R E P O R T

Preliminary Environmental Assessment for a Gas Turbine Facility, Marulan, NSW

Prepared for

Delta Electricity

Level 12, Darling Park
201 Sussex Street
Sydney NSW 2000

3 May 2006

43177371

URS

Project Manager: .....
David Chubb
Principal Environmental Scientist

URS Australia Pty Ltd
Level 3, 116 Miller Street
North Sydney, NSW 2060 Australia
Tel: 61 2 8925 5500
Fax: 61 2 8925 5555

Project Director: .....
Matt Coetzee
Principal Environmental Scientist

Author: .....
Andrew Dudgeon
Senior Environmental Engineer
/ Lia Camillos
Environmental & Statutory Planner

Date: 3 May2006
Reference: 43177371
Status: Final

Contents

1.1 Overview

This is a Preliminary Environmental Assessment Report prepared under the provisions of Part 3A of the *Environmental Planning and Assessment (EP&A) Act 1979* for the development of a gas turbine facility on one of two sites, located near Marulan, NSW. This document has been prepared by URS on behalf of Delta Electricity (Delta).

Delta has carried out preliminary consultation with Department of Planning (DoP) during November 2005 with regards to the proposed development. Delta advised DoP of their intention to seek approval under Part 3A of the Act as a Concept Application. DoP advised Delta in a letter dated 24 April 2006 that the proposed development is declared to be a project to which Part 3A of the EP&A Act 1979 applies for the purpose of section 75B of the Act.

This Preliminary Environmental Assessment has been structured to provide general environmental, cultural and socio-economic information about the sites under consideration and its context, with details of the development to be provided in the form of detailed project applications, at subsequent stages.

The proposal comprises the development of a gas turbine facility and associated infrastructure at one of two sites located within 15 kilometres of the NSW Southern Highlands town of Marulan. The two sites are: the 'Big Hill Site' (approximately 12 km north of Marulan) and the 'Marulan Switchyard Site' (approximately 12 km northwest of Marulan). The locations of these two sites are shown in **Figure 1** below.

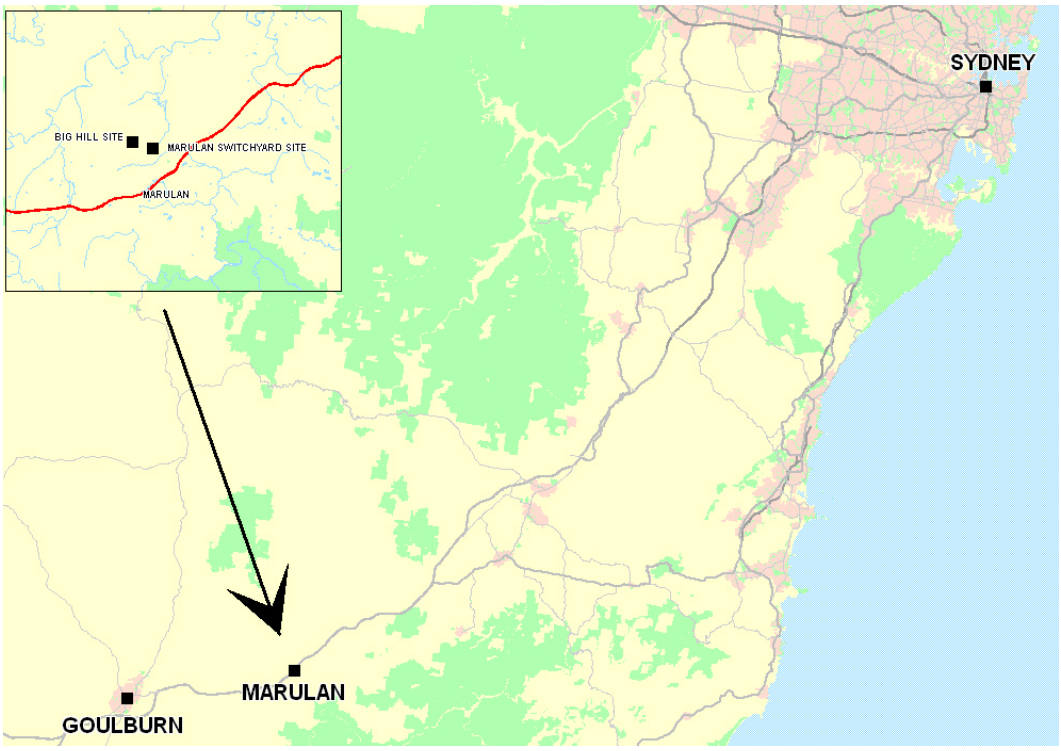


Figure 1 –Proposed Development Location

At this stage a firm decision has not been made regarding which of these sites will be developed. Each of the sites has technical and environmental advantages and disadvantages and either could conceivably be developed. It is for this reason that a Concept Application is to be submitted for this project.

1.2 The Proponent

Delta Electricity is a NSW State Government owned corporation which produces approximately12 % of the electricity used by consumers in NSW, Victoria, South Australia, Queensland and the ACT[1]. Most of Delta's generation occurs at four power stations located in NSW: Mt Piper and Wallerawang (near Lithgow), and Vales Point and Munmorah on the Central Coast. These stations have a combined generating capacity of 4,240 megawatts (MW). Small amounts of renewable energy are also produced from mini-hydro facilities located at Mt Piper near Lithgow and Chichester Dam and Dungog Water Treatment Plant in the upper Hunter Valley.

1.3 Project Need

Peak electricity demand in NSW is growing at a faster rate than average demand. This diverging trend between average or base load and peak load demand profiles can generally be attributed to the sustained period of strong economic growth and prosperity that has been occurring in Australia over the past 10 to 15 years.

The 2005 Statement of Opportunities (SOO) report produced by the National Electricity Market Management Company (NEMMCO) confirms forecasts that NSW is likely to experience a summer peak deficit (or shortfall below the low reserve condition) by 2008/09 unless additional generation capacity is provided to cater for this deficit.

Based on the forecasts provided in the SOO report and Delta's own analysis of current market conditions and potential future demand scenarios, Delta 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.

1.4 Project Justification

In order to meet this short term deficit in NSW's peak electricity generating capacity Delta propose to construct an electricity generating facility consisting of two open cycle gas turbines. This type of generating system can supply electricity to the grid at short notice and is therefore well suited to provide electricity in peak demand periods. Gas turbines represent one of the most effective options to provide electricity for short term demand. Delta Electricity propose to convert the open cycle gas turbines to

[1] Delta Electricity Web Site April 2006 (www.de.com.au)

combined cycle turbines to generate electricity base load electricity. The conversion of the peaking plant to a base load plant will be dependent on the future demand for electricity in NSW.

