to gully, Transmission Line - 70m easement and includes area in the TransGrid Site, Access road - 70 m easement
2. Construction footprint includes an area of an existing easement within the Marulan Site benefitting the University of Sydney for purposes of transmission.
3. Biodiversity Offset Area excludes an area of an existing easement within the Marulan Site benefitting the University of Sydney for purposes of transmission.

In summary, the following points are noted:

- The Marulan Site is approximately 120 ha total.
- The construction footprint is 30.5 ha comprising:
  - cleared grassland (14.4 ha or 47.2 % of construction footprint);
  - Tableland Hills Grassy Woodland (15.3 ha or 50.2 %);
  - Box Gum Woodland TSC EEC (0.1 ha or 0.3 %); and
  - Snow Gum / Candlebark / Applebox Woodland (0.7 ha or 2.2 %).

Flora

Development at the Marulan Site would require the clearing of approximately 30.5 ha of vegetation, comprising 15.3 ha of Tableland Hills Grassy Woodland, 14.4 ha of Cleared Grassland, and 0.1 ha of Box Gum Woodland TSC EEC and 0.7 ha Snow Gum / Candlebark / Applebox Woodland (**Table 4-12**). There is approximately 38.7 ha of Tableland Hills Grassy Woodland present within the Site, including areas within existing easements. Approximately 21.7 ha of the woodland would be permanently conserved within the proposed biodiversity offset area. Tindall *et al.* (2004) estimate that approximately 18,800 ha of Tableland Hills Grassy Woodland remains in south-eastern NSW. This community is not currently listed as threatened and no threatened flora species were recorded within the community. Whilst this community is not listed as threatened at the State level, on a regional scale it has been highly cleared within the CMA area. Conservation of 21.7 ha of Tableland Hills Grassy Woodland in perpetuity, including the management of noxious weeds, would increase the long-term viability of this community within the region. Additionally it would protect a larger area of low quality woodland than would be cleared by the Proposal.

There is approximately 15.1 ha of Box Gum Woodland TSC EEC present within the Site. Approximately 13.8 ha of the Box Gum Woodland TSC EEC would be permanently conserved within the proposed biodiversity offset area.

An existing easement is located within the Marulan Site benefitting the University of Sydney for the purposes of a potential future transmission line. The total area of the easement within the Marulan Site is approximately 4.5 ha. The terms of the easement do not currently allow this easement to be included in the proposed Offset Area. This easement covers an area within the Marulan Site of 1.2 ha of Box Gum Woodland TSC EEC, 2.1 ha of Tableland Hills Grassy Woodland 1.3 ha of cleared grassland. Further discussions may be undertaken between with the Proponent and the University of Sydney regarding this easement.

Where possible Delta Electricity and Energy Australia have avoided impacts on the Box Gum Woodland TSC EEC, these are outlined below.

- **Facility Footprint:** The location of the footprint within the Site was also assessed as presented in Section 3.7 of the Joint Concept Environmental Assessment. Consideration was given to the location of the Facility footprint within the proposed Marulan Site. These factors included:
  - proximity to the Wollondilly River in relation to flooding issues and required setbacks;
  - potential visual catchment;
  - flora and fauna implications; and

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– noise implications.

Based on the need to avoid this EEC, further assessment was undertaken to refine the access road alignment within the Site to avoid this EEC as far as possible and hence reduce the impact of the Facilities. The southern boundary of the Facilities' footprint has been moved northward to avoid the Box-Gum Woodland TSC EEC. One small non-contiguous patch (approximately 0.13 ha) in the north western portion of the Site cannot be avoided by moving the Facilities' footprint based on the other constraints within the Site.

- **Access Road:** Based on the need to avoid this EEC, further assessment was undertaken to refine the access road alignment within the Site to avoid this EEC as far as possible and hence reduce the impact of the Facilities. This option is presented as the preferred alignment for the access road on the basis that while it requires clearing of Tableland Hills Grassy Woodland, it avoids clearing of the Box-Gum Woodland TSC EEC. The final alignment would be refined during detailed design but would remain on the western edge of the area as Box-Gum Woodland TSC EEC.

- **Gas Pipeline:** A western (Option 1) and eastern (Option 2) option for the gas pipeline were presented in the Joint Concept Environmental Assessment within the Marulan Site (**Figure 2-3** of this Report). Based on the refinement of the gas pipeline options, the eastern pipeline option (Option 2) within Marulan Site is unlikely to be required. In addition, removal of this option also reduces the potential impact on the dominant area of Box-Gum Woodland identified within the Site. The western pipeline option within the Site has also been realigned to be contained wholly within the Marulan Site and not traversing the adjacent TransGrid property as presented originally.
  In addition the alignment of the gas pipeline within the Marulan Site has been moved west to avoid clearing of the EEC.

Given the avoidance measures for the footprint and Site infrastructure outlined above, the proposed Project avoids the larger mapped area of Box-Gum Woodland TSC EEC within the constraints regarding the existing University of Sydney easement. One small non-contiguous patch (approximately 0.1 ha) in the north western portion of the Site cannot be avoided by moving the Facilities' footprint based on the other constraints within the Site. The existing University of Sydney easement covers an area of 1.2 ha of Box-Gum Woodland TSC EEC.

Fauna

Clearing of woodland habitat would result in the loss of nesting, roosting and foraging resources for native fauna. The Project footprint contains a number of habitat features including feed trees, hollow bearing trees, standing and fallen dead timber, and a good coverage of leaf litter and woody debris. Approximately 75 % of the mapped area of this habitat, and associated habitat values, would be retained within the Site. The habitat values of the vegetation surrounding the Site are likely to be equivalent to those within the Site and as such the loss of habitat associated with construction is unlikely to have a significant impact upon local populations of native fauna.

Clearing of woodland for the Project is unlikely to result in significant isolation or fragmentation of habitat. The position of the proposed Facilities is such that contiguity of woodland is maintained in areas adjoining the proposed Facility. There would be some fragmentation of remaining woodland to the south caused by the proposed access road, gas pipeline and transmission line. The gaps created by this common infrastructure are likely to have a minor impact upon the movement of native fauna due to the relatively small area of disturbance initially (<20 m) and smaller areas of impact following rehabilitation (eg. 20 m gas pipeline cleared during construction would be rehabilitated to a 6 m corridor). In addition woodland on the Site is already highly fragmented by existing infrastructure including the TransGrid switchyard, access tracks and transmission line easements. There may be additonal fragmentation from future development within the existing University of Sydney easement although it is understood that future development would need to be addressed through a separate approvals process.

Approximately 14.4 ha of pasture grassland would be removed during construction of the Project (**Table 4-14**). Habitat values in cleared areas are low and so the construction of the Facilities and infrastructure is likely to have negligible impact on ecological values.

4.8 Project Biodiversity Offset Assessment

Biodiversity Offsets have been considered as a whole for the Facilities (and on-site infrastructure), gas pipeline connection to the Moomba to Sydney Gas Pipeline, and water supply pipeline.

This section provides a discussion of the overall Biodiversity maintenance and improvement.

Table 4-14 provides a summary of the clearing and offset provided for the Project as a whole (i.e. Marulan Facilities' Site and gas pipeline, including worst case scenario for each of the Western and Eastern pipeline options and alternatives).

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Table 4-14 Summary of Project Vegetation Clearing

Component	Area of component within vegetation community type (ha)				Total
	EEC	Native Woodland and Forest	Native Grassland	Exotic Vegetation	
Within the Marulan Site	0.1[1]	15.6[2]		14.4	30.10
Gas pipeline					
Maximum clearing for pipeline route and alternatives					
Initial 20 m clearing	0.1	9.3[3]		7.1	16.5
Modified 6 m clearing	0.04	2.8[3]			2.9
Biodiversity Offset Area	**14.2[5]**	**23.3[4]**		**8.2**	**45.7[5]**

Notes:

1. EEC for the Marulan Site and gas pipeline collectively refers to Box Gum Woodland EEC.

2. Native Woodland for the Marulan Site collectively refers to Cabbage Gum / Red Gum Woodland, Snow Gum / Candlebark / Applebox Woodland, Tableland Hills Grassy Woodland.

