



Coolimba Power Project

Powering the Mid West and delivering energy security for WA

COOLIMBA POWER PROJECT

PROPONENT'S RESPONSE TO SUBMISSIONS

2009



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1. INTRODUCTION

1.1. *The Proposal*

Coolimba is an Integrated Energy Project located in the North Country region of the South West Interconnected System (SWIS) in Western Australia's Mid West Region. The development of Coolimba and its associated coal deposit offers not only a new, reliable, stable, competitively priced and secure source of base-load power for the SWIS but is important to the development of the mineral rich Mid-West region of Western Australia.

Coolimba's coal fired power generation units will source their fuel stocks from the Central West Coal (CWC) deposit (refer to the CWC Project PER [Aviva/URS (2009b)] and Proponents' Response to Submissions [Aviva (2009)]). The proposed Coolimba Gas Fired Units will source fuel from the Dampier to Bunbury Natural Gas Pipeline (DBNGP) or the Parmelia gas pipeline via a new gas pipeline to be constructed in the proposed infrastructure easement.

The Coolimba site is located 270 kilometers north of Perth near the mining town of Eneabba.

1.2. *The Environmental Approval Assessment Process*

1.2.1. *Western Australian Environmental Impact Assessment Process*

The purpose of the Western Australian environmental assessment process is to provide information to the relevant Decision Making Authorities (DMAs), as well as to the public, about proposed developments that may impact on the natural and social environment. The environmental approval process and where the project is up to in the process is illustrated in Figure 1.

The environmental 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 a Public Environmental Review (PER) level. Appeals on the level of assessment were received in October 2007, and on 8 January 2008 the WA Minister for the Environment overruled the appeals and confirmed the level of assessment at PER with a public review period of eight weeks.

Coolimba, in consultation with the EPA and other relevant DMAs, prepared an Environmental Scoping Document (ESD), as required under Section 6.1 of the Environmental Impact Assessment Administrative Procedures 2002, and submitted it to the EPA. The ESD outlined the intended scope of work and the environmental issues that should be addressed in the PER. The ESD was approved by the EPA in August 2008 and by the DEWHA in November 2008.

The PER was made available for public comment for an eight week period closing on 23 June 2009. During this time, government agencies, private organisations, community groups and the public were invited to make submissions to the EPA in relation to the Project. The submissions received during this time are listed in Section 3 and the responses of the Project to the matters raised in those submissions are included in Section 4 to 7 of this document.

These submissions and this response to submissions along with the PER will now be considered by the EPA as part of its assessment of the Project.

1.2.2. Commonwealth Environmental Impact Assessment Process

Under the EPBC Act, an action requires approval from the Commonwealth Minister for the Environment, Water, Heritage and the Arts if the action has, will have, or is likely to have a significant impact on any Matters of National Environmental Significance (MNES). The MNES are:

- World Heritage Properties;
- National Heritage places;
- Ramsar wetlands of international significance;
- Nationally listed threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas; and
- Nuclear actions.

On 22 November 2007, Coolimba referred the Project to the Commonwealth Minister for the Environment, Water, Heritage and the Arts (EPBC Ref: 2007/3869) as the Project may impact on the following listed threatened and migratory fauna species.

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

Following this referral, the DEWHA deemed the proposal a 'controlled action' and that it will be assessed in accordance with the "Agreement between the Commonwealth of Australia and WA under Section 45 of the EPBC Act relating to the Environmental Impact Assessment (the Bilateral Agreement) and in conformance with the Cooperative Arrangements to the Bilateral". This means that the

environmental assessment undertaken by the State for this Project is accredited by the Commonwealth.

Following its review of the PER and other relevant documentation, the DEWHA then prepares an assessment report for its Minister.

If the Commonwealth Minister for the Environment, Water, Heritage and the Arts decides to approve the Project, Coolimba will be notified and the decision published.

This approval, under the EPBC Act, is a separate approval to that issued by the WA Minister for the Environment under the WA *Environmental Protection Act 1986*. Consequently, if approved, the Project will need to comply with both State and Commonwealth conditions of approval.

Figure 1 shows this process and where the project is up to in the process.



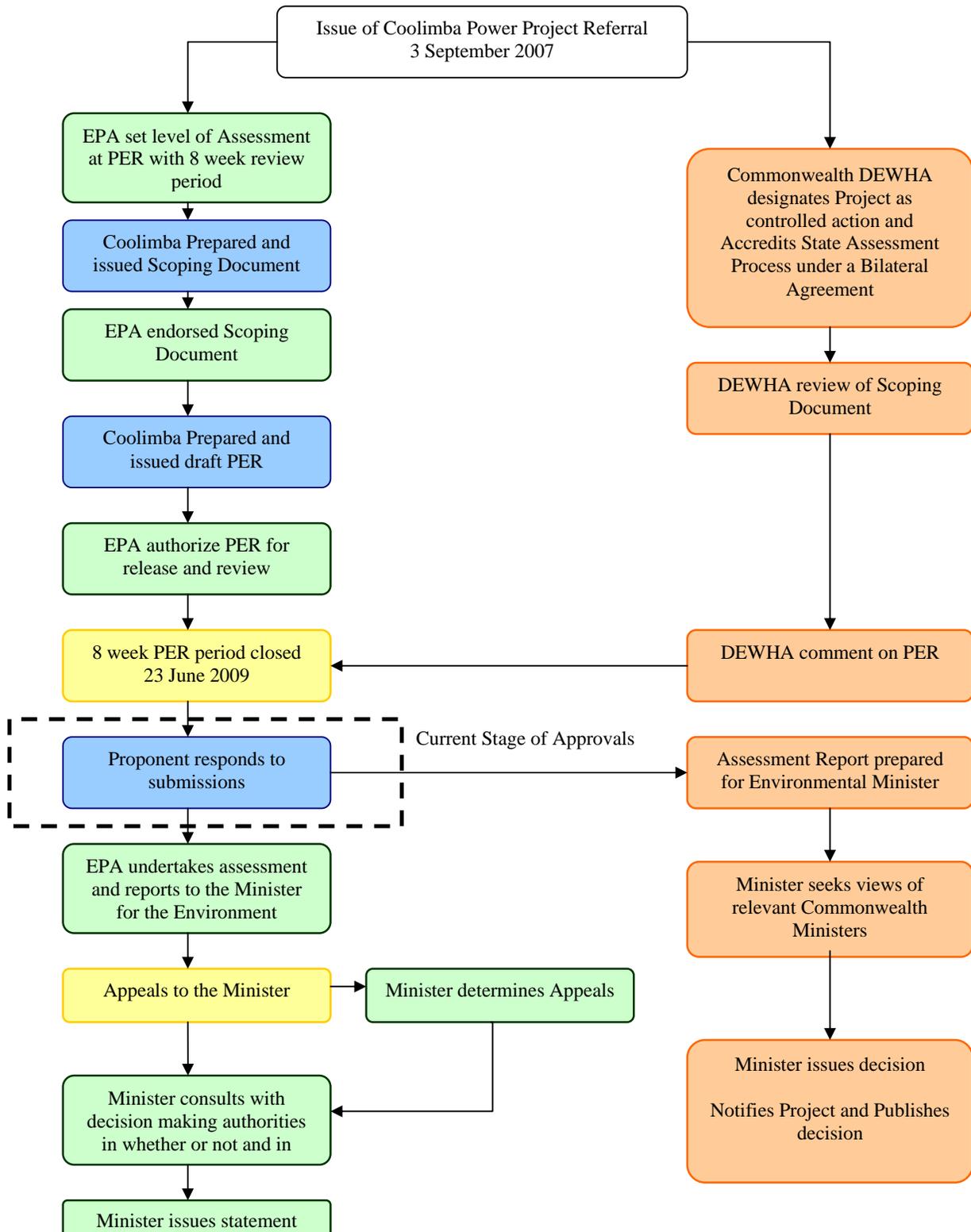


Figure 1- WA and Commonwealth Environmental Approvals Process

1.3. Purpose and Scope of Document

The Environmental Impact Assessment (Part IV Division 1) Administrative Procedures (2002) state that the Proponent is required to:

- prepare a summary of the matters raised in public and government agency submissions;
- respond in writing to the issues raised in public and government agency submissions and any other issues the EPA may consider need to be addressed; and
- amend the proposal and change environmental commitments where appropriate.

The purpose of this Proponent's Response to Submissions document is to provide a summary of the key matters raised in public and government agency submissions and the Project's response to those matters. Matters raised in submissions have been addressed and collated according to the environmental factor they addressed (e.g. Flora, Fauna, Air Emissions etc). A response has been prepared for each key matter raised.

The summary and response to submissions will be considered by the EPA and DEWHA during their assessment of the proposal.

1.4. Structure of Document

The Response to Submissions document has been structured as follows:

- ◆ **Section 1 – Introduction:** provides background on the Project, the environmental assessment process and the purpose and structure of this document.
- ◆ **Section 2 – Project Updates:** outlines changes to the Project Proposal that have occurred since the release of the PER for public review, and provides an assessment of the revised environmental impacts of these proposed changes.
- ◆ **Section 3 – Public Submissions:** outlines the submissions received on the PER.
- ◆ **Section 4 to 7 – Response to Submissions:** provides responses to all issues raised during the public submission period. The responses to submissions have been structured according to the categories and environmental factors identified in the PER.
- ◆ **Section 8 – References:** provides a list of references used in the preparation of this Response to Submissions.

2. PROJECT UPDATES

2.1. Changes to the Project

The following changes to the details presented in the Coolimba Power Project PER dated April 2009 are identified, described and discussed in this Proponents Response to Submissions:

1. Greenhouse Gas Emissions

Table 8-16 on Page 8-22 in Section 8.3.3 of the PER estimated the total quantity of CO₂-e (carbon dioxide equivalent) emissions from the Coolimba Power Project as 4.008 Mtpa CO₂-e. This amount of CO₂-e emissions included 0.219 Mtpa CO₂-e emissions from the gas fuel in the gas turbines. The amount of 0.219 Mtpa CO₂-e only covered the estimated emissions from one of the two proposed gas fired units. This was an oversight.

The correct amount of CO₂-e emissions from the gas fuel in gas fired turbines should have been reported as 0.438 Mtpa CO₂-e. The corresponding total CO₂-e emissions from the Coolimba Power Project is therefore also increased to 4.227 Mtpa CO₂-e.

The corrected total CO₂-e emissions have been reflected in Table 1 on page 19. and in the response to Issue 6.3.6.

2.2. Revised Environmental Impacts

The following revised environmental impacts need to be considered as the effect of the changes to the project outlined in Section 2.1 above.

1. Greenhouse Gas Emissions

As discussed in item 1 of Section 2.1 above, the required change to the project description results in an increased in the proposed CO₂-e emissions of 0.219 Mtpa. This is an increase of 5% from the annual proposed CO₂-e emissions from that defined in the PER (4.008Mtpa CO₂-e).

The PER also provided details of the impact of Coolimba's CO₂-e emissions compared to Australian and Western Australian CO₂-e emission levels. These comparisons also change as discussed below:

Total Coolimba CO ₂ -e emissions	<u>CO₂-e emissions disclosed in PER</u> 4.008 Mtpa	<u>Updated CO₂-e emissions disclosure</u> 4.227 Mtpa
Contribution to Australian CO ₂ -e emissions	0.70%	0.73%
Contribution to Western Australian CO ₂ -e emissions	5.77%	6.11%

Other than the matter referred to in item 1 of Section 2.1 and 2.2 there is no other evidence or knowledge that has been identified subsequent to the issue of the Coolimba Power Project PER nor any revisions to the Coolimba Power Project proposed in the Coolimba Power Project PER that would suggest any revision to the environmental impacts identified and described in the Coolimba Power Project PER dated April 2009.



2.3. Revised Environmental Commitments

The following table is a list of commitments that the Proponent is making to manage the environmental impacts of the project. This list includes the commitments from the PER and additional commitments made in response to the submissions received on the PER.

Environmental Management Commitments – Updated for Response to Submissions

Subject	PER Section	No.	Proposed Actions	Project Phase	On Advice From
Greenhouse Gas		1a	<p>Coolimba will comply with the Australian Government’s legislation as enacted on matters related to GHG’s. This will include the CPRS in whatever form it is finally enacted. The CPRS (or alternative GHG emission trading system legislation) will progressively and substantially increase the costs of permitting GHG emissions from the Coolimba project and force the incorporation of GHG reduction technologies as they become commercially viable.</p> <p>In the event that the CPRS or alternative GHG legislation is not enacted by the time the Coolimba Power Station is commissioned Coolimba shall prepare and submit to the Minister for Environment a Greenhouse Gas Abatement Report.</p>	Prior to commissioning	



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Environmental Management Commitments – Updated for Response to Submissions

Subject	PER Section	No.	Proposed Actions	Project Phase	On Advice From
Greenhouse Gas - Carbon Capture and Sequestration	2.2.1	1b	<p>Coolimba's proposed GHG mitigation strategy is the Coolimba CCS Implementation Project.</p> <p>i. Coolimba will design and construct the power station in such a way as to be suitable for conversion to CO₂ capture technologies.</p> <ul style="list-style-type: none">• Design – Coolimba will ensure that its plant design incorporates all of the currently known components necessary for future operation as a carbon capture plant. Coolimba will consult widely on these design elements and share final design plans with the regulatory agencies as far as confidentiality and intellectual property obligations permit.• Construction – Coolimba will construct the power station incorporating the design elements from above to allow future conversion of the boiler and plant to carbon capture with minimal disturbance to operations and the environment. It is expected that this will be an additional capital cost of approximately 3% over and above the required construction cost of the total non capture ready power station.• Implementation Strategy – Coolimba will develop an execution strategy to implement the installation of the carbon capture technology regardless of ultimate carbon capture technology in as seamless a manner as possible.	Prior to commencement of construction	

Environmental Management Commitments – Updated for Response to Submissions

Subject	PER Section	No.	Proposed Actions	Project Phase	On Advice From
			<p>ii. Coolimba will assess the suitability of the North Perth Basin for geological storage of CO₂ and continue to consult with key stakeholders to develop the appropriate understanding of the CO₂ storage possibilities and the impacts and issues that exists with their use.</p> <ul style="list-style-type: none"> Coolimba will communicate the results of the current North Perth Basin CO₂ Storage Study with regulators and stakeholders. Coolimba will work with relevant interest groups to conduct field investigations to confirm the study findings and determine the detailed requirements to support approval for the sequestration of the CO₂. Coolimba will define, install and manage the required monitoring to provide baseline data to support environmental impact assessments and approval of the future CO₂ storage project. <p>iii. Coolimba will work with relevant interest groups to complete regular studies and prepare a Definitive Feasibility Study so that the relevant stakeholders will have appropriate information for decision making. This study will include all matters requiring consideration including the potential routes for GHG pipelines to the sequestration sites and potential barriers to the use of those routes.</p> <ul style="list-style-type: none"> 1 year before commissioning - Presentation of a Pre Feasibility Level Study 3 years after commissioning of Coolimba – Presentation of the first Definitive Feasibility Level Study (DFS) Every 3 years after the first DFS – Presentation of a refreshed DFS 		
Flora	7.3.3	2	<p>Coolimba commits to providing an appropriate offset for any clearing of DRF. The required offset will be negotiated with the DEC.</p> <p>Further surveys of Priority and DRF flora will be conducted in Spring 2009 and Autumn 2010. Impacts and management mitigation options will be discussed with DEC following these surveys.</p>	Prior to commencement of construction	DEC
	7.3.3	3	<p>Coolimba will design the infrastructure route to avoid as many individuals of the Declared Rare Flora <i>Tetratheca nephelioides</i> and Priority Flora species, as possible. Ministerial approval will be sought before any individuals of the Declared Rare Flora <i>Tetratheca nephelioides</i> are damaged, taken or destroyed.</p> <p>Coolimba will restrict its impact on the <i>Tetratheca nephelioides</i> population around the infrastructure route to no more than 10% of the population found in this area.</p>	Prior to commencement of construction	DEC

Environmental Management Commitments – Updated for Response to Submissions

Subject	PER Section	No.	Proposed Actions	Project Phase	On Advice From
	7.3.3	4	Coolimba will undertake further field studies to assist in locating further populations of Declared Rare and Priority Flora species outside the Project Area and within the Eneabba region, particularly in the local conservation estate. The location and numbers of additional populations found will be reported to DEC.	Prior to construction and continuous throughout the Project	DEC
Dieback	7.4.3	5	Coolimba will implement vehicle hygiene procedures to minimise potential spread of dieback and conduct an inspection throughout the Project Area at the completion of construction for the presence of the disease. In the event that dieback is detected, Coolimba will determine appropriate management in consultation with DEC.	Prior to construction and continuous throughout the Project	DEC
Conservation Estate	7.10.3	6	Coolimba commits to providing an appropriate offset for any clearing in the South Eneabba Nature Reserve. The required offset will be negotiated with the DEC.	Prior to commencement of construction	DEC
Air Quality	8.1.3	7	Coolimba commits to the installation of a meteorological station and the review of air quality modelling using on-site meteorological data. The onsite meteorological station will be installed in adequate time to include the data collected from it in a model validation process prior to final design of the power station being completed. A program of radiosondes or similar will be conducted after commissioning.	Continuous throughout the Project	DEC
	8.1.3	8	Coolimba commits to monitoring of SO ₂ emissions from the Coolimba Power Project in accordance with the requirement of the DEC license. The SO ₂ monitors will be established 12 months prior to commissioning to give an adequate period of background levels.	Prior to construction and continuous throughout the Project	DEC
Noise	8.4.3	9	Coolimba commits to investigating and implementing the most suitable noise attenuation measures during the design phase that will reduce the noise impacts to achieve compliance with the <i>Environmental Protection (Noise) Regulations 1997</i> at any noise sensitive receptor identified in this assessment.	Prior to commencement of construction	DEC
	8.4.3	10	Coolimba will monitor noise levels from the power station following commissioning to validate the predictions	Continuous	DEC



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Environmental Management Commitments – Updated for Response to Submissions

Subject	PER Section	No.	Proposed Actions	Project Phase	On Advice From
			of the modelling exercise. In the event that noise levels exceed the <i>Environmental Protection (Noise) Regulations 1997</i> , Coolimba will further investigate plant design initiatives to reduce noise to acceptable levels.	through out the Project	
Water Quality	8.5.3	11	Coolimba commits to ongoing ground and surface water monitoring to identify any changes to water quality from the Project's operations.	Continuous through out the Project	DEC DoW
Solid and Liquid Wastes	8.6.3	12	Coolimba commit to additional coal combustion ash chemical characterisation testwork to confirm the appropriate handling methods for the waste ash prior to commissioning the plant.	Prior to construction and continuous throughout the Project	DEC
Community and Social	9.1.3	13	Coolimba will work with the relevant stakeholders to provide a positive legacy for the community within the region.	Continuous throughout the Project	DEC, local shires and communities
Visual Amenity	9.3.3	14	Coolimba will use directional lighting and screening vegetation, where appropriate, to reduce impacts on visual amenity.	Continuous throughout the Project	
Aboriginal Heritage	9.4.3	15	Coolimba will continue consultation with the Native Title Claimant Working Group and additional Aboriginal heritage surveys will occur prior to any proposed works.	Continuous throughout the Project	DIA and SWALSC

3. PUBLIC SUBMISSIONS

3.1. Submissions Received

A total of twelve submissions related to the PER were received as follows:

Government agencies (6):

Department of Environment, Water, Heritage and the Arts

Department of Environment and Conservation (DEC)

Environmental Management Branch

Air Quality Management Branch

Noise Regulation Branch

Office of Climate Change

Midwest Region

Terrestrial Ecosystems Branch

Department of Health (DoH)

Department of Water (DoW)

Department of Indigenous Affairs (DIA)

Shire of Coorow

Non-government and/or community group organisations (3):

Greenpeace Australia Pacific

Conservation Council of Western Australia Inc

Wildflower Society of Western Australia (Inc)

Individual (private) (3):

The Proponent has responded to key questions raised in the submissions with the most accurate information currently available in relation to the issues. The Proponent would like to acknowledge all groups that chose to forward a submission to the EPA as part of this environmental impact assessment process.

