TRANSFIELDSERVICES

Moranbah and Nebo Power Stations Project

Initial Advice Statement

Transfield Services Limited

March 2006



TRANSFIELD SERVICES


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SERVICES

Moranbah and Nebo Power Stations Project

Prepared for

Transfield Services Limited

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Transfield Services Limited

March 2006

10101906

Quality Information

Document Moranbah and Nebo Power Stations Project

Ref 10101906

Date March 2006

Prepared by Jeromy Claridge

Reviewed by Allan Reid

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	07/03/06	Draft to client	Andrew Macleod Technical Director	

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Figures:

Terms and Abbreviations

The following terms and abbreviations have been used in this report:

Terms	Definition
Regional ecosystems	Vegetation communities in a bioregion that is consistently associated with a particular combination of geology, landform and soil.
Remnant vegetation	Is defined as vegetation where the predominant stratum of the vegetation is still intact, i.e. has at least 50% of the cover and more than 70% of the height, and is composed of species characteristic of the vegetation's undisturbed predominant stratum.
Abbreviations	
APIA	Australian Pipeline Industry Association
ATP	Authority to Prospect Permit
CCGT	Combined Cycle Gas Plant
CHMP	Cultural Heritage Management Plan
CLR	Contaminated Land Register
CTBD	Cooling Tower Blow Down
DEH	Commonwealth Department of Environment and Heritage
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMR	Environmental Management Register
EPA	Queensland's Environmental Protection Agency
EP Act	Queensland's *Environmental Protection Act 1994*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPC	Exploration Permit for Coal
ERA	Environmentally Relevant Activity
HRSG	Heat Recovery Steam Generator
HSE	Health, Safety and Environment
IAS	Initial Advice Statement
ILUA	Indigenous Land Use Agreement
kV	Kilo Volt
MV	Mega Volt
NRMW	Queensland Department of Natural Resources, Mines and Water
OCGP	Open Cycle Gas Plant
PDH	Pastoral Development Holding
RE	Regional Ecosystem
ROW	Right-of-Way
STIG	Steam Injected Gas Turbine
TDS	Total Dissolved Solids
ToR	Terms of Reference
TSL	Transfield Services Limited
VMA	Queensland's *Vegetation Management Act 1999*
WRC	Water Resources Commission
ZD	Zero Discharge

Executive Summary

Transfield Services Limited

Transfield Services Limited is a leading power station developer and provider of operations, maintenance and asset management services. The company operates in Australia, New Zealand, South East Asia and the Gulf Region and has extensive infrastructure development expertise in the power industry as developers and 100% owners, operators and maintainers of:

- The Townsville and Collinsville power stations in Queensland;
- The Kemerton power station in Western Australia; and
- A 30% owner of Kwinana power station in Western Australia.

The company, which is publicly listed in Australia and is included in the S&P/ASX 200, has more than 13,000 employees and a turnover in excess of AUS$1.5 billion (2004/05). Transfield has a proven track record delivering large greenfield projects.

TSL proposes to expand its operations within the power sector and has identified a need for additional peaking power in Queensland. It has been forecast that peaking demand will grow at a rate of 3.5% per year (see Powerlink's "*Annual Planning Report 2005*"). If the existing power generation asset base is not augmented, forecast peaking power loads will significantly outstrip supply after the summer of 2008/09.

As a result, Transfield proposes to establish gas fired power generation facilities at Moranbah and Nebo to address this need and to be located in the rapidly expanding North Queensland region.

Purpose of this Report

Transfield seeks *Significant Project* status for the development of the proposed power stations and supporting infrastructure. This Initial Advice Statement provides information to:

- Assist the Coordinator-General to make a decision on *Significant Project* declaration;
- Enable stakeholders to determine the nature and level of their interest in the proposal; and
- Enable the preparation of *Terms of Reference* for an *Environmental Impact Statement* for the proposed project.

Moranbah and Nebo Gas Fired Power Stations Project

The project proposal consists of two power station sites connected with a high-pressure gas pipeline. Specifically:

- Two new gas-fired power stations built on two sites, an intermediate/baseload plant near the township of Moranbah and peaking plant near the township of Nebo;
- A 1 km gas pipeline connection from the existing North Queensland Gas Pipeline to the Moranbah power station and a new 97 km pipeline linking the Moranbah power station to the Nebo power station; and
- Water supply connections from the Burdekin Moranbah Water Pipeline Project to each of the proposed power stations;
- A switchyard on the power station site at Moranbah and connections to the existing nearby Ergon substation at Moranbah and from the Nebo power station to the existing Powerlink substation at Nebo; and
- Other associated works on infrastructure such as access and water disposal aspects of the project.

Phased Development Proposed

TSL proposes to develop the project in three phases:

- Phase 1 would result in the development of generating capacity of nominally 420 MW;
- Phase 2 would employ additional new high efficiency generating units of up to 120 MW at Moranbah and up to 150 MW at Nebo, providing a total of up to 690 MW; and
- Phase 3 of the project would involve additional peaking plant or conversion of existing OCGT generating units to Combined Cycle Gas Turbine configuration to nominally 300 MW at Moranbah and additional peaking plant to nominally 600 MW at Nebo, increasing the total generating capacity of the power station up to 900 MW.

The power station at Moranbah is intermediate/baseload plant and would have a minimum 45% annual capacity factor to satisfy the weekday daily demand. The plant at Nebo is peaking plant that would operate up to 20% annual capacity factor to satisfy summer demands and system needs (to overcome short duration plant outages elsewhere in the grid). The gas pipeline between the two power station sites provides a fuel supply and fuel storage element to even out demand on gas supplies.

The proposed development phases provides an expansion path that is structured to meet Queensland's increasing peak and intermediate/baseload electricity demands. Site selection, design and layout of the power generation facilities will better enable Queensland's power demands to be met reliably and securely through the use of multiple units and sites. The plant has been designed for a life of at least 25 years.

The following milestones and target dates have been established for this project:

Milestone	***Target date***
Indicative pricing	End March 2006
Final pricing	May 2006
Preferred Suppliers selected	June 2006
Financail Close / Notice to proceed	**September 2006**
Commissioning and Performance testing commenced	Beginning August 2008
Commercial operating date (Phase 1)	**September/October 2008**
Completion of Phase 2	2011-2013
Completion of Phase 3	2015-2017

Commencement of construction date is important in order to meet the 2008/2009 summer period.

Project Investment

The total investment for the construction and commissioning of the Moranbah and Nebo power stations and associated infrastructure is AUS$400M (for Phase 1), AUS$200M (for Phase 2) and AUS$200M (for Phase 3) respectively, or a total investment of AUS$800M.

The Project is to be fully funded by Transfield using a similar financial structure to that adopted for other like opportunities undertaken by Transfield; the creation of a *Special Purpose Vehicle* that will be 100% owned by Transfield.

The project structure incorporates financing using non-recourse bank debt covering both the construction and operation of the Project. The market for non-recourse bank debt financing of power sector assets in Australia is very well established and financiers have a depth of experience in the financing of greenfield generation assets.

Transfield would fund development activities up to Financial Close from its own funds. At Financial Close, the Special Project Vehicle becomes a fully financed separate legal entity (100% owned by Transfield) and all contracts for plant supply and construction commence.

Environmental Issues

Preliminary environmental investigations have been undertaken to determine the issues that will need to be addressed through the design, construction and operation of the Moranbah and Nebo Gas Fired Power Stations Project and the associated environmental and planning approvals.

The following five key issues were identified:

- The proposed pipeline will traverse areas of Brigalow and Bluegrass communities that are listed as Endangered under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*. From our initial assessment, it is considered that the level of impact is such that a referral to the Commonwealth will not be required for this matter.
- The pipeline may directly impact potential habitat for State and Commonwealth listed threatened species. Detailed investigations will be undertaken to determine the presence and extent of these habitats and will seek to avoid, minimise or mitigate any impacts on these communities. With the provision of these measures, it is not anticipated that impact will be significant.
- Soils with moderate to high erosion potential have been identified at locations along the pipeline alignment. Appropriate mitigation measures will need to be set out in an Environmental Management Plan and implemented during and following construction to avoid unacceptable levels of erosion at these locations.
- The proposed power stations require a supply of water. Estimated consumption rates will vary depending on the type of plant selected and the operating conditions. Net water consumption will vary depending upon the operating regime and the final plant selection. At the completion of Phase 1 total water demand is expected to be 1400 ML/yr, Phase 2 total water demand is expected to be 2555 ML/yr and at the completion of Phase 3 2800 ML/yr. Discussions are being held to determine the availability of water from an existing Coal Seam Gas supplier. Other options also are being considered to determine both supply and disposal options.
- The proposed development will require a workforce for the construction of each power station, the pipeline and associated infrastructure. These workers will need to be accommodated in Moranbah and Nebo. While Moranbah is a thriving, single-purpose mining town, accommodation and services are stretched to the limit because of an expanding mining industry. Opportunities for expansion are limited given the location of the town within the significant coal reserves of the Bowen Coal Fields. Further discussions will need to be held with accommodation providers (BMA and Anglo) as well as with representatives on the Moranbah Growth Management Group to determine an appropriate housing strategy.

Regardless of whether *Significant Project* status is secured for this Project, a range of environmental and development approvals and permits will be required. These approvals and permits will necessitate:

- Negotiations with two local authorities – Belyando Shire (Moranbah) and Nebo Shire (Nebo);
- Addressing issues relating to a variety of land tenures including grazing homestead freehold lease, grazing homestead perpetual lease, pastoral development holdings, crown reserve, existing easements and mining tenures;
- Negotiations with numerous utility providers including Powerlink, Ergon, Main Roads, Queensland Rail, Telstra, SunWater, water authorities and gas providers;
- Negotiations with a number of Native Title claimants; and
- Negotiations with approximately 14 landholders.

Costs and Benefits

While a number of environmental costs have been identified, it is considered that the Project will result in considerable benefits to the local area, the region and the State. These benefits include:

- A partial solution to the increasing demand for peaking power, meeting the demands for power in North Queensland and now that the Powerlink high voltage grid from Nebo south has been considerably strengthened, providing support for other regions, such as South East Queensland;
- Support for the continuing development of the coal mining activities of the Bowen Coalfields, which are of economic significance to the State of Queensland;
- Being gas-fired, the proposed power stations can assist retailers meet the Queensland Government's 13% Gas Scheme under which “Queensland electricity retailers and other liable parties are required to source at least 13% of their electricity from gas-fired generation”;
- Further employment opportunities for about 500 skilled and unskilled workers during construction of the power stations, pipelines and associated infrastructure; and
- Total investment for the construction and commissioning of the power stations and associated infrastructure of AUS$400M (for Phase 1), AUS$200M (for Phase 2) and AUS$200M (for Phase 3) respectively, or a total investment of AUS$800M.

1.0 Introduction

1.1 Proposed Project

Transfield Services Limited (TSL) proposes to establish gas fired power generation facilities at Moranbah and Nebo in the Bowen Coal Fields in North Queensland.

The project proposal consists of two power station sites connected with a high-pressure gas pipeline. Specifically:

- Two new gas-fired power stations built on two sites, an intermediate/baseload plant near the township of Moranbah and peaking plant near the township of Nebo;
- A 1 km gas pipeline connection from the existing North Queensland Gas Pipeline to the Moranbah power station and a new 97 km pipeline linking the Moranbah power station to the Nebo power station; and
- Water supply connections from the Moranbah Pipeline Project to each of the proposed power stations;
- A switchyard on the power station site at Moranbah and connections to the existing nearby Ergon substation at Moranbah and from the Nebo power station to the existing Powerlink substation at Nebo; and
- Other associated works on infrastructure such as access and water disposal aspects of the project.

1.2 Justification and Alternatives

TSL proposes to expand its operations within the power sector and has identified a need for additional peaking power in Queensland.