3. Native Woodland and Forest for the Gas Pipeline refers to Stringybark/Black Sheoak forest, Candlebark gully Forest, Argyle Apple Forest, Cabbage Gum/Stringybark Forest, Scribbly Gum Woodland, Acacia Scrub, Frost Hollow Grassy Woodland.

4. Native Woodland and Forest for the Biodiversity Offset collectively refers to Cabbage Gum / Red Gum Woodland and Tableland Hills Grassy Woodland.

5. Includes an additonal 0.4 ha located south of the Marulan Site (south of Canyonleigh Road – Lot 153 DP 750053 – also owned by the Proponent) as discussed in Section 4.8.6.

4.8.1 Impact Avoidance

Table 4-15 summarises the means of avoidance of vegetation clearing employed for the Project.

Table 4-15 Avoidance of Impact for the Marulan Project

Element	Means of Avoidance of Clearing
Facility Footprint	Locating the proposed Facilities as far as possible in cleared areas, aiming to avoid woodland areas. The location of the Facilities was constrained by the need to remain at some distance from the Wollondilly River, so the footprint is located partly within cleared pasture and partly within woodland. Based on the need to avoid this EEC, further assessment was undertaken to refine the access road alignment within the Site to avoid this EEC as far as possible and hence reduce the impact of the Facilities. The southern boundary of the Facilities' footprint has been moved northward to avoid the Box-Gum Woodland TSC EEC. One small non-contiguous patch (approximately 0.13 ha) in the north western portion of the Facilities' footprint cannot be avoided by moving the Facilities' footprint based on the other constraints within the Site.
Access Road (within Marulan Site)	Further refinement of the access road alignment within the Site to avoid the Box Gum TSC EEC as far as possible and hence reduce the impact of the Facilities. This option is presented as the preferred alignment for the access road on the basis that while it requires clearing of Tableland Hills Grassy Woodland, it avoids clearing of the Box-Gum Woodland TSC EEC. The final alignment would be refined during detailed design but would remain on the north eastern edge of the area as Box-Gum Woodland TSC EEC.
Gas Pipeline (within Marulan Site)	Based on the refinement of the gas pipeline options, the eastern pipeline option (Option 2) presented in the Joint Concept Environmental Assessment) within Marulan Site is unlikely to be required. In addition, removal of this option also reduces the potential impact on the dominant area of Box-Gum Woodland identified within the Site. The western pipeline option within the Site has also been realigned to be contained wholly within the Marulan Site and not traversing the adjacent TransGrid property as presented originally. In addition the alignment of the gas pipeline within the Marulan Site has been moved west to avoid clearing of the EEC.
Gas Pipeline (Marulan Site to Moomba Sydney Pipeline)	Avoidance of certain geological features such as rocky outcrops, severe side slope, and river and creek crossings where possible. Preference for route selection was given to routes in the mid to western quadrants of the corridor that followed paper / Crown Public Roads / land parcel boundaries where possible. Balance of impacts associated with needs of the property owners likely to have the gas pipeline traversing their property, preference of RFS for a route that provides additional access from a bushfire management perspective, portions of the western route exist along already cleared paths would minimise vegetation disturbance.
Water Supply Pipeline	Preliminary study undertaken only. Surveys to be undertaken and refinement of pipeline route if the option of supplying water to the Marulan Site via pipeline is progressed. It is noted that the water supply pipeline is one option for supply of water for the Project. Trucking of water is also proposed. The water source yet to be confirmed by the Proponent. Likely that proposed works would be contained within a narrow easement that has previously been cleared for road development and/or gas pipeline instalment and maintenance.

As noted in **Section 4.7.3,** an existing easement is located within the Marulan Site with a total area of approximately 4.5 ha, benefitting the University of Sydney for the purposes of transmission. The terms of the easement do not currently allow this easement to be included in the proposed Offset Area. Further discussions may be undertaken between with the Proponent and the University of Sydney regarding this easement.

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4.8.2 Impact Mitigation

Environmental Management Plan

An Environmental Management Plan (EMP) would be developed for the construction and operational phases of the proposal and would include measures for the minimisation or avoidance of impacts on native flora and fauna. An overview of the impact mitigation and environmental management measures proposed for flora and fauna is provided below. The EMP would contain further details regarding these measures, including performance indicators, timing and responsibilities.

Tree Fauna Management

Care would be taken during clearing to reduce direct impacts to any tree dwelling fauna species which may be utilising the area. The CEMP would detail procedures for a pre-clearance survey and fauna management including the following points:

- trees would be monitored for fauna before and during clearing operations;
- trees with resident fauna would be avoided as far as is practicable;
- hollow-bearing trunks and branches would be carefully sawn and placed intact in adjacent areas of native vegetation; and
- replacement habitat, such as nest boxes, would be provided where habitat trees are to be removed.

A detailed pre-clearance survey by qualified ecologists would be required prior to development of the Site. This would involve:

- diurnal searches for birds, nests and roosts;
- active searches for reptiles, including checking of woody debris within the development footprint;
- active searches for micro bats, including checking under exfoliating bark; and
- nocturnal surveys, including stag-watching of identified habitat trees, specifically focusing on observing use of trees by micro bats.

This survey would focus on locating individuals, and especially roosts of threatened species.

If nests or nestlings of threatened species are observed within, or close to, the development footprint then construction should be postponed until the nestlings have hatched and fully-fledged. If construction constraints mean that this delay is not practicable then DECC would be consulted to determine if relocating the species is acceptable.

Groundcover Clearance Protocol

Groundcover substrate and especially large woody debris provides important habitat for native fauna, including threatened species. A groundcover clearance protocol would be incorporated into the CEMP. The protocol would involve the following steps:

- remove large woody debris using excavator grabs or manual handling if practicable (raking);
- place intact large woody debris within adjacent areas of intact vegetation;
- scrape and stockpile leaf litter and topsoil separately from deeper fill material; and

- reuse leaf litter and topsoil in rehabilitation works.

Site Management (Marulan Site)

The following mitigation measures are proposed in order to minimise potential impacts on native fauna associated with the operation of the proposed Facilities:

- set maximum speed limits during construction and operation traffic on Site to reduce fauna road fatalities;
- limit vehicular and personnel entry into retained vegetation (including offset areas) during construction and operation through temporary exclusion fencing during construction, locating access roads and paths to avoid biodiversity areas and use of signage where necessary; and
- employing down-lights and motion sensor lighting in order to reduce light spill and the associated secondary impact on nocturnal fauna species potentially utilising the adjoining vegetation.

Exclusion of Grazing (Marulan Site)

Fencing to exclude grazing by cattle is proposed at the Marulan Site as a means of improving the habitat value and floral diversity of retained vegetation. This is likely to aid the regeneration of cleared areas and degraded remnants. Exclusion of grazing improves the growth of many native herbs and grass species which are important feed species for declining woodland birds and other native animals (Garnett and Crowley, 2000).

Weed and Pest Management

A Weed and Pest Management Plan would be completed as part of the EMP. Active control of feral animals, such as the Red Fox and European Rabbit, and noxious weeds, such as Blackberry and Serrated Tussock, would be required during and after construction.

Bushfire Management (Marulan Site)

The Bush Fire Assessment (refer Chapter 16 in the Environmental Assessment) identifies a minimum recommended Asset Protection Zone of 10-15 m, depending on the applicable site boundary. The Assessment recommends the preparation of a Bushfire Management Plan for the Marulan Site, which would include specific measures to avoid undue or adverse effects on native flora and fauna. However, it is not anticipated that clearing or hazard reduction burns would be required to manage the APZ once established.

Soil Erosion / Runoff

The CEMP would formulate safeguard measures to reduce soil erosion and pollutant run-off during both construction and operation phases.

4.8.3 Biodiversity Offset Area

The DECC (2007) principles were used as the basis of the offset package outlined below. Review of provisional guidelines and case studies suggests that the proposed package outlined below constitutes an acceptable offset. Further to the above broad principles, the following specific principles were applied such that the current offset package:

- is preferably located on the Site or at least within the locality;

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- contains the same or equivalent vegetation communities as the impacted area (as per the 'like-for-like' principle stated above);
- is in equivalent or better condition than the impacted area and thus has equivalent or higher biodiversity value;
- has the potential for improvement in biodiversity values as a result of conservation and management;
- is located on land owned by the proponent (or can be purchased by the proponent);
- has a low perimeter-to-area ratio and therefore avoids high edge effects and maintenance requirements; and
- is suitably located for ongoing administration, maintenance and evaluation by either the proponent or DECC and has relatively easy access.