4. RESPONSE TO GENERAL ISSUES RAISED IN SUBMISSIONS

Issue 4.1 *"The Environmental assessment should consider the cumulative impacts of the CWC and Coolimba Projects."*

Raised by the Department of Environment and Conservation and the Wildflower Society of Western Australia

Response The PER documentation for both projects clearly identified that the two projects were interdependent and integrated. The Projects are being presented as separate projects as they are owned by separate legal entities and are quite different projects – though related. Where the impacts of the two projects are cumulative the PER documentation has made a cumulative assessment of the combined impacts so that the environmental impact assessment can be made on the cumulative impacts. This information was provided in Sections 6-9 of the PERs under each of the relevant factors.

The greatest cumulative impacts will be to local distribution of vegetation communities and to the species *Tetradlea nephelioides* and *Grevillea althoferorum* subsp. *althoferorum*.

Cumulative impacts are discussed in Sections 6-9 of the PER (Aviva/URS 2009a and b) and summarised in the table below (Table 1).

Table 1: Summary of Significant Cumulative Impacts and Management Measures Applicable to the Relevant EPA Environmental Factors.

Factor	Element	Objectives	Cumulative Potential Environmental Impacts	Proposed Mitigation and Management Measures	Predicted Outcome	Section
Biophysical	Conservation Estate	To protect the environmental values of areas near the project area identified as having significant conservation value.	Clearing of up to 30 ha of vegetation along the southern boundary of the SENR, including the loss of some individuals of DRF and Priority Flora. Potential for indirect impacts due to activities such as mine dewatering. Potential impacts on the South Eneabba Nature Reserve and Lake Logue Nature Reserve due to dust impacts on vegetation, mine dewatering and other issues listed in Table 6-2 of the PER.	Implement EMPs and rehabilitation and closure plans. Clearing of infrastructure corridor within the SENR restricted to 20 m wide. Environmental offset proposed.	Localised reduction of biodiversity within that section of the power station infrastructure corridor that traverses the SENR, including the loss of some individuals of DRF and Priority Flora. No significant impact on the Lake Logue Nature Reserve conservation values predicted.	See below
	Landforms and Soil	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.	Disturbance of a total footprint of 2,183 ha, of which 1,273 ha has already been cleared to previous land uses. This includes some areas of dispersive soils.	Implementation of proposed EMPs including progressive rehabilitation.	Landform and soil issues can be managed through appropriate handling and storage methods.	Section 7.9 of CCP PER, and section 7.6 of CWC PER.
	Acid Mine Drainage	To minimise the risk to the environment resulting from potentially acid forming materials	No cumulative impact as all AMD issues are associated with the CWC Project.	As per CWC EMPs. Further testwork proposed to assist in management of any residual risks.	No unacceptable environmental outcome predicted.	Section 8.3 of the CWC PER.

Table 1: Summary of Significant Cumulative Impacts and Management Measures Applicable to the Relevant EPA Environmental Factors.

Factor	Element	Objectives	Cumulative Potential Environmental Impacts	Proposed Mitigation and Management Measures	Predicted Outcome	Section
	Surface Water	To maintain the quantity and quality of surface water flows so that environmental values, including ecosystem maintenance, are protected.	Localised and minor changes to surface water flows due to drainage diversion and other project activities.	As per EMPs.	No unacceptable environmental outcome predicted	Section 7.8 of the CPP PER and Section 7.7 of the CWC PER.
	Groundwater	To maintain the quantity and quality of ground water so that existing and potential environmental values, including ecosystem function, are protected.	Coolimba will use mine water abstracted by the Central West Coal Project. Pumping from the Yarragdee aquifer may be required to provide back-up water.	As per EMPs. Measures include comprehensive water and vegetation monitoring programs.	Reduction in groundwater levels due to mine dewatering and water supply for the CPP.	Section 7.8 of the CWC PER and Section 7.7 of the CPP PER.
	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.	Total remnant vegetation clearing for both projects is 910 ha, most of which will be due to the mine pit (860ha). This will include the loss of some populations of DRF and priority flora. Vegetation may be adversely affected by groundwater drawdown in localised areas.	As per EMPs. Measures including minimising clearing, progressive rehabilitation, studies of vegetation dependence on groundwater and monitoring of vegetation stress from groundwater drawdown, , further studies to locate DRF and Priority species within adjacent Conservation Estate areas as well as weed, fire and dieback management. The proponent commits to taking only 10% <i>Tetralochea nephelioides</i> and 20% <i>Grevillea althoferorum</i> subsp. <i>althoferorum</i> of individuals known to occur within the Project Area. Ministerial Approval will be sought before taking DRF species	Loss of some populations of DRF and Priority Flora within the Project Areas, but no loss of species expected or ecosystem productivity at a regional scale expected. The risk of indirect impacts affecting DRF and Priority Flora outside the project footprints is expected to be minimal after mitigation measures are implemented. Environmental offset proposed in relation to clearing of vegetation including some populations of DRF and priority flora.	Section 7.2,7.3 of the CWC PER and CPP PER

Table 1: Summary of Significant Cumulative Impacts and Management Measures Applicable to the Relevant EPA Environmental Factors.

Factor	Element	Objectives	Cumulative Potential Environmental Impacts	Proposed Mitigation and Management Measures	Predicted Outcome	Section
	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.	Localised loss of feeding and breeding areas for species including the Carnaby's Black-Cockatoo and the Rainbow Bee-eater.	As per EMPs. Measures include restricting vegetation clearing, progressive rehabilitation with appropriate species for a food source for Carnaby's Black-Cockatoo.	No unacceptable environmental outcome predicted.	Section 7.5 of the CPP PER and 7.9 of the CWC PER
	Invertebrate and Short Range Endemic (SRE) 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.	There will be no cumulative impact as all species recorded were found outside of the project areas and no residual effects on local SRE populations are considered likely.	No measures are considered necessary.	No unacceptable environmental outcome predicted.	Sections 7.10.2 of CWC (p222) and Section 7.6 of the CPP PER
	Subterranean Fauna	To maintain the abundance diversity, geographic distribution and productivity of subterranean fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	One stygobite species (Bathynellidae syncarid) is likely to be affected by the CWC Project, but no cumulative impact is predicted.	No measures are considered necessary.	No unacceptable environmental outcome predicted.	Section 4.9 of CPP PER and Section 7.11 of CWC PER
Pollution	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.	Both projects will result in air emissions including dust. SO ₂ emissions are within acceptable limits.	As per EMPs.	Minimal risk of impacting receptors. No unacceptable environmental outcome predicted.	Section 8.1 of the CPP PER and 8.4 of the CWC PER.

Table 1: Summary of Significant Cumulative Impacts and Management Measures Applicable to the Relevant EPA Environmental Factors.

Factor	Element	Objectives	Cumulative Potential Environmental Impacts	Proposed Mitigation and Management Measures	Predicted Outcome	Section
	Greenhouse Gases	To minimise emissions to levels as low a practicable on an ongoing basis and consider offsets to further reduce cumulative emissions.	4.227Mtpa of CO ₂ e cumulative impacts.	As per EMPS. Measures include development of a power station that is CCS ready. Other measures include implementing energy efficiency programs.	The Proponents are committed to a phased carbon capture and storage (CCS) Implementation Project. Development of the coal mine has potential to decrease WA's GHG emissions on a per unit energy consumed basis through the adoption of CCS practices at Coolimba.	Section 8.5 of the CWC PER, Section 8.3 of the CPP PER
	Noise	To protect the amenity of sensitive receptors.	A small exceedance at one residence (R6).	As per EMPs, which include attenuation noise measures and monitoring.	Minor exceedances of prescribed noise limits during construction phase and at nearest receptor during the operation phases of the Projects.	Section 8.4 of the CPP PER and section 8.6 of the CWC PER
Social	Visual Amenity	To ensure that aesthetic values are considered and visual impacts minimised.	Both projects will be visible to transient and stationary receptors at various locations adjacent to the Project Areas.	As per EMPs. Measures include directional lighting to limit the impact of night time views and planting of screening vegetation.	No unacceptable environmental outcome predicted	Section 9.3 of the CPP PER and section 9.3 of the CWC PER
	Aboriginal Heritage	To ensure that changes to the biophysical environment do not adversely affect historical	There are no cumulative impacts as no Aboriginal heritage sites have been	Consultation with indigenous land owners and implementation of heritage agreements where	No unacceptable outcome predicted.	Section 9.4 of the CWC PER and CPP PER

Table 1: Summary of Significant Cumulative Impacts and Management Measures Applicable to the Relevant EPA Environmental Factors.

Factor	Element	Objectives	Cumulative Potential Environmental Impacts	Proposed Mitigation and Management Measures	Predicted Outcome	Section
		and cultural associations and comply with relevant heritage legislation to avoid impacts to Aboriginal heritage sites.	recorded at the CPP. Two potential sites are likely to be disturbed as part of CWC Project development.	appropriate. Section 18 clearances will be sought for any disturbance of heritage sites.		
	European Heritage	To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.	There are no cumulative impacts as no European sites occur within the Project Areas.	No measures are considered necessary.	No unacceptable outcome predicted.	Section 9.5 of the CWC PER and CPP PER
	Public Health and Safety - Road Transportation	To minimise changes to local traffic where possible, and ensure road safety.	Increased traffic due to the Projects, but no significant impact predicted.	Improvement measures to the existing road networks have been made and will be discussed with Main Roads WA and the Shires.	No unacceptable outcome predicted.	Section 9.2 of CWC PER and CPP PER
	Land Use and Community	To maximise social and economic benefits to the local community.	Increased population due to combined construction and operational workforces (600 persons and 100 persons respectively) could result in social impacts and increased pressure on services and businesses. (Benefits including increased employment opportunities, reliable energy supply, business opportunities etc.	Measures are designed to combat cumulative impacts.	Positive legacy due to the introduction of the construction camp. No unacceptable outcomes predicted.	Section 9.1 of CWC PER and CPP PER

Issue 4.2 *"Project will offer opportunities for employment and local business."*

Raised by Public Submission #3

Response As much as possible Coolimba intends to support the local communities. This will be done by providing employment opportunities, supporting residential (rather than work camp) accommodation for employees where possible and diversifying the employment base in the region.

Issue 4.3 *Adequacy of the information on the project presented by the PER*

Raised by the Department of Environment and Conservation, the Shire of Coorow and Public Submission #1

Response Whilst the Shire of Coorow and Public Submission #1 commented that the information provided in the PER was adequate for their review, the DEC made a general comment that -

"There is insufficient information to enable DEC to adequately assess the proposal."

Coolimba disagrees with the DEC conclusion on the sufficiency of the information provided. Adequate information has been provided to allow an assessment of the existing environment that the project will impact on, the potential environmental impacts of the project and the management, mitigation and remaining impacts of the project on the environment.

Coolimba has prepared the PER after extensive consultation with the DEC and others and the PER was released after approval of the EPA considering the input from the DEC and others on the ESD and the Draft PER document.

The key environmental and social issues associated with the proposed Project are outlined below. Coolimba considers that these issues can be adequately managed through the implementation of the Environmental Management Plan developed specifically to address these aspects. An Environmental Management System will be implemented during the operations phase. Draft Rehabilitation and Closure Plans have been developed for the Project and will be reviewed and revised where necessary throughout operations.

Of the environmental and social issues potentially associated with the proposed Project, the most significant issues are likely to be:

- The clearing of approximately 49 ha of vegetation within and adjacent to, the South Eneabba Nature Reserve, which will include the removal of selected individuals of Priority Flora and the Declared Rare Flora (DRF) species *Tetratheca nephelioides*.
- Potential for clearing to reduce the habitat that may be used by Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) and the Rainbow Bee-eater (*Merops ornatus*), both of which are protected under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- Potential for noise from power station operations to impact on local receptors.

- Potential air quality impacts. Fugitive dust was identified as being the key issue for the construction phase whilst the operations phase would result in gaseous emissions to atmosphere including SO₂, NO₂ and a number of trace pollutants.
- The generation and abatement of greenhouse gas emissions.

The following studies were completed and reported on or included in the PER:

Geotechnical Assessment

Dr Ian H Clark – Geonet Consulting Group

Pit Dewatering Assessment & Bore Completion Report

Mr Grant Bolton, Rockwater Pty Ltd.

Geochemistry Report

Mr Ian Swane, Terrenus Pty Ltd.

Acid Sulphate Soils Assessment

Melanie Nunn, URS Australia

Surface Water Assessment

Mr Fanie Van der Linde, Senior Design Engineer.

Ms Michelle O'Shea, Graduate Hydrologist

Ms Amandine Bou, Project Groundwater Modeller.

Flora and Vegetation Report

Dr Libby Mattiske, Mattiske Consulting Pty Ltd.

Dieback Assessment

Mr Evan Brown, Glevan Consulting.

Vertebrate Fauna Report

Mr Stewart Ford and Dr. Erich Volschenk, *ecologia* Environment.

Carnaby's Cockatoo Habitat Assessment

RE Johnstone and T Kirkby

Short Range Endemics

Mr Stewart Ford and Dr. Erich Volschenk, *ecologia* Environment.

Stygofauna Surveys

Mr Stefan Eberhard, Subterranean Ecology

Noise Assessment

Mr Paul Keswick, SVT Engineering.

Air Quality Assessment

Ms Christine Killip, Katestone Environmental.

Social Impact Assessment

Ms Gaye McKenzie, Principal Social Scientist.

Traffic and Transport Assessment

Mr Benham Bordbar, Transcore Pty Ltd.

Stygofauna Risk Assessment

Mr Stuart Halse, Bennelongia Pty Ltd

Solute Transport

Ian Brunner, Senior Principal Hydrogeologist, URS.

Mr Rob Wallis, Principal Hydrogeologist, URS.

Mr Boon Eow, Senior Hydrologist, URS.

Mr Wen Yu, Principal Hydrogeologist, URS.

Mr Andrew Mussell, Project Hydrologist, URS.

Greenhouse Gas Assessment

Mr Venky Narayanaswamy, Principal Engineering and Technical Sustainability, URS.

Mr Chacko Thomas, Environmental Engineer, URS.

Aboriginal Heritage Survey

Mr Nicholas Green, Anthropos Australis.

Contributions to the PER were made by personnel from URS Australia including:
Ms Sonia Finucane, Senior Principal Environmental Scientist.
Ms Jenny Becher, Principal Environmental Scientist.
Ms Karen Ariyaratnam, Associate Environmental Scientist.
Mr Chris Thomson, Senior Environmental Scientist
Ms Gillian Tomkinson, Project Environmental Scientist.
Mr Jared Leigh, Senior Environmental Scientist.
Mr Don Burnside, Principal Natural Resource Scientist.
Ms Tanya Carpenter, Senior Environmental Scientist.
Ms Hannah Fletcher, Project Environmental Scientist.
Mr Julian Neurauter, Graduate Environmental Scientist.
Ms Kate Philp, Graduate Environmental Engineer.

Coolimba has worked closely with the EPA and other agencies through the Environmental Impact Assessment (EIA) process including the Referral, the development of the ESD and the preparation of the Draft and Final PERs. Coolimba has gathered a very experienced team of specialists in each field of environmental impact to define and assess the various potential impacts. Coolimba has presented the existing environment, definition of impacts and description of impact management and mitigation in such a way as to assist in the understanding of the project and its impacts on the environment.

The Proponent considers that the process of approval for the scoping document and the PER was adequate to ensure that all issues were appropriately defined, described and outlined so as to provide adequate information to readers of the PER to make comment on the Project proposal.

Sections 4 to 7 of this Response to Submission deal in turn with the specific issues raised by the DEC. Our responses to the issues below address the issue of adequacy of information on particular issues to enable an environmental impact assessment.

Issue 4.4 *“Why is Leeman left off the map in figures 4-3 and 4-15?”*

Raised by Public Submission #2

Response This is an error. There is no reason why Leeman was left off the maps.

Issue 4.5 *Inadequate consideration of the principles of Environmental Protection as set out in Position Statement No.7*

Raised by the Wildflower Society of Western Australia

Response The Wildflower Society has stated that “... we don't believe the proponent has properly considered the ...Precautionary, Intergenerational Equity, Conservation of Biological Diversity and Ecological Integrity Principles.”

The Proponent is of the view that these principles have been adequately considered throughout the PER including and specifically in Section 7.1.1 Sustainability Assessment and 7.1.2 Assessment of EPA Principles of Environmental Protection.

A discussion of the consideration of the definitions of these principles' (from Position Statement 7 (Table 7-2) (EPA 2004a)) and specific examples of how Coolimba has addressed some matters is included below.

The Precautionary Principle states that where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by (a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment, and (b) an assessment of the risk-weighted consequences of various options.

For the Precautionary Principle to be applicable there needs to be two concurrent situations. The first is a threat to the environment and the second is a degree of scientific uncertainty. For example, a threat to the environment will consist of the clearing of some individuals of the DRF species *Tetratheca nephelioides*, impacting on the regional distribution of this species. In order to reduce the scientific uncertainty, a targeted DRF search was undertaken. In total, approximately 1,500 individuals both within and outside the proposed infrastructure corridor were found. Coolimba Power has committed to taking only 10% of individuals, therefore not threatening the species. An offset for vegetation clearing and localized loss of DRF and Priority Flora species within the SENR will be negotiated with the DEC.

The principle of Intergenerational Equity requires that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. This definition implies that the current generation has stewardship of the environment. In terms of the CPP project, application of this principle would suggest that the proponent is responsible, as an example, to ensure that the current amount of vegetation is not reduced at the end of the project. The proponent has committed to assuming stewardship by (as an example) providing an appropriate offset of vegetation and rehabilitation of disturbed areas over the life of the project.

The principle of the conservation of biological diversity and ecological integrity requires that this be a fundamental consideration. EPA (2004a) further defines the levels and underlying principles of biological diversity and ecological integrity, under the assumption that the protection of biological diversity will protect ecological integrity.

