FINAL REPORT

Coolimba Power Project
Environmental Scoping Document

Prepared for

Coolimba Power Pty Ltd

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22 September 2008

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List of acronyms

ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
ATSIC	Australian and Torres Strait Islander Commission
BoM	Bureau of Meteorology
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEC	Department of Environment and Conservation
DEWHA	Department of Environment, Water, Heritage and the Arts
DIA	Department of Indigenous Affairs
DMA	Decision Making Authority
DoCEP	Department of Consumer and Employment
DPI	Department of Planning and Infrastructure
DRF	Declared Rare Flora
DoH	Department of Health
DoIR	Department of Industry and Resources
DoW	Department of Water
EIA	Environmental Impact Assessment

Tables and Figures

EMP	Environmental Management Plan
EPA	Environmental Protection Authority
EPASU	Environmental Protection Authority Service Unit
EP Act	*Environmental Protection Act* 1986
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999
GDE	Groundwater Dependant Ecosystem
ha	hectare
Mt	million tonnes
NACC	North Agriculture Catchment Council
NCR	North Country Region
NOHSC	National Health and Safety Commission
ODAC	Office of Development and Approvals
PER	Public Environmental Review
PF	Priority Flora
ROM	Run Of Mine
SRE	Short Range Endemic (species)
SWIS	South West Interconnected System
TEC	Threatened Ecological Community

Section 1 Introduction

1.1 Overview

Coolimba Power Pty Ltd, (Coolimba), a wholly owned subsidiary of Aviva Corporation Limited (Aviva), proposes to develop a coal-fired power station with gas-fired peaking power generating capacity (the Project) adjacent to the Central West Coal Deposit near Eneabba, in the Mid-West Region of WA. Figure 1 provides the site's location in relation to populated centres and Figure 2 provides the current land tenure of the surrounding area.

Coolimba proposes to provide the Project with coal sourced from the proposed Central West Coal Project which will be developed by Central West Coal Pty Ltd (a wholly owned subsidiary of Aviva). The coal project will undergo a separate Environmental Impact Assessment (EIA) process. Cumulative impacts between the two projects will be included in each respective Project's documentation.

1.2 Purpose of this Document

The Referral for the Project was submitted to the Environmental Protection Authority (EPA) on 3 September 2007 and the EPA set the level of assessment at PER. Appeals on the level of assessment were received in October 2007 and on 8 January 2008 the Minister for Environment overruled the appeals and confirmed the level of assessment at Public Environmental Review (PER),

A referral document (EPBC Ref: 2007/3876) was submitted to Department of the Environment, Water, Heritage and the Arts (DEWHA) on 22 November 2007 for assessment under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). On 24 December 2007, the DEWHA decided that the proposed action is a controlled action and that it will be assessed bilaterally under the WA process.

This Environmental Scoping Document has been prepared in accordance with the requirements of Part IV of the *Environmental Protection Act* 1986 (EP Act). It also meets the requirements of the EPBC Act in providing Terms of Reference for the purposes of Commonwealth environmental assessment. The purpose of this document is to provide a framework for the formal environmental assessment of the Coolimba Power Project (the Project). It outlines the basis for assessment by the EPA and DEWHA in respect to the scope of the PER in addition to providing an indicative timeline for the assessment.

The purpose of this Environmental Scoping Document is to provide the Decision Making Authorities (DMAs) with the following information about the Project:

- An identification of the relevant environmental factors;
- A summary of potential environmental and social impacts;
- The details of the scope of works for the various environmental investigations and studies to address the potential environmental impacts; and
- An outline of the preliminary management strategies to minimise potential adverse environmental impacts.

1.3 The Proponent

Coolimba Power Pty Ltd, a wholly owned subsidiary of Aviva, is the proponent for the Project.

Proponent Details:

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Section 1 Introduction

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The contact person for this project is Robert Griffiths, Environmental Manager, Aviva.

Aviva is a Perth-based integrated energy company and is listed on the Australian Stock Exchange. Aviva also has an international presence and is listed on the Botswana Stock Exchange. The company has a portfolio of energy assets, including the Central West Coal Project (and associated Coolimba Power Project) in WA and the Mmamantswe Project in Botswana.

Section 2 Project Description

2.1 Overview and Project Setting

Coolimba proposes to construct a 440 MW coal-fired power station coupled with a separate 330 MW gas-fired peaking power generating facility (the Coolimba Power Project) located near Eneabba, WA. The Coolimba Power Project is being proposed to help satisfy the rapid growth in demand for electricity in the South West Interconnected System (SWIS).

The coal-fired generation capacity will be fuelled from the adjacent proven Central West Coal Deposit which has approximately 75 Mt (million tonnes) of sub-bituminous grade coal reserves. The coal will be mined, crushed and transported to the Coolimba Power Project via a conveyor. This coal will be stored temporarily in stockpiles prior to being fed into the Coolimba Power Project process. Mixed with limestone sourced from a third party, the coal will be combusted in two fluidised bed boilers producing high pressure steam, and gaseous emissions.

The high pressure steam produced is used to rotate turbines to produce the 440 MW of electricity per year, whilst the gaseous emissions will be released to atmosphere through a chimney approximately 130 m high. The combustion process also produces a quantity of ash. The ash produced by Coolimba will comprise fly-ash, which deposits in the chimney, and bottom-ash which deposits in the boiler. Both components of ash will be returned to the mine by truck and deposited into the empty mine void.

The gas-fired generation capacity of the Coolimba Power Project will primarily operate at peak periods, when demand for the grid's capacity is approached. One key feature of this project is to design in flexibility to the plant so that it can accommodate carbon capture technology at some point in the future (as discussed below). If this occurs, one or both of the gas-fired units may be converted to base load units to satisfy the increased operating power demand. Commissioning such new carbon capture technology and the conversion of gas-peaking power to gas base load power will be the subject of a separate proposal at that time. The gas turbines will be fed by natural gas accessed via the Dampier to Bunbury Natural Gas Pipeline (DBNGP) or the Parmelia Gas Pipeline. Diesel will be used as a back-up fuel in the unlikely event of disruption to the gas supply.

The Coolimba Power Project and the Central West Coal Mine Project are integrated in their design, although they share the use of some elements of infrastructure. This report focuses on the components belonging to the Coolimba Power Project, as listed below:

- Coal Handling Plant;
- Turbine Process;
- Carbon Capture Technology;
- Power Transmission;
- Process Water Handling;
- Ash Handling;
- Supporting Infrastructure; and
- Solid Waste Management.

A conceptual site layout is provided as Figure 3 of this report.

2.2 Coal Handling Plant

The coal fuel supply will be transported via an overland conveyor system to be constructed between the Central West Coal Project and Coolimba Power Project. Although the conveyor is part of the mine project, the power station's coal handling plant comprises movement and stockpiling a maximum of 400,000 tonnes of coal (approximately 60 days of supply). This volume is calculated to ensure adequate supply at the Coolimba Power Project in the event of an interruption to supply from the mine.

Section 2 Project Description

2.3 Turbine Process

The coal-fired generation capacity turbine process comprises two coal-fired steam turbo alternators, each with a nominal output of 220 megawatts (MW) (total output of 440 MW). These power generation units will be based on conventional Rankine cycle steam plant (boiler and steam turbo alternator). A simplified process flow diagram is provided in Figure 4.

The units will be of sub-critical pressure design and will be water cooled to utilise the water resulting from de-watering of the adjacent Central West Coal deposit.

The units will incorporate sulphur-reduction technology; this will be in the form of fluidised bed boilers. Lime will not be mined by Aviva and does not form part of the project acitivities, instead, the lime necessary for this type of boiler will be delivered directly to site as Limesand by a reliable third party supplier. The Coolimba Power Project will stockpile a certain quantity of limesand to ensure sufficient to safeguard against any variation in supply.

Whilst the coal-fired boilers will provide electricity supply to help satisfy base loads on the SWIS grid, the design of the Coolimba Power Project also includes provision for gas turbines for peaking power supply. This describes electricity which is generated for a limited period when demand for electricity approaches supply capacity of the SWIS. Coolimba is proposing that this peaking supply be generated by two 165 MW open cycle gas-fired turbines (OCGTs). OCGTs are ideally suited for high demand situations of short duration as they have very short start up times, typically less than fifteen minutes from start to full load compared to 24 hours for coal-fired units. OCGTs also require minimal supporting infrastructure which results in a small footprint area and a lower capital cost. The OCGTs will be air-cooled.

The gas supply will be transported by a gas pipeline lateral connected to the nearby DBNGP or Parmelia Pipeline. The gas supply, routed along a 100 m wide infrastructure easement, will also initiate the start-up process for the coal-fired plant after periods of maintenance. Further details of the gas lateral route are provided in Section 2.8 of this report.

2.4 Carbon Capture Technology

The difference between the proposed coal-fired generation and conventional coal-fired power stations is that it will be designed “carbon capture ready”. This means that it will be constructed in such a way that it can be easily converted to a plant that is capable of capturing carbon from its air emissions at some future point.

The coal-fired generation design will be sufficiently flexible to allow conversion to either a post-combustion capture plant or a pre-combustion or “oxygen firing” plant. The required design modifications of the proposed plant to be carbon capture ready will include making provision for the necessary space for ducting, piping and additional plant such as an air separation unit and carbon dioxide compression plant.

The coal-fired generation capacity portion of the Coolimba Power Project will be the first commercial scale “carbon capture ready” boilers used in Australia. The operational life-span of the Coolimba Power Project is planned to be least 30 years. The PER will include details on the current status of Carbon Capture Storage research and development measures being undertaken by Coolimba.

The inclusion of the two 165 MW open cycle gas-fired turbines allows Coolimba flexibility in available plant to meet the future power requirements of the carbon capture technology. A separate proposal will be prepared for the conversion of the gas-fired units from peaking plants to base load units.

Section 2 Project Description

2.5 Power Transmission

The Coolimba Power Project will be connected via a 20 km transmission line to the nearby SWIS. The connection will follow the common infrastructure easement and will consist of a twin circuit 330 kV line to the Eneabba switchyard (substation).

2.6 Water Handling

The source of the process and cooling water for the Coolimba Power Project is mine water from the Central West Coal Project.

This raw water will be transported along a water pipeline linking the two projects. If water supplied by the mine is in excess of Coolimba's requirements, then the excess will be diverted to an evaporation pond, within the confines of the development footprint of the Central West Coal Project. The Projects have a zero discharge policy which means water input to the projects will be used on site, with no discharge to the external water environment.

If the mine dewatering is unable to provide adequate volumes of water to the Coolimba Power Project, the additional water will be obtained from the Yarragadee and/or Catamarra aquifers and/or other local sources. The estimated consumption of water from these aquifers will be included in the PER documentation.

On-site water treatment systems will supply water of suitable quality for the boiler makeup water, auxiliary cooling systems, potable water and wash water. Settling and evaporation ponds for waste water streams, including boiler blowdown and water treatment plant wastes will be constructed. The rate of waste water discharge to the evaporation pond will be approximately 1.5 GL/year. The power plant waste water will have a Total Dissolved Solids (TDS) concentration of approximately 5,550 mg/L and a pH of approximately 10. The salt laden water sent to the evaporation ponds will deposit a salt solid upon evaporation. Periodic residue clearing of the ponds will be necessary, the salt residue is anticipated to be sent to the mine void along with the power station ash component.

Sewage will be processed by an on-site package sewage treatment plant and treated to a quality suitable for discharge to the evaporation ponds.

Both projects will generate other liquid wastes such as waste lubricating oil, waste hydraulic oil, cleaning fluids and natural gas system condensate. These liquid wastes will be collected and taken to an appropriate off-site facility.

2.7 Ash Handling

During the operational phase, approximately 380,000 tonnes/year of ash will be generated. The ash will be collected in the power plant as fly-ash and bottom-ash. The fly-ash will be collected in bag filters or in electrostatic precipitator hoppers, whilst the bottom-ash will be collected in water-filled hoppers. The bottom-ash will be separated from water, screened and crushed prior to disposal. The fly-ash and bottom-ash will then be transported to the adjacent Central West Coal Project via haul trucks and will be used for backfilling the mine void. The disposal of ash into the void is part of the Central West Coal Project.

2.8 Supporting Infrastructure

Construction of a natural gas lateral between the Coolimba Power Project and the DBNGP or the Parmelia Pipeline will provide a source of start-up fuel for the coal-fired plant and fuel for the gas turbines.

The gas pipeline lateral, the transmission line and potentially a water pipeline will be located within a common 100 m wide infrastructure easement south from the Coolimba Power Project and then east adjacent to the southern border of the nearby South Eneabba Nature Reserve. There will be some site preparation activities necessary both within and external to the nature reserve boundary to so as to

accommodate the Coolimba Power Project and the supporting infrastructure, however as the majority of the site consists of old farmland, limited vegetation clearing is anticipated.

2.9 Solid Waste Management

Solid wastes, other than those that have been included in the previous paragraphs to be generated by the Coolimba Power Project will include office and canteen wastes, and packaging wastes from inbound goods. Central West Coal Pty Ltd and Coolimba Power Pty Ltd will adopt the waste hierarchy (i.e. avoid, reuse, reduce, recycle, treat and dispose) for the management of waste.

2.10 Construction Camp

The construction camp will occupy approximately 20 ha of land and will be situated in Leeman. Whilst the camp is designed to accommodate up to 600 workers during the peak construction period, this peak period is likely only to last approximately 6-12 months of the four-year construction phase. The construction camp is not part of the scope for the PER and will be subject to a separate assessment.