The key features of the proposed Project Biodiversity Offset are:

- a Box Gum Woodland TSC EEC offset area involving permanent conservation of 13.8 ha within the main portion of the Marulan Site (north of Canyonleigh Road) and 0.4 ha in Lot 153 DP 750053 to the south of the Marulan Site (also owned by the Proponent);
- a woodland offset area, involving permanent conservation of a portion of land that contains 21.7 ha of Tableland Hills Grassy Woodland; and
- a riparian rehabilitation area of 9. ha, located along a degraded drainage line in the northern parts of the Site.

A summary of the Project Biodiversity Offset components is provided in **Table 4-16** and presented on **Figure 4-9**.

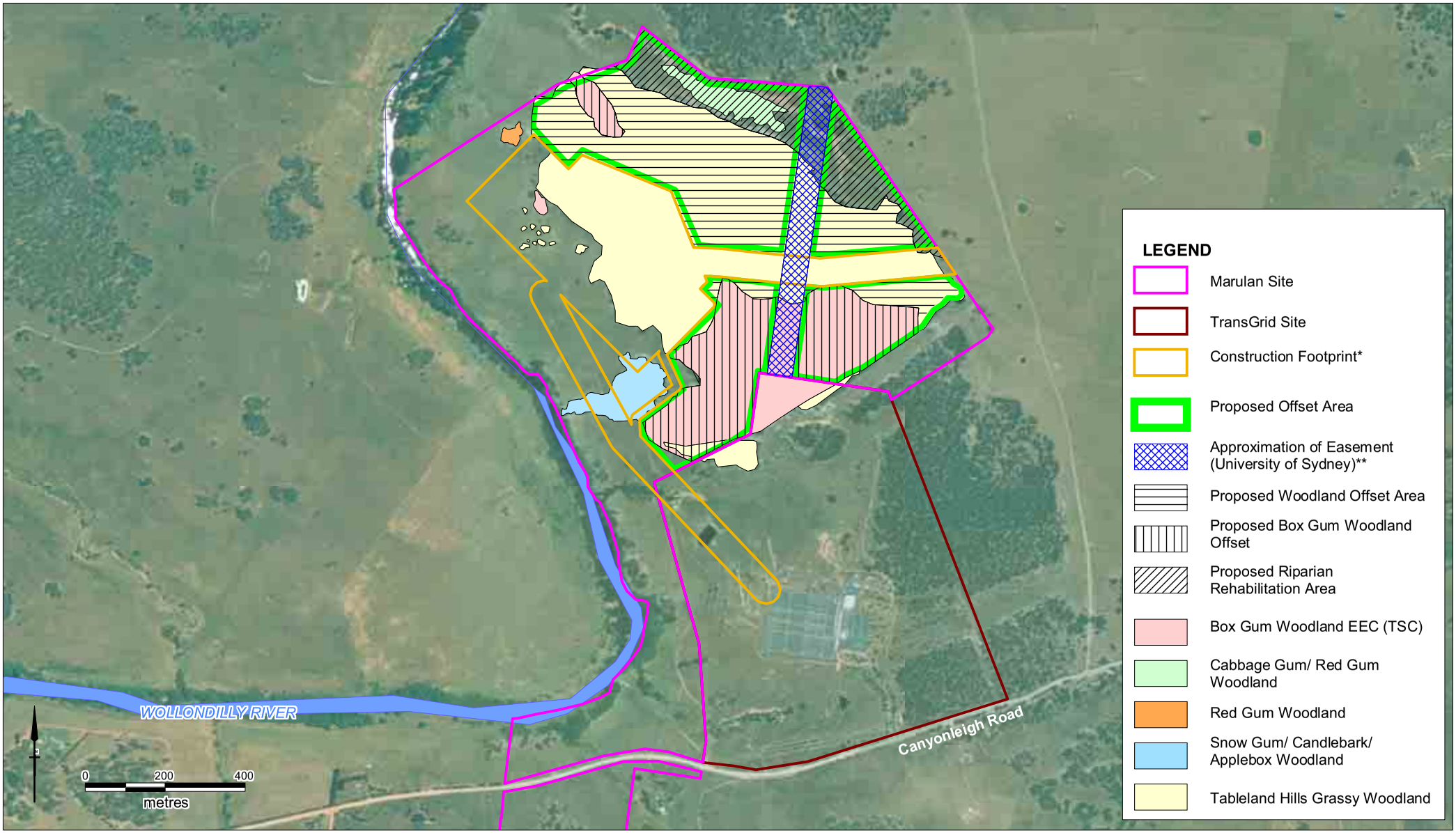
Table 4-16 Summary of Project Biodiversity Offset Components

Component	Area of offset within vegetation community (ha)							Total
	Box Gum TSC EEC	**Cabbage Gum / Red Gum Woodland**	**Red Gum Woodland**	**Snow Gum / Candlebark / Applebox Woodland**	**Tableland Hills Grassy Woodland**	**Riverbank Forest**	**Cleared Grassland**	
Woodland Offset	13.8[1]				21.7		0.8	*36.3*
Riparian Rehabilitation Area		1.6					7.4	*9.0*
Additional Proposed Area	0.4[2]							*0.4*
Total Biodiversity Offset Area	***14.2***	**1.6**			***21.7***		***8.2***	***45.7***
Area within the existing easement (excluded from Offset)	1.2				1.7		1.3	4.1

Notes:

1: Located within the main part of Marulan Site

2: Located south of the Marulan Site (south of Canyonleigh Road – Lot 153 DP 750053 – also owned by the Proponent)



* Boundary includes clearance for construction footprint, laydown area, access roads, pipeline and transmission line.

** Easement Approximated (Survey 26/09/07)

Source: Delta Electricity, EnergyAustralia

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **PROPOSED OFFSET AREA**
URS	Drawn: AO; Approved: NB; Date: 11/03/2009; Job No: **43177371**; File No: 43177371-227.wor	Figure: **4-9**

Box Gum Woodland TSC EEC Offset Area

The proposed Box Gum Woodland Offset Area contains 13.8 ha of Box Gum Woodland TSC EEC.

The Box Gum Woodland community in the eastern portion is dominated by thin-leaved stringybark and Argyle apple and co-dominated by cabbage gum and apple box with very few scattered individuals of immature yellow box, with a predominantly native grassland understorey.

The Box Gum Woodland community in the western portion is dominated by thin-leaved stringybark, cabbage gum and immature yellow box, with an understorey dominated by the noxious weed serrated tussock.

The conservation of 13.8 ha of Box Gum Woodland TSC EEC in perpetuity would improve the long-term viability of this vegetation community within the region. It meets the DECC guidelines for offsets of 'like for like or better' and would adequately offset the clearing of Box Gum Woodland and some of the other woodland communities that would be affected by the Proposal.

Woodland Offset Area

The proposed Woodland Offset Area contains 21.7 ha of Tableland Hills Grassy Woodland. The majority of the woodland within the proposed offset adjoins and is contiguous with woodland within the development footprint. Hence, the structure, species composition and condition of the offset area are equivalent to woodland within the proposed construction footprint. The offset area also contains equivalent quantities of habitat resources such as feed trees, hollow bearing trees, standing and fallen dead timber, leaf litter and woody debris. It is likely to provide habitat for the threatened fauna species recorded on the Site and surrounding areas.

The understorey vegetation within the proposed offset area is patchy and of low density, probably due to historic grazing of the Site. It is likely that the condition of the vegetation would improve with the exclusion of grazing. Accordingly fencing and conservation of this area as a biodiversity offset is likely to improve the biodiversity value of the area over time. Additional management actions may achieve further conservation gains (see below).

Riparian Rehabilitation Area

The biodiversity offset area also includes a 9 ha portion of degraded riparian habitat along the drainage line in the northern portion of the Site. The riparian area contains approximately 7.4 ha of cleared grassland and 1.6 ha of woodland. The drainage line currently features severe gully erosion and adjacent cleared land is also seriously eroded. This is probably causing ongoing sedimentation and degradation of aquatic habitat in the Wollondilly River downstream. A rehabilitation program would be undertaken within this area.