This need for additional peaking power is driven by increased domestic consumption due to population growth together with air conditioning demand and expansion in Queensland industry. It has been forecast (see Powerlink's "*Annual Planning Report 2005*") that demand for peaking power will grow at a rate of 3.5% per year. The National Electricity Market Management Company, which is responsible for overseeing the national network and forecasting capacity needs, has indicated that Queensland will face reduced reserve margin (i.e. essential spare generation) from 2008/2009. (See NEMMCO's "*2004 Statement of Opportunities (SOO)*"). There are serious consequences if insufficient generation is available to meet the forecast loads – such as blackouts and/or extreme price spikes, both events that lead to higher cost electricity. If the existing peaking power generation asset base is not augmented, forecast peaking power loads will significantly outstrip supply after the summer of 2008/09.

Locating the proposed project in the Moranbah/Nebo area is strategic as it supports the growth of power in North Queensland as well as South East Queensland, now that the Powerlink high voltage grid from Nebo south has been considerably strengthened to carry more power. The power plant located at Nebo feeds directly into the grid. The plant at Moranbah supports the massive growth in coal mining in the Moranbah area and the plant feeds into the Ergon Energy network that distributes power to the town and surrounding mines.

This project was instigated because of discussions with energy retailers who intend to purchase additional peaking hedges in the near future. Accordingly, the *do nothing* option is not a viable alternative; additional power generation is required. Locating a power station plant in Moranbah, adjacent to Coal Seam Gasfields will result in the lowest cost of generated electricity from gas.

The peaking power stations proposed for Moranbah and Nebo have several distinct advantages over traditional power station configurations and existing facilities:

- They are located within the Bowen Basin and close to the centre of major existing and proposed additional industrial activity and will provide enhanced security of electricity supply;
- Sites for each power station are close to the major power distribution network, the North Queensland Gas Pipeline and Moranbah Water Supply Pipeline Projects;
- Multiple Peaking Power Plants in a plant configuration that optimises fuel purchase obligations while also providing operational flexibility, and supply reliability; and
- Being gas-fired, the proposed power stations can assist retailers meet the Queensland Government's 13% Gas Scheme under which "Queensland electricity retailers and other liable parties are required to source at least 13% of their electricity from gas-fired generation" (Department of Energy 2006).

Sites for the two power stations have been carefully selected on the basis that they:

- Minimised impacts on known coal resources and mining leases;
- Avoided sensitive noise receivers;
- Located on level sites with flood immunity; and
- Avoided vegetation with high ecological values.
- Avoided land that had Native Title or known sensitive cultural significance.

Similarly, the preferred alignment of the gas pipeline:

- Avoids areas with significant ecological values;
- Minimises impacts on known coal resources and mining leases;
- Minimises impacts on existing infrastructure; and
- Minimises landholder impacts.

1.3 Proponent

TSL is an experienced developer and operator of power stations in Australia. TSL from its origins has been involved in a number of projects valued at over 1 billion dollars and currently owns and operates a number of power stations, which have a value of over $640M.

TSL is a public listed company included in the S&P/ASX 200 (the top 200 companies listed on the Australian Stock Exchange) and is the largest dedicated operations and maintenance service provider in Australia with annual revenue exceeding $1.5 billion and with over 10,000 permanent employees.

The experience of TSL can take a project from the conceptual stage, through development and construction and then during the operation stage to provide proven performance, availability and reliability. TSL can provide a complete and total solution and take full responsibility of ownership, development and operation to provide a reliable supply of electricity.

TSL has been extremely successful in project development and has won two major power station development projects in Australia in the last four years:

- The expansion and conversion to gas of the Townsville Power Station; and
- The Western Australia SWIS Stage 1 power procurement process.

These projects included a number of the following aspects, which are key core competences of TSL:

- Developing unique technical solutions;
- Providing viable commercial arrangements (including all commercial agreements);

- Provision of funding (including through non-recourse project financing); and
- Obtaining all licences and approvals required for the project.

TSL currently owns a number of infrastructure assets in the power, water and transportation industries. The power and water assets with the exception of Collinsville (which was refurbished), were build, own and operate (BOO) projects that have been operating successfully for several years under long term contractual arrangements with government authorities.

The following are examples of project financing undertaken by TSL in the power, water and transport sectors:

- Kemerton Power Station - A$245M non-recourse construction and 15 year term facility. Transfield Services role: 100% equity interest (invested in 2003), project developer and operator.
- Townsville Power Station - A$65M non-recourse construction and 15 year term facility. Transfield Services role: 100% equity interest (invested in 1996), project developer and operator.
- Collinsville Power Station - A$120M syndicated non-recourse construction and 18-year term loan facility. Transfield Services role: 100% equity interest (50% equity interest invested in 1997, and remaining 50% bought out from NRG in 2002), project developer (refurbishment) and operator.
- Macarthur Water Filtration Plant - A$100M syndicated non-recourse construction and term loan facility. Transfield Services role: 50% equity interest (invested in 1995) and joint project developer.
- Yan Yean Water Treatment Plant - Transfield Services role: 50% equity interest (invested in 1994) and joint project developer.
- Metrolink (Yarra Trams Franchise) - A$100M syndicated construction and term lease facility. Transfield Services role: 50% equity interest (invested in 1999) in the tram operator.

TSL has significant experience and success in financing BOO power generation facilities, particularly on a non-recourse basis. The company is well recognised in the specialised project finance market and has built up important relationships with major domestic and international banks.

TSL is committed to protecting the health and safety of all employees and ensuring that their activities are not harmful to the environment and the greater community. This commitment is set out in a Health, Safety and Environment Policy based on the principles that:

- All accidents can be prevented
- No task is so important that risk of injury to people or damage to the environment is justified; and
- Effective Health, safety and Environment (HSE) management is a critical foundation for sustainable management.

This Policy applies to all sites where TSL is performing work and covers all activities and services.

This Policy is supported by the following objectives:

- Zero harm to people and the environment;
- Leadership in the field of HSE management; and
- Work undertaken in a responsible and sustainable manner.

These objectives are to be met by:

- Promoting a positive culture based on improving our HSE performance;
- Complying with all legal and regulatory requirements;
- Maintaining externally certified safety and environmental management systems;
- Eliminating hazards, practices and behaviours that could cause accidents, injuries or illness;
- Implementing controls to eliminate pollution and environmental harm;
- Providing training and resources for staff to maintain safe systems of work;
- Integrating HSE management into all aspects of the organisation;
- Employing contractors who aspire to the same HSE standards; and
- Reporting publicly and annually on HSE performance, measured against objectives and targets.

On April 28 2004, TSL successfully completed an extensive external audit program to obtain triple accreditation with BVQI for certification to AS/NZS 4801:2001 Occupational Health and Safety Management Systems, ISO 14001:1996 Environmental Management Systems and AS/NZS 9001:2000 Quality Management Systems certification.

1.4 Purpose and Scope of Initial Advice Statement

It is TSL's intention to seek *Significant Project* status as set out in the *State Development and Public Works Organisation Act 1971*. In considering whether a project should be declared a Significant Project, the Coordinator-General is required to have regard to one or more of the following:

- The detailed information contained in an Initial Advice Statement (IAS);
- Relevant planning schemes and policy frameworks;
- Potential effects on infrastructure;
- Employment opportunities;
- Local, State and Commonwealth requirements for the project;
- The level of investment required; and
- The strategic significance of the project.

This IAS therefore:

- Addresses the criteria for which the Coordinator-General is to have regard; and
- Scopes out the issues that need to be addressed through further reporting as required.

With regard to the decision-making processes for *Significant Projects*, this IAS has been prepared to:

- Assist the Coordinator-General to determine whether the project should be declared a *Significant Project*;
- Enable stakeholders to determine the level and character of interest in the project; and
- Enable preparation of the Terms of Reference (ToR) for an Environmental Impact Statement (EIS) as required.

2.0 The Proposal

2.1 Location

The power generation facilities are proposed to be located within the Central Queensland Bowen Basin coalfields near the towns of Moranbah and Nebo, approximately 190 km and 90 km inland of Mackay as shown on Figure 2.1 and shown in Figure A1 and A2 at Appendix A.

Figure 2.1 Location of proposed power generation facilities

Sites selected for the two proposed power stations are:

- The Moranbah power station is to be on an 85 ha parcel of land located on Goonyella Road approximately 4.5 km north-west of the town of Moranbah, as shown in Figure A3 in Appendix A. This land is described as part of Lot 3390 CP907952.
- The Nebo power station is to be on a 45 ha to 100 ha property, located approximately 6 km north-west of the town of Nebo. Negotiations are continuing with a number of land owners.

The alignment of the proposed natural gas pipeline is shown on the figures in Appendix A. The alignment for the pipeline is located close to and parallel with sections of variously the Goonyella Rail Line, the Peak Downs Highway and the Powerlink easement for the 132kV powerline proposed between Mount Power switching station and Mindi sub-station. The pipeline is to be located mostly within rural properties. Dedicated easements would be established along the length of pipeline.

The following sections provide a description of:

- The proposed gas-fired power station site to be located on a site near the town of Moranbah;
- The second gas-fired power station to be located near the town of Nebo;
- The gas pipeline connection from the existing gas pipeline network to Moranbah and a new gas pipeline whereby gas flows from the Moranbah power station to the Nebo power station;
- Water supply connections from the Moranbah Pipeline Project to each of the proposed power stations;
- Connections approximately 3 km from the Moranbah power stations to the existing Ergon Energy electricity feeder lines in Moranbah and nearby substations and including a switchyard at Moranbah; and
- Connections from the Nebo power station approximately 3 km to Powerlink's existing Nebo switchyard; and
- Other associated works on infrastructure such as access and water disposal aspects of the project.

2.2 Moranbah Power Station

A gas-fired power station is proposed for Moranbah. This power station is planned to be developed in three phases:

- Phase 1 of the proposed power station will employ highly efficient Open Cycle Gas Turbine (OCGT) technology with a generating capacity of up to 120 MW. Depending on power demand needs, a Combined Cycle Gas Turbine (CCGT) of approximately 120 MW may be included in the power station in Phase 1.
- Phase 2 will employ an additional plant introduced at a scale and rate to meet Queensland's peak demand consisting of an additional OCGT generating unit of up to 120 MW, providing a total of up to 240 MW; and
- Phase 3 of the proposed power station will involve additional OCGT or conversion of the OCGT generating units to a CCGT baseload configuration, increasing the total generating capacity of the power station up to 300 MW.

The Moranbah power station may comprise very efficient OCGT, CCGT or Steam Injected Gas Turbine (STIG) machines of up to 120 MW capacity each consisting of:

- One high efficiency Gas Turbine (Frequency 50Hz, NOx control via water injection) and step-up transformer to 66 KV;
- 1 x Heat Recovery Steam Generator (HRSG);
- Chillers or evaporative coolers for the purpose of Gas Turbine air inlet cooling; and
- Water Treatment Plant (i.e. Reverse Osmosis and water storage).

The gas turbines may use inlet air chilling to ensure that maximum plant performance is achieved on the hottest days when demand is usually highest. The proposed development phases provide an expansion path that is structured to meet Queensland's increasing peak and intermediate electricity demands.

The power station at Moranbah would have a minimum 45% annual capacity factor to satisfy the weekday daily demand. Generation operation will usually occur between 7 am to 10 pm weekdays, but part load operation could also occur overnight and weekends. Annual capacity factor could be up to 90% depending upon demand and supply factors in the electricity market

The generation units will be selected through a competitive tendering process. Potential units will be evaluated on the basis of proven levels of efficiency, reliability and operability. The units selected will be "off-the-shelf" units, as provided by prospective manufacturers. Precise outputs can only be provided once the tendering process has been completed.

Figure 2.2 Typical layout of a two unit power station

2.3 Nebo Power Station

A second power station is to be built simultaneously at Nebo. Like the Moranbah power station, this will be developed in three phases. Phase 1 of the Nebo Power Station will comprise efficient Open Cycle Plant (OCGT) of approximately 300 MW nominal capacities with:

- Two or three Gas Turbine (Frequency 50Hz, either dry low NOx or water injected control) and associated generator step up transformers to 275 KV (see Figure 2.2). ;
- Chillers or evaporative coolers for the purpose of Gas Turbine air inlet cooling;
- Water Treatment Plant (i.e. Reverse Osmosis, Demineralisation Plant etc); and
- All balance of plant necessary to deliver a complete operational power station.