1.5 Project Benefits

Implementing the proposal would benefit the local and regional community on a number of levels. Potential benefits include:

- increased reliability of supply during peak demand periods;
- improved security of electricity supply during system emergency or black outs;
- improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional power generation technologies such as coal; and
- provides social and economic benefits associated with the ability of the NSW supply network to meet peak energy demands.

2.1 Site Location

As described in Section 1, two sites are being considered under this Concept Application i.e. Big Hill and Marulan Switchyard Site. Both sites lie approximately 12 km north of Marulan, which is 25 km east of Goulburn (refer to **Figure 1**). Marulan is historically a primarily a rural farming area. In recent years the area has experienced increasing levels of rural residential development and more recently proposed quarrying operations. The topography varies from flat valley areas which have typically been cleared for grazing to steeper ridges where vegetation has been retained.

Big Hill Site

The Big Hill Site is approximately 12km north of the village of Marulan. It is 20km from the Marulan Highway. turnoff and 10.3km from the Canyonleigh - Brayton Road turnoff (refer to **Figure 2**). The property is owned by Delta Electricity and comprises only one land parcel Lot 1 DP 1013868.

The Big Hill Site comprises 222 ha of pasture land and some dry eucalypt forest. The property is bounded by private land holdings primarily used for farming/grazing and weekend retreats. The site is at an elevation of approximately 660m AHD within an open valley and headwaters of an unnamed creek that falls toward the Wollondilly River. The Wollondilly River is approximately 5km to the east of the Big Hill site. The site is located in the Upper Lachlan local government area.

Marulan Switchyard Site

The Marulan Switchyard Site is part of the Arthursleigh property which is located on Canyonleigh Road, Brayton, approximately 12km northeast of the village of Marulan. The site is 19.6km from the Marulan Highway turnoff and 10km from the Canyonleigh-Brayton Road turnoff (refer to **Figure 2**). The Arthursleigh property is currently owned by the University of Sydney. Delta Electricity is in negotiation with the University over the purchase of part of the property for the development of a gas turbine facility. The land parcels which would be affected by the development are Lot 18 DP1056592 and Lot 2341 DP622834.

The site comprises approximately 150ha of pasture land and dry eucalypt forest. The proposed plant locations lies within a partially cleared area bordering a tree covered area which continues on the higher ground east of the Wollondilly River. It is situated on a bench approximately 20m above the river's edge at an elevation of approximately 600m AHD. Overall the site slopes gently west towards the river. The site is located in the Goulburn Mulwaree local government area.

OLD MACQUARIE TRACK

BRAYTON RD

WOLLONDILLY RIVER

PADDYS RIVER

CANYONLEIGH RD

MARULAN
APPROX 5KMS

HUME HWY

LEGEND

- TRANSGRID SITE
- MARULAN SWITCHYARD SITE
- BIG HILL SITE
- POTENTIAL GAS TURBINE FOOTPRINT
- TRANSMISSION LINE
- SYDNEY TO MOOMBA GAS MAIN

0 1 2km
Kilometers
(1:50 000 @ A4)

N
W E
S

Source: Delta Electricity

Map compiled using MapInfo StreetPro Data. © 2004 MapInfo Australia Pty Ltd, URS Australia and PSMA Australia Ltd. URS Australia, MapInfo Australia or PSMA Australia do not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that these companies shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Client: DELTA ELECTRICITY	Project: DELTA GAS TURBINE FACILITY	Title: **LOCATION OF SITES**
URS	Drawn: BH · Approved: DC · Date: 21/04/06	Figure: **2**
	Job No: **43177371** · File No: 43177371-002.wor	

2.2 Gas Turbine Power Station

The development of a gas turbine facility at either the Big Hill or Marulan Switchyard site would comprise the following main elements:

- gas turbine facility including ancillary equipment, process control system and administration facilities;
- electricity transmission line;
- gas inlet delivery facility and gas pipeline connecting the Sydney to Moomba Gas Main to the site; and
- associated Infrastructure i.e. site access roads, internal roads and water storage.

2.2.1 Gas Turbine Facility

The implementation of the proposed gas turbine facility would be carried out in two stages:

Stage 1 Two open cycle gas turbines with a total capacity in the range of 250 to 320 MW. Each turbine could have a capacity in the order of 125 to 160 MW depending on final equipment selected.

Stage 2: Conversion to combined cycle facility to generate electricity for intermediate/base load electricity demand. The proposed capacity of the Stage 2 combined cycle plant is in the range of 400 to 450 MW

The main components of the gas turbine facility would be:

- two open cycle 'E' class gas turbines comprising compressor, combustion and turbine stages (including low NOx burners) and exhaust stack (approx. 40m height) each. Turbines will be connected to air cooled generators. The turbines would be converted to combined cycle during Stage 2;
- ancillary equipment including power transformers, demineralised water storage and safety equipment;
- process control and monitoring systems; and
- administration, amenities and control building (approximately 10m height).

The open cycle gas turbine draws in cool filtered air, through a compressor, where it is mixed with natural gas and injected at high pressure into the combustion chamber of the gas turbine for combustion. The hot exhaust gas is used to drive the turbine which connected to the electrical generator produces electricity. The exhaust gases are vented to the atmosphere through the stacks.

The combined cycle facility would require the addition of heat recovery steam generators (HRSG) to each turbine. This plant acts to recover the heat energy previously emitted to atmosphere by the open cycle system by generating steam and producing electricity.

A typical layout for Stage 1 and 2 for both the Big Hill and Marulan Switchyard site is shown in Figures3 to 6. The plant location at each site is indicative and will be optimised as part of the Environmental Assessment process.

The supplier (and therefore the type) of the gas turbines would be selected through a competitive tender process as part of the overall project procurement.

2.2.2 Electricity Transmission Line

The development of a gas turbine power station at either site would require the construction of a transmission line linking the power station to the existing Transgrid switchyard. Transformers at the gas turbine facility would step the voltage from 11 kV [illegible]30 kV for transmission.

The proposed routes for the two transmission line options are shown in Figure 2 i.e. Big Hill site to Transgrid switchyard and Marulan Switchyard site to Transgrid switchyard.