The levels of biological diversity as defined by the EPA (2004a) are genetic, species and ecosystem diversity. These will be impacted locally by the clearing proposed for the CPP Project. Baseline studies have been undertaken for the Project to assess the environmental value of areas which could be impacted by the construction and operation of the Project and management plans (drafts included in PER) will be implemented as required. The environmental impact, as demonstrated by these studies, will be minimal. It is proposed to protect these values by providing a vegetation offset, rehabilitating disturbed areas, avoiding clearing where possible (e.g. only taking 10% of individuals of *Tetratheca nephelioides*), by conducting studies to ensure that there is sufficient representation of species and communities in surrounding nature reserves.

Issue 4.6 *What impact does the WA Government's decision to suspend the 330 kV network development in this area have on the proposal?*

Raised by the Department of Environment and Conservation – Terrestrial Ecosystems Branch

Response The Project depends on the proposed 330kV transmission line from Pinjar to Eneabba to enable its generated electricity to be transmitted to potential customers through the SWIS.

The Project requires this transmission line (along with the ability to connect to it) to be in place prior to the commencement of commissioning trials in the first half of 2014. The Project expects that this line will be constructed by this time.

Without the proposed 330 kV transmission line there are a number of benefits of this proposal that would be lost. These include:

- Secure reliable power supply in the Midwest
- Reduced transmission losses into the Midwest
- Diversity of fuel for baseload power on the SWIS
- Diversity of geographical location for baseload power in the SWIS
- Support for additional wind generation in the SWIS
- Regional jobs in the Midwest
- Diversity of industry in the Midwest
- Supply of energy for existing and new projects in the Midwest

The Project believes that these benefits are compelling enough for the 330kV transmission line to receive the support of the Government and Western Power and will continue to promote the development of the 330kV transmission line to Eneabba along with the promotion of the Coolimba Power Project.

5. RESPONSE TO BIOPHYSICAL ISSUES RAISED IN SUBMISSIONS

5.1. Impact of Dewatering

Issue 5.1.1 *"The currently available information from the proponent does not demonstrate that the potential risks to the mentioned GDEs are environmentally acceptable."*

Raised by the Department of Environment and Conservation - Midwest Region Office

Response The Coolimba Power Project (CPP) does not have any predicted direct or indirect impacts on GDEs. The CPP will receive water from the CWC Project which will be sourced from the dewatering activities of the CWC Project and the impacts of the dewatering on the GDEs is discussed in Section 7.4.2 of the CWC Project PER and Response to Submissions.

Issue 5.1.2 *"Particular care should be taken to monitor groundwater for depth changes and pollutant to reduce the impact the mine/powerstation will have in lowering the GW levels in the area".*

Raised by Public Submission #1

Response The CPP may abstract some water from the Yarragadee aquifer to supply water if the CWC dewatering activity does not yield enough water. This is the subject of a Section 5C license and will involve groundwater monitoring of the abstraction sites and surrounding local areas.

This comment is more relevant to the dewatering activities proposed in the CWC Project, however, as the submitter has not made this comment in a submission to the CWC Project we will respond to the comment in the Coolimba Project Response to Submissions.

The CWC PER identifies the issue of the dewatering activity and its potential impact on groundwater levels around the project area. The CWC PER also details the predicted level and range of drawdown impacts from the dewatering activity. Further, the CWC PER advises that the groundwater model will be validated by expanding the groundwater monitoring network during mine development and operations phases, and further studies will be undertaken to confirm the relationship between native vegetation and the water on which it relies.

Specifically the following points were included in the CWC PER at Section 7.8.3.

- *"The Project will conduct additional dewatering studies to refine the understanding of the groundwater drawdown potential. Where further studies identify different outcomes to those modelled by Rockwater (2009) management measures will be reviewed to address differences.*
- *Groundwater level monitoring will be conducted, particularly in the shallow*

groundwater areas around Bindoon Creek and Erindoon Creek, which may be affected by drawdown impact on the watertable.

- Drawdown impact on private bores located southwest of the project area will be monitored to determine any potential negative impacts for other bore users in the area. Alternative water supply will be provided if necessary.
- Further assessments and field monitoring will be undertaken in order to:
 - Further develop the drawdown model and refine the predicted drawdown;
 - Improve the knowledge of vegetation groundwater dependency and tolerance to regional watertable changes; and
 - Increase the understanding of the hydraulic connectivity between perched water and regional groundwater (CCM aquifer and superficial aquifer).

A monitoring program will be developed to monitor the drawdown effect on groundwater levels and vegetation condition. Mitigation plans, such as supplementation of groundwater levels, and reticulation of vegetated areas, may be developed to manage the impact if the vegetation is significantly adversely affected by the dewatering impact.”

5.2. Management of groundwater water quality

Issue 5.2.1 *“The PER provides a water balance for the project, however it lacks details relating to the water quality required for the various power plant uses. The water supplied from dewatering is expected to have an average salinity of 2,500 mg/L. The PER has not explained how potential increases in the salinity of the water from the mine can be tolerated in these power plant uses or will be managed. This may have implications for water licensing and the proponent is encouraged to fully consider the water requirements for the power station and how this will be managed. The proponent must consider having contingency measures in place should water sources fail to meet their needs.”*

Raised by the Department of Water

Response The Power Station will have a three stage water purification process to prepare mine dewatering water for use in the power station water dependant functions.

1. Raw water from the Power Station process water pond is passed through aeration, clarification and filtration plant.
2. A portion of the water (approximately 30%) is passed through a Reverse Osmosis (RO) plant.
3. RO permeate will be used as feedwater to a demineralised water plant, which will produce a quality of water suitable for boiler make-up.

The Project has considered the possible variations in quality of dewatering water feed and developed its water treatment design accordingly.

The Project has also considered the possibility that the dewatering water sources will fail to meet its needs and has provided for backup water supply in that event.

The Power Station will require approximately 11 GLpa as process water. The CWC project will provide the majority of this water from its mine dewatering activity. A sensitivity analysis of the groundwater model results for the CWC project resulted in a range of average extraction rates from 1.1 GLpa to 12.5 GLpa (see Rockwater [2009] and Appendix C, both in the PER). The base groundwater extraction model shows a long term annual average of 5.3 GLpa for one dewatered cell and 7.2 GLpa for five dewatered cells. With this range of outcomes it is essential that the Project determine a suitable long term backup supply of water in the event that the dewatering outcome in any year or number of years does not meet the power station's requirements for process water.

The Project decided to assume a long term average supply of water from the CWC project of 8 GLpa and seek a further and separate abstraction license to extract the remaining portion of annual requirement and potential annual backup from the nearby Yarragadee or Cattamarra aquifers (an abstraction licence separate to the mine dewater licence to abstract).

The Project is committed to using all the available water from the CWC Mine dewatering activity first and only abstract additional water if the CWC mine is unable to meet these requirements.

Issue 5.2.2 *"Together with the acidic bottom ash and saline solids this mixture all buried in the spoil would present a danger to underground water in the future"*

Raised by Public Submission #2

Response The proposed co-disposal of coal combustion ash and saline residues from the Coolimba Power Station and mine waste rock from the CWC Mine in the CWC mine backfill operation has been assessed by URS and reported on in the CWC PER.

The assessment considered the co-disposal of mine waste rock and ash separately to an assessment of mine waste rock, ash and saline residues.

URS concluded that salinity and metal concentrations of the leachate from the waste rock and coal combustion ash are much lower than the baseline groundwater. This suggests that there will be minimal impact for the co-disposal of ash and waste rock on the groundwater quality.

URS concluded that the effect of the saline residues on local groundwater is poorly defined by the current model. URS suggested that unmitigated disposal of the saline residue could have unsatisfactory groundwater outcomes and that further modelling to define this impact better was required. The project responded to this risk by proposing that saline residues will be disposed of above the water table thereby restricting the impact on the groundwater and by connection the final void, until further modelling could confirm satisfactory outcomes associated with disposal within the water table.

URS concluded that the final void will act as a local groundwater sink and capture the salt and metal concentration plumes.

CWC has committed to conduct further testwork where required on the impacts on groundwater quality. Refer Commitment 10.

CWC will monitor and report groundwater quality during the mine life to confirm understanding of groundwater movement and quality issues. Refer Commitment 8.

5.3. Supply of backup water

Issue 5.3.1 *"In the event of this cleaned mine water being insufficient quantity the proponents intend to abstract 3GL/a from the Yarragadee aquifer. Approval for any abstraction from this important aquifer has not been addressed. When is this likely to occur?"*

Public Submission #2

Response The DoW is currently assessing an application made by Central West Coal Pty Ltd for a 5C licence to take 7.2 Glpa from the Cattamarra Coal Measures aquifer and an additional application for an additional 6 Glpa of water has been made for the power station. These applications will be assessed by the DoW under Schedule 1, Division 2, clause 7(2) of the *Rights in Water and Irrigation Act 1914*, with a decision pending the outcome of the PER.

5.4. Vegetation and Flora

Issue 5.4.1 *"Locating the infrastructure corridor in South Eneabba Nature Reserve is not compatible with DEC's objectives, or the statutory purpose of the nature reserve "the conservation of flora and fauna".*

"The proponent has not adequately demonstrated that it has exhaustively considered options to establish the infrastructure corridor outside of the South Eneabba Nature Reserve on adjacent cleared private property, a recommendation DEC made to the proponent over 12 months ago."

"... the planned infrastructure corridor has been made considerably longer than it need be in order to specifically traverse, for much of its length, the nature reserve rather than adjacent farmland."

"DEC is not aware of any technical reason why the proposed corridor needs to be within the nature reserve, or of any justification for the effective loss of the proponent's estimate of 30 hectares of undisturbed native vegetation from the reserve."

Raised by the Department of Environment and Conservation

Response Coolimba acknowledges the DEC's position with regard to the statutory purpose of the SENR and the DEC's objectives.

Coolimba has used all reasonable efforts to locate the infrastructure corridor outside the SENR. Coolimba discussed this matter with the DEC and the EPA at many of its meetings dating back to June 2008 with the DEC and EPA (Refer Section 5 of the Coolimba PER for meeting register).

The various options available for the infrastructure corridor were raised at those meetings and the reasons for the need to locate a portion of the corridor in the SENR were also discussed. Coolimba has endeavoured wherever possible to

locate the corridor outside the SENR on cleared pasture but was unable to negotiate access with some landholders hence the only remaining option was to locate the corridor along the boundary of the SENR. In discussions with the DEC three options for locating the corridor in the SENR were discussed being:

1. Through the nature reserve on previously undisturbed paths;
2. Through the SENR on previously disturbed paths; and
3. Along the boundary of the SENR.

The DEC advised Coolimba during these meetings that the DEC did not wish for there to be any impact on the SENR however if there were no other options then the impact should be minimized by locating the corridor along the boundary of the SENR so as to minimize the disruption to the SENR and to eliminate any barriers (cleared areas) to fauna movement. This meant that the option of using a pre-existing disturbed corridor was eliminated.

Coolimba followed the DEC recommendations with the placement of the corridor along the boundary of the SENR. It is unfortunate that the length of the corridor is increased by the need to follow the boundary of the SENR (rather than going through the SENR between two boundary points), but this is what the DEC indicated was its preference. The corridor could also be made shorter by going through cleared farmland however as stated above that option is not available to the project.

Coolimba plans to do all preparatory construction and installation work on cleared land and to minimize its impact in the SENR.

Section 7.2.3 of the PER defines Coolimba efforts to minimize impacts arising from the need to place a portion of the infrastructure corridor in the SENR with regard to the size of the clearing required.

There are no technical reasons for the placement of the corridor in the SENR and it would be Coolimba's preference to build the infrastructure outside the SENR however for the reason discussed above this option is not available to Coolimba. Coolimba will continue to explore any option available to minimize or eliminate clearing in the SENR.

Coolimba has committed to an appropriate offset for any clearing in the SENR (refer Commitment 2 in Section 7.2.3 of the PER and Commitments 2 and 6 in Section 2.3 of this Proponents Response to Submissions).

Issue 5.4.2 *"Whilst it is proposed to build the power station on cleared land it appears 49 ha of vegetation will be cleared for infrastructure leading to a significant loss of vegetation and fauna habitat as well as fauna. Thirty hectares of the vegetation is in the South Eneabba Nature Reserve. This reserve is already severely impacted by mineral sand mining and it is unacceptable to have further impacts when the infrastructure could occupy adjacent cleared land."*

Raised by the Wildflower Society of Western Australia

Response Refer to the response to Issue 5.4.1 and 5.4.6.

As discussed in sections 7.2.2 and 7.3.2 of the Coolimba PER (Aviva/URS 2009a), the following impacts to the SENR are expected;

- Clearing of up to 30 ha, including areas of the E4 and T1 communities.

- Loss of some individuals of the DRF *Tetratheca nephelioides*.
- Impact on areas that historically contained *Eucalyptus johnsonia*, *Eucalyptus crispata* and *Eucalyptus impensa*.
- Loss of some individuals of the following Priority species; *Desmocladius elongatus* (P3), *Lepidobolus quadratus* (P3), *Georgeantha hexandra* (P4), *Grevillea rudis* (P4) and *Banksia chamaephyton* (P4).
- Exposure to indirect impacts such as *Phytophthora* Dieback.

The management of these impacts is described in sections 7.2.3 and 7.3.3 of the Coolimba PER (Aviva/URS 2009a) and are described below:

The management of vegetation impacts:

- Clearance of native vegetation will be restricted to the project area. The majority of clearing is associated with the southern portion of the infrastructure corridor. The infrastructure corridor is 100 m wide and will accommodate the gas pipeline and the transmission line. Clearing for pipeline construction within the corridor is generally 30 m in width. However, clearing within the SENR for the gas pipeline will be restricted to a maximum of 20 m width. The 20 m will allow sufficient room for access and activity during pipeline construction. After construction a portion of the 20 m will be rehabilitated and a smaller maintenance track will remain. In addition, spurs of 50 m long by 10 m wide off this cleared pipeline access area will be required to access the cleared pads (each 40 m x 40 m) for the ten transmission line towers within the SENR.
- Rehabilitation of previously vegetated areas will aim to provide a range of similar species to those existing prior to clearing. This will include species suitable as a food source for Carnaby's Black-Cockatoo.
- Access to all non-operational areas will be restricted and personnel and vehicles shall remain on designated roads and tracks. This will assist in minimising risk of fire, vegetation disturbance, and the spread of dieback and weeds.
- Vehicle hygiene will be maintained at all times to minimise the potential spread of dieback and weeds. Vehicles that arrive on site will not access site unless clean and cleared for access.

The management of flora impacts includes:

Rare Flora – Tetratheca nephelioides

- The Rare flora species will be avoided wherever possible. The infrastructure route within the corridor will be designed in discussion with the DEC to avoid as many individuals as possible.
- Clearing within the SENR for the gas pipeline will be restricted to a corridor with a maximum width of 20 m. The 20 m will allow sufficient room for access and activity during pipeline construction. After construction a portion of the 20 m will be rehabilitated and a smaller maintenance track will remain. In addition, clearing within the SENR for the transmission line will be restricted to spurs of 50 m long by 10 m wide off the cleared pipeline access area to the cleared pads (each of 40 m x 40 m) for the ten transmission line towers. This will allow flexibility in choosing the best alignment for the pipeline and location of the power line tower pads to minimise impact on the DRF.

- From preliminary design for the gas pipeline and transmission line within the infrastructure corridor in the SENR up to 10% of the population of *Tetratheca nephelioides* recorded by Mattiske will be removed.
- Where it is not possible to avoid the rare species, an "application to take" will be submitted for the rare flora at the State level and a "controlled action" at the Federal level. It is recognised that Ministerial approval will be required before any rare or threatened plant can be damaged, taken or destroyed.
- Seeds and propagules of the rare flora species will be collected and stored for future research needs to assist in their re-establishment in rehabilitation areas.
- Further field studies will be undertaken to assist in locating further populations of the species outside the project area, particularly in the conservation estate.
- Access to all non-operational areas will be restricted and personnel shall remain on designated roads and tracks.
- Topsoil and vegetation will be respread as soon as possible to assist in rehabilitation programs.
- Rehabilitation programs will include trials on Rare and Threatened Flora species.

Priority Flora species will be avoided wherever possible.

- Clearing within the SENR for the gas pipeline will be restricted to a corridor with a maximum width of 20 m. The 20 m will allow sufficient room for access and activity during pipeline construction. After construction a portion of the 20 m will be rehabilitated and a smaller maintenance track will remain. In addition, clearing within the SENR for the transmission line will be restricted to spurs of 50 m long by 10 m wide off the cleared pipeline access area and pads (each of 40 m x 40 m) for the ten transmission line tower footprints. This will allow flexibility in choosing the best alignment for the pipeline to minimise impact on Priority Flora.
- Where it is not possible to avoid the Priority flora species, seed and propagules will be collected and stored for future research needs to assist in their re-establishment in rehabilitation areas.
- Further field studies will be undertaken during the operation phase to assist in locating further populations of Priority species offsite, particularly in the conservation estate.
- Access to all non-operational areas will be restricted and personnel shall remain on designated roads and tracks.
- Topsoil and vegetation will be respread as soon as possible to assist in rehabilitation programs.
- Rehabilitation programs will include trials on Priority flora species.

It is expected that these measures will reduce the impacts of the clearing within South Eneabba Nature Reserve.

Issue 5.4.3 “Clearing from road upgrading is also not included in the PER as four alternatives are being considered. Impacts from each alignment such as clearing native vegetation for road widening, drainage impacts and pathogen vectoring should be considered.”

Raised by the Department of Environment and Conservation – Terrestrial Ecosystems Branch

Response There is minimal anticipated clearing from road upgrading. The roads are considered largely adequate in width for the level of upgrading required. The upgrading refers to extending sealed surfaces for turning lanes and or roads. These matters will be managed using the Project EMP’s.

Issue 5.4.4 “Three vegetation communities E4, H3 and T1 (all of which are classified as locally or regionally significant) will be impacted by this proposal.”

Raised by the Department of Environment and Conservation

Response These communities are considered to be regionally significant because they form habitat for Declared Rare Flora taxa in the case of T1, and of Priority Flora in communities H3 and E4 (EPA 2004b). All of these communities will have more than 30% of their surveyed area preserved, by both the Coolimba and CWC projects and some areas of the conservation estate. Community T1 contains *Tetratheca nephelioides* and records of *Eucalyptus crispata*. Neither species are restricted to habitat typified by T1. *E. crispata* has been recorded from “clayey soils in shallow gullies, or on lateritic or granite breakaways and slopes” (Brown *et al.* 1998), more similar to the H3 community. The habitat for *T. nephelioides* in the species description (Butcher 2007) is grey-white sand and yellow-brown clayey sands suggesting that the T1 does not form the only habitat for these species.

The E4 and H3 communities are considered to be locally significant because these communities contain Priority Flora. The Priority Flora found to be directly impacted include *Desmocladius elongatus* (P3), *Lepidobolus quadratus* (P3), *Banksia chamaephyton* (P4), *Georgeantha hexandra* (P4) and *Grevillea rudis* (P4). These are well represented in local areas that will not be directly impacted by Coolimba. This, with the fact that these communities have at least 30% of their extent undisturbed, minimises the risk to biodiversity.