These gas turbines may use inlet air chilling to ensure that maximum plant performance is achieved on the hottest days when demand is usually highest.

The power station at Nebo would operate up to 20% annual capacity factor to satisfy the weekday daily peak demand. Generation could normally occur between 7 am to 10 pm weekdays, but more usually between late afternoon and early evening (nominally 5 pm to 9 pm) to meet the peak demand. Operation could occur infrequently at any other time. Operation outside these hours could occur if other plant elsewhere in the network trips off and the Nebo plant called to operate to support demand.

Phase 2 would consist of additional plant introduced at a scale and rate to meet Queensland's peak demand. Up to approximately 600 MW could be located on the site (anticipated to be 3 to 5 years after the completion of Phase 1). The actual generation capacity on site will be determined at the time as a balance between Queensland's demand, grid constraints and plant installed at Moranbah.

Phase 3 would consist of converting one or more of the open cycle plants to base load operation. Multiple open cycle generation units may be converted to combined cycle (base load) configuration in future years as required (anticipated to be 4 to 6 years after the completion of Phase 2).

The same competitive tendering process as proposed for the Moranbah site will be adopted. Potential units will be evaluated on the basis of proven levels of efficiency, reliability and operability. It is envisaged that the units selected will be "off-the-shelf" units, as provided by prospective manufacturers. Precise outputs can only be provided once the tendering process has been completed.

2.4 Power Transmission

Generated power will need to be distributed to the relevant power grids and to the mines.

It is proposed that the Moranbah power station be connected to the Moranbah substation using overhead double circuit 66 kV feeders and 132 kV single circuit feeders along a 4 km easement (see Figure 2.3). Several 66 kV feeders that currently come from the switching station to supply mines in the area may be rerouted by Ergon as part of their normal planning cycle from a point on the existing network to the new power station. The exact nature and location of these changes to overhead lines will be subject of further investigations and discussions.

Depending on feeder configurations from the Moranbah site, a switching station may most likely be required within the proposed Moranbah power station site.

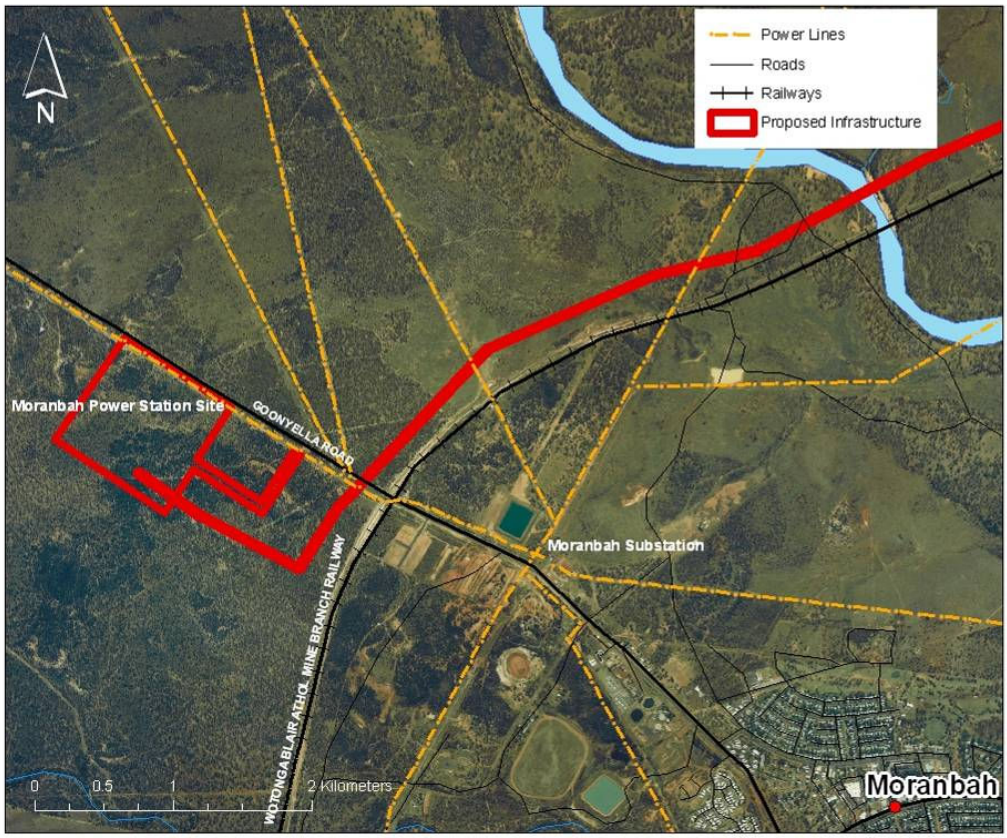

Figure 2.3 Existing powerlines near the Moranbah site

The Nebo power station will be connected to the nearby Powerlink owned Mount Power switching station via double circuit 275 kV overhead lines. This will require an easement of up to approximately 4 km in length depending upon land owner negotiations.

2.5 Fuel Supply

Gas turbines are able to operate on both natural gases and liquid fuels (with a preference for kerosene). This provides operational flexibility and ensures continuous power generation in the event of gas supply disruptions. In this project, coal seam gas (CSG) is available locally and will be the primary fuel supplied to both the Moranbah and Nebo sites from CSG fields at Moranbah. The gas is high quality and exceeds 96% methane. Liquid fuel normally required as a back-up fuel is unnecessary in this project because the new gas pipeline between Moranbah and Nebo is designed to be a fuel storage system. Liquid fuel is therefore not required for this project.

The two power stations will be connected to the CH4 CSG gas collection system at the Moranbah Inlet Compressor Station via a 400 mm underground pipeline. This will require the construction of an Inlet Compressor Station to service this line on the Moranbah power station site and will comprise:

- 750 kPa Suction Pressure; and
- Redundant Compressors System (2 x 100%) in duty/standby configuration delivering gas:
  - At 6 MPA to Moranbah Power Station;
  - At 15 MPA to the gas pipeline supplying Nebo Power Station;
  - Continuous capacity at 6 MPA – matched to supply all generating units at Moranbah (including degradation margins); and
  - Continuos Capacity at 15 MPA – matched to supply at least two generating units at Nebo (including degradation margins).

The pipeline will be constructed within a 30 m wide easement using open trenching and fill for most of the length, with small sections requiring underboring (such as at significant road, rail and creek crossings). The pipeline will be approximately 97 km in length and will comprise:

- 40 TJ Line Pack;
- Material x 70;
- Operating Pressure 15.3 MPa;
- 400 mm Nominal Pipeline Size
- 9.5 mm Selected Wall Thickness
- Design Factor 0.72

Consultation with CH4 has indicated that there will be adequate supply for Phases 1 to 3 of the project.

2.6 Water Requirements

2.6.1 Supply

SunWater owns and operates the two major raw water supplies, which deliver raw water into the town of Moranbah as well as to the surrounding coalfields. Figure 2.4 shows the water supply infrastructure associated with these raw water supplies from the Burdekin Falls Dam and the Eungella Dam. This water would need to be treated on-site. Treatment technology will be of electrical rather than chemical recharging of resins avoiding the need for storage and use of large quantities of chemicals on the site. The water treatment / power station will need to be designed to be able to use either water supply or a combination of water supplies.

The capacity of the Burdekin to Moranbah pipeline will be 16,800 ML per annum upon the completion of the pipeline in early 2007. Sun Water advises that the pipeline is augmentable in a single stage only, providing an additional capacity of 6,000 ML per annum. When commissioned the capacity of the pipeline will be 100% committed to foundation customers. However, some foundation customers may hold capacity that is surplus to their short to medium term requirements, and may be interested in trading this capacity to new users. TSL is currently in negotiation with foundation customers.

The CH4 Limited Coal Seam Gas project currently has a supply of high TDS water of approximately 1 ML/d available produced by the wells. CH4 are examining their long-term water balance to determine long-term supply possibility. Gas production wells produce water with high bi-carbonate and high chloride ion content. Currently this water is disposed of in evaporation ponds at the gas fields near the proposed power station. Consideration is being given to the feasibility of using this approximately 350 ML/yr resource.

Raw water for the Nebo Power Station will be supplied either from the local bore fields at Nebo (which are currently allocated to coal miner BHP Billiton – Mitsubishi Alliance) or will be supplied via a pipeline extension to the Eungella Water Pipeline Eastern Extension (see Figure 2.4). Treatment technology will be of electrical rather than chemical recharging of resins to avoid the need for storage and use of large quantities of chemicals on the site. The water treatment / power station will need to be designed to be able to use water supply either from the Eungella Water Pipeline Eastern Extension or from the Nebo Bore Fields.

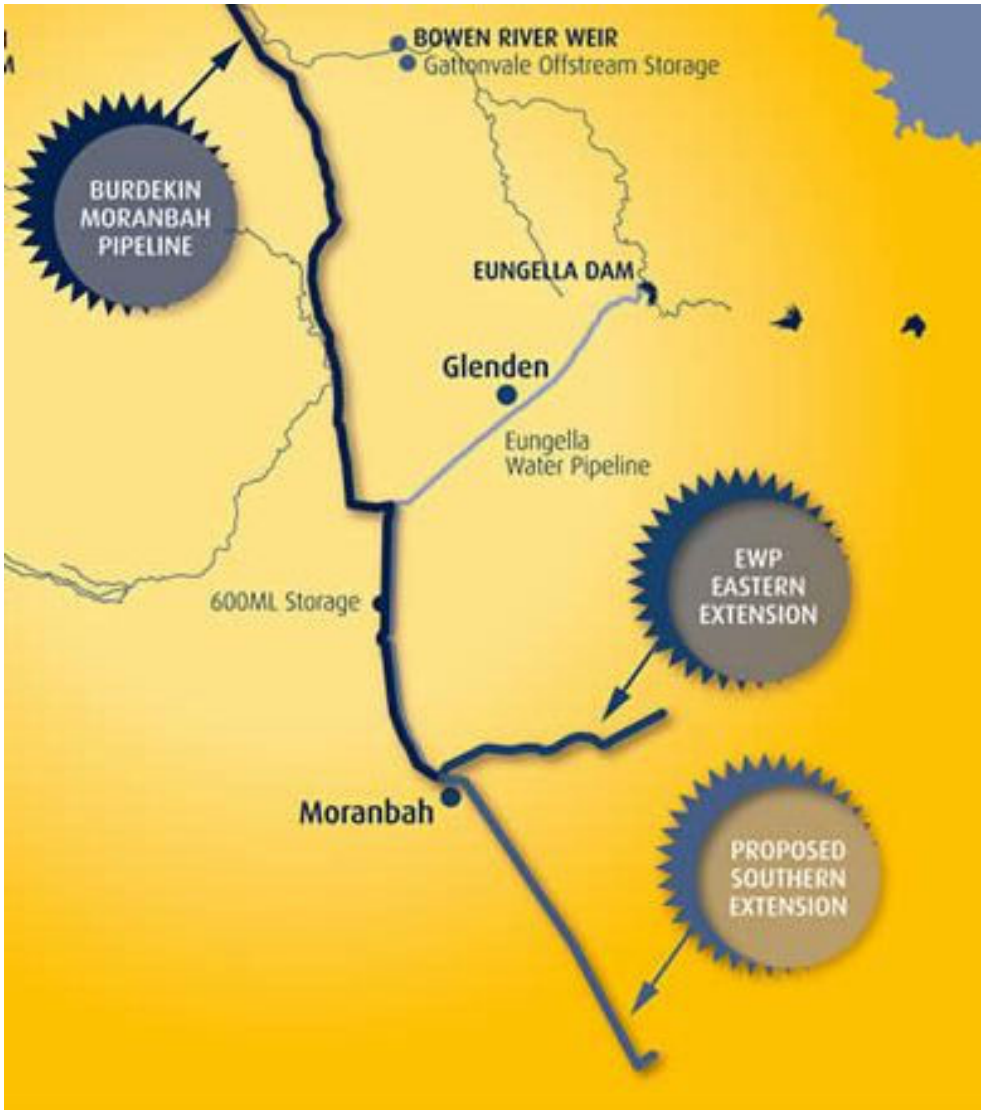

Figure 2.4 SunWater pipelines in the Moranbah/Nebo region

2.6.2 Consumption

Water use of the power stations is dependent upon power demand from the electricity network. The Moranbah power station is expected to operate with 45% to 90% annual capacity factors as an intermediate/peaking plant and Nebo up to 20% annual capacity factor. The capacity of each power station will also increase with each of the phases. Different plant suppliers and different configurations of plant would result in different rates of water consumption. For Phase 1 of the project total water usage ranges from 1045 ML/yr to 1400 ML/yr and for a fully developed Phase 3 total water consumption ranges from 1,585 ML/yr to 2800 ML/yr depending upon the plant selection.