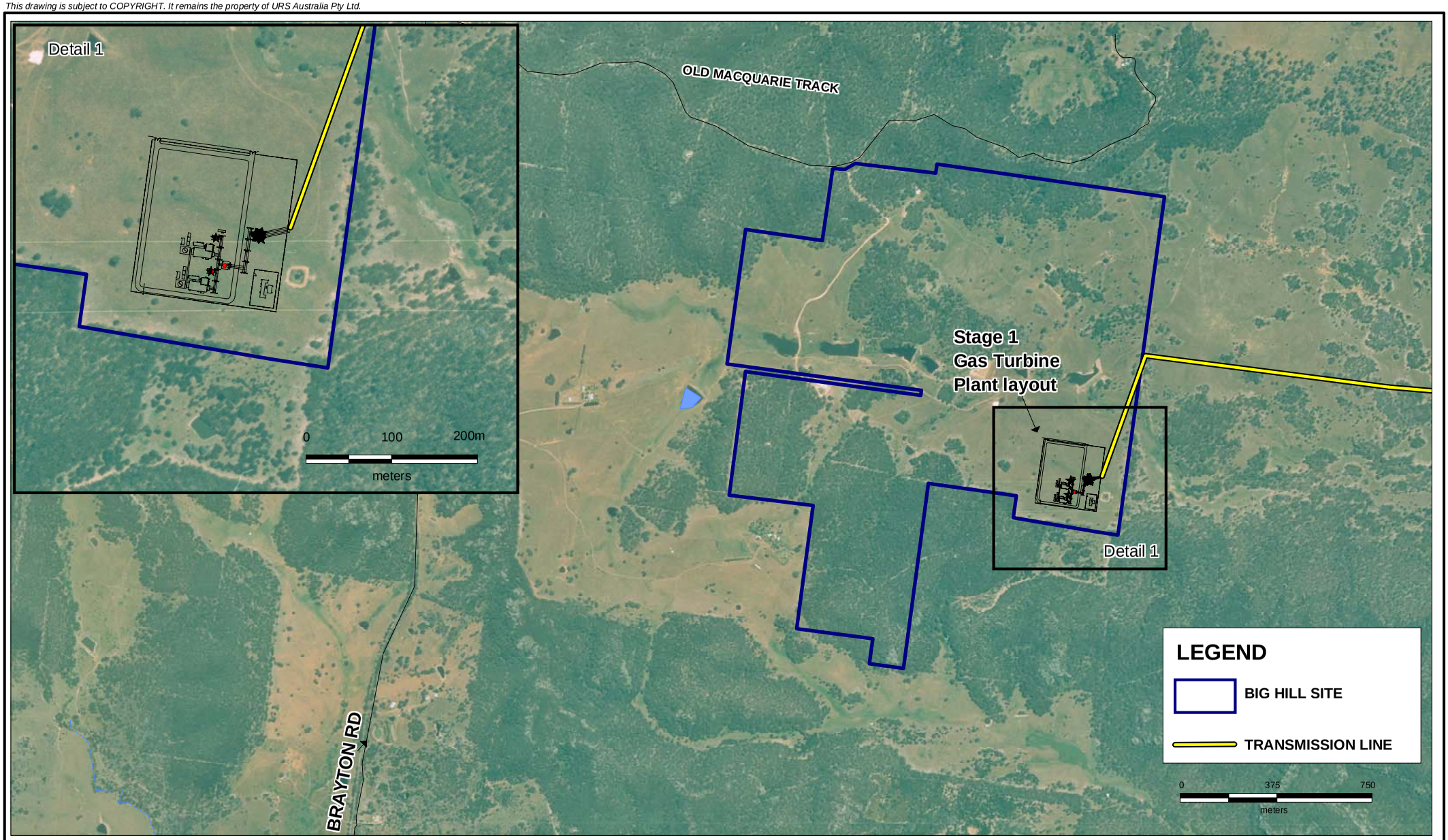
The Big Hill Site would require approximately 5 km of transmission line which would head east from the site across the Arthursleigh property to the switchyard. Delta is currently undertaking negotiations with University of Sydney with regards to obtaining a transmission easement across the property. It is anticipated that the transmission line would be mounted on single poles (with three sets of conductors standing off from the pole in a triangular arrangement) rather than towers. The towers would be painted so as to reduce their visual impact, and it is anticipated that they would range in height from 30 to 40m.

The transmission line required for the Marulan Substation site would be approximately 500m in length as shown in Figure 2.

2.2.3 Gas Delivery Pipeline

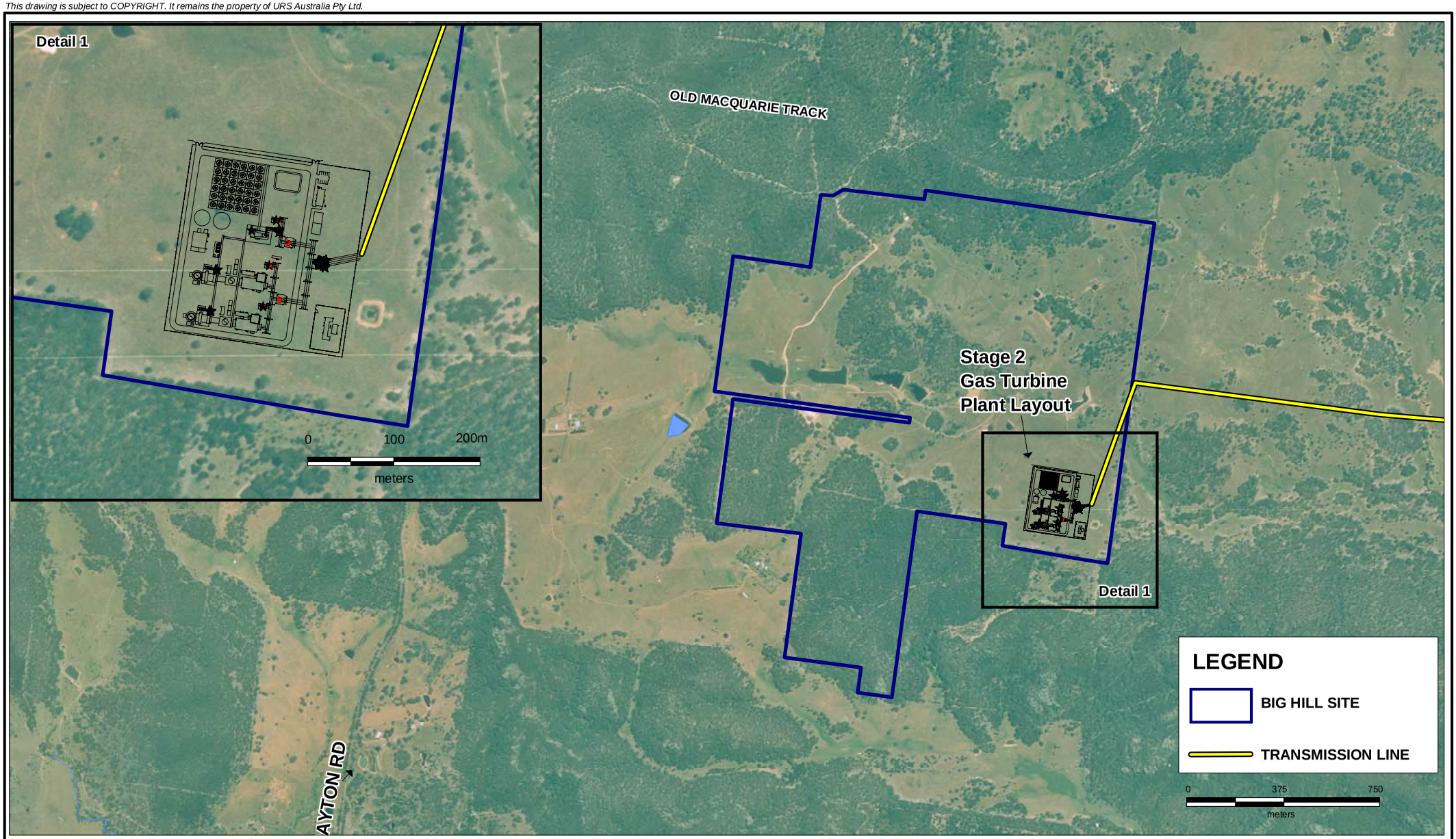
As described previously, the turbines would be fuelled solely by natural gas. No contingency has been made for the use of any other type of fuel, as a back up source or otherwise.