The rehabilitation of the area would have an emphasis on controlling the gully erosion that is currently evident. Measures proposed include erosion control, complementary plantings, weed control, habitat enhancement and stock fencing. Plantings should be extended to bridge cleared areas between the proposed woodland offset area and stands of woodland along the drainage line. This would provide an important linkage between the offset area, woodland to the north of the Site, and the riparian vegetation along the drainage line. Details of the rehabilitation program would be included in the EMP for the proposed works.

4.8.4 Management of Offset Area

Ongoing management of the offset area would be required to comply with the DECC (2006a) guidelines and to maintain or improve biodiversity values. Management actions would include, as a minimum:

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- exclusion of grazing through fencing;
- weed removal and control;
- erosion control;
- retention of fallen timber, hollow logs, leaf litter, rocks and other habitat resources;
- maintenance and monitoring of natural surface water quality and flows;
- control of feral animals, where appropriate and practical; and
- annual monitoring and reporting on biodiversity, results of management actions undertaken and general condition of the Site.

Full details of the proposed management regime would be included in a Vegetation Management Plan that would be included in the Environmental Management Plan for the proposed facility.

4.8.5 Maintain or Improve Test

The DEC (2005) guidelines identify matters that are relevant to the assessment of impacts to threatened species, populations or ecological communities, or their habitats, arising from a development proposal assessed under Part 3A. A key principle presented in these guidelines is that proposals should maintain or improve biodiversity values (i.e. there is no net impact on threatened species or native vegetation). Where impacts cannot be avoided or mitigated then it is necessary to identify a suitable biodiversity 'offset' in order to maintain or improve biodiversity values. The application of the 'maintain or improve' test to the proposal is summarised in **Table 4-17.**

Table 4-17 Comparison of Biodiversity Impacts and Offsets

Impacts	Mitigation	Offsets
• Permanent removal of 15.3 ha of Tableland Hills Grassy Woodland during construction of Facilities • Permanent removal of 0.1 ha of Box Gum Woodland during construction of the Facilities • Initial clearing of approximately 7-9 ha of native woodland and forest, of which approximately 2-3 ha would be permanently modified within a 6 m corridor maintained as understorey vegetation only. Would remove some native vegetation with moderate habitat value, including native grassland that will be remediated to its original condition. • Permanent loss of fauna habitat features (mature hollow-bearing trees, logs, leaf litter, ground debris, rocks and other resources) • Loss of 15.3 ha of threatened fauna species habitat within the Marulan Site.	• Retention of fallen timber (salvage of selected felled trees in development footprint of Facilities) • Temporary exclusion fencing during construction for Facilities • Timing of construction to avoid breeding seasons of resident fauna (where practical) • Presence of similar woodland in the locality • Pre-clearing surveys for (and salvage of) resident native fauna • Installation of nest boxes for displaced arboreal fauna located in the development footprint	• Maintenance of Box Gum Woodland TSC EEC through permanent conservation of 13.8 ha within the main portion of the Marulan Site. Land portion to be re-titled (with Positive Covenant) for this purpose in perpetuity. • Maintenance of woodland biodiversity values through permanent conservation of 21.7 ha of Tableland Hills Grassy Woodland. Land portion to be re-titled (with Positive Covenant) for this purpose in perpetuity. • Improvement in biodiversity values through ongoing management of woodland offset area. Stock-proof fencing, retention of fallen timber, weed control, erosion control, feral animal control • Rehabilitation of 9. ha of riparian vegetation and adjoining cleared land in Riparian Rehabilitation Area. Creation of vegetated corridor connecting offset area to nearby woodland stands and adjacent riparian zone

The biodiversity offset package is proposed as a means to ensuring that construction and operation of the proposed Facilities and gas pipeline maintains or improves biodiversity values at the Site. The offset would protect and conserve, in perpetuity, threatened species habitats, vegetation types, habitat types and landscape features similar or equivalent to those found within the development footprint. Moreover, the proposed offset package would improve biodiversity values at the Site due to the following:

- conservation of an area of Box Gum Woodland TSC EEC;
- the woodland offset area is larger than the area of woodland impacted by the Project;
- ongoing management of the offset area would improve its condition and biodiversity values;
- rehabilitation of the degraded drainage line in the northern portion of the Site would provide substantial improvements in the biodiversity values of riparian and aquatic habitats.

Conclusion

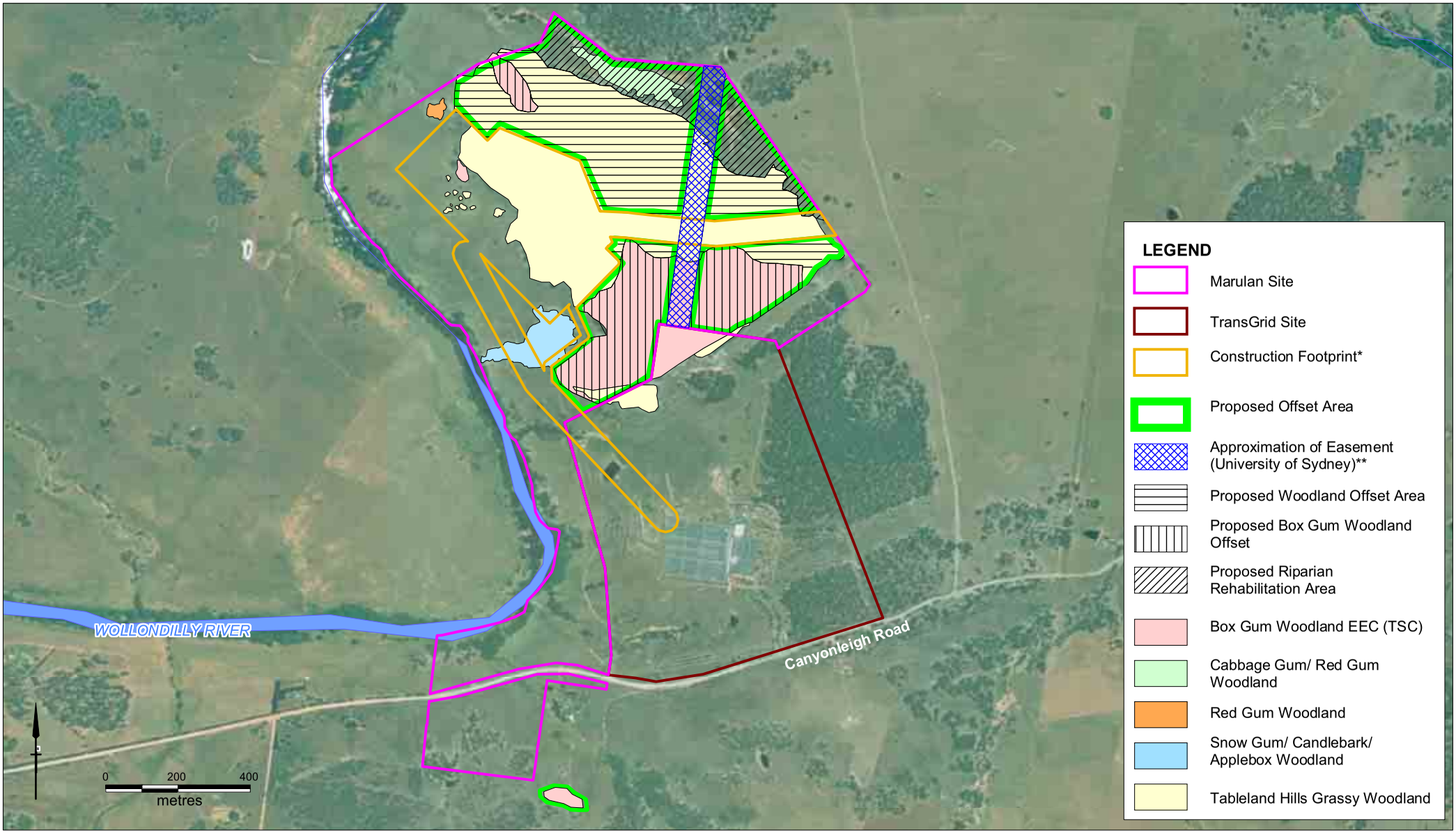
On the basis of the above assessment, the proposed offset is consistent with the DECC guidelines for offsets and meets the key criterion for like-for-like trade-offs of biodiversity values. Adoption of the offset would adequately compensate for the loss of threatened species habitat associated with the Project and maintain biodiversity values.