Consumption (ML/yr)

	Plant Configuration 1			Plant Configuration 2		
	Moranbah	**Nebo**	**Total**	**Moranbah**	**Nebo**	**Total**
Capacity Factor	80%	20%	**ML/a**	80%	20%	**ML/a**
Phase 1	1035	365	1400	1020	25	1045
Phase 2	2070	485	2555	1020	40	1060
Phase 3	2190	610	2800	1545	40	1585

Waste Water Production (ML/yr)

	Plant Configuration 1			Plant Configuration 2		
	Moranbah	**Nebo**	**Total**	**Moranbah**	**Nebo**	**Total**
Capacity Factor	80%	20%	**ML/a**	80%	20%	**ML/a**
Phase 1	220	90	315	255	5	260
Phase 2	455	120	580	255	10	265
Phase 3	475	150	625	385	10	395

2.6.3 Disposal

Waste water from the power stations will have a water quality suitable for use in both industrial and agricultural industries, especially coal mines and washeries and it is anticipated that this option will be readily be taken up. Most of the waste water is produced at Moranbah near operating coal mines.

2.7 Other Physical Infrastructure

Both power stations and most of the alignment of the proposed gas pipeline are located close to the public road network providing ready access during construction and for maintenance during the operational phase.

During construction, access will be required to accommodate construction activities, at each power station site, along the pipeline right-of-way (ROW) and to other work areas and accommodation facilities. Existing roads, tracks and disturbed areas will be utilised where feasible to minimise further disturbance.

Details of the proposed access arrangements for the operational phase of the power stations and gas pipeline will be subject to further and more detailed investigations, but will include:

- Access to the Moranbah power station directly from Goonyella Road;
- Access to the Nebo power station site from the Peak Downs Highway; and
- Off-road access as appropriate for maintenance purposes for the length of the pipeline.

External infrastructure requirements in addition to those described above will be limited.

During construction, either diesel generators located on the site will provide power to both the Moranbah and Nebo construction sites or 11 KV feeders will be constructed from the Moranbah and Nebo switchyards to the respective power station site.

Once operational, all sites will be self-sufficient with permanent provisions made for power, vehicular access and communication to each power station. An on-site septic system will be provided allowing disposal of sewage and kitchen wastes. Stormwater will be directed from roofs and hardstand areas to soak areas within the site.

2.8 Workforce and Housing

During construction, a workforce of up to 200 people will be required at Moranbah and 200 people at Nebo. An additional 100 to 150 workers will be required for the construction of the pipeline and associated infrastructure. These workforces will vary in size and composition through the construction phase. The workforce will comprise a range of tradesmen and skilled and unskilled workers.

Given the current level of mining activity within the Bowen Coalfields, obtaining any form of accommodation in or around Moranbah and Nebo towns is difficult. There are no vacant rental houses or worker accommodation. Hotel and motel rooms are booked out years in advance by the major mining companies and associated industries.

Current accommodation shortages will be increase demands for additional worker accommodation, particularly in Moranbah, as a result of a number of new and proposed developments. These may include the construction and operation of the Dyno Nobel Ammonium Nitrate Plant and the construction of the Burdekin Moranbah Water Pipeline Project, as well as the need for housing for the construction workforces for the proposed power stations at Moranbah and Nebo and the proposed gas pipeline.

Further, it needs to be understood that opportunities for residential developments at Moranbah are extremely limited as a result of the location and extent of the underlying coal reserves. Other issues include current shortages of water supply and the provision and suitability of other infrastructure.

Investigations will be undertaken during the preparation of the EIS to identify construction workforce housing options and determine the most appropriate housing and infrastructure strategy for both the construction and operational workforces. The focus for these investigations will be the provision of housing for the construction workforces. The options that will be investigated will include:

- Potential for securing worker accommodation from existing and available single worker accommodation;
- Identification of one or more new sites and the development of these sites with single worker housing, with appropriate access, transport, water and other services;
- Working with the Proponents of other proposed new developments to provide a single solution that is able to accommodate all proposed developments..

During operation, the demand for housing and services will be minimal as the power stations are being designed for unattended operation at night. Approximately 20 workers in total will operate both the power stations during normal business hours and to periodically perform maintenance. Approximately every three years an additional 30-40 people will be required to be on-site to undertake major overhauls lasting approximately 6-8 weeks.

2.9 Project Milestones and Target Dates

The following milestones and target dates have been set for this project:

Milestone	*Target date*
Indicative pricing	End March 2006
Final pricing	May 2006
Preferred Supplier selected	June 2006
Financail Close / Notice to proceed	**September 2006**
Commissioning and Performance testing commenced	Beginning August 2008
Commercial operating date (Phase 1)	**September/October 2008**
Completion of Phase 2	2010-2013
Completion of Phase 3	2013-2015

The date proposed for the commencement of construction is important in order to meet the 2008 / 2009 summer period. Construction of Phase 1 of the project will take two years. The power stations will commence operation at 4Q/2008.

2.10 Financial Requirements

The total investment for the construction and commissioning of the Moranbah and Nebo power stations and associated infrastructure is AUS$400M (for Phase 1), AUS$200M (for Phase 2) and AUS$200M (for Phase 3) respectively, or a total investment of AUS$800M.

The Project is to be fully funded by Transfield using a similar financial structure to that adopted for similar opportunities undertaken by Transfield; that is the creation of a *Special Purpose Vehicle* that will be 100% owned by Transfield.

The structure incorporates financing using non-recourse bank debt covering both the construction and operation of the Project. The market for bank debt financing of power sector assets in Australia is very well established and financiers have a depth of experience in the financing of greenfield generation assets.

Transfield would fund development activities up to Financial Close from its own funds. At Financial Close, the Special Project Vehicle becomes a fully financed separate legal entity (100% owned by Transfield) and all contracts for plant supply and construction commence.

3.0 Existing Environment

3.1 Land Use and Land Tenure

3.1.1 Land Use

The entire area potentially impacted by the proposed development is used for low density grazing with an area of dryland cropping south of the Nebo power station site. Much of the grazing land has been partially or wholly cleared, however, areas of remnant vegetation exist, particularly around Coppabella.

3.1.2 Land Tenure

The Moranbah power station site is currently leasehold land, while the Nebo site occurs on freehold land (Appendix A Figure A1). Negotiations are underway to secure each of these properties.

The pipeline occurs predominately on freehold land with some areas of leasehold land around Coppabella and Broadlea. Negotiations are being undertaken to an easement 30 m in width for the length of the pipeline route.

3.1.3 Mining Permits and Leases

A search of the Department of Natural Resources Mines and Water (NRMW) Interactive Resource Tenure Maps shows Mining Leases, Exploration Permits Coal and Coal Resource Areas (see Appendix A Figure A6).

This figure shows that a mining lease covers the Moranbah power station site. Other portions of the pipeline between Moranbah and Coppabella are also covered by Mining Leases. Similarly, the Moranbah power station site and areas around Moranbah are contained within Coal Resource Areas. There are no Mining Leases or Coal Resource Areas over the Nebo power station site.

3.2 Physical Characteristics

3.2.1 Topography

Both power station sites are relatively flat and slope gently from north to south. The Moranbah site has an elevation of approximately 260mAHD, while the Nebo site has an elevation of approximately 215mAHD (as shown on Figures A4 and A5 at Appendix A).

The pipeline route passes through gently undulating terrain from Moranbah to Coppabella and skirts to the south of the steep and undulating terrain that forms the Carborough Range. The Carborough Range is the dominant topographic feature in the region, rising to a height of 570mAHD. Heading west from Coppabella, the topography is more variable and there are numerous gullies and moderately incised drainage lines. Heading north from the Peak Downs Highway, the topography is particularly flat, however, the pipeline crosses several incised watercourses.

3.2.2 Geology

The western portion of the study area is located on the “Mount Coolon, Qld” 1:250,000 geological series map, compiled by E J Malone (1968) and the eastern portion on the “Mackay, Qld” 1:250,000 map compiled by A R Jensen (1964). Examination of these maps shows that the western portion of the route comprises Tertiary sandstones and conglomerates of the Suttor Formation. Between Moranbah and Coppabella there are Cainozoic alluviums, sand and lateritic gravels over Palaeozoic quartz, slate and sandstone.

The route skirts around sandstones of the Mimosa Group in the Carborough Range and continues across unconsolidated Quaternary sands, silts and gravels with some Tertiary olivine basalts. These Quaternary sediments exist over Permian siltstone and claystones.

Further investigations will be undertaken during the preparation of the EIS to determine constructability and rip ability of the power station sites and pipeline easement.

3.2.3 Soils

The Moranbah power station site contains yellow and grey duplex soils, coarsely structured non-cracking clays and bleached grey massive earths. The Nebo power station site contains cracking clays, melonhole clays and similar coarsely structured non-cracking clays. Field studies undertaken during the EIS will confirm these soil types.

The pipeline alignment crosses several landscape units with a diverse range of soils. Soils across the pipeline route includes:

- Yellow and grey duplex soils, coarsely structured non-cracking clays and bleached grey massive earths;
- A range of duplex soils, red and brown structured earths and small areas of massive earths;
- A range of duplex soils, red and yellow massive earths, loams, sands, structured earths, cracking clays and melonhole clays; and
- Cracking clays and melonhole clays.

It is expected that soil erosive potential would range from moderate to high with particular erosion hazard on alluvial soils. Duplex soils are highly susceptible to rill and sheet erosion following disturbance, as finer soils overlay denser cohesive subsoils. Cracking clays can have variable erosion potential dependent on particle size. Areas of active erosion along the pipeline route were observed during initial site visits undertaken on 28 March and 1 May 2006.

Further investigations will be undertaken during the preparation of the EIS to determine soil characteristics, including erodibility and mitigation measures.

Examination of the NRMW Burdekin Catchment Salinity Hazard Map that covers an area from Emerald to Townsville shows that the study area has a low to moderate salinity hazard potential.

3.2.4 Contaminated Land

Given the rural nature of the study area it is considered unlikely that any there will be any significant contaminated sites. Potential contamination could occur from cattle dips and other isolated agricultural uses. As part of the EIS, a search of the Contaminated Land Register and Environmental Management Register will be undertaken to determine if any contaminated sites occur. An inspection of the power station sites and pipeline will be undertaken for any signs of contaminated areas.

3.3 Biological Characteristics

3.3.1 Bioregions

Australia is divided up into 85 bioregions that contain similar ecological processes. Bioregions are assigned based on areas with a particular geology, climate, and broad scale flora and fauna assemblages. Bioregions are used as a fundamental framework for conservation and biodiversity planning in Queensland. The study area occurs entirely within the Brigalow Belt North Bioregion.