Natural gas would be supplied from the existing Sydney to Moomba gas pipeline. The operating pressure of the existing gas main is in the range of 4,400 to 5000 kPA. The pipeline is located to the southwest of both the Big Hill and Marulan Substation sites, as shown in Figure 2.



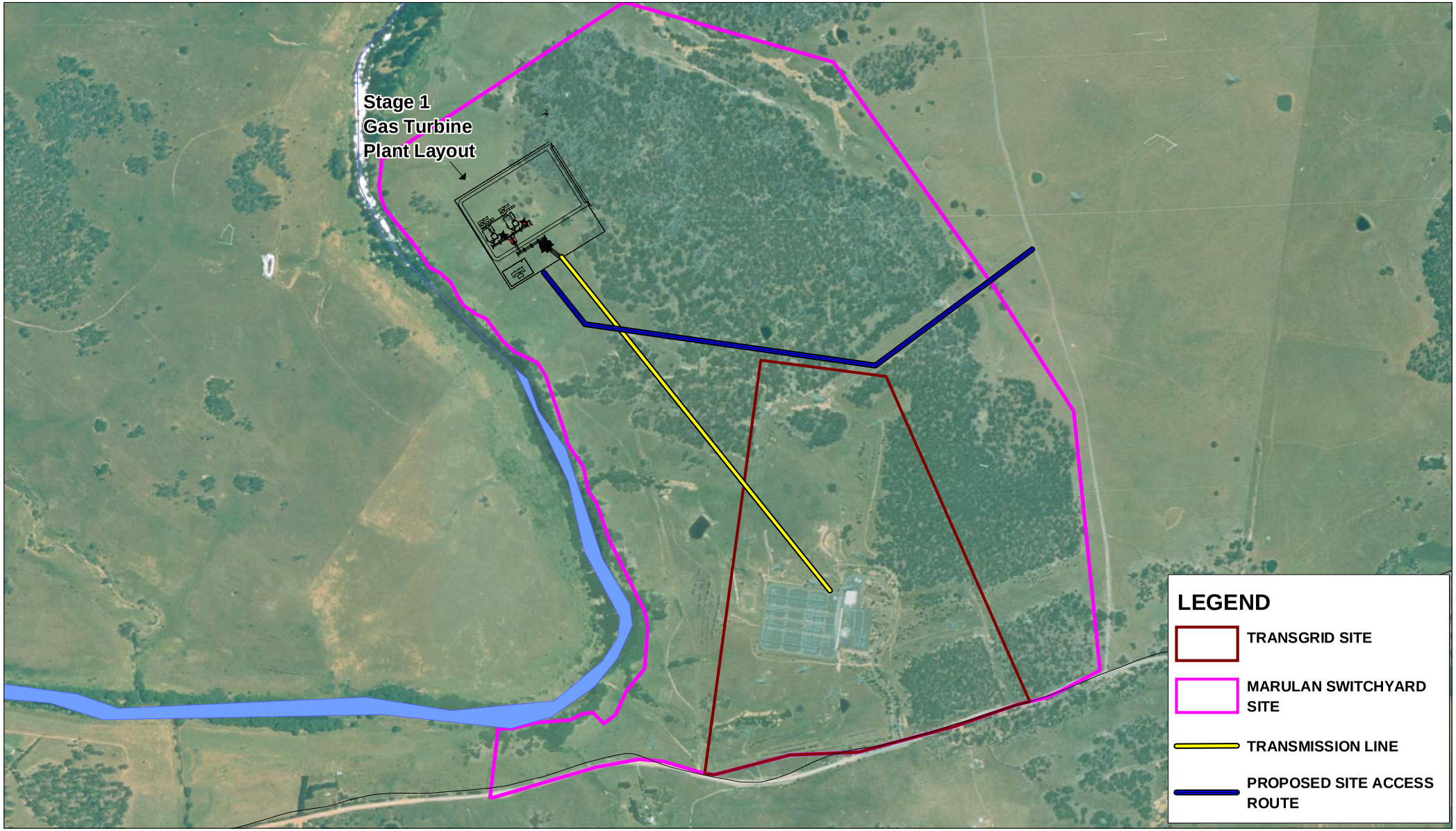
Source: Delta Electricity

Client: DELTA ELECTRICITY	Project: DELTA GAS TURBINE FACILITY	Title: **PROPOSED BIG HILL PLANT LAYOUT (STAGE 1)**	
URS	Drawn: AJW	Approved: DC	Date: 27-04-06
	Job No: **43177371**	File No: 43177371-003.wor	Figure: **3**
			Rev: A
			A4



Source: Delta Electricity

Client: DELTA ELECTRICITY	Project: DELTA GAS TURBINE FACILITY	Title: **PROPOSED BIG HILL PLANT LAYOUT (STAGE 2)**	
URS	Drawn: AJW	Approved: DC	Date: 27-04-06
	Job No: **43177371**	File No: 43177371-003.wor	Figure: **4**
			Rev: A
			A4