The two overarching vegetation systems in the local area will not have their extent significantly affected by the clearing proposed by the Coolimba Power Project. In 1994, there was approximately 60 000 ha of the Eridoon system and 113,500 ha of the Tathra system in remnant vegetation. The proposal will clear approximately 50 ha of the Tathra system and 0.5 ha of the Eridoon system. Based on 1994 data (all that is currently available) this equates to approximately 0.04% of the Tathra system and 0.001% of the Eridoon system. Approximately 22.7 % of the Eridoon and 12.2% of the Tathra system of 1994 extents of remnant vegetation are in reserves. However, a suitable offset for vegetation clearing will be negotiated with the DEC.

Issue 5.4.5 “The DEC considers the impacts and risks to DRF and the South Eneabba Nature Reserve have not been demonstrated to be acceptable for biodiversity conservation, and on those grounds cannot support the proposal in its current form.”

"The project has the potential to impact on four declared rare flora (DRF), two Priority 3 and three Priority 4 species in the South Eneabba Nature Reserve."

*"The infrastructure corridor could potentially impact up to 45.08 percent (706 plants) of the largest known population of DRF *Tetratheca nephelioides* (Endangered)."*

*"The infrastructure corridor will also impact on the habitat of the following DRF: *Eucalyptus impensa* (Critically endangered), *Eucalyptus crispata* (Endangered) and *Eucalyptus johnsoniana* (Vulnerable)."*

"From the information presented in the PER, it is not possible to determine whether significant groundwater drawdown effects associated with dewatering of the proposed Central West Coal mine would further threaten the habitat and survival of this species."

"The impact assessment should be presented with further information from targeted survey work to determine the occurrence and the potential impact of the development on these species and their status"

Raised by the Department of Environment and Conservation

Response The following are the potential impacts on DRF and Priority species in the Coolimba Power Project area:

- *Tetratheca nephelioides*: approximately 150 plants within the Project Area will be impacted and 1,350 will not be impacted locally. Approximately 200 individuals are known to occur in other regional populations. *Tetratheca nephelioides* was first described by Butcher (2007), and at that stage only three populations were known of, with all populations in close vicinity to Eneabba. According to records of the WA Herbarium (WAH 2009), there are now several known populations, although again those are all found in the Eneabba area and number approximately 200 individuals. The populations identified during studies completed for the Coolimba Power Project are by far the largest at approximately 1,500 individuals. With the constraints placed on the location of the infrastructure corridor (refer to the response to issue 5.4.1 and 5.4.6), there will be a need to take some individuals, but Coolimba has committed to taking only 10 % of these individuals. This will still preserve at least 1,350 individuals that were previously unknown.
- *Eucalyptus impensa*: One population potentially impacted, but this is a historical record and no presence of this species was recorded within the Project Area during the Mattiske surveys. Another five populations are known (Stack and Broun 2004).
- *Eucalyptus crispata*: One population within the Project Area will be potentially impacted, but this is a historical record and this species was not found in the Project Area during the Mattiske surveys. Another nine populations are known from the region (TSSC 2008a).
- *Eucalyptus johnsoniana*: Two potential populations may be affected but these are historical records and were not recorded during the Mattiske surveys. More than 30 other populations are known to occur in the region (TSSC 2008b).

Coolimba accepts that there will be some impact (although not unmanageable) on the habitat of the listed Eucalyptus species, but the impact on these species themselves will depend on whether they do in fact occur in this area (they were not recorded during the Mattiske surveys). The historical records inside the proposed corridor place the following species in the following communities:

- Records for Eucalyptus johnsonia place it in community types H3 and T1. Over both the Coolimba Power Project and Central West Coal Project, these community types will have approximately 31% and 72% of the mapped extent left.
- Records for Eucalyptus impensa place it within the T1 community, which will have 72% of its mapped extent uncleared.
- The record for Eucalyptus crispata place in within a cleared paddock. WAH records (2009) suggest that it may be associated with community H3. This community will have 31% of its mapped extent left.

It is the position of Coolimba that these habitats will be protected adequately from direct impacts (through minimising clearing and an offset package) and indirect impacts (such as those listed in Table 1).

The Priority species *Desmocladius elongatus* (P3), *Lepidobolus quadratus* (P3), *Banksia chamaephyton* (P4), *Georgeantha hexandra* (P4) and *Grevillea rudis* (P4), are all well represented in local areas that will not directly impacted by Coolimba Power Project, therefore reducing the risk to these species. It is unlikely that these projects will increase the inferred threat level to these species.

In order to quantify these impacts additional DRF searches will be carried out on *Paracaleana dixonii* and *Thelymitra stellata* (other DRF known to occur in the local area), *Eucalyptus crispata*, *Eucalyptus impensa*, *Eucalyptus johnsonia* and potentially *Grevillea althoferorum* subsp. *althoferorum* (dependent on other studies being jointly funded by Aviva Corporation and Iluka Resources), in August/September 2009. This work will also include searches of populations on and off proposed impact sites, including counting of plant numbers.

The effect posed by groundwater dewatering for the local area is covered in the CWC PER (Aviva/URS 2009b). As the Coolimba Power Project is not the source of the groundwater impact, it was not considered a cumulative impact.

Coolimba has presented the vegetation and flora studies (Appendix G to the PER) to provide the information required for the assessment of the proposed project. As part of finalising EMPs and a future program of studies has been prepared and is outlined below:

August/September 2009

- Additional DRF searches will be carried out on *Paracaleana dixonii* and *Thelymitra stellata*, *Eucalyptus crispata*, *Eucalyptus impensa*, *Eucalyptus johnsonia* and potentially *Grevillea althoferorum* subsp. *althoferorum* (dependent on other studies being jointly funded by Aviva Corporation and Iluka Resources). This work will also include searches of populations on and off proposed impact sites, including counting of plant numbers .

- Additional Priority flora species searches will be carried out to expand on current knowledge and to enable plant numbers to be recorded both on and off the potential impact sites.
- Extension of mapping of the Lake Logue Nature Reserve and mapping inside South Eneabba Nature Reserve, as well as the establishment of permanent vegetation plots (which can also be used for assessing longer term trends) in a range of locations on the creeklines and near the TEC.
- Monitoring sites (including transects) established on the TEC community on Rocky Spring Road. This will entail coverage of the variety of communities near the DEC designated site and will provide more detail clarity on the issues associated with this TEC.

Autumn 2010

- Continuation of mapping and establishment and monitoring of permanent plots.
- The communities flagged by relevant departments as significant were E4, H3, H1, S1, T1, particularly T1 and H1. The extent of these will be determined locally and regionally, either through fieldwork or by finding areas of comparable communities from other projects.

It is expected that impacts on the flora will be presented after spring 2009, and the impacts and management/mitigation options discussed with DEC.

Coolimba will consult with the DEC for suitable offsets to compensate for the loss of vegetation from clearing in the SENR.

Issue 5.4.6 *“Four alternative alignments are presented within the PER, all of which impact the South Eneabba Nature Reserve, no alignments that extend either north or south with no impact to the NR have been considered. This demonstrates a lack of consideration of sensitive environmental values.”*

Response *Raised by the Department of Environment and Conservation – Terrestrial*
Coolimba has considered options to establish the infrastructure corridor outside of the SENR.

Coolimba initially looked at four alternative alignments all of which were associated with existing corridors of historical clearing (tracks, fire access paths etc) within the SENR to minimize the impact on the SENR.

From consultation with the DEC it was determined that a path with minimal impact was required including restricting any impacts to the SENR to the boundary of the SENR rather than paths through the SENR.

Coolimba then looked for an easement path that went around the SENR.

Northern Alignment Option

An alignment to the north of the SENR is not an acceptable option for the following reasons:

- The Coolimba power station will be required to connect to the SWIN at the Eneabba substation which is due east of the power station. From the

Eneabba substation the SWIN powerline infrastructure continues to move away from the power station site in a north easterly direction further reinforcing the need to connect at the Eneabba substation.

- An alignment of the power line to the north of the SENR would still require impact on some vegetation units as there are extensive vegetation units to the north of the SENR all the way to Eneabba and to the east of Eneabba as well. This option would therefore require a fragmentation of the vegetation units.
- An alignment of the power line to the north of the SENR would first need to go to the north of the propose coal mine (the powerline cannot pass over the mine footprint) then north of the SENR and north of additional native vegetation units directly to the north of the SENR before returning south to the Eneabba substation. This would double the distance of the infrastructure easement without any real reduction in vegetation impacts.

Southern Alignment Option

The southern alignment required negotiation with a number of landholders with regard to accessing their land for easement purposes. As a private company Coolimba has no right of resumption on land and was unsuccessful in receiving approval to propose an easement through one landholder's properties. This was discussed with the DEC and Coolimba advised that it would seek access to a portion of the southern boundary of the SENR with impacts kept to a minimum.

Issue 5.4.7 *"Specifically, the features of 330 kV transmission line discussed in Section 3.2.2 is reduced to tower spacing and height. No discussion on tower type, foundation type and depth, electrical safety clearance or tower base footprint is presented. Additionally no justification of tower spacing and height is presented to allow assessment of the full alternatives of the 330 kV transmission line."*

Raised by the Department of Environment and Conservation – Terrestrial Ecosystems Branch

Response Information items raised are not relevant to a Part IV A assessment. There are no matters of environmental significance attached to this level of detail however if anything should come up the project will notify the regulators.

Issue 5.4.8 *"It is not clear what management is associated with the 330 kV transmission line. Actions to reduce construction footprint, such as utilizing cleared areas as access, if not alignment, should be assessed and included in the PER"*

Raised by the Department of Environment and Conservation – Terrestrial Ecosystems Branch

Response Section 7.2.3 of the PER includes the following comments and commitment:

"Clearance of native vegetation will be restricted to the project area. The majority of clearing is associated with the southern portion of the infrastructure corridor. The infrastructure corridor is 100 m wide and will accommodate the gas pipeline and the transmission line. Clearing for pipeline construction is generally 30 m in width. However, clearing within the SENR for the gas pipeline will be restricted to a maximum of 20 m width. The 20 m will allow sufficient room for access and activity during pipeline construction. After construction a portion of the 20 m will be rehabilitated and a smaller maintenance track will remain. In addition, spurs of 50 m long by 10 m wide off this cleared pipeline access area will be required to access the cleared pads (each 40 m x 40 m) for the ten transmission line towers within the SENR."

The total area of clearing in the nature reserve proposed to be limited to an area of 10ha within the 30ha of infrastructure easement.

Of this 10ha approximately 3ha will be rehabilitated immediately following construction with the remaining disturbance maintained as maintenance access and doubling as firebreaks for the SENR.

Where possible the project will utilize existing cleared areas for access and all possible preparatory work.

Coolimba will provide a suitable offset for all disturbance in the SENR.

Issue 5.4.9 *“No demonstrated application of the impact mitigation, adequate justification for the corridor alignment, assessment of regional/local impact or suitable remediation to clear DRF is presented in the PER.”*

Raised by the Department of Environment and Conservation – Terrestrial

Response Justification for the alignment is provided in section 2.2.6 of the PER (Aviva/URS 2009a). Further justification for the current location of the proposed infrastructure is provided in response to issue 5.4.1 and 5.4.6.
In summary:

- Coolimba initially looked at four alternative alignments all of which were associated with existing corridors of historical clearing (tracks, fire access paths etc) within the SENR to minimize the impact on the SENR.
- From consultation with the DEC it was determined that a path with minimal impact was required including restricting any impacts to the SENR to the boundary of the SENR rather than paths through the SENR.
- Coolimba then looked for an easement path that went around the SENR.

Northern Alignment Option

An alignment to the north of the SENR is not an acceptable option for the following reasons:

- The Coolimba power station will be required to connect to the SWIN at the Eneabba substation which is due east of the power station. From the Eneabba substation the SWIN powerline infrastructure continues to move away from the power station site in a north easterly direction further reinforcing the need to connect at the Eneabba substation.
- An alignment of the power line to the north of the SENR would still require impact on some vegetation units as there are extensive vegetation units to the north of the SENR all the way to Eneabba and to the east of Eneabba as well.
- An alignment of the power line to the north of the SENR would first need to go to the north of the propose coal mine (the powerline cannot pass over the mine footprint) then north of the SENR and north of additional native vegetation units directly to the north of the SENR before returning south to the Eneabba substation. This would double the distance of the infrastructure easement without any real benefit in vegetation impacts.

Southern Alignment Option

The southern alignment required negotiation with a number of landholders with

regard to accessing their land for easement purposes. As a private company Coolimba has no right of resumption on land and was unsuccessful in receiving approval to propose an easement through one landholders properties. This was discussed with the DEC and Coolimba advised that it would seek access to a portion of the southern boundary of the SENR with impacts kept to a minimum.

A survey of the proposed infrastructure route occurred and the following significant values of flora and vegetation were recorded (Section 4.6 of the PER):

- The communities T1, E4 and H3
- The DRF *Tetratheca nephelioides* and the following Priority Species; *Desmocladius elongatus* (P3), *Lepidobolus quadratus* (P3), *Banksia chamaephyton* (P4), *Georgeantha hexandra* (P4) and *Grevillea rudis* (P4).

The impacts from the infrastructure corridor are stated in a previous response and in sections 7.2.2 and 7.3.2 in the Coolimba PER (Aviva/URS 2009a).

The Coolimba Power Project has committed to taking only 10% of the 1,500 individuals found of *Tetratheca nephelioides* and providing an appropriate vegetation offset.

Issue 5.4.10 *"CCWA believe that the impact on already fragmented Kwongan Heath vegetation (one of the most species-rich vegetation type anywhere in the world) as are result of extensive clearing associated with the mine site and transmission lines is unacceptable. CCWA understands that a significant proportion of the clearing proposed for the transmission lines will take place in a nature reserve which is a wholly unacceptable outcome for a project of this type."*

Raised by the Conservation Council of WA

Response The response to this submission will only focus on clearing for the Coolimba Power Project.

The proponent agrees that the area is of world importance, but disagrees that the clearing is unacceptable. The vast majority of the Coolimba Power Project is located in the Tathra vegetation system (Beard 1979). In 1994, there was approximately 60 000 ha of the Eridoon system in remnant vegetation and 113 500 ha in the Tathra system. The proposal will clear approximately 50 ha of the Tathra system and 0.5 ha of the Eridoon system. Based on 1994 data (all that is currently available), this equates to approximately 0.04% of the Tathra system and 0.001% of the Eridoon system. Approximately 22.7 % of the Eridoon and 12.2% of the Tathra system of 1994 extents of remnant vegetation are in reserves. However, a suitable offset for vegetation clearing will be negotiated with DEC.

The proponent agrees that the location for proposed clearing inside the South Eneabba Nature Reserve is not the most environmentally desirable option, however as the company cannot compulsively acquire the farmland to the south, and other northern alignments will equate to the similar or worse impacts on vegetation, the consensus with DEC was the current route was the most appropriate.

Issue 5.4.11 *“DEC has identified significant issues relating to survey standards, deficiencies and discrepancies in relation to the flora survey report.”*

“There is insufficient information to enable DEC to adequately assess the proposal.”

Raised by the Department of Environment and Conservation

Response The Department of Environment and Conservation (Environmental Management Branch) concluded that the flora and vegetation studies had the following deficiencies. These will be discussed in turn.

“The flora survey area did not include South Eneabba Nature Reserve, directly east of the project area and contiguous with the project footprint, and likely to be indirectly impacted.”

Given the time constraints of the project and the lack of publicly available information in the area, it was considered that vegetation studies in Lake Logue Nature Reserve would best serve the purposes of determining the direct impacts (e.g. regional extent of communities) and the indirect impacts (e.g. groundwater drawdown on surrounding communities). Indirect impacts on South Eneabba Nature Reserve are to be managed using the Precautionary Principle (e.g. restricting access to South Eneabba Nature Reserve to minimise its' exposure to *Phytophthora Dieback*).

“Quantitative data regarding impacts on conservation significant flora are not presented”

At the time of the surveys the objective was to locate the sites that contain Priority Flora, with data provided in Appendix G of the PER. The Priority species impacted are *Desmocladius elongatus* (P3), *Lepidobolus quadratus* (P3), *Georgeantha hexandra* (P4), *Grevillea rudis* (P4) and *Banksia chamaephyton* (P4). None of these species should be locally affected as all have records inside South Eneabba Nature Reserve, Lake Logue Nature Reserve and other local vegetation. The definitions of these populations, in terms of size and local impact will be completed this spring.

“The majority of flora surveys were not conducted during August or September, timing that would detect the presence of two declared rare species as potentially occurring in the project area.”

DEC suggests that timing the surveys in August or September would detect the presence of DRF *Paracaleana dixonii* and *Thelymitra stellata*. These species flower between October and November (Brown *et al.* 2008), which is the easiest time to identify these orchids in the field (both the flower and leaf are present). Times which flora surveys were carried out included the months of October and November.

“The surveys are not in compliance with the EPA Guidance Statement No. 51, in so far as the following information was not provided or was deficient:

- Survey methods and sampling effort were not detailed.*
- A measure of species richness, including methodologies applied, was not included.*
- Species accumulation curves were not provided.*

- Maps of vegetation condition were not provided.
- Information from sampling sites was not recorded.
- Information on the methods used to characterise and delineate the vegetation communities was absent.
- Lodgement of flora specimens with the Western Australian Herbarium did not occur.
- Proposed flora surveys have not been completed.”

The sampling times and locations surveyed was described in Appendix G to the CPP PER (Mattiske Consulting Pty Ltd 2009). The times of survey were November 2005, January 2006, October 2006, November 2007, April 2008, July 2008 and October 2008. Survey sites represented inside their respective communities within the project area were included on Figures 4-12c and d of the CWC PER (Aviva/URS 2009b) and Figures 4-11b,c, and d of the CPP PER (Aviva/URS 2009a). As a large amount of the project area has no conservation value (*i.e.* cleared areas), the rest of the area was considered to have significant values rendering a condition map pointless as the Precautionary Principle was applied. A count of species richness was not provided as all vegetation in the local area has a degree of conservation significance.

It is recognised that there are some gaps in information, largely as parts of the survey area to date have been impacted by intense and regular fires. It is intended to undertake additional DRF searches in the spring months of 2009. In particular efforts will be directed to search for *Paracaleana dixonii* and *Thelymitra stellata*, *Eucalyptus crispata*, *Eucalyptus impensa*, *Eucalyptus johnsonia*, *Tetratheca nephelioides* and *Grevillea althoferorum* subsp. *althoferorum*. This work will also include searches of populations on and off proposed impact sites, including counting of plant numbers (as required now by DEC).

Additional mapping and targeted searching will be undertaken in the spring months of 2009 and early 2010 to place the work into a more regional as well as local context.