The Brigalow Belt is a large complex bioregion comprising 36.4 million hectares. Before European settlement, Brigalow was the dominant vegetation and it is estimated that there was over 6 million hectares. The Brigalow Belt North bioregion has been subject to extensive clearing pressures, particularly since the 1960s, with more than 90% of Brigalow cleared (Sattler and Williams, 1999).

3.3.2 Flora

Flora investigations to date have involved a desktop examination of:

- The latest NRMW regional ecosystem mapping (version 5);
- Aerial photographs;
- Biodiversity and connectivity mapping;
- EPA's WildNet Database;
- Queensland Herbarium's HERBRECS Database;
- The Department of the Environment and Heritage's EPBC Protected Matters Search Tool; and
- Relevant reports.

Regional Ecosystem Mapping

Regional ecosystem (RE) mapping has been compiled by the Queensland Herbarium and is an important tool for the EPA in assessing the environmental impacts of developments. The term 'regional ecosystems' refers to vegetation communities in a bioregion that are consistently associated with a particular combination of landform, geology and soil. The system of mapping involves examining satellite imagery, geology, landform and soils maps.

Regional ecosystems are classified into one of three categories that denotes their conservation status under the Queensland *Vegetation Management Act 1999* (VMA). These categories are:

- *Endangered* - Remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion;
- *Of Concern* - Remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; and
- *Not of Concern* - Remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion.

The latest regional ecosystem mapping (Version 5) for the study area is summarised in Figure A5. This mapping shows that the power station sites and pipeline route intersects a number of areas of remnant *Endangered, Of Concern,* and *Not of Concern* regional ecosystems as detailed in the following table.

RE Number	RE Description(s)	Status
11.3.2	*Eucalyptus populnea* woodland to open-woodland. *E. melanophloia* may be present and locally dominant	*Endangered*
11.3.25	*Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland.	*Not of Concern*
11.3.2/11.3.1	*Eucalyptus populnea* woodland to open-woodland. *E. melanophloia* may be present and locally dominant./ Open-forest dominated by *Acacia harpophylla* and/or *Casuarina cristata* (particularly in southern parts), with or without scattered emergent Eucalyptus trees such as *E. coolabah*, *E. largiflorens*, *E. populnea*, *E. orgadophila*, and *E. pilligaensis*.	*Endangered*
11.3.4	*Eucalyptus tereticornis* woodland to open-forest.	*Of Concern*
11.3.4/11.3.2	*Eucalyptus tereticornis* woodland to open-forest. / *Eucalyptus populnea* woodland to open-woodland. E. melanophloia may be present and locally dominant.	*Of Concern*
11.3.25	*Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland.	*Not of Concern*
11.3.36	*Eucalyptus crebra* and/or *E. populnea* and/or *E. melanophloia* woodland with a grassy ground layer.	*Of Concern*
11.4.2	*Eucalyptus populnea/brownii* or *E. melanophloia* ± *Corymbia dallachiana* ± *C. tessellaris* ± *E. crebra* ± *E. platyphylla* woodland.	*Of Concern*
11.4.9	Open-forest, occasionally woodland, dominated by *Acacia harpophylla* usually with a low tree mid-storey of *Terminalia oblongata* and *Eremophila mitchellii*	*Endangered*
11.4.13	*Eucalyptus orgadophila* open-woodland.	*Not of Concern*
11.5.3	*Eucalyptus populnea* ± *E. melanophloia* ± *Corymbia clarksoniana* ± *C. dallachiana* and occasionally *E. cambageana* dominate the tree layer (14m median height and 11-15m range) woodland.	*Not of Concern*
11.5.3/11.3.4	*Eucalyptus populnea* ± *E. melanophloia* ± *Corymbia clarksoniana* ± *C. dallachiana* and occasionally *E. cambageana* dominate the tree layer (14m median height and 11-15m range) woodland. / *Eucalyptus tereticornis* woodland to open-forest.	*Of Concern*
11.5.3/11.7.2	*Eucalyptus populnea* ± *E. melanophloia* ± *Corymbia clarksoniana* ± *C. dallachiana* and occasionally *E. cambageana* dominate the tree layer (14m median height and 11-15m range) woodland. / Monospecific stands of Acacia forest/woodland on Cainozoic lateritic duricrusts. *Acacia shirleyi* and or *Acacia catenulata* usually predominate the woodland to low woodland to low open-forest tree canopy (7-12m high).	*Not of Concern*
11.5.9c	*Eucalyptus crebra* + *Corymbia intermedia* + E. *moluccana* + C. *dallachiana* woodland.	*Not of Concern*
11.7.2	Monospecific stands of Acacia forest/woodland on Cainozoic lateritic duricrusts. *Acacia shirleyi* and or *Acacia catenulata* usually predominate the woodland to low woodland to low open-forest tree canopy (7-12m high)	*Not of Concern*

RE Number	RE Description(s)	Status
11.8.5	*Eucalyptus orgadophila* grassy open-woodland.	*Of Concern*
11.8.11	Grassland dominated by *Dichanthium sericeum*, *Aristida spp.*, *Astrebla spp.* and *Panicum decompositum* with or without trees such as *Eucalyptus orgadophila*, *E. melanophloia*, *Corymbia erythrophloia* and *Acacia salicina*, (height 11±3 m)	*Of Concern*
11.5.5/11.8.11	*Eucalyptus melanophloia* predominates forming a distinct but discontinuous canopy (12-18m high) often in association with *E. populnea* which may dominate localised areas. / Grassland dominated by *Dichanthium sericeum*, *Aristida spp.*, *Astrebla spp.* and *Panicum decompositum* with or without trees such as *Eucalyptus orgadophila*, *E. melanophloia*, *Corymbia erythrophloia* and *Acacia salicina*, (height 11±3 m)	*Not of Concern*
11.9.2/11.3.4	*Eucalyptus melanophloia* and/or *E. orgadophila* grassy woodland to open-woodland on Cainozoic to Proterozoic consolidated, fine-grained sediments / *Eucalyptus tereticornis* woodland to open-forest.	*Of Concern*
11.9.5	Open-forest dominated by *Acacia harpophylla* and/or *Casuarina cristata* (10-20m).	*Endangered*
11.9.7a	*Eucalyptus populnea* predominates forming a distinct but discontinuous canopy (10-15 m high).	*Endangered*
11.9.9	Narrow-leaved Ironbark (*Eucalyptus crebra*) grassy woodland.	*Not of Concern*

WildNet Database (Flora)

The WildNet database is maintained by the EPA and lists plant specimens collected and catalogued from various sources. The EPA has records of 624 species near the site between latitude -21.5000 and -22.1550 and longitude 148.1500 and 148.7472 are. The full list of species presented in Appendix B. The table below identifies the species listed as endangered, vulnerable or rare under the *Nature Conservation Act 1999* (NCA) and the EPBC Act.

Family	Scientific Name	Common Name	NCA	EPBC	Sig
Euphorbiaceae	*Bertya pedicellata*		R	-	Y
Fabaceae	*Desmodium macrocarpum*		R	-	Y
Poaceae	*Dichanthium queenslandicum*		V	V	Y
Poaceae	*Dichanthium setosum*		R	V	Y
Poaceae	*Digitaria porrecta*		R	E	Y
Myrtaceae	*Eucalyptus raveretiana*	Black Ironbox	V	V	Y
Combretaceae	*Macropteranthes leiocaulis*		R	-	Y
Poaceae	*Paspalidium scabrifolium*		R		Y
Proteaceae	*Persoonia amaliae*		R	-	Y

NCA Status - Indicates the conservation status of each taxon under the Nature Conservation Act 1992.
E = Endangered
V = Vulnerable
R = Rare
EPBC status: Environment Protection and Biodiversity Conservation Act 1999.
V = Vulnerable
Sig - Conservation significant species include those that are listed as rare or threatened under the Nature Conservation Act 1992 or threatened under the Environment Protection and Biodiversity Conservation Act 1999, have a management status of rare or threatened, or are listed under an international agreement (such as JAMBA, CAMBA and Bonn Convention).

HERBRECS Database

The HERBRECS database is maintained by the Queensland Herbarium (EPA) and lists plant specimens collected and catalogued with the Herbarium.

A search of the HERBRECS Database was undertaken for the same area and returned the two additional species to the WildNet search; namely *Ozothamnus eriocephalus* (listed as vulnerable under the NCA) and *Solanum adenophorum* (listed as endangered under the NCA).

EPBC Act Protected Matters Search Tool (Flora)

The EPBC Act Protected Matters Search Tool is maintained by the Commonwealth Department of the Environment and Heritage. A search of this database for the study identified four flora species or their habitats that may occur near the site. These include King Bluegrass (*Dicanthium queenslandicum*), Finger Panic Grass (*Digitaria porrecta*), Black Ironbox (*Eucalytps raverentiana*) and *Leucopogon cuspidatus*.

This database also recorded the potential occurrence of the following endangered ecosystems:

- Bluegrass (*Dicanthium spp*) dominant grasslands of the Brigalow Belt;
- Brigalow (*Acacia harpophylla* dominant and co-dominant); and
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.

Regional Ecosystem Mapping prepared by the NRMW (2005) indicates Semi-evergreen vine thicket communities are not likely to occur along the proposed route, but Brigalow and Bluegrass communities are. Field surveys undertaken during the EIS will determine the occurrence of endangered species, potential habit and ecosystems. The preliminary field visit confirmed the presence and absence of these ecosystems.

Weeds

From other investigations undertaken in the region (Maunsell, 2005 and GHD, 2005) it is known that several weed species are likely to occur. These species include *Xanthium spinosum* (Bathurst Burr), *Parthenium hysterophorus* (Parthenium Weed), *Asclepias curassavica* (Red-head Cottonbush) and *Sporobolus fertilis* (Giant Parramatta Grass). A Weed Management Plan may need to be developed to prevent potential spread of weed species during construction, operation and maintenance activities.

A study to determine the presence of weed species and other declared plants will be undertaken with flora surveys undertaken during the EIS.

3.3.3 Fauna

Fauna investigations to date have involved analysis of:

- The EPA's WildNet database;
- The Queensland Museum's Vertebrate Zoology Database;
- Corridor mapping; and
- Review of relevant reports.

Regional Ecosystem Mapping

Corridor mapping as supplied by the NRMW shows ecosystems that are important for contiguity. Review of the RE mapping for the locality did not identify the presence of any significant fauna corridors along the proposed route.

WildNet Database Search (Fauna)

The WildNet Database is maintained by the EPA and lists plant specimens collected and catalogued from various sources. The WildNet Database has records of 624 species near the proposed power stations and pipeline between latitude -21.5000 and -22.1550 and longitude 148.1500 and 148.7472. The full list of species is presented in Appendix B. The following table highlights listed threatened species likely to occur within the study area.

Class	Family	Scientific Name	Common Name	NCA	EPBC
Amphibians	*Myobatrachidae*	*Taudactylus eungellensis*	Eungella Dayfrog	E	E
Birds	*Columbidae*	*Geophaps scripta scripta*	Squatter Pigeon	V	V
Birds	*Meliphagidae*	*Melithreptus gularis*	*Black-chinned Honeyeater*	R	-
Bird	*Ciconidaea*	*Ephippiorhynchus asiaticus*	Black-necked Stork	R	-
Mammals	*Vespertillionidae*	*Chalinolobus picatus*	Little Pied Bat	R	-
Mammals	*Dasyuirdae*	*Dasyurus hallucatus*	Northern Quoll	C	E
Mammals	*Emballonuridae*	*Taphozous troughtoni*	Troughtons Sheathtail Bat	E	-

NCA Status - Indicates the conservation status of each taxon under the Nature Conservation Act 1992.
C = Common
E = Endangered
V = Vulnerable
R = Rare
EPBC status: Environment Protection and Biodiversity Conservation Act 1999.
V = Vulnerable
E = Endangered
Sig - Conservation significant species include those that are listed as rare or threatened under the Nature Conservation Act 1992 or threatened under the Environment Protection and Biodiversity Conservation Act 1999, have a management status of rare or threatened, or are listed under an international agreement (such as JAMBA, CAMBA and Bonn Convention).