0 200 400m

Meters

Source: Delta Electricity

Client: DELTA ELECTRICITY

Project: DELTA GAS TURBINE FACILITY

Title: **PROPOSED MARULAN SWITCHYARD PLANT LAYOUT (STAGE 1)**

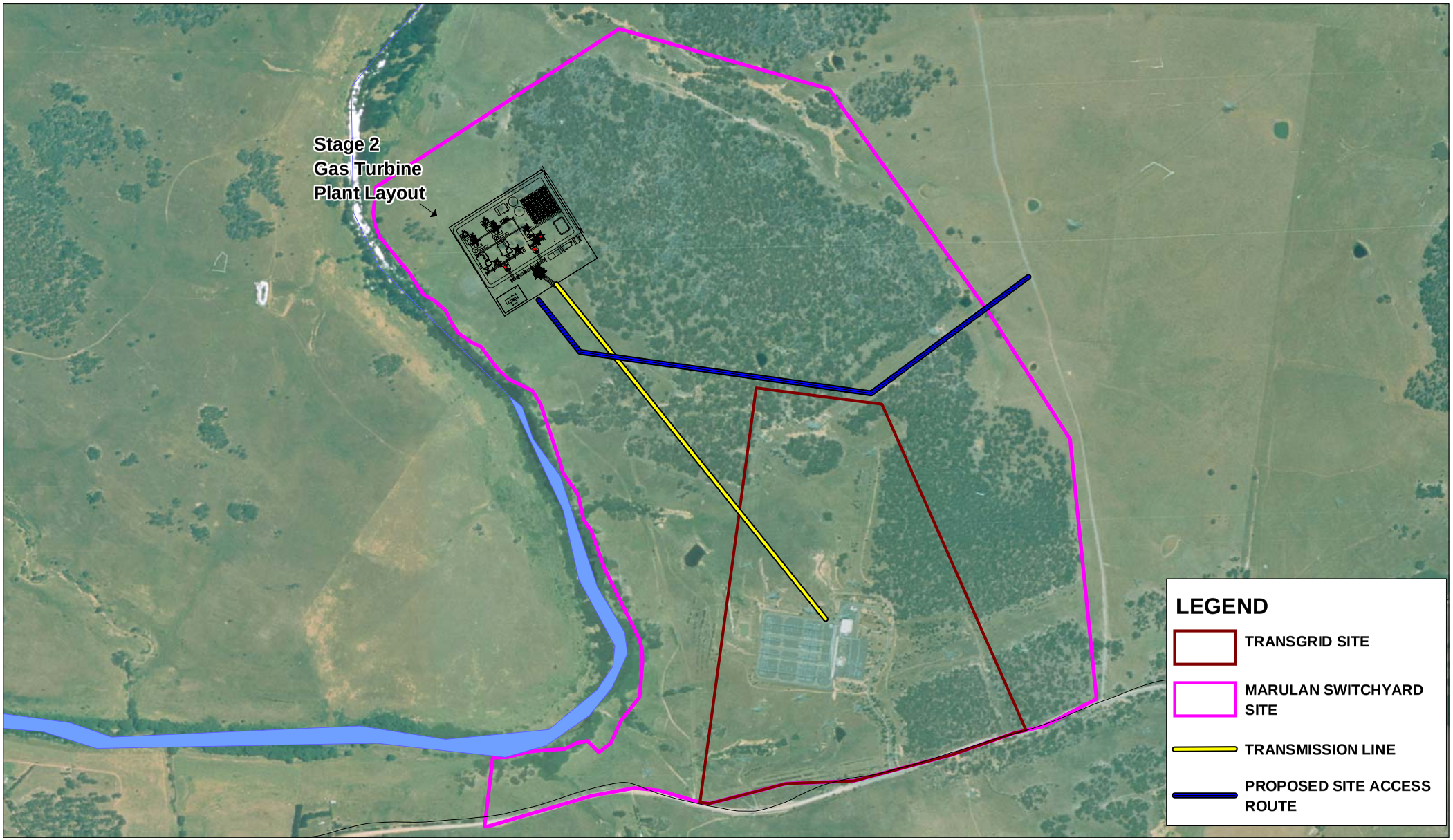
URS

Drawn: AJW	Approved: DC	Date: 01-05-06
Job No: **43177371**	File No: 43177371-003.wor	

Figure: **5**

Rev: B

A4



0 200 400m

Meters

Source: Delta Electricity

Client: DELTA ELECTRICITY

Project: DELTA GAS TURBINE FACILITY

Title: **PROPOSED MARULAN SWITCHYARD PLANT LAYOUT (STAGE 2)**

URS

Drawn: AJW	Approved: DC	Date: 01.05.06
Job No: **43177371**	File No: 43177371-003.wor	

Figure: **6**

Rev: B

A4

Delta Electricity has consulted with Australia Pipeline Trust (APT), who manage the pipeline, with regards to constructing a connection and supplying gas to the power station. APT advised that the pipeline would be able to supply gas for Stage 1 of the development. Gas supply for Stage 2 may require an upgrade of the pipeline. The upgrade of the gas main is dependant on demand for gas in the future and the timeframe for Stage 2 of the development. Due to these uncertainties the upgrade of the gas main has not been considered as part of the scope of this assessment.

At this stage, the location of the connection to the gas main and the preferred route for the gas delivery pipeline has not been determined for either site option. Delta Electricity is currently assessing the preferred location for the gas main connection and the pipeline routes. APT advised that there are no specific constraints on the location of the connection.

Delta has made initial contact with local landholders whom may be affected by the gas delivery pipeline routes. Once a preferred development site is determined Delta Electricity will enter negotiations for an easement for the gas pipeline across the relevant properties.

2.2.4 Associated Infrastructure

Site Access

Both sites would be accessed from public roads. Access for construction and operation traffic to the Big Hill Site would be from the Hume Hwy, along Brayton Road then on to Old Macquarie Track prior to entering the site.

Site access to the Marulan Switchyard site would be via Canyonleigh Road. Internal roads would be constructed on the site to facilitate the movement of construction and operation traffic to the gas turbine facility. An assessment of the potential traffic generated by the construction and operation of the development will be carried out as part of the Environmental Assessment.

Water and Wastewater

Several water and wastewater systems are associated with the power plant. Service water is required for purposes including fire services, gas turbine wash down and domestic services. Demineralised water is also used the gas turbine cooling system. The quantity of demineralised water required for Stage 1 is relatively small and would be tankered in and stored on-site. For Stage 2 the amount of demineralised water would require on-site treatment facilities to supply the required volume of water. An assessment of water supply options will be carried out as part of subsequent Environmental Assessments, if Stage 2 was to be pursued, and in consultation with relevant authorities.

Site runoff and any process water generated from the plant will be stored in on-site settlement dams prior to recycling or if appropriate, disposal.

2.3 Project Cost Estimate

Delta Electricity estimates that the total estimated capital cost (Stage 1 and 2) of the project is $340 million.

2.4 Project Employment

Based on similar projects which Delta has undertaken it is anticipated that the employment generated during the project would be as follows:

- ***Construction Phase***
  - *Stage 1*: maximum of approximately 150 Construction jobs. Average 100.
  - *Stage 2*: maximum 300 Construction jobs and average 200.
- ***Operation Phase***
  - *Stage 1*: 8 full time staff most located off-site.
  - *Stage 2*: 18 full time most located on-site.
- Scheduled maintenance: 20 to 50 contractors for a period of approximately 2 months every 2 to 3 years.

2.5 Project Timetable

Key project dates are listed in the table below. The date of operation assume that Project Approval is granted. A date for Stage 2 construction and operation has not been specified. This stage is dependent on the electricity demand and supply of gas at the time.