The proposed biodiversity offset package is included in the Statement of Commitments provided in **Section 5**. With regard to the specific administrative arrangement for titling the offset area, the proponent would negotiate and finalise a suitable arrangement with DECC prior to construction works commencing, in accordance with the options discussed above.

4.8.6 Additional Proposed Offset Area

Although as discussed in **Section 4.8.5**, it was concluded that the key DECC criterion are met by the proposed offset area, the Proponent has committed to conserve an area above that required by the criterion.

The Proponent would additionally permanently conserve an area of 0.4 ha within Lot 153 DP 750053 (also owned by the Proponent) of Box Gum Woodland EEC as shown on **Figure 4-10**.



* Boundary includes clearance for construction footprint, laydown area, access roads, pipeline and transmission line.

** Easement Approximated (Survey 26/09/07)

Source: Delta Electricity, EnergyAustralia

Client: DELTA ELECTRICITY AND ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITIES – SUBMISSIONS RESPONSE AND PREFERRED PROJECT REPORT	Title: **PROPOSED OVERALL PROJECT OFFSET AREA**
URS	Drawn: AO · Approved: NB · Date: 11/03/2009 · Job No: **43177371** · File No: 43177371-237.wor	Figure: **4-10**

4.9 Plume Rise Assessment

4.9.1 Background

Due to the plume rise from the Facilities' stack emissions, an aviation hazard analysis (URS, April 2008) was performed and is presented in the respective *Project Applications*.

This assessment has been revised (URS, October 2008) to reflect an update to URS methodology for these assessments. The full revised assessment is presented in **Appendix I** of this report.

The statistics were compiled in accordance with the Civil Aviation Safety Authority's (CASA) Advisory Circular "*Guidelines for Conducting Plume Rise Assessments*" (June, 2004). Where there is potential for an exhaust plume with a vertical velocity greater than 4.3 m/s at the Obstacle Limitation Surface (OLS) of 110 m, a hazard analysis is required.

4.9.2 Outcome of Assessment

Assessment

The proposed Marulan Gas Turbine Facilities have been assessed for their potential impacts on aviation safety. This has been performed using the CSIRO's TAPM model to predict upper air meteorology, and plume rise profiles for each hour of the year 2006, such that the critical vertical extent of the plume (height at which the plume average velocity slows to 4.3 m/s) can be estimated.

The assessment has considered three scenarios:

Scenario 1: Both the Delta Electricity Facility Stage 1 and EnergyAustralia Facility plants operating in open cycle mode, with the assumption that plume merging between the two plants does occur;

Scenario 2: Both the Delta Electricity Facility Stage 1 and EnergyAustralia Facility (plants operating in open cycle mode), with the assumption that merging between the two plants does not occur. This assumes isolation of the two plumes, hence it is also representative of a single plant operating in open cycle mode;

Scenario 3: The Delta Electricity Facility Stage 2 exhaust stacks only operating in combined cycle mode.

The distances between stacks (plumes) can have a significant influence on the buoyancy of the plumes, as plumes that are located within proximity to each other would have a greater potential to merge, resulting in greater buoyancy.

Further analysis of the plume radii at the critical vertical extent indicated that for the majority of hours, Scenario 2 is considered more representative of simultaneous operation. Furthermore, Scenario 2 results are considered more appropriate for consideration of the plume velocities at the OLS. Scenario 1 is considered most appropriate for the hours of greatest critical vertical extent.

Based on this assessment, for one year (2006) of modelled open cycle operation using TAPM, the OLS is exceeded during approximately 70 % of the year, with an average critical vertical extent at 156 m and 212 m above ground level for Scenarios 1 and 2 respectively.

Section 4 Preferred Project Information

Furthermore, results for Scenario 3 indicate that the exhaust from combined cycle Delta Electricity stacks would exceed the OLS for approximately 10% of the year, with an average critical vertical extent at 75 m above ground level.

Table 4-10 displays the maximum, minimum and average critical plume extents.

Table 4-18 Maximum, Minimum and Average Critical Plume Extents

Statistic	Critical Plume Extent (m)					
	Scenario 1		Scenario 2		Scenario 3	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
Maximum	1318	435	931	347	379	78
Minimum	76	79	61	51	47	17
Average	212	183	156	116	75	32

Management

Whilst this assessment is considered conservative with respect to the modelled operating times and operating conditions, consideration should be given for the plant to be designated a potential hazard to aircraft operators in the area. The implementation of such designation is at the discretion of the Civil Aviation Safety Authority (CASA).

Further consultation with CASA would be undertaken following detailed design. It is understood that CASA would require confirmation of any changes to the design that may affect the plume rise assessment. Prior to operation of the Facilities, CASA would need to be provided with the following information:

- “as constructed” coordinates in altitude and longitude of the Facilities;
- final height (in AHD) of the exhaust stacks; and
- ground level of the site (in AHD).

Statement of Commitments | Section 5

The following table updates Table 19-1 of the Environmental Assessment Volume 1 Main Report. It provides the commitments proposed by the Proponent for the Marulan Gas Turbine Facilities Project.

The phase of implementation is indicated in the table by *Cons* – Construction *Ops* – Operation, *Planning* and *Design.*

In general it is noted that additional commitments have been added to outline responsibilities regarding traffic management and emergency response in particular response to submissions and in relation to the proposed gas pipeline and potential water pipeline.

Two additional columns have been added:

- a column referencing new / amended commitments to those presented in the Environmental Assessments; and
- a column providing a reference number for the commitment for ease of reference.

Table 5-1 Draft Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
General					
	A1	The Proponent would carry out construction and operation in accordance with the: – Concept and Project Applications; and – Agreed Statement of Commitments.	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)	✓ (Planning , Cons. & Ops)
	A2	Monitoring would be undertaken in accordance with the Environmental Protection Licence.	✓ (Cons & Ops)	✓ (Cons & Ops)	
Environmental Management					
	B1	The construction and operation would be undertaken in accordance with an Environmental Management System(s) to the standard of ISO 14001 or equivalent.	✓ (Cons & Ops)	✓ (Cons & Ops)	✓ (Cons & Ops)
	B2	The EMS would provide an overarching system to achieve the environmental management objectives for the Project and address commitments in the statement. This would also include the Minister's Conditions of Approval and any environmental due diligence requirements identified by the Proponents and/or contractor.	✓ (Cons & Ops)	✓ (Cons & Ops)	✓ (Cons & Ops)

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	B3	Prepare and implement: – CEMP(s); and – OEMP(s). Which include the specific measures outlined in the following sections of this table. These may be developed as a suite of documents that would address each Facility, shared infrastructure, staging of the development and shared responsibilities.	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)
	B4	Depending on the construction sequence of the Facilities, one or multiple Environmental Management Representatives would be appointed for the construction of the shared works, the construction of the EnergyAustralia Facility and the construction of the Delta Electricity Facility.	✓ (pre-Cons)	✓ (pre-Cons)	✓ (pre-Cons)
NEW	B5	The CEMP and OEMP shall include an Emergency Response Plan developed in consultation with the relevant authorities (eg. Rural Bush Fire Service, Ambulance Service).	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)
Consultation					
	C1	Further consultation and negotiation would occur with affected property owners along the potential Gas Pipeline routes.			✓ (Planning, Cons. & Ops)
	C2	Consultation would continue with stakeholders during the planning, detailed design, construction, operation and maintenance of the Facilities, as needed.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	✓ (Cons. & Ops)
	C3	Notify potentially affected local residents and businesses of construction activities, as needed.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	C4	Develop and implement protocols to notify stakeholders of relevant activities and as appropriate, any relevant incidents should they occur.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	✓ (Cons. & Ops)
	C5	A consultation plan would be developed as part of the CEMP / OEMP to outline a coordinated, jointly managed consultation process for the Facilities and pipeline. A single complaints line would be established for the two Facilities with a jointly managed response process to be developed.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	✓ (Cons. & Ops)