EPBC Act Protected Matters Search Tool (Fauna)

The EPBC Act Protected Matters Search Tool maintained by the Commonwealth Department of the Environment and Heritage identified 26 threatened fauna species or their habitats potentially occurring near the site. The following table outlines the results of this search.

Class	Scientific Name	Common Name	EPBC
Reptiles	*Denisonia maculata*	Ornamental snake	V
Reptiles	*Egernia rugosa*	Yakka Skink	V
Reptiles	*Paradelma orientalis*	Brigalow Scaly-foot	V
Reptiles	*Reodytes leukops*	Fitzroy Tortoise	V
Birds	*Erythrotriorchis radiatus*	Red Goshawk	V
Birds	*Geophaps scripta scripta*	Squatter Pigeon	V
Birds	*Neochima ruficuada ruficauda*	Star Finch	E
Birds	*Rostratula australis*	Australian Painted Snipe	V
Birds	*Haliaeetus leucogaster*	White-bellied Sea-eagle	MT
Birds	*Hirundapus caudacutus*	White-throated Needletail	MT
Birds	*Hirundapus rustica*	Barn Swallow	MT
Birds	*Monarcha melanopsis*	Black-faced Monarch	MT
Birds	*Monarcha trivirgatus*	Spectacled Monarch	MT
Birds	*Myiagra cyanoleuca*	Satin Flycatcher	MT
Birds	*Gallinago hardwickii*	Lathams Snipe	OM
Birds	*Nettapus coromandelianus albipennis*	Australian Cotton Pygmy Goose	OM
Birds	*Numenius minutes*	Little Curlew	OM
Birds	*Rostratula benghalensis*	Painted Snipe	OM
Birds	*Anseranas semipalmate*	Magpie Goose	OM
Birds	*Apus pacificus*	Fork-tailed Swift	OM
Birds	*Ardea alba*	Great Egret	OM
Birds	*Ardea ibis*	Cattle Egret	OM
Birds	*Merops ornatus*	Rainbow Bee-eater	OM
Mammals	*Dasyurus hallucatus*	Northern Quoll	E
Mammals	*Nyctophylis timoriensis*	Eastern Long-eared Bat	V
Mammals	*Pteropus conspicillatus*	Spectacled Flying-fox	V

EPBC status: Environment Protection and Biodiversity Conservation Act 1999.
E = Endangered
V = Vulnerable
MT = Migratory
OM = Overfly Marine

Queensland Museum Vertebrate Zoology Database

A search of the Queensland Museum Vertebrate Zoology Database between latitude 21 and 22 and longitude 147 and 148 revealed 187 terrestrial vertebrates specimens recorded within the area. Of these 187 specimens, there were 13 different species of frogs, 40 different species of reptiles, two species of birds and seven species of mammal. None of the species recorded listed threatened species. The full list of specimens recorded is included in Appendix B.

Review of Relevant Reports

A review of the *North Queensland Project North Queensland Gas Pipeline Environmental Impact Statement* (Enertrade, 2002) identified that this area is a known habitat of the Ornamental Snake (*Denisonia maculata*), which is listed as Endangered under the EPBC Act. It is understood that during construction of the Enertrade pipeline 118 specimens were removed from the trenches within the Moranbah area. Specific measures would therefore need to be included in the Environmental Management Plan prepared as part of the EIS to limit potential impacts on this species.

Conservation and Environmental Reserves

There are no defined national parks or nature conservation areas directly impacted by construction of the proposed power stations, gas pipeline or associated works. A small reserve managed by Belyando Shire Council occurs at Coppabella where the railway line and road deviate from each other. This reserve is outside the proposed alignment. The nearest National Park (Dipperu National Park) occurs approximately 10 km south of the proposed pipeline.

3.4 Hydrological Characteristics

3.4.1 Surface Water

Surface water in the area forms part of the 73,828km^2 Belyando/Suttor sub-catchment that is in turn part of the 136,000km^2 Burdekin Basin catchment. Watercourses predominately flow from north to south. More than 80% of the annual streamflow of rivers in the Belyando/Suttor sub-catchment occurs between December and April, with no flow between May and November (NRMW, 2002).

The proposed gas pipeline crosses a number of small creeks and drainage lines. These include (from west to east) the Isaac River, Smoky Creek, North Creek, Harrybrandt Creek, Dingo Creek, Oaky Creek, Rocky Creek, Copper Creek and Aarons Folly Gully. The largest watercourses are the Isaac River and Cooper Creek. Most watercourses in the area are ephemeral, and for most of the year do not contain water.

The Moranbah and Nebo power station sites occur approximately 3 km and 0.3 km from Isaac River and Nebo Creek respectively.

The major water quality influences in the region are erosion and sedimentation. The turbidity of waters from the Belyando/Suttor sub catchment is extremely high because of high rates of erosion (NRMW, 2002). Levels of salinity in the Belyando/Suttor sub-catchment waters are generally well within guideline limits.

3.4.2 Groundwater

The study area lies on the easterly edge of the Great Artesian Basin and forms part of the intake area. Little local information exists with respect to groundwater in the study area, however, it is not expected that the proposal would have significant impacts on groundwater.

3.5 Air and Noise Environments

3.5.1 Climate

The area has a hot semi-arid climate with a mean daily maximum temperature of 29.7°, a pronounced dry season in winter and a wet season in summer. The median annual rainfall recorded at the Moranbah water treatment plant is around 589.5 mm (BOM, 2006).

3.5.2 Air

Winds are generally of low velocity (less than 10 km/hr) with the prevailing wind direction from the north and northeast in the spring and summer and mainly from the southeast in autumn and winter (BOM, 2006). Air quality in the area is generally good given the rural character of the surrounding environment, however, particulate concentrations are likely to be elevated at times due to the coal mining activities in the area and occasional dust storms.

3.5.3 Noise

The closest residences to the Moranbah power station site are located within the Moranbah town area, approximately 4 km to the south, with the Enertrade compressor station situated between the power station site and the town. The nearest residences to the Nebo power station site is a rural property located approximately 1.6 km to the north east and 2 km to the south. The urban area of Nebo town is about 3.5 km from the proposed power station site.

Examination of 1:250,000 topographic maps of the region show that several rural homesteads occur within 5 km of the pipeline route. These properties include Harrybradt, Broadlea and Annadale.

Overall background noise levels for rural areas of the study area are expected to be low. Much of the pipeline route occurs adjacent the Goonyella railway and the Peak Downs Highway where noise environments could be expected to be more variable.

Time Period	$L_{A\,90}$ dB(A)
Day (7:00am – 6:00pm)	30 - 40
Evening (6:00pm – 10:00pm)	25 - 35
Night (10:00pm – 7:00am)	20

3.6 Native Title and Cultural Heritage

3.6.1 Native Title

The power station sites and pipeline alignment occur within areas that are covered by several native title claims by groups who constitute “Aboriginal Parties” under Section 35 of the *Aboriginal Cultural Heritage Act 2003.* These claims have been brought forward by Traditional Owner Groups registered as BBKY#3, BBKY#4 and Wiri#2. A fourth claim, Wiri#3, has recently been dismissed by the Federal Court but if the area formerly covered by this claim does not lie within another registered claim area, the parties to this claim become native title parties and should also be included in consultation (see Section 34 *Aboriginal Cultural Heritage Act 2003*). Consultation with Native Title Claimants will be undertaken during the EIS.

3.6.2 Cultural Heritage

Indigenous Cultural Heritage

The relevant legislation is the *Aboriginal Cultural Heritage Act 2003* and associated Duty of Care Guidelines.

Based on previous infrastructure projects, it is understood that there is a likelihood for cultural heritage material to be encountered along watercourse corridors and in areas of remnant vegetation, although, finds may be encountered anywhere.

European Cultural Heritage

Grazing has been undertaken within the study area since the 1900’s and large-scale coal mining has occurred in the area since the 1960’s. A search of the Commonwealth Department of the Environment and Heritage’s Australian Heritage Database revealed that there were no registered cultural heritage sites within the study area. Field investigations will be undertaken during the EIS and will further investigate European cultural heritage in the area.

3.7 Socio-Economic Conditions

3.7.1 Populations

Moranbah is a thriving, single-purpose mining town with a population of nearly 8,000 people, located 190 km west of Mackay. Utah Development Company Ltd established Moranbah in 1971 to service the Goonyella and Peak Downs Coal Mines. Since then, the Riverside Coalmine to the north of the town has also been established. The railway to the Hay Point coal-loading terminal near Mackay was constructed in 1972.

Nebo is located approximately 90 km north east of Moranbah. The town of Nebo is approximately a one-hour drive along the Peak Downs Highway west of Mackay City. Nebo Shire is a rural shire of approximately 2,143 people, of which 350 people live in the town of Nebo.

Moranbah and Nebo are undergoing significant growth at present as a direct result of the accelerated development of coal mining in the region.

3.7.2 Demographic Characteristics

The demographic profile of the populations of the local government areas reflects the younger, mostly male, transient populations associated with recent, remotely located mining activity. As a result, the median age for Belyando and Nebo Shires was 31 and 32 respectively, with a majority male population in all age cohorts (significantly so in the Nebo Shire), particularly within the 20-29 years age range (ABS, 2001Census).

The majority of the shires' population have completed secondary schooling only. Limited further education has been completed and very few people have any university or other tertiary level education. Most people with tertiary qualifications are working either in the mining or services industries.

3.7.3 Housing

As stated in Section 2.8, most demand for housing for this Project will occur during construction of the power stations at Moranbah and Nebo and the pipeline, requiring construction workforces that will need to be accommodated presumably in or around the towns of Moranbah and Nebo.

The population of Moranbah (8,000 residents) has been supplemented with several large camps of single worker accommodated provided by the major mining companies and located at locations North West of the town centre and closer to the site of the proposed power station. This increases the resident population by about 2,000. Further accommodation is available in the various hotels and motels located in and around the town.

However, given the current level of mining activity within the Bowen Coalfields, obtaining any form of accommodation in or around Moranbah is extremely difficult. There are no vacant rental houses or worker accommodation and hotel and motel rooms are booked out years in advance by the major mining companies and associated industries.

The town of Nebo is much smaller (350 residents) but includes additional mine worker accommodation with several single worker accommodation camps located around the town. Accommodation options are limited with a single hotel located within the town and with few residential properties available for rent or purchase.

3.7.4 Social and Community Services

Both Moranbah and Nebo towns have social and community services commensurate with the size of the urban communities. Moranbah has a comprehensive range of services including schools, health, recreation and entertainment. The town supports an airport with direct flights to Brisbane. The range of services in Nebo is much more limited and includes grocery store, hotel and two service stations.

Higher order services are available at Mackay located one or two hours drive to the east.

4.0 Potential Impacts and Management Requirements

4.1 Land Use and Infrastructure Issues

4.1.1 Land Use Conflicts

Construction of the power stations will remove a small area currently used for grazing. Given the relatively small size of the sites and the significant grazing land that occurs locally it is not expected that this development would have a significant impact on grazing.

Development of the pipeline has the potential to restrict stock movement and property access during construction. Post construction, there may be potential for localised erosion and subsidence that may limit access in some conditions.

Consultation will need to be undertaken with landholders to determine appropriate methods to minimise these impacts. During operation of the pipeline, stock movements will not be restricted and pastures will be reinstated. It is therefore not expected that there will be any significant impacts to grazing. Construction and operation of the pipeline across the area of dryland cropping to the south of the Nebo power station site will remove an area of land that can be farmed.

4.1.2 Coal Mining

Development of the Moranbah site has the potential to sterilise an area of coal from open cut mining (see Figure A6 at Appendix A). Consultation with the owner of the mining lease has been undertaken and development of the site has been determined to be beneficial. It is unlikely that construction of the pipeline would result in the sterilisation of coal resources as the pipeline will be constructed adjacent to existing infrastructure and occurs where no mining development is likely. The Nebo power station site is not near known coal resources and is not likely to have any impact on future mining.