Item	Date
Concept Application	April 2006
Project Application	October 2006
Stage 1 Operation	January 2012 (latest date dependent on electricity demand and other developments)
Stage 2 Operation	To be determined (depending on Electricity demand growth and other developments)

3.1 Introduction

This section details the statutory requirements of the proposed Power Station at Commonwealth, State and Local legislative levels.

3.2 NSW State Legislation

3.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment (EP&A) Act 1979* and its supporting Regulation, the *Environmental Planning and Assessment (EP&A) Regulation 2000*, provide the framework for the assessment and approval of proposed developments within NSW. Assessment provisions are provided in three parts of the EP&A Act, Part 3A, Part 4 and Part5.

The proposed development of the subject site for the purpose of a gas fired power station falls under the provisions of Part 3A of the Act. Part 3A of the EP&A Act provides processes for the assessment of development applications which are considered to be a "Major Project" as declared by a State Environmental Planning Policy (SEPP), or by order of the Minister in the Government Gazette.

The proposed works will have a capital investment of over $30million dollars and therefore the proposal is considered a Major Project by virtue of Clause 24(a) of Schedule 1 of SEPP 2005 Major.

Under the provisions of Part 3A a developer is required to submit an application to the Department of Planning (DoP) for a development to be assessed as a Concept Application. As previously noted Delta has previously submitted a request to DoP to be assessed as a Concept Application.

3.2.2 Environmental Planning and Assessment Regulations 2000

Clause 8F of the Regulations describes the conditions under which owner's consent is required for Part 3A development to be assessed. The clause states that "*(1) The consent of the owner of land on which a project is to be carried out is required for an application for approval under Part 3A of the Act unless: (a) the application is made by a public authority."* and "*(3) the consent of the owner of land on which a project is to be carried out is required for an application for approval under Part 3A of the ACT unless:…..(d) the application relates to a linear infrastructure project*". The development of a gas turbine power station at Marulan by Delta Electricity (a public authority) is also considered to fall under the definition of *linear infrastructure project* in the clause, and therefore written consent is not required for the Project Application to proceed. Delta Electricity is currently in negotiation with University of Sydney for the purchase of the parcel of land at the Marulan Switchyard Site. Negotiations have also been held with regards to the proposed transmission easement route from the Big Hill Site to the TransGrid switchyard.

3.2.3 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations (POEO) Act 1997* relates to pollution and waste disposal in NSW and provides for the licensing of certain types of development. It is anticipated that the proposed development would require licensing under the provisions of the POEO Act. In order to ensure that the proposed development is designed and approved in accordance with the requirements of the POEO Act DoP will forward this Preliminary Environmental Assessment to the Department of Environment and Conservation (DEC) for comment.

3.2.4 Other Acts

While the EP&A Act provides the framework for the planning and development approvals system within NSW, there are several other Acts and Regulations which must be considered. While the Integrated Development provisions do not apply to Part 3A Major Projects the provisions of these Acts still need consideration in the preparation of the Concept Application and associated Preliminary Environmental Assessment, and any subsequent Environmental Assessments or Project Applications.

Relevant Acts include:

- The *Rivers and Foreshores Improvement (RFI) Act 1948* which provides for the protection of river and lakeside land in NSW. The Marulan Switchyard Site is located approximately 100m from the Wollondilly River. Under the RFI Act it is necessary to consider any development within 40 metres of any watercourse onsite, and DoP and Department of Natural Resources will need to consider this in the preparation of the environmental assessment requirements for this Concept Application.

- The *Threatened Species Conservation (TSC) Act 1995* provides for the conservation of threatened species, populations and ecological communities of animals and plants. It provides a framework for the assessment of any action that may impact on threatened species.

- The *Heritage Act 1977* provides for the protection of items of local, regional and State heritage significance. It contains a list of State Heritage Items and outlines processes assessment of development which may impact items of heritage significance.

- The *National Parks and Wildlife (NPW) Act 1974* governs the establishment, preservation and management of national parks, historic sites and certain other areas. The NPW Act also provides the basis for the legal protection and management of threatened native flora and fauna and Aboriginal sites within NSW. A search of the Aboriginal Heritage Information Management System (AHIMS) revealed there were no known Aboriginal objects or places on or in the vicinity of either of the proposed sites. It is proposed that an Indigenous heritage and archaeological study be carried out as part of the Environmental Assessment for the project Application.

- The *Native Vegetation Act 2003* provides for the conservation of native vegetation through the prevention of inappropriate clearing and promotion of rehabilitation practices. Any development on site that would result in clearing of native vegetation will need consideration by DoP in consultation

with DEC during the preparation of the environmental assessment requirements for this Concept Application.

- Preliminary investigations by Delta have indicated that licences/approvals may also be required under the *Dangerous Goods Act 1974*, *Electricity Supply Act 1995*, *Pipelines Act 1967* and the *Roads Act 1993*. This will be assessed fully as part of the Environmental Assessment.

3.2.5 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are planning instruments under the EP&A Act that address more specific planning matters, where it is not considered appropriate for the Act to provide the detail.

State Environmental Planning Policy (SEPP) – Major Projects (2005)

From the information provided to URS to date it is considered that the proposed development would constitute a Major Project under the provisions of Schedule 1 of the Major Projects SEPP, under clause 24(a).

Clause 24 Electricity generation provides that development for the purpose of an electricity generation facility that:

(a) has a capital investment value of more than $30 million for gas or coal-fired generation, or co-generation, or bioenergy, bio-fuels, waste gas, bio-digestion or waste to energy generation, or hydro or wave power generation, or solar power generation, or wind generation, or

(b) (Repealed)

(c) is located in an environmentally sensitive area of State significance.

The total estimated capital cost for the development, including Stage 1 and 2, is $340 million.

State Environmental Planning Policy (SEPP) 33 – Hazardous and Offensive Development

This applies to development for the purpose of potentially hazardous industries, and potentially offensive industries. The proposed development would constitute a potentially hazardous and offensive industry as defined under clauses 3 and 4 of SEPP 33. As SEPP 33 would apply the consent authority must consider the proposal within the context of its compliance with current circulars and or guidelines published by the DoP and Australian Standard relating to hazardous or offensive development.

State Environmental Planning Policy No 58—Protecting Sydney's Water Supply

This Policy applies to the proposed development as both the sites are located in local government areas identified in Schedule 1 of the SEPP (Upper Lachlan and Goulbourn-Mulwaree). The Policy aims:

a) to ensure that development in the hydrological catchment from which Sydney draws its drinking water supply does not have a detrimental impact on water quality,

b) to provide a concurrence or notification role for the Chief Executive of the Sydney Catchment Authority in relation to development in the hydrological catchment that is likely to have an impact on water quality, and

c) to ensure that there is a consistent approach to the assessment and control of development in the hydrological catchment that is likely to have an impact on water quality.