Section 3 Project Justification

The demand for energy in the SWIS continues to grow at approximately 120 MW each year. In addition to the growth in demand for the entire SWIS, there is a strong local requirement for power in the Mid-West region of WA. One of the recommendations of the Mid-West Regional Minerals Study conducted by The Department of Industry and Resources (DoIR) (2000) was to enact policies to stimulate development of large power stations in the region.

A further study was conducted by DoIR (2004) titled "Energy for Minerals Development in the South West Coast Region of Western Australia". The resulting report gave importance to the development of both energy and industry in the Mid-West Region. The study recommended that the "development of a northern Perth Basin coal mine as a source of energy supply to facilitate iron ore processing initiatives should be promoted". The study also considered the contribution to the gross state product and number of long term full time jobs.

Energy losses of up to 12% are currently experienced when transmitting power from the state's South-West to its Mid-West Region. The Coolimba Power Project will greatly reduce these losses by shortening the distance of transmission. By reducing the transmission losses, the amount of greenhouse gas emissions produced per mega watt of usable electricity is also reduced.

Another benefit of a Mid-West based generator is the balancing of the SWIS. New generation in the Mid-West will assist in meeting the State Government's "Fuel Diversity Policy" and could provide the transmission capacity to support additional renewable energy projects, such as wind projects, in the region.

The Project, in conjunction with the Central West Coal Project, will generate significant ongoing annual revenue over a life of at least 30 years. The Project will offer the following benefits to the Mid-West and WA:

- Contribution to the local economy due to the provision of full-time employment for 100 personnel during operation, with additional contributions from flow-on impacts on service industries and other sectors of the economy.
- Contribution to the State economy resulting from taxes associated with salaries and the purchase of goods and services.

Section 4 Project Alternatives

Coolimba considered three options for the coal-fired generation capacity. These were:

- Construction of a plant with no carbon capture ready capabilities;
- Construction of the plant to be able to capture carbon from the outset; or
- Construction of the plant to be carbon capture ready.

Coolimba decided that construction with no carbon capture ready capabilities was not appropriate due to the forecasted climate change predictions, the current political and social environment as well as the likelihood of carbon trading in the future. However, being able to capture carbon from the outset is not commercially viable without carbon trading due to the costs of the technology. Carbon capture technology also requires suitable sequestration locations which are currently being investigated but yet to be secured. Therefore, Coolimba proposes to construct a coal-fired power station which is ready to be converted to carbon capture once economics of a carbon trading system gives the financial support and sequestration sites are proven to be available and technically sound.

Coolimba has considered the option of proposing the two OCGTs as combined cycle gas turbines. At this stage it is considered that the supply and price of gas is such that an OCGT is the best commercial outcome and represents the preferred method of operation for the likely peaking nature of the energy requirement from these units. At a point in the future it may be determined that the OCGT should be converted to combined cycle gas turbines, if gas supply and price was more favourable and/or the energy demand profile required additional gas-fired baseload then a proposal for conversion to combined cycle would then be advanced.

Section 5 Applicable Legislation, Guidelines and Standards

5.1 State Legislation

Western Australian legislation and Regulations relevant to the Project comprise:

- *Aboriginal Heritage Act* 1972.
- *Agriculture and Related Resources Protection Act* 1976.
- *Bush Fires Act* 1954.
- *Conservation and Land Management Act* 1984.
- *Contaminated Sites Act* 2003.
- *Dampier to Bunbury Pipeline Act* 1997.
- *Dangerous Goods Safety Act* 2004.
- *Dangerous Goods (Transport) Act* 1998.
- *Electricity Act* 1945.
- *Electricity Corporations Act* 2005.
- *Electricity Industry Act* 2004.
- *Electricity Transmission and Distribution Systems (Access) Act* 1994.
- *Energy Operators (Powers) Act* 1979.
- *Energy Safety Act* 2006.
- *Energy Safety Levy Act* 2006.
- *Environmental Protection Act* 1986.
- Environmental Protection (Noise) Regulations 1997.
- *Explosives and Dangerous Goods Act* 1961.
- *Fuel Energy and Power Resources Act* 1972.
- *Gas Pipelines Access (Western Australia) Act* 1998.
- *Health Act* 1911.
- *Heritage of Western Australia Act* 1990.
- *Land Administration (Amendments) Act* 1997.
- *Local Government Act* 1995.
- *Main Roads Act* 1930.
- *Occupational Safety and Health Act* 1984.
- *Planning and Development Act* 2005.
- *Pollution of Waters by Oil and Noxious Substances Act* 1987.
- *Rights in Water And Irrigation Act* 1914.
- *Wildlife Conservation Act* 1950.

- *Waterways Conservation Act* 1976.
- *Water and Rivers Commission Act* 1995.

5.2 Commonwealth Legislation

Commonwealth legislation relevant to the Project comprises:

- *Australian Energy Market Act* 2004.
- *Australian Heritage Council Act* 2003.
- *Commonwealth Native Title Act* 1993.
- *Environment Protection and Biodiversity Conservation Act* 1999.
- *Gas Pipelines Access (Commonwealth) Act* 1998.

5.3 Guidelines, Standards and Policies

The following guidelines, standards and policies are relevant to the Project:

- Australian Energy Regulator Gas and electricity distribution guidelines — scoping paper (2006).
- Australian and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
- Australian and Torres Strait Islander Commission (ATSIC), Department of Indigenous Affairs (DIA) and Department of Premier and Cabinet Citizens and Civics Unit – Consulting Citizens: Engaging with Aboriginal Western Australians (2004).
- Department of Climate Change (DCC), National Greenhouse Accounts Factors (2008).
- DEC Contaminated Sites Management Series Bioremediation of Hydrocarbon-Contaminated Soils in Western Australia (2004a).
- DEC Western Australian State Greenhouse Strategy - WA Greenhouse Task Force (2004b).
- Department of Premier and Cabinet Citizens and Civics Unit – Consulting Citizens: A Resource Guide (2002).
- Department of Premier and Cabinet Citizens and Civics Unit – Consulting Citizens: Planning for Success (2003).
- EPA Guidance Statement No. 8 (Draft) – Environmental Noise (2007).
- EPA Guidance Statement No. 12 – Minimising Greenhouse Gases (2002).
- EPA Guidance Statement No. 18 - Prevention of Air Quality Impacts from Land Development Sites (2000b).
- EPA Guidance Statement No. 41 – Assessment of Aboriginal Heritage (2004c).
- EPA Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (2004d).
- EPA Guidance Statement No. 54 and 54a – Sampling of Subterranean Fauna in Groundwater and Caves (2003b).

Section 5 Applicable Legislation, Guidelines and Standards

- EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment (2004e).
- EPA Guidelines for Preparing a Public Environmental Review/ Environmental Review and Management Programme (2008).
- EPA Interim Industry Consultation Guide to Community Consultation (2003c).
- Environment Protection and Heritage Council National Environmental Protection Measure (NEPM) for Ambient Air Quality (2003).
- EPA Position Statement No. 2 - Environmental Protection of Native Vegetation in Western Australia (2000a).
- EPA Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia (2003a).
- EPA Position Statement No. 6 – Towards Sustainability (2004a).
- EPA Position Statement No. 7 – Principles of Environmental Protection (2004b).
- EPA Position Statement No. 9 – Environmental Offsets (2006).
- National Occupational Health and Safety Commission (NOHSC). Approved Criteria for Classifying Hazardous Substances (NOHSC: 1008 [2002]).
- Standards Australia AS/NZS 4801 Occupational Health and Safety Management Systems (2001).

Section 6 Existing Environment

6.1 Land Use

The site comprises approximately 300 ha of land located 16 km south, south-west of Eneabba. Historically the area has been used for pastoral activities and more recently the Iluka mineral sands mining operations. The site is part of a larger farm area which has been predominantly used for mixed broadacre agriculture. This predominantly disturbed land is therefore likely to undergo little or no clearing of native vegetation.

Although Eneabba is the nearest populated centre occupied by between 250 – 300 inhabitants, a number of scattered farm residences exist within the wider area. The closest identified resident is located approximately 1.5 km south-west from the site boundary. Other than the Iluka mineral sands mining and processing operations and the scattered farms, nature reserves comprise the remaining predominant land use in the wider area.

6.2 Climate

Eneabba experiences a dry Mediterranean climate. Data from Eneabba's Bureau of Meteorology (BoM) weather station, indicate mean maximum temperatures ranging from 19.6°C in July to 36.1°C in February and mean minimum temperatures ranging from 9.0°C in August to 19.5°C in February. Rainfall monthly averages range from 105.2 mm in June to 7.3 mm in January, with an annual average of 505.8 mm (BoM, 2007).

6.3 Geology

The geology of the region is characterised by tertiary sands overlying the Cockleshell Gully Formation which comprises sandstone, siltstone, shale, claystone and coal (Lowry, 1974). The Cockleshell Gully Formation is further divided into the upper Cattamarra Coal Measures Member and the lower Eneabba Member. The Cattamarra Coal Measures Member consists of interbedded shale, sandstone and coal seams. The Eneabba Member is distinguished by multi-coloured claystone (URS, 2006a).

The Project Area lies within the onshore northern Perth Basin, which is an Early Permian to Holocene extensional basin on the western edge of the Australian Craton. The basin has a complex deformational history, including two major tectonic phases; a Permian extension in a south-westerly direction and an Early-Cretaceous transtension to the north-west (URS, 2006b). The geology of the Project Area is typical of the regional geology, comprising sand overlying the Cattamarra Coal Measures Member of the Cockleshell Gully Formation. The sand layer is believed to be less than 10 m thick and overlies rock comprising interbedded to interlaminated sandstone and siltstone, claystone and coal seams (URS, 2006a).

6.4 Landform and Soils

The Project Area is located on the Eneabba Plain, between the Coastal Belt to the west and the Gingin Scarp to the east. The Eneabba Plain is formed by a series of ancient shorelines, lagoon and dune deposits and slopes gently downwards to the north and west (URS, 2006b). Preliminary studies indicate that no acid sulphate soils occur within the Project Area.

6.5 Surface Water

According to the Northern Agricultural Catchments Council (NACC) (2002), the Project Area lies within the Logue Catchment, which extends across the Arrowsmith Region, west of the Gingin Scarp onto the Swan Coastal Plain, and east of the North Coastal Dunes.

The Project Area contains a series of watercourses that form the headwaters of the Erindoon Creek. A string of wetlands, including Lake Indoon and Lake Logue are located to the north-west of the Project.

Section 6 Existing Environment

Lakes Logue and Indoon are the largest components of a north-south chain of wetlands perched on Aeolian sands. Lake Logue is a large seasonal freshwater lake. Lake Indoon is a permanent brackish lake, which is linked to Lake Logue by groundwater. It is a broad shallow claypan comprising grey soils, heavy bluish-grey clays and silty clays (ATA Environmental, 2001).

6.6 Hydrogeology

6.6.1 Groundwater

Superficial formations of Quaternary and Tertiary deposits cover the Project Area. Underlying the superficial formations is the Cattamarra Coal Measures.

The superficial formations consist mainly of silt, sand and clay in varying proportions. The superficial formations form an unconfined aquifer system. The aquifer predominantly consists of a shallow marine and Aeolian sequence that has been deposited in strandlines parallel to the coast.

The groundwater flow system is bound by the Indian Ocean in the west and by the Gingin Scarp to the east. Upward leakage by discharge from the Cattamarra Coal Measures into the flow system takes place in the coastal area and locally. Throughflow and upward leakage also occurs from the Yarragadee Formation across the Warradarge Fault (URS, 2006b).

Groundwater levels in the Project Area reflect regional groundwater gradients, seasonal and long-term climate changes, groundwater abstraction and land clearing. Limited salinity data prior to 1990 suggests that land clearing has resulted in both local and regional increases in groundwater levels (NACC, 2002).

At the project site, groundwater levels are approximately 7 to 12 m below ground surface (URS, 2006b).

The site is located within the Arrowsmith Area, which is a proclaimed groundwater management area. The ground water is currently abstracted for pastoral and mining purposes.

6.6.2 Groundwater Dependant Ecosystems

There is potential that the Project Area and surrounding region may contain Groundwater Dependant Ecosystems (GDEs). The types of GDEs that may occur in the region have been identified by Sinclair Knight Mertz (2001) as comprising:

- Terrestrial vegetation;
- River base flow systems;
- Aquifer and cave ecosystems;
- Wetlands; and
- Terrestrial fauna.

The extent of GDEs in the area is currently unknown, and will be investigated as part of the studies for the project.

6.7 Vegetation and Flora

The Mid-West Region has a large range of species which have conservation significance. The following paragraphs should be read in relation to Figure 6 of this report, which shows the location of these species in relation to the site. Figure 6 is accompanied by Figure 7, which shows the location of nature reserves in the surrounding area.

6.7.1 Vegetation

Vegetation in the region primarily consists of Kwongan (sand plain) type with a fairly uniform scrub heath assemblage containing patches of melaleuca thicket, with scattered trees and woodlands (Hopkins and Hnatiuk, 1981). The vegetation is known to have high biodiversity values and supports endemic species. The study area described by Hopkins and Hnatiuk (1981) is slightly east of the Project Area, and demonstrates a considerable variation in the number of species recorded at each site. A band of greater species richness is located along the overlap of two zones – the vegetation of the lateritic gravels to the east, and the vegetation of the deep sand of the west.