4.1.3 Erosion Hazard

While soil properties vary greatly along the pipeline route, the lack of steep slopes reduces potential erosion hazards associated with concentrated flows. The highest risk of erosion occurs in riparian areas and alluvial fans adjacent to riparian areas where soils have a high proportion of sand and fine particles. Trenching in riparian areas will require special attention to ensure the site is rehabilitated effectively and monitored for the development of erosion problems.

In general, the soils within the study area pose no major practical constraints to construction of the power stations or the pipeline, provided best practice measures are employed to manage erosion and sedimentation issues.

4.1.4 Electricity

Development of the Moranbah power station will require the construction of feeders to the Moranbah substation approximately 1 km to the south. With the construction of a switching yard within the Moranbah site, there is also the potential to supply electricity directly to mines instead of coming from the substation. Consultation with stakeholders is currently being undertaken to determine the best possible configuration. It is anticipated that issues relating to the redirection of feeders and construction of a switching yard will be addressed in the EIS phase of the project.

Development of the Nebo power station will require connection to the Mount Power switchyard. It is anticipated that this connection will require the construction of a double circuit overhead 132kV line. Details relating to the construction of this feeder are still under negotiation and will be addressed in the EIS.

Construction and operation of the pipeline will not have any impact on existing electricity infrastructure.

4.1.5 Water and Sewerage

Both power station sites will be remotely operated and will not require connection to potable water supplies or sewer.

Construction of the pipeline will require the identification and location of underground services. It is not anticipated that there will be any impact to water supply or sewer connections.

4.1.6 Road Network

Construction of the Moranbah and Nebo power stations will require the movement of heavy vehicles on local roads. There will be an increase in vehicle movements during construction. However, it is not anticipated that this will pose any significant problems.

Direct access to the Moranbah site will be provided from Goonyella Road and no upgrades will be required. For the Nebo site, Leggett Road may require upgrading. Investigations will be undertaken during the EIS to determine the carrying capacity of these roads and whether any upgrades are required.

There will be no impact on traffic during the operation of the power stations.

Where the pipeline crosses major roads they will be underbored resulting in a disruption to traffic during construction.

4.1.7 Rail Infrastructure

The pipeline crosses the Goonyella rail line where underboring methods will be employed, resulting in no disruption to rail operations.

4.2 Biological Issues

4.2.1 Flora

The proposed footprint for the Moranbah power station is expected to be approximately 200 m x 200 m. This will require the clearing of remnant vegetation mapped as *Not of Concern*. The REs present on the site are not known to present habitat for listed threatened flora species, however, detailed flora investigations will be undertaken during the EIS to determine the extent of impacts and placement of the power station and infrastructure within the site.

The site of the proposed Nebo power station contains small areas of remnant vegetation that are located in parts of the site that are not expected to be impacted. Other vegetation exists over much of the site but is not considered remnant due to previous clearing. It is not expected that this area would contain, or provide habitat for, any listed threatened flora species. Field investigations will be undertaken during the EIS to determine flora impacts at both of the power station sites.

Construction of the pipeline will require clearing of a 30 m wide right of way (ROW) through existing vegetation. Preliminary mapping has shown that this will require the clearing of vegetation communities listed as *Not of Concern, Of Concern* and *Endangered* under the VMA and communities listed as *Endangered* under the EPBC Act. It is also likely that some of these areas may provide habitat for listed threatened species. Mapping shows that most of these areas are small and refinements to the alignment can be made to further avoid sensitive areas.

Field investigations will be undertaken during the EIS to confirm the location of vegetation communities and undertake targeted searches for listed threatened species. Results of these surveys will be used to refine the alignment so that impacts on *Of Concern* and *Endangered* communities, and listed threatened species are minimised. Depending on the final route selected and mitigation measures implemented, a referral may be required to the Commonwealth under the EPBC Act to determine if the proposal would constitute a controlled action. Based on preliminary investigations, it is not anticipated that a referral will be necessary.

Regional Vegetation Management Code Northern Brigalow Region addresses management issues for the remainder of the study area. This code provides performance requirements and acceptable solutions to achieve the purpose of the VMA and will be considered in further investigations.

Disturbance created during construction may provide an environment that encourages the proliferation of weed species. Measures will be included in the Environmental Management Plan in the EIS to prevent the spread of weeds and insure that existing infestations are controlled.

4.2.2 Fauna

Clearing of any vegetated areas has the potential to displace fauna and clearing a 30 m wide easement for the pipeline may present a barrier to fauna movement.

The Project has the potential to impact listed threatened fauna species. Field investigations will be undertaken during the EIS to determine species present and suitable habitat. It is anticipated that construction and operation will not significantly impact any listed threatened species or their habitat.

Fragmentation of habitat through the clearing of a 30 m wide easement is not anticipated to be a significant threat given the small clearing width and existing barriers created by the Peak Downs Highway and railway.

Avoidance and mitigative options will be explored and considered during detailed route planning and design process undertaken during the EIS.

As a minimum, the following further field investigations will be undertaken during the EIS:

- Detailed surveys of remnant regional ecosystems intersected by the proposed route to ground truth mapping and assess integrity and structure;
- Targeted surveys for legislatively or otherwise significant flora and fauna species and their habitat; and
- Ecosystem habitat surveys.

4.3 Water Management and Disposal

4.3.1 Construction Issues

Construction and clearing disturb the soil and alter the surface hydrology, creating an environment with the potential for increased erosion and sedimentation.

Environmental management strategies will be adopted during construction to ensure water quality is not adversely affected by runoff. Normal stormwater management practices of erosion and sediment control will be implemented.

Construction of the pipeline will create significant soil disturbance because of vegetation clearance and trenching earth works. The greatest risk of erosion and sedimentation will occur where the pipeline crosses drainage lines and watercourses. Particular care will therefore need to be taken near watercourses to ensure that sites are adequately stabilised and rehabilitated.

Some of the creek crossings may require the installation of bridging structure if the waterways have deeply incised or unstable banks. Construction will also need to take into account seasonal factors to avoid periods with high intensity rainfall. An Environmental Management Plan prepared during the EIS will contain measures to reduce erosion potential and mitigate the impacts through the implementation of standard control measures.

During construction, care will need to be taken when undertaking works near drainage lines and watercourses to ensure spills and accidents do not cause contamination. Measures will be included in operational management plans to manage spills.

4.3.2 Operational and Maintenance Issues

When construction of the power stations is complete, there will be significant areas of impervious surfaces that will increase stormwater runoff in comparison with an undeveloped site. No significant contamination of stormwater from the site is expected. Stormwater from roofs and hardstand will be directed to soak areas within each site.

Operation of the power stations will require water consumption and disposal. There are several water supply options that are being investigated including supply from the SunWater Burdekin Moranbah pipeline; the Nebo bore fields or reuse of the wastewater from the CH4 Limited Coal Seam Gas project (as outlined in Section 2.8). It is expected that wastewater will be resold to supply surrounding mines and there will be no requirement for ponds or dams.

4.4 Air Emissions

4.4.1 Construction Issues

During construction of the power stations and pipeline, dust is likely to be the most significant emission. It is expected that the effects of dust would be localised, given that prevailing winds in the region generally have low velocities. Taking into account the seasonal direction of winds, and distances to sensitive receivers it is unlikely that these sources of dust would be significant impact.

4.4.2 Operational and Maintenance Issues

The operation of the power stations involves the combustion of natural gas and subsequent exhaust emissions. The main components of combustion include CO_2 and water vapour. The proposed gas-fired power stations have significant air quality advantages when compared with equivalent coal-fired facilities, including reduced greenhouse gas emissions and minimal SO_2 and odour emissions. In fact the CSG sourced locally contains no SO_2. Australian best practice black coal generators produce about 900 kg CO_2-e/MWh, while combined cycle gas turbines generate around 550 kg CO_2-e/MWh (URS, 2004).

The emissions performance of proposed plant will meet the specifications outlined in the Australian Greenhouse Challenge Plus document titled *Technical Guidelines – Generator Efficiency Standards*. Emissions performance of the power stations will approach world's best practice with NOx emissions <25ppm.

During the EIS, studies will be undertaken to determine the impacts of emissions on local and regional air sheds. These studies will include:

- Greenhouse gas emissions assessment in accordance with the requirements of the Australian Greenhouse Office. CO_2 equivalent emissions will be estimated for the life of the project and compared to other power station developments and AGO standards; and
- Dispersion modelling using the nine second DEM terrain information.

It is not anticipated that there will be any significant air quality impacts on the local airshed from the operation.

During the EIS, investigations will be undertaken to determine the maximum plumes that will be generated by the power stations, including any increased vertical updrafts. The results of these investigations will be presented to satisfy the requirements of the Civil Aviation Safety Authority.

4.5 Waste

Most waste generated during construction of the power stations and pipeline will be suitable for disposal at local council landfills. Recycling of materials (such as paper, metal, glass, plastics, oils) will need to be implemented where practical. All hazardous wastes will need to be appropriately stored in bunded areas and away from any watercourses.

The operation of the power stations will require only limited staffing. As a result, only limited domestic waste will be generated.

Key waste streams, waste minimisation techniques, recycling and disposal methods will be investigated during the EIS.

4.6 Noise and Vibration

4.6.1 Construction Issues

Varying levels of construction noise are likely to occur for the duration of the 18 month construction period. Earth moving and construction machinery are likely to be the main sources of noise and vibration during construction.

While construction of the power stations will be confined mostly to the two power station sites, construction activities associated with the pipeline will extend progressively along the length of the pipeline alignment.

Potential noise impacts of construction at the power station sites will be limited as the sites have been selected that include a separation distance to incompatible uses. As reported in Section 3.5 separation distances to nearest residences are 4 km for the site at Moranbah and 1.6 km for the site at Nebo. Noise impacts are not expected to be significant, however, the degree of impact and appropriate mitigation measures will be investigated in detail in the EIS.

Construction of the pipeline is likely to have limited impacts on sensitive receivers (rural homesteads) because they are spatially removed. Further studies will be undertaken to determine potential impact in mitigation measures during the EIS.

Due to the distance to sensitive receivers, and the nature of substrate materials, it is considered unlikely that vibration generated during construction or operation of the line would have any significant impact.

4.6.2 Operational and Maintenance Issues

Operation of the power stations will result in noise from a number of sources including:

- Gas turbines;
- Heat Recovery Steam generators;
- Steam turbines; and
- Stacks.

Appropriate, noise attenuation will be incorporated into the design of the power stations. The levels of noise generated from the power stations will be determined during the preparation of the EIS, however, noise modelling of a similar gas-fired combined cycle power plant (Dames and Moore, 1995) reported less than 30dBA 3 km from the site.

Potential operational noise impacts will be addressed during the preparation of the EIS.

4.7 Visual Amenity

The proposed Moranbah power station site is located on the Goonyella Road that is the main access to the Goonyella mine. While final placement of the power station within the block of land has not been finalised, it is likely that the substation will be set back from the road and screened by trees. The site occurs in an elevated position in the landscape with views to the site partially screened from the town of Moranbah by a ridge.

The Nebo power station site is spatially removed from the Nebo town, however it is likely that the taller parts of the power station will be visible from the town. The site will also be visible from the Peak Downs Highway, although, the site would be partially screened by trees.

Development of the pipeline would have a significant short-term impact on visual amenity associated with vegetation clearance and earthworks. Once the site has been rehabilitated, there will effectively be no impact on visual amenity as the pipeline remains below ground.

A viewshed analysis will be undertaken during the EIS.

4.8 Native Title and Cultural Heritage

Consultation with Indigenous people with interests in the study area is considered integral to any cultural heritage study. Such consultations will be held during the EIS phase of the project and a cultural heritage survey in consultation with the local aboriginal representatives will be conducted over the proposed route.

4.9 Socio-economic Issues

4.9.1 Construction Issues

During construction of the power stations and pipeline, approximately 200 workers may be required at each power station site and 100 to 150 workers for the construction of the pipeline. It is anticipated that these workers will be housed in Moranbah and Nebo.