3.3 Commonwealth Legislation

3.3.1 Environment Protection and Biodiversity Conservation Act 1999

Part 3 of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* provides that an action which "*has, will have or is likely to have a significant impact on a matter of national environmental significance*" may not be undertaken without prior approval from the Commonwealth Minister for the Environment and Heritage, as provided for under the provisions of Part 9 of the EPBC Act. The EPBC Act provides the following as matters of national environment significance for which Ministerial approval is required:

- *World Heritage properties;*
- *Wetlands of International Significance (Including Ramsar wetlands);*
- *Listed threatened species and communities;*
- *Listed Migratory Species protected under international agreements (CAMBA and JAMBA);*
- *Protection of the Environmental from Nuclear Actions; and*
- *Marine Environment.*

The Administrative Guidelines for the EPBC Act set out criteria intended to assist in determining whether an action requires approval. In particular, the Guidelines contain criteria for determining whether a proposed action is likely to have a significant impact on a matter of national environmental significance.

A search of the EPBC database has revealed that the neither of the sites under is located with a World Heritage area, a Commonwealth marine environment, nor does the proposed development involve nuclear activities. However, the preliminary review of the database has revealed that threatened ecological

communities, threatened species, migratory species and listed marine species **may** occur on or near both the Big Hill and Sydney University sites.

3.4 Regional Legislation

Draft Drinking Water Catchments Regional Environmental Plan No. 1

This Regional Environmental Plan addresses the environmental, social and economic future of the catchments that supply drinking water to Sydney, Blue Mountains and the Illawarra extend over 16 000 square kilometres of land. The plan has not yet been gazetted and is in draft format. Both sites are located within the Sydney Water Drinking Catchment and therefore the provisions of this REP will be considered in the Environmental Assessment for the development.

3.5 Local Legislation

3.5.1 Mulwaree Local Environmental Plan 1995

The realignment of the local government area (LGA) boundaries has resulted in the two sites being located within two different LGAs. The Big Hill site is located in the Upper Lachlan shire Council Area and the Marulan Switchyard site is located within the Goulburn-Mulwaree Council Area. Though this is the case, as neither of the Councils has updated their LEP both sites are still subject to the provisions of the Mulwaree Local Environmental Plan (MLEP) 1995.

Under MLEP 1995 both sites are zoned 1(a) General Rural and the proposed development is permissible subject to the granting of consent by the relevant consent authority.

4.1 Introduction

The following sections discuss the extent of potential impacts that could be expected from the proposed gas turbine development at either the Big Hill or Marulan Switchyard Site. Potential impacts have been identified through review of previous studies carried out for the site as well as through the undertaking of some addition limited desktop studies where required by the studies undertaken to date.

The following environmental issues have been identified as being relevant for this preliminary environmental assessment:

- Flooding, Surface Water and Hydrological Issues;
- Air Quality;
- Noise Issues;
- Flora and Fauna Issues (including threatened species and communities);
- Visual and Landscaping Issues;
- Heritage and Archaeology;
- Hazard and Risk; and
- Traffic and transportation.

4.2 Key Issues

Flooding, Surface Water and Hydrology Issues

In order to develop a gas turbine facility at either of the sites under consideration, water management issues will be addressed as part of the Environmental Assessment.

The Big Hill site contains an existing drainage line running through the property with several farm dams located along it. It is anticipated that one or more of the existing farm dams would be used for water storage.

The Marulan Switchyard Site is located adjacent to the Wollondilly River. The topography rises from the Wollondilly River to a low ridgeline running in a rough north-south direction, rising more prominently in the south-eastern corner of the site. Several drainage lines and small creeks traverse the site all draining into the Wollondilly River. As there are no existing dams on the site one would be constructed as part of the development.

During the construction and operation of both phases of the development surface water runoff from either of the sites would have the potential to impact surrounding water bodies. A detailed assessment of

potential water quality and flooding issues will be carried out for the site taken forward for Project Application. Consultation would be carried out with the SCA and DNR to ensure that the proposed development complied with relevant guidelines and legislation. Mitigation measures will be recommended to address any potential impacts identified on surrounding water bodies.

Air Quality

Gas fired power stations emit the products of combustion through an exhaust stack. The emissions from the Stage 2 plant are relatively minor concern with respect to the range of significant pollutants. For example, SO_2 and particulate emissions are normally low, but a potentially significant issue is the magnitude of NO_x (oxides of nitrogen) emissions. Other pollutants that will be addressed in the air quality assessment are carbon monoxide (CO), volatile organic compounds (VOC) and particulate matter (as TSP, PM_{10} and $PM_{2.5}$). An assessment will be carried out as part of the Environmental Assessment to model the dispersion of emissions from both Stage 1 and 2 at the preferred site.

Gas turbine power stations generally have a lower greenhouse intensity than conventional coal fired power stations. The Environmental Assessment will consider the potential greenhouse emissions generated by the project and compare these to average emission intensity for electricity generation in NSW.

Noise Issues

The sound generated by the gas turbines used in both Stage 1 and Stage 2 would have the potential to affect nearby receivers if unmitigated. A preliminary noise study was undertaken as part of the Site Comparison Study (Parsons Brinckerhoff 2005). The modelling indicates that without any noise mitigation measures up to three houses could be impacted at both sites at noise levels above 40 dBA. Given this potential impact noise mitigation measures will be required at both sites to bring noise levels down to acceptable levels (i.e. 40dBA or less).

A detailed noise assessment will be included part of the Environmental Assessment for the site put forward in the Project Application. The assessment will identify appropriate mitigation measures to ensure that relevant noise guidelines are met.

Flora and Fauna Issues (including threatened species and communities)

A detailed flora and fauna assessment has been carried out on the Big Hill Site, while a preliminary review has been completed for the Marulan Switchyard Site. The Big Hill site contains three areas of native vegetation comprising Tableland Hills Grassy Woodland, Tableland Grassy Box Gum Woodland, Hinterland Sandstone Gully Forest and Eastern tablelands Dry Forest. on this site, distributed in the following remnant areas:

- approximately 20 hectares in the centre of the site;

- approximately 30 hectares along the southern boundary; and
- a thin strip along the northern boundary.

The assessment revealed that there are four threatened species of plant and 27 threatened species of animal that have been recorded or are expected to occur in the local area. It is considered though that the likelihood of these species being impacted by the proposed development is low due to the following reasons:

- core habitats are unlikely to be recorded at the site;
- the area is outside the normal range of the species recorded and records are likely to be of vagrants or invalid;
- the species is considered locally extinct; and/or
- resources used by the species are unlikely to be adversely affected, or are only likely to be minimally affected by the proposal, as the development footprint is relatively small.