Mattiske Consulting Pty Ltd (Mattiske) conducted flora and vegetation surveys of the relevant leases during spring 2005 and spring 2006 (Mattiske, 2007). During these surveys, 17 plant communities were recorded, including five heath communities; six scrub and thicket communities and six eucalypt woodland communities. The remaining land areas consist mainly of cleared paddocks, with localised stands of trees.

6.7.2 Flora

The surveys carried out by Mattiske identified a total of 394 taxa (including subspecies and varieties) from 167 genera and 57 families within the survey area. Of these taxa, a total of 30 Priority taxa, were identified, comprising two Priority 1 species, 10 Priority 2 species, 13 Priority 3 species and four Priority 4 species.

Previous records from the DEC indicate that there are potentially 12 Declared Rare Flora (DRF) species within the Project Area. Of these, six species are listed as endangered and six are listed as vulnerable under the EPBC Act. The records also indicated that the Project Area may contain Priority Flora, comprising five Priority 1, 11 Priority 2, 28 Priority 3 and 17 Priority 4 species. The locations of species of conservation significance are presented in Figure 6. Definitions of the flora conservation classifications are described in Appendix A.

6.7.3 Threatened Ecological Community

One Threatened Ecological Community (TEC) occurs in the Eneabba region. This TEC, Community 72 Ferricrete Floristic Community, is listed as vulnerable by the DEC. This TEC occurs outside the Project Area to the north-east, and none of the native plant communities found in the survey area match this community.

No TECs listed under the EPBC Act occur near the Project Area.

6.7.4 Weeds

Twenty taxa recorded by Mattiske within the survey area are introduced species. None of the introduced species is listed under Section 37 of the *Agriculture and Related Resources Protection Act* 1976.

6.8 Vertebrate Fauna

According to the DEC database, the wider Project Area could potentially support a range of vertebrate fauna species, including seven protected species. These comprise one bat species, one skink species and five bird species. Of these, three species are listed under Schedule 1 of the *Wildlife Conservation Act* 1950 and four species are listed as Priority 4 by the DEC. These species are listed below and the conservation significance classifications are described in Appendix A of this report.

- Schedule 1:
  - *Cyclodomorphus branchialias* (a skink),
  - *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo); and

- *Calyptorhynchus baudinii* (White-tailed Black Cockatoo).

- Priority 4:
  - *Macroderma gigas* (Ghost Bat),
  - *Ardeotis australis* (Australian Bustard),
  - *Calamanthus campestris* (Rufous Fieldwren); and
  - *Oreoica gutturalis* (Crested Bellbird).

A search of the EPBC database indicated that six species listed under the EPBC Act could potentially occur within or near the Project Area. These comprised one endangered species and five migratory species:

- Endangered:
  - *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo);
- Migratory:
  - *Haliaeetus leucogaster* (White-bellied Sea-Eagle);
  - *Merops ornatus* (Rainbow Bee-eater);
  - *Ardea alba* (Great Egret, White Egret);
  - *Ardea ibis* (Cattle Egret); and
  - *Apus pacificus* (Fork-tailed Swift).

6.9 Invertebrate Fauna

DEC database searches and literature reviews indicate that there is a rare trapdoor spider species and four Priority invertebrate species known to occur in the region. Of these five species, there is one species listed under Schedule 1 of the *Wildlife Conservation Act* 1950 (Shield-backed Trapdoor Spider), one species listed as Priority 1 (a scorpion fly), one species listed as Priority 2 (a stick insect) and two species listed as Priority 3 (a cricket and a native bee).

The Shield-backed Trapdoor Spider (*Idiosoma nigrum*) is endemic to south-western Australia throughout the semi-arid central and northern wheatbelt, occurring mainly in *Eucalyptus-Acacia* woodlands and sclerophyll open forests. Most of the favourable habitat for the species has been cleared, and consequently its distribution has become fragmented. This species is currently under threat from land use activities, land clearing and from habitat loss caused by rabbits, galahs and secondary salinity (DEWHA, 2005 and Main, 2003).

6.10 Subterranean Fauna

There is the potential for stygofauna to occur in the vicinity of the Project Area. According to the EPA Guidance Statement No. 54 (EPA, 2003b), stygofauna are aquatic subterranean animals, found in a variety of groundwater systems. The stygofauna in WA exhibit high levels of endemism and many of the species appear to have restricted ranges. In addition, the EPA considers that the WA stygofauna species have considerable scientific importance and conservation significance because they appear to represent links to the time when Australia was part of Gondwanaland, bordered by the Tethys Sea (EPA, 2003b).

Stygofauna have been recorded in the Eneabba region. Records from the Western Australian Museum indicate that the copepod, *Metacyclops fiersi*, has been found in the groundwater of the Eneabba area (De Laurentiis, Pesce and Humphreys, 2001). This species was found in areas underlain by Tamala Limestone. Although the Tamala limestone in the region is known to contain stygofauna, there is no Tamala Limestone within the Project Area.

Section 6 Existing Environment

6.11 Noise

The mining operations from the adjacent Iluka mineral sands mining and processing operations and the traffic travelling along the Brand Highway are the two main noise sources in the area.

6.12 Air Quality

The nearby Iluka operations close to the township of Eneabba comprise dry mining activities. Historically ,dust from these operations has been a concern to the local community. Iluka addressed this concern through meetings with the community and action to reduce the dust arising from the mine site. The major sources of dust were roads, stripped areas, mining pits, stockpiles and tailings storage facilities. Dust at the site is monitored by dust deposition gauges, high volume air samplers and a real time dust monitor whilst weather conditions are monitored by the on site meteorological station.

In addition to the Iluka operations, fugitive dust is prevalent in the area. Contributions to fugitive dust arise from wind passing over exposed areas of soil or land subject to erosion, suspended dust from vehicle movements over unsealed roads, bushfires, wind blown pollen and agricultural activities. Daily background dust levels vary significantly depending on location, meteorological conditions, proximity of major point sources and fugitive sources.

6.13 Conservation Values

There are two reserves located in close proximity to the Project. These are the South Eneabba Nature Reserve and Lake Logue Nature Reserve. The locations of reserves are presented in Figure 6.

The South Eneabba Nature Reserve comprises two adjoining nature reserves (Reserves 27886 and 31030) with a total area of approximately 6,192 ha. They are located approximately 7 km south of Eneabba and adjoin the eastern boundary of the Central West Coal Project Area. The reserves are registered on the Register of the National Estate as they contain representative Kwongan vegetation with floristic richness and a high degree of species endemism.

The Lake Logue Nature Reserve is approximately 7 km to the north-west of the Project Area. It is a “C” Class nature reserve vested in the National Parks and Nature Conservation Authority and managed for conservation of flora and fauna by the DEC.

Approximately 10 km north-west of the Project area lies the Lake Indoon Reserve. This reserve is vested in the Shire of Carnamah as a Class “A” reserve for public recreation.

The Lake Logue-Indoon system has been classified as a ‘Nationally Important Wetland’ by DEWHA.

6.14 Aboriginal Heritage

All Aboriginal sites in WA are protected by the *Aboriginal Heritage Act* 1972, whether or not they are known to the Department of Indigenous Affairs (DIA). The DIA database provides the locations of known sites of Aboriginal importance. Searches of the DIA register of sites have been undertaken and indicate no known sites of Aboriginal ethnographic or archaeological significance within the Project Area.

6.15 European Heritage

The Australian Heritage Database contains information about natural, historic and indigenous sites, including places in the following lists and places under consideration for any one of these lists:

- World Heritage List.
- National Heritage List.
- Commonwealth Heritage list.

Section 6 Existing Environment

- Register of the National Estate.

According to the Australian Heritage Database, the nearest place of European heritage found in the searches of the databases is McPherson Homestead in Carnamah, approximately 60 km east from Eneabba. However, a number of lakes and reserves located in close proximity to the Project Area are listed on the Australian Heritage Database. The reserves within an approximate 10 km radius of the Project comprise:

- Lake Logue Reserve;
- South Eneabba Nature Reserve;
- Beekeepers Nature Reserve;
- Stockyard Gully Nature Reserve; and
- Lake Indoon Reserve.

Section 7 Stakeholder Consultation

7.1 Overview

The environmental approvals process is a public process and it is expected that proponents will consult with government agencies, Non-Government Organisations (NGOs) and the public to ensure that local issues and concerns are taken into account during the planning and environmental assessment of proposed projects.

Coolimba is committed to conducting a comprehensive stakeholder consultation programme and maintaining engagement with all relevant stakeholders throughout the life of the Project. Consultation with government agencies has already commenced and is being facilitated by the Office of Development and Approvals Coordination (ODAC) through the Integrated Project Approvals System (IPAS).

The objectives of Coolimba's stakeholder consultation programme are as follows:

- To identify individuals, groups and agencies with an interest in the proposed Project;
- To enable stakeholders to have access to relevant information regarding the Project;
- To provide a means for stakeholders to raise issues and concerns; and
- To identify main areas of environmental concern so that these concerns can be included in the EIA documentation being prepared for the Project.

7.2 Key Stakeholders

The consultation programme will involve consultation with a range of stakeholders including:

State Government Ministers

- Minister for State Development – The Hon Eric Ripper.
- Minister for the Environment - The Hon David Templeman.
- Minister for Energy; Resources; Industry and Enterprise – The Hon Francis Logan.
- Minister for Mid West – The Hon Kim Chance.
- Minister for Communities – The Hon Sue Ellery.
- Minister for Local Government - The Hon Ljiljana Ravlich.
- Minister for Housing and Works, Indigenous Affairs and Heritage - The Hon Michelle Roberts.
- Minister for Planning and Infrastructure - The Hon Alannah MacTiernan.
- Minister for Regional Development and Fisheries - The Hon Jon Ford.
- Minister for Health - The Hon Jim McGinty.
- Minister for Water Resources - The Hon John Kobelke.

Commonwealth Government

- Department of the Environment, Water, Heritage and the Arts.
- Department of Agriculture, Fisheries and Forestry.
- National Environmental Protection Council.
- Australian Heritage Commission.

Section 7 Stakeholder Consultation

State Government

- EPA
- Environmental Protection Authority Service Unit (EPASU).
- ODAC.
- DoIR.
- DEC.
- Department of Water (DoW).
- Office of the Appeals Convenor.
- Department of Planning and Infrastructure (DPI).
- DIA.
- Department of Consumer and Employment Protection (DoCEP).
- Department of Agriculture.
- Office of the Commissioner of Soil and Land Conservation.
- Department of Health (DoH).
- Department of Education and Training.
- Main Roads Western Australia.

Local Government

- Shire of Carnamah.
- Shire of Coorow.

Non-government Organisations (NGOs) and Community Interest Groups

- Chamber of Minerals and Energy WA.
- Chamber of Commerce and Industry WA.
- Greening Australia - Reconnections Project.
- World Wide Fund For Nature.
- Conservation Council of WA.
- Wildflower Society of WA.
- Australian Heritage Commission.
- CSIRO.

Communities

- Eneabba.
- Leeman.
- Green Head.

- Coorow.
- Carnamah.
- Jurien.
- Dongara.
- Geraldton.
- Badgingarra.
- Native Title Claimant groups (Arnold Franks, Amangu and Taylor Family).

7.3 Consultation to Date

A meeting was held with Mr John Güld and Mr Doug Betts of the EPASU on 14 August 2007. This meeting involved a briefing on the project, discussion about the environmental approvals required and the key environmental issues that need to be addressed in the EIA. The key issue raised by the EPASU in relation to this Project was to advise that the Environmental Management Plan (EMP) should be submitted with the environmental assessment document.

A meeting with the Shire of Carnamah was held on 15 August 2007. The Shire raised the issue as to whether the DBNGP was in competition with the Project.

A meeting with the Shire of Coorow was held on 15 August 2007. The meetings included the Councillors and the Chief Executive Officer of the Mid-West Development Commission. The issues raised were as follows:

- Will the Project be drive in/drive out?
- Coolimba Power Pty Ltd should look at opportunities to source workers from the local communities or house the workers within the local town.

A multi-agency briefing was conducted on 19 September 2007, as arranged by ODAC. The briefing was attended by the DoIR, DEC, DPI, DIA, DoCEP, DoW, DoH and the EPASU. Written comments and advice were received from these agencies. The key issues raised during the meeting were as follows:

- Land tenure and ownership details need to be defined before the EIA document is approved for public review.
- Aboriginal heritage surveys should be completed and copies forwarded to DIA.
- Applications for water licences can be assessed in parallel to assessment under Part IV of the EP Act. However, the assessment of applications cannot be finalised until Ministerial approval under Part IV of the EP Act has been received.

A meeting with DoIR was held on 21 September 2007 to obtain feedback and advice regarding the project. A meeting was also held with the DEC Environmental Management Branch (formally the Department of Conservation and Land Management [CALM]) on 9 October 2007 to obtain advice on the scope of works for the environmental studies. The key issues raised were as follows:

- Where will the accommodation camp be located?
- Screening should be considered to reduce the visual impact of the project.

An Open Day was held on 26 October 2007 in Eneabba. Approximately 60 members of the public attended and were provided with information on the Project. The key issues raised by community members were as follows:

- The permanent workforce should be housed within the Eneabba town site.

Section 7 Stakeholder Consultation

- What is the proposed schedule for the Project?

Coolimba Power Pty Ltd met with the Office of the Appeals Convenor on 7 November 2007 to provide a briefing on the Project to the Appeals Convenor in response to appeals lodged in relation to the level of assessment set by the EPA. No issues were raised by the Appeals Convenor during this meeting.

A meeting with the DoW was held on 7 November 2007 to provide a briefing on the Project progress and discuss the water requirements for the Project. The issue of water availability from the Yarragadee was discussed with the DoW during this meeting.

On 15 November 2007, Coolimba Power Pty Ltd met with the Yued Working Group at Moora. The issues that were raised during this meeting were as follows:

- Employment opportunities for young people.
- Concept of carbon sequestration and the location of the storage site.
- Financial benefits to Yued people.
- Aboriginal heritage survey requirements.

An Initial Screening Meeting was held by the ODAC on 4 December 2007 with relevant government agencies. The purpose of the meeting was to discuss whether the Project Definition Document submitted had adequate information to enable agencies to proceed to scoping the assessment requirements. The agencies agreed that the Project could proceed to scoping the assessment requirements and the main issues raised during screening were:

- DoW – The main concerns are land tenure, water availability and water accessibility.
- DoIR – Land tenure and ownership details need to be addressed.
- DIA – Aboriginal Heritage Surveys should be conducted as soon as possible.
- EPASU – The EMP should not be submitted with the Scoping Document, and the PER must identify impacts and management clearly.
- DPI – Land access, leases and zoning. Other issues concerned environmental and social aspects.
- DEC – The plant type must be defined before the Project can be assessed for a Works Approval. Timelines should be extended for the PER period, and consultation should be increased. Further information is required regarding biodiversity, cumulative impacts and the lime source.
- DoCEP – Although absent from the meetings, DoCEP noted that the Proponent is aware that *Mines Safety and Inspection Act* 1994 approval is required.
- DoH – Emissions, water supply, waste, fauna, flora and vegetation, community infrastructure, public health and transport were all discussed as issues.

An Open Day was held in Leeman and Green Head on 12 December 2007. The main issues raised were:

- Employment opportunities for local people.
- Opportunities for further consultation.
- Air quality impacts.

A meeting was held with representatives of the Northern Wildflower Conservation Council and the owners of the Western Flora Caravan Park on 12 December 2007. The main issues raised were:

- Clearing of vegetated land.
- Drainage of radioactive water into the Indian Ocean.

Section 7 Stakeholder Consultation

A meeting was held on 30 January 2008 with Shire of Coorow and the Shire of Carnamah to identify possible construction camp locations. A location was discussed and a plan to proceed was outlined.

A meeting was held on 7 February 2008 with the DoW to discuss the recent dewatering tests and possible future actions. The main issues raised were:

- Allocation limits in Cattammarra and Yaragadee aquifers surrounding the site.
- Limited available data to assess an allocation limit above the current levels.

A meeting was held on 14 February 2008 with the DEC Parks and Conservation Division. The main issue raised was the potential direct and indirect impacts that may occur on vegetation within the Project Area and surrounding Nature Reserves as it is of high biodiversity and in very good condition.

A meeting was held on 27 February 2008 with the Department of Health. The main issues raised were:

- The Health Risk Assessment included with the PER would focus on air quality health impacts for residents in the region.
- The PER should also include waste and waste water issues both for the Coolimba Power Project and the construction camp.
- The effects of the influx of Coolimba Power Project construction workers to local townships during the peak period should include stresses on existing health and other community services.

A meeting was held on 29 February 2008 with the DoIR Industry Regulation Branch. The main issues raised were:

- Emissions trading regime.
- Carbon sequestration legislation.

A meeting was held on 4 March 2008 with the DEC Industry Regulation Branch. The main issues raised were:

- The proponent would need to provide a mine closure plan in the PER and must include achievable rehabilitation criteria.
- A good dust management plan is essential for the Project.
- Appropriate air quality meteorological station data were essential to enabling accurate modelling of the ambient dust emissions.

A meeting was held on 13 March 2008 with the air quality branch of the EPASU. The main issues raised were:

- The proponent should ensure all criteria pollutants are included in the air quality modelling and any pollutants which are significant in their own right.
- The air quality assessment should examine chronic and acute health effects.
- Accurate meteorological data is key to accurate dust modelling.
- Desulphurisation technology must be clearly defined and the reliability of the technology should be provided.

A meeting was held on 11 March 2008 with the Department of Indigenous Affairs. The main issues raised were:

- The DIA agreed that the archaeological and ethnographic surveys would be conducted initially on a limited area to enable information to be submitted to the PER.

- A scope of future progressive archaeological and ethnographic studies would be included in the PER to ensure that all areas likely to be disturbed are covered by the appropriate survey.

A presentation was provided for the West Midlands Natural Resource Group at Dandaragan on 17 March 2008. The main issues raised were the impact of dewatering on Lake Logue and rehabilitation of the mine.

A presentation was given to the Shire of Coorow council meeting on 19 March 2008. The main issues raised were employment opportunities for local people and the timetable for construction and operations.

An open day was held at Leeman on 19 March 2008 at the Leeman Recreation Centre. The main issues raised were:

- Employment and business opportunities for local people;
- Location of construction camp;
- Location and number of permanent workforce;
- Impact of dewatering on farmers' bores; and
- Timetable for construction and operations.

A meeting was held with the Southwest Aboriginal Land and Sea Council representing the Yued Group on 31 March 2008. The main issues raised were:

- Indigenous employment and training;
- Indigenous employment opportunities; and
- Heritage agreement.

7.4 Stakeholder Consultation Programme

Coolimba has developed a Stakeholder Consultation Plan which provides a framework for the consultation programme. The plan outlines the Coolimba's commitment to involve all interested parties in full and frank disclosure of the plans for, benefits of, and impacts from the Project.

Numerous and continuous consultation opportunities for all levels of the community will be created and welcomed as part of the consultation process. To facilitate this, community information days will be held in the immediate communities and with any other communities that request one. A mailout to all residents will also be conducted inviting feedback.

Briefings/presentations will be offered to the following groups:

- Government Ministers.
- Government Agencies (including local shires).
- NGOs and Community Interest Groups.

Regular newsletters updating progress on the EIA and Project development will be circulated to interested parties and made available on the Company website.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

8.1 Summary

Table 8-1 provides a summary of environmental factors relevant to the Project, the Proponent's objectives, the potential impacts, the investigations required and potential management activities.

The text that follows Table 8-1 provides additional information on the scope of investigations and covers

- Landforms and soils.
- Acid drainage.
- Surface water.
- Vegetation and flora.
- Vertebrate fauna.
- Invertebrate fauna.
- Air quality.
- Greenhouse gases.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 Relevant Environmental Factors, Potential Impacts and Scope of Investigation

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Conservation Values	To protect the environmental values of areas near the Project Area identified as having significant conservation value.	There are two nature reserves located in close proximity to the Project. These are the South Eneabba Nature Reserve, Lake Logue Nature Reserve. There is the potential for direct and indirect impacts on conservation values from the Project such as: • Potential for limited clearing for a short section of transmission line easement. The final extent is dependent on final easement route. • Wildfire. • Weed infestation. • Dieback infestation. • Dust. • Modification of local hydrology and hydrogeology.	A number of field surveys and technical investigations will be undertaken to define the environmental values and their conservation significance of the Project Area and surrounds. These investigations comprise: • Baseline soil and acid sulphate soil surveys. • Acid drainage study. • Flora and vegetation surveys. • Dieback survey. • Vertebrate and invertebrate fauna surveys. • Surface water study. • Groundwater investigations. • Air quality modelling. • Aboriginal heritage survey. • European heritage study. The results of the above surveys and investigations will be used to conduct a desktop assessment of the potential impacts on the conservation values in the area. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. Management measures will be developed following the assessment of the potential impacts on the conservation values in the area.	Management measures will be developed following the assessment of the potential impacts on the conservation values in the area. These measures will aim to prevent impacts to conservation areas, however where this will not be possible, measures will be developed to minimise the potential impacts.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Landform and Soils	To maintain the integrity, ecological functions and environmental values of soils and landforms in the Project Area. To minimise the footprint of disturbance during the life of the Project. To maximise the retention and viability of topsoils for future rehabilitation activities.	The potential impacts to landform and soils in the Project Area are as follows: • Increased erosion through changes in surface water regimes. • Accumulated sedimentation downstream of the Project Area. • Modification of landforms within the Project Area. • Release of acid and metals as a result of acid sulphate soils being disturbed during construction.	A baseline soil survey has been undertaken, including a site and soil description with physical and chemical soil analyses on representative soil types. An acid sulphate soil survey has been undertaken to determine whether acid sulphate soils exist within the Project Area and surrounds. Further detail on the investigations is provided in Section 8.2 of this report. The results of the above surveys and investigations will be used to conduct a desktop assessment of the potential impacts on the landform and soil values in the area. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	The landform and soil issues will be managed by implementing the following: • Minimise the area of land that is exposed to erosion. • Optimise Project design measures to minimise erosion and sediment transport. • Define the location of acid sulphate soils and avoid disturbance of acid sulphate soils where possible. Where it cannot be avoided, manage this material so that the potential for acid generation is minimised. • Develop an Acid Sulphate Soil Management Plan (if required) detailing the handling, storage, encapsulation, rehabilitation and monitoring of acid sulphate soils in accordance with the relevant guidelines.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Acid Drainage	Minimise the risk to the environment resulting from potentially acid forming materials.	The potential impacts from acid drainage are as follows: • Acid drainage from coal stockpiles. • Changes to soil characteristics from acid drainage exposure and resultant metal releases. • Contamination of surface water and groundwater, and subsequent impacts to vegetation from acid forming materials.	An acid drainage investigation is being undertaken, and includes: • Review of existing information on the geochemical characteristics of the coal. • Sampling and laboratory testing of drill core/cuttings representing coal that will be stockpiled at the power station. • Characterisation and assessment of the materials, including an assessment of the results in context with the geology, climate and regulatory requirements to determine the potential for coal materials to generate acid and potentially release metals and salts into the surrounding environment. • Geochemical testing of ash Further detail on the investigations is provided in Section 8.3 of this report. The results of the above surveys and investigations will be used to conduct a desktop assessment of the potential impacts of acid drainage in the area. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	If the acid drainage investigation indicates that there are potentially acid forming materials, this will be managed by implementing the following management measures: • Developing procedures for handling, placement and storage of these materials. • Using acid consuming materials, such as lime, where appropriate. • Monitoring and characterisation of stockpile materials in order to monitor changes in waste rock chemistry. • Developing adequate bunding to capture run-off.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Surface Water	To maintain the quantity and quality of surface water so that environmental values, including ecosystem maintenance, are protected.	The potential impacts to surface water in the Project Area such as the Lake Logue Nature Reserve, Lake Indoon, Erindoon Creek and Bindoon Creek, are as follows: • Changes to surface water flows due to the presence of infrastructure. • Increased sedimentation and erosion due to the land disturbance required for the construction of the Project.	A surface water study is being undertaken and comprises: • Review of hydrological and topographic data. • Characterisation of baseline surface water runoff such as runoff volume, peak discharge rate and water quality. • Assessment of potential impacts of the Project on surface water hydrology. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. • Development of the conceptual surface water management system as part of the overall design. Further detail on the investigations is provided in Section 8.4 of this report.	The potential surface water management strategies are as follows: • Optimise design parameters to manage surface water and minimise impact on existing hydrological regimes. • Manage erosion and sedimentation from disturbed areas. • Implement a Surface Water Management Plan to maintain the quantity and quality of surface water so that environmental values, including ecosystem function, are protected.
Groundwater	To maintain the quantity and quality of ground water so that existing and potential environmental values, including ecosystem function, are protected.	The potential impacts to groundwater are as follows: • Alteration to local and regional ground water regimes, as a result of changes to recharge patterns. • Potential contamination to groundwater as a result of hydrocarbon spills and other chemicals.	A hydrogeological investigation is being undertaken to characterise the quality and quantity of groundwater. The results of the baseline hydrogeological surveys will inform the impact assessment study so as to identify the impacts of the proposal on groundwater. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. The baseline investigations and the impact study will inform the process for determining appropriate management activities.	The following management measures may be implemented to minimise groundwater impacts: • Implement a Groundwater Management Plan to maintain the quantity and quality of groundwater so that environmental values, including ecosystem function, are protected. • Implement a groundwater monitoring programme.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Vegetation and Flora	To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	The potential impacts of the Project on vegetation and flora are as follows: • Reduced regional representation of flora and vegetation communities. • Loss/degradation of vegetation due to vegetation clearing. • Potential loss of priority flora species. • Potential loss of vegetation due to changes in water flows. • Increased weed infestation • Transport and spread of dieback from increased vehicle traffic. This could include the spread of dieback into sensitive areas. • Potential effects on vegetation due to changes in air quality due to stack emissions and site generated dust arisings. • Adverse effects on declared rare flora (DRF)	A vegetation and flora survey is being undertaken and includes: • Preparing survey methods compliant with DEC requirements and EPA guidance statements. • Integration of findings with previous studies so that the impacts on flora and vegetation can be assessed in a local and regional context. • Searching targeted areas for declared rare flora and priority flora. • Vegetation mapping, including TECs and GDEs. • An assessment of the potential impacts (direct and indirect) of the Project on vegetation and flora. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. • A peer review of the vegetation and flora report will be undertaken by a botanist with experience with Kwongan vegetation. In addition, a dieback survey of the Project Area has commenced. Further detail on the scope of investigation is provided in Section 8.5 of this report.	The potential management measures to minimise impacts on vegetation and flora including DRF are as follows: • Optimise Project design/footprint to avoid or minimise clearing. • Implement clearing control procedures during construction and operation. • Develop a Flora and Vegetation Management Plan, which includes weed and dieback management procedures. • Implement a monitoring and eradication programme for weeds within the Project Area during construction and operation.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Vertebrate Fauna	To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	The potential impacts on vertebrate fauna include: • Direct removal or disturbance of fauna habitat. • Effect of noise, dust or artificial light impacts on sensitive fauna. • Alterations to hydrology may affect vertebrate fauna habitat. • Secondary impacts, such as collisions with vehicles and deaths/injuries as a result of fire.	Two vertebrate fauna surveys have been undertaken. These comprise a Level 2 survey in Spring 2007, and a Level 1 survey in Autumn 2008. The scope of the assessment is being undertaken and involves: • Preparing survey methods compliant with DEC requirements and EPA guidance statements. • Undertaking a desktop fauna assessment incorporating searches of all relevant databases and background information, including previous surveys in the regional and local area. • Conducting a reconnaissance survey to determine basic fauna communities, fauna habitat values and the likelihood of occurrence of conservation significant fauna. • Conducting a detailed level 2 fauna survey, using trapping and foraging techniques. The results of the desktop assessments, fauna surveys and other environmental studies (such as vegetation) will be used to assess the impacts of the Project on fauna. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. Cumulative and consequential impacts as defined by Section 527E of the EPBC Act, where they affect matters of NES protected under Part 3 of the EPBC Act will be described in the PER. Further detail on the investigations is provided in Section 8.6 of this report.	The potential management measures to minimise the impacts on vertebrate fauna are as follows: • Optimise Project design/footprint to avoid or minimise disturbance. • Implement dust control measures. • Impose speed restrictions around the site to reduce the chance of vehicles colliding with fauna. • Retain large trees, where possible. • The details of mitigation measures proposed in the PER affecting matters protected under Part 3 of the EPBC Act, will be provided and substantiated, based on best available practices.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Invertebrate Fauna	To maintain the abundance, diversity, geographic distribution and productivity of invertebrate fauna at the species and ecosystem levels through the avoidance or management of adverse impacts.	The potential impacts to surface invertebrate fauna are as follows: • Direct removal or disturbance of invertebrate fauna habitat. • Loss of some surface invertebrates.	A surface invertebrate fauna assessment is being undertaken to collect SRE invertebrate species by foraging in target areas. The survey comprises: • Preparing survey methods compliant with DEC requirements and EPA guidance statements. • Undertaking a desktop invertebrate fauna assessment incorporating searches of all relevant databases and background information, including previous surveys in the regional and local area. • Conducting a single season, opportunistic surface invertebrate fauna survey in autumn 2008, using trapping and foraging techniques with the aim of collecting SRE taxa in the local area. Further detail on the investigations is provided in Section 8.7 of this report. The results of the above surveys and investigations will be used to conduct a desktop assessment of the potential impacts on the invertebrate fauna values in the area. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	The potential management measures to minimise impacts on invertebrate fauna are as follows: • Optimise Project design/footprint to avoid or minimise disturbance. • Adopt appropriate design measures that maintain fauna movement across the landscape. • Implement a post disturbance fauna monitoring program to enable a comparison of baseline data (i.e. prior to disturbance of habitat). • Mitigation and management measures for fauna and, if required, contingency plans will be addressed.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Subterranean Fauna	To maintain the abundance, diversity, regional distribution and productivity of subterranean fauna at the species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	The potential impacts to subterranean fauna include: • Degradation of stygofauna habitat due to impacts on groundwater quality. • Disturbance of troglofauna and troglofauna habitat in nearby areas.	Two stygofauna sampling events have been completed, in accordance with advice from the DEC and EPA Guidance Statement No. 54 and 54a – Sampling of Subterranean Fauna in Groundwater and Caves (EPA 2003b). This involved the sampling of existing bores within and outside of the Project Area. Further regional survey work is planned and will be aimed specifically at the bathynellid syncarid, on advice from the DEC. In addition, a desktop assessment of the likelihood of prospective troglofauna habitat occurring in the Project Area will be undertaken. In the event that troglofauna habitat is found within the Project Area, a field survey will be undertaken.	The potential management measures that will be implemented to minimise impacts to subterranean fauna are as follows: • If required, develop and implement a Stygofauna Management Plan. • Where practicable, minimise disturbance in areas of known populations of troglofauna (if present). • If relevant, develop mitigation and management measures for troglofauna.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Air Quality .	To ensure that emissions and dust do not adversely affect environmental values or the health, welfare and amenity of people and land users.	The potential impacts of air emissions from the Project include: • Generation of dust during construction and as a result of vehicle movements. • Reduced visual amenity. • Dust deposition on surrounding vegetation. • Emission of other important pollutants, including sulphur dioxide, oxides of nitrogen and carbon monoxide. • Volatile organic compounds (VOCs) and toxic pollutants such as metals, fluoride, polycyclic aromatic hydrocarbons (PAHs) and persistent organic pollutants (POPs) may also be emitted in small quantities.	An air quality assessment is being undertaken and comprises: • Description of neighbouring land use and identification of potential sensitive air quality receptors (including human and vegetation receptors such as declared rare flora). • Examination of meteorology and existing air quality in the vicinity of the Project Area. • Dispersion modelling to predict dust emissions levels. • Modelling of sulphur dioxide, and oxides of nitrogen and carbon monoxide. • Emission rates of VOCs and air toxics such as metals, fluoride, PAHs and POPs will be quantified. • Health risk assessment for pollutants of importance. This includes the deposition rates for contaminants into water and soil and includes; arsenic, cadmium, lead, mercury, chromium, nickel, boron, copper and selenium. Non-metals Benzyl-pyrene and dioxins and furans are also being measured for deposition. Further detail on the investigations is provided in Section 8.8 of this report. The results of the air quality modelling and investigations will be used to identify the potential impacts on the air quality in the area. The air quality effects from the Coolimba Project will be examined in conjunction with those identified for the Central West Coal project so as to adequately assess cumulative impacts from the combined projects.	The potential management measures for minimising impacts on air quality are as follows: • Dust suppression measures. • Restrict vehicle speeds to minimise dust generation from vehicle movement. • Weather forecasting to predict strong wind events. • Dust and emissions monitoring in accordance with Draft DEC guidelines May 2008. • Provision of an air quality management plan.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Greenhouse Gases	To minimise emissions to levels as low as practicable on an ongoing basis and consider offsets to further reduce cumulative emissions between the power station and coal mine Projects.	The main impact of the Project is the release of greenhouse gases due to the proposed power generating activities. As a result, the Project will contribute to Western Australia's greenhouse gas emissions.	A greenhouse gas study is being conducted to assess the emissions of greenhouse gases from the proposed power station. This uses quantitative data from the equipment manufacturer and in accordance with the National Greenhouse Accounts (Department of Climate Change, 2008) (previously Factors and Methods Workbook published by the Australian Greenhouse Office [2005]). Further detail on the investigations is provided in Section 8.9 of this report. The results of the baseline investigations will be used to identify the potential impacts of greenhouse gases arising from the project. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	The power station will be designed so that it is ready to be rapidly converted for carbon capture and storage when economic and regulatory conditions allow. Investigations are underway to identify locations for carbon storage. In the event that Carbon Capture and Storage (CCS) is or is not a solution to Coolimba's greenhouse gas emissions, a greenhouse gas abatement plan will be prepared which provides measures and procedures to: • ensure that the plants are designed and operated in a manner which achieves reductions in greenhouse gas emissions as far as practicable; • provide for ongoing greenhouse gas emissions reductions over time; • ensure that the total net greenhouse gas emissions and/or greenhouse gas emissions per mega Watt from the project are minimised; and • Manage greenhouse gas emissions in accordance with the Framework convention on Climate Change 1992, and consistent with the contemporary National Greenhouse Strategy.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Noise	To protect the amenity of sensitive receptors.	The main noise impact from the Project is the generation of noise as a result of Coolimba Power Project operation, which may impact on sensitive receptors.	A noise assessment is being undertaken and the scope of work includes: • Developing sound power levels for the various noise activities associated with the Project during the construction and operational phases. For assessment of fixed plant and mobile equipment, suitable data bases will be examined. • Identifying all potential noise sensitive locations around the power station. • Developing a noise model based on the construction case and on operational phases plus worst case noise impacts at noise sensitive locations. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant. • Using the noise model to assess the existing noise impacts in the area. • Assessing ambient noise levels at potential receiver locations (e.g. closest noise sensitive premise). In the absence of existing ambient noise data, continuous noise loggers will placed on site for a period of two weeks at an appropriate location in, or close to, the noise sensitive locations. • Comparing predicted noise levels with the assigned noise levels allowed under the Environmental Protection (Noise) Regulations 1997. • The noise effects from the Coolimba Project will be examined in conjunction with those identified for the Central West Coal project so as to adequately assess cumulative impacts from the combined projects.	If there is potential for the noise levels to exceed allowable noise levels, relevant noise mitigation measures will be developed.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Visual Amenity	To ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape as low as reasonably practicable.	The potential impact on visual amenity will be the permanent alteration to the existing landscape.	A desktop visual impact assessment is being undertaken using project description information and the following data: • Site topography. • Surrounding landforms and vegetation. • Plant layout. • Plant design. • The results of the desktop assessment will determine the necessity of modelling the site.	The potential management measures that may be implemented to minimise the impact on visual amenity include: • Implement a progressive rehabilitation programme. • Consult with local stakeholders throughout the project planning and construction phases to seek feedback on the views of the planned changes to the landscape. • Establish screening (e.g. vegetation) around the Project to reduce the visual impact from the main road.
Aboriginal Heritage	To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation. To avoid impacts to Aboriginal cultural sites.	The potential impacts on Aboriginal heritage include: • Disturbance to, or removal of, Aboriginal heritage sites as a result of land clearing. • Direct and indirect disturbance from construction activities.	An Aboriginal heritage archaeological and ethnographic survey is being undertaken. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	Coolimba Power Pty Ltd will comply with the requirements of the *Aboriginal Heritage Act* 1972-1980 in the event an Aboriginal heritage site is identified during heritage surveys or uncovered during ground disturbing activities during construction and operation. Where indigenous aboriginal heritage issues are identified and have the potential to be in conflict with the project, a management strategy will be prepared for the duration of the project.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
European Heritage	To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.	The potential impacts to European heritage include: • Disturbance to heritage sites as a result of land clearing. • Direct and indirect disturbance from construction activities.	A European heritage assessment is being undertaken. This comprises a desktop evaluation of the European cultural and heritage values of the Project. The assessment is using the following data bases to identify the location of any European heritage sites: • Australian Heritage Places Inventory; • Register of the National Estate Database; • The National Trust; • Heritage Council of Western Australia; • Shire of Coorow Municipal Inventory; and • Shire of Carnamah Municipal Inventory. • An assessment of the potential impacts of the Project on these values will then be conducted, based on this information. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	Management measures will be developed relevant to the results of the impact assessment.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Public Health and Safety – Road Transportation	To minimise changes to local traffic where possible, and ensure road safety.	The potential impacts on public health and safety comprise the impact to other road users due to increased traffic as a result of the Project.	A traffic impact assessment is being undertaken using baseline data from Main Roads Western Australia. The assessment comprises: • Reviewing of existing documents, plans and traffic data. • Assessing the access systems for the Coolimba Power Project and the construction camp; • Assessing the construction traffic and traffic flow; • Undertaking traffic modelling to estimate the traffic that would be generated from the Coolimba Power Project and the camp site; and • Establishing the impact of the proposed development on the adjacent road network. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.	Traffic management measures/plans will be identified to accommodate the Project-related traffic as appropriate.

Section 8 Potential Environmental Impacts, Scope of Work and Management Commitments

Table 8-1 continued

Environmental Factor	Environmental Objectives	Potential Impacts	Investigations Required	Potential Management Activities
Land Use and Community	To maximise social and economic benefits to the local community.	The Project will provide employment opportunities for local people and businesses.	A desktop social impact assessment is being undertaken which includes: • A social profile of the Mid-West Region; • The potential impacts of the Project; • Outline of community attitudes towards the Project; • Assessment of likely magnitude and significance of impacts of the Project; and • Identification of impact management. The regional community profile will include the population trends, number of households and the socioeconomic characteristics. Information from the Aboriginal heritage survey and community consultation programme will be integrated with the social impact assessment. The demand and provision of public services, including transport infrastructure, housing, education, health and social services will also be assessed. Cumulative impacts will be examined between the Power station and the proposed adjacent coal mine, where they are likely to be significant.	Appropriate management and/or mitigation measures will be developed based on the results of the social impact assessment.

8.2 Landforms and Soils

A baseline soil survey is being undertaken to identify and describe the soils in the proposed Project Area and identify any issues that could affect rehabilitation activities.

A site and soil description for soil pits includes the physical and chemical soil analyses undertaken on representative soil types. Soil testing comprises:

- pH ($CaCl_2$, water) and salinity ECe (saturation paste) for all samples.
- Emerson dispersion and slaking for samples with clay content from hand texture of sandy clay loam or greater.
- Total phosphorus, total nitrogen, available nitrogen, phosphorus and potassium, % organic carbon and trace elements (copper, zinc, manganese and iron) for topsoil samples.
- Lead analyses, if a site is believed to be contaminated.
- Exchangeable cations for selected samples.

The final report will present a description of soils within the Project Area, identification of soil materials that may affect rehabilitation activities and a soil map of the Project Area.

A preliminary acid sulphate soils assessment is being undertaken in conjunction with the soil survey. The results of the preliminary survey is being used to determine whether a detailed investigation is required. The general objective of the acid sulphate soils investigation is to obtain sufficient information on the characteristics of any acid sulphate soils material present in the vicinity of the Project Area to enable an assessment of the risks to the environment as a result of the Project.

The scope of work for the preliminary acid sulphate soils assessment includes:

- Desktop review of all available data including available geotechnical logs, topographic maps, geological and environmental series maps within a predetermined radius of the Project Area.
- A search for any previous acid sulphate soils investigations and associated geochemical data conducted within the Eneabba region and more specifically within the Lake Logue Nature Reserve, Lake Indoon Reserve and along creek systems of the Project Area.
- A site visit, to characterise the site, identifying soil and water indicators of potential acid sulphate soils and conducting nominal soil sampling (to 1 m below ground level via hand auger) in areas identified as “hot spots”. This site visit would be conducted in conjunction with the proposed soil survey.
- In situ field tests for pH and pH_{fox} of the subsurface profile at sampling sites and pH values of surface waters.

8.3 Acid Drainage

The acid drainage investigation is being undertaken and comprises four components, described below:

1. *Review of existing information*

Available existing information on the geochemical characteristics of the coal is being reviewed to enable a suitable sampling and testing programme to be developed.

2. *Sampling and laboratory testing*

Sample collection primarily includes drill core/cuttings representing coal that will be stockpiled at the power station. Existing drillcore/cuttings from previous drilling campaigns are unlikely to be suitable for

use in the proposed geochemical assessment programme due the likelihood of existing soil and rock materials having already started to oxidise, or potentially having fully oxidised. Testing comprises three components:

a) Static testing of all collected materials to determine the acid generating potential of the materials.

b) Multi-element testing of selected materials, typically composites of materials of similar rock type and acid generating potential.

c) Kinetic column leach testing of selected materials may be required, particularly those materials with some potential to generate acidic leachate.

3. *Characterisation and assessment*

The characterisation and assessment part of the investigation examines the test results in context with the project methodology, geology, climate and regulatory requirements to determine the potential for coal to generate acid and potentially release metals and salts into the surrounding environment.

4. *Geochemical testing of ash*

The geochemical testing of ash includes solid analysis and bottle tumbling test work on solid ash mix samples. The results will be analysed to determine the potential impacts of the stockpiling of ash as part of the Project. If the constituents of the ash may produce seepage, geochemical modelling will be undertaken to assess the impacts of any seepage from the disposed ash on groundwater quality.

8.4 Surface Water

The surface water study is being undertaken and comprises the following four components:

1. *Review of hydrological and topographic data and site visit.*

A detailed review of available topographic, climatic and hydrological information, including the identification of catchment boundaries, natural flow paths and important surface water features through examination of the topographic maps. Such surface water systems include but are not restricted to, the Lake Logue Nature Reserve, Bindoon Creek, Erindoon Creek and Lake Indoon. A site visit is included to confirm the results of the desktop review.

2. *Characterisation of baseline surface water runoff such as runoff volume and peak discharge rate and water quality.*

A rainfall and runoff model is being developed to predict surface runoff volumes and flow rates associated with specified rainfall events of specific annual recurrence interval. The pre- and post-project conditions are being investigated to assess the potential impacts by the proposed power station.

3. *Assessment of potential impacts of the Project on surface water hydrology.*

The potential impacts, including cumulative impacts between the power station and the coal mine Projects on surface hydrology will be assessed, based on the project description (i.e. plant layout, plant design, and proposed construction and operational activities) and the outcomes from the baseline surface runoff characterisation. The flood risk to the Coolimba Power Project was also assessed.

4. *Development of the conceptual surface water management system for the project site.*

The design of a surface water management system for the Coolimba Power Project has been conducted as part of the overall plant design. A key component of the surface water management system is an evaporation pond to collect all wastewater generated by the Coolimba Power Project so as to achieve a “zero waste water discharge” target. The review of the conceptual surface water management system would involve a water balance analysis of the evaporation pond to check adequate sizing of the pond.

8.5 Vegetation and Flora

A vegetation and flora assessment is being undertaken, which includes a spring vegetation and flora survey carried out in accordance with EPA Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2004d) and the principles set out in EPA Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia (EPA, 2003a).

The study also includes a search of DEC and DEWHA databases and literature review. The results provide the basis of a list of vascular flora species that could potentially occur within the Project Area. From this list, the rare, threatened and vulnerable species are identified and any additional species of special conservation interest highlighted.

Field work is used to clarify the site preferences of the rare, threatened or vulnerable species and to locate any flora or vegetation communities of particular significance. Therefore, targeted site areas were searched for Declared Rare Flora and Priority Flora species. Samples were collected and identified then confirmed after returning to Perth at the State Herbarium.

The findings will be integrated with those of previous studies so that the impacts on flora and vegetation can be assessed in a local and regional context.

A peer review of the vegetation and flora report will be undertaken by a botanist with experience with Kwongan vegetation.

A dieback survey of the Project Area has been commissioned, which will identify and map any dieback in the survey area so as to determine the potential impacts of the Project and avoid potential spread of dieback.

8.6 Vertebrate Fauna

Two vertebrate fauna surveys have been undertaken. These comprise a Level 2 survey in Spring 2007, and a Level 1 survey in Autumn 2008 carried out in accordance with the EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA, 2004e) and the principles set out in EPA Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia (EPA, 2003a). The primary objective of the proposed surveys is to provide baseline data on the fauna and fauna habitats of the Project Area, as well as determine potential risks to conservation significant fauna. The survey involves:

- Preparing survey methods compliant with DEC requirements and EPA guidance statements.
- Undertaking a desktop fauna assessment incorporating searches of all relevant databases and background information, including previous surveys in the regional and local area.
- Conducting a reconnaissance survey to determine basic fauna communities, fauna habitat values and the likelihood of occurrence of conservation significant fauna.
- Conducting a single season, detailed fauna surveys, using trapping and foraging techniques.

8.7 Invertebrate Fauna

A surface invertebrate fauna survey is being undertaken in accordance with EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA, 2004e) and EPA Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia (EPA, 2003a). The survey will be conducted during April 2008 to collect SRE invertebrate species by trapping and foraging in target areas. The aim of the work is to provide information on the SRE fauna and habitats of the Project Area, as well as determining potential risks to SREs. The survey comprises:

- Preparing survey methods compliant with DEC requirements and EPA guidance statements.
- Undertaking a desktop invertebrate fauna assessment incorporating searches of all relevant databases and background information, including previous surveys in the regional and local area.
- Conducting a single season, opportunistic surface invertebrate fauna survey in autumn 2008 following rainfall, using foraging techniques with the aim of collecting all SRE taxa in the local area.

8.8 Air Quality

An air quality assessment is being undertaken and comprises:

- Description of neighbouring land use and potential sensitive air quality receptors (both human and flora receptors such as DRF).
- Assessment of meteorology and existing air quality in the vicinity of the Project Area.
- Dispersion modelling to predict dust emissions levels as well as sulphur dioxide, oxides of nitrogen and carbon monoxide.
- Emission rates of VOCs and toxic air pollutants such as metals, fluoride, PAHs and POPs will be quantified.
- Health Risk Assessment for pollutants of importance.

The modelling will include possible operating scenarios for non-typical operations such as the potential failure or non-operation of the desulphurisation unit or use of diesel for the OCGTs in the event of gas supply problems. The results of the modelling programme will be used to assess the air quality impacts of the Project.

The output of the dispersion modelling will be used to directly assess the potential risk to human and vegetation health, by comparison of the model predictions at the most exposed individual to both ambient air quality goals and published unit risk factors. Cumulative impacts will be examined between the power station and the proposed adjacent coal mine, where they are likely to be significant.

8.9 Greenhouse Gases

The power station will be designed to facilitate rapid conversion for carbon capture and storage once economic conditions and regulation allow. Investigations are being undertaken to identify suitable locations in the Mid-West region for carbon storage. This work is being done in partnership with Arc Energy by the Cooperative Research Centre for Greenhouse Gas Technologies (CO2 CRC).

A greenhouse gas study is being undertaken to assess the emissions of greenhouse gases from the Coolimba Project. This will provide an emissions trajectory showing best practice Greenhouse Gas reduction/management. This assessment will be quantitative and will be in accordance with the National Greenhouse Accounts (Department of Climate Change, 2008) (previously Factors and Methods Workbook published by the Australian Greenhouse Office [2005]).

The emission rates of greenhouse gases will be estimated for the life of the project and compared to the national greenhouse gas emissions. The efficiency of the proposed Coolimba Power Project will be assessed against the Department of Climate Change's energy efficiency standards.

The PER will outline the proposed emissions from the coal-fired generation and the gas-fired generation at the proposed efficiency and operating levels. The OCGTs will be proposed to operate for 20-30% of the time (as peaking plants).

Irrespective of whether Carbon Capture and Storage (CCS) is, or is not a feasible solution to Coolimba's greenhouse gas emissions, a greenhouse gas abatement plan will be prepared which outlines the proponent's approach to the options on abatement and offsets available at the time for carbon

management. The PER will go into detail on these options. Any offsets accredited will be in accordance with the Federal Department of Climate Change's Greenhouse Friendly Programme, or the equivalent which is in use at the time.

Preliminary work already completed on the emissions from the Coolimba Power Station has identified those emissions presented in Table 8-2 to be reasonable estimations.

Table 8-2 Estimated Emission Rates for the Coolimba Power Station

Parameter	Power Station [1]	Gas Turbines [3]
SO_2	800 [2] mg/Nm^3	n/a
NO_X	500 mg/Nm^3	25 ppmv
CO	200 mg/Nm^3	10 ppmv
CO_2 equivalent	3,730,000 tpa	880,000 tpa[4]
PM_{10}	50 mg/Nm^3	n/a

Note:

1 Figures stated at the standard reference conditions of 6% (vol) O_2, dry basis

2 Will vary depending on the sulphur content of fuel and the efficiency of the lime injection system. Emissions expected to be less than this value for 90% of the time

3 Emissions are referenced to STP conditions and 15% O_2

4 Will vary according to the turbine use. The emissions provided are 'worst case', based on the gas turbines running full-time.

Section 9 Study Team

The environmental assessment document for the Coolimba Power Project will be prepared by URS Australia Pty Ltd on behalf of Coolimba Power Pty Ltd, with assistance from a team of specialist consultants.

Coolimba Power Pty Ltd Team

- Mr Lindsay Reed, Chief Executive Officer.
- Mr Mark Chatfield, General Manager Energy.
- Mr Richard Harris, General Manager Development.
- Mr Stephen Jones, Chief Financial Officer.
- Mr Robert Griffiths, Environmental Manager.

URS Project Team

- Ms Sonia Finucane, Senior Principal Environmental Scientist.
- Ms Jenny Becher, Senior Associate Environmental Scientist.
- Ms Karen Ariyaratnam, Associate Environmental Scientist.
- Mr Chris Thomson, Senior Environmental Scientist.
- Ms Gillian Lane, Project Environmental Scientist.
- Mr Rob Wallis, Principal Hydrogeologist.
- Mr Boon Eow, Senior Hydrologist.
- Mr Andrew Mussell, Project Hydrologist.
- Mr Fanie Van der Linde, Senior Design Engineer.
- Mr Venky Narayanaswamy, Principal Engineering and Technical Sustainability.
- Mr Chacko Thomas, Environmental Engineer.
- Mr Don Burnside, Principal Natural Resource Scientist.
- Ms Gaye McKenzie, Principal Social Scientist.

Key Team Specialists

- Dr Geoff Kew, Kew Wetherby Soil Survey.
- Mr Grant Bolton, Rockwater.
- Mr Nick Evelegh, Rockwater.
- Dr Libby Mattiske, Mattiske Consulting Pty Ltd.
- Mr Evan Brown, Glevan Consulting.
- Mr Stewart Ford and Mr Jarrad Clark, e*cologia* Environment.
- Mr Stefan Eberhard, Subterranean Ecology.
- Mr Steve Wilson, PB Power.

Section 9 Study Team

- Ms Christine Killip, Katestone Environmental.
- Mr Paul Keswick, SVT Engineering.
- Mr Nicholas Green, Anthropos Australis.
- Mr Benham Bordbar, Transcore Pty Ltd.
- Mr Adam White, CAD Resources.
- Mr Ian Swane, Terrenus Pty. Ltd.

Peer Reviewers

- Mr Doug Blandford, consultant soil scientist.
- Mr Ted Griffin, consultant botanist.

Section 10 Schedule and Timing

10.1 Project Schedule

Coolimba proposes to commence construction activities in May 2009 following receipt of environmental and other approvals. Based on the current estimate of reserves, the anticipated life of the Coolimba Power Project is 30 years. The Project milestones are outlined in Table 10-1.

Table 10-1 Project Milestones

Project Stage	Timing
Commence construction of the power plant.	August 2009
Commissioning of the power plant.	August 2012
Commercial operation of the power plant.	February 2013

10.2 Environmental Impact Assessment Schedule

The level of assessment for the Project is set as a PER with an eight-week public review period. An indicative project assessment schedule is provided in Table 10-2.

Table 10-2 Environmental Impact Assessment Schedule

Project Stage	Timing
EPA Finalisation of Scope for PER	August 2008
Baseline Studies	October 2007 - October 2008
Stakeholder Consultation	October 2007 – March 2009
First Draft PER submitted to EPASU	October 2008
Final PER submitted to EPASU	November 2008
Public Review Period (8 weeks)	December 2008/January 2009
Summary of Submissions provided by Proponent	February 2009
Proponent's Draft Response to Public Submissions submitted to EPASU	February 2009
EPA Bulletin (Report and Recommendations) (10 weeks after Proponent's Draft Response to Public Submissions)	May 2009
EPA Bulletin Appeals Period (2 weeks)	May 2009
Ministerial Approval Issued (assuming no appeals)	June 2009
Commonwealth Ministerial Approval Issued	June 2009

It is assumed that DEWHA will co-ordinate its review of relevant assessment documents through the EPA, as the Project will be assessed bilaterally under the WA process.

Section 11 References

ATA Environmental (2001) *Lake Indoon Catchment Management Plan*. Report reference: 2000/85

Australian Energy Regulator (2006) *Gas and electricity distribution guidelines—scoping paper*. March 2006. Available online at: http://www.aer.gov.au/content/index.phtml/itemId/692565 Accessed 4 February 2008.

Australian and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. October 2000.

Australian and Torres Strait Islander Commission, Department of Indigenous Affairs and Department of Premier and Cabinet Citizens and Civics Unit (2004) *Consulting Citizens: Engaging with Aboriginal Western Australians*. Department of Premier and Cabinet, 2004.

Bureau of Meteorology (2007) http://www.bom.gov.au/ Accessed 5 November 2007.

Cale D.J., Halse S.A., and Walker C.D. (2004). *Wetland monitoring in the wheatbelt of south-west Western Australia: site descriptions, waterbird, aquatic invertebrate and groundwater data*. Conservation Science Western Australia 5(1), pp. 20-136

De Laurentiis, P., Pesce, G.L. and Humphrys, W.F. (2001) *Copepods from ground waters of Western Australia, V1. Cyclopidae (Crustacea: Copepoda) from the Yilgarn Region and the Swan Coastal Plain*. Records of the Western Australian Museum Supplement No. 64: 115-131.

Department of Climate Change (2008) *National Greenhouse Accounts Factors*. January 2008. Available online at http://www.greenhouse.gov.au/workbook/index.html. Accessed 8 February 2008.

Department of Environment (2004a) *Contaminated Sites Management Series Bioremediation of Hydrocarbon- Contaminated Soils in Western Australia*. October 2004.

Department of Environment (2004b) *Western Australian State Greenhouse Strategy - WA Greenhouse Task Force*.

Department of Industry and Resources (2000) *MidWest Regional Minerals Study*. Perth, Western Australia. June 2000.

Department of Industry and Resources (2004) *Energy for Minerals Development in the South West Coast Region of Western Australia*. Study Report. December 2004. Prepared by Sleeman Consulting in alliance with GBRM.

Department of Premier and Cabinet Citizens and Civics Unit (2002) *Consulting Citizens: A Resource Guide. Department of Premier and Cabinet Citizens and Civics Unit*. April 2002.

Department of Premier and Cabinet Citizens and Civics Unit (2003) *Consulting Citizens: Planning for Success. Department of Premier and Cabinet Citizens and Civics Unit*. June 2003.

Department of the Environment, Water, Heritage and the Arts (2005) *Species Bank*. Available online at: http://www.environment.gov.au/biodiversity/abrs/online-resources/species-bank/. Accessed 8 December 2005.

Environmental Protection and Heritage Council (2003) *National Environmental Protection Measure for Ambient Air Quality*. May 2003.

Environmental Protection Authority (2000a) *EPA Position Statement No. 2 - Environmental Protection of Native Vegetation in Western Australia*. December 2000.

Environmental Protection Authority (2000b) *EPA Guidance Statement No. 18 Prevention of Air Quality Impacts from Land Development Sites*. March 2000.

Section 11 References

Environmental Protection Authority (2002) *EPA Guidance Statement No. 12 – Minimising Greenhouse Gases*. October 2002.

Environmental Protection Authority (2003a) *EPA Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia*. March 2003.

Environmental Protection Authority (2003b) *EPA Position Statement No. 54. Consideration of Subterranean Fauna in Groundwater and Caves during Environmental Impact Assessment in Western Australia*. Environmental Protection Authority, December 2003.

Environmental Protection Authority (2003c) *Interim Industry Guide to Community Involvement.* Environmental Protection Authority. December 2003.

Environmental Protection Authority (2004a) *EPA Position Statement No. 6 – Towards Sustainability*. Environmental Protection Authority. August 2004.

Environmental Protection Authority (2004b) *EPA Position Statement No. 7 – Principles of Environmental Protection*. Environmental Protection Authority. August 2004.

Environmental Protection Authority *(*2004c*) EPA Guidance Statement No. 41 – Assessment of Aboriginal Heritage*. Environmental Protection Authority. April 2004.

Environmental Protection Authority (2004d) *EPA Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment*. Environmental Protection Authority. June 2004.

Environmental Protection Authority (2004e) *EPA Position Statement No. 56. Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.* Environmental Protection Authority, June 2004.

Environmental Protection Authority (2006) *EPA Position Statement No. 9 – Environmental Offsets*. Environmental Protection Authority. January 2006.

Environmental Protection Authority (2007) *EPA Guidance Statement No. 8 (Draft) – Environmental Noise.* Environmental Protection Authority. May 2007.

Harvey, M.S. (2002) *Short-range endemism among the Australian fauna: some examples from non-marine environments*. Invertebrate Systematics, 16: 555-570.

Hopkins, A.J.M. and Hnatiuk, R.J. (1981) *An Ecological Survey of the Kwongan South of Eneabba, Western Australia*. Wildlife Research Bulletin Number 9. Western Australian Wildlife Research Centre, Department of Fisheries and Wildlife, Perth, Western Australia.

Jasinska, E.J., Knott, B. and Poulter, N. (1993) *Spread of the introduced yabby, Cherax sp. (*Crustacea: Decapoda: Parastacidae*), beyond the natural range of freshwater crayfishes in Western Australia*. Journal of Royal Society of Western Australia 76: 67-69.

Lowry, D.C. (1974) *Explanatory Notes on the Dongara – Hill River Geological Sheet*. Australian Government Publishing Service, Canberra.

Main, B.Y. (2003) *Demography of the Shield-back Trapdoor Spider Idiosoma nigrum Mainly in Remnant Vegetation of the Western Australian Wheatbelt*. Records of the South Australian Museum Monograph Series No. 7: 179-185.

Mattiske Consulting Pty Ltd. (2007) *Flora and Vegetation Assessment of Aviva Lease Area, South Eneabba*. Unpublished report prepared for URS Australia Pty Ltd on behalf of Aviva Corporation Ltd. February 2007.

National Occupational Health and Safety Commission (2002) *Approved Criteria for Classifying Hazardous Substances* (NOHSC:1008[2002]). National Occupational Health and Safety Commission, Canberra.

Section 11 References

Northern Agricultural Catchments Council Inc. (2002) *West Midlands Hydrology Project, Stage One Report: The Impacts of Hydrological Issues on Biodiversity and Agriculture in the West Midlands Region*. January 2002.

Rockwater Pty Ltd (2007) *Stygofauna Sampling for the Central West Project*. Unpublished report prepared for Aviva Corporation. October 2007.

Sinclair Knight Mertz Pty Ltd (2001) *Environmental Water Requirements of Groundwater Dependent Ecosystems. Environmental Flows Initiative Technical Report No 2.* Environment Australia, Canberra. http://eied.deh.gov.au/water/rivers/nrhp/groundwater/summary.html

Standards Australia (2001) AS/NZS 480: *Occupational Health and Safety Management Systems*.

URS Australia Pty Ltd (2006a) *Pre feasibility Study – Geotechnical Investigation and Design of Central West Coal Project*. Unpublished report prepared for Aviva Corporation Ltd. January 2006.

URS Australia Pty Ltd (2006b) *An Evaluation of Groundwater and Surface Water Characteristics for the Central West Iron Project Pre-Feasibility Study*. Unpublished report prepared for Aviva Corporation Ltd. March 2006.

Section 12 Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Coolimba Pty Ltd and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 9 October 2007.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between November 2007 and April 2008 and is based on the information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

Figures

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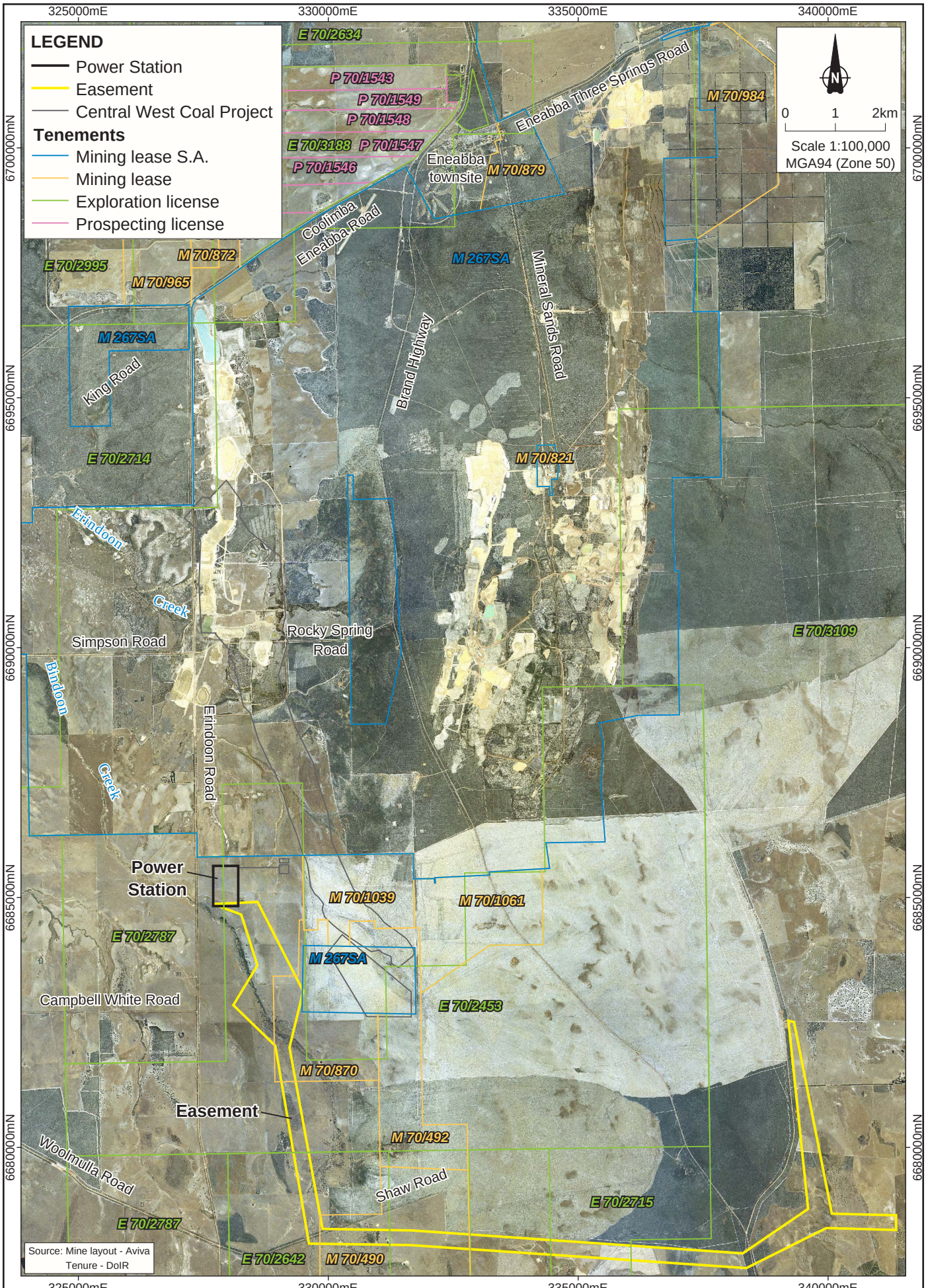
Coolimba Power Project

Location

Consultant: URS
Drawn: CAD Resources

URS Job No: 42906632
CAD Resources File No: g1571_CP_ESD_f001

Figure No: 1



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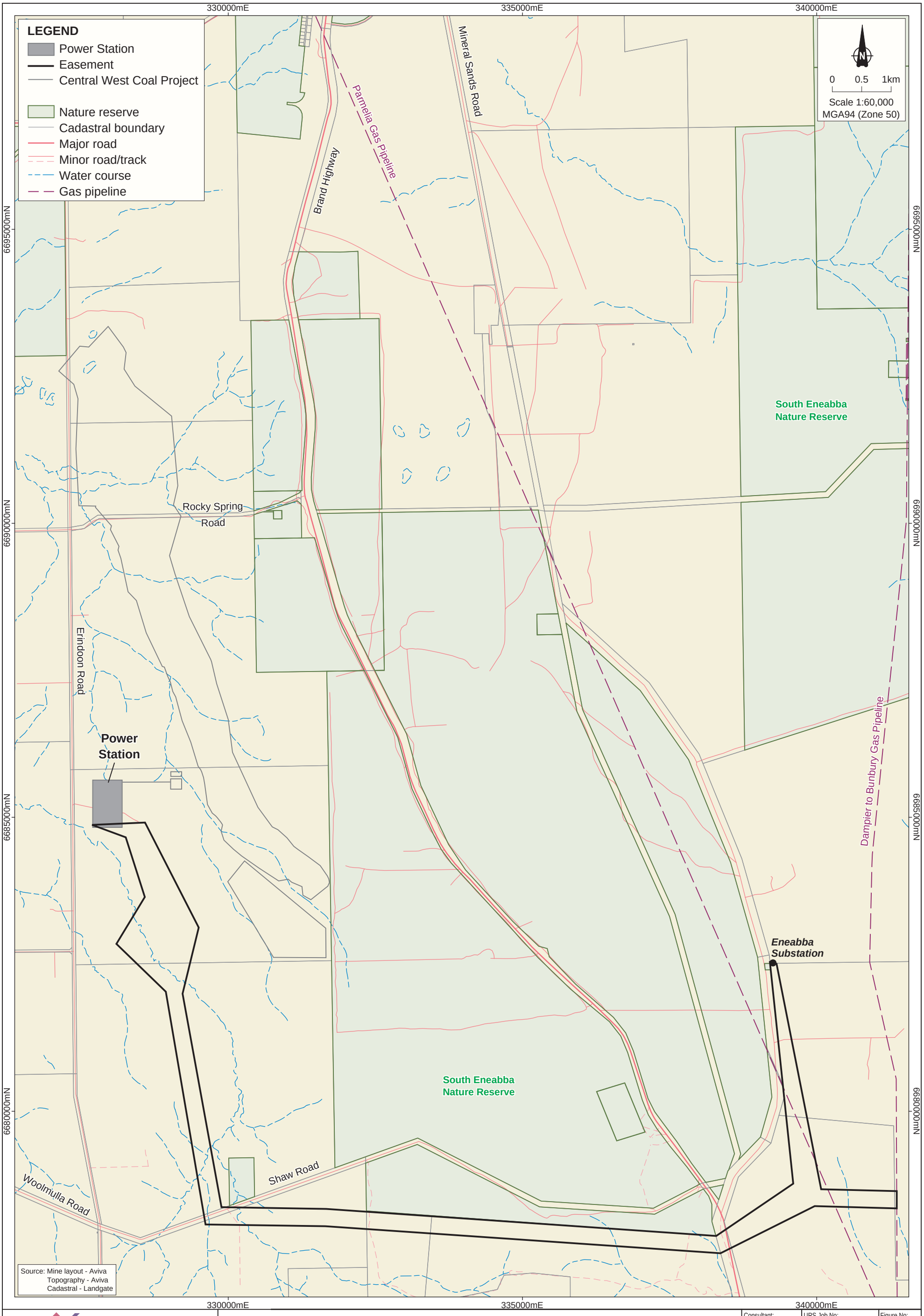
Land Tenure

Consultant: URS
Drawn: CAD Resources

URS Job No: 42906632
CAD Resources File No: g1571_CP_ESD_f003

Figure No: 2



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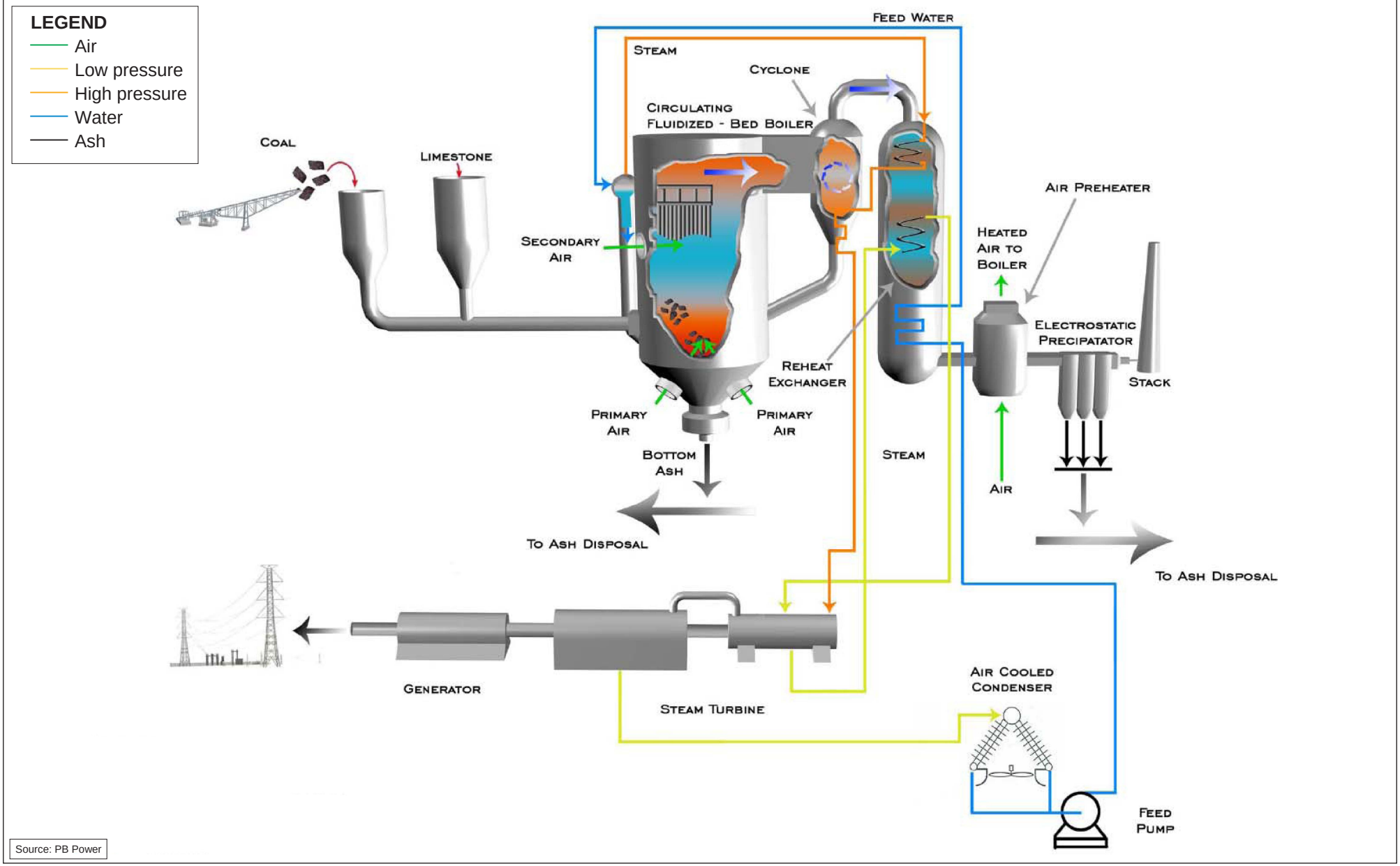
Conceptual Site Layout

Consultant: URS	URS Job No: 42906632	Figure No: 3
Drawn: CAD Resources	CAD Resources File No: g1571_CP_ESD_f002	



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Conceptual Process Flow Diagram

Consultant: URS	URS Job No: 42906632	Figure No: 4
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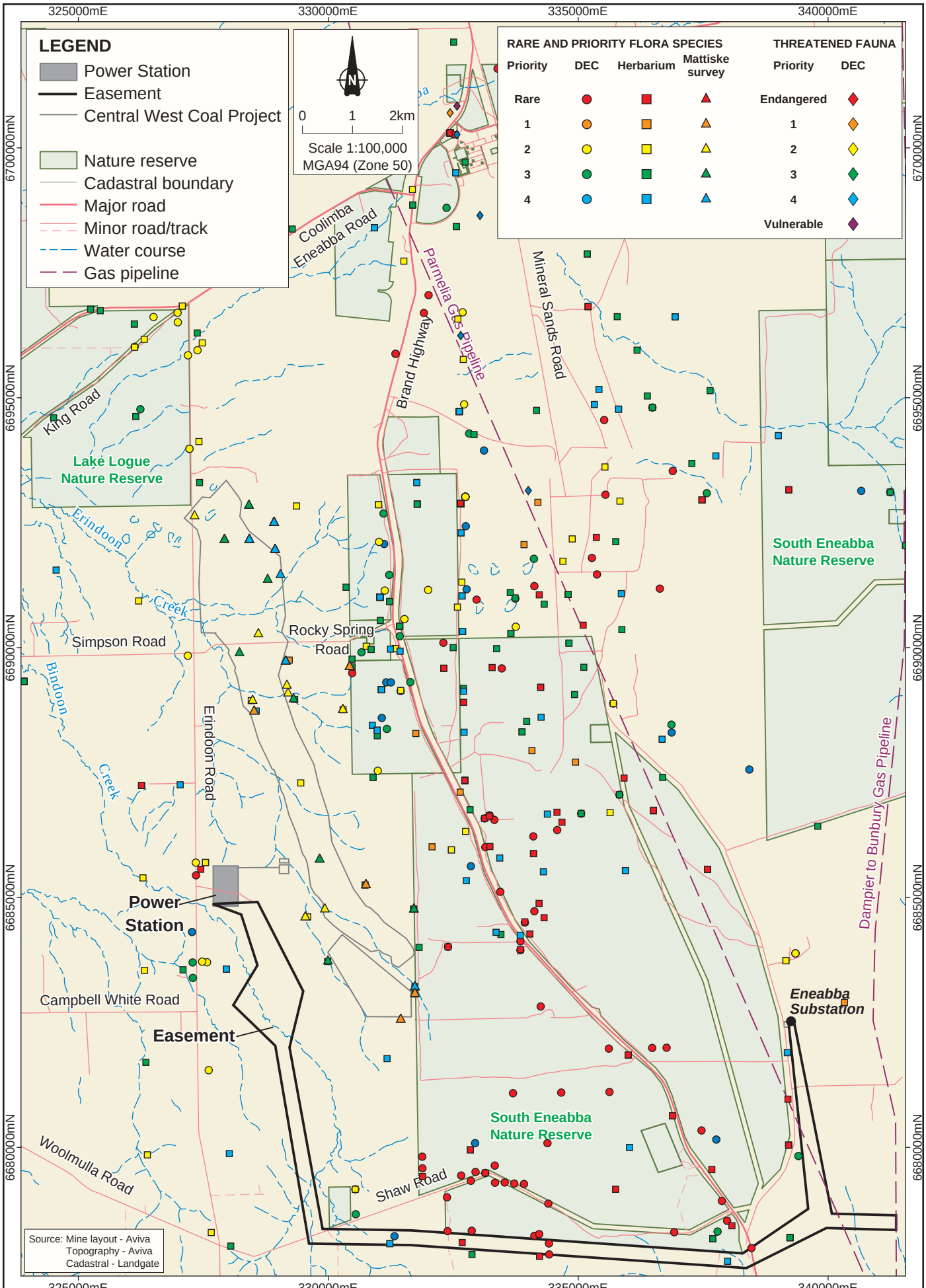

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Species of Conservation Significance

Consultant: URS
Drawn: CAD Resources

URS Job No: 42906632
CAD Resources File No: g1571_CP_ESD_f005

Figure No: 5

Appendix A Conservation Significance Classification

Flora

Definition of Rare and Priority Flora Species (Department of Environment and Conservation, 2007)

Declared Rare Flora - Presumed Extinct: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

Declared Rare Flora - Extant: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

P1: Priority One - Poorly Known: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2: Priority Two - Poorly Known: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3: Priority Three - Poorly Known: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4: Priority Four - Rare: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

Categories of Threatened Flora Species (Environment Protection and Biodiversity Conservation Act 1999)

Extinct - Taxa for which there is no reasonable doubt that the last member of the species has died.

Extinct in the Wild - Taxa which are known only to survive in cultivation, in captivity or as naturalised populations well outside past ranges; or have not been recorded in known and/or expected habitats, at appropriate seasons, anywhere in past ranges, despite exhaustive surveys over time frames appropriate to their life cycles and forms.

Critically Endangered - Taxa which face an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

Endangered - Taxa which are not critically endangered and face a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.

Vulnerable - Taxa which are not critically endangered or endangered and face a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Conservation Dependent - Taxa which are the foci of specific conservation programs, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Appendix A Conservation Significance Classification

Fauna

Wildlife Conservation Act 1950 Schedule 1 - Fauna that is rare or likely to become extinct

DEC Priority Species classifications:

Priority 1- Taxa with few, poorly known populations on threatened lands

Priority 2- Taxa with few, poorly known populations on conservation lands

Priority 3 - Taxa with several, poorly known populations, some on conservation lands

Priority 4 - Taxa in need of monitoring

EPBC Act

A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

Listed migratory species include species listed in the Convention on the Conservation of Migratory Species of Wild Animals; the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); and the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA). Listed migratory species also include any native species identified in an international agreement approved by the Commonwealth Environment Minister. The Minister may approve an international agreement for this purpose if satisfied that it is an agreement relevant to the conservation of migratory species.