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
Air Quality					
	D1	Liaise with Civil Aviation Safety Authority (CASA) to address the issue of potential aviation hazard of the plant.		✓ (Design)	
	D2	The Construction Environmental Management Plan (CEMP) would consider the most appropriate dust mitigation method suited to the activity and circumstances. This would likely include measures such as: • watering, spraying or covering earthworks during excavation and handling, and on exposed surfaces and stockpiles; • scheduling activities for more favourable meteorological conditions; • covering or limiting truck soil loads; • reducing speed limits on unsealed surfaces; and • cleaning soil off the undercarriage and wheels of trucks when required.	✓ (Design & Cons)	✓ (Design & Cons)	✓ (Design & Cons)
	D3	Any long-term stockpiles would be stabilised (for example using measures such as fast seeding grass or synthetic cover spray).	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	D4	Delta Electricity and EnergyAustralia both monitor GHG emissions and thermal efficiency and, when possible, implement programs to improve operational performance to reduce emissions.		✓ (Ops.)	
Noise and Vibration					
	E1	Prepare and implement a Construction Noise Management Plan (CNMP) within the CEMP to consider, if appropriate: • positioning of plant / processes; and • limiting the "clustering" of plant / processes.	✓ (Design & Cons)	✓ (Design &Cons)	✓ (Design &Cons)
	E2	EnergyAustralia Facility and Delta Electricity Facility Stage 1 would incorporate the following inherent noise treatments into the design: • air intake silencers; • generator transformer walls on three sides; and • exhaust air silencers.		✓ (Design)	
	E3	Delta Electricity Facility Stage 2 detailed design would incorporate mitigation measures as necessary to achieve the specified noise limits.		✓ (Design & Ops)	

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	E4	Where operational noise is predicted to exceed the noise criteria for residential dwellings (established in accordance with the Industrial Noise Policy (INP) guideline and most recent assessment process) property acquisition or negotiated agreements would be put in place.		✓ (Design)	
	E5	Low frequency noise would be addressed during detailed design, consistent with the most recent assessment process that has been developed overseas in lieu of the INP.		✓ (Design)	
NEW	E6	Community liaison would be undertaken with potentially affected residents prior to particularly noisy works and in the event that complaints are received.			✓ (Cons)
Soils, Geology and Groundwater					
	F1	A Construction Soil and Water Management Plan would be developed and implemented to ensure effective management of potential soil erosion issues.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F2	All construction works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation, and managed through a Soil and Erosion Control Plan. These measures would be incorporated into the CEMP.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F3	As a minimum the measures outlined in the *Managing Urban Stormwater – Vol 1 Soils and Construction* would be implemented. Measures may include: • limiting slope length; • installation of sediment filters; and • the construction of a sedimentation basin downstream of the disturbed areas.	✓ (Design &Cons.)	✓ (Design &Cons.)	✓ (Design &Cons.)
	F4	Soil erosion and sedimentation devices would remain in place until the surface is restored. These devices would also capture any gross pollutants.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F5	Where practicable, disturbed areas would be quickly revegetated or covered with a non-erodable surface following construction.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F6	Should the earthworks be progressed at the same time for both Facilities and if there is a time lag between further construction, appropriate longer term erosion control measures would be implemented on that vacant pad area until further work for construction of the Facility commences.	✓ (Cons.)	✓ (Cons.)	

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	F7	Subject to design requirements, where excavation work extends into bedrock, suitable material may be reused as engineering fill on the Site.	✓ (Design)	✓ (Design)	
	F8	Assess need for groundwater control and collection system during further geotechnical investigations.	✓ (Design)	✓ (Design)	
	F9	Depending on engineering design requirements for the fill, material excavated from the Site (except for up to 150 mm of topsoil and root-affected material) may be used as engineered fill in any cut / fill operations.	✓ (Design & Cons.)	✓ (Design & Cons.)	
	F10	Construction would be planned to minimise the time that disturbed land is exposed.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F11	Water required for dust suppression would be sourced from the existing dams on the Site where available and practicable, or imported if necessary.	✓ (Cons.)	✓ (Cons.)	✓ (Cons.)
	F12	Appropriately bunded areas would be included for storage of fuels, oils and chemicals.	✓ (Cons.)	✓ (Cons. & Ops)	✓ (Cons.)
	F13	Areas within the Facility area would be appropriately drained so that surface runoff would be prevented from infiltrating directly onto the ground and from reaching the groundwater.	✓ (Cons. & Ops.)	✓ (Cons. & Ops.)	
	F14	All possible pollutant materials would be stored well clear of Site boundaries and stormwater drainage lines and stored in a designated covered area.		✓ (Ops.)	
	F15	Waste disposal and collection would be properly undertaken.	✓ (Cons. & Ops.)	✓ (Cons. & Ops.)	
	F16	All major vehicle maintenance would be undertaken offsite.	✓ (Cons. & Ops.)	✓ (Cons. & Ops.)	
	F17	Stormwater and wastewater ponds would be lined with an appropriate impermeable liner to minimise the risk of water escaping into the natural groundwater system.		✓ (Design & Ops.)	
NEW	F18	All construction works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Construction works would also be managed through a Soil and Erosion Control Plan (as part of the CEMP).			✓ (Cons.)

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
NEW	F19	In the case where a pipeline (gas or water) trench would have to intersect the water table, a Groundwater Management Plan would be prepared as part of the CEMP.			✓ (Cons.)
NEW	F20	All construction works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Construction works would also be managed through a Soil and Erosion Control Plan.		✓ (Cons – water pipeline)	
NEW	F21	Gas pipeline construction areas would be rehabilitated in accordance with a Rehabilitation Plan as part of the CEMP.			✓ (Cons.)
Traffic and Transport					
NEW	G1	A traffic management plan would be developed as part of the CEMP and OEMP addressing detailed traffic management measures and include measures to address: - Safety - Potential hazards – eg flooding, stock - Maintenance of roads - Cumulative impacts with other movements for quarries	✓ (Design & Cons, Ops)	✓ (Design & Cons, Ops)	✓ (Design & Cons)
AMENDED	G2	Further traffic assessments undertaken: - to review what works may be required to bridges, causeways, traffic islands, intersections and drainage culverts along Canyonleigh and Brayton Roads to facilitate the construction and operation of the Facilities; - to identify and cater for any necessary remedial treatments to facilitate passage to the Site along Canyonleigh and Brayton Roads once the actual weight and dimensions of the proposed plant are known; - identify any flood potential and remedial works required for the access to the Site along Brayton and Canyonleigh Road; and - in consultation with Goulburn Mulwaree and Upper Lachlan Shire Councils.	✓ (Design & Cons)	✓ (Design & Cons)	
	G3	Pre construction evaluation of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site).	✓ (prior to Cons)		

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	G4	Post construction evaluation of pavement condition of Brayton Road (between George Street intersection and Canyonleigh Road intersection) and Canyonleigh Road (from intersection of Brayton Road to the Site) to determine remedial action required following passage of oversized vehicles.		✓ (post- Cons)	
	G5	Transport of over-mass and over- dimensional loads to be undertaken under RTA and NSW Police permit conditions and approved routes.	✓ (Cons)	✓ (Cons)	
NEW	G6	Prior to the start of Project construction, the Proponent would level and grade the road and apply a single coat seal on Canyonleigh Road between the Brayton Road intersection and the Project Site access. This would consolidate the pavement and minimise dust during the construction period. On completion of the Project, the Proponent would carry out minor repairs where necessary and reseal the road.	✓ (pre – Cons. and post – Cons.)		
Biodiversity					
	H1	As part of the Environmental Management Plan, prepare and implement a Vegetation Management Plan which complies with the DECC (2006a) guidelines.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	H2	Management actions would include the implementation of an offset strategy and include measures (as appropriate) such as: • exclusion of grazing through fencing; • weed removal and control; • erosion control; • retention of fallen timber, hollow logs, leaf litter, rocks and other habitat resources; • installation of nest boxes for displaced arboreal fauna (if required); • maintenance and monitoring of natural surface water quality and flows; • control of feral animals, where appropriate and practical; • timing construction to recognise breeding seasons of resident fauna (where practical); • setting low maximum speed limits to reduce fauna road fatalities; • limiting vehicular and personnel entry to adjacent vegetation through appropriate fencing; and • using down-lights and motion sensor lighting in order to reduce impacts on fauna species using woodland.	✓ (Planning, Cons. & Ops)	✓ (Planning, Cons. & Ops)	
AMENDED	H3	Implement an offset strategy with key measures such as: • maintenance of woodland biodiversity values through permanent conservation of approximately 13.8 ha of Box Gum Woodland TSC EEC, 21.7 ha of Tableland Hills Grassy Woodland within the Marulan Site. Permanent conservation of approximately 0.4ha of Box Gum Woodland TSC EEC in Lot 153 DP 750053 (south of the Marulan Site). Land portion to be re-titled (with VCA or equivalent) for this purpose in perpetuity. • rehabilitation of 8.2 ha of riparian vegetation and adjoining cleared land in Riparian Rehabilitation Zone. Creation of vegetated corridor connecting offset area to nearby woodland stands and adjacent riparian zone. • temporary exclusion fencing of offset area during construction.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	✓ (Cons. & Ops)