The majority of the Marulan Switchyard Site is covered in native woodland and forest vegetation, mainly located along the eastern side of the site. The remainder of the site is open pasture and a mix of exotic and native pasture species with native Poa forming distinctive tussocks.

Three main vegetation types were identified in the assessment, these being:

- Open grassland/pasture – The pasture contains scattered individual trees and groups of regenerating juvenile trees, including Red Stringybark and possible Ribbon Gum. Many of these trees are in poor health.
- Woodland – the woodland communities showed a diversity of assemblages within the dominant tree layer.
- Dry sclerophyll forest – these were found around the southeast areas of the site, along the steeper slopes.

Although not specifically identified on the Marulan Switchyard site, the site is located within the range of Natural Temperate Grasslands of the Southern Tablelands of NSW and the ACT, which is listed as an Endangered Ecological Community under the provisions of the EPBC Act. The review found four threatened species of animal and no threatened plant species that had either been recorded or were expected to occur in the area of the site. It is considered that threatened fauna species are unlikely to occur in the vicinity of the site and unlikely to be dependent upon habitat resources found on this site. This is due to the relative isolation of the site from contiguous vegetation and is further fragmented by the existing transmission line easements.

An assessment of the flora and fauna communities at the preferred site will be carried out as part of the Environmental Assessment for the Project Application. This will also include survey of the proposed

transmission easement if required. Mitigation measures will be recommended so as to prevent any significant potential impacts.

Visual and Landscaping Issues

The development of a gas turbine generating facility in the existing rural landscape may reduce the visual amenity of the area at either site. Both the Big Hill and the Marulan Switchyard Sites are located in a predominantly rural farming area, however the landscape around the Marulan Switchyard Site has been affected by the industrial development of the switchyard and transmission towers.

URS has completed a preliminary visual assessment comprising of a site visit and viewshed analysis for both sites. There are three residences within 2km of the Big Hill Site. Two of these property's would potentially have views of the stacks from their properties depending upon the level of screening from the property. In addition, the transmission line and poles associated with this site would have the potential to be viewed from up to ten properties between the Big Hill Site and the Transgrid switchyard.

Mitigation of potential visual issues associated with the transmission line would be determined by appropriate route selection in relation to existing topography and vegetative cover. Additional screen buffer planting could be carried out subject to land owners' agreement.

It is estimated that there are approximately five properties within 1 to 4km of the site which could potentially have views of the gas turbine stacks at the Marulan Switchyard Site. However, generally visual issues from rural residential properties to the south and south west of the site could be partially mitigated by screen buffer planting carried on Sydney University land subject to owner's agreement. Tree planting could be undertaken to reinforce existing vegetation along the river bank. It is noted that many of the properties surrounding the Arthursleigh site are currently impacted by views of the switchyard facility.

A detailed assessment of the potential visual impacts from the preferred site will be carried out as part of the Environmental Assessment for the Project Application. Mitigation measures such as screening and planting will recommended as appropriate.

Heritage and Archaeology

There exists the potential for items of Aboriginal significance to exist on both the sites, though this is considered unlikely due to the history of clearing, grazing, and in the case of the Marulan Switchyard site, previous construction activity (substation and transmission corridors).

As part of previous studies, online searches of the NSW State Heritage Register, the Australian Heritage Register, and the Mulwaree LEP 1995 have been carried out to determine the presence of any items of heritage significance within the vicinity of both sites. The search found that there were no items of heritage significance located on or within the vicinity of either of the proposed sites.

A detailed assessment will be carried out as part of the Environmental Assessment to identify all recorded and potential Indigenous and non-indigenous archaeological material and heritage values within the study area, to assess the significance of sites and heritage places, and to provide mitigation measures that will assist in conserving the local Indigenous and non-indigenous heritage. Detailed mitigation and management recommendations will be provided to ensure address any potential significant impacts.

Hazard and Risk

Consideration will be given to the hazards and risks associated with the construction and operation of the gas turbine power station and gas connection from the Moomba to Sydney Pipeline lateral to the Big Hill or Marulan Switchyard connection point. A review of potential impacts on local bushfire risk will also be carried out.

A preliminary hazard analysis (PHA) will be undertaken as part of the Environmental Assessment, in accordance with the requirements of SEPP 33.

Traffic and Transportation

An assessment of the potential traffic generated by the construction and operation of the development will be carried out as part of the Environmental Assessment. Once the potential impacts from the development on the local road network are understood, appropriate mitigation measures will be suggested to address these impacts. Mitigation measures might include management techniques such as scheduling of deliveries, or measures could include capital works such as widening or regrading of roads.

4.3 Community Consultation

The proposed development sites are located with the communities of Big Hill and Brayton. The sites are located adjacent to a number of landowners with generally large landholdings. The land usage of these areas is mixed, with some residents permanent residents while others use their properties as holiday homes.

Consultation to Date

Delta, with assistance from URS, have carried out a number of consultation activities to date. These include on-on-one meetings with neighbours surrounding the sites, advertising in the local press and setting up a telephone information line and email address. From the initial consultation, it is noted that residents value the rural setting of the area and the undisturbed character of the locality. Consequently, consultation about the proposed development will reflect the concerns of the residents that the development could influence the lifestyle within the area. Issues which have been raised to date include:

- Visual impact on surrounding properties;
- Noise impact on surrounding properties;

- Air quality impact on surrounding properties;
- Impact on surrounding property values;
- A perception of human health risk including electromagnetic radiation;
- Impacts on local flora and fauna;
- Impacts on soils and potential erosion;
- Bushfire safety; and
- Impact on local water courses.

Future Consultation

URS have developed a detailed consultation plan on behalf of Delta Electricity. The plan identifies communications and engagement process and activities for the project. Future consultation activities planned include further on-on-one meetings, advertisements, newsletters, consultation with government and community stakeholders, and an information session and public display. Outcomes from these activities will be incorporated into the Environmental Assessment.

Conclusion

SECTION 5

This Preliminary Environmental Assessment Report addresses the proposed development of a gas turbine facility on one of two sites, located near Marulan, NSW. Delta Electricity has previously advised DoP of their intention to seek approval under Part 3A of the Act as a Concept Application.

The two sites are located within 15 kilometres of the NSW Southern Highlands town of Marulan. The sites are: the 'Big Hill Site' (approximately 12 km north of Marulan) and the 'Marulan Switchyard Site' (approximately 12 km northwest of Marulan), as described in Section 2.

As set out in the report, a firm decision has not been made regarding which of these sites will be developed. Based on the preliminary environmental assessment, it is recognised that each of the sites has technical and environmental advantages and disadvantages. The nature of the development and the characteristics of the proposed sites are such that the project could conceivably proceed at either location, consequently a Concept Application is to be submitted for this project.