Construction workforce numbers will fluctuate with the maximum workforce numbers peaking during periods of intense construction activity for each of the phases of the proposed development.

Details of the size and composition of the workforce numbers will be detailed in the EIS to follow. However, given current workforce shortages generally, and the lack of sufficient temporary and permanent accommodation in the area, it is self-evident that accommodation and services for the workforce will be important issues.

Development of an appropriate housing strategy for the proposed development needs to be undertaken within the broader context, taking into account, not just existing shortages but also proposed developments and associated worker numbers. The proposed development will facilitate the development of new mines, providing economic growth locally and for the state of Queensland. Currently there are approximately 30 new mining developments planned to commence locally within the next five years, with approximately half in Nebo Shire. This includes the recently announced Poitrel coal project located south of Moranbah.

Recognising current shortages and potential impacts in the mining sector, the State government has established the Moranbah Growth Management Group with the objective of identifying options for longer-term residential development in and around Moranbah.

While this may relieve demand for longer-term accommodation at some future date (and provide a solution for the operational workforce for the Moranbah power station workforce), the focus of the Group is not on addressing the immediate shortage of accommodation.

Part of the difficulty in finding new sites in Moranbah is its location within identified reserves of coal and the extent of those reserves. A recent application for residential development was called in and rejected by the Minister for Local Government and Planning because of the potential conflicts with proposed future mining activity.

Due consideration will therefore be required to determine an appropriate housing strategy for the construction workforce at Moranbah.

While current accommodation shortages for the mining sector also extend to Nebo, the issues are not as significant, partly because of the size of the shortage and partly because there are fewer constraints over the land around the town of Nebo.

4.9.2 Operational and Maintenance Issues

During operation of the power stations and pipeline, a crew of approximately 20 workers will be employed to operate the power stations and periodically perform maintenance operations. Accommodation will be required for these workers and their families. This accommodation will presumably be in Moranbah, Nebo, and surrounding areas. Given current housing shortages, consideration will need to be given to an appropriate long term housing strategy to ensure a stable workforce for the operation and maintenance of the power stations and pipeline.

5.0 Development and Environmental Approvals

5.1 Environmental Assessment and Decision Making Process

TSL is seeking designation of the Moranbah and Nebo Power Stations and associated Pipeline as a Significant Project under s26 of the *State Development and Public Works Organisation Act 1971*. Part 4 of the Act sets out the requirements for the environmental assessment and public review of the EIS. The Coordinator-General will manage the EIS process for the project.

5.2 Planning Scheme Provisions

Relevant land use planning provisions are contained in the Whitsunday, Hinterland and Mackay Regional Planning Project (WHAM).

5.2.1 Whitsunday, Hinterlands and Mackay Regional Plan

The proposed development area falls within the boundaries of the WHAM. It is anticipated that a Regional Plan will be released by WHAM in May 2006. The Plan will be endorsed by the State Government and local government planning schemes may require amendment to ensure compliance.

Most activity within the region is located along the coastline. This pattern of development is reflected in the regional plan. This means that the regional population is highly concentrated into urban nodes, with approximately 85% of the population living along the coastline. While inland centres have stabilised, the coastal areas have seen high growth that is predicted to increase in the future. The additional infrastructure of the nature in question will be necessary to meet the predicted future growth of the region.

However, there is also significant growth in a number of inland communities on the back of strong growth in the mining sector. This is especially the case for the town of Moranbah, centrally located within the Bowen Basin Coal Fields, which will require further services to support current residential and business development.

The power station and gas pipeline will contribute to achieving the regional goal of meeting the energy requirements of the region's projected population and economic growth on a sustainable and timely basis. It will develop and promote energy efficient regional supply sources.

5.2.2 Local Government Planning Schemes

The proposal falls with the borders of two Local Government Areas, Belyando and Nebo Shires. Both areas have transitional schemes under IPA, Moranbah gazetted in February 1995 and Nebo in October 2000. Both councils are in the process of completing IPA compliant planning schemes and, according to the DLGP, it is currently anticipated that the Moranbah and Nebo Schemes will be finalised in July and August of 2006 respectively.

Both the power stations and the gas pipeline are located within rural designations under the current planning schemes. Consideration should be given to the compatibility of the development to the rural zoning and how any adverse impacts on agricultural land may be mitigated through the planning stages. Within this zoning, both planning schemes designate the development as impact assessable material change of use.

It should be noted that in the case that the EIS is completed before the introduction of the IPA compliant schemes, the Cody principle will apply and significant weight must be given to the draft planning scheme provisions.

5.3 Authorities and Licences

Access permits and a Pipeline Licence pursuant to the *Petroleum and Gas (Production and Safety) Act 2004* (PGA) will be required for the construction and operation of the proposed pipeline. For the grant of the Pipeline Licence a relevant environmental authority is required; this can be gained under the *Environmental Protection Act 1994* (EP Act). The environmental authority will be developed as part of the EIS process. General authority will be required for the operation of the power stations pursuant to the *Electricity Act 1994*.

Construction of the pipeline will impact ecosystems and species listed in the *Environment Protection and Biodiversity Conservation Act 1999.* Current investigations have determined that there is not likely to be a significant impact and a referral under the act is therefore not required. Further consideration of issues of National Environmental Significance will be given during detailed field investigations undertaken during the EIS.

Construction of the pipeline will result in removal of riparian vegetation protected under the *Water Act 2000*. Riverine Protection Permits will need to be obtained for works within watercourses.

5.4 Other Legislative Requirements

Other Legislation that may apply to the project includes:

- *Aboriginal Cultural Heritage Act 2003;*
- *Environmental Protection Act 1994 and Environmental and Other Legislation Amendment Act 1997;*
- *Petroleum and Other legislation Amendment Act 2004; and*
- *Petroleum and Gas Regulations 2004.*

As there will be some water and sewerage connections to local authority facilities, it also falls within the provisions of the *Local Government Act 1993*.

5.5 Codes and Standards

There are also codes, policies and standards they may be relevant to the project, including:

- Environmentally Relevant Activities (including mining activity, dredging material, motor vehicle workshop or extracting rock or other material); and
- Environmental Protection Policies (including Noise, Air and Water).

6.0 Conclusion

6.1 Complexity of Local, State and Commonwealth Requirements

The project will necessitate:

- Negotiations with two local authorities – Belyando Shire (Moranbah) and Nebo Shire (Nebo);
- Addressing issues relating to a variety of land tenures including grazing homestead freehold lease, grazing homestead perpetual lease, pastoral development holdings, crown reserve, existing easements and mining tenures;
- Negotiations with numerous utility providers including Powerlink, Ergon, Main Roads, Queensland Rail, Telstra, SunWater, water authorities and gas providers;
- Negotiations with a number of Native Title claimants; and
- Negotiations with approximately 14 landholders.

In addition, a number of environmental approvals and licenses may be required. These approvals and licenses are set out in Section 5.

Under the EPBC Act potential matters of National Environmental Significance require a referral to the Commonwealth. While the project has the potential to impact EPBC listed communities and species, it is anticipated that these impacts can be effectively mitigated and would not have as impact on any matters of National Environmental Significance.

6.2 Environmental Issues

Preliminary environmental investigations have been undertaken to determine issues that will need to be addressed through the design, construction and operation of the Moranbah and Nebo Gas Fired Power Stations Project and the associated environmental and planning approvals.

The following five key issues were identified:

- The proposed pipeline will traverse areas of Brigalow and Bluegrass communities that are listed as Endangered under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*. From our initial assessment, it is not considered that the level of impact is such that a referral to the Commonwealth will not be required for this matter.
- The pipeline may directly impact potential habitat for State and Commonwealth listed threatened species. Detailed investigations will be undertaken to determine the presence and extent of these habitats and will seek to avoid, minimise or mitigate any impacts on these communities. With the provision of these measures, it is not anticipated that impact will be significant.
- Soils with moderate to high erosion potential have been identified at locations along the pipeline alignment. Appropriate mitigation measures will need to be set out in an Environmental Management Plan and implemented during and following construction to avoid unacceptable levels of erosion at these locations.
    - The proposed power stations require a supply of water. Estimated consumption rates will vary depending on the type of plant selected and the operating conditions. Net water consumption will vary depending upon the operating regime and the final plant selection. At the completion of Phase 1 total water demand is expected to be 1400 ML/yr, Phase 2 total water demand is expected to be 2555 ML/yr and at the completion of Phase 3 2800 ML/yr. Discussions are being held to determine the availability of water from an existing Coal Seam Gas supplier. Other options also are being considered to determine both supply and disposal options.
- The proposed development will require a workforce for the construction of each power station, the pipeline and associated infrastructure. These workers will need to be accommodated in Moranbah and Nebo. While Moranbah is a thriving, single-purpose mining town, accommodation

and services are stretched to the limit because of an expanding mining industry. Opportunities for expansion are limited given the location of the town within the significant coal reserves of the Bowen Coal Fields. Further discussions will need to be held with accommodation providers (BMA and Anglo) as well as with representatives on the Moranbah Growth Management Group to determine an appropriate housing strategy.

6.3 Significant Project Status

Under Section 27 of the *State Development and Public Works Organisation Act 1971* a number of matter are listed that the Coordinator-General must have regard to. These matters are:

- Detailed information about the project given by the proponent in an initial advice statement;
- Relevant planning schemes or policy frameworks, including those of a relevant local government or of the State or the Commonwealth;
- The project's potential effect on relevant infrastructure;
- The employment opportunities that will be provided by the project;
- The potential environmental effects of the project;
- The complexity of local, State and Commonwealth requirements for the project;
- The level of investment necessary for the proponent to carry out the project; and
- The strategic significance of the project to the locality, region or the State.

It is considered that the Project complies with all the matters set out at Section 27 of the Act to which the Coordinator-General is to have regard. Specifically:

- Detailed information on the various components of the project is set in *Section 2 The Proposal*;
- Relevant planning schemes and policy frameworks (including those of the relevant Local Governments, State and Commonwealth) have been identified and possible development and environmental approvals in *Section 5 Development and Environmental Approvals*;
- The project's effect on relevant infrastructure has been described in *Section 2* and the potential impacts and management requirements set out in *Section 4 Potential Impacts and Management Requirements*;
- The employment opportunities are set out in *Section 2* (construction and operation workforce); issues relating to housing and the provisions of social services is described in *Section 3* and potential impacts and management requirements set out in *Section 4*;
- The potential environmental effects of the project are described in Section 3 and potential impacts and management requirements set out in *Section 4*;
- The complexity of local, State and Commonwealth requirements for the project have been set out in *Section 6.1 Complexity of Local, State and Commonwealth Requirements*;
- Details of the level of investment necessary to carry out the project are set out in *Section 2.10 Financial Requirements*; and
- A statement demonstrating the strategic significance of the project to the locality, region or State is given in our Initial advice Statement in *Section 1.2 Justification and Alternatives*.

6.4 Costs and Benefits

While a number of environmental costs have been identified, it is considered that the Project will result in considerable benefits to the local area, the region and the State. These benefits include:

- A partial solution to the increasing demand for peaking power, meeting the demands for power in North Queensland and now that the Powerlink high voltage grid from Nebo south has been considerably strengthened, providing support for other regions, such as South East Queensland;
- Support for the continuing development of the coal mining activities of the Bowen Coalfields, which are of economic significance to the State of Queensland;
- Being gas-fired, the proposed power stations can assist retailers meet the Queensland Government's 13% Gas Scheme under which “Queensland electricity retailers and other liable parties are required to source at least 13% of their electricity from gas-fired generation”;
- Further employment opportunities for about 500 skilled and unskilled workers during construction of the power stations, pipelines and associated infrastructure; and
- Total investment for the construction and commissioning of the power stations and associated infrastructure of AUS$400M (for Phase 1), AUS$200M (for Phase 2) and AUS$200M (for Phase 3) respectively, or a total investment of AUS$800M.

7.0 References

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