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
AMENDED	H4	The CEMP would detail procedures for a pre-clearance survey and fauna management and groundcover clearance to reduce direct impacts to tree dwelling fauna and minimise impacts from clearing of vegetation. The CEMP would include specific instructions on where to locate salvaged habitat features. A qualified ecologist would be present during salvage and construction to ensure appropriate placements.	✓ (Cons.)		
	H5	A Weed and Pest Management Plan would be prepared as part of the EMP for the Site, which would aim to actively control feral animals and noxious weeds.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	✓ (Cons)
	H6	The CEMP would formulate safeguard measures to reduce soil erosion and pollutant runoff for the Site particularly for waterbodies.	✓ (Cons. & Ops)	✓ (Cons. & Ops)	
	H7	Disturbed sites would be quickly revegetated or covered with a non-erodable surface following construction.	✓ (Cons.)	✓ (Cons.)	
NEW	H9	A CEMP would be developed and implemented to address the construction of the gas pipeline addressing the ecology issues and mitigation measures relating to tree fauna management, ground dwelling fauna management, groundcover clearance protocols, timing of construction works, site management, Phytophthora management, remediation / rehabilitation, weed and pest management and EECs.			✓ (Design, pre-Cons. & Cons.)
NEW	H10	If the option of a water supply pipeline is progressed, further assessment and field surveys to be undertaken of the water supply pipeline routes.		✓ (Design – water pipeline)	
NEW	H11	Develop and implement a Rehabilitation Plan as part of the CEMP(s) addressing biodiversity issues arising from further assessment of the water pipeline routes following construction.		✓ (Design & Cons. – water pipeline)	
NEW	H12	Develop and implement a Rehabilitation Plan as part of the CEMP(s) for the gas pipeline.			✓ (Design & Cons.)

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
Cultural Heritage					
	I1	A sub-surface investigation program would be undertaken when the areas of ground disturbance within the Marulan Site for the Facilities and associated infrastructure are known following detailed design, prior to construction. This sub-surface investigation program would aim to determine the presence of Aboriginal archaeological sites and to identify the importance of the recorded sites. The draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation would be followed.	✓ (Design)		
	I2	All reasonable attempts would be made to avoid significant Aboriginal archaeological sites within the Study Area through changes to the proposed design and construction methods.	✓ (Design)		
	I3	If the Aboriginal archaeological cultural material cannot be avoided, then all reasonable attempts to reduce impact would be made through the development of a Cultural Heritage Management Plan (CHMP). The CHMP would outline strategies for dealing with recorded and un-recorded Aboriginal archaeological sites encountered within the proposed development area.	✓ (Design & Cons.)		
NEW	I4	A sub-surface investigation program would be undertaken when the areas of ground disturbance within the gas pipeline footprint are known following detailed design, prior to construction for potential archaeological areas and sites.			✓ (Design)
NEW	I5	All reasonable attempts would be made to avoid significant Aboriginal archaeological sites within the Study Area through changes to the proposed design and construction methods.			✓ (Design)
NEW	I6	The CEMP will be developed and implemented to include a Cultural Heritage Management Plan (CHMP) addressing the area within the footprint of the gas pipeline. The CHMP would outline strategies for dealing with recorded and un-recorded Aboriginal archaeological sites encountered within the proposed development area.			✓ (Design & Cons)
NEW	I7	If the option of a water supply pipeline is progressed, further assessment and field surveys to be undertaken of the water supply pipeline routes.		✓ (Design – water pipeline)	

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
Visual Amenity					
	J1	Subject to CASA requirements, where practicable, colour and texture of structures in the proposed Facilities would be appropriate and utilise non-reflective materials		✓ (Design)	
	J2	Tree and shrub planting would be carried out within the general site area to provide additional screening to views from surrounding properties. Consideration would be given to planting on mounding within the Site.		✓ (Design, Cons & Ops.)	
	J3	Where practicable, tree planting within selected private residential properties would be considered, subject to negotiation and agreement by property owners.		✓ (Design & Ops.)	
	J4	Lighting design would avoid direct line of sight from properties surrounding the proposed Facilities.		✓ (Design & Ops.)	
	J5	Top of the exhaust stacks would not have lighting unless requested by CASA.		✓ (Design & Ops.)	
	J6	• Measures would be employed to avoid light spill from security lighting onto surrounding residences.		✓ (Design & Ops.)	
	J7	Further assessment of impact on visual amenity of the Gas Pipeline would occur at Project Approval Stage.			✓ (Planning)
Water Cycle Management					
	K1	As a way of further enhancing public infrastructure, and if deemed viable, upgrade works would be undertaken to local sewage treatment facilities to meet the Facilities' operational water requirements.	✓ (Cons & Ops)	✓ (Cons & Ops)	
		Site Design			
	K2	The Facilities would be designed to incorporate the following: • minimum elevation of risk averse property within the Facility is to be approximately 605 m AHD to minimise the potential for flooding; and maintaining approximately 150 m between the Wollondilly River and the Facilities.		✓ (Design)	
	K3	**Soil Erosion**			

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	K4	All construction works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Construction works would also be managed through a Soil and Erosion Control Plan. These measures would be incorporated into the CEMP. The CEMP would address the potential staging of the bulk earthworks: • should the bulk earthworks be progressed at the same time for both Facilities and if there is a time lag until further construction, measures required for longer term erosion control would be implemented on the vacant pad area until further work for construction of that facility commences; and in the event that earthworks progress separately for the two Facilities, then each Facility Site would manage the earthworks and runoff appropriately through a Soil and Erosion Control Plan.	✓ (Cons)	✓ (Cons)	✓ (Cons)
NEW		All construction works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Construction works would also be managed through a Soil and Erosion Control Plan.		✓ (Cons – water pipeline)	✓ (Cons.)
		Spills and site management			
	K5	All possible pollutant materials would be stored well clear of site boundaries and stormwater drainage lines and stored in a designated covered area.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
	K6	Appropriately bunded areas would be included for storage of fuels, oils and chemicals.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
	K7	Waste collection areas would be designated.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
	K8	Appropriate bunding would be installed and appropriate containers would be provided.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	K9	Waste disposal and collection would be properly undertaken.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
	K10	All major vehicle maintenance would be undertaken off-site.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
	K11	Any vehicle washing on-site would be restricted to designated bunded areas.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	
	K12	Staff facilities would be installed and maintained so that pollutants, including wash water are not conveyed from the Site in stormwater to ensure zero discharge to the environment.	✓ (Design & Cons. & Ops.)	✓ (Design & Cons. & Ops.)	✓ (Cons.)
		Surface water			
	K13	There would be no direct drainage from the Site to the Wollondilly River other than natural surface flows.	✓ (Design & Ops.)	✓ (Design & Ops.)	
AMENDED	K14	Water management strategies would be developed and implemented to maintain zero water discharge from the Site except for natural surface flows.	✓ (Design & Ops.)	✓ (Design & Ops.)	
	K15	Water from impervious surfaces would be directed through oil and grit traps designed to remove any oil and minimise suspended solids to an acceptable level, prior to discharge from the site. This system may also be fitted with a gross pollutant trap to collect any large material mobilised by stormwater.	✓ (Design & Ops.)	✓ (Design & Ops.)	
	K16	The outlet of the Facilities' stormwater system would be designed to maximise the dispersion of these high flows and spread the outflow over a wider area and thereby minimise their potential to cause soil erosion downstream.	✓ (Design & Ops.)	✓ (Design & Ops.)	
		Wastewater Treatment			
	K17	Maintain a minimum distance of 150 m from the Wollondilly River for effluent management areas.	✓ (Design & Cons.)	✓ (Design & Cons.)	