5.5. Cumulative Impacts

Issue
5.5.1 *“DEC is also concerned about the progressive proposed development of key vegetation communities in the Lesueur area and the likelihood that specific vegetation community types may be lost from the cumulative impacts of development. In this case, the key risk is to the native vegetation system mapped as 'Lesueur grey'...”*

Raised by the Department of Environment and Conservation

Response There is a possibility that all or any proposed projects in the mid west area have the potential to cause loss of significant flora values of the Lesueur grey vegetation subsystem (similar to Beard 1979 “Eridoon” system) identified by Hopkins, Griffin and Langley for the West Midlands study (unpublished). However, as the documents describing Tiwest's Falcon and Iluka's Eneabba Expansion (and any other projects) are not publicly available the cumulative impact of all projects can not be commented on by Coolimba. All Coolimba can comment on is what is known to it.

The impact on the Eridoon system by both the Coolimba Power and Central West Coal Project is as follows: In 1994, there was approximately 60 000 ha of the

Eridoon system in remnant vegetation. The proposal will clear approximately 200 ha therefore approximately 0.3 % of the Eridoon system. Approximately 22.7 % of the 1994 extents of remnant vegetation are in reserves. The clearing of vegetation will not significantly reduce the extent of remnant vegetation in these two systems. However, an offset package that will hopefully add to conservation reserve system is proposed.

Issue 5.5.2 *“The cumulative impact of this project, in conjunction with Tiwest's Falcon and Iluka's Eneabba Expansion projects, would cause unacceptable loss of biodiversity in the form of a unique vegetation system in the Lesueur Sandplain subregion.”*

Raised by the Department of Environment and Conservation

“These projects (Coolimba Power Project and the Central West Coal Mine), in combination with the Iluka expansion and Tiwest Falcon expansion have the potential to significantly impact this area in the long term via the removal of restricted vegetation communities, critical habitat for threatened flora, altered surface and ground water conditions, pollution of groundwater and drawdown effects on groundwater dependent ecosystems.”

“The cumulative impact to the regional biodiversity by Aviva's projects and other existing and proposed developments has not been adequately assessed to determine suitable offsets.”

Raised by the Department of Environment and Conservation Midwest Branch

Response There is a possibility that all three projects have the potential to cause loss of significant flora values of the Lesueur grey vegetation subsystem (similar to Beard 1979 “Eridoon” system) identified by Hopkins, Griffin and Langley for the West Midlands study. However, as the documents describing Tiwest's Falcon and Iluka's Eneabba Expansion are not publicly available the cumulative impact of all projects can be commented on. The impact on the Eridoon system is as follows by both the Coolimba Power and Central West Coal Project: In 1994, there was approximately 60 000 ha of the Eridoon system in remnant vegetation. The proposal will clear approximately 200 ha therefore approximately 0.3 % of the Eridoon system. Approximately 22.7 % of the 1994 extents of remnant vegetation are in reserves. The clearing of vegetation will not significantly reduce the extent of remnant vegetation in these two systems. However, an offset package that will hopefully add to conservation reserve system is proposed.

Without the specifics of other projects this submission cannot be fully addressed.

Cumulative impacts from both proposals (the Coolimba Power Project and the Central West Coal Project) have been addressed in Section 6 of the Coolimba Power Project PER (Aviva/URS 2009a) and Table 1. It is the position of both CWC and Coolimba Power that the cumulative actions can be managed or mitigated adequately by the measures described in Table 1.

The Central West Coal and Coolimba Power Projects do have potential to impact upon restricted vegetation and flora. The two main impacts are; vegetation clearing for both projects of 910 ha, most of which will be due to the mine pit and the flora affected will be two DRF species and Four Priority 2, ten Priority 3 and six Priority 4 species will be directly impacted by clearing.

Aviva is of the position that the two DRF species *Tetratheca nephelioides* and *Grevillea althoferorum* subsp. *althoferorum* will have only 10% and 20% of

individuals recorded directly impacted by CWC and Coolimba. Aviva has also committed to avoiding Priority Flora where possible, and determining the local population sizes.

The restricted vegetation types are expected to exist in secure tenure nearby, and conservatively, is expected to occur in secure conservation estate as approximately 22.7 % of the 1994 extents of remnant vegetation of the Eridoon system and 12.2 % of the Tathra system are in reserves.

Issue 5.5.3 *“The magnitude of the limestone mining should be as part of the overall project footprint, contributing to the cumulative impact of the Coolimba project on the biodiversity and environmental values of the region.”*

Raised by the Department of Environment and Conservation

Response The project is obtaining its required limestone from third parties who will be responsible for permitting of their operations.

5.6. Fauna

Issue 5.6.1 *“The potential impact of relocating fauna to adjacent 'occupied territories' needs to be assessed by a suitably qualified ecologist prior to implementation.”*

Raised by the Department of Environment and Conservation

Response Coolimba will select a suitably qualified ecologist to assess and suggest management actions to minimize impact of this relocation.

The relocation is relatively small given it is only for an easement of up to 30 meters in width and will only require relocation for a small distance to neighbouring fauna habitat i.e. the habitat is continuous and only meters away.

Issue 5.6.2 *“The PER fails to adequately assess the fauna assemblage in a regional context. This is mainly compounded by major errors in the regional fauna data provided in Appendix C.*

For example the dataset ascribed to Dell et al. (1979) is not from this data source and includes an assemblage with many arid distributed species. All other data sets in this table need to be checked for accuracy and likely occurrence of species in the region of the project area.”

Raised by the Department of Environment and Conservation - Terrestrial Ecosystems Branch

Response The data set described above (Dell *et al.* 1979) was incorrect. A second survey attributed to Dell *et al.* 1979 (from Wilroy Nature Reserve) was previously deleted as it was thought to be too far from the project area to be relevant. Unfortunately the wrong set of Dell *et al.* 1979 data was deleted and we apologise for this error. Appendix C has since been revised and the attached document adjusted to reflect this.

Adjustments to Appendix C include:

- One native mammal was added and one introduced mammal species was removed.
- 56 bird species were added. The majority of such were deleted in the previous version of the report due to the very low likelihood of occurrence in the project area (typically wetland species). As they were recorded in

the literature cited in this document we have decided to keep them in this version of our report to avoid any further confusion.

- 22 reptile species were removed as they are arid species that no longer occur in the revised Appendix C.
- 2 amphibian species was removed and 1 species was added, also due to the revision of Appendix C.

Due to the above revision a further four species of conservation significance were added to the report, although all were of low likelihood of occurrence and as such do not require a detailed discussion. To further refine the report all other detailed descriptions of conservation significant species that have a low likelihood of occurrence have been removed.

The revision of regional faunal assemblage has not altered the species of conservation significance that potentially occur in the project area and as such no changes to management strategies of impact assessments are anticipated.

This response and the revised Fauna report was forwarded to the EPASU on 24 July 2009 to allow the DEC review to continue.

Issue 5.6.3 *“Until the fauna data is revised and corrected the Terrestrial Ecosystems Branch is not able to assess the likely impacts on the fauna of the project area.”*

Raised by the Environment and Conservation – Terrestrial Ecosystems Branch

Response Refer to the response in 5.6.2 above.

This response and the revised Fauna report was forwarded to the EPASU on 24 July 2009 to allow the DEC review to continue.

5.7. Impacts on EPBC listed species

Issue 5.7.1 *“It is ... unclear from the PERs, how impacts on the Carnaby's Black Cockatoo will be mitigated.”*

“Further clarification of the impact on the Carnaby's Black Cockatoo is required to allow the Minister to be able to make a decision on approval of the projects. This should include mitigation measures and whether off-sets for loss of Carnaby's Black Cockatoo foraging habitat will be proposed.”

Raised by the DEWHA

“The proposal has the potential to significantly impact on Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) foraging habitat”

Raised by the Environment and Conservation

Response As stated in the PER it has been assessed that;

“No significant direct or indirect adverse impact to this species or any population of the species is anticipated as a result of the Project.”

This assessment is relevant to both the individual impacts of the two separate

projects (Coolimba and CWC) and the cumulative impacts of both projects.

The assessment of no significant adverse impact is based on the following points:

- There are large areas of Kwongan heath in secure reserves in the region, such as South Eneabba, Lake Logue, Beekeepers, Coomallo, Drovers and Lesueur reserves. The immediate area has a total of 152,000 ha of native vegetation in Conservation estate and the wider region (area covered by the 250,000 maps of Dongara, Hill River, Perenjori and Moora) has 991,000 ha of native vegetation which is 23% of the land covered by those maps.
- Cumulative clearing over 30 years is limited to 870ha (860ha private land and 10ha nature reserve).
- It is unlikely that this species or the local population breeds within the project area or South Eneabba Nature Reserve. The nearest known breeding location is approximately 40 km south-east of the project area at Coomallo Nature Reserve.

The projects impacts to Carnaby's Black Cockatoo will be mitigated in the following ways:

- Progressive rehabilitation will occur on all but approximately 10ha of this cleared land.
- Significant portions of the cleared land will be rehabilitated within 10 years of the commencement of the project.
- Onsite mitigation measures including the inclusion of flora species that are suitable for Carnaby's Black Cockatoo foraging in the rehabilitation efforts will be incorporated in rehabilitation planning. Suitable targets for concentration of foraging species and survival rates will be discussed with the DEC and DEWHA.
- Offsets will be determined with the DEC for clearing in the SENR.
- Section 5 of the Environmental Management Plan (EMP) describes the management steps to minimise impact on Carnaby's Black-Cockatoo and other fauna species. Included amongst the 13 specific actions within Section 5 are 10 actions that are related to management of the impact on Carnaby's Black-Cockatoo. These include:

- 1) Vegetation clearing will be restricted to that which is necessary, and disturbed areas (including construction areas) will be rehabilitated as soon as practicable.
- 2) Fire prevention strategies will be an integral component of risk assessments for construction contractors. All vehicles will be fitted with fire extinguishers and site personnel will be trained in their use.
- 4) Dust control and suppression measures will be implemented in accordance with the Dust Management Plan, which is discussed in Section 6 of the EMP.
- 5) Directional lighting will be used to minimise light spill outside of the project area.
- 6) Dieback management will be undertaken in accordance with the Flora and Vegetation Management Plan, as described in Section 4.5.3 of the EMP.
- 7) Weed management practices will be implemented in accordance with the Flora

and Vegetation Management Plan which is discussed in Section 4.5 of the EMP.

8) Driving on site at dusk or dawn and at night will be minimised to reduce impacts to fauna which are active during these times.

9) Speed restrictions will be in force around the site and fauna on roads will be avoided, if this can be done safely.

10) All ponds associated with the Project will be fenced to prevent entry by fauna.

11) Sightings of Carnaby's Black-Cockatoo and any observations of Carnaby's Black-Cockatoo activities will be reported to on site environmental personnel for collation and reporting to relevant stakeholders.

Issue 5.7.2 *"It is unclear from the PERs how impacts on the EPBC Flora species *Grevillea althoferorum*, *Eucalyptus crispate*, *Eucalyptus impensa* and *Eucalyptus johnsonia* will be addressed by the two proponents."*

Raised by the DEWHA

Response During the preparation of the PER, there were five known locations of *Grevillea althoferorum* subsp. *althoferorum* in proximity to the Central West Coal Project and therefore the Coolimba Power Project. Indirect impacts on these locations (e.g. groundwater drawdown, *Phytophthora* Dieback, etc) have been addressed (Table 1). The Coolimba Power Project will not directly impact this species.

The *Eucalyptus* spp. were not located during field surveys but future occurrences of these species will be avoided where possible (to minimize direct impacts), and other measures that protect other vegetation and flora, should provide protection from indirect impacts. Some of these issues are being addressed through additional studies in the spring months of 2009 (refer to the response to issue 5.4.5).

Issue 5.7.3 *"It is unclear from the PERs how impacts on the EPBC species Rainbow Bee-eater will be addressed."*

Raised by the DEWHA

Response As stated in the PER it has been assessed that:

"No significant direct or indirect adverse impact to this species or any population of the species is anticipated as a result of the Project."

This assessment is relevant to both the individual impacts of the two separate projects (Coolimba and CWC) and the cumulative impacts of both projects.

The assessment of no significant adverse impact is based on the following points:

- There are large areas of Kwongan heath (similar habitat to that being cleared) in secure reserves in the region, such as South Eneabba, Lake Logue, Beekeepers, Coomallo, Drovers and Lesueur reserves. The immediate area has a total of 152,000 ha of native vegetation in Conservation estate and the wider region (area covered by the 250,000 maps of Dongara, Hill River, Perenjori and Moora) has 991,000 ha of native vegetation which is 23% of the land covered by those maps.
- Cumulative clearing over 30 years is limited to 870ha (860 private land and 10ha nature reserve)

The projects impacts to the Rainbow Bee Eater will be mitigated in the following ways:

- Progressive rehabilitation will occur on all but approximately 10ha of this cleared land.
- Significant portions of the cleared land will be rehabilitated within 10 years of the commencement of the project.
- Flora species that are suitable for Carnaby's Black Cockatoo foraging will be included in the rehabilitation efforts.
- Section 5 of the Environmental Management Plan describes the management steps to minimise impact on Rainbow Bee Eater and other fauna species. Included amongst the 13 specific actions within Section 5 are 10 actions that are related to management of the impact on Rainbow Bee Eater. These include:

- 1) Vegetation clearing will be restricted to that which is necessary, and disturbed areas (including construction areas) will be rehabilitated as soon as practicable.
- 2) Fire prevention strategies will be an integral component of risk assessments for construction contractors. All vehicles will be fitted with fire extinguishers and site personnel will be trained in their use.
- 4) Dust control and suppression measures will be implemented in accordance with the Dust Management Plan, which is discussed in 8.
- 5) Directional lighting will be used to minimise light spill outside of the project area.
- 6) Dieback management will be undertaken in accordance with the Flora and Vegetation Management Plan, as described in Section 4.5.3.
- 7) Weed management practices will be implemented in accordance with the Flora and Vegetation Management Plan which is discussed in Section 4.5.
- 8) Driving on site at dusk or dawn and at night will be minimised to reduce impacts to fauna which are active during these times.
- 9) Speed restrictions will be in force around the site and fauna on roads will be avoided, if this can be done safely.
- 10) All ponds associated with the Project will be fenced to prevent entry by fauna.
- 13) The potential for Rainbow Bee-eaters to breed in sandy areas and embankments will be monitored and if present, nest tunnels will be avoided if possible.

5.8. Rehabilitation

Issue 5.8.1 *“Council does have some concerns on the lake being left behind and the quality of the water as it states in the PER that the concentration of salts in the final pit void will increase over time the PER does not appear to cover what action will be taken to ensure the area is not used for recreation purpose and the effect of the rising salt levels will have on the surrounding areas .”*

Raised by the Shire of Coorow

Response The Coolimba Power Project and the CWC Project are integrated projects seeking separate environmental approvals. This allows for all environmental impacts to be managed in the most suitable way to minimise cumulative environmental impacts.

The Coolimba Power station will generate ash and saline residue waste that is proposed to be disposed on in the CWC mine backfill with the waste rock from the mining process.

Therefore the impacts of the Coolimba ash and saline residues is considered in the CWC Project PER.

Refer to the CWC Project PER Section 8.2 and Issue 5.7.1 of the CWC Response to Submissions for further detail on the response to this issue.

Issue 5.8.2 *“The completion criteria for rehabilitation presented in Section 7.3 is inadequate and does not represent criteria in any form. Measurable criteria should be presented.”*

Raised by the Department of Environment and Conservation – Terrestrial Ecosystems Branch

Response Rehabilitation of the infrastructure corridor will occur where possible as soon as the construction of the pipeline and transmission line is complete. The rehabilitation effort proposed and measurement criteria is summarised in the PER in Section 7.3.3 and described in more detail in the Draft Environmental Management Plan (Appendix Q of the CPP PER) Section 4.4 and 4.5 and the Draft Closure Plans (Appendix D of the CPP PER).

Measurable criteria were not presented because the community and government expectation of the standards of rehabilitation will most likely change before rehabilitation like that described in the Closure Plan is undertaken. However, the rehabilitation success will be measured against at least the following criteria:

- A range of similar species to those existing prior to clearing (extent of the range will be determined through discussions with DEC).
- Inclusion of species suitable as a food source for Carnaby's Black-Cockatoo. Percentage of content of rehabilitation that is foraging food source will be determined through discussions with DEC and DEWHA.
- A targeted species richness and density. The target will be determined in discussion with DEC.
- A targeted content of rare and priority species. The target will be determined in

discussion with DEC.

- Return of surface drainage patterns
- Control of weeds and dieback to satisfactory levels.
- These plans will be refined prior to implementation in consultation with stakeholders and regulators.

5.9. Dieback

Issue 5.9.1 *“There is an unacceptable risk of the introduction of *Phytophthora* dieback and weeds into South Eneabba Nature Reserve from the construction of the infrastructure corridor.”*

Raised by the Department of Environment and Conservation

Response We do not agree that there is a significant risk of the spread of *Phytophthora* dieback and weeds. This position is based on the assessment of the existing environment and the range of management activities available to assist in the management of the spread of *Phytophthora* dieback and weeds in the project.

These matters are discussed in the PER in Section 4.7 and Section 7.4 and in the EMP.

In summary

- There is no evidence of dieback in the project area
- The annual rainfall in the area is only marginally conducive to the survival of *P. cinnamomi*.
- It would therefore be expected that the disease expression throughout the majority of the project area would be episodic rather than progressive disease expression that is seen in areas of higher rainfall.
- The spread of *P. cinnamomi* and other phytophthora species will be minimised through appropriate hygiene management measures such as:
 - All vehicles and mobile plant entering the project area will be free of soil, gravel and plant material.
 - Any contaminated vehicles and mobile plant will be cleaned at a hygiene point to be positioned at the project area entrance.
 - Any fill required will be sourced from dieback disease free areas and transported in cleaned vehicles.
 - Dieback assessments will continue to be undertaken throughout the life of the Project.
 - The DEC *Phytophthora cinnamomi* Management Guidelines will be adopted as part of the dieback management strategies in the draft EMP.
 - Access to non-essential tracks will be discouraged by signs and/or physical barriers.
 - Access to nature reserves will be prohibited, except for any requirements to undertake monitoring, where prior approval from the DEC will be sought.
 - Any tracks used within the project area will be well drained with culverts installed to prevent any water flow across the road from adjacent disease infested vegetation. If this is not possible, roads will

- be closed in moist-soil conditions, or wash-down facilities will be installed on both sides of the affected road surface.
- The on-site induction will advise contractors and employees of the current dieback mitigation processes.

Issue 5.9.2 *“A complete dieback management plan should be created including wash downs locations, wastewater management and procedures for breach of hygiene.”*

Raised by the Department of Environment and Conservation

Response Dieback management was addressed in the draft EMP prepared for the project. The EMP & Closure Plans will be finalized with consideration of these comments.

5.10. Visual amenity

Issue 5.10.1 *“The proposal does not address impacts on landscape and visual amenity.”*

Raised by the Department of Environment and Conservation

Response Section 4.18 of the PER details the existing environment with regard to visual impacts and Section 9.3 of the PER makes an assessment of the visual amenity of the Project area and the impact of the project on the landscape from a visual perspective as per EPA Guidance Statement 33.

The PER deals with the visual impacts on transient (people moving through the area) and stationary receptors (residents living in the area) and discusses the impacts for both the CWC and the Coolimba Projects.

The assessment concludes that:

- Due to the size of the Power Station stack and buildings and the mine waste dump, there will be varying degrees of visibility of the Projects from transient and stationary receptors.
- Transient receptors will be affected for short periods only as they approach the site and given its short duration the impact is not considered significant.
- It is acknowledged that those stationary receptors closest to the site are likely to experience the greatest change in views.
- Therefore, the additional management measures proposed here focus on reducing changes in views to residential properties. Appropriate measures include:
 - Directional lighting has been included to limit the impact of night time views.
 - Planting of suitable screening vegetation at identified properties that will experience uninterrupted views of the visible features.
 - Where feasible, consideration will be given the colour of building

cladding to minimise contrasts with backgrounds.

In summary while the projects will have a visual impact (Coolimba's impact likely to be more significant than CWC's impact) it is felt that this impact is not such as to make the project environmentally unacceptable. Management of the projects will enable the visual impacts to be reduced and the remaining impacts are not inconsistent with development along the Brand Highway in the vicinity of the project.

Issue 5.10.2 *"No assessment is given to the visual impact of the transmission line. Given that this is a low vegetative form and gently undulating landscape, 40 m towers would pose a significant visual impact, particularly where they cross a major tourist road."*

Raised by the Department of Environment and Conservation

Response Section 9.3 of the PER deals with the Visual Amenity of the project.

Specifically 9.3.2 "Potential Impacts" on page 9-12 discusses the visual impact of the transmission lines, towers and easement corridor on stationary and transient receptors from all directions around the project.

A description of the existing environment and the proposed changes is provided along with a description of the compatibility of the landscape with the proposed new activities.

Coolimba acknowledges that the plant stack and the transmission lines will be visible by both stationary and transient receptors both near to the project and from some distant vantage points.

Coolimba believes that the visual impact of the plant stack and transmission line is minimal given the short time frame that it would be visible to the transient receptors (e.g. travelers on the tourist road – the Brand Highway) and the compatibility of the impact with existing visual impacts (other transmission lines) in the area.

Coolimba believes that the visual impact whilst not entirely consistent with existing landscape is acceptable to the region as it endeavors to diversify its economic base.

5.11. Offsets

Issue
5.11.1 *“DEC will not be in a position to endorse strategies for offsetting impacts given impact on critical assets until the level of significance of the impacts is adequately determined and the EPA has formed a view on the environmental acceptability of the project.”*

Raised by the Department of Environment and Conservation

“The cumulative impact to the regional biodiversity by Aviva’s projects and other existing and proposed developments has not been adequately assessed to determine suitable offsets. In order to determine the appropriateness and adequacy of the proposed offset, the level of significance of the residual impact on critical assets (such as SENR) needs to be known and agreed upon.”

Raised by the Department of Environment and Conservation Midwest Branch

Response Coolimba has committed to the following specific offsets.

- An offset for the loss of 861ha of vegetation clearing – CWC
- An offset for any clearing in the SENR - Coolimba
- An offset for any clearing of DRF - Coolimba

Each of these offsets are subject to discussion with the DEC.

CWC will re-engage with the DEC to determine the appropriate offsets when the environmental acceptability of the project has been determined by the EPA.

6. RESPONSE TO POLLUTION ISSUES RAISED IN SUBMISSIONS

6.1. Air Emissions

Issue 6.1.1	<p><i>“Commitment 7 relates to the installation of a meteorological station and review of the modeling using onsite met data. The commitment fails to include the critical point, namely the need to measure upper winds (plume height winds) in order to test and improve model validity.”</i></p> <p><i>“Commitments 8 and 9 are vague and inadequate. AQMB recommends, in light of the uncertainty caused by inadequate information, that if the project is to proceed, the proponent be required to conduct a program which will include:</i></p> <ul style="list-style-type: none"><i>• a comprehensive meteorological Station for plume dispersion, including a sodar or better for upper wind measurement (plume height);</i><i>• a program of radiosondes or alternative temperature profiling (after commissioning);</i><i>• anemometers for mine and on escarpment;</i><i>• and two SO2 monitoring stations with anemometers.</i> <p><i>The comprehensive meteorological station and sodar should be installed ASAP for a review of modeling and HRA, which should be completed prior to construction so the results can be taken into account as necessary in plant design.”</i></p> <p><i>Raised by the Department of Environment and Conservation – Air Quality Management Branch</i></p>
Response	The PER details the air quality modeling work done by Katestone with much discussion with the Air Quality Management Branch.

The main criticism of the modeling is that it is based on weather data that is not directly recorded at the Coolimba site and that it does not include wind data from the height of the proposed emission stack. The air quality assessment was completed by credible experts in the field and with considerable discussion with the DEC – Air Quality Management Branch. Whilst there was no available site specific data the data used in the assessment came from Iluka’s daily weather station only 15km away. A Meteorological Assessment for the Eneabba Region (Appendix B to Katestone’s Report in the PER) was completed to confirm the adequacy of the meteorological conditions to be used in the model. Whilst the absence of the site specific data meant that the model validation could not be conclusive the model was considered adequate for modeling work.

Katestone’s report as referred to in the PER states as follows:

“Due to the limited availability of meteorological observations for the power station site, particularly at plume height, the validation assessment is not conclusive. The model used for this assessment, TAPM, has been validated in many situations and has been proven as a suitable model for modeling tall stack sources. However, there is insufficient information at the site to conclude that the local phenomena exclusive to the CPP site are adequately characterised by the model. Due to these uncertainties this assessment presents a range in possible impacts in general areas and has assessed

compliance with the maximum exposure regardless of location. This methodology will provide a conservative assessment as the uncertainties in the modeling should be outweighed by the relaxation of spatial constraints. That is, the exact predictions at key receptors may not be accurate, but the range in predictions in the general areas should adequately represent the expected range in predicted maximum ground level concentrations due to the operation of the power station. Prior to commissioning of the power station additional studies should be conducted to verify the model predictions.”

In summary the air quality assessment that was conducted for the Project included a dispersion modelling assessment for the prescribed pollutants nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and small particulate matter (PM₁₀).

Fugitive dust was identified as being the key issue for the construction phase whilst the operations phase would result in gaseous emissions to atmosphere including SO₂, NO₂ and a number of trace pollutants. No exceedences of air quality standards for human health are predicted at any of the sensitive receptors in the study area for any of the prescribed pollutants assessed. Similarly, the risk to human health from acute or chronic exposure to air emissions from the power station is predicted to be low.

Through considered design there has been careful selection of the Project's emissions abatement technology to meet the required air quality standards.

The Power Station Project's primary design measure to reduce SO₂ emissions is through the addition of lime sand to the coal fuel before it is fed into the fluidised bed boilers. The injection of lime sands with the fuel feed results in a chemical reaction within the boiler that binds the lime with the sulphur from the coal to form a solid particulate. The solid particulate is then removed from the boiler with the bottom ash. The ash is then collected and returned to the mine and backfilled into the void along with the other solid (including flyash) waste streams from the power station and saline solids from the evaporation pond.

The selection of fluidised bed boilers was influenced by their ability to both remove SO₂ and reduce the generation of oxides of nitrogen. This technology is being used at similar scales to that proposed by Coolimba's development partner AES around the world.

The findings of this assessment show that the maximum ground level concentration at sensitive receptors included in the study are compliant with the appropriate standard, for dust, gaseous emissions NO₂, SO₂ and PM₁₀.

Whilst this is a desirable situation, whereby the likely effects of the power station emissions on air quality are acceptable in accordance with prescribed limits in legislation and recognised guidelines, the environmental management of the Project requires ongoing monitoring and surveillance to ensure the predicted concentrations are reflected in the power stations operations.

Coolimba has recognised the limitations of the meteorological data used for the air quality modelling and therefore has committed to the installation of an onsite meteorological station. The advantage of gathering onsite data such as this is that future scenarios or unforeseen modifications to the process can be incorporated into a predictive model able to identify the likely impact on identified receptors before the action has been taken. The on site data progressively replaces the data used in this assessment and the model can be improved in accuracy and precision which take into account site conditions. This onsite meteorological station will be installed in adequate

time to include the data collected from it in a model validation process prior to final design of the power station being completed.

Coolimba has committed to the monitoring of SO₂ emissions from the Coolimba Power Project in accordance with the requirement of the DEC license. The SO₂ monitors will be established 12 months prior to commissioning to give an adequate period of background levels.

The program of radiosondes or similar is not required until after commissioning.

Coolimba will continue to consult with the Air Quality Management Branch throughout the final design of the power station.

Issue 6.1.2 *"The, release of pollutants from the burning of the coal in the power station needs to be managed and monitored to ensure no adverse impacts in the local area. Please provide more detail on operational monitoring plan for stack emissions."*
"This area is an international biodiversity hotspot any emissions from the powerstation/mine should be minimised to reduce impact on the natural ecosystem."

Raised by Public Submission #1

Response Through considered design there has been careful selection of the Project's emissions abatement technology to meet the required air quality standards.

The Power Station Project's primary design measure to reduce SO₂ emissions is through the addition of lime sand to the coal fuel before it is fed into the fluidised bed boilers. The injection of lime sands with the fuel feed results in a chemical reaction within the boiler that binds the lime with the sulphur from the coal to form a solid particulate. The solid particulate is then removed from the boiler with the bottom ash. The ash is then collected and returned to the mine and backfilled into the void along with the other solid (including flyash) waste streams from the power station and saline solids from the evaporation pond.

The selection of fluidised bed boilers was influenced by their ability to both remove SO₂ and reduce the generation of oxides of nitrogen.

The modelling of air emissions that was completed by Katestone and presented in the PER did not identify any adverse impacts on the natural ecosystems.

Coolimba has committed to the installation of a meteorological station and the review of air quality modelling using on-site meteorological data and the monitoring of SO₂ emissions from the Coolimba Power Project in accordance with the requirement of the DEC license.

The monitoring would propose to establish baseline conditions and confirm that the emissions from the operations phase of the Project are below regulatory standards. Monitoring will need to include periods when lime sand is not being injected (approximately 1% of the time) for comparison with normal operations when desulphurisation is applied.

Issue 6.1.3 *“Emissions from the power station stack will need to be frequently monitored as easterly winds blow directly from the site over the township of Leeman.”*

“Why are there no monitoring sites for dust, particulates and air borne emissions in Leeman?”

Raised by Public Submission #2

Response Coolimba has committed to the monitoring of SO₂ emissions from the Coolimba Power Project in accordance with the requirement of the DEC license.

No monitoring sites are proposed for Leeman as there are no predicted impacts in the region of the Leeman township.

Issue 6.1.4 *Given the demonstrated potential for exceedances of the SO₂ NEPM standard to increase proportionally with desulfurisation downtime, there is a need for the proponent to operate the power station so as to limit desulfurisation downtime to say 1% of the time. The emissions of SO₂ without desulphurisation are very large”*

Raised by the Department of Environment and Conservation – Air Quality Management Branch

Response Coolimba acknowledges that the air quality impacts of not applying desulphurisation technologies are significant.

For this reason Coolimba has sought to design a project with suitable desulphurisation as a core operation.

SO₂ emissions may be affected by both the variability in the coal sulphur content and the performance of the flue gas desulphurisation system. The stochastic modelling method assessed the probability and frequency that an exceedance of the NEPM(Air) standard for the 1-hour average of SO₂ was likely to occur due to the following variable parameters:

- Non-normal operations occurring with the flue gas desulphurisation system not operating for 1, 2 and 5% of the year.
- Full distribution of coal fuel sulphur contents.
- 100% capacity factor.
- Full range of meteorological conditions.

If the desulphurisation system is not operating for 1% of the year, then:

- An exceedance of the NEPM(Air) standard for the 1-hour average of SO₂ is likely on one hour per year in the area within approximately 3 km to the north and northeast, and approximately 5 km to the west of the Power Station.
- An exceedance is not predicted at the location of any nearby sensitive receptors nor at the town of Eneabba.

If the desulphurisation system is not operating for 2% of the year, then:

- An exceedance of the NEPM(Air) standard for the 1-hour average of SO₂ is likely on one to two hours per year within an area approximately 7 km to the north to east, and up to 10 km to the west of the Power Station.
- An exceedance is not predicted at the location of any nearby sensitive receptors nor at the town of Eneabba.

If the desulphurisation system is not operating for 5% of the year, then:

- An exceedance of the NEPM(Air) standard for the 1-hour average of SO₂ is likely on one hour per year up to 15 km from the Power Station and up to five hours per year closer to the plant.

- An exceedence is predicted to occur for one hour per year at the location of any nearby sensitive receptor (<15 km).
- An exceedence is not predicted at the town of Eneabba.

The results reveal that even when the desulphurisation system is not operating for 5% of the year an exceedence of the NEPM(Air) standard for the 1-hour average of SO₂ is likely on only one hour per year up to 15 km from the Power Station and up to five hours per year closer to the plant.

It is expected that the maximum time the system would not be operating would be 1% of the year.

The NEPM allows 1 day per year exceedence of the maximum 1-hour concentration limit for SO₂.

The monitoring would propose to establish baseline conditions and confirm that the emissions from the operations phase of the Project are below regulatory standards. Monitoring will need to include periods when lime sand is not being injected (approximately 1% of the time) for comparison with normal operations when desulphurisation is applied.

Issue 6.1.5 *“CCWA is concerned about the impacts of sulfur emissions from the power station on this local and regional vegetation in the form of localised acid-rain.”*

Raised by the Conservation Council of WA

Response The Coolimba Power Station will have desulphurization technology included in the form of circulating fluidized bed boilers to manage the emissions of SO₂ through the addition of lime.

It is expected that the maximum time the system would not be operating would be 1% of the year.

The air emission modeling confirmed that if the desulphurisation system is not operating for 1% of the year, then:

- An exceedence of the NEPM(Air) standard for the 1-hour average of SO₂ is likely on one hour per year in the area within approximately 3 km to the north and northeast, and approximately 5 km to the west of the Power Station.
- An exceedence is not predicted at the location of any nearby sensitive receptors nor at the town of Eneabba.

There is no evidence to suggest that the sulfur emissions from the proposed power station will cause acid-rain. See also the response to Issue 6.1.4 on desulphurisation.

Issue 6.1.6 *“Were dust issues from the proposal assessed in light of the Iluka operations to the east of the proposal area? Cumulative impact from dust may pose an unacceptable scenario.”*

Raised by the Department of Environment and Conservation - Terrestrial Ecosystems Branch

Response The potential dust issues arising from Iluka’s mineral sands operations were considered in the air quality assessment studies.

A background level of 30 µg/m³ was used in the assessment based on the reported levels from recording conducted by Iluka at the Eneabba monitoring location. Reported dust monitoring was generally less than 30 µg/m³ so a conservative level of 30 µg/m³ was chosen.

Issue 6.1.7 *“Dust exceedances at nearby receptors remain a concern with both projects. The proponent should ensure that the proposed dust management and monitoring plans are implemented in a timely fashion and comply with DEC reporting requirements. It would be appropriate for DEC to develop strategies which can provide feedback to DOH on the implementation of the Dust Management Plan and should circumstances arise where health standards may be breached, to include DOH in response processes.”*

Raised by the Department of Health

Response Coolimba will ensure that the dust management and monitoring plans are implemented in a timely fashion and comply with DEC reporting requirements. The plans will include regular feedback to DEC and DoH and include DoH in the response process to any breach.

6.2. Liquid and Solids Waste Management

Issue 6.2.1 *“If the 150 hectare ponds are bunded and lined where are the monitoring practices outlined in the environmental review?
How safe are these ponds in the event of a 50 or 100 year weather events?
“How will the underground aquifers and adjoining creeks be monitored over the life of the project?”*

Raised by Public Submission #2

Response Section 8.5.3 of the CPP PER details the management processes and commitment of Coolimba with regard to the environmental impact of process water.

The storage, handling and disposal of materials will comply with all the local and State regulations. Final design and construction will be confirmed with the DEC during license approvals.

Commitment 11 in the PER states that Coolimba commits to ongoing ground and surface water monitoring to identify any changes to water quality from the Project’s operations.

Details of the required monitoring practises and related management plans will be

developed during works approvals.

In the event of 50 or 100 year weather events Coolimba believes that the localised and regional flooding necessary to create a breach of the Coolimba storage facilities will be adequate to dilute any stored water to a point where it does not create an environmental issue.

Monitoring of the ground and surface water will be monitored by physical inspection, recording and laboratory analysis over the life of the project through regular seasonal monitoring of quality and levels of both surface and groundwater.

Issue 6.2.2 *There are general requirements for AVIVA - Central West Coal Project and the Coolimba Power Project to control pests (weeds, plant pathogen, vermin, vectors, feral animals etc) on the site. AVIVA's proposal has identified the presence of weeds, dieback and feral animals at the site and highlighted the issues related to clearing of the land (vegetation), and that increased activity around the power station and surrounding area from personnel and vehicles will increase feral animals, vermin and the spread of weed and dieback. AVIVA has drafted an Environmental Management Plan to implement controls to deal with these pests.*

It is expected that any treatment and application of pesticides must be applied in accordance with the Health (Pesticides) Regulations 1956. In addition, contractors, persons who are applying the pesticides for reward must be appropriately trained and hold a current Pesticide License and be employed by a Registered Commercial Pest Firm. However, if the proponent company wishes its own employees to apply pesticide(s) as part of their Pest Management Program, then the employees should be provided with sufficient knowledge, skills, training and the personal protective equipment to safely apply the pesticide(s). Furthermore the need to adequately store handle pesticides on site should adhere to the AS 2507:1998 Australian Standard for the storage and handling of agricultural and veterinary chemicals.

AVIVA's Environmental Management Plan should include development, implementation, monitoring and evaluating processes for the prevention and control of pests (such as weeds weed pathogens, vectors, vermin, Feral animals etc) and must include education of all employees, contractors, visitors and the public to the site. Education should cover proper disposal of waste material, limiting access to non-essential tracks and ensure good hygiene practices are used to prevent pests being conveyed and attracted to operational site activities.

Raised by the Department of Health

Response All treatment and application of pesticides will be applied in accordance with the Health (Pesticides) Regulations 1956.

All persons who are applying the pesticides will be appropriately trained and hold a current Pesticide License and be employed by a Registered Commercial Pest Firm or be provided with sufficient knowledge, skills, training and the personal protective equipment to safely apply the pesticide(s).

All storage and handling of pesticides on site will adhere to the AS 2507:1998 Australian Standard for the storage and handling of agricultural and veterinary chemicals.

The Environmental Management Plan will include development, implementation, monitoring and evaluating processes for the prevention and control of pests (such as weeds weed pathogens, vectors, vermin, Feral animals etc) and will include appropriate education of all employees, contractors, visitors and the public to the site.

Issue 6.2.3 *“Fluidized Gas Boilers will produce an unspecified amount of organic sulphur particulates which are to be buried in the spoil.”*

Raised by Public Submission #2

Response There are no proposed fluidized gas boilers in the project. The residue from the combustion of coal in the Fluidised Bed Boilers will be co-disposed with mine overburden in the mine backfill operation. This removes the need for separate ash storage dams and is a preferable environmental outcome.

The volume of ash residues is predicted to be approximately 820,000tpa.

6.3. Greenhouse Gas Emissions

Issue 6.3.1 *The appropriateness of the fuel being used*

Raised by Greenpeace Australia and Conservation Council of Western Australia

Response The Western Australian energy market (WEM) regulated by the Independent Market Operator is a capacity based market which strives to ensure that there is sufficient generation capacity available at any point to meet the maximum demand from the market. In addition the WEM needs to ensure that it secures a reliable supply of competitively priced base-load energy. The most suitable fuels for base-load energy are fossil fuels as they provide both competitive pricing and secure reliable generation. There is a serious shortage of gas available for domestic use in Western Australia and the currently available renewable generation options do not offer the reliability required by the market.

The Coolimba Project has been designed to be CCS ready (refer below). Being CCS ready will enable Coolimba to be converted to capture and sequester its future greenhouse gas emissions when CCS is fully available.

Whilst Coolimba is not a renewable project it is worthwhile to note that the Project will support the addition of more renewable and intermittent fuels such as wind and solar in the Midwest region of the South West Interconnected Network (SWIN). This support comes from having the large, reliable secure base-load generation available to support the intermittent generation options.

Issue 6.3.2 *“A combined-cycle gas turbine has a lower GHG emission intensity and therefore is considered best practice technology for gas-fired power stations. The Coolimba power station project should be required to adopt best practice technology; otherwise, strong justification needs to be provided.”*

Raised by the Office of Climate Change

Response The PER seeks approval for the OCGTs to operate as peak demand power generators. The short start-up times associated with the OCGTs mean that they can adequately satisfy short-term peaks in electricity demand from the SWIS grid. The provision of the OCGTs acts as a supplementary secure energy source for the region.

OCGTs are the most economical units to run as peaking units and are the best practise for this type of generation unit. OCGTs also complement wind generation through their fast start up operation to pick up when the intermittent wind generation falls off.

The project envisages converting the OCGT's to CCGTs in the event that they are required for long term base load type generation. Once the Project is ready to convert to CCS, the conversion proposal may incorporate the OCGTs being converted to base load units.

Issue 6.3.3 *“The need to burn coal to produce power with current Greenhouse gas concerns. Gas fired stations are generally much more efficient and cleaner. These could also be located closer to where the power is needed, reducing transmission losses.”*

Raised by Public Submission #1

Response The Coolimba Project provides a secure supply of energy to the SWIS at a time when energy security is being pressured from a number of areas including supply of fuel.

The Coolimba Project is also located in an area that presents a diversity of generation locations and meets the needs of the current and predicted growth in the Northern Country portion of the SWIS (Midwest WA).

The location of the Coolimba Project is ideal for reducing transmission losses and supplying reliable secure power to the Midwest and the Perth metropolitan regions. Power consumers are widely spread across the SWIS, generation is best located close to fuel with the SWIS network providing the distribution to the consumers.

Coolimba is being designed to be CCS ready with the intention to convert to CCS when the necessary framework, commercial drivers, technologies and approvals are in place.

Issue 6.3.4 *“CCWA is opposed to the development of the Central West Coal Project and the Coolimba Power Station Project by Aviva Corporation Ltd due to the dangers of greenhouse gas pollution generated by the coal mine and power station.”*

Raised by the Conservation Council of WA

Response Coolimba is being designed to be CCS ready with the intention to convert to CCS when the necessary framework, commercial drivers, technologies and approvals are in place.

Conversion to CCS will reduce the GHG emissions by up to 90% making Coolimba the lowest GHG emitting baseload power station on the SWIS.

The other responses to issues in this section 6.3 are also helpful in consideration of this issue.

Issue 6.3.5 *"It is also not clear if line losses from transmission is included in the GHG calculation. This is a cumulative amount that should be calculated to fully assess the project impact."*

Raised by the Department of Environment and Conservation

Response Line losses from transmission are not included in the calculation of GHG generated by the Coolimba Project.

If there was a way of determining the amount of line losses from transmission before and after the addition of Coolimba to the SWIS it would demonstrate that Coolimba saves a certain amount of total generation (to supply the losses from transmission) and therefore a certain amount of GHG generation each year. The reduction in power losses associated with generation in the South West and consumption in the mid west will create a net environmental benefit from the introduction of Coolimba to the SWIS.

Issue 6.3.6 *"The Central West Coal Mine and the Coolimba Power Station will generate 4.05 MtCO₂ per year which is approximately 5% of WA's current greenhouse gas emissions and 27% of the State's emissions from electricity generation. These figures represent significant contributions to the level of Western Australia's greenhouse gas pollution." "The Coal feedstock that is proposed is significantly more emissions intensive than WA benchmark Collie coal, and the subsequently, the emissions intensity of the proposed power station (approx 1315kg/Mw hour) will be significantly worse than, for example, Collie A power station (951 kg CO₂-e/MW hr) and significantly worse than the average emissions intensity for the SWIS (910 kg CO₂-e/MW/hr)"*

Raised by the Conservation Council of WA

Response The GHG emissions from Coolimba and CWC are approximately 4.280 Mt CO₂-e.

Coolimba's CO₂-e emissions will contribute 0.73% to the total annual CO₂-e emissions for Australia and approximately 6.11% to the total annual CO₂-e emissions for Western Australia.

The total GHG emissions of 4.280Mt CO₂-e shown in the PER includes the GHG emissions from the following activities that are not valid inclusions for making comparisons with other stand alone coal fired generation units:

- 0.438 Mt CO₂-e of GHG emissions from the proposed gas fired units
- 0.053 Mt CO₂-e of GHG emissions from the coal mine activities

These items need to be removed to make a more meaningful comparison with other stand alone coal fired generation units.

The remaining 3.789 Mt CO₂-e of GHG emissions from the coal units and related activities alone is equal to 1,012kg CO₂-e /MW hr.

As a direct comparison then it can be seen that the GHG emissions from Coolimba is

approximately 7% more than the GHG emissions from Collie A (as stated by the CCWA).

Whilst Coolimba is more GHG emissions intensive than Collie A (or the SWIS average), due to the intrinsic thermal qualities of its coal fuel source, it will be the only power station in the State (and maybe Australia) that is built CCS ready and able to take advantage of CCS opportunities in the future (when the necessary framework, commercial drivers, technologies and approvals are in place), to reduce its GHG emissions to approximately 10% of total emissions or less than 150 CO₂-e /MW hr. This will be a significant long term benefit to the State of WA and the environment.

Issue 6.3.7 *"The OCC supports the proponent's efforts to ensure that the plant is made CCR as carbon dioxide capture and geosequestration holds the largest potential for GHG mitigation for a coal fired power station."*

Raised by the Office of Climate Change

Response Coolimba appreciates the support of the OCC as efforts are made to ensure that the Coolimba Power Station will be CCS ready. Coolimba agrees that CCS does hold the largest potential for GHG mitigation for a coal fired power station.

Issue 6.3.8 *"... only a staged process to investigate the potential for geosequestration is presented as GHG mitigation, many other actions are available to reduce carbon impact and should be investigated and adopted by the proponent."*

Raised by the Department of Environment and Conservation

Response Coolimba has investigated many methods of GHG reduction, abatement and mitigation.

Coolimba has chosen not to pursue bio-sequestration offset options as they are not viable in the Western Australian scenario, will not make a meaningful reduction in CO₂, are exposed to significant long term risk of failing to sequester the proposed amount of CO₂ and will only serve to distract Coolimba from achieving the best possible outcome which is advancing the prospects of CO₂ capture and storage.

The addition of Coolimba to the North Country section of the South West Interconnected Grid (the power network) will facilitate the addition of significant quantities of wind generators that are currently unable to service the grid due to the concerns of intermittent generation not being supported by baseload generation. Coolimba does not see any immediate advantage in being another wind generation proponent in a long list of proponents.

Coolimba will continue to ensure that all possible GHG reduction methods will be investigated and where possible adopted during the detailed design phase of the power station and through the implementation of CCS technologies.

A staged approach to real and meaningful CO₂ reduction through CCS research and implementation is a much more realistic and appropriate method of addressing the environmental impacts of Coolimba's CO₂e emissions.

The Commonwealth Department of Resources, Energy and Tourism has recently announced its intention to fund several CCS projects to assist in the adoption of CCS technologies to address the CO₂e generated in Australia. Coolimba believes it stands a

very good chance of being selected and thereby assisting Australia to achieve its long term GHG targets.

Issue 6.3.9 *“The fact that it will be constructed so that it will be ready for carbon capture and storage is a nonsense as this technology is still being researched and it may never be available during the life of the power station and almost certainly would not be economic to install and operate even if it is technically feasible.”*

Raised by the Wildflower Society of Western Australia

Response Whilst the position of the Wildflower Society is understood we suggest that it is based on a lack of current understanding of the developments in CCS technologies around the world and within Australia.

Considerable global effort has already gone into the definition, trialing and demonstration of CCS technologies.

Capture technologies are being trialed in pilot plants around the world and pilot plants are under construction in Australia.

The Commonwealth Government of Australia has set up and committed funding for a number of years to the Global Carbon Capture and Storage Institute (GCCSI) which is based in Canberra, Australia. The purpose of the GCCSI is to promote the construction of structures and technologies throughout the world capable of turning harmful emissions into resources. The Global CCS Institute is to be hosted in Australia and all of the G8 member countries will be founder members. US President Barack Obama, British Prime Minister Gordon Brown, Canadian Prime Minister Stephen Harper, Mexican President Felipe Calderón and President of the Korean Republic Lee Myung-bak all voiced their support for the initiative at the G8 Summit in 2009.

Coolimba has been working with the GCCSI since its initiation.

In 2009 Prime Minister Rudd also announced \$2.5Billion would be made available for early adoption of CCS technologies in a number of locations around Australia, further demonstrating Australia's considerable commitment to CCS as part of its approach to managing GHG emissions.

Coolimba is well advanced (possibly the most advanced) in defining its storage locations and storage capacities. On 27 February 2009 Coolimba released the findings of a “Regional Study of CO₂ Geosequestration Potential in the Northern Perth Basin, Western Australia” prepared by CO₂CRC (Australia's preeminent authority on CCS) into the possible locations for sequestration in the Northern Perth Basin.

The study investigated three possible mechanisms for the storage of CO₂ - in depleted oil and gas reservoirs, deep saline aquifers and deep coal measures - with the study area confined to the onshore areas of the North Perth Basin, broadly in the region from Dongara to Eneabba.

The study concluded that there is potential CO₂ storage capacity for up to 40 million tonnes in the Beharra Springs, Dongara and Woodada depleted gas reservoirs. The study also identified several deep saline reservoirs in the region with a CO₂ storage potential that would exceed the lifetime CO₂ production of the power station. These reservoirs, with potential capacity of 500 million tonnes, require additional evaluation in order for their capacity to be confirmed.

Aviva's partnership with AES enabled the use of extensive data from AWE oil and gas fields in its study giving the results a degree of certainty that exceeds all other potential WA sequestration sites.

Coolimba is investigating technical and funding partnerships to accelerate the implementation of a CCS project in the North Perth Basin including the Commonwealth Government's financial commitment to fund CCS projects.

Further commercial possibilities include the potential to utilise the CO₂ from Coolimba to enhance the recovery of oil from AWE's Dongara oil reservoir.

Coolimba is one of the best placed Australian projects to utilise CCS to make a significant contribution to reducing Australia's GHG emissions in the future.

Issue 6.3.10 *The OCC recommends that the proponent be required to assess its pre-investment options against the guidance outlined in Sections 7 to 10 of the International Energy Agency's CO₂ Capture Ready Plants. The section(s) relevant to the proponent's preferred technology for carbon capture should be used. Decisions on the adoption or otherwise of each pre-investment option are to be justified."*

Raised by the Office of Climate Change

Response Coolimba has already committed to the following.
Commitment Number 1

"i. Coolimba will design and construct the power station in such a way as to be suitable for conversion to CO₂ capture technologies.

- Design – Coolimba will ensure that its plant design incorporates all of the currently known components necessary for future operation as a carbon capture plant. Coolimba will consult widely on these design elements and share final design plans with the regulatory agencies as far as confidentiality and intellectual property obligations permit.*
- Construction – Coolimba will construct the power station incorporating the design elements from above to allow future conversion of the boiler and plant to carbon capture with minimal disturbance to operations and the environment. It is expected that this will be an additional capital cost of approximately 3% over and above the required construction cost of the total non capture ready power station.*
- Implementation Strategy – Coolimba will develop an execution strategy to implement the installation of the carbon capture technology regardless of ultimate carbon capture technology in as seamless a manner as possible."*

Extract from Coolimba PER Section 8.3.

Coolimba will ensure that in its design it will consider the guidance outlined in Sections 7 to 10 of the International Energy Agency's CO₂ Capture Ready Plants. The section(s) relevant to the proponent's preferred technology for carbon capture will be used. Decisions on the adoption or otherwise of each aspect of the CCS readiness plant elements will be justified and presented to the EPA for consideration and discussion.

Issue 6.3.11 *“A plant that is carbon capture ready is pointless without the identification of a suitable geosequestration site capable of sequestering the captured carbon dioxide gas. The OCC is concerned that the proponent has yet to identify a site with the capacity to sequester the total captured carbon dioxide. The three depleted gas reservoirs have a total capacity of 40 million (tonnes, translating to approximately 12 years of the coalfired power plant's carbon dioxide emissions. Although the study concludes that there are several deep saline reservoirs with total capacity of 500 million tonnes, the PER does not provide details on the capacity of each reservoir. Using multiple geosequestration sites is likely to increase the cost of carbon capture and storage (CCS). The proponent should identify one or a few suitable storage sites each capable of storing all of the coal-fired power plant's captured carbon dioxide gas over its lifespan. Once the preferred site(s) is identified, the proponent's decision should be peer-reviewed by an independent third party.”*

Response Coolimba agrees that CCS requires storage options that are able to deliver the storage requirement.

Coolimba believes that it has already identified adequate sites to store a significant portion of GHG if not all GHG that are possible of capture from the Coolimba plant.

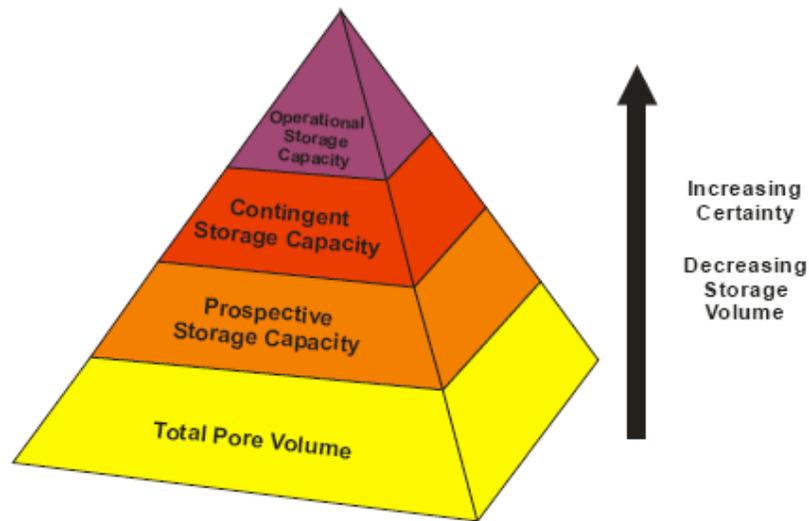
Coolimba believes this because of the conclusions of the work that has already occurred and the confidence of the conclusions that have been reached.

Whilst there is no current internationally recognized code for classification of CO₂ storage possibilities there is already in existence a proposed CO₂ volume classification system.

This system (proposed by CO₂CRC in a March 2008 Report titled Storage Capacity Estimation, Site Selection and Characterisation for CO₂ Storage Projects CO₂CRC March 2008, CO₂CRC Report No: RPT08-1001, refer https://extra.co2crc.com.au/modules/pts2/download.php?file_id=2144&rec_id=1033) proposes 4 levels of classification each with increasing levels of certainty (not unlike the JORC code of mineral classification).

The levels (in increasing levels of certainty) are:

Continued over page



Aviva's partnership with AES has enabled the use of extensive data from AWE oil and gas fields in its study giving the results of the CO2CRC study into the potential of the North Perth Basin a degree of certainty that exceeds all other potential WA sequestration sites.

The Executive Summary of the "Regional Study of CO₂ Geosequestration Potential in the Northern Perth Basin, Western Australia" prepared by CO2CRC concluded that the near depleted gas fields in the region had the contingent storage capacity of 21.1MT CO₂ to 40.5Mt CO₂. Further, the regional study concluded that the prospective storage capacity of the regional deep saline formations was in the order of 512Mt.

Further work is required on all these potential storage options however the current level of certainty and confidence in the storage capacity is reassuring.

In the PER Coolimba committed to the following.

Commitment Number 1

"ii. Coolimba will verify the suitability of the North Perth Basin for geological storage of CO₂ and continue to consult with all stakeholders to develop the appropriate understanding of the CO₂ storage possibilities and the impacts and issues that exists with their use.

- *Coolimba will communicate the results of the current North Perth Basin CO₂ Storage Study with regulators and stakeholders.*
- *Coolimba will work with relevant interest groups to conduct field investigations to confirm the study findings and determine the detailed requirements to support approval for the sequestration of the CO₂.*
- *Coolimba will define, install and manage the required monitoring to provide baseline data to support environmental impact assessments and approval of the future CO₂ storage project"*

Current Storage Capacity

Whilst the storage capacity in the “prospective classification” is adequate for all the CO₂ emissions the capacity that is currently classified as “contingent” is only adequate to handle a portion of the emissions.

The coal fired GHG emissions are approximately 3.637Mtpa of which it is estimated that approximately 90% or 3.273Mtpa would be able to be captured. If the project ran for 30 years this would result in 98.2Mt of GHG emissions to store.

The storage capacity that is classified as “contingent” is adequate to store approximately 21% to 41% of these emissions. Whilst not the entire potentially captured GHG emissions, these storage locations are adequate to store all the emissions captured by a demonstration plant of global scale and significance.

Details of the individual storage formations is contained in the “Executive Summary for Public Dissemination” of the Regional Study, issued in April 2009.

Using multiple geosequestration sites is likely to increase the cost of CCS, however, all of the storage sites considered in the Regional Study are relatively close (i.e. less than 100km) to the proposed power station location and many of them present potential commercial revenue streams such as enhanced oil recovery which will go some way to offsetting the cost. Having a range of storage locations will also provide opportunities for considerable advancement of knowledge of storage locations.

The potential storage locations are being determined and studied and final selection will be assisted by the pre-eminent body on CCS in Australia, the CO₂CRC.

Issue 6.3.12 *“... the proponent has yet to identify a site with the capacity to sequester the total captured carbon dioxide.”*

Raised by the Office of Climate Change

Response Refer to the response to the above Issue 6.3.11.

Issue 6.3.13 *“The proponent should also assess potential route(s) to preferred geosequestration site(s) and identify any potential barriers to using their preferred site(s).”*

Raised by the Office of Climate Change

Response Coolimba has made a preliminary assessment of the potential routes and potential barriers to using the potential sequestration sites.

The assessment identified landholder rights of access and the diversity of flora in the area to be the major items requiring consideration.

The existence of pipeline and other easements in the area were considered to be advantages for potential use of CO₂ pipelines if required.

Further assessment of these matters will be a part of future studies and environmental approval processes. This level of detail is not within the scope of this proposal. Coolimba will include this matter in its future feasibility studies for CCS implementation. Please refer to the amendment to Commitment 1.

Issue 6.3.14 *“...the proponent should be required to submit the feasibility study and any updates to the EPA for approval and inclusion in the EPA’s assessment of the economic and technical feasibility of CCS. If a fully functional emissions trading scheme is not in place when CCS is judged feasible by the EPA, the proponent should be required to retrofit CCS to the project’s full capacity within a set timeframe.”*

Raised by the Office of Climate Change

Response In the PER Coolimba committed to the following.

Commitment 1

“iii. Coolimba will work with relevant interest groups to complete regular studies and prepare a Definitive Feasibility Study so that the relevant stakeholders will have the best information for decision making.

- 1 year before commissioning - Presentation of a Pre Feasibility Level Study
- 5 years after commissioning of Coolimba – Presentation of the first Definitive Feasibility Level Study (DFS)
- Every 3 years after the first DFS – Presentation of a refreshed DFS.

Issue 6.3.15 *“Prior to CCS implementation, the OCC recommends that the proponent refer the proposal to the EPA to ensure that all environmental impacts have been adequately addressed and monitoring and contingency plans are adequate.”*

Raised by the Office of Climate Change

Response The CCS Implementation Project will be submitted referred to the EPA. The EPA will consider the adequacy of the referral and the level of assessment required.

Issue 6.3.16 *“The proponent should indicate when the CCS technology will be available and applied to the project.”*

Raised by the Office of Climate Change

Response Coolimba is unable to advise when the CCS technology will be available or when it will be applied.

Considerable effort is being applied globally to the demonstration of CCS technologies and Coolimba will ensure that it is built CCS ready so it can adopt CCS technologies and outcomes when the following matters are addressed:

- when the necessary framework to allow the storage of GHG in geological formations has been developed and applied to Western Australia
- when the commercial drivers to deal with the additional capital and operating costs of applying CCS are put in place,
- when technologies are approved to a level to allow introduction, and
- when relevant environmental and operational approvals are in place.

Whilst Coolimba is committed to building a power station that is CCS ready (which will have an additional cost over a non CCS ready plant) and has committed to certain activities to advance or maintain Coolimba’s readiness there are many aspects of the

matters addressed above that are outside the control of Coolimba at this time.

Issue 6.3.17 *“The proponent should also explain how the plant's CO₂ emissions during the interim period (from start-up to post CCS application), will comply with the Australian Government's objective to reduce carbon emissions.”*

Raised by the Office of Climate Change

Response Coolimba will comply with the Australian Government's legislation as enacted on matters related to GHG's. This will include the CPRS in whatever form it is finally enacted. The CPRS will progressively and substantially increase the costs of permitting GHG emissions from the Coolimba project and force the incorporation of GHG reduction technologies as they become commercially viable.

Coolimba has been proposed from the outset as a project that will be best suited to deal with the legislation and policies enacted by the governments of Australia in response to the global concerns of climate change.

Coolimba will be designed, constructed, operated using best practices for carbon emission reduction currently commercially available and economically viable. Coolimba will be designed and constructed as CCS ready enabling ready conversion to CCS when viable.

Prior to the introduction of CCS technologies on the project, Coolimba will honour its commitment to assess the suitability of the Northern Perth Basin for geological storage of CO₂, continue to consult with key stakeholders to develop the appropriate understanding of the CO₂ storage possibilities and the impacts and issues that exists with their use, and work with expert advisors to complete regular studies and prepare a Definitive Feasibility Study so that the relevant stakeholders including government agencies will have appropriate information for decision making on the suitable time to install CCS on the Coolimba project.

Coolimba will work closely with the State and Commonwealth governments on these studies. Coolimba has submitted a proposal to the Commonwealth Department of Resources, Energy and Tourism for the CCS Flagships Program with the aim of Coolimba becoming one of the first CCS projects in Australia.

Issue 6.3.18 *“The proponent has indicated that the project will be Carbon Capture and Storage (CCS) 'ready', but has failed on several points to provide certainty that the CCS technology will ever be implemented. The proponent has failed to adequately address the following fundamental factors that would be necessary at a minimum to provide certainty to claims about the viability of CCS for this project:*

- a) whether Carbon Capture and Storage (CCS) is actually feasible in this location, including whether suitable geological formations exist to permanently store CO₂;*
- b) Exactly what circumstances would provide the 'trigger point' for moving to full CCS operation;*
- c) In the event that CCS is not feasible, what other options for offsetting emissions from the power station will be used.*

Raised by the Conservation Council of WA

Response Refer to the response to Issues 6.3.1 to 6.3.17 for further detail.

Issue 6.3.19 *“The proponent states that in the event of CCS coming on line, there will be ‘provision for additional generation capacity to supply the considerable energy load of a CCS plant’ establishing the firm possibility of increased power costs for the consumer. Is there a plan for the gradual introduction of CCS, is the idea practical or just conceptual at this stage?”*

Raised by Public Submission #2

Response The application of any GHG emission reduction will add cost to the generation of energy. The application of the Carbon Pollution Reduction Scheme (CPRS) will also add cost to the generation of energy.

All of these added costs will increase the cost of energy to the consumer.

Coolimba is being built CCS ready so it is able to deal with the issue of environmental pollution from GHG emissions and the economic issue of additional costs of dealing with GHG pollution.

It is estimated that the ‘parasitic load’ or additional energy required to run CCS technologies will be around 25% of the energy generated therefore requiring additional energy generation to produce the same amount of “net” salable energy. The OCGTs that are proposed may be used to supply some or all of this ‘parasitic load’.

Whilst the whole Coolimba plant is being designed CCS ready it will be possible to convert portions of the plant to CCS at different times thereby staging the introduction of CCS at Coolimba.

Coolimba believes that the work being done around the globe is very close to making CCS a practical (not only conceptual) reality.

Issue 6.3.20 *“Is CCS being tested, demonstrated or modelled anywhere at present?”
“Who holds the intellectual property rights for CCS?”*

Raised by Public Submission #2

Response CCS is being modeled, tested and demonstrated in many places in many forms around the globe.

The following list of Australian projects is not exhaustive:

Carbon Capture

- CS Energy in Queensland, Aust. is retrofitting its out of commission Callide A plant as a demonstration project involving the conversion of an existing 30MW unit to capture CO₂.
- Hazelwood and Loy Yang PCC in Vic, Aust. Have plans for a demonstration unit to capture and chemically sequester CO₂
- The ZeroGen - Stanwell Integrated Gasification Combined Cycle and CO₂ Capture and Storage Proposes to demonstrate integrating coal-based gasification and CCS to be commercial by 2015. The CO₂ is proposed to be transported approximately 200km by pipeline for storage in the Denison Trough (up to 400,000 tonnes CO₂ per annum).

Carbon Storage

- The Otway Basin CO₂CRC Project is demonstrating and studying storage

option in depleted gas fields.

Reuters reported on 21 July 2009 that “The European Union has pledged to have 10-12 demonstration carbon capture and storage (CCS) plants in operation by 2015 and the technology fully commercialised by 2020”.

Refer to <http://in.reuters.com/article/oilRpt/idINLL61331920090721> for the Reuters article.

CCS traps, transports and buries underground carbon dioxide, the main greenhouse gas blamed for global warming. While it can cut carbon emissions from coal plants by 90 percent, no commercial-scale project exists anywhere yet to demonstrate the technology, partly because the up-front capital costs are high.

Among functioning pilots are Swedish utility Vattenfall's VATN.UL 30 megawatt (MW) OxyFuel pilot plant in Schwarze Pumpe, Germany. ScottishPower (IBE.MC: [Quote](#), [Profile](#), [Research](#)) started up a 1 MW CCS test unit in May 2009 at its Longannet coal-fired power plant. Doosan Babcock will open its 40 MW OxyFuel test facility on July 24 2009 in Renfrew, near Glasgow.

Britain will help fund up to four CCS trials and require new coal-powered plants to fit the technology within five years of it being proved viable, probably by 2020. Carbon dioxide can be captured before or after combustion using a range of existing and emerging technologies. Following is a list of planned projects in Europe and slated operation dates.

<u>COMPANY/PROJECT NAME</u>	<u>FUEL</u>	<u>PLANT OUTPUT</u>	<u>TECHNOLOGY</u>	<u>OPERATIONAL</u>
Centrica, Teeside, UK	Coal	850 MW	IGCC	Postponed
Dong Energy, Denmark	Coal	400 MW	Postcombustion	2015
Enel, Brindisi, Italy	Coal	660 MW	Retrofit	2012
Endesa, Leon, Spain	Coal	N.A.	OxyFuel	2015
E.ON, Killingholme, UK	Coal	450 MW	IGCC	Cancelled
E.ON, Kingsnorth, UK	Coal	1,600 MW	Postcombustion	After 2014
Fortum, Finland	Coal	565 MW	Retrofit	2015
GE / Polish utility	Coal	1,000 MW	IGCC	N.A
Hypogen/ Dynamis, EU	Coal	N.A	Precombustion	2014-2016
Kaarstoe, Norway	Gas	384 MW	IGCC	Stalled
Mongstad, Norway	Gas	280 MW	Postcombustion	2014
Nuon, Eemshaven, Neth.	Various	1,200 MW	IGCC	2013
Powerfuel, UK	Coal	900 MW	IGCC	2013
Progressive Energy, UK	Coal	450 MW	IGCC	N.A.
RCI consortium, Neth	Coal	N.A.	N.A.	2015
RWE, Germany	Coal	450 MW	IGCC	2014
RWE, Tilbury, UK –	Coal	N.A.	Postcombustion	2016
RWE, Eemshaven, Neth.	Coal	160 MW	Retrofit	N.A
RWE, Blyth, UK –	Coal	N.A.	Retrofit	2014
RWE, south Wales,	Coal	N.A.	Postcombustion	2010

UK				
ScottishPower, UK	Coal	N.A.	Postcombustion	2014
Scottish & Southern, UK	Coal	800 MW	Retrofit	2014
Union Fenosa, Spain	Coal	N.A.	Postcombustion	2017
Vattenfall, Denmark	Coal	N.A.	Postcombustion	2013
Vattenfall, Germany	Coal	N.A.	OxyFuel	2015

6.4. Noise

Issue 6.4.1 *Noise Branch would again recommend the condition at the works approval and licensing stages that the proponent redo the noise impacts assessment and demonstrate the noise compliance when the detailed design information is available.*

Raised by the Department of Environment and Conservation – Noise Branch

Response Coolimba agrees with the assessment of the DEC Noise Branch that, “... at the buffer distance of at least 2 km, the proposed power plant would be able to be designed to fully comply with the noise regulations”. Coolimba also agrees with the assessment of the DEC Noise Branch that the “... noise control measures recommended by SVT to achieve full compliance reasonable and practicable.”

Coolimba does not see the need to redo the assessment of the noise impacts but confirms Commitment 9 in the PER to investigate and implement the most suitable noise attenuation measures during the design phase that will reduce the noise impacts to achieve compliance with the Environmental Protection (Noise) Regulations 1997 at any noise sensitive receptor identified in this assessment and Commitment 10 in the PER, to monitor noise levels from the power station at commissioning to validate the predictions of the modeling exercise. In the event that noise levels exceed the Environmental Protection (Noise) Regulations 1997, Coolimba will further investigate plant design initiatives to reduce noise to acceptable levels.

6.5. Other

Issue 6.5.1 *“The long term potential risk of AMD requires kinetic testing for accurate results.”*

Raised by the Department of Environment and Conservation – Midwest Branch

Response This issue, though raised in the DEC submission on the Coolimba project relates to the Central West Coal project and is addressed in the CWC responses to the DEC submission on the Central West Coal Project.

Issue 6.5.2 *“No assessment of actual or potential acid sulphate soils that may be encountered during transmission tower foundation construction has been included. If foundations extend to 8 meters and include dewatering, issues may be encountered or created.”*

Raised by the Department of Environment and Conservation

Response The location for the transmission towers will be within the proposed infrastructure easement.

This easement is located in an area where the depth to groundwater is in the range of 10 – 125 meters below ground level.

Coolimba does not expect that any foundations will be required to be dewatered as part of the construction of the transmission towers.

Should any foundations for transmission towers require dewatering Coolimba will conduct an assessment of the potential to create acid sulphate soils and develop a suitable management plan to address the issue with the input from the Department of Environment and Conservation.

Details of the arrangements for assessment of acid sulphate soils and notification of the DEC will be provided in the works approval for the transmission line.

7. RESPONSE TO SOCIAL ISSUES RAISED IN SUBMISSIONS

7.1. Community and Social Effects

Issue 7.1.1 *“The development is proposed in a region where mosquito-borne disease is not generally a major concern. However, under certain environmental conditions the region can experience problems, with nuisance mosquitoes and cases of Ross River virus have been reported.”*

Raised by the Department of Health

Response Coolimba agrees that mosquito-borne disease is not generally a major concern in the area of the project.

Coolimba will continue to monitor the environmental conditions and work with the Department of Health and local government authorities to identify health or nuisance impacts and develop management plans should it be determined that plans are required.

Issue 7.1.2 *Set up a social impact unit to consider and manage issues in consultation with communities.*

Raised by Public submission #2

Response Commitment 13 in the PER states that Coolimba will work with the relevant stakeholders to leave a positive legacy in the community.

Coolimba will work with the Shires of Carnamah and Coorow to manage community issues related to the construction and operation of the projects.

7.2. Temporary Camp Site

Issue 7.2.1 *"The PER does not assess the impacts of the accommodation camp."*

Raised by the Department of Environment and Conservation

Response As discussed in Section 9.1 of the PER, the Proponent is planning to have a largely residential operation workforce with employees and their families living in one of the nearby towns of Eneabba, Leeman, Greenhead, Dongara or Jurien. There is no anticipated need or intention to maintain a long term "accommodation camp" for employees.

During the construction phase however there will be a need to have a form of short term accommodation for the construction workers. The Project has looked at the options of basing that camp in Eneabba, Leeman, Greenhead or at the construction site and has not at this point determined the final location of the construction accommodation camp.

Coolimba believes that a part of the construction workforce could be accommodated in the short term accommodation that currently exists in the local towns (Jurien, Greenhead, Leeman already have a sizable stock of holiday style accommodation) however the project expects that there will be a need for a camp of some size. The required size is yet to be determined but is planned to be no more than 600 workers.

There are a number of options for accommodation of the construction workforce of up to 600 people for up to 4 years, including:

- Fully serviced accommodation camp for the entire workforce
- Partially serviced accommodation camp for the entire workforce (using local town facilities for some services)
- Fully or partially serviced accommodation camp for a portion of the workforce (using local town facilities for some services) and existing rental properties / facilities for the remainder of the workforce.

The preferred accommodation option will be largely determined by negotiation with the local shires to determine the best way to achieve Commitment number 13 of the PER which is to leave a positive legacy for the community within the region.

As a result of the range of options that exist Coolimba determined that the issues related to the final accommodation camp approval would best be determined and assessed at a time when those issues could be more appropriately defined.

Appropriate approvals for the accommodation camp will be sought at the appropriate time.

Issue 7.2.2 *"It is however essential that the proponent works closely with Council and the Community in relation to the temporary camp site."*

Raised by the Shire of Coorow

Response The proposed construction camp for the Coolimba Power Project and the Central West Coal Project will be located at a suitable site.

The location of the camp has been and continues to be openly discussed with the

Shire of Coorow. The site is expected to contain the accommodation, amenities and vehicle parking. The camp will provide for a capacity of 600 construction workers for both the power station and mine.

The camp is being designed so that it forms a beneficial feature for the Shire to use once the construction phase is complete.

Commitment 13 in the PER touches on the desire of Coolimba to work with the relevant stakeholders to leave a positive legacy in the community from the accommodation camp and ongoing relationship between the project and the community.

7.3. Traffic and Transport

Issue 7.3.1 *"The Shire of Coorow disputes that the roads would have the spare capacity to carry this volume of traffic with out a major reconstruction or sealing of the Penn and Erindoon Roads with in the Shire of Coorow. These roads have been only constructed to small traffic volumes of 30 to 45 vehicles per day. The current materials make these roads slippery during the winter months and the Penn road intersection is closed annually due to heavy rainfall events washing out the access. Council would have made its current traffic counts available to the consultants if requested.
The Shire of Coorow would like a commitment that the proponents would assist Council in lifting the quality of these roads to a bitumen standard as the road would not require upgrading without the expected level of traffic movements"*

Raised by the Shire of Coorow

Response Section 9.2.3 details the required management activities for the transport links.

CWC will discuss the upgrade requirement with the relevant authorities and offer appropriate assistance.

7.4. Aboriginal Heritage

Issue 7.4.1 *"... locations, which have been identified as significant to the Aboriginal community in the report, need to be submitted on site forms and sent to the Registrar of Sites in DIA."*

Raised by the Department of Indigenous Affairs

Response The site of the Coolimba Power Station has been surveyed by consultants representing the relevant claimant groups. There were no sites or items found of Aboriginal significance on the site for the Power Station.

Two distinctive features were identified during the survey near to the site of the Coolimba Power Station. Coolimba will report these distinctive features to the DIA and work through the process of confirming the validity of these distinctive features.

The site of the water management and treatment facilities has not been surveyed at this time. All of this area is on cleared agricultural land. Heritage surveys will be

conducted of all proposed areas of disturbance well prior to disturbance and reports of those surveys made available to the claimant groups and the DIA.

The path of the infrastructure easement has not been fully surveyed at this time. More than 70% of the proposed infrastructure easement is on cleared agricultural land. Heritage surveys will be conducted of all proposed areas of disturbance well prior to disturbance and reports of those surveys made available to the claimant groups and the DIA.

If required, Coolimba will seek Section 18 clearances for any confirmed sites.

Commitment 15 in the PER addresses this issue.

Issue 7.4.2 *Should cultural material be discovered during the project, work should cease immediately and the site should be recorded and the DIA notified.*

Raised by the Department of Indigenous Affairs

Response As outlined in the PER at Section 9.4 the proponent will prepare a management plan in consultation with the DIA and Native Title Claimant Groups to deal with any requirements for cultural material discovered during the project.

- *Should cultural material be discovered during the project, work in areas that directly impact the location of that material will cease immediately and the site will be recorded and the DIA notified.*
- *If the site is confirmed to be a site then a section 18 notice will be sought.*
- *Proponent will follow the requirements of Heritage Act.*

8. REFERENCES

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