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	K18	Staff facilities would be installed and maintained so that pollutants, including wash water are not conveyed from the Site in stormwater. All wastewater generated during the construction period would be disposed of offsite to a licensed facility.	✓ (Design & Cons.)	✓ (Design & Cons.)	✓ (Cons.)
	K19	"Black" wastewater generated during operations would be treated by a proprietary septic-type system and waste products stored and then disposed of offsite by a licensed contractor.	✓ (Design & Ops.)	✓ (Design & Ops.)	
	K20	Clean water drains would be directed to the stormwater storage pond from which any stormwater flow would be released in a regulated manner.	✓ (Design & Ops.)	✓ (Design & Ops.)	
	K21	Dirty water drains would be directed to settlement ponds and oil/water separators before discharge to the on-site wastewater pond.	✓ (Design & Ops.)	✓ (Design & Ops.)	
	K22	Contaminated drains would be directed to a contaminated drains tank with oil water separator. Oil would be disposed offsite to a licensed facility and water would be directed to the on-site wastewater pond.	✓ (Design & Ops.)	✓ (Design & Ops.)	
Preliminary Hazard Analysis					
	L1	In accordance with Department of Planning's HIPAP No. 3 *(Environmental Risk Impact Assessment Guidelines),* the safety assessment process would continue throughout the design, construction and commissioning of the Facility to refine and update the outcome of the development approval / environmental risk process.		✓ (Design & Ops.)	
	L2	An assessment of the safety management system implemented and used at the site, specifically as it applies to the proposed hazardous materials handling, pipelining and storages, would be conducted within the first year of operation.		✓ (Ops.)	
	L3	Leak detection equipment would be used in areas where high risk natural gas piping is used (high likelihood of leak and/or confined locations).		✓ (Design & Ops.)	

Statement of Commitments Section 5

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	L4	The detailed design of the turbine housing and associated equipment would clearly outline the safety approach used to ensure that explosive situations do not arise (the risk is rendered negligible). Reference should be made to European ATEX Directive and the UK HSE PM84 or other guidance / regulation of equivalent safety.		✓ (Design)	
	L5	Fire protection ratings inside the turbine housing would be determined, including use of explosion panels and use of fire retardant material.		✓ (Design)	
	L6	Installation of an automatic valve at the Site boundary to isolate natural gas supply from the Site in case of a major leak at one of the natural gas pipes on site. The reliability of this automatic valve to close on demand is set as 95% (SIL1). A major leak is regarded as one which results in a mass flow through the hole in the pipe of 5 kg/s or more.		✓ (Design)	
	L7	An assessment of the safety management system as relevant to the gas delivery pipeline would be conducted within the first year of operation.			✓ (Ops.)
Bush Fire					
	M1	Prepare Bush Fire Management Plan within the CEMP.	✓ (Cons)	✓ (Cons)	
	M2	Prepare Bush Fire Management Plan within the OEMP, which could include measures such as management and maintenance of Asset Protection Zone(s), landscaping and vegetation management, water supply, access and other bush fire protection measures for the Site.	✓ (Ops)	✓ (Ops)	
	M3	Include emergency response provisions for bush fire in a site emergency response plan. The plan would include evacuation arrangements, drills and nominated control staff for bush fire events.		✓ (Ops)	
	M4	Where practicable, provide an Asset Protection Zone approximately 10 m to 15m wide around the Site boundaries.	✓ (Design & Ops)	✓ (Design & Ops)	

Section 5 Statement of Commitments

Comment	Item	Mitigation Measures	Implementation of mitigation measures		
			Common Shared Works	Facilities	Gas Pipeline
	M5	Where practicable, the Asset Protection Zone would be managed as follows: • according to the *Standards for Asset Protection Zones* (RFS 2007); • groundcover and understorey strata would be managed to avoid accumulations of dense grass, weeds or shrubs; • dense swards of grass would be slashed prior to summer or as required; • shrubs should be thinned only as required to ensure no connection to canopy stratum; and • maintain fuel loads through mowing/slashing during the spring/early summer months, as required.	✓ (Design & Ops)	✓ (Design & Ops)	
	M6	Where practicable, provision of water tank(s) at appropriate locations (in consultation with RFS) within the Facilities, fitted with Storz valves compatible with RFS hoses.	✓ (Design & Ops)	✓ (Design & Ops)	
	M7	Provide access for fire fighting vehicles to all parts of the Site.		✓ (Design)	
	M8	Where practicable, landscaping would include the following features: • tree canopy separation by at least 2 m; • discontinuous shrub layer (clumps or islands of shrubs where possible; not rows); • vertical separation between canopy and shrub layer; • tree canopies not overhanging structures; • no landscaping trees within 2 m of any building; • use of non-combustible mulch, e.g. stones; and use of 'fire retardant' species of local provenance.	✓ (Design & Ops)	✓ (Design & Ops)	

Conclusions Section 6

This Submissions Response and Preferred Project Report (Report) supports the Environmental Assessments of the proposed Marulan Gas Turbine Facilities applications MP 07_0174, MP 07_0175 and MP 07_0176 by providing a response to matters raised during the public exhibition period as well as providing additional project information.

Following exhibition of the Environmental Assessments, copies of all submissions to the NSW Department of Planning (DoP) were provided to Delta Electricity and EnergyAustralia. Delta Electricity and EnergyAustralia have reviewed the submissions and responded to issues raised in **Section 3** of this Report. The main issues raised related to:

- lack of water supply;
- impact of traffic and proposed mitigation measures;
- construction, operation and traffic noise impact;
- extent of vegetation clearing for the Project.

Responses have been provided to all issues raised and where required, additional information has been presented in the Preferred Project Report.

In accordance with Section 75H (6) of the EP&A Act, a Preferred Project Report can be submitted to the Director-General that outlines any proposed changes to the project to minimise its environmental impact, and any revised statement of commitments. **Section 4** of this Report presents additional project information in the following areas:

- traffic assessment;
- traffic noise assessment;
- water supply assessment;
- water pipeline infrastructure assessment;
- gas pipeline assessment;
- biodiversity assessment;
- Facility Site infrastructure;
- Project biodiversity offset; and
- plume rise assessment.

Where appropriate these additional assessments are presented as appendices to this Report.

Section 5 presents the revised Statement of Commitments.

Environmental impacts associated with the proposed development have been identified and addressed in the Environmental Assessments according to the Environmental Assessment Requirements issued by Department of Planning. Where appropriate, environmental safeguards in the form of mitigation measures have been recommended to minimise the environmental effects of the Project.

Section 6 Conclusions

No significant adverse environmental impacts have been identified through the course of studies. Environmental impacts that have been identified comply with relevant standards and are capable of being mitigated through the use of appropriate environmental controls.

References Section 7

GHD, 2009, *Energy Australia and Delta Electricity Power Station near Marulan Integrated Water Management Strategy Report,* February 2009, Ref: 21/17301/145474.

GHD, 2009, EnergyAustralia Report for Marulan Gas Pipeline Environmental Assessment of Pipeline Options, March 2009, Ref: 21/17633/146319.

GHD, 2009, EnergyAustralia Report for Marulan Gas Pipeline Environmental Assessment of North Eastern Route Option, April 2009, Ref: 21/17633/146320.

GHD, Email B. Harrington to N.Brewer, 8 May 2009 *Re: Final calculations for URS to complete the PPR*.

URS 2008, *Revised Plume Rise Assessment for Marulan Gas Turbine Facilities*, 10 October 2008, Ref: 43217475

URS, 2009, *Marulan Gas Turbine Facilities Traffic Impact Assessment*, 2 March 2009. Ref : 43177585.

URS, 2009, Marulan Gas Turbine Facilities Mapping of Endangered Ecological Communities, 24 April 2009, Ref: 43177585, (V4)

URS, 2009*, Memorandum Marulan Gas Turbine Facilities – Desktop Assessment of proposed water pipeline route,* 23 February 2009

Wilkinson Murray, 2009, *Marulan Gas Turbine Facilities Traffic Noise Impact Assessment,* 26 February 2009, Ref : 05255 traffic 18-12-2008 Ltr